

Research diary log.

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url : <http://bmarzouk.free.fr/search.txt>

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About ~ 31000 lines, 900 pages.

Diary : BEGIN @ ~ Line 575. p15.

Timeline.

Start

21.09.20 line 585.

01.01.21 line 3658. p104.

01.01.22 line 16518. p470.

01.01.23 line 28000. p777.

Some symbols :

* = videos reports (mostly youtube math videos).

® = reading reports (articles, books, web pages).

• = Personal notes; often enclosed between (thick or thin) arrows; thick being for important remarks, the thinner are more for comments.
 "===>" or "--->" mark their beginning and the reverse ones,
 "<===" or "<---" mark their end.

© = computers science notes.

Abbreviations & jargon :

I) maths.

ab	= abeli/an/nisation.
alg	= algebra(ic) or algebraically.
algeo,ag	= algebraic geometry.
app	= application.
approx	= approxima/te/tion.
arXicle	= arXiv article.
bbki	= Bourbaki.
birat,bir	= birational.
bsd,BSD	= Birch-Swinnerton-Dyer conjecture.
cat	= categor-y/cal.
cj(s)	= conjecture(s).
cm, CM	= complex multiplication.
cplx	= complex (ified, ification).
crt	= criterion.
cs	= computer science.
ctrex	= contre-example.
dbl	= double.
dbt	= doubt(ful).
def	= definite, definition(s).
deg	= degree.
den	= denominator.
dep	= dependent, dependency.
der	= derived, derivative, derivation.
det	= determinant.
dvt	= develop/ment.
diag	= diagram, diagonal, diagonalisable.
diff	= differentia/te/ble/l.
dioph	= diophantine.
ec	= elliptic curve.
end(o)	= endomorphism, endofunctor, endogenesis.
ext	= extension, extended, exterior.

frac	= fraction-al.
func	= function, functor.
geo(m)	= geometry.
grp(s)	= group(s).
hom	= homomorphi(c/sm), homeomorphi(c/sm).
hypg	= hypergeometric.
ind	= independent/ce.
inv	= invariant.
int	= inte/ger/gral.
intro	= introduction.
irr	= irreducible.
k_	= algebraic closure of k.
lin	= linear, linearity.
mem	= memoire.
mtv	= motiv/es/ic.
nber	= number.
num	= numerator.
ppties	= properties.
prg	= program.
proj	= projective.
prop	= proposition.
rat	= rational.
ref	= reference.
reg	= regular.
rep	= representation.
res	= resolution, resultant, result.
rh, RH	= Riemann Hypothesis.
rmk	= remark.
sch	= schemes.
sing	= singular/ity/ities.
sm	= smooth.
smprj	= smooth-projective.

th = theory.
 thm = theorem.
 top = topolog/y/ical.
 tr = trace, transcendent/al.
 transc = transcendent/al.
 trdeg = transcendantal degree.

uni-v = univer-sal/sity.

var = variety, variable.
 vect = vector, vectorial.
 vrb = verbally, verbosely.

II) computer sciences.

asm = assembly.

box = computer system (laptop, desktop pc).
 bt = bluetooth.

cal = california.
 cn = china-ese.
 conf = config(uration).
 cs = computer sciences.
 ctrl = control.

deb = Debian.
 dev = development, device.
 dir = directory.
 dload = download, pull.

e = electronics.
 ecc = elliptic curve cryptography.
 en = english.

fr = french.

gui = graphical user interface.

hd, hdd = hard-drive.
ide = integrated developpement environnement.
img = image.
jp = japan-ese.
mv = move.
nbook = notebook.
os = operating system.
phone = smartphone.
prg = program.
repo = repository.
rm = remove, delete.
ru = russia-n.
src = source.
us = usa.
vid(s) = video(s).
vm = virtual machine.

III) Internet.

eom = Encyclopædia of Mathematical Sciences.
ffox = Firefox.
g = Google.
ytube = YouTube.
wkp = Wikipedia.
evn = Evernote.
m\$ = Micro\$oft.
win\$ = Window\$.
fb = Facebook.
insta = Instagram.

To Do.

=====

- Coquilles in txts and TeXtes.

0) Txts.

A) search.txt : separate lines : date-begin.

alternating sum.

riemann hurwitz.

modulo \mathbb{Q} algebraic equivalence.

Spreading out sets the dna of the forecoming collected data.

Bouquets : spreading out- nodes along $\text{Spec}(Z)$

Arizona.

Log Div, Log Der.

th

endo.

B) Sites

post a winter tips page.

1) TeXtes.

A) serie.tex : max (ultra metric). check base solution.

-> Change ugrad series templates, retrieve underlines.

p1. replace "l-adique" by algèbre polynomiale graduée de degré ∞ = limite projective pour

$d \rightarrow \infty$ d'algèbres graduées $Ad[X]$, de polynomes de degré $\leq d$.

p4 : -1 in numerators of $F(z)$ (rational function+closed form).

p4 : bibliography "Fourier".

B) critere.tex

- p1. "sneaky" with "intricate". "former" by "former algebraic".
- p2. "path" with "band".
- p2. "Another object" with "Another original object".
- p5. "In that formulation, only an algebraic version".
- p5. "is not possible as formulated here". "No non-trivial".
- p6. "References" with "Reference."

--> For corrections/updates, use different :

- a) fonts.
- b) fonts styles.
- c) colors.

C) mem.tex.

French version.

typo on ellipsoid volume : lacks 1/3.

Groupe galois.

Dependence π et $E(\sqrt{2}/2)$.

r et π algébriquement indépendents.

p2 bot : La question de la répartition.

p5 mid : sur une variété algébrique.

p5 bot : spécialisation locales.

p8 bot : localisés du corps des fonctions.

p11 bot : variétés; indep algébriques de nombres (reels)

p14 mid : cj famille algébriquement libre sur \mathbb{Q} alors ...

pas de \mathbb{Q} -pt non trivial.

p22 top : $G_F(V)=h_F(G_V)$; l'ideal serait que $h_F = F$; ie $G_F(V)= F(G_V)$.

p22 bot : Du coté des motifs, déjà leurs applications aux points précédents (approximations des periodes fondamentales; Hodge De Rham); puis considerer

$K=k(P(V))$ avec $k = \mathbb{Q}$...

p22 bottom : en termes d'invariants periodiques.

D) slides.tex

The remaining versions of 2007 has many.

I remember that last updated versions of 2009 (in Hitachi stuck-hd) were bettered with corrections.

==> Try to fix that hd :

a) find parts or a complete spare.

b) learn deep technics.

- Rewrite.

- DNDE

$\alpha(\beta + \frac{1}{2}(\gamma - \beta))$

$\alpha + d[(0, \gamma); (\alpha, \beta)] = \alpha + \sqrt{(\alpha^2 + (\gamma - \beta)^2)}$

- Glueing $C/6 + L(\text{ramble})$.

Seems ok.

$Q\text{-pt} \rightarrow (\lambda, \mu, \rho)$ alg dep, since (λ, μ) are already alg dep (nested degeneration case).

- Transcendental cos.

$e^{it} = \cos t + i \sin t$, would be algebraic.

(it, e^{it}) both alg.

But z alg $\Rightarrow \ln z$ transc (Lindemann Baker th) : contradiction, if $z = e^{it}$.

So if t rat $\neq 0$, $\cos t$ transc.

Compute k^\wedge .

- Motives.

$\$V$, measure Module V .

\$Alg \to transc.
Polyakov measure.

- Surface.

$T = \text{tore}(r, R)$
 $V(T) = \frac{1}{2} r S(T).$
 $\chi(T) = 0.$
 $\pi_1(T) = \mathbb{Z} \oplus \mathbb{Z}.$

- Exp.
 $xy = \exp(x-y).$

- Ebauches.

1) Bouquets d'espaces.

$$\begin{array}{c}
 Y \text{---} Y \text{---} Y_i \text{---} Y \text{---} Y \\
 \backslash \quad | f_i | \quad | \quad / \\
 \quad \quad \quad X.
 \end{array}$$
 (Y_i, f_i) "arrows above X" :
 $f_i : Y_i \dashrightarrow X$ applications.

If X is a topological space covered by a family of sets $\mathcal{Y} = (Y_i)$

Topology on \mathcal{Y} or the (Y_i) : final topology associated to the (f_i) . When (f_i) are etale morphisms to a fixed X (resp from a fixed Y), so both X and Y are schemes, this gives the etale topology on X (resp Y).

Etale morphism $Y \dashrightarrow X$.

Existence of a covering (U_α) of X such that $V_\alpha = f^{-1}(U_\alpha)$ is a covering of Y satisfying $f_\alpha = f|_{V_\alpha} : V_\alpha \dashrightarrow \{\alpha\} \times U_\alpha$ and other regularity-flatness pptides (=flat+unramified).

Existence of a covering (U_i) of Y such that $f|_{U_i} : U_i \dashrightarrow f(U_i)$ gives a covering $(f(U_i))$ of X with $f(U_i) \sim \{i\} \times U_i$; plus other prerequisites of regularity-flatness.

\implies Consider the 2nd level : bouquets above the nodes of that structure or even bouquets above the structure itself; or add some structure to \mathcal{Y} for instance :

2) Bouquets de torseurs.

$Y \dashrightarrow Y \dashrightarrow Y_i \dashrightarrow Y \dashrightarrow Y.$ $\mathcal{Y} = (Y_i) : (X \dashrightarrow)$ torseurs under the action of G_i
 $\backslash \quad | \quad f_i | \quad | \quad /$ $f_i = F_i \circ \pi_i.$
 $X.$

(Y_i, G_i, f_i) family of torseurs above X , under the actions of the groups (G_i) . If the (Y_i) are a fixed Y ; a family of groups (G_i) acting on Y , invariantly against a fixed morphism to X (the correct term is equivariantly) , gives rise to a family of torseurs above X .

If the family (G_i) is replaced by a family of families $((G_{ij})_j)_i$ we get a double-indexed family of torseurs.

Clarify :

a) The isomorphism classes of such families are given by the cohomology classes G -structure of $|H^1(X, G)$ where $|H(X, G) = H(G, H_b(X))$.

b) The isomorphism-classes of such families are given by the cohomology classes living in $|H^1(X, G)$. "Define $|H(X, G) = H(G, H_b(X))$ ".

c) Explicit order in H .

$H(X, \Lambda) = H(\pi^1(X, x), \Lambda)$ for any constant abelian sheaf Λ .

* Tropical geometry.

Moduli (parametrized curves) : from combinatorial intersections ptties at degenerating values of the parameter, that give "degenerate cases", trying to pull back those ptties to the whole moduli from those simpler "degenerate" situations.

Framework : on discrete valuations fields, aka non

archimedean ones.

The key object of tropical theory is the discretization of valuation.

This goes along discretization aspect of toric varieties :
The underlying feeling is that all that is driven by computers treatment of varieties.

$A=C((t))$: Laurent power series.

$C\{\{t\}\} = C((t))_{\neq} = \text{Frac}(A)_{\neq} = \sqcup C((t^{1/n}))$ Puiseux series.

LINKS

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® Forum.

<https://math.stackexchange.com/>

<https://mathoverflow.net/>

<https://mathoverflow.net/questions/127633/what-are-the-possible-motivic-galois-groups-over-mathbb-q>

<https://ncatlab.org>

<https://ncatlab.org/nlab/show/period>

® Seminars.

http://m.mathnet.ru/php/seminars.phtml?wshow=comsoon&option_lang=eng

<https://researchseminars.org/seminar/NTWebSeminar>

Sigma forums Cambridge.

® Library.

edx.org

numdam.org

projecteuclid.org

<https://press.princeton.edu/books/paperback/9780691193779/arithmetric-and-geometry>

<https://pi.math.cornell.edu/~kbrown/publications.html>

® Bookshelves.

http://www-fourier.ujf-grenoble.fr/~marin/une_autre_crypto/Livres/

<http://nozdr.ru/biblio/kolxoz/m/ma>

<https://zh.b-ok.africa/book/2710292/3ed31a>

http://www.ebyte.it/library/refs/Refs_Math_Books.html

http://www.bdim.eu/item?id=BUMI_2009_9_2_1_259_0

<https://archive.org/download/MathematicsEbooksMegaCollection>

<https://epdf.pub/number-theory-04-transcendental-numbers.html>

® Encyclopedias.

<https://encyclopediaofmath.org>

https://encyclopediaofmath.org/wiki/Gel%27fond-Schneider_method

<https://planetmath.org/>

<https://planetmath.org/PrimeSpectrum>

® Scholars articles.

Joseph Ayoub

<http://user.math.uzh.ch/ayoub/>

Annette Huber

<https://home.mathematik.uni-freiburg.de/arithgeom/>

Giesbert Wustholtz

<https://scholar.google.com/citations?user=9knV80QAAAAJ&hl=en>

https://scholar.google.fr/scholar?start=10&q=wustholz+elliptic+and+abelian+period+spaces&hl=en&as_sdt=0,5&as_vis=1

New researcher

Martin Orr

<http://www.martinorr.name/blog/2015/10/06/periods-of-abelian-varieties/>

® Vulgarisation.

<http://images.math.cnrs.fr/Le-rang-des-courbes-elliptiques.html>

<http://eljidx.canalblog.com>

® Docs.

https://docs.google.com/document/d/1EMhvjvhtcQmXvBhaFeQo7f_Rg7032y0e1M0tUEFilsxY/edit?usp=sharing

File conversion

https://www.print-driver-fr.com/howto/convertir_djvu_to_pdf.html

UTF8 (extensions)

====

a) Symbols.

1 2 3 4 n $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{2}{3}$ $\frac{3}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{7}{8}$

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b) Accents.

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e) Russian.

й ц у к е н г ш щ з х э ж д л о р п а в ы ф я ч с м и т ь
б юЙ Ц У К Е Н Г Ш Щ я з З Х Ф Ы В А П Р О Л Д Ж Э Я Ч С М И
Т Ь Б Ю

BEGIN diary.

=====

21.09.2020.

• Arithmetic-Geometry Schools :

Eu(Be, Ch, Aut, De, Dk, Ei, Es, Fi, Fr, Gb, Gr, Hu, It, Nl, Nw, Se, Sp, , ..); Ru, US, Au, Nz; Ar, Cu, Br; In, Ir; Jr, UAE(remote west dpt); Asia(JP,KR,TW,CN).

--> After a few days getting back to maths, felt new trends since mid 00's :

A) raise of emerging countries (In, Ir) and China.

B) huge growth of online resources :

1) digitalized sources : (books, articles, reviews, web-pages, etc).

2) wikipedia (en) close to cutting edge but some articles are doubtful;

3) youtube (online courses, conferences, etc), vimeo, dailymotion : living maths can be accessed virtually without being physically @ classic lectures courses places; enlarging hugely the learning-landscape from all over the world. Ytube being the centralizing source of videos on the internet; easing the search.

--> Drawback : digital tech (data & applied sciences, from IT, ... to finance)

a) have drained "pure disciplines" physical population;

b) are also distracting from the unbeatable pen-paper deep-learning/thinking;

c) they are also less permanent : missing of good conferences, web-pages, articles, etc, of 2005-2009, generally the "older" the stuff; the harder to get it now.

d) centralizing videos ressources may compromise freedom for both content-providers and consumers : g being omnipotent may have "tyrant" temptations, taking benefit of its dominant position (ads floods injection after capturing large enough amount of preys).

C) maturation of theories, confirming the long-term aspect of maths progress : motives, 3-manifolds, perfectoids, etc.

D) Anecdotic effect of 2020 sanitary crisis : curfews and other movement restrictions allowed a settling-down of ideas by saving energy-consuming traditional physical commitment (go, teach-learn, go-back).

Periods

=====>

- Simple periods P form a Q_- -algebra between C and Q_- :

$$Q \subset Q_- \subset P \subset C$$

- It is not known whether e or $1/\pi$ are periods or not (e

= $\sum 1/n!$), so P may be not a subfield of C .

--> Hence one more interest of studying $\text{Spec } P$.

--> See $xy=1$ in P : Fubini & Young Equality; and μ^\wedge .

- It is also not known whether e and π are algebraically independent or not.

--> See Schanuel conjecture trend of ideas.

<====

* Jose Ignacio Burgos Gil (ICMA Madrid). Motivic MZVs talk @ Algebra Leiden Seminar in Dec 18.

- ZVs & MVZs are periods, the MZVs interest is that their products can be weight-linearized, so that algebraic independency is reduced to linear independency.

- It is conjectured that $\pi, \zeta(3), \dots, \zeta(2n+1)$ are algebraically ind.

- Sub lattices of Z^n (n -dimensional integers lattice) or subgroups of free abelian groups of finite rank. Those ones appear as applications of discrete mathematics : in number theory (θ series), crystallography, network topology, cryptography, etc.

® Thomas Preu thesis 2019 (ETH Zurich).

Computations of some quartics Brauer groups with Magma.

© The quick way to compute inverses of easy n -matrices ($n \leq 6$) :

- Android apps : Matrix Calc, Graphing Calc.
- Casio CP400.

© Data recovery : hardware issue from 350e up to 800e per drive.

==> The price of a good laptop for each hdd.

22-24.09.

- Sorted 2006-2009 research paper notes.

1) Study of two arithmetic functions for perfect integers approach.

a) Power of n : $\rho(n)$.

b) $\text{Rad}(n)$: product of prime divisors of n .

2) Study of Muirhead inequality.

3) Fibonacci numbers : matrix representation, gcd, expression & approximation with powers of ϕ .

4) Theoretical study of Euclidean gcd algorithm.

5) Finite group theory towards additive number theory (lack p1-7) : iterated commutators and derivatives subgrps, (conjugation, orbits) applied to arithmetical functions for perfect numbers investigations.

a) $\sigma(n) = \sum d$.

b) partitions.

6) Some basic Galois theory (lack p1-4).

7) At arithmetic-geometry and periods side (lack p5-9).

a) Criterion "counter example" from algebraic independency of π and $E(\frac{1}{2}\sqrt{2})$ coming from Legendre relation for elliptic integrals @ normal modulus ($k=k'$) and algebraic independence of π and $\Gamma(\frac{1}{4})$.

---> Case treated by extended criterion.

b) A discrete dynamics approach to evaluations @

successive hyperquadratic algebraic integers of the elliptic integral of first type, more precisely, nature of $E(x_n)$ with x_n algebraic integer of degree 2^n (algebraic independency with π).

8) Misc(grad. courses, putnam, icm, etc).

9) Ramblings, Books intro, Articles review.

10) Cryptography : discrete logarithms, discrete decomposition.

25.9

* Conference of Y.Andre 2015 IHP talk (Ayoub thm).

${}_2F_1(a,b;c|z) = f/g$. Euler Integral rep.

The transcendental nature comes from the g or the limit in the integration process.

The denominator is obtained for $t \rightarrow 0$; in the function field case, it is a scalar.

- Kontsevich conjecture.

Algebraic dependency of periods comes from basic integral calculus operations :

- Addition & Linearity on domain and on differential form.
- Multiplication : Fubini theorem.
- Leibniz or Stokes.
- Change of variables.

26.09

- Sorted last 2006-2009 paper notes.
- 1) MZV's.
- 2) Periods.
- > Less clear : @.
- > Among ~ 2000p (2001-2010) : 3-4%.

27.9.

* IHP rational points meeting (Ytube). 2019.

Hellenberg talk on etale fundamental grp.
(Dogra, Hest).

-Minhyong Kim
Chabauty applied to fundamental groups.

-Coates-Kim (2010)
If X/Q is such that $J(X)$ has CM then $X(Q)$ is finite.

28.9

* IHES. 2015 Conference. (Ytube).

Motivic periods & cosmic Galois group (Motives for Feynman amplitudes) Francis Brown talk.

--> neat exposition.

* Euler institute. 2013. (Ytube).

Cosmic Galois group talk of Pierre Cartier.

- Grothendieck letters to Serre. Manin Demazure (1960's).
Standard conjectures.

- Ramis, Malgrange, Brodhurst .

-Motivic Galois grp : beginning of Galois theory
for transcendental nbers, from functional approach
(Differential Galois grps of Fuschian ODE, Monodromy).

Euler (1737) : Basel pb.

$$\zeta(2) = \sum 1/n^2 = \pi^2/6.$$

$$\sin(\pi/z)/\pi/z$$

$$= 1 - \pi^2/6 \cdot z + \dots \text{ Taylor series.}$$

$$= \prod (1 - z/n^2). \text{ Euler product, Hadamard thm.}$$

$$= 1 - (\sum 1/n^2)z + \dots$$

-Blowing up singularities.

Cov(X,Y) : M.Karoubi algebraic topology diagonal
technique.

- Motives : Pure motives; Mixed motives : Deligne built
them to avoid Hodge cj; Voevodsky Motives : Extension by
using complex chains to define them, used to prove Milnor
cj.

- Hodge cj : not so optimistic.

Weil cj K3 surfaces ctexample : Claire Voisin.

-H Esnault, S.Bloch, D Kremer, Borchers.

M.Marcolli

Swchinger-Feymann amplitude to Motives.

Kirchoff polynomials from Feyman diagrams.

$X_G(\mathbb{F}_p)$.

-Tate Motives

$|P_n(\mathbb{F}_q)| = 1 + q + q^2 + \dots + q^n = q^0 + \dots + q^i + \dots + q^n.$

$q^i = |A^i(\mathbb{F}_q)|$ Affine-Matrioshka of dim i .

-MTM(Q).

Mixed Tate Motives (Deligne, Goncharov, Voedvedski).

$|X_G(\mathbb{F}_q)| = P_g(q)$

P_g polynomial : Kontsevitch cj, disproved.

--> P_g = Modular form : S.Bloch-F.Brown.

The latter found a linear basis for MZVs in his thesis.

-Hope : algebraic independence of MZVs from Tate Motives.

-Grothendieck-Techmuller grp is the cosmic galois grp, operating on them.

-For elliptic cases, algebraic independence may come from motivic/cohomological interpretation of Beukers formulas.

29.9

Sorted 2004-2006 paper Notes :

- Lack at least two sets of research paper notes.

Dossier 1 : "P(X) : periods stratification" , " Exp-Schanuel cj" , "Criterion Birational invariance" , ...

Dossier 2 : "Enneper surfaces", "Ellipsoide case", ..

- Found also an odd shuffle (notes among EMS samples).

- Criterion on simplexes and convex polytopes.
- Approximating periods as periods of approximating varieties.
- E-functions, Hypergeometric functions, Fuschian ODE, monodromy.
- Related abstract theories study : Sheaves, Cohomologies, Brauer grps, etc.

30.9

Sorted 2002-2004 paper notes :

- Naive criterion, integrals, mean point.
- Less naive one, periods variety or space : parametrized periods with corresponding parametrized fields : "Bouquets" over \mathbb{R} .
- Divisors, Jacobian variety.
- Periods c_j , motives : related abstract theories notes study (commutative rings, cohomologies, Kunneth formula, etc). Study of Serre, André, Bertolin related articles.

1.10.20

- Writing-back attempt of the lacking "P(X) stratifications" and "Schanuel cj" research paper notes.

---> The brain is more resilient than paper or data storage but less quick than years ago; it has a "restart" procedure ...period; proportional to the length of the interruption.

- Memoire

Q point -> Algebraicity of the moduli parameter -> Algebraicity of the "simplest" or "ambient" period ($d\sigma$ in \mathbb{R}^2 , dv in \mathbb{R}^3) -> Coarse or trivial algebraic dependency of fundamental periods. (i.e $P(X)Y=0$, nested or second order degeneracy i.e degeneracy of degeneracy).

- Note that most examples had degenerate or trivial Q-points (either one zero coordinate, or two coordinates equal).

* Barak Weiss talk about Eskin-Mirzakhani-Mohammadi thm @ international center of theoretical sciences in Dec 2012. Simplex & convex polytopes : Translation surfaces. ICPT (Italy).

2.10

© Emre Sertoz (Max Planck). Computations of Periods of

higher dimensional varieties. 2020.

--> Deform both domain/integrand with a parametrization, then solve the differential equation satisfied by the parametrized periods, to get the desired one : solving ODE is quicker and more efficient than numerical computations/evaluations of integrals. (Sage riemann-surfaces & abelfunctions packages).

<-- .

3.10

- Looked around among piles for the lacking paper sets.
--> not found.

- Galois motivic grp : multidimensional generalisation of the classical finite one, since it has an algebraic group structure.

- Several frameworks depending on motive theories chosen (Nori, Ayoub, Voedvosky, André, etc) : on going classifications.

--> Recent articles (2016-2019) of Peter Jossen, Javier Fresan, Chodhoury-DeSouza-Galauer.

6-10.10.

- Expliciter fleches of textes.

© Data recovery.

Deepspar : ca.

Datasavers

Recoverit.

--> On the hdd board, a (8 pins) rom-chip contains its unique calibration data. It must be taken out to the eventual donor board.

© MathJax example.

https://images.math.cnrs.fr/Le-triangle-de-Pascal.html?lang=fr&var_ajax_redir=1

© Maxima

```
f(z):=sin(%pi*sqrt(z))/(%pi*sqrt(z));
taylor(f(z),z,0,5);
```

```
F(x):=integrate(sqrt(1+exp(2*t)),t,0,x);
F(1);
```

Evaluation flags.

```
(sqrt(5)+1)*(sqrt(3)-1), float;
(sqrt(5)+1)*(sqrt(3)-1), expand;
```

© Math editor (Android LaTeX renderer).

```
x^{a}+y^{a}=z^{a}
\sqrt{a}+\sqrt{b}\leq c\mid \backslash
a\in \mathcal{R}_{\geq 0}
\tau \mu
\varphi
\varphi +\varrho\backslash \phi +\rho\backslash \eta +\mu +\delta
```

© Math (Android-M\$ ocr : handwrite > tex, like MathPix)

```
x^{8} - 2x^{5} = 2.
\varphi ^ { 3 } - 2 \varphi ^ { 2 } - 1 = 0
\begin{eqalign}
```

$$\phi = -\frac{2^{\left(\frac{2}{3}\right)} \left(1 + \sqrt[3]{i}\right) \left(-\sqrt[3]{3\left(9\sqrt{59} + 43\sqrt{3}\right)} i - \sqrt[3]{3\left(\sqrt{177} + 43\right)} + 2\sqrt[3]{43 - 3\sqrt{177}} - 2\sqrt[3]{2} + 2\sqrt[3]{3}\sqrt[3]{2} i\right)}{24} \approx -0.102784715 + 0.665456951i$$

- Periods stratification.

* ICTP/NPTELHrd Algebraic geometry courses.

1) $J = \langle \Pi \rangle_{\mathbb{C}}$: finite sum $\sum p_i q_i$, $p_i \in \mathbb{C}[x_1 \dots x_n]$; $q_i \in I$ ideal of $\mathbb{Q}[x_1 \dots x_n]$

Take $P \in \mathbb{Q}[x_1 \dots x_n]$, since $\langle P \rangle_{\mathbb{C}} \subset J$

$$Z(J) \subset Z(P) \text{ so } Z(J) \subset \cup Z(P).$$

Take $\mathfrak{m} \in \cup V(P)$, $\exists P \in \mathbb{Q}[x_1 \dots x_n]$, $P(\mathfrak{m}) = 0$;

take $R \in J$, is $R(\mathfrak{m}) = 0$? No, not necessarily.

2) $\prod_{a \in A} Z(Ta) = Z(\cup_{a \in A} Ta) = Z(\langle \cup_{a \in A} Ta \rangle) = Z(\sum_{a \in A} \langle Ta \rangle)$.

3) Weak nullstellensatz.

If k is algebraically closed, if $S \subset A = k[X_1, \dots, X_n]$ is such that no finite A -summation gives 1 (no A -Bezout for finite subsets of S) then $Z(S) \neq \emptyset$.

This is equivalent to saying that if 1 is not in $\langle S \rangle_A$, that is, if $\langle S \rangle_A$ is not the unit ideal $(1) = \text{whole } A$, then $Z(S) \neq \emptyset$.

For $n = 1 \implies$ Fundamental thm of algebra.

4) Category switch.

Affine k -space \longleftrightarrow Commutative k -algebras/rings.

k -variety \longleftrightarrow Finitely generated reduced (no nilpotents) k -Algebra.

k-subvarieties	<-->	Radical spectrum Radical ideals.
k-irreducible variety	<-->	Prime spectrum. Prime ideals
k-points.	<-->	Maximal spectrum. Maximal ideal
A, n	<-->	$R=A[x_1, \dots, x_n]$
Varieties $Z(I_a)$	<--> <-->	$d = \text{ISpec } R$ $\{I_a\}$
Irr. var. of A^n	<-->	$d_p = \text{SpecPrim } R = \text{Spec } R.$
Points of A^n	<-->	$d_m = \text{SpecMax } R$
$[A^n, \text{polynomial, Zarisky-topology}]$ $\mathfrak{J}=(x_1, \dots, x_n)$	\sim	$[d_m, \text{ideal-Zariski-topology}]$ $ \mathfrak{J}=\Sigma\langle(X_i-x_i)\rangle$
$V = Z(J), \mathfrak{J} \in V$ $V)$	$-->$	$d_V : \text{Glued Scheme.}$ $[J; (\Pi\langle \mathfrak{J}\rangle, \mathfrak{J} \in W \subset V); (\mathfrak{J}, \mathfrak{J} \in V)]$
If V is irreducible	:	$[J; (\mathfrak{J}, \mathfrak{J} \in V)]$

$d_V : \text{Augmented } V.$

The "generating or seed-pt $|\mathfrak{J}$ " keeps track of the variety V and tags all its subvarieties by "stamping-generating" them.

a) Spectrum.

"For any ideal I of R , define V_I to be the set of prime ideals containing I .

One can thus view the topological space $\text{Spec}(R)$ as an "enrichment" of the topological space A (with Zariski topology): for every subvariety of A , one additional non-closed point has been introduced, and this point "keeps track" of the corresponding subvariety. One thinks of this point as the generic point for the subvariety.

Furthermore, the sheaf on $\text{Spec}(R)$ and the sheaf of polynomial functions on A are essentially identical. By studying spectra of polynomial rings instead of algebraic sets with Zariski topology, one can generalize the concepts of algebraic geometry to non-algebraically closed fields and beyond, eventually arriving at the language of schemes."

->

$V_I = [I, \infty[$. Section ou coupure commençant en I .

Topologie issue de la trace du pseudo-ordre or semi-ordre de l'inclusion des parties de l'ensemble sous-jacent (algèbre de type finie sur un corps ou anneau commutatif); sur les idéaux de cet ensemble-sous-jacent.

<-.

b) Generic point.

"In classical algebraic geometry, a generic point of an affine or projective algebraic variety of dimension d is a point such that the field generated by its coordinates has transcendence degree d over the field generated by the coefficients of the equations of the variety."

-> (Co) dense point.

c) Motives.

Q^* . π : Conjugates under motivic Galois grp, $G_L = Q^*$, of the motivic period π of the motive of the pointed real line L° .

Period c_j says $\dim_Q(G_L) = \text{trdeg}_Q(P(L^\circ))$, ie is equivalent to the non algebraicity or transcendence of π .

* Jose Ignacio Burgos Gil MZVs talk @ Leiden 2018.

" E elliptic curves over Q with periods :

$$\tau_{ij} = \int_{\gamma_i} \omega_j$$

Period c_j : $\text{Trdeg}_Q Q(\tau_{11}, \tau_{12}, \tau_{21}, \tau_{22}) = \dim G_Q(E)$

$\text{Trdeg} = 2$ if E has CM.
 $= 4$ if E no CM "

--> The latter non CM case : conjectural algebraic independence of periods, so no non trivial Q -points. See when an elliptic curve over Q has a Q point. I remember tackling this issue with j -invariant computations (Second stuck hard drive, around 2004-2006).

The former : the Galois mtv grp has to account for more symmetries of the associated mtv (decomposition) so more constraints to fullfil, hence its smaller size.

<---

® Elliptic curve with CM from https://en.m.wikipedia.org/wiki/Complex_multiplication

"elliptic functions, or abelian functions of several complex variables, are then 'very special' functions satisfying extra identities and taking explicitly calculable special values at particular points.

$$Y^2=4X^3 - aX"$$

-->

Having CM means $\text{End}(E)$ is not trivial, more symetries for the elliptic functions attached to E . Degeneracy or trivialization of the periods relations.

$$Y^2 = X(4X^2 - a)$$

$$aX = 4X^3 - Y^2$$

If E has a non trivial Q -point then a is in Q .

Reciprocally if a is in Q , then $a = p/q$, so

$$px = q(4x^3 - y^2)$$

$x = r/s$ $y = t/u$ with non zero q, s and u .

$$prs^3u^2 = sq(4r^3u^2 - s^3t^2)$$

$$prs^2u^2 = q(4r^3u^2 - s^3t^2)$$

If $x = y = n \in \mathbb{Z}$ then $a = n(4n-1) \in \mathbb{Z}$ if $n \neq 0$.

Reciprocally, if $a = n(4n-1)$ with $n \in \mathbb{Z} - \{0\}$ then

$(x, y) = (n, n)$ is a \mathbb{Z} -point of E .

<-----

12.10

- Naive tensors in $\dim d=3$. Rank $n : d^n$.

Rank 2 : Forces applied to the faces of a cube.

Axx Axy Axz

Ayx Ayy Ayz

Azx Azy Azz

Rank 1

Ax Ay Az

Rank 0

Ax

- Stratifications : pulls back candidate varieties with non trivial Q -points and those without (open set), the latter are the "normal" or "common" dense case; the former the exceptions, corresponding to the discrete "degenerate periods" space varieties.

-> "Suite" : in the general framework, can be used to

extract algebraic varieties out-of general ones.

-> Connect fundamental periods to Kontsevitch-Zagier ones and to the Grothendieck DeRham-Betti-pairing ones.

- Gmotf : algebraic grp. Rep?

© André 2014.

"La cohomologie de De Rham algébrique $H_{dR}(X) := H_{Zar}(\Omega^*(X))$ fournit une réalisation

$$H_{dR} : M(k) \rightarrow \text{Vec}_k$$

À toute k -variété projective lisse X (et plus généralement à tout

motif pur), on associe un torseur sous $G(X)_k$

$$P(X) := \text{Iso}^{\otimes}(\text{HdR}, \text{HB} \otimes k)_{\langle X \rangle^{\otimes}},$$

muni d'un point complexe canonique :

$$\omega_X : \text{Spec } \mathbb{C} \rightarrow P(X)$$

donné par l'isomorphisme des périodes.

La conjecture des périodes de Grothendieck dans le cas pur (11) prédit que si $k \subset \overline{\mathbb{Q}}$, l'image de ω_X est un point Zariski-dense de $P(X)$, ou, de manière équivalente,

$P(X)$ est connexe et le degré de transcendance des périodes de X est $\dim G(X)$.

Par exemple, $G(P^1) = G_m$ et les périodes sont 1 et $2\pi i$, de sorte que la conjecture équivaut dans ce cas à la transcendance de π . Pour un panorama des résultats de la théorie des nombres transcendants en faveur de cette conjecture, voir [Wal] (12).

10. de même que la théorie de Galois usuelle ramène les problèmes d'extensions finies de k à des questions d'actions de groupes finis ; au reste, $\text{Gal}(\overline{k}/k)$ est un quotient de $G_{\text{pur_mot}}(k)$, correspondant aux variétés de dimension 0."

==> Line 1141 Spec $P(X)$?

- Some paper notes :

Motivate (!) the search of Q-points on varieties for real life problems :

a) Tesselations. Cover in an optimal way a given area enclosed by a C-curve with polygonal tesselations.

b) Periodic trajectories of billards enclosed by a given C-curve; these being useful in industrial tech :

c) Rays reflections; acoustics of forums; public speech buildings of a given V-shape.

d) Proteins space configurations to get desired properties of big-amino acid molecules (building-blocks : amino-acids sophisticated V-shaped Legos); the geometry of the surfaces of the different molecules (cles et recepteurs) of big-amino=acid proteins determining their functional pties.

e) Piling, stacking or packing small solids (ellipsoids, spheres = balls bearings, fruits, eggs; etc).

® Wikipedia.

a) Special function.

"The simplest way to evaluate a function is to expand it into a Taylor series. However, such representation may converge slowly or not at all. In algorithmic languages, rational approximations are typically used, although they may behave badly in the case of complex argument(s). Hypergeometric series became an intricate theory, in need of later conceptual arrangement."

==> Indeed : Hypergeometric series may be one element of the unifying quest (transcendental-algebraic cases).

Extension of the space of approximants to rational functions with Pade approximations.

<==

b) Hypergeometric series.

"In mathematics, the Gauss or ordinary hypergeometric function ${}_2F_1(a,b;c;z)$ is a special function represented by the hypergeometric series, that includes many other special functions as specific or limiting cases. It is a solution of a second-order linear ordinary differential equation (ODE). Every second-order linear ODE with three regular singular points can be transformed into this equation."

- See also <https://dlmf.nist.gov/15.4>

c) MacDonald cj

https://en.m.wikipedia.org/wiki/Selberg_integral

=> Brain Happy-Meal.

* Birational geometry (Caucher Birkar. ICM18 talk).

Abundance cj.

Minimal model prg.

Res of sing, compactify.

X alg var; find Y compact non singular, birationally equiv to X : $X \dashrightarrow Y$

Building blocks.

Dimension 1

1) Sphere

Fano : $g=0$, $\deg K < 0$.

K anti ample $K.C < 0$ for every curve C .

2) Donut or Torus

Calabi-Yau : $g=1$, $\deg K = 0$.

K trivial. $K.C = 0$ for every C .

3) Multidonut

Canonically polarized : $g \geq 2$, $\deg K > 0$.

K ample. $K.C > 0$ for every C .

--->

K defined by divisors from rational multipliers of coordinates changes (Jacobian dets) for the canonical d -th diff top-form w ($d = \dim X$).

$K.C = \sum m_i.n_i = NK(C)$: intersection nber.

Bezout for positive case.

$N = d_1.d_2$

<---

13-14.10

® Periods articles.

1) André 2014. Overview insights.

2) Ayoub GKJ.

a) Effect of morphism. $P(f(X))$ in terms of $P(X)$.

b) Effect of base field extension.

$P(X_K)$ in terms of $P(X_k)$

$\text{trdeg}_k P(X_K) = \text{Dim } G_{\text{mot}} + \text{trdeg}_k(K)$.

* Kashiwara (Chern Prize) video.

Gives research tips @ the end :

- 1) Select fields & subjects (what is important & what is not) : most difficult.
- 2) Use notebooks instead of paper sheets.

--> Read the masters ? <---.

® wikipedia

a) Brauer-Severi variety.

"In dimension one, the Severi–Brauer varieties are conics. The corresponding central simple algebras are the quaternion algebras. The algebra $(a,b)_k$ corresponds to the conic $C(a,b)$ with equation

$$C(a,b) : z^2 = ax^2 + by^2$$

and the algebra $(a,b)_K$ splits, that is, $(a,b)_k$ is isomorphic to a matrix algebra over k times K , if and only if $C(a,b)$ has a point defined over k : this is in turn equivalent to $C(a,b)$ being isomorphic to the projective line over K ."

----->

$$(a,b)_k \otimes K \sim M_n(K) \iff C_{(a,b)}(k) \neq \emptyset \iff C_{(a,b)}(K) = C_{(a,b)}(k) \otimes K \sim P^1(K).$$

$(a,b) = 0$ in $Br(K)$

<-----

b) Neron Severi grp.

built from a more rigid (algebraic? rational ?) equivalence relation on divisors than the linear one.

Encodes topological invariants.

See https://encyclopediaofmath.org/wiki/Neron-Severi_group

© ColliotThelene_Skorobogotov recent article.

"Rappelons le calcul du groupe de Brauer $Br(X)$ (Grothendieck, [5, III.8, p. 144-147]). Soit $\rho = \dim_{\mathbb{Q}}(NS(X) \otimes \mathbb{Q})$ le nombre de Picard de X , et soit b_2 le second nombre de Betti de X . Notons $Br_0(X)$ le sous-groupe divisible maximal de $Br(X)$. On a un isomorphisme de groupes abéliens :

$$Br_0(X) \sim (\mathbb{Q}/\mathbb{Z})^{(b_2-\rho)}.$$

Le quotient $Br(X)/Br_0(X)$ est fini, plus précisément il y a une suite exacte de Γ -modules

$$\begin{array}{ccccccc} & & 0 & \rightarrow & Br_0(X) & \rightarrow & Br(X) & \rightarrow & \bigoplus_{p|b_2-\rho} H^3_{\text{ét}}(X, \mathbb{Z}(1))_{\text{tors}} \\ \rightarrow & 0 & & & & & & & \\ & & & & & & p & & p \end{array} \quad (7)$$

où p parcourt l'ensemble des nombres premiers."

15.10

- Extended criterion : for the $E(a,b)$ relies on the elliptic integrals of third kind.

--> Seems quite solid. See hypergeometric expressions and Beukers treatment of their algebraic independence.

<---

© Latex online :

MathJax.org

Overleaf.com
 Codecogs.com
 Latexbase.com
 Texrendr.com
 QuickLatex.com
 Arachnoid.com

17.10 am.

® From wikipedia.

a) Pure motives.

- From proper Varieties. Some calls proper varieties, complete varieties. Complete varieties V over C are the compact, Hausdorff ones. Defined with "topological-like" properties of projectors $\pi : V \times Y \rightarrow Y$ being closed, that is sending closed subvar of $X \times Y$ into closed subsets of Y .

b) Complete or proper.

"a complete algebraic variety is an algebraic variety X , such that for any variety Y the projection morphism

$$X \times Y \rightarrow Y$$

is a closed map, i.e. maps closed sets onto closed sets.[1] This can be seen as an analogue of compactness in algebraic geometry: a topological space X is compact if and only if the above projection map is closed with respect to topological products."

- Videos YouTube.

Gottingen, HIM, MaxPlanck.

Mathnet.ru, Mathnet.kr

IHES, CdF, Cirm, IHP, Fourier, Lyon, Orsay : CarminTV.

IAS, Harvard, Clay, MSRI, Simons, Graduate course.
 ICTP
 IMPA
 NPTELhrd
 Graduate mathematics.
 Insight into mathematics.
 Xuang-Gottfried Yang.
 Varoqui

Richard Borcherds.
 Macauley@emerson.
 Krzysztof Klosin Elliptic curves.
 HenrideSt-Gervais.

Vulgarisation (cautious).

Science etonnante
 Passe Science
 Prof Dave Explains
 Aleph_0
 Ljj

17.10 pm.

* Rational points@CMI 2006.

- CMI : Clay Maths Institute managed by mathematicians.
- Rational points with bounded height are finite.

® Read a few articles from last arXiv nbtheory posts
 (10.20)
 --> Wu Han on Brauer grps.

© Last CD save of Dell Laptop (drive n°1) Jan 09.

Bad optical data engraving, half complete (hd worn and/or
 coarse optic burning process, smart drive not available?).

-All interesting notes.txt in corresponding folders
 (algnb, geodiff, algeo, cohom, etc) are missing.

-Source articles in qpts & other folders are almost all unreadable (D.Marques, André ones could be recovered)

--> Nonetheless, wrote back some key ideas (stratifications, fundamental periods, etc) by tackling peculiar key cases.

--> Again, the brain resilience outperforms paper or data storage. See dedate : Galois filtrations, with μ^{\wedge} .

* J.L ColliotThélène @ Euler Institute of StPetersbourg. 2017.

$$x^3+py^3+p^2z^3=0.$$

p prime.

No non-trivial Q-point.

19.10

® Read some introductory articles on topos theory.

==> Its connection to Logic + recent progress of AI, and the perspective of quantum computers ("multi-truth_states" of well chosen "Logic" topos matching multi-states of q-bits), seems announcing a new era in automata or machine algorithms for testing and/or producing heuristics, proofs and even theories.

Despite new hitechs and multi-miltenary background, maths is still quite inefficient in solving its own pbs; it suffers a huge deficit of synergy; while thousands of mathematicians are still unable to "work in harmony"; thousand of thousands of minds; some quite brilliant, working in a "prehistorical" way; reinventing the wheel

billions of billions times.

There is an urgent need of collaboration-management refoundation : think of parallel/distributed/collaborative systems in computer sciences; where small units accomplish efficiently a simple task; then a mainframe hypervisor gather the results and outputs an effective result.

(Note that this pattern is actually present in maths-research but is very, very,very narrow and local; where an advisor-hypervisor ultraspecialized in a "quite narrow" ("pointu" in french) domain-field of research; gives tasks to thesis students; the issue relies in the narrowing ultraspecialisation that hides/blinds wider and possibly more efficient/fruitful perspectives).

The dream would be a AI-Giant Mainframe Hypervisor that distribute simple tasks to small units around the globe; either small proofs left to mathematicians or why not using wasted petaflops of billions of computers/smartphones whose users are just scrolling dynamic pages of "social/webstores networks" not to say a crude word.

© Investigate this area :

Build

I) a gigantic mathematics knowledge database containing all the books, articles and papers; web resources (encyclopedias, dedicated sites : mathematicians, institutes, seminars, conferences, videos, etc) web-posts of forums; chat rooms, maths cafes, etc.

II) An AI that can output something out of it or hints in % :

- 1) the proofability of submitted conjectures;
- 2) the correctness of proofs submitted by mathematicians.

The dream would be that it can also output answers to conjectures/questions that are bloating the mind of mathematicians; to release them from those obsessive burdens.

See Logic theory application to computer sciences or Applied Logic theory :

- 1)Set the axioms
- 2)Set then logic rules.
- 3)Let the big AI generate outputs so that it finally build
 - a) its own next engine-upgrade.
 - b) its own next level knowledge databases (theories).

(Paris 7 was a pioneer in this domain from the late 70's to early 90's).

--> After Stephane Mallat vids : this approach seems outdated; trend is oriented towards AI-treatment of large-scale/big-data/large arrays of db-informations.

- See Vodevosky last research themes,
 - Also the norvegian mathematician : Andreas Holmstrom
- <===

20.10

© Back-up of Lenovo Debian home into usb-sticks.

© Left Google Keep (size limit) to other notes (colornote, evn, Q-edit, xplora).

© Found last reliable data save of Dell Laptop (drive n°1). August 2007.

© Beginning of notes.txt in corresponding folders (algnb, geodiff, algeo, cohom, etc) are there. So the diff with 09 : lack the last versions from 2007 to 2009; for instance, in cohom.txt lack "Spectral sequences : Hoschild Serre", "Tor"; "Etale theory of schemes", etc...; in catsch.txt lack "n-and-derived categories", "motives", "toposes", etc).

Unfortunately gone since the last back-up was an optical one that was scrambled. (I remember hdd agonizing in Mediatheque de la cité des sciences, after the attempt done there to save files).

© Nonetheless some keys files with keys ideas could be retrieved :

1) a small TeXte about insufficiency of two periods in the transcendental case.

--> This case can be treated by the extended criterion in the general framework. <---

2) Some src files dir were not affected, like cplxgeo (analytic geometry folder), etc; were correctly optically engraved.

* J.P Serre conference @ JDieudonné building in Nice. 1996.

Galois cohomology & elliptic curves.

22.10

© Tried to get data back with Lenovo Linux + Usb-Ata bridge + jumpwired ATX power supply.

Disk 1 (Hitachi from Dell Laptop) : nothing but clicks on Dell Laptop.

Disk 2 (WD) : clicks.

Disk 3 (WD) : clicks.

Disk 4 (Quantum) : nothing.

© Swaped Disk 2 & 3 boards : same clicks.

---> Try to find out the calibration-data chips and swap them also.

--> Tips for Research (notes).

a) Use two cloud services.

b) Scan handwritten notes (pen tablet?), save them with txts and TeXtes as well as articles to read (at least their address : uri, url).

c) Without clouds, back-up data at least every week in two different places. If a data failure occurs, with no backup : "reboot quickly the research process" from last backup, using brain "persistence of ideas" fresh footprint.

<-----

• Nonetheless, wrote two minutes of maths investigations :

---> the \wedge is the "critical" period process to dig into, cohomologically or in terms of motives : seek possible interpretations.

<----.

23.10

* Laurent Lafforgue@IHES "Science et bienveillance" talk.
Importance of Topos for theories transfers.

Godel thm \leftrightarrow # pts of a topos. (Deligne).

Langlands Prg is also a case of that transfert process.

\rightarrow Logic Toposes as "universal entities" whose realisations are theories, a kind of classifying topology on the "space of theories". What about homotopy that deforms a theory to another?

\leftarrow .

® Caramello-Barbieri-Lafforgue paper.

Gmot action on $\mathfrak{e} = \text{Spec}(P_{KZ})$, endows \mathfrak{e} with a structure of a torsor above P_{KZ} .

24.10

® Read articles on wikipedia on ring spectra, homogeneous spaces.

25.10

® Read articles on wikipedia on torsors, principal homogeneous spaces.

® Read Ayoub GKZ, Andre, Huber, periods articles.

® <https://home.mathematik.uni-freiburg.de/arithgeom/>

26.10

® Huber MuellerStach.

Equivalence of periods definitions.

$G \sim KZ$.

Equivalences of "motived" categories.

Nori \sim Voedvoski.

* Insights into maths.

Homology

---> Z -groups (= free abelian grps) of simplexes of (dim $n, \dots, 0$)

Homology : Matrices over Z .

Linear algebra of Z -modules, i.e modules over a principal ideal domain (pid-modules or modules sur les anneaux principaux).

<---

* Richard Borcherds

A, B abelian grps.

$\text{Tor}(A, B)$ abelian grp, measures exactness of tensorization functor.

A, B finite : torsions.

Cech : Manifold M

$H_i(M, G)$ in terms of $H_i(M, Z)$.

For a commutative ring R , the group $\text{Pic}(R)$ measures how far is R from being a PID.

® Manin. Motives, forgotten past . 14.

" Motives : "linearization" of algebraic geometry, as linearization occurring in physics (probabilistic density span of particles)."

-->in the spirit of linearization of a curve by its jacobian, to get arithmetics data of the initial curve. Note that this process is done through parametrized periods. Periods encodes the arithmetics of varieties through the topologico-differential Grothendieck DeRham-Betti pairing (Lier le nombre à la forme). Note also that the fundamental periods process is not a linearization process but is used to get a stratification one on moduli of varieties. See Griffiths approach.

<--

® J. Carlson, S. Mueller-Stach, and C. Peters, Period Mappings and Period Domains, Cambridge Univ. Press, 2003, 559pp.

® LMA 3. Motifs. Bruno Khan.
Clear overview (no periods).
 H_{dr} from C^∞ to algebraic H_{Adr} .

® C.Bertolin, Federica Galuzzi. (Torino).
Non algebraic (extension of) Brauer grps : gerbes and Brauer groups over stacks.

® J. Jahnel. Brauer groups, Tamagawa measures, and rational points on algebraic varieties. Mathematical Surveys and Monographs, 198. American Mathematical Society,
Providence, RI, 2014.

* Diophante. 300bc.
 $4ab = (a+b)^2 - (a-b)^2$.

28.10 3h00 am.

- Less inspired : sda.

® Ramanujan. Series for $1/\pi$. Quart journal. 1914.

® J.Guillera. Ramanujan series. 2020.

* Michel Raynaud. Orsay Video. History of the splitting of Geometry into GA-GA(Geometrie Algebrique; Geometrie Analytique) around mid 50's during IHES settlement @ Bures with Grothendieck troops; and history of Orsay centre.

Fiber products for étale theory : refinement of coverings.

$X \times_Y$

S

® P.Griffiths. J.Harris p216.

Curvature & topological invariant of Riemann surfaces.

Curvature on tangent bundle $T^*(M) = K_M^*$ is Gauß-Bonnet curvature $\times 1/\sqrt{-1}$ \times volume form.

Riemann Hurwitz formula.

$\deg K_M = 2g(M) - 2 = -\chi(M)$ with $g(M) = \frac{1}{2} b_1(M)$.

* IHP 2013 Tamasz Samuely talk.

Footprint of Grothendieck in Galois theory.

Functorization, topologization of a pure algebraic theory : introducing topological concepts; fundamental groups, fiber functors, base point, etc, in a pure algebra area.

=> Grothendieck maths = melting-stiring up theories in a foundational creuset to extract pure foundational essence

= Categorification-Axiomatisation-Formalisation in action.
 <=.

29.10 3h a.m

® Begin Huber-Muller_Stach motives book.

--> This is embodied Motive maturation. <--.

- Visited stacks.org project (DeJong)
 Python Flask-github microframework.

© Got back to old Gabel (Debian Sarge 05).

Sorted some articles files of 2006-2007 (djvu, dvi).

- Found a djvu of a short article (late 60's) of Grothendieck about Weil & standards conjectures : very neat exposition of Hodge and related theories (Lefschetz), mentions motives.

- Found a djvu of D.Mumford 1975 Curves & their jacobians.

® Read some other articles on Brauer grps.

- A. Skorobogatov.

- Index and period (from Brauer grp quotients).

- Thesis of M.Lieblich, one DeJong student : the trend is using stacks & gerbes with Giraud thm giving H^2 in terms of classes of stacks isomorphisms.

- Some interesting personal txts : first versions of notes.txt.

--> In one.txt inspiring ideas : $\Omega = (\text{Affine}, \text{Proj})$ & $\$VdV$. <---

Wrote them down on paper for extended criterion.

- * Some conferences

- J.M Fontaine @ IHP Motifs & Galois rep(Langlands prg).

- * 5mn@IHL(Lebesgue).

- B.Lesturm. Perfectoids introduction.

Espaces de Berkovich. Graphe compact ayant pour noeuds, les distances sur Z .

- Elise Goujard. Eskin-Mirzhatani thm (ray traces in closed room).

- Remi Charles. Dimensions fractales.

- Tobias Schmidt. Congruent nbers (Elliptic curves approach). N congruent \leftrightarrow N aire d' un Δ rationel. Al-Kazim (10ieme siecle) 5, 6, 7,13,14,15. Fibonacci.

- * Easy vulgarisation conjectures.

Collatz $3x+1$ (Syracuse usa) cj.

Goldbach cj.

1.11

® Recalls from wikipedia entries.

==>

Grothendieck topology : "topologisation" of objects of a category, considering objects of a category as (elements of ?) open sets of a suitable "higher topological space".

Site = (Category + Grothendieck topology on it).

Topos : Category of sheaves over a site, i.e over a topologized category. To each open set of a site, coming from objects of the studied category ("topologized category") is associated an object of another category.

One level higher.

Stack or 2-sheaf : a sheaf with values in categories, may be defined on a site. The category of stacks is a category of sheaves of categories.

-> Correction of wkp quirks : how wkp can mislead, from that day 1.11.20 to 11.06.22, two different defs from the same entry @ two different dates.

<- .

=> Prefer n-lab or EOM, more maths oriented.

eom : Topos form a category equivalent to the category of Sets-sheaves on a site.

<= A stack is a topos : the notion of topos generalizes that of stacks, if the notion of the category of categories is tolerated.

If not it is the reverse, the topos are defined as

equivalent to the sheaves on a site with values in Sets or more generally in objects of ONE category; and stacks generalizes topos by being sheaves on a site with values in VARIOUS categories.

-For a stack

To each open set of the site is associated, non-plus a simple object of a category like a ring, but a whole category.

$F(U) = C_U$ ie (objects+morphisms).

-For a topos

$F(U) = ob(U)$, one object of a fixed category C.

In that sense a stack is a higher topos.

Gerbes : a gerbe (on a topological space or a site) is a stack with values in groupoids ("groupified" categories, ie whose morphisms are all invertibles).

Ex :

-Points of a site S can be groups automorphisms G_x of the studied structure Y.

$U = \{G_x \in \text{Aut}(Y), x \in X\}$: Open set of a site S.

-ST Tokos.

objects of ST : σ , sheaves over a site S.

$\sigma(U)$, section of σ over U, values in another category, like [G]roups or [R]ings.

-> If ST is a stack : values in [[C]]ategories.

-> If ST is a gerbe : values in groupoids or [G[C]]ategories.

-> If ST is a topos : values in one category [C].

-> what about values in $[[[T]]]$ opos? "logic" licit?

morphisms of T :

--> Nested, fractalized or recursive structures.

Process : structure a space, then use that structuration process on such structured spaces, considering those as ... elements of the "next" or "higher level" space to be structured, at a "higher level" or "next level" or "level+1" or "n+1-cat".

-Exemple. Given a space X, structure it with a topology, topologize it.

Then consider all such topologized spaces, as elements of a "higher level" SPACE on which a TOPOLOGIZATION is again processed.

Queries :

- Repeating that structuration series process, when does it stop?

- What information do we get for the level-0, or initial spaces?

- Can this process be applied to the structurisations-processes themselves?

- Is this "set-logic" licite? Leading to "structure monsters" as the highly non differentiable Peano-Koch-Cantor continuous curves, some of them able to fill plane regions. Risks of theoretical cancer-illness for theories : pathologically-bloated with abstract-nonsense leading nowhere; ie to the big-void; or to a black-hole in the universe of theories : it is here that a big AI should be launched; to prevent mathematicians from losing themselves in time and efforts.

-> Check if this related to ∞ -categories.

<===

->
 Stack = Champs?
 Sieves =
 Quivers = carquois (que ce soit, ce possible narquois)
 Fibered category.
 Final object.
 Initial object.
 Direct limits (of categories?).
 Simple cnx.
 Arc cnx.
 <-

- Scheme : ringed space that is locally the spectrum of a commutative ring.

A topological space T with a sheaf of rings, which arises from gluing together spectra of commutative rings along its open subsets. T admits a covering or can be covered by open subsets who are homeo/iso-morphic to spectra of rings (those being endowed with the Zariski topology).

=> Glueing over can have several possible formalisations :

- a) Coverings : by fiber products.
- b) Categorically : Fibered categories.

® "Relative" point of view. "Bouquets-above-object" philosophy.

Rather than studying a scheme Y , one should consider schemes over Y , or arrows above Y : $X \rightarrow Y$. Again the family of those schemes above Y , noted $(X \rightarrow Y)$ can be considered as a scheme, quickly called a moduli space over Y .

So in order to study a scheme Y with a collecting Y -data goal in mind; consider other objects above Y , denoted $(X \rightarrow Y)$ and often called arrows above Y ; depending on the category where the covering object X live, we get different types of data-collecting objects about Y .

--> Bouquets; used to generate/collect invariants data-
and/or-information that is processed again (eventually
with the same tools as the initial object) to get the
desired understanding
of the initial object.

<--

- Etale topology.

Topologisation of the space of etale morphisms of schemes
above the studied one (fixed "base").

- Etale point of view.

Replacing open sets of X by etale morphisms to X .

Gives a sufficient finer topology than Zariski one to have
good integer coefficients (co)homologies.

==> Bouquets.

==> Good explanations in Gabel catsch.txt, with
the insight that for E-sites, choosing the class E of
morphisms from which the site over X is built gives
different theories :

Class of inclusions : Zariski site.

Class of etale morphisms : Etale site.

-> Salvaging the lost hdds might be worthy to gather those
insights

collected along the years.

<-

- Ringed space : topological space endowed with a sheaf of
rings; with points admitting well overlapping stalks of the
structure sheaf [stalk = limit@ a focus point, along its
neighborhoods U , of sheaf-sections over U : so the limit
must be available].

- Sheaf : contravariant functor with good overlapping
pties from the category of open subsets of a topological
space to another category C :

$(\text{OpenSub}(X), \text{inclusions}) \rightarrow (\text{Obj}(C),$
 $\text{morphisms}(C)).$

<==

® Mumford-Tate groups are grps of symmetries of Hodge structures (filtrations ?) . Grounds in Lie theory, Hopf algebras. Extentable to motives ?

• Wrote 5mn of maths on paper : Formulation of extended criterion, in more elaborated terms :

$$\text{LogD}_\delta(V)(\#V(k)) = n_f(V) - \text{Trdeg}_k k(\Omega_f(V)) = \text{"codim}_k(\text{Gmot}_f(V)).$$

The "f" underscript is for "fundamental".

* HdStGervais. IM Lyon.

Le groupe fondamental par les revetements. Etienne Ghys.

"Les ambiguities ou la multiformité de $f(z)$ se traduisent par la taille du groupe d'invariances ou symetries de la fonction duale $f^{\wedge}=f^{-1}$."

- Compare $\rho(90^\circ)=\rho(\pi/2)$ and σ_Δ .
- Poincaré & DeRham dualities, isomorphisms.

® B.Poonen. Introduction to Arithmetic geometry.

- Absolute values, completions of \mathbb{Q} by classes of Cauchy seq; p-adics valuations; \mathbb{Q}_p , \mathbb{Z}_p .

=> Smart sticking-to-reality approach as in his \mathbb{Q} -book : fruitfull new trend from computer science era generation.

<=

® Curvature reading.

Carlos Sacre, François Gramain, Frédéric Pham.

2.11

Wikipedia.

® Curvature

Surface curvatures given by eigenvalues of a symmetric (Weigarten) endomorphism, and directions by corresponding orthogonal eigen spaces.

® Gauss Bonnet Theorem

M : compact Riemann manifold without boundary.

$$\hat{K} = \int K / \mu(M) = 2\pi \cdot \chi(M) / \mu(M).$$

$\chi(M)$ = Euler characteristic of M = $\sum (-1)^i \cdot b_i(M)$ = alternate sum of Betti numbers of M = $\sum_i (-1)^i \dim H_{i-1}(M)$.

For convex polytopes $\chi(P) = V(P) - E(P) + F(P)$.

χ = Vertices - Edges + Faces.
= Sommets - Arêtes + Faces.

$\Rightarrow VEF$ (SAF) = Qui est VEuF est SAuF.

- Wrote some notes on paper.

Torsor, Multiplicative grp, Group schemes : μ_n .
"Bouquets over objects".

- For a real (variety) compact orientable surface V.
Br(V) in terms of $\chi(V)$ and $nc(V)$ nber of connected components of V :

$$nc(V) = \dim_{\mathbb{R}}(H^0_{dR}(V, \mathbb{R})) = d_{dR}(V).$$

$b_1(V) = \dim_{\mathbb{R}}(H^1_B(V, \mathbb{R})) = \dim_{\mathbb{R}}(H^1_{dR}(V, \mathbb{R}))$. Because $H^1_{dR}(V, \mathbb{R}) \cong H^1_B(V, \mathbb{R})$.

3.11

- Wrote on paper some notes :

Bouquets (pincesaux) in the plane; fixing a subset of fundamental periods.

- 1) general curves.
- 2) algebraic $E\beta$ ones.

4.11 3am.

© M Lieblich. Thesis intro.

<https://math.columbia.edu/~dejong/students.html>

Extensions of Brauer grps towards toposes.

X smooth, simply connected complex surface.

$$\mathrm{Br}(X) \sim (\mathbb{Q}/\mathbb{Z})^{\lfloor b_2(X) - \mathrm{rank}(\mathrm{NS}(X)) \rfloor}.$$

The corank of $\mathrm{Br}(X)$ measures how many cohomology classes are non algebraic.

- Research Writing tips.

a) Keep a diary : helps to solve pbs (Mechanics-era lesson solving bike misfires from a review of diaries : at each run noted the good ones; while analysing their contexts, found out that when a bit of new gas was poured in, the bike would fire correctly).

b) A writing tablet, to take notes and to read articles and e-books. A folding one (side 1 : read; side 2 : write).

Size : about 12" to 14".

Weight : about 300g.

* CIRM. J H Evertse. On Schmidt subspace thm.

Winter school: "on Lang and Vojta's conjectures" March 03, 2014

Approximating rationals to alg nbers are finite.

--> Criterion with " \leq " instead of " $=$ ". <--

© Tried to get files from damaged 09 CD with Win\$98.

- Made a partial backup : files of "primenb, zeta, qpts, motifs, russian" folders are unreadable although appearing in file allocation table. Took photo snapshots.

--> Avoid Disks (optic or magnetic) : mechanical issues added to electronic ones.

--> Prefer SD & SSD.

<-- Found by the way some gifs of pencils of Chatelet surfaces and good djvus :

® Read some articles.

- Yoshinaga on construction of a Non period.

- Claude Sabagh on Hodge cplx varieties (Lefschetz thms or slicing

an intricate variety by hyperplanes to collect homology data from the simpler slices, Hodge structures, Distributions).

- Motivic integration (Maxim Kontsevitch 1995) from measures on them (toric varieties).

- Wrote some remarks on paper :

Bulbes (onions, multi-layers wrapping, spot_welded matrioshka : the weld is done by fixing some periods, draps-couvertures) in 3d space; fixing a subset of fundamental periods.

0) Bulbes of bubbles.

1) Nested balloons : "spot-welded" or "spot-glued" at their tying knot.

5.11

© M.Reid. Final comments; good clues on algebraic geometry.

- Projective embedding with very ample divisors.

- Rigid aspect of projective CP^n : the only regular functions on it are the constants (Liouville).

- Euler-characteristic in terms of intersections nbers.

- Generic points of extended variety (base change to an algebraically closed field) up to absolute Galois group conjugacy give generic points of base variety.

- Completeness rephrased in terms of fullness.

© Bombieri Gubler p529.

"A.5.16. A line bundle L on X is a vector bundle of rank 1

over X . Note that the tensor product or the pull-back of line bundles are again line bundles. We use the following notation: The n -fold tensor product of L is denoted by $L^{\otimes n}$ and $L^{-1} = L^*$ for the dual. For negative n , we define $L^{\otimes n} := (L^{-1})^{\otimes |n|}$.

The set of isomorphism classes of line bundles on X form a group under \otimes . It is called the Picard group $\text{Pic}(X)$. An element c of $\text{Pic}(X)$ is always written boldly. The Picard group is abelian and so it is written additively. The isomorphism class of a line bundle L is denoted by $\text{cl}(L)$. We have $0 = \text{cl}(OX)$ and $-\text{cl}(L) = \text{cl}(L^{-1})$. To check this, note that the transition functions of $L \otimes L^{-1}$ are given by $\alpha\beta\alpha^{-1} = 1$.

© Read first versions of notes.txt of 08-09 in old 1999 Gabel (Debian Sarge05).

==> Good insights in them, plus some original ideas :

1) abstract theories (for example in catsch.txt : bi-categories, Universes, E-sites, "Hyper" Homologies, and so on).

--> Expliciting "points of views" (scheme):
topologisations of

either (sub)objects or Homs from/to the studied-object related-object. The related-object is either the initial-object or is of the type of the initial-object or of other type like morphisms, couples of the latters [objects,morphisms], categories, etc .

<--

2) concrete theories (divisors, jacobians, rational points).

$$X \rightarrow \text{Jac}(X) = C^g / \Lambda$$

$$x \mapsto \omega / \omega$$

--> It may be worthy to recover, @least, the last hdd to get back the latest versions of those txts, with the begining of other TeXtes (ebauches : slides.tex,

article.tex), plus some pieces of open source/free software to make all that stuff available online as initially intended.

<--.

<==.

* A.Wiles 05 talk @IAS.

Rational points on high genus curves from

A. Pal articles. Deligne-Mumford.

$C : 3x^3+4y^3+5z^3=0$ (Point in \mathbb{Q}_p , but no \mathbb{Q} -point).

$\text{Jac}(C) : x^3+y^3+60z^3=0$ has a \mathbb{Q} -point.

6.11 3am.

® Wei Ho (ams 2014). HOW MANY RATIONAL POINTS DOES A RANDOM CURVE HAVE?

Explains \mathbb{Q} -points for curves defined over \mathbb{Q} ; with emphasis on genus 1 curves, ie elliptic curves over \mathbb{Q} . Relates most recent progress including invariant asymptotics (Barghava-Shanks on ranks, Selmer grps computations, etc).

Grp homology approach.

"For genus 1 curves, $J(C)$ is the connected component of $\text{Aut}(C)$ ".

--> ? Explicit "the", maybe should be of " $C/\text{Aut}(C)$ ".

Since $J(C)$ is built from C , its "genetic-seed subvariety", as a complex quotient space by a period lattice, we have a surjective map, or canonical projection

$$C \twoheadrightarrow J(C)$$

C is a $J(C)$ -torsor, ie a torsor under the action of the automorphisms group $\text{Aut}(C)$. Note that varying fields of definitions (base field extensions, restrictions,

reductions, etc) generate torsors under the corresponding (eventually Galois) groups. Studying those in a suitable setting (structure of the space of fibres above those grps-fields actions) may be of interest.

Recalls from Alexei Skorobogatov Q -pts and Torsors book. "An arrow $Y \rightarrow X$, stable under an algebraic group G action on Y , makes Y an X -torsor under G ; with some conditions on the arrow. Moreover, X is then often noted $X=Y/G$, as the space of orbits of Y given by the G -action on Y , the arrow being the canonical surjective projection π_G that sends an element y of Y to its orbit $\text{Orb}_G(y)=G.y$ ".

\rightarrow For principal homogeneous spaces, the action of G is free and transitive, Y has only one orbit; Y is then viewed as an unramified (hence "orbit-connected" or "one orbit") covering of X under the action of the grp G . Cf Gabel arithgeo.txt @ Mike Stoll conference.
<-

® Read some articles on Brauer grps.

-Harpaz-Shlank. Extensions towards toposes : category homotopy.

- J.L ColliotThèlene. Brauer Manin grp pathologies.

[27] A. Skorobogatov. Torsors and rational points. Cambridge University Press, 2001.

[28] A.N. Skorobogatov. Descent obstruction is equivalent to etale Brauer–Manin obstruction. Math. Ann. 344 (2009) 501–510.

- Wrote some ideas in bnotes.txt on Gabel (Debian Sarge), after Voedvosky talk, to get the good category of varieties to set their "Q-level".

\rightarrow Lan Gabel.

Consider gdrive one phone; dbox, github, ftp other.

<-

- Wrote some paper notes about Δ^n .

==>

Explicit the isomorphism between A and Δ^n , geometric-pt of views, the possible arrows.

---> Choosing one arrow, sets the setting. Apply this to $P(X)$.

Timeout wasda.

<==

* Some conferences : Rational pts @ CMI 2006.

Brendan Hassets, on models. Rational pt as sections.

Andrew Kresch. Torsor or principal G -bundle : set of G -orbits.

7.11

Some Rational pts conferences.

* B. Poonen.

1) IAS. Most hyperelliptic curves of odd degree have no \mathbb{Q} -pts.

Considering M_g projective model of $y^2=P(x)$.
deg $P = 2g+1$. ∞ only rational pt of model.

(Barghava Shankar : degree 2-covers).
Density of curves having only one \mathbb{Q} -pt.

Chabauty : If $\text{rk } J(C) < g(C)$ then $C(\mathbb{Q})$ finite.

If C has a Q -pt P .

$$C \subset J(C)$$

$$P \rightarrow [P-\infty]$$

2) MSRI. Cohomological obstruction to Q -pts.

Inclusions chains : $[X(k) \dots X(A_k)]$.

$X(k)$

$X(A_k)^{\text{Br}}$ obtained from taking torsors under PGL_n 's.

$X(A_k)^{\text{Dsc}}$ obtained from taking all torsors.

$X(A_k)$.

--> seeking filtration refinements of

$$X(k) \subset X(A_k)^{\text{Dsc}} \subset X(A_k)^{\text{Br}} \subset X(A_k).$$

* John Tate († 2019) talk @ Abel Prize 2013. Rational pts on elliptic curves.

I) Mordell-Weil thm.

a) Weak Mordell-Weil.

$E(k)/2E(k)$ finite. (P_1, \dots, P_q) .

b) Height control under 2-map.

$$|h(2P) - 4h(P)| < C.$$

c) Bounded height points are finite.

II) Asymptotics for moduli of elliptic curves of bounded height by t .

$$\Gamma_t = \{ y^2 = x^3 + ax^2 + b, (a, b) \in \mathbb{Z}^2, h(a^3, b^2) \leq t \}$$

$$\theta(r, t) \sim \begin{cases} \frac{1}{2} & \text{if } r = 0, 1. \\ 0 & \text{if } r > 1. \end{cases} t^{-\infty}$$

$\theta(r, t)$: density of the subset of elliptic curves of rank r lying inside the h -ball of radius t of the moduli of elliptic curves over \mathbb{Q} ; $\text{IE}_{\mathbb{Q}}$.

For the few high rank cases ($rk=28$, Elkies 08), it seems that rational points have a basis of integers pts.

* Richard Borcherds. Mordell-Weil.
Doubly periodic functions on a lattice, must be meromorphic to be non trivial.

8.11 am.

- Wrote some paper notes on $A_n - \Delta_n$, timed out when arriving to $P(X)$.

Conference. Videos.

* 2mn Ljj.

1) Tesselations. Hilbert 1900. Pb 3 : Bolyai-Farkas-Gerweyn. Quadrature of convex polytopes. H.Dudeney. M.Dehn. (invariant-angles for congruence). Tarsky Laczovich.

--> N-version of crt.

2) Conway : Tesselations. Calendars.

* Barry Mazur talk@IHES.
Prime distributions, Riemann hyp.

8.11 pm.

© Backup : maths srcs of phones to gdrive.

9.11

- Groups acting on varieties. (3 J's) :

J.P Serre. Galois cohomology. Springer.

J. Milne. Etale cohomology. Princeton.

J.L ColliotThélène A.Skorobogatov. Brauer Manin groups.
e-book.

- Wrote some notes on paper.

-An, Δ_n comparison.

X_* as a torsor over X under $\text{Gal}(k_*/k)$.

-Crt conceptual big steps : k -relation, k -pt. Pullback-classification stratifications from large-arrays of periods.

* Conference. Videos.

- 2mn Ljj.

Pavages (plan) Frise (bande).

- F.Villegas talk@IAS 2016. Hypergeometric motives.

From Dwork-Igusa studies.

Finding monodromy varieties.

© Qadr (dual hd-boot) restart.

--> Unlock 1) Win\$xp 2) users startx.

10.11

© Qadr restart.

- 1) ok for 30d.
 - 2) Tinkered chmods of x-bins : quirks@next level after each mod.
 - 3) Some floppy (txts,pdfs) tedious transfers from Gabel.
- > Lan those boxes.

© Clouds sign-ups tediously (apps+web).

- 1) Verbofus LaTeX. (Austria : GeoGebra ?).
- 2) Github. Not so convenient for notes updates. Best maybe is Android apps : xplore, Q.

© Browsed banggood for folding tablet.
13.5" 14.5" 8G ram 250G ssd ~ 300e.

© Android math apps.

- 1) M\$ Math : impressive TeX ocr.

$$y^{\{2\}} = x^{\{3\}} + x$$

$$x = \frac{2^{\{\frac{2\}{3}\}} \sqrt[3]{\frac{\sqrt{81y^{\{4\}}+12}}{9} + y^{\{2\}} + 2^{\{\frac{2\}{3}\}} \sqrt[3]{-\frac{\sqrt{81y^{\{4\}}+12}}{9} + y^{\{2\}}}}}{2}$$

- 2) Math Editor (TeX renderer) : free version has pitfalls (ads).

--> e-stuff = (tool, burden). Save time by speeding process (search in e-files versus paper); but bugs & use-learning, waste a lot of it.

• Facing again research paradigm dilemma :

- 1) go ownway/check-before, what was done by others so far.
- 2) prove a thm/explore-build a new field with conjectures.

11.11

® Read Stefane Fermigier 1995 thesis on algorithms in Arithmetic of elliptic curves (finding ranks from L-functions zeros).

--> machines computations help stick to hardcore grounded reality.

* Videos (ytube).

A) Arithmetic topology talks@IAS.

1) Kim Minhyong : Some arithmetic path integrals.

2) Tony Feng : Some analogies between arithmetic and topology.

B) APMEP Lyon : $w(n) = |\text{Primefactors}(n)|$. Averaging. Ramanujan.

C) 2mn Ljj :

1) Jordan plane curve thm. Interior points.

--> For crt. Alg or q-Cg : q or alg rays, intersecting C.

2) Classification of Tesselations. Hilbert 1900. Pb 3 : pavages (tiling possibility detected by invariance grps of motif shape). Mickael Rao.

Quadrature of convex polytopes. Bolyai-Farkas-Gerweyn.

H.Dudeney. M.Dehn (invariant-angles for congruence).

Tarsky Laczovich.

--> N-version of crt.

• Finish.

-An- Δ_n . Base field ext. Torsor over Galois grps. Then Gmot.

-Trivial torsors : base, covering, etc.

- Ajz-torsors : one space, one kaors.
- Comp two definitions of $\text{Jac}(C)$: transc & linear one.

12.11

© Ordered tablet-pc@banggood to read e-books everywhere, in a larger screen than smartphones.
 --> 3 step cb quirks.

® Read Milne Étale cohomology introduction : // mem Br. with Weibel book (good exhaustive tool) for cohomologies.

- Wrote on paper a more general, extended criterion (between alg cycles & motives).
- Tackling Elliptic curves & abelian varieties.

Rank of E. (From Knapp and Silverman-Hindry)
 $L(E,s)$ zero formula.
 Cm issue on rnk.

- Pt- on moduli pt- on curve.
 ---> k-point on moduli -> k-point of base variety. Case of fibered moduli above (parameter space, points)

® Huber Mueller-Stach. Period & Nori Motives book.

- Good intro to motives & arithmetic geometry with smart balance abstract theory/concrete examples.

See their // treatment of Elliptic curves-Jacobians/Tate motives.

-Motives : "nuclinarisation" of varieties.

-Normal crossings : fundamental or "orthogonal" basis cycles, giving all cycles in H_b .

-Category theories.

-Torsor from grp sheaves (set-ification allowing identifying X with G , then Y (above X) is copies of G : peignes) hence maybe the $G \leftarrow X$ swap found in nomenclatures (also in $H_{\text{et}}()$?).

-Tarsky-Seidenberg Pullback of semi algebraic sets.

-Tate motives (Z-pullback) for L-functions. (Yamashita).

-Tanaka category.

Abelian category, its tensor pairing gives, or generates cohomology dualities.

Its dual category is represented by a pro-finite grp scheme functor G_{mot} .

- Motivic π_1 .

Brown : (2, 3) arguments of MZVs that give \mathbb{Q} -generators of all MZVs.

Infinitesimal motivic Galois grp actions.

Homotopy of motives.

(Goncharov-Beilinson).

-Family of motives, Sheaves.

Conservity cj Ayoub.

$X \sim Y \rightarrow M(X) \sim M(Y)$.

$\text{Gal}(\mathbb{Q} \setminus \mathbb{Q}) \times \text{Spec } \mathbb{Q} \rightarrow \text{Spec } \mathbb{Q}$

$G_{\text{mot}} \mathbb{Q} \times \text{Spec } P \rightarrow \text{Spec } P$

$G_{\text{mot}}(\mathbb{Q})$ is Nori's motivic Galois group of \mathbb{Q} . This is a pro-algebraic group attached to the rigid tensor category of mixed motives over \mathbb{Q} .

$\rightarrow \otimes := \text{Br.} \leftarrow$

-Yoshinaga Non Period : automata applied to real nbers
(Turing machines).

--> Tensor, functor, derived ... categories. Again,
nestification or fractalization of structures operations.

Remember : from periods fan to periods fannes.

-Analyse what's gone :

periods cj

qpts

zetas

primenb.

Remained : level.

<--.

* Videos.

-A.Wiles 2005 talk @IAS. Q-pts of curves C.
Ramification approach for $g(C) > 1$.

-S.Bloch on motives. 1991.
Good intro.

© Restarted Lenovo Linux Mint.

- Td around.
- Triple save txts with phones.
- Another (3rd) phones/Maths -> gdrive sync.

--->

- Find a local sync app. Needs smart multi cloud/syncing
and a commit-app for reports/diaries txts in "a web
suited" way.

- Prefer commit to sync for such small txts.

<----.

16.11

- Night: Wrote some paper notes about extended periods (large-array periods).

- 1) Corresponding trdeg fields.
- 2) Functions on/from them for stratifications.

© Read some e-(article,books) on smartphone then on Lenovo Linux. Found a russian repo for the latter, spend time to pull a bookshelf of classics (arith geometry, nb theory, algebraic geom) :

® Periods books.

- 1) Kulikov on Jacobians @(Parshin, Shafarevich) EMS : Good oldschool russian stuff.

- 2) More recent same spirit treatment : Periods maps of Carlson, MuellerStach & Peters.

- 3) Update with Huber-MuellerStach treatment in Nori Motives Periods book.

==> Path : towards Topologisation of the moduli of Arithmetic varieties, before Analyfication and Differential-geometrisation it in next future.

© Looked longly for a missing piece of diary.txt in all repos (remote & local : Was adu gncn mzk during a A806 save around 25.10 for time rasr ?) :

---> prefer commit to sync; because sync overwrites : tempered remote-data may ruin local-files after a sync.
 ---> Stop the ramble, producing mountain-piles of paper and e-notes (periodic redites ... on periods).
 ---> Settle down for a synthesis.

Etant donne y_o dans C , l'ensemble des nbres x tels que (x, y_o) soient algebriquement

- 1) dependants est denombrable.

2) independant est indenombrable.

Mais cela ne s'etant pas a la dimension superieure :
l'ensemble des couples (x,z) de C^2 tq (x,y, z_0) soit
algebriquement

1) dependant n'est pas necessairement denombrable.
Considerer les (x,x,z_0) , pour x dans C , annullant $R(X,Y,Z)$
 $= (Y-X)P(X,Y,Z)$, pour tout P dans $Q[X,Y,Z]$. Certes, c'est
une dependance degenerée.

Check : "2) independant n'est pas necessairement
indenombrable."

Videos.

* DNDE

* Science etonnante. Systemes dynamiques discrets.

1) Fourmi de Langton.

2) Jeu de la Vie de Conway

Emergence : generation de structures hypercomplexes a
partir d'un petit nbre de regles simples d'evolution
discretes (equ diff discrete elementaire).

Certains etats initiaux peuvent engendrer, à une plus
grande echelle, des configurations (pattern) ayant le meme
schema d'evolution qu'eux.

Ex : Petit pulsar de quatre petits carres initiaux
generant un grand Pulsar de quatre grandes surfaces
carrees (constituees de carres plus petits).

Des automates finis peuvent simuler des machines de Turing
(Turing machines).

* Topos. L Lafforgue talk "Bienveillance en sciences" @ IHES.

Godel incompleteness \leftrightarrow presence de suffisamment de points sur un topos (Deligne).

Rusovski logical model theory (stability) applied to arithmetic.

17.11

• Wrote some paper notes on :

- 1) $P(X)$, galois grps and torsors.
- 2) Tackling periods torsors.
- 3) Reformulation of $Br_K(P(V))$ --III mem link.

® Read

-Brauer Grps:

ColliotThelene_Skorobogatov. Brauer grp book end (Tate motives c_j true for some Kuga-Satake K3 surfaces).

-Transcendance :

1) Huber Wustholtz : on 1-motifs periods.

--> key article : good balance theory/concrete cases with important abelian varieties results.

2) Nesterenko Feldman : hypergeometry, dioph. approx; using rational expansions (series, continued fractions, etc).

3) Overviews.

- Waldschmidt : fundamentals overview (09 Arizona Univ slides).
- Andre : Galois heritage, with motives insights.

© Writing tablet.

Remarkable 2 : 8g ram ... 450e.

19.11

- Wrote some paper notes.
Gmot bi-categories, dble tensor product.
--> Already tackled by Breen around 2000.

Aut(X). mot 2- : moy of mot, lim; int, der; function $f(M)$; values in μ .
--> Already tackled by Kontsevich around 1995.

- Sorted last 2006-2008 paper notes.
Approximating periods : lack p5'-p12'.

® Read

Paula Retkoff. Hypergeometric periods.
--> Introduction to abelian varieties and jacobians.
Wolfart j. werte hypergeometrische functionen.

Wustholtz

<https://scholar.google.com/citations?user=9knV80QAAAAJ&hl=en>

* Ljj RH.

Au plus un prolongement depuis une partie dense d'une fonction continue.

Un bon prolongement conserve les pptes de la fonction initiale.

20.11 am.

® Read Waldschmidt reports :

1) G.V. Chudnovsky – On the path to Schanuel's conjecture. Algebraic curves close to a point.

I. General theory of colored sequences.

II. Fields of finite transcendence type and colored sequences. Resultants.

Studia Sci. Math. Hungar. 12 (1977), 125–157 (1980).

2) G. Diaz : If α is an algebraic number, $\alpha \neq 0$, $\alpha \neq 1$ and if β is an irrational algebraic number of degree d , then $\text{tr deg}_Q Q(\alpha^\beta, \alpha^{\beta^2}, \dots, \alpha^{(\beta^n)}) \geq \text{floor}((d+1)/2)$

3) Denote by L the set of complex numbers λ for which e^λ is algebraic : $L = \{\log \alpha ; \alpha \in Q_\times\}$.

Hence L is a Q -vector subspace of C .

The most important special case of Schanuel's Conjecture is :

Conjecture. Let $\lambda_1, \dots, \lambda_n$ be Q -linearly independent elements in L . Then the numbers $\lambda_1, \dots, \lambda_n$ are algebraically independent over Q .

Not yet known that the transcendence degree is ≥ 2 : Open problem : Among all logarithms of algebraic numbers, one

at least is transcendental over $\mathbb{Q}(\pi)$.

20.11 pm.

- Sorted last 2006-2008 piles.

One set "Algebraic curves ($d^\circ=2,3,>3$)": Lack p5-sq of high degree.

- Tackled close algebraic curves on paper : polygons/convex polytopes case. Ray tracing.

® Read Giorgi-Zannier lectures.

Wulstholz. Leibniz motives.

Mumford. Space of varieties.

21.11

© Tried Jupyter install on Android KitKat A806 phone.

Bugs a lot : time consuming.

Tried connecting from terminal in vain.

Then rambling around with --h on Python console commands.

Managed to get the jupyter-console.

Finally got the idea (ide...a : Remote/cloud

coding/computing technology) : Jupyter is a front-end for

Python; allowing coding dev through a remote ide web-

interface, through a browser, that accesses a host server

(this one may be local) via web-sessions with (login,

token) authentication; during those sessions, code is

remotely written, modified and run; with the outputs sent

back to the client terminal. This process may be done

locally on the user device, by running a local server-bot

that listen on specified ports range : the user connects

to its own server with a web browser.

Jupyter notebook list : displays servers.

--> Copy the login data & paste it in a browser.
 ==> Better with Firefox.

```
2020-11-21 02:16:43.876 ServerA
file:///data/data/ru.iiec.pydroid3/app_HOME/.local/share
/jupyter/runtime/jpserver-22035-open.html
http://localhost:8888?token=e968913d4e3130ddb29f645d6a9f32
1b284a4b3bd225b7d3
http://127.0.0.1:8888
/?token=e968913d4e3130ddb29f645d6a9f321b284a4b3bd225b7d3
```

22.11

© Lenovo Linux Mint 18.3 : back-up home data on blue stick. No Jupyter, nor Sage in its repos.

© Debian 9.4 : has both, plus cohomology pckgs.

--> So, Updated Debian from 9.4-Stretch to 10.3-Buster, in two steps :

- 1) dist upgrade current one.
- 2) modify apt-source files & re-dist upgrade. Maybe just upgrading the apt-stuff of current would have been sufficient (try this for eventual upgrade to BullEye-Testing).

© Installed both Sage and Jupyter suites of Buster.

© Installed gvfs for thunar (xfce file manager) to get automatic

mount@hotplugging removable media.

--> works for Android phones storage.

© Lenovo Linux Mint Sylvia 18 3.

Evn upgrade note was missing.

1. dist-upgraded current one.
 2. installed mintupgrade app. Done a simulation to upgrade to Tara 19.
- Note that current one is Ulyana 20.

23.11

- Found out (golden-age) paper notes :

1) small notebooks 1990_1997.

2) ramblings in 3 sets :

a) from 1992 to 1995.

b) 1996-2000.

c) 2000-2004.

Three or four piles; maybe about 7000p; out-of 2% are worthy.

* Ken Ono. RH 2018 talk@ Simon Foundation.

Euler product formula.

Riemann sum $\sum 1/k$ for $\log(n)$ approximation.

* Insight into Maths.

Algebraic topology basics.

A_1 not homomorph to S_1 .

© Linux packages repos

-Debian

Backports : tuned from current-testing, to fit current-stable.

-Mint

main

upstream
import
backport
romeo

© Seems that both Debian & Mint needs step by step upgrades to go from version i to $i+j$ ($j>1$); One way of avoiding that is to upgrade through a fresh re-install (re-partition).

Time required for the one step upgrade : Debian \leq 45mn,
Mint \geq 1h15.

--> Try to make a lan for sync-commit txts.
1) dlina/smb of ispbox. dlina : more media-iot oriented (wireless).
2) router with nfs.

24.11

© Mainly computer-science :

- Linux Debian-Mint study. Going back to internet/computer prehistory.

(Maths origins : Pascal pascaline, Leibniz, Babbage, Boole, Ada Lovelace, Turing, Von-Neumann).

First us mainframes of early 50's : progress made mainly by universities labs with "confettis" coding (punch cards); then private companies took the lead)

- Tried Jupyter-Sage on Lenovo Debian Buster, first plots. Comparison with Genius maths tools. (Gamma and zeta functions).

- Wrote some notes on paper :
Tackled close algebraic curves : polygons/convex polytopes case. Ray tracing.
Approximations by polygons/polytopes.

- Faltings finiteness applied to approximating polygons. Poly-gons/topes case. Even for the simplest of the simplest varieties (regular polygons ie piecewise affine varieties with a high symmetry) the proof of the criterion seems requiring a lots of tedious work and efforts, including for its weakest insufficient versions (two periods).

© Found, in last available CD backup of Jawa (July 2007) a forgotten small TeXte, about the criterion future investigations; mentioned in the memoir. This small note is well written in english; it is a good sequel of the memoir : consider publishing it, at least in a personal website; as it is showing elaboration of maths.

Revising it : some typos. Replace :

- 1) p1. "sneaky" with "intricate". "former" by "former algebraic".
- 2) p2. "path" with "band".
- 3) p2. "Another object" with "Another object which is original".
- 4) p5. "In that formulation, only an algebraic version".
- 5) p5. "is not possible as formulated here". "No non-trivial".
- 6) p6. "References" with "Reference."

25.11

- © Tried to get some records in dropbox files of the blackout era 09-12.
--> Nothing.
 - © Sorted a bit, smartphones and Lenovo-Linux data.
 - © Put on Lenovo Debian Buster the content of the faulty CD of 0109
Jawa backup.
 - © Installed two old 21" flat screens upside-down to read e-books. The Lenovo Linux Laptop does not seem to handle more than 2 screens.
 - © Found among the salvaged files two key articles.
 - ® Minhyong Kim (From a talk@ Leeds University 08).
 π_1 of the thrice punctured P^1 .
From Etale Chabauty and etale fundamental grps to motivic fundamental grps.
 - ® André. Motifs et multizetas. 08.
Overview of motives. Tate motives $cj(\text{"Weil type"}) \Leftrightarrow N_p(M)$ polynomial in p .
Multizetas and Feynman amplitudes.
- => Personally, I am not so optimistic about nearness of Grothendieck periods cj proof; maybe in the next century or even later.

26.11

- © Lenovo Debian Buster
Adjusted tediously screens layout(td a bit) with xrandr multi-displays widget : unstable and buggy. Either

firmware issue or kernel-uefi sync or xwindow backend system.

© Restarted Qadr (dual hd-boot) for future hdds recovery attempts with Win\$XP/Debian Wheezy.

® Updated motifs and Q-pts articles repo.

Yves Andre, Francis Brown, [Youness Lamzouri, Driss Essaouabri, Samir Siksek, Ahmed Abbes, Karim Belabas, Joseph Ayoub], Minhyong Kim, Maxim Kontsevich, Gilbert Wustholz.

27.11

© Partly set an old adsl-router for sync-commit : needs a constant connected machine with a fixed adress as a file server; ie running a file server (through nfs); because the router has no built-in storage device nor even corresponding ports/sockets (no usb, no sd) to plug external ones.

© Qadr pci-card hardware & network layers are buggy (possible bios/firmware issues with automatic pci irq attribution quirks); the bunch of jtag-able fpga chips on the board seems to be the reason of this machine (de-jp : siemens-fujitsu) unstability appearing in (usb plugs, network cards and dvd, kernel latency oops, etc).

® Found in a graduate repo, a neat introductory text on Riemann surfaces.
(Nicolas Bergeron-Antonin Guilloux).

® Read Huber-Wustholz on 1-motifs.
=> Smart focus on periods fields.

- Finally wrote in a hurry some paper notes on periods

variations of a moduli of general plane curves.

=> One key pt is the way the moduli spreading out is done from the initial curve; this process shapes the "dna" of the collected data.

28.11

© Sorted notes in both Linuxes, with file names format : dates.txt;

Done the same for last paper ones.

® Found out a good introductory recent book to etale cohomology :

Lei Fu 2017@ World_scientific.

® Read Brauer grps of real-varieties articles of Nikulin (1993), Demeyer-Knus (1976).

* Bjorn Poonen 2008 talk @MSRI.

Cohomological obstructions to Q-pts.

==> Good introductory talk about torsors, bringing from graduate to research level.

Some torsors allow :

1) Q-pts partitions and

2) building corresponding obstructions-sets to the existence of Q-pts

3) combinations among them (torsors), to get refinements of their filtrations.

Examples of torsors :

- Y , torsor above $\text{Spec } k$, or $\text{Spec } k$ -torsor; under $G = \text{Gal}(K/k)$.

Y is trivial iff it has a rational k -pt, $Y(k) \neq \emptyset$.

- Take all PGL_n stratification or the connected alg grps ones (D.Harrari), to get the Brauer-Manin set.

--> So a torsor or a homotopy grp above those torsors-engines grps may be a suitable object to get a functor (or a "techniques" sheaf or a stockos) with values in "obstructions-filtrations" .
 <====

* Science etonnante. Chaos theory.

Pendules.

$$d^2\theta/dt^2 = g/l \sin\theta$$

Doubles pendules : magnifying effect of recursion in perturbation theory.

A double pendule or 2-pendule : second-order or redundancy, generates/amplifies/magnifies chaos by giving a system with ultra-chaotic behaviour against perturbations of initial-conditions;

starting from a single pendule that has a stable behaviour against perturbations of initial conditions.

® From Huber Wustholz. Nori motives. p50.

"Nori showed that every affine algebraic variety admits a filtration by sub-varieties defined over \mathbb{Q} such that their relative homology is concentrated in a single degree. This "good filtration" should be seen as an analogue of the skeletal filtration of a simplicial complex or a CW-complex."

1.12

© Received Tablet-pc (monday).

Win\$ 10 pro. Slicker than Win\$ 8.0.

A bit unstable @ login.

© Usb not working so far (like Android-tv-box: for security ?) ; yet seems ok in device manager & getting some dmsg in Debian Buster but not in Mint Tara. Maybe win-to-go(usb-boot option), or firmware(uefi boot menu option) or cable issue.

© Put e-books in it via Bluetooth.

© Les câbles USB Type-C doivent comporter un logo, soit lié à l'USB 3.1 (mention SS pour Gen1 ou SS 10 pour Gen2), soit indiquant qu'il s'agit d'un modèle Thunderbolt 3 (un éclair avec le chiffre 3). Il faut également vérifier l'épaisseur du câble, ainsi que le connecteur.

- Insta.

Plotting gears with Open source/Free software on a Lenovo Laptop running a GNU/Linux Debian operating system. The first screenshot shows how to get gear profiles by wrapping a floor/ceiling/round graph function around a circle with polar coordinates with Genius Maths Tools & wxMaxima/GNUpot. The second screenshot shows glxgears, a demo applet natively present in the X graphic interface (Xorg) of Linux boxes.

3.12

© Noticed some quirks on Debian Buster with A806 Lenovo phone (usb Lenovo-suite, appearing as cdrom and searching

root access or brute-forcing login); that with the weird effect of "telephone" daemon (starts with internet access; pushing ads with a red-x appearing on screen) suggests that this gift phone might be a trojan, spy-device (keylogger/data-thieving, pushed on remote servers, or else) .

© Some notes from Huber-Wustholz. 1-motives monograph. Smart focus on periods fields.

1-motives versions of :

- 1) G.Wustholtz analytic alg grp thm (Lie grps/algebra).
- 2) Baker ln(alg)-thm :
 \mathbb{Q} -linear independency of alg-data \Rightarrow \mathbb{Q} -algebraic independency of ln(alg-data).

4.12

© In Debian Buster.

- Reorganized home.
- Translation of mem into english : faced again mfpics time consuming quirks for diagrams; looked in vain for mfpic-usage note wrote around 2006 on available devices (might be lost in one of the 4 gone hds), so solved issues via man-console of mfpic-pckg in Gabel.
- Used web g documents-translate, then evn firefox browser addon : evn did a neat remote post-process.
- Noticed that g-chromium was kicked away from both Linuxes (Debian Buster & Mint Tara) repos.

© Downloaded Wiles BSD paper exposed @ IAS-2008 talk.
 \Rightarrow 8p. Short-clear-dense style.

© Mint

Put some e-books on Tablet (meca, maths).

During this process, noticed that bt from phone or tablet are quicker.

® Read Andre Bbki 1-motifs article.

Functional case (Ayoub thm) of motivic-Galois thm for series of functions defined on the unit polydisk.

- Wrote on paper, proof of weak-crt for algebraic \mathbb{Q} -curves; using Faltings finiteness thm + approximating varieties-periods, to get a contradiction. Sought possible extensions to transcendental curves since it was the initial goal of all of that.

7.12

© Transferred some e-books & articles to Tablet.

® Began Carlson-Mueller_Stach-Peters Periods book.

Well balanced exposition bringing to advanced theoretical corpus through Griffith-style concrete examples.

- Wrote some notes about Wiles BSD article.

=> Roughly, "BSD is a twisted-augmented version of Weil cjs".

=> I think that Tate/1-motives with Beilinson cjs approach can prove BSD.

© Found a way to pull evn post-processed mem translation-file into Debian Buster data repo :

1) save locally from evn-platform the complete html-page note; then open it locally with firefox : it is hidden as an html file in one folder of the retrieved-data tgz file.

- After two months of getting back to maths.

1) Mid september 2020, refreshing memory with smartphone introductory linear algebra courses (Lang books and Strang MIT videos).

2) Tackling research stuff in early november.
 => Quite steep learning curve due to very-high resilient plasticity of brain : what was deeply analysed decades ago come to the surface as resurgences; or "thoughts-geysers"; chunks of souvenirs; suddenly merging together; bringing back pieces of knowledge, theories and ideas. Noticed that this process keeps the body fit with brain "burning" fat from glycogenesis.

9.12

© Debian Buster.

- Quirks again when the A806 phone is connected; consider either destroy-it or deep analysis-it

("teleyphone.com.android", CD-suite; doubtful jars; usb layers) to eventually respond to the possible malware.

- Processed mem translation :

==> Translation is a subtle process; the machines outputs are quite inadequate sometimes; here again human brain outperforms technology.

==> Try the machine-processing with source.files next time (instead of output.files).

• "Serie".

p1. replace "l-adique" by algèbre polynomiale graduée de degré ∞ = limite projective pour

$d \rightarrow \infty$ d'algèbres graduées $Ad[X]$, de polynomes de degré $\leq d$.

p4 : -1 in numerators of $F(z)$ (rational function+closed form).

p4 : bibliography "Fourier"

11.12

® Pulled some articles/books to Debian Buster repo.

-Milne's historical documents (Grothendieck-Deligne).

-Garrets Paul : Automorphic forms book.

-Tiel University : M\$ Word Math-Eqn addon spreadsheets...

* Videos

Brique2Maths (Lille University).

Quantum cryptography (Melissa Rossi @ ENS 2018).

Geometry of elliptic curves. Joe Silverman 2016 talk @ Boston university.

• Wrote some paper notes.

-Generic pt of initial variety = generic pt of extended variety up-to Galois grp conjugacy.

-Prime nber cryptography (in brain, no paper).

Asymmetric, Unidirectionality from computability gap between an operation and its inverse (multiplication, factorisation).

Public key cryptography; tried different scenari : pq, pqr, pqrs.

=> Oral version to Miky; the cat was only interested in a quiet sleep, and not in my disturbing elucubrations.

12.12

- Wrote some paper notes.

====>

Investigations on Weil cjs. Conexion to periods attempt (not conclusive).

Not easy task in non zero characteristic, the easiest case is for zero characteristic algebraically closed fields.

Expressing $|X(k)|$ in terms of periods : even with thoses fields hypothesis; only got a bound for the 0-dimensional case, an inequality $|X(k)| \leq \text{deg}_f(X) = \text{amplitude, length, or dimension of the fundamental periods subspace over } k;$ with $\text{deg}_f(X) \leq n_f(X)$.

Maybe something like :

$$|X(k)| = F(n_f(X), \text{deg}_f(X), k, g(X), \text{etc}(X));$$

should be reachable in a far, far, far away future.

By the way, the asymptotics of $|X(k)|$ in terms of pts-size is more tractable in all field cases k ; but unfortunately not the exact nb of pts.

Nonetheless; this attempt lead to a new Zeta(X) as a generating function built from a series in this periods subspace.

This function should be tackled with the tools reported by :

<====

© Mircea Mustata. Zeta functions of algebraic varieties.

--> Fulgurant text in new trend style (computer-science/internet generation), going to the point quite fast. Treats all kind of zeta functions attached to algebraic objects; the ones attached to finite groups are fascinating objects of a new theory (early 00's, some french mathematicians contributed to it). Mentions Lothar

Gotsche.

< - - -

13.12

® Books repo.

<http://nozdr.ru/biblio/kolxoz/m/ma>

© Android TeX Renderer.

LateX formula Redactor : best so far (russian, as usual).

```
\textcolor{Blue}{Blue}, \textcolor{Brown
}{Brown}, \textcolor{Cyan}{Cyan}, \textcolor{Magenta}
{Magenta}, \textcolor{orange}{Orange}, \textcolor{red}
{Red}, \textcolor{Yellow }{Yellow}, \textcolor{Violet}
{Violet}.
```

* Video (ytube): Geometry of elliptic curves. Joe Silverman 2016 talk @ Boston university.

All the arithmetic of elliptic curves is encoded by the [m] map structuring engine.

kernel : m-torsion

image : pts orbits.

1-dimensional space of holomorphic differentials, spanned by $w_\epsilon = dx/2y$.

Tate modules. Direct limits of torsion subgroups along powers of an integer m that is not divisible by the characteristic of the base field. Those generating torsion subgroups are the kernels of the iterations [m] endomorphism evocated before.

-> Discretization.

Ⓜ Rambled around in Gabel Debian Linux repos.

-> Found out a bunch of quite good old djvus in subfolders (qpts, basics, nbth, etc) of src folder; this old trusty Debian/Linux (about 20y with 0-failure) on an obsolete hp machine is a gold mine.

-> Read Olivier Wittenberg 2005 thesis about Brauer groups of some del Pezzo surfaces.

-> Research tip (insta).

Two snapshots of arithmetic geometry PHD thesis intros (Olivier Wittenberg, Max Lieblich).

Reading PHD thesis introductions is a good bet to collect core-insights data about a theory, since their authors strove to master the deep results about the objects of their study and often reveal the results of this process in the introductions of their thesis.

- Wrote some paper notes.

After J.Silverman vid.

> "Geometrically" : base field extension to an algebraic closed field.

Generic pt of initial variety = generic pt of extended variety up-to Galois grp conjugacy.

> Discretization.

Euler products of L-functions of varieties(BSD) or number fields (RH).

After Wittenberg thesis intro.

Brauer grps stuff.

14.12

© Lurked @ News in nt web : Online conferences. Pages of newcomers researchers. Read their texts :

-Lang Jacklyn : hyperelliptic jacobians 2-descent.
(Bryn Mair Msc, Phd Hida Berkeley, Laga post doc)

-Gazaki Angela : periods polynomials of Hilbert modular forms.

-Vethee, (Kato student), θ -theory seminar.

-Olivier Benoist : Moduli of surfaces.
<http://www.math.ens.fr/~benoist/>

-Martin Orr : Abelian varieties, Mumford Tate groups.
Phd @ Orsay (Colliot?).
<http://www.martinorr.name/>

© Updated ffox bookmarks, pocket & evn notebooks to include a maths folder as the same was done with pics galleries in (phones, g photos).

- Corrected "Serie" typos.

© Looked for web-friendly commit interface, like the Github stack project interface.

- Investigate other CMS, with Latex to MathsML ability, like Arachnoid, Wordpress-Blogger, Spip, etc.

* Videos. Ytube.

1) 5mn Lebesgue, panpan63.

Beziers curves $\beta_A = \{M(t) \mid t \in [0,1]\}$, barycentric curves built from some finite set :

$$A = \{A_i, 1 \leq i \leq n \}$$

pondered by Bernstein polynomials(t), those parametrizing the curve, inside the convex hull of A, $Cv(A)$.

$$M(t) = \text{bar}((A_i, \beta_{ni}(t), 1 \leq i \leq n),$$

$\beta_{ni}(t) = \binom{n}{i} (1-t)^{n-i} t^i$, Bernstein polynomial of index (n,i) .

© --> Tried to enter binomial formula via M\$ OCR Android app. Time waste : quirks a lot.

2) How to learn pure mathematics on your own: a complete self-study guide.
<https://m.youtube.com/watch?feature=youtu.be&v=fo-alw2q-BU>

--> Now, you do not need either libraries, or going to attend courses : just an internet access and ... a smartphone as done in the coming-back in September.

3) Geometry of Elliptic curves. Joe Silverman.

Why study elliptic curves ? Simplest arithmetic varieties after P^1 , plus rich structure from grp law, that have cryptography computer applications.

--> Cryptography.

--> BSD.

All the arithmetic of elliptic curves is concentrated by the $[m]$ map perties.

kernel : m -torsion

image : pts orbits.

1-dimensional space of holomorphic differentials, spanned by $w_\epsilon = dx/2y$.

Tate modules. Direct limits of torsion subgroups along powers of a integer prime.

-> Discretization.

Euler products of L-functions of varieties(BSD) or number fields (RH).

> Discretization.

If $\text{char}(k) \neq 2,3$.

$y^2 = x^3 + Ax + B$ Weirstraß form.

$\Delta = -16(a^3 + 27b^2)$

$j = 1728(4a^3 / a^3 + 27b^2)$.

Two E 's are geometrically isomorphic \Leftrightarrow they have same $j(E)$.
 (geometrically = over an alg closed field).

17.12

---->

• $\text{End}_k(E)$.

has a ring structure with multiplication given by composition, making it a k -algebra, not necessarily commutative, like $\text{End}_k(V)$ for k -vector spaces. But if u is such an endomorphism, $k[u]$ is a commutative subalgebra of $\text{End}_k(V)$, that encodes linear pptyes of u (eigen data, euclidean data, etc, via pid-modules theory). For elliptic curves, if $u=[m]$, then $k[u]=k[[m]]=k[m]$, note that since $[m]$ is in the center of $\text{End}_k(E)$; $k[m]$ is also in the center of $\text{End}_k(E)$, so that $\text{End}_k(E)$ has a non trivial center. Note also that $k[m] = \{ \sum a_i [m^i], a_i \in k \} = \langle m \rangle_{\text{End}_k(E)}$ k -algebra generated by $[m]$

$$\begin{array}{ccc} k[t] & \text{---->} & k[m] \\ P(t) & | \text{-->} & P(m) \end{array}$$

Tate modules are built as projective limits of the kernels of the $[m^i]$; noted $E[m^i]$ or kernels of powers of those $[m^i]$:

$$E[m^{(i+v)}] \xrightarrow{(m_v)^i} E[m^v]$$

with $m_v = m | E[m^v]$ and $(m_v)^i = m^i | E[m^v]$:

$$T_a(m, v) = \lim_{\leftarrow i} \ker [(m_v)^i].$$

For elliptic curves over \mathbb{Q} ; $E(\mathbb{Z}_p^l)$ the reduction mod p^l of E may be also considered, we then get a quadruple

indexed system that generates a quadruple level Tate-modules matriochka :

$$1) Ta(m,p,l,i) = \lim_{\leftarrow v} \ker [(m_v)^i]_{p^l}$$

$$2) Ta(m,p,l) = \lim_{\leftarrow i} Ta(m,p,l,i)$$

$$3) Ta(m,p) = \lim_{\leftarrow l} Ta(m,p,l)$$

$$4) Ta(m) = \bigoplus_p Ta(m,p) , \text{ this one should relate to BSD.}$$

$$\text{Finally the big one : } Ta = \bigoplus_m \lim_{\leftarrow m} Ta(m).$$

<-----

* Back to Joe Silverman vid.

Isogen(E_i, E_j) Isogenies between E's.

if f is one of those, there is the dual f^\wedge of it, that is its inverse modulo $[\deg f]$:

$$f \circ f^\wedge = [\deg f].$$

$\text{End}(E) = \text{Isogen}(E, E) = \text{Isogen}(E)$ being the set of isogenies of E ie from E to itself. This ring endomorphisms of E is either :

- 1) trivial $[Z]$. (E is a No-CM type).
 - 2) non trivial, (E is a CM type), ie isomorphic to
 - a) an order in a quadratic imaginary field or
 - b) an order in a quaternion algebra ($\text{char } k > 0$). CM
- type : more arithmetic pptyes and symetries for the attached objects: (functions , modules, cohomologies, etc).

Singular pts. $y^2 = P(x)$.

Nodes, dble pt from $P(x)$ dble root, semi-stable.

Cusps, triple pt from $P(x)$ triple root, unstable.

E_{ns} : set of non singular pts still form a group, isomorphic to G_m for nodes curves, G_a for cusps curves.

Multiplicatively $Z/mZ \times Z/nZ$ node

Then

Generic pt of initial variety = generic pt of extended variety up-to Galois grp conjugacy.

® Masur–Veech volumes and intersection theory on moduli spaces of Abelian differentials.

Don Zagier & al.

Abstract

We show that the Masur–Veech volumes and area Siegel–Veech constants can be obtained using intersection theory on strata of Abelian differentials with prescribed orders of zeros. As applications, we evaluate their large genus limits and compute the saddle connection Siegel–Veech constants for all strata. We also show that the same results hold for the spin and hyperelliptic components of the strata.

=> Needs pairing against eventual corresponding strata of topological spaces to generate the corresponding periods "bi-graded" spaces.

<=

18.12

* Some videos

1) 5mn Lebesgue. Sylvain Crovisier (Orsay). Dynamical systems and chaos theory.

From polynomial functions (on the unit interval I) iterations : $U_{(n+1)} = f(U_n) \rightarrow U_n = f^n(U_0)$.

A period of (f, I) is a point u of I such that $(f^n(u))$ is periodic.

Sharkovsky thm. Si f admet un nbre de periodes qui n est

pas une puissance de 2 alors f admet un nbre infini de periodes.

2) IHES

M.Kontsevich. String topology & matrix integrals.

--> cryptic exposition or the "IHES russian style" (Mikhail Gromov).

- Wrote some paper notes.

a) Picard groups $\text{Pic}(X)$, Jacobians as $\text{Pic}^\circ(X)$, degree-0 subgroup of $\text{Pic}(X)$, interpretation in terms of homology groups H^n (Lieblich : $n=2$, Colliot $n=1$).

b) Studied $Z[t,1/t]$ since $\text{Br}(X) = H^2(X, \text{Spec } Z[t,1/t])$.
et

c) Some Galois theory applied to varieties (actions on pts, initial variety as full-galois-grp fixed part of extended variety).

19.12

® Read wikipedia elliptic_curves entry.

-> One of the best wikipedia maths article so far : maybe leading mathematicians behind it?

® Read also Ribet ϵ -thm entry.

® Read begining of Wittenberg Thesis.

--> elaborated sieving-classification of "low" algebraic varieties; by dimensions, genus and other algebro-geometric invariants/data : quite smart & intricate.

=> Discrete stratifications; unfortunately helpless for high dimensions.

* Modular forms Vids.

1) Keith Conrad. Introduction to modular forms. Uconn courses (Connecticut University).

2) Aleph0. Introduction to modular forms.

=> Discrete Grps (pid/integers, Z-matrices) operating on analytic/complex functions spaces : Z really suits well the rigidity of those analytic functions and spaces.

20.12

© Rambled around in www to see maths blogs and how to create maths contents for the web.

® Examples of maths blogs.

- CMS (WordPress).

Terence Tao@wordpress. <https://terrytao.wordpress.com/about/>

"WordPress has the ability to insert LaTeX math code (e.g. $\int_{-\infty}^{\infty} e^{-\pi x^2} dx = 1$) into both posts and comments. The format for this is "\$\textit{latex} [\textit{Your LaTeX code}]\$" (without typing the square brackets). See this announcement for details. Note that LaTeX macros and environments are not supported, similarly, double dollar signs \$\$ do not create LaTeX displays (one can use `\displaystyle` to get an approximation of these displays, though.) Also, line breaks are not allowed within a LaTeX code.

There used to be a number of quirks with the WordPress LaTeX plugin, but they have now largely been fixed. If you find any problems, please report them at this page.

WordPress also supports a certain amount of HTML. As a consequence, be careful with using the signs in a comment, they may be misinterpreted as HTML tags! You can use `<` and `>` instead.

I use the Tarski theme with a modified CSS, in order to do things such as boxed theorems. (To use the CSS, one needs to purchase a CSS upgrade.) I also use Luca Trevisan's LaTeX to WordPress converter to write the more mathematically intensive posts."

--> Analytic number theory; measures, geometry of numbers; lattices.

- NO CMS (better).

David Mumford.

<http://www.dam.brown.edu/people/mumford/blog.html>

==> Neurosciences, AI, algebraic geometry (archives).

Martin Orr.

<http://www.martinorr.name>

--> Abelian varieties, Arithmetic geometry.

22.12

© Tried to put external javascript calls (MathJax, codecogs, etc) in blogger.com templates : Google seems to block all those external scripts.

© Tried instead (also in vain) to include them in templates (header) of one site in sites.google.com

=> Google also blocks imports of all external javascripts there; this may be also a internet-stratification issue.

==> However found outhere an interesting built-in remote ide (scripts editor : code.gs for "google-script code" I guess) for editing sites templates.

=> Google allows only what it can control and no outside scripts sources.

=> Configuring/customizing no-fee-CMS hosting services is a time consuming hassle.

==> Better : full manual coding of html static pages with no CMS nor websites software generating contents, for a total control of what is published.

© New math Jax (version 3), frontend server.

<https://www.mathjax.org/>

Javascripts providing servers :

<https://polyfill.io/>

<https://cdn.jsdelivr.net>

```
<!DOCTYPE html>
<html>
<head>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width">
  <title>MathJax example</title>
  <script src="https://polyfill.io
/v3/polyfill.min.js?features=es6"></script>
  <script id="MathJax-script" async
src="https://cdn.jsdelivr.net/npm/mathjax@3/es5/tex-mml-
chtml.js">
  </script>
</head>
<body>
<p>
  When  $(a \neq 0)$ , there are at most two complex
solutions to  $(ax^2 + bx + c = 0)$ 
  and they are  $[x = \{-b \pm \sqrt{b^2-4ac} \over 2a\}.$ 
  Note that if  $(b^2-4ac \leq 0)$  then
 $[\sqrt{b^2-4ac} = \text{tbf}\{i\} (4ac-b^2)^{1/2} ]$ .
```



```

</p>
</body>
</html>

```

© MathJax works fine in jsbin.com (awesome renderer) and free.fr : Chrome, Firefox are ok but not the native Android KitKat & Marshmallow browser (gecko-engine).

=> Building a math site seems possible.

=> wget the MathJax javascripts to have a look @ them or maybe include them in the free server.

=> Jupyter notebook may also be an alternative with jekyll package (for static websites).

<https://thedatafrog.com/en/articles/jupyter-notebooks-web-pages/>

© Connected tablet-pc to wifi.

=> has a random mac addresses generator : changes mac address @ each new network connexion.

=> Better security since ISP seems to attribute a definitive IP for each domestic box.

=> usb tether by gsm-data may be another option : console ftp does not work so far.

- Day before

Wrote paper notes on periods spaces and Brauer groups as always,.. orbiting ... around periods spaces, torsors, motivic Galois groups, Brauer groups, elliptic curves, Tate Shafarevich groups, Jacobians.

® Put Huber MuellerStach Nori Motives Periods book in Lenovo Debian Buster repo.

- Wrote some paper notes on dimension of varieties and some other on Jacobians of curves and higher dimensional varieties.

* Pierre Deligne. What is a motive, talk @IAS Jan 20. Starts with the different cohomologies attached to the studied variety X , insists in the importance of the embedding nature of the base field k in its algebraic closure..

Motives carry a higher homology whose realisations are those different cohomologies.

24.12

- Wrote some paper notes on Tate modules, and the $Zentrum(\text{End}_k(E))$.
- Wrote also a synthesis+prospective after 3 months of coming back to maths.

25.12

® Read beginning of articles and monographs on K-theory. Grothendieck ring of varieties (hinted by Mustata Zeta book); links to K-theory since I came accross similar relations-concepts while investigating $\text{End}_k(E)$.

27.12

© Formated all diary.txt in yymmdd.txt in P9 and Lenovo Linux Debian Buster.

® Read parts of Huber Wuhstolz 1-motives periods monograph.

- Wrote 2mn of maths on paper notes on hyperelliptic curves.

28.12

® Read Olivier Benoist papers :

1) Thesis.

Study the surface analogue of the moduli space of genus g curves M_g along

Mumford and other algebraic geometers (Kollar, Viehweg, Knusden, DeJong,

etc,) footsteps : the moduli space M_g can be analyzed in a higher-level (extended) context of a "champs algebrique"

--> "Champs algebriques" should be "stacks".

2) Brauer index problem for real surfaces.

29.12

- Wrote some note on paper about motives after reading Huber MuellerStach Nori motives book.

Ⓜ First looks @ Tannaka formalism on wikipedia.
--> Holstrom (Lambda-rings). Martin Orr.

30.12

Mainly computers.

Ⓜ MathML

Lot of progress since mid 00's : now includes all basics mathematics symbols formula (sets, linear algebra even matrices, calculus with integration symbol, etc).

Lack just

- 1) agility : some scripts to get those are quite lengthy.
- 2) diagrams stuff.

Ⓜ Mousepad : bugs mostly when box is connected to internet.

--> versions shuffle; inopinuous cuts.

==> Go back to good oldschool console with nano (no graphical interface).

Ⓜ Gecko-engine.

dna mutations : netscape, aol, mozilla.

Ⓜ Jupyter (local).

Python libs :

graphic : plotly bokeh graph-tool igraph mplstyler

data : networkx snap Scikit-learn

calculus : gmpy2 ADiPy

nb-algebra : matalg27 , pyprimesieve

© A region : shrunked by dun, dnb.

© Insta

-Changed name : changes the url.

---> Not a good idea; all links are now broken.

-Posts.

Maths Photos.

1) the first one of today weather forecast here (France, Paris-Versailles suburb) shows that weather mathematical models and their implementation in large-data computing mainframes have a lot of progress to do. Here the 1st column might be the "mean" of the next two...

2) Then some snapshots of the plot outputs of Zeta and Gamma functions from a Sage maths session on a Jupyter notebook done on a... smartphone under Android. This shows that smartphones deserve their names; with a little effort, they can be actually powerfull pocket computers, that are able to process maths numerical investigations.

3) The last photo show some Zeta function approximations plots from MathsGenius a maths software on a Lenovo Laptop running the GNU/Linux Debian "Buster" distribution.

Maths videos

The first ones, inspired by cosmological verses of the Qu'ran; show the power of the elementary periodic transcendental function Cosinus; implemented in MathGrapher an Android maths app : it shows a pulsating sphere orbiting around the Z-axis that switchs its poles when getting close to the other X and Y-axis; the basic Cosinus function is inserted thrice in the equation of the animation : 1) for the orbiting motion 2) for the squishing motion 3) for the poles inversion.

In early 2000's I googled the honorable function name for research issues and got an ad in the search results saying that the Cosinus function was for sale...This definitely marked the shift from the golden-age scholar-web era to the era of the giant commercial/ads/business oriented system, not to say a crude word.

The second video illustrates the discrete mathematics fundamental concept of recursion that has its foundations in Logic Theory and on the other side of the spectrum; applications in Algorithms Theory for computer science. It is an instagram maths video about a maths concept, taken from a smartphone showing another smartphone displaying an instagram maths video of the instagram user Mathsbook7474. Problably, it will be watched in another smartphone, as those line are read, giving the last level of recursion of the process.

© Martin Orr blog.

-> Abelian varieties, Mumford-Tate groups.

* Bjorn Poonen hyperelliptic curves 2018 talk @ IAS.

-> average or asymptotics on the (moduli) strata obtained from fixing the nb of rational pts. (Bargava Shankar).

1.1.21

- Wrote some notes

paper : Algebraic-Transcendental p-adic issue.

txt : Seeds and Bouquets (motives generalisation attempt).

* Some videos

1) Peter Scholze. Locally hyperbolic spaces and Galois representation 2014 talk @ Harvard.

Links :

a) Algebra : Galois representations.

b) Geometry : hyperbolic Bianchi spaces. (1892).

Recalls on higher reciprocity laws, modular forms.

2) Vadim Voevodsky. Logic, Type & Homotopy theories 2016 talk @ IAS.

-ZFC. Set theory.

Starts from :

1) \emptyset

2) $\in, =$.

3) relations : not, exist, for all, and, or.

4) some axioms : x does not belong to x, a singleton can be built from one element.

From that get $\{\emptyset\}$ or singleton or "1", then $\{\emptyset, \{\emptyset\}\}$ or "2", etc.

Then insists that a set has a unique tree-graph representation.

=> Bouquets

-Type theory = setified logic theory.

* Andrew Wiles. 20 years of BSD, 2020 talk @ Clay (CMI).

Lucid, settled exposition.

The algebraic interpretation of the rank of $E(Q)$ is the issue.

Insists on the parallel between :

- 1) Nber fields (class number & class field theories)
- 2) Elliptic curves.

==> For algebraic interpretations of the rank; I have the souvenir

that Alexander Belinson proposed some conjectural motivic interpretations

in terms of $\text{Ext}()$ groups.

==> See what 1-motives à la Deligne and others say about those L-functions

values (Huber-Wustholz).

3.1

® Read a djvu of Schneider contribution to a book on L-functions values and motives; related to Belinson cj about L-functions.

--> Souvenirs confirmed : there are cjs about pptides of motivic L-functions (values) in terms of $\text{Ext}()$ groups involving Hodge filtrations.

- Some paper notes.

Memory refreshing about Q_p ; the two products (of series) subtlety :

- 1) p-adic expansions : convolute-collect.
- 2) Q_p build from Q -cauchy sequences : term by term.

4.1

© Mainly computers.

1-Installed then tried a Latex suite, and two code-editors on both M\$ (window\$ 8-10) :

a) MikTeX : has a bunch of engines (TeX, LaTeX, XeTeX, ConTeX, LuaTeX, ...)

b) notepad++ : best code-editor so far.

c) bluefish (needs internet to complete install, no LaTeX color-syntax).

--> Try other code editors : vscode, sublime, brackets, geany.

==> Debian-GNU-Linux still outperforms by far all those new M\$ working environments, in both capabilities/speed/efficiency and even in less relevant look & feel.

2- For formatting documents, consider :

a) evn : neat outputs (mem_e, web/blog pages).

b) ffox reading-view.

3- Inspected ffox html-analyser tools : should be possible to turn those into an html-ide.

4- Put Notes tableau in front end of free site : news-update tableau.

® Read some maths entries @ nLab.

1- For global quest (algebraic-transcendental), see nLab

pt of view : categories with differential and analytic sheaves. Theoretical Physics (physics Forum) approach; may give inspiring insights on abstract-nonsense to make it usefull and output concrete results.

--> Cf Schreiber (admin) articles on categories applied to GUT.

2- Hodge filtrations/cj (Beilinson cj) should give in (n,n) degree the perfect clue.

5.1

© Mathjax seems the way to go : ams, arxiv, cnrs, etc.

© Ponder wkp : confusing articles in english (hodge cj, principal homogeneous space, etc).

--> Tip for wikipedia : when a doubt comes, change sources; either switch to other langages (fr, es, it, de, etc) or even other srcs EOM, planet maths, etc.

© Could actually use ffox web-analyzer as builtin html-ide.

--> Not so handy : html lines code mangling (inspect-> expand html-> cut past nodes, or dble click, modify then cut html code) no ftp-save-on-the-fly found but should be possible to get it (either add-ons, or in inspecting source code).

© Tablet-pc

Looked for type-C cables, found one (Vention with 0.5m cable : ask) another with rj45 (small cable), and another with 3usbA-vga-hdmi-rj45.

--> ? how can a single typeC port handle that ???.

* James Cook.

original exposition (lecturer) to undergrad-grad
-> HdR(M).

* Aleph θ .

Products of vector spaces : graded spaces linearizing
multilinear maps from the direct (set) products of
initial spaces.

a) Tensor product. Factorises multilinear maps.

round-product

$$v_{i1} \otimes \dots \otimes v_{ik}$$

b) Symmetric or inner product. Factorises symmetric
multilinear maps.

Dotted notation

$$v_{i1} \cdot \dots \cdot v_{ik}$$

$$i_1 \leq \dots \leq i_k.$$

\implies Left \leq , but if so; multilinearity might be lost with
 v_i^2 in some applications like $\text{Sym}[V]$.

c) Alternating or exterior product. Factorises anti or
skew symmetric multilinear maps.

\wedge product : (differential forms).

$$v_{i1} \wedge \dots \wedge v_{ik}$$

$$i_1 < \dots < i_k.$$

7.1

* Guido Kings (Munster) BSD 2018 talk@ Tulio Levi-Civita
Math institute (Un Padova it).

--> Padova : Fibonacci alma matter ?

BSD report after articles of Bertolini-Darmon-Rodger and Kings-Loeffler-Zerbes.

1) $X = Z(P_1, \dots, P_m)$. $P_i \in \mathbb{Q}[X_1, \dots, X_n]$
 $\dim X = n - m = \dim$ Ambient space (number of unknowns) -
 nb of equations.

Relatively known cases : low dim = 0, 1 and 2.

2) 0-dim is trivial.

--> ? Just consider all algebraic number, Galois and class field theories; not to talk of transcendental nb theory unable so far to determine the rationality of γ , or other fundamental constants like zeta values@odd integers.

<--

3) dim 1.

$X(\mathbb{C}) =$ Riemann surface, hence classify by genus $g(X)$:

a) $g(X) = 0$ trivial : $X(\mathbb{Q}) = \emptyset$ or ∞ ($X \sim \mathbb{P}^1$).

--> ? Not so trivial.

b) $g(X) = 1$ Elliptic curves. BSD.

$X(\mathbb{Q}) = \emptyset$, finite or ∞ .

c) $g(X) > 1$ Faltings finiteness thm.

$X(\mathbb{Q}) = \emptyset$, finite.

4) Higher dim less known : Lang cj.

$X(\mathbb{Q})$ finite $\Leftrightarrow X$ does not contain any algebraic grp.

Faltings thm : Lang cj true if X is an abelian variety.

$X(\mathbb{Q})$ finite $\Leftrightarrow X$ does not contain any sub-abelian var.

- Found before trashing it while sorting golden-age piles :

-A printer output listing of early 90's (20y naive student) of first math computer programs in Turbo pascal

on a 8Mhz-8086's box :

Irreducible polynomials over F_p , for small values of p from implementation of Berlekamp algorithm.

-A query doddle left aside : "liens entre motifs et invariants polynomiaux des groupes finis ?"
 ==> Quite puzzling.

* Some videos.

1) William Stein on Victor Kolyvagin approach to BSD talk @ Berkeley.

Via subgroups of E , built from subgroups (orders) of $\text{End}(k_E)$.

A five steps proof with last step remaining to be proved.

2) Olivier Wittenberg. Integral real Hodge-filtrations on varieties talk @ Cirm.

A) Mentions :

- a) french alg geom school (Voisin, Benoist),
- b) works of Kollar on rationally connected varieties.

B) Overview of cohomological machinery (Galois equivariant cohomology, with sheaf coefficients and even cohomology coefficients), Chow grps, etc.

C) Hodge c_j : Continuous loops homotopically deformed to algebraic cycles.

==> Substantial overview, considering the reals (R) base field case : new generation trend sticking back to Reality ?

© On P9; noted that instagram drains most of gsm data-transfert; far more than youtube : seems to auto-connect to preload data maybe in a cached-buffer when connected to internet

--> Consider retrieving it from P9.

--> Here are apps that auto-start; mostly data ads-bloater or collectors :

- a bunch of Google apps (youtube, location, maps, playstore, ...), instagram.
 Le boncoin, Amazon, Ebay, SnCF. Some randomly = doubtful.
 Oddily also GeoGebra apps.

8.1

© Retrieved instagram from P9.

- Wrote some refreshing memory notes on DeRham and Betti cohomologies; and going towards rings of varieties & motives.

- Meditated on writing, remembering 1) Henri Cartan advises and 2) history of Suzuki Motor Company.

1) A text should be as precise and self-sufficient as possible.

2) Each engine evolution is a rebuild from scratch.

==> An ideal text on extended criterion should be a monograph as complete/auto-sufficient as possible starting from a blank page.

® Read Danilov article of Algebraic Geometry III @ Shafarevich-Parshin russian EMS.

"G. Faltings (1983) Parshin-Zarhin (1986)): Let X be an algebraic curve defined over the field Q of rational numbers; if its genus is greater than 1, then the set $X(Q)$ of its Q -rational points (as well as $X(K)$ for an arbitrary finite extension K of Q) is finite. This result

is similar to a more elementary assertion due to :

(de Franchis) Let X and Y be Riemann surfaces, with X of genus greater than 1; then there are only finitely many nonconstant holomorphic maps from Y to X .

This topic is discussed in a recent remarkable survey on arithmetic of curves (B. Mazur (1985))."

9.1 1h am.

® Read some articles in collected articles books (from seminars, meetings, etc).

1) Istanbul 2005 summer school on hypergeometric functions.

Arithmetic and Geometry Around Hypergeometric Functions
Lecture Notes of a CIMPA Summer School held at Galatasaray University, Istanbul, 2005

Rolf-Peter Holzapfel

Masaaki Yoshida

Muhamadi Uludag

Editors

a) Carlson, AllenCock, Domingo : orbifolds or H^3/G , quotient of complex spaces by grps actions (Coxeter diagrams).

b) Beukers : good insights and overview on Gauß hypergeometric function and its ODE; mentions Euler, Riemann and Kummer ways of tackling it. Treats

concretely the ODE monodromy :

Euler integral rep. with rat. frac. of gamma factors.

Monodromy

D-operator.

A matrix , z cplx nb.

$z^A = \exp(\ln z \cdot A)$.

2) Arithmetic geometry meeting in honor of Shafarevich
60th bday volume I.

a) Aoki-Shioda contribution :

Neron Severi grp of some Fermat hypersurfaces noted
NS(Xf), computation of their Q-tensored dimensions, ie
Picard numbers of Xf :

$$\rho(Xf) = \dim_{\mathbb{Q}} [NS(Xf) \otimes \mathbb{Q}]$$

b) S.Bloch speculative one, on p-adic/crystalline/Tate
cohomologies.

c) Classic one on Jacobian of curves of Cassels from
Cambridge arithmetic geometry school.

d) A.Weil : enlighting historical overview; from Euler to
Kummer on Jacobians.

==> Volume II contains a contribution of Moisezon on
Arithmetics of braids.

11.1

- Mostly writing paper notes.

1) Investigated a bit Lie algebras after Wustholz Giorgi Lectures on Leibniz motives, about algebraic grp and Lie algebra interpretation of Schanuel cj.

[Dimitri Fuks. Cohomology of infinite dimensional Lie Algebras : good russian style introduction to the notations.]

==> Derived a seemingly-well formulated Schanuel-like cj from that in terms of exponential periods.

2) Wrote some notes on periods spaces (bouquets from seeds) : the future directions of investigations, embryo of unifying Weil, RH and BSD cjs (biology terminology well suited).

3) Some others notes on Q-pts : rephrasing in terms of grids, images of polynomial maps.

4) Some co-abstract-nonsense : cokernels, coimage, corank, cohomologies.

5) Wrote a todo list.

6) Sorted some paper notes in 2005-2009 piles :

In most of them begin with studying abstract concepts then sliding slowly in last pages to finish with ending doodles about periods spaces.

==> A definitive txt should stop this winding around.

12.1

* Some videos :

1) maths PHDs (Hadamard foundation : Orsay gathering IHES, Paris 11, X; is a pole; other poles are Paris centre (6-7-ens-ihp-cdf); Paris 13 (Galilée).

- PHDs end mostly in teaching/research; industry (actuariat previsions-risque : bnk finance (stats); modeling (autos-aircraft-transport); but nowadays the trend of data-sciences/it/AI is draining most of it.

-> interesting : cnrs multidisciplinary labs (maths+geophysique/astrophysics/newnrjs, etc).

2) J.L Koszul (†) history of Grenoble pole (IPG, Fourier : Chabauty, Brelot).

3) H. Pajot. Pb de Kakeya, ensembles de Besicovitch.

- Sorted some paper notes (2007).

1) J.P Serre. Collected papers review 1985-1998 on Motives.

=> Clear overview : try to get the text.

2) Jacobians after Scharashkin Thesis : uses the Mordell-Weil grp of the jacobian of a curve to study its Q-pts.

13.1

® Grigory Perelman @ wkp.en

Rocambolesque history on how fame/position/status greed of some rare ones can lead to the outcasting/exclusion of selfless genuine researchers.

© Noted quirks in this uploaded txt :

MintDebian upgrade-install times retrieved.

Debian \leq 45mn, Mint \geq 1h15.

Arabic letters moved.

14.1 4am.

- Reread Cassels contribution to the Shafarevich-60y-book (Artin-Tate ed.) on jacobians.
-> Discrete stratification for low dim varieties (actually curves).

© Time machine : google keep+photos.

- 6am

Finished sorting one pile : products formulas rh, derived functors, divisors, jacobians, ..., plus a quite tedious one on curvature.

--> Solo research without "encadrement", requires a lot of maturity; since risks of too many ramblings around; those anarchic-chaotic-random walks are good for exploring & discovering but not suited for academics.

--> Or follow/interrupt this process with ...periodic

synthèses, that may be more efficient, by gathering/organizing/compressing... fruits of random ramblings, in order to extract different blended juices : from nectars to essence.

© 9am

-Finally managed to get the two upside-down screens on Mint from the buggy xrandr applet.
-Consider splitting pc part of diary.

® 10am

Begun : Gille-Samuely. Central Simple algebras book.
Central piece = Merkurjev-Suslin classification thm in K-theory terms.

15.1

* Benjamin Collas. Arithmetic of Fuchs ODE talk 2016 @ IMPA.

Grothendieck Teichmuller theory.

Aim : investigate perties of $G = \text{Gal}(Q_/Q)$.

Tools : Uses different G-related Q-schemes/stacks X to collect data about G.

---> G_Q -bouquets.

Introduction : || buildings.

$X_{\sim}(C)$

$X_{\sim\text{et}}(C)$

Riemann

finite coverings of $X(C)$ ----- Finite etale covering of X.

$X(C)$

$X(C)$

First (left) tower has $X_{\sim}(C)$ or the universal covering as roof;
 the floors are classified by $\pi_1(X(C))$.
 --> ? not $H()$?

Uses Riemann correspondance + projective limit to build the second tower roof and the corresponding classifying grp
 $\pi_1_{\sim, \text{et}}(X(C))$.

Then a Lefschetz thm to pass from C to \mathbb{Q}_p to get the investigating tool of G , namely
 $\pi_1_{\sim, \text{et}}(X(\mathbb{Q}_p))$

Treat some examples, the thrice punctured projective line, n -marked- M_g for small g , etc ; with Puiseux series (tropical geometry) machinery + their ODE (monodromy).

® Refreshing memory with books.

1) Continue Gille-Samuely CSA book.
 The grp cohomology chapter.

2) Begun Lie theory with Mneimné-Testard.

- Wrote some notes on paper :
 - 1) Basics on points of elliptic curves.
 - 2) Extension of the notion of dimension.

16.1

- Sorted the second pile : added a % worthyness.

==> Contents, as always : hypergeometry, periods, curvatures, algebraic polygones, etc;
 ==> Mostly "boring" redites but some very fulgurant/original ideas/remarks that give mind-kicks : inspirations to be developped.
 ==> Consider adding this % to other piles.

© Read some books intros & chapters.

1) Stewart-Tall : Algebraic Number Theory.
 Nice introductory book : read it like a novel.

2) J.P Lafon (Paris 13) : les formalismes fondamentaux de l'algèbre commutative.

A 1974 Algebra undergrad course, begining with categories and functors, projective & inductive limits, Yoneda lemma... : what a gap with nowadays Algebra undergrad courses.

17.1

© Mainly computers.

1) Android A806.

Browser comp for file txt read-import :

- gecko: neat & fast but no save option found.
- ffox : neat but less fast, has the read-view formatting; save in pdf format, like print.
- > 60p for search.
- chrome : not fast (mem/disk bloat) , rather neat, has the save in txt format option.

Sorted both bookshelves (local+g).

Beware : Rm dwnload list entry = rm file.

2) Debian Buster.

Done an apt-autoremove : 554mb deletion+initramfs boot upgrade.

-> Send xrandr bug feedback.

18.1

© m\$ (Lenovo & Tablet).

1) Installed GeoGebra 6 in both m\$ (Win\$8 & 10).

-> 3D is ok in Lenovo.

2) Formated (A.Cheritat Hermite article) webpage @tlse: File prn option good in ffox preview but the print-to-file prn output file is unusable.

-> Seems to be "asm ctrl-code" for printers.

-> Try to find howto preview it (hex-edit or prn cmd).

==> Hermite article on e-transcendance contains a core period process.

® Some abstract-nonsense from wkp.

1) Derived category & Derived functor : derived functor measures non exactness of functor with long chain expansions; when those stop, exactness is near.

2) Verdier duality (Thesis under Grothendieck, ~1985 Paris 7).

Verdier duality is a Higher Poincaré duality.

=> See the difference with motives theory; those actually give Poincaré duality from a "higher dual".

© Sorted a bit math stuff.

1) maths repos in phones, synced with g-drive for redundancy.

2) Updated g-Keep maths notes.

19.1

© Lenovo Win\$ 8.

1) Retrieved ningxia account & hdd indexation of content.

2) Dwloded vscode, geany, brackets :

--> average size is 40mo...for editors : see if either contains ide debug tools (html/java/js/c/... engines) and/or corresponding dicts for syntax correction/completion.

3) Put by bt geany src in tablet : seems to need internet for install.

-> Add an online acount (user) for sync.

© Phones

Retrieved some topology books (russian) :

1) Fomenko, Novikov.

2) Novikov, Fuks, Rohklin.

3) Fomenko, Viro.

© Continued Schneider article on Belinson cjs.

--> Fulgurant text : brings straightly & clearly to the point. Some notations not understood : typos (exponents in Euler systems).

- From that reading derived heuristics paper notes :

Dichotomy.

1) Alg,transc.

2) H_{dr} , H_{algdr} ; H_b , H_{algb} : double ... dichotomy.

3) $\text{car}(k)=\bar{0}$, $\text{car}(k)=p$: necessity of a p-adic geometry.

4) Biology DNA encapsulation : nested/fractalized process in twisting-torsion of successive levels of helix structures.

21.1

© Tablet.

1) Received rj45 usb-hub : all devices are now ok.

2) Looked for Win\$store-app djvu reader :

-> All djvu readers are coupled with pdfreader :

300mo...Seems a "m\$ flatpack" bloat.

-> Look for simpler exes; I remember a good djvu-reader in Debian of about 2.7mo;

hence the agility of Debian compared to bulky m\$. Recall 20.4.20 insta post :

Some mathematical open source software (Genius maths tool

& wxMaxima) used for modelizing (petrole engine performance), on a laptop running a Debian Gnu/Linux operating system. Open source softwares are generally more "agile" than bulky proprietary ones, but foremost they allow to check their source code if an output seems too bizarre, they can also be finely tuned by the final user. Using two different softwares for the same output is a good habit to confort the results.

© Phones

Dwloaded a french classics bookshelf from Fourier repo :

Amice, Lang, Samuel, Weil, etc .

* Some algebraic topology introductory videos.

1) Wildberger insights.

The dodecahedron is a discrete approx of the Sphere S^2 ; it has as dual (face-centers process) the icosahedron; the sphere is more geometric, the dodecahedron is more combinatorical.

2) Pierre Aubin graduate course.

• Continued heuristics notes :

1) Double dichotomy from structure fields choices :

a) Base-field topology/Space-definition field.

2) Managed to encapsulate nb-of-points into periods for Hasse-Weil Zeta through period ext.

3) Simplify, from Ecureuil-Alouette-Gazelle helicopters chief engineer (ONERA) : simplifying requires a lot of deep thinking (St-Exupery : la perfection est approchée quand on ne plus rien ôter).

==> Suzuki GS500 : air-oil cooled parallel twin.

==> In maths, motives as a "nuclinarisation" of "highly

non-linear" algebraic varieties.

23.1

© Beziars curves @ GeoGebra.org

The Spline() function seems to be a cubic.

==> So consider 3-partitions of sample-points set; and glue the interpolating pieces.

Cf screenshot (g photos).

© Debian Buster.

Formatted search.txt into search.pdf with ffox : seems to have more layout options than in Android and m\$; and foremost has a print-to-file pdf output.

© Android m\$ math

$A = \left(\begin{matrix} 1 & 3 \\ 2 & 4 \end{matrix} \right)$

* J.P. Serre @ Nice (1996).

$k = H^0(G, K)$.

->? $X(k) = H^0(G, X(K))$

$X(k) = X(K)^G$

$X(k) \otimes_k K = X(K)$

* Leila Schneips. Teichmuller spaces.

$G^{\wedge} = \text{Lim}_{H \leq G} G/H$.

$H \leq G$

© Pierre Deligne : definitions are the keys; cjs/proofs are only dis/proof-challenges.

- Vids : maths vids are less demanding (more still-images : lecturer in front of blackboard with few movements) for brain light-data processing than action docs; the worse being rapid-actions in noisy us blogbusters, jp-animés (actions manga) and videogames = all that junk quickly becomes brain saturating poison.
- Learn process with vids.
Repeat, resee; to increase/dig memory paths/footprints in cells networks, ie "engrave" data for a longer term trace in deep-memory structures.

* Friedrich Schuller (Erlangen)

Geometry for physics

Top manifolds.

Diff manifolds.

Light & gravity 2018 Winter School lectures @ Linz (Aut).

* 5mn Lebesgue.

1) Mathilde Martinez

Banach Tarsky partitions paradox (1920).

Paradoxal partitions P of balls B in \mathbb{R}^n for $n=3$, ie the usual differential geometer working space.

There exists a partition P of B , $P=(A_1, \dots, A_n; B_1, \dots, B_m)$ and $(f_1, \dots, f_n; g_1, \dots, g_m)$ associated isometries of \mathbb{R}^3 such that

$$B = \sqcup f_i(A_i) = \sqcup g_j(B_j)$$

This has a grp-theory formulation in terms of paradoxal grps.

ex: Words in $a, b, a^{-1}, b^{-1} = \langle a, b \rangle = |F_2$.

Non paradoxal grps are called summable .

2) Miguel Rodrigues

Sobolev spaces, the space of real regular functions vanishing @ ∞ , is structured by successive norms "filtrations".

$E^\infty : |\dots|^\infty$

$E_p : |\dots|_p$

Study some exponents associated to convex hulls of those E_p .

3) Guy Casal. Modular Fermat thm.

Fermat around 1660, Dickson 1910 (mod p , true for $p \gg 1$), Schur 1916.

From congruences and Schur numbers (additive thm).

4) Axel Rogue. Platonic solids.

Graph combinatorics + Euler Formula \rightarrow integer inequations \rightarrow 5 possibilities = (Platonic Solids).

5) Zoist Moitier

A classic : Hear the shape of a drum.

® Wkp.

a) Paracompact : less restrictive than compact, some def require Hausdorff, some not.

Every covering, has a refinement with a local finite trace.

b) Compact : "global paracompact", every covering is reducible to a finite one.

c) Perfect field : every alg ext is separable, ie every alg element has a minimal polynomial with simple roots.

d) Conductor : products of ideals built from characters of rep of Galois grps of fields generated by finite order pts.

e) Regulators : "The number R is called the regulator of the algebraic number field (it does not depend on the choice of generators u_i). It measures the "density" of the units: if the regulator is small, this means that there are "lots" of units.

The regulator has the following geometric interpretation. The map taking a unit u to the vector with entries $N_j \log|u_j|$ has an image in the r -dimensional subspace of \mathbb{R}^{r+1} consisting of all vectors whose entries

have sum 0, and by Dirichlet's unit theorem the image is a lattice in this subspace. The volume of a fundamental domain of this lattice is $R^r + 1$.

The regulator of an algebraic number field of degree greater than 2 is usually quite cumbersome to calculate, though there are now computer algebra packages that can do it in many cases. It is usually much easier to calculate the product hR of the class number h and the regulator using the class number formula, and the main difficulty in calculating the class number of an algebraic number field is usually the calculation of the regulator."

24.1

© Consider a Pen for Tablet (m\$-Math-app with handwrite -> TeX ocr) in mind.
and a usb-mouse & keyboard.

© Debian Buster.

Agility of Debian soft from modularity :

Debian Sarge djvu-reader bin & lib : 2.7mo.

Debian Buster Evince djvu-lib = 1.7mo.

- Add in site "pc".

I conceived and tested a prototype of a cheap chem kit ("pré-catalyse") easily pluggable into the air-box that reduces hc emissions @ cold starts; while increasing performance;

with 2.12.20 insta post :

Plotting gears with Open source/Free software on a Lenovo

Laptop running a GNU/Linux Debian operating system. The first screenshot shows how to get gear profiles by wrapping a floor/ceiling/round graph function around a circle with polar coordinates with Genius Maths Tools & wxMaxima/GNUpot. The second screenshot shows glxgears, a demo applet natively present in the X graphic interface (Xorg) of Linux boxes.

© Debian Buster.

Sage : originally built for BSD investigations, so well suited for elliptic curves. Wrote a basic python script :

$$\text{Cyclicity of } U(\mathbb{F}_p) = \mathbb{F}_p^{-1} = \mathbb{F}_p \times = \mathbb{F}_p - \{0\}.$$

* Adriana Salerno. Arithmetic of mirror symmetry @ UTexas.

Special functions : exp, log, trig, Bessel, Hurwitz, ..., and hypergeometric.

-> There are heavy books shelves dealing only with them.

$${}_nF_m := \sum (\alpha_1)_k \dots (\alpha_n)_k / (\beta_1)_k \dots (\beta_m)_k z^k / k!.$$

$(a)_k = a(a+1)\dots(a+k-1)$: Pochhammer or rising-factorial symbol.

${}_nF_n(z) = \exp(z)$: exponential-sum associated to

${}_2F_1(1,1; 1 | z) = \sum z^n = 1/(1-z)$: the good-old (algebraic) geometric serie.

Hence the name hyper-geometric, obtained by $/k!$ each term, accelerating hyper-fastly the cvg, the series becoming hypercvg.

Certain moduli $(C\lambda)$ of cubics over \mathbb{F}_p have their (asymptotic?) nb of pts $|C\lambda(\mathbb{F}_p)|_p = N_p(\lambda)_p$ in terms of hypergeometric series.

$C\lambda : x^3 + y^3 - 3\lambda \cdot xy^2 = 0$. Moduli of curves.

Motivations.

1) Count pt -> zeta func -> ECC.

2) Some K3 Calabi-Yau surfaces moduli : in string-theory, the classification seems to reveal a pair-pattern: hence the term "mirror symmetry".

© Debian Buster.

Find how to insert characters with ascii-codes in mousepad.

Again when plugging A806 : quirks & tends to overload thunar, with a seemingly usb-issue instability, surely from lenovo-suite cdrom (found it using 30% of all cores).

--> This cdrom-feature autostarts @ usb hotplug : usb dsu/dfu malware.

--> Inspect its code.

==> Reserve A806 for bloat-tasks (instagram, aliexpress, etc) or for sandboxing apks or as a bt-repo, avoid usb-plug to other devices, use bt for file transfert, retrieve all sensible apps and change passwords.

*© Tim Tech Tip @ Ytube (python).

ide have heavy requirements : space /cpu load.

Kyte : auto-completion (gnu).

Vim.

nerdy editor, a bit hard learning (no gui) but ultra-efficient (kbd shortcuts+plugins).

==> a more elaborated nano.

Vscode

M\$ dev, optimized for python (requires it); heavy (stalls).

Atom

github dev, so optimized for github, git.

Sublime.

lightweight, complete : good balance.

Pycharm

very heavy, but the most complete (database).

* 5mn Lebesgue.

Christophe Krathenthaler : Cimpa (Nice).

==> Good but only 4 EU countries...Norway, France, Swiss, Spain.

26.1

© Tablet Win\$10 VS Laptop Lenovo Linux-Mint.

Retrieved all the spying bloat of Tablet Win\$ 10 : dble tranchant, in claiming helping the user experience; it can actually be a redoutable spying machinery (microphones, cams, and even all the activity on the machine can be spied-logged; worse privacy breaches than all the previous versions).

New trend of AI+recognition-soft proliferation (the so called assistants...agents is better suited) are a serious privacy-threat for modern societies bearing in mind the bipolar-facing : (hardware/asia VS software/west).

==> Even in the parameters config, m\$ warns that not allowing apps using those

devices will not prevent m\$ from using them. So it lets think that users can control their privacy by ticking some config boxes; but they actually don't.

Had some issues with bt-pairing to Lenovo-Mint; recognized by Tablet-Win\$10 as audio-device; so data-bauds were drained by audio-transfert; had to tweak Win\$10 drivers properties to disable bt-audio to better data-rate; that with radio-issues (phones-radio noise), turn bt into rasr like scramblings after the two worlds confrontation battle.

© Got back to trusty Debian Sarge (djvu stuff).

27.1

© P9

sorted a bit g drive (formated txts) , photos and watch later vids.

Done the same @ free.

-> Put a Readme.txt in folders

vm : a secondary os running on top of a primary os through an "hypervisor".

* Pierre Audin Solides de Platon@Palais de la decouverte.

cube : called hexaedre by greeks.

polyedre convexes reguliers.

$$v-e+f = 2$$

$$f-a+s = 2.$$

{Alternate} sum of Betti nb.

{dim 2 - dim 1} + dim 0

Duality (Vertices of dual-simplex from face-centers of initial simplex).

Hexaedre(Cube)-Octaedre.

Dodecahedre-Icosaedre.

Tetraedre-Tetraedre. (normal or autoadjoint or selfdual).

* Grad Maths. Q-pts & Brauer Manin.

Damaris Schindler Utrecht.

Rachel Newton Leiden.

* Kato (U Chicago). Height on motives @ IHES.

Good & inspiring notations but voice-phrasing not understood.

® Abstract-nonsense (Homological algebra).

Rotman

Guelfand Manin.

- AE has ctrl over inerte-inorganic/living-organic matter, as well as time ticks. Ticks suggests that in fact time may be discrete & non continuous, quantized as energy; so all physics should be rephrased with discrete-derivation, or maybe distribution-derivation. I remember Nottale discrete-non continuous-fractal physics.

- Maths in research are already tough, if you add to that difficulty another hurdle by making src hard to get (books), you prevent developping & progress.

- Writing tips : atelier maths; revenir sans cesse sur l'ouvrage.

30.1

Hypergeometry.

* Andre. Periods @ IHP.

Euler Integral representation of Gauss hypergeometric function as a quotient of periods.

The denominator is obtained by taking the limit for $t \rightarrow 0$ of the functional(t) of the numerator, it is a scalar.

==> It is a rational expression of Gamma values; or a gamma quotients; as for the Pochhammer symbol defining this hypergeometric function.

<==.

® Beukers @ Hypergeometry meeting in Turkia.

Euler integral representation with rational fraction of gamma factors.

Monodromy

D-operator.

A matrix, z cplx nb.

$$z^A = \exp(\ln z \cdot A)$$

* Hodge Theory.

1) Kazuo Kato. Height of motives @ IHES.

2) Salim Tayou (i). Density of some Hodge-Tate Loci @ IAS.

F^i Hodge Filtration.

$F^1 \subset H^1(X, \mathbb{C})$.

Lesfchetz.

(i) Ma : thesis Ens-Orsay (advisors : Charles-Chenevier)

© Phones.

1) Pushed notes into g-drive & Free.

-> Do the same to img.

2) Pulled a bookshelf of sheaf cohomology.

Pushed it into g-drive.

31.1

- About wkp doubtful articles, and generally coquilles, errors, in books, articles, etc, either proofs or simple syntax :

a) the good in them is that they raise questions and develop "esprit-critique", not taking for granted what is published.

b) The bad is that they make lose time in always having doubts.

c) The proliferation of those is a plague, mostly due to the "publish-pressure", publications often taken as a "scientific gauge" by institutions and science-to-society interfaces entities.

® Read Nottale webpage about Fractal-Scale physics.

Associates a 5 dimensional vector field to space-time; the

last entry being the "scale range". Raises the question of non differentiability of space-time.

•--> About fractal time : time and matter quantization suggest using the conjectural "p-adic geometry" as a new frame for physics to get a "Q-fractal" space-time. The observed lack of matter would then be accounted by "brittleness" of those Q-fractal spaces (espaces friables).

<---

©* Tutorials @ Ytube.

1) John Hammond. x86 assembly.

nasm is a common outputer from source code; gives object .o files; ie elf executables.

2) Ben Awad. Vim keys.

```
:q
:q!
:wq
:w
```

i ins mode

(nb) hkjl : arrows (nb) of times.

{ } : up-down blocks.

u : undo.

G, g, gg : fast up-down .

d : delete char.

dd : delete line.

esc : back cmd mode.

3) Engineer man. Bash.

ls-l : forks the current bash-term into a second-one that becomes the parent process of the child process ls; whose output is piped into; when the child is done, it terminates the parent and the forked shell; so that remains only the initial bash-term.

`exec ls-l` : does not fork; so when `ls` terminates, it closes the `bash-term`.

`ctrl-z` : suspend.

1.2

© Debian Buster.

1) From (`vim.tiny`) man-page :

`vim can`

0) run as a server for netbeans.

`vim -nb`

1) run as a client for (remote or local) vim servers.

`vim --remote`

2) read binaries.

`vim -b`

3) diff multiple files.

`vim -d files.txt`

4) open multi-tabs or multi-windows.

5) run in lisp mode.

```
vim -l
```

etc)...

==> In fact, Vim can be more than an editor : it is ide-able, like "python-tck" editor; or the lisp based emacs-environment.

2) Looked (prompt TAB) for the tcl-tk gui python-ide : not there anymore after dist-upgrade.

--> Jupyter-install kicked it away?

--> Found ipython :

a) ipython, jupyter-like console ([IN] [OUT]); hence the .ipnb (ipython notebook ?) extensions of Jupyter files.

b) find how to parse multi-lines code; except with a "copy from clipboard" options command.

c) retrieved 21" to get back to console; laptop fonts are tiny (--> see how to change those; either @ kernel-boot or in user-space; terminal-config, locales or something like that).

d) See how to have vga-upside down, in order to quit xorg & guis.

© P9.

Android Termux : small term-emulator; comes with a micro-distribution; just enter

"pkg install xyz" to install the "xyz" package : those seems to be .deb bundles.

- Back to paper criterions TeXtes :

a) Studying basics cases of curves (dim 1) and surfaces (dim 2).

b) derived some general (dim n) heuristics on "Arithmetic cohomology of periods spaces" :

non-trivial $V(Q) \implies$ non-trivial " Q_- "-IH¹P(V) with " Q_- " meaning under Q_- -algebraic \sim .

c)® Read begining of Preu thesis : refreshing memory with schemes notes.

3.2

- Todo

search.txt

alternating sum.

riemann hurwitz.

modulo Q_- algebraic equivalence.

Spreadingout sets the dna of the forecoming collected data.

Sites

huh? in pc.

add link in blogspot.com About. x.

post a winter tips page.

© Mostly computers.

1) time-machine

g : keep-photos-drive.

dbox

insta

2) "social" networks (insta, ytube, fb, etc)

strategy (maybe elaborated by/with... AI-strategy-game

prgs : chess, empire, etc...)

- a) hire freelance webdevs for smart interfaces, etc..
- b) attracts future good-content providers by offering open-access to high-quality relevant... content from temporary-hired freelance content-providers.
- c) When done by reaching a plateau in audience; lock the network to force registration; get rid of previous content-freelancers; keep periodically (once/3y) the smartness of the interface with the first web-devs-freelancers; and let the attracted-then-captured audience loop-feed "the beast" with ads-injections in the closed space.

3) Mint

prompt TAB

p 415 entries.

s 290 entries.

Tara has :

ruby (2.3)

--> orca : for blind.

man pages

nm

nc

nl

usb-devices

xman

xed

xedit

* wasm : web asm executable by browsers.

There are now 7h Gnu/Linux ytube online courses : what a grow in learning resource since 00's.

© Michel Andre. EPL (X-Lausane). Homology of commutative algebras. 1973.

Enlightening introduction about homology tools, linearizing invariants/ontological data-collecting tools.

* Benoit Claudon IHP

Semi-positivité du cotangent logarithmique et conjecture de Shafarevich.

$f : \Sigma \dashrightarrow C$. fibration (surjective maps, with connected fibers) de genre ≥ 2
 D : fibres singulieres.

If $2g(C) - 2 + |D| \geq 0$: the pair (C, D) is called speciale.
 $\deg(K_C + D) \geq 0$.

Th (Shafarevich 1962 cj) Parshin 68 Arakelov 71.
 If (C, D) is special, f is isotriviale.

Fibrations, moduli, Mg paradigm : iso trivialite (degenerate fibers, ie isomorphic to one another) cannot be mapped into a "generic" (non degenerate) image in Mg.

* Ariane Mezard. Math Park IHP.
 Arithmetique de la reduction modulo p .

$$x^n + y^m = z^l$$

$$(n \ m) = l.$$

\implies Pochhammer diophantine equation.

* Cynthia Vinzant @ IAS.
 Log concave polynomials : theory and applications.
 $P \in \mathbb{R}_{\geq 0}[x_1, \dots, x_n]$ satisfying a $F(P, \nabla) \geq 0$,
 positiveness condition.

® The Rapinchuk, Igor and Andrei.
 Arithmetic of linear algebraic grps.
 Shafarevich conjecture on finiteness of isomorphism classes of abelian varieties having good reduction outside a finite set of primes.
 \implies Good introduction paper to recent progress.

4.2

© Sorted a bit.

1) g keep (dates, hi-tech diary : Lenovo Laptop).
uploaded a rescued arch dir of math-research pictures
computed/plotted/made around 03.

2) P9 math repo : Synced it a bit with A806 one.

-> Most good-relevant smart Android apps (pydroid,
termux, latex renderer, etc,) are russian.

* Science etonnante.
Machine Learning.

Evaluation function on a state of the discrete dyn
system : helps to choose on a tree of a certain depth ;
the next steps.

1) Apprentissage par renforcement : autolearning. Alpha0.

2) Apprentissage statistique supervisé a partir d'une
knowledge db . AlphaGo.

Go 100 games : A0-wins=100 vs AlphaGo= 0

3) StockFish. Chess.
100 games : A0=70 vs SF=30.

5.2

© Mostly computers from Ytube vids.

©* joe colins , jason wertz. Linux bash.

Begin Edit

```
# Here is comment of this updatescript.
```

```
# absolute path of interpreter.
```

```
#! /bin/bash
```

```
-> Space after "!" ("the bang") ?
```

```
# Script body : execute an apt-upgrade.
```

```
apt-get update -yy
```

```
# The "-yy " forces "yes" to apt-prompting queries.
```

```
# exit gives back the handle to terminal.
```

```
exit
```

End Edit

Then :

```
    chmod +x updatescript
to make it executable.
```

©* LukeSmith

1) Batch cmd with vim.

a vid of vim saving hours & hundreds of click-copy/cut-paste.

```
sudo su
```

```
vim /etc/hosts
```

2) Ranger : mc like file-manager with vim syntax.

3) Filtering dns-outputs.

```
ip url=hostname.domain.updomain hostname
```

```
0.0.0.0 unwanted.com (unwanted)
```

©* LearnLinuxTV.

Wireless drivers for Broadcom chips.

-> If possible trash them to install Intel ones.

How to install them on Debian
 add non-free to /etc/apt-source.list
 apt-update
 apt-get install broadcom-sta-dkms

©* JoeCollins
 OEM : Original Equipement Manufacture.
 State of the art virtualization : boxes can be remote or
 vitual machines.

©* Andreas Spiess. Radio-hacks.
 radio-networks (no gsm) for high-altitude hikers.
 meshstatic
 disaster radio.

©* Luis Ceze. g academy-UWashingtown
 x86 assembly
 computer memory.

© • Win\$
 -> download hexedit.

*© Rasim Muratovic
 asm : emu386.
 -> Qemu?

©* Cyber CPU Tech.
 windows10 Debloater (git script).
 --> there's a lot of debloating softs and scripts : chose
 one of them carrefully.

©* Craft Computing. Making a clean win\$10 img.

Multi pcs install (a bunch boxes on a lan)
 win\$ dployment system+ 1 ref pc containing the img-src to
 be spread-out;
 img-src made with win\$ img system manager, creating wims
 files from
 ans files (xml confile for tweaked img); the latter are
 from a catalog file that indexes what can be tweaked

(kernel db skeleton, configed by ans file to get tweakedimg).

00Be
out of the box experience.

6.2

© Mostly computers.

© P9

Updated 1) Maple 2) m\$ Maths.

- 1) Maple is better.
- 2) M\$ does not work anymore.

-> Android should propose sandboxing updates before definitive installs.

See how to sandbox updates.

-> See m\$ Math alternatives : Maths pix, etc.

==> Installed some Maths apps : SnipIt (Maths pix), Desmos, PhotoMaths, Algeo.

Tried :

1) SnipIt (Maths pix) : web-based (register) TeX ocr, far better than m\$ Maths.

2) Algeo : "Mathematics" app like.

©A806

Installed MathsWay : does not work.

==> Mathematicians distraction : computer sciences.

® * JoeCollins.

Bash is a prg interfaces between user and hardware through kernel.

hardware firmware-drivers kernel-drivers-modules, os low level cmds (hardware devices cmds : hdparam, lsub, lspci, etc,) bash user.

has builtin cmds like cd, but mostly used for external ones like ls.

sudo flaws disaster.

has a lot, with privilege escalation breaches risks.

©* Andreas Spiess. Radio networks.

Lora mesh : comm w/o infrastructure.

Sounds like samsung "anynet".

- Some maths

* Lectorium Tv @ Euler Institute of St-Petersbourg.

James Simmons & Daniel Sullivan. Differential cohomology.

Introducing K-groups in usual de-Rham differential cohomology.

- Todo.

Mv Textes to home racine or create link.

Find how to screenshot in tv box.

© Debian Buster.

Sage 8.6

a) Found static html docs (tutorials+modules).

b) Put them in ffox favs.

c) Read Beziers curves entries.

-> Sage has a "gauche" (non-planar) curve options in 3d Bezier.

d) Opened sage.script session with xfce launcher;
then opened code folder in jupyter-sage session : opened a
pynb there, noticed that it then parsed all the python
files of the current dir, creating a mess from kernels
swap-reconnect. Had to restart a new session in order to
stop kernel-swapping quirks msg loop.

e) Plotted some Beziers 3D Gauche curves.

f) Rewrote Fpx py-script one.

g) Some syntax and grammar.

underscore_notation (snake) : functions and
procedure.

CamelNotation : object.

function implementation.

```
def funct() :
    instructions
    return True
endef
```

h) ZZ for Z.

ReSt format into pdf, html, etc.

Piping several functions by dotting.

```
v1.dotproduct(v2).isreal
```

- Translated a bit mem.tex.

Using mousepad not TeXstudio : swifter.

=> Go to nano/vim/emacs vga-console.

® Mon systeme Linux. Lallemand-Schuller. Ellipses.

=> Good refresher for cmds (editors, shell, etc).

* NPTEL (Madras). Riemann surfaces.

Recalls on the analytic-functions fundamental
3-equivalence.

1) Riemann-Green relation of partial derivatives.

2) Standard first derivative : one order basic
differentiation change-rate ($\Delta f/\Delta z$)-criterion.

3) Local Taylor series expansions.

The 3) Gives D-rigidity of cplx/analytic functions :

from finite order (order one or f') to infinite order differentiation.

holomorphic injective = bi-holomorphic = iso-holomorphic.

Moving on into topological manifolds.

7.2

© Mostly computers.

1) Ipython exploration.

Intelligent python-shell combining bash-terminal (completion), python-parser, cells management of code; paste-from/to clips container (clipboard or remote pastebin); has interface with html, javascript, ruby, sgv, latex.

Importance of `init-dir` : changes behaviour when changing dirs. In `~.ipython` are 3 directories, one contains a history sqlite db-file; if ipython jerks it may be worthy to delete it.

Wrote some basic scripts on multiplicative orbits of F_p . Handles differently string outputs than Idle-tcl-tk ide.

2) A bit of Sage console : quite similar to ipython.

3) Swapping back & forth to P9.

For python, Pydroid-ide challenges both ipython/jupyter

ones.

- Wrote some heuristics paper notes.

1) Br-functor, μ Log-Hologies.

2) Trees, Treillis of prime-nb, bouquets over N nodes (spreading out $\text{Spec}(Z)$ @ each n-node : spreading-out $\text{Spec}(Z)$ bouquets @ integer nodes of a diagram-tree whose branches are arrows; $\text{Spec}(Z)$ -Hologies) : useful when computing linearizing Hologies(co & homology) that are "N-division"-graded; like the big Tate one whose cplx is built from $\text{Ta}(E)$ the big Tate module ($\text{Ta}(E)$ div-gathers torsion-matriochkas building-blocks) ; there should be a "Log of N-div-Hology" that functors it into a classic additive graded one; About "Log of Hologies" there should also be a "Log-der" functor, for periods spaces Hologies that outputs/spread-out the alg. ind. data encapsulated by the Betti-DeRham pairing/interlacing process.

3) Some extension of Hology_nonsense (co & homology) in next level : Hology-cplxes of modules of ... hology-modules.

* Vids that fits this framework.

a) Denis Charles Cisinsky (Mulhouse) talk @ IHP on ∞ -categories.

∞ -categories as generalized spaces.

Classifying categories as Truncated ∞ -derived categories : fundamental grp functor

as a truncation-functor on a ∞ -cat.

Simplexes of/on finite ordinaux.

∞ -cat groupoids & Kan cplx. Milnor.

Derived Geometry : cat of cats (Joyal, Lurie, Toen & al);

b) Alexei Lubovski. Cohomology in computer sciences @ Hebrew Uni.

And of course nLab corpus of ideas.

8.2

- Sorted recent (this year!) notes.
- > Try to not repeat (!) the mountain-piling of notes.

* Some vids.

A) J.P Serre.

1) Apps of lin alg grps @ U Washington.

G lin alg grp/ k . (ρ, V) k -rep : V k -vect space and ρ grp-hom from G to $GL(k, V)$

simple rep : V direct sum of irred subspaces

semi-simple rep : every G -stable subspace of V has a G -stable direct-summand.

Equidistribution. measures on cpct metric space.

a) measure from sets.

b) measure from function space duals (Banach).

For a diff manifold M , avoid $d\mu$ notation if μ is defined from the top diff form

$$\varphi(x) dx_1 \wedge \dots \wedge dx_n = \omega ,$$

since $d(\mu) = 0$ if d denotes the exterior derivative.

==> What about another d , derivative of measures ?

2) Bbki seminar talk @ IHP.

Mean of scattered averaged Dirac Measures on circles :
measures built from ab-var moduli (Abelian varieties).

B) Physics

1) Ahmed Alhemeiri احمد العومري on SpaceTime metrics talk 2019 @ IAS.

2) 2B1Br on brain recognition-treatment of fuzzy pixelized imgs.

© P9.

Retrieved Desmos (stuck-loops splashscreen), Sorted imgs.

© Debian Buster.

a) Continued mem translation with TeXstudio, a quite complete latex-ide, a bit buggy (usine à gaz, like most heavy-ide):

b) TexStudio copy-selection rendering is buggy : works 50% , this features dumps & parses small /tmp/Hash_name.tex's containing clipboard data.

-> Created a small commented render.tex instead and parsed it after uncommenting wanted pieces for preview.

c) Ctrl Alt U : unicode.

Alt P/N : Evince nav ←/→ history.

9.2

© P9

Noticed that screenshot imgs ~ 50k whereas camshots ones are > 500k.

==> Find a screenshot keybd-combination in remote-ctrl of androidtv.

© * RS (Richard Stalman) tips about clouds.

Gather future export files in a folder, encrypt each of them then encrypt the whole folder, tar-it and finally push the tar-gpg²-gz into the cloud.

* Some transcendence th. vids (Varoqui@ Ytube)

1) M Waldschmidt @ Arizona.

General historico-update overview.

2) Paula Cohen @ Arizona.

Hypergeometry alg ind from Siegel thms.

• Some heuristics paper notes.

1) Brauer grp investigations : Br-functor.

2) Beware of the two j for elliptic curves functions, capital J , the modular function from a quite intricate Laurent expansion; and the small j or the j -invariant given by a simple \mathbb{Q} -rational fraction of the two moduli variables a and b , if the elliptic curve is given by

$$y^2 = x^3 + ax + b$$

® Read ColliotThelene_Skorobogatov (CTS) Brauer grps e-book.

No explicit systematic Br-functor but implicit : scattered all over the book since this monograph is/will-be the future (exhaustive) ref on Brauer Grps.

Chapters on grp cohomology.

-> Read Faltings-Vojta thms txts to take a decision about abstract_nonsense bloat.

10.2

© P9

Workout mem g-translate/evn htmls.

Best viewed in built-in html viewer/chrome.
Converted part of it to txt for mem_e.tex

12.2

- Typos.

search.txt

alternating sum.

riemann hurwitz.

modulo \mathbb{Q} algebraic equivalence.

Spreading out sets the dna of the forecoming collected data.

Bouquets : spreading out- nodes along $\text{Spec}(Z)$

Arizona.

Log Div, Log Der.

th

endo.

- Fate meditation : Trashed bikes places better conservation in desertic regions; gather concentrated blocks of (matter-nrj from manufacture process & virtual data-info-knowledge from engineering), waiting to close the Universal cycle ie returning where it was extracted : Earth-Ground it was "stolen-extracted", Earth-ground-dust it will ineluctably return.

* David Harari. Rational pts on Zero cycles. 2018 talk@IHP.

Zero-cycles are 0-dimensional cycles on X ; that is, formal \mathbb{Z} -sums of points of X ; they form a canonical \mathbb{Z} -module : $\mathbb{Z}^{\text{pt.}X}$; somme de pts de X pondérée par des entiers relatifs;

=> So it is a huge grp, $\mathbb{Z}^{\text{pts-}X}$.
= Bouquet over \mathbb{Z} .

$$z = \sum_{x \in X} n_x \cdot x \text{ with } n_x \in \mathbb{Z}$$

x pt ferme : pt def sur (par?) une ext finie de k , $k(x)$

$$\deg z = \sum n_x [k(x) : k]$$

pt-rationnel : zero-cycle trivial constitué d'un unique pt indexé par $1 \in \mathbb{Z}$: $z \cdot q = \{q, n_q=1\}$.

\mathbb{Q} -pts : $z \cdot \mathbb{Q} = \sum q \cdot n_q$

Fibrations : Bouquets over base-space through a map.

$f : X \dashrightarrow C$. here the base space is a curve.

Hyp : $\omega(\text{Jac}(C))$ finite , (ex : P^1).
=> Confirm that hyp.

Articles
CTS 1987

Borovoi 1996.
Liong 2013

Browning-Mathiesen 2014. analytic methods from additive nb theory methods from analytic nb theory (circle, Green, Tao).

Schinzel hyp : Dirichlet prime nb th extended to/with homogeneous polynomials values.

© A806.

Retrieved Maths way : splashscreen loop as Desmos; either server-side issue/stratification pbs/or honeypots. --> aduasr (time /spam/botnets deployment).

bt-export does not work with tex files (extension filter ?).

* Yan Pradeau.
Algebre exo-fiction : bio-roman.

- Some notes.

If the fundamental periods are alg ind over Q then the variety has no non-trivial Q -pt.

Reinventing billions times the wheel but not going too far like intellectual-hamsters in their rolling-ideas cages, or fitness addicts wasting atp-cells metabolic nrj on rollers or pulling tons of irons plates to burn fat (go by bicycle to the grocery store or to workplace or elsewhere; grab an ax and cut some dead-tree wood or take a pioche to dig a well or to plow a field or to look for stone building-blocks or to plant trees is a much more relevant way of burning fat).

- Continued translation of TeXTes.

=> found in all tex srcs files, keys ideas in comments. so salvaging back the stuck-hds may be worthy to put also all those hidden insights-newideas on-line.

•© Gathering math symbols in evn and g Q-pts htmls.

⊕ $\int \partial \leftrightarrow \rightarrow \forall$

$\times \varphi \in \prod \sqrt$

$\sum \pi$

$\phi \varphi$

\in

* Joe Collins. Linux Tips.

popd pushd

cat *.txt | less

Less is a more with options keystrokes.

Webemu.

14.2

- A bit mem translation.

® B.Poonen article : A p-adic approach to Q-pts.

Considers HyperElliptic curves $\Gamma : Y^2 = P(x)$, with $d = \deg P$.

Writes $d = 2g + 1$ or $2g + 2$, Then concludes $g(\Gamma) = g$.

More generally, for any fixed $d \geq 4$ and $a \in \mathbb{Q}^\times$, the curve $x^d + y^d = a$ has only finitely many rational points.

\implies But from Shafarevich Algeo 1 p211 and Lang EMS NTH III p11 :

$$g(\Gamma) = (d - 2) = \frac{1}{2}(d-1)(d-2) = g(g \pm 1) \dots$$

g is a topological invariant, so coming from (ordered) product topology of C .

<==

* Akim Demaille. Langages formels. (Epita).

Amaeutique style : asks what is a langage?

=> Maybe it is what (allows him)/(he uses) to ask that question, ie a langage is already/intrinsecally needed to define a langage; so in a way it cannot be defined.

<==

Langages du 1er ordre.

Building a foo-compiler written in c++.

Input : code in langage foo.

Process : core c++ code of the foo-compiler to treat input foo-src code.

Ouputs : object-assembly files, from foo-src code files.

==> This may be reduced to a dictionnary from foo to c++ to translate foo-code into c++ code.

<==

* Dalila Chiadmi. Automates finis.

Wandida,EPFL

© Phones.

-P9

Sync maths/office bunches of imgs : p9 <-> A806.

Sorted them in new dirs.

-A806

Dwloaded Q-green soft, seems from India.

Has more options than QReader : size of translation fonts (arb, en) + tfs english.

- Some heuristics notes.

a) Galois grp-th reformulation, in terms of arithmetic geometry (fixator of Q -varieties).

b) Around genus of curves.

$g(X)$ and Betti more fundamental invariants (topological) than $nc(X)$ and de-Rham (differential) : the latter nc -deRham is from constance on conx-components $nc(X)$ of a function with a null d -derivative on X ; so it presumes a richer structure on the studied space X than g -Betti. The kernel of the d -der-linear form on function space on/of X spreads out through the bouquet of cnx -components of X : values/img of elts f of $\ker d$ are in bijection with $cn(X)$,

$$\ker d \sim k^{\wedge cn(X)} \sim cn(X)$$

d -der defined from k -ring soustraction/difference ratios :

$$df = f(x+h) - f(x).$$

Order-topology with order "compatible" with ring-structure operations, and 0-neutral elt for addition, playing the role of the "initial" elt, the gauge.

15.2

* Some vids

A) Marc Levine

a) From K -th to Motivic Homotopy 2015 talk @ Euler

institute (St-Petersbourg).

Begins with K-th historical recalls.

b) Connecion between motivic stable & classical Homotopy th, 2018 talk @ IAS.

Homotopy type.

B) Olivier Benoist. Picard nber $\rho(X)$ of K3 surfaces. 2014 talk @IHP.

Application of Kuga -Satake to use abelian var endo framework for the study of (class of) K3 surfaces Line bundles.

Importance of K3 surfaces as buiding blocks.
-> Caucher Birkar.

K3 : Trivial invariants $H^1(X, \mathcal{O}_X) = 0$ and $K_X \sim \mathcal{O}_X$ (deg $K_X = 0$).

$\text{Pic}(X)$ as the parametrizer of line bundles over X , free- \mathbb{Z} group of rk $\rho(X)$.

Recent work on $\rho(X)$ computation : bounds of this algeo discrete-invariant that accounts for algeo sub-complexity of X , ie renders the codim-1(-subvar)-cycles; the hypercycles; here curves on surfaces.

M.Artin, jp-algeo school (Kuga, Satake, Igusa, ..)

(M.Artin, Boston area, Son of E.Artin; sister = spouse of J.Tate)

$1 \leq \rho(X) \leq 22$.

Dichotomy : car $k=0$ (well understood).

car $k=p$ ("p-adic realm" oddities)

Tate-conjecture($T_{c,j}$) tries to catch-up the (1,1)-Hodge-Lefschetz isom thm of the car $k=0$

case that gives $\text{Pic}(X) \sim H^2(X, Z)$ hence $\rho(X)$.

$(T_{c_j}) : H^2_{\text{et}}(X, \mathbb{Q}_l(1))^G$ isomorphic to $\text{Pic}(X) \otimes \mathbb{Q}_l$.

Line bundles $\otimes \mathbb{Q}_l$ isomorphic to the \mathbb{Q}_l -Etale-cohomology Galois-fixed subspace.

Faltings M. Artin-Moser Oggus-Niegar
Charles, Maulik, Galudi, Perrin.

Asterisk : Surface K3 modules et periodes.

*© Adrien Linuxtricks .

/etc/init/udev : autoexec scripts @ usb-hotplug.

© Tablet win\$10.

Tried bt-mouse : works fine only when emitter is near receptor; otherwise jerks a lot.

Sorted some dirs, bt-pushed some P9 TeXtes into them .

Launched GeoGebra6 : 3D feature is a bit buggy (hangs from time to time) but managed to get

Plots of some basic conics/quadratics in \mathbb{R}^3 (paraboloid, hyperboloids, ellipsoid, spheres, etc).

© Linux Mint Tara.

Updated TeXtes dirs, noticed that pushed-P9-TeXtes were not the last ones; there is often quirks : pushed-files on target are not the last updated ones, but anterior versions; it seems that P9 file system has a kind of redundancy (P9 often appearing twice in thunar).

The same occurs in the other way from pushed-Mint-TeXtes to P9.

==> It may be a /dev/ramdisk-memory dump issue; the physical data being only written to disk afterwards; you think putting the last versions, but it is only the last physical traces that are pushed.

==> before pushing : closing apps in which those files are loaded may force dumping dev/ram buffers into their physical data container.

- Continued a bit mem translation.

17.2

® Rambled on the big SRC (www) :

a) tried to find the nb of nb theorists : no value, but i guess ≤ 10000 .

b) found out that all the SGAs were LaTeXed by the (ENS/bbki) armies.

==> Compagnonage, compilation-communautaire, moines-templiers copistes.

© Tablet-pc bios

Keys entering bios aptio setup american megatrends 2019
In order to access BIOS on a Windows PC, you must press your BIOS key set by your manufacturer which could be F10, F2, F12, F1, Ins, or DEL. If your PC goes through its power on self-test startup too quickly, you can also enter BIOS through Windows 10's advanced start menu recovery settings

* Olivier Bailleux. Langage du 1er ordre. Univ Bourgogne.

Syntaxe,

Variables

Quantificateur : $\exists \forall$

Operateur : binaire : \Rightarrow et ou \Leftrightarrow

unaire : not

Formules closes : toutes les variables sont quantifiées
(pas de var libres).

* Engineer man.

Java, Python, Php, C#, Javascript.

* Linode : Open/Free software web-hosting; includes vm-distros, a kind of jupyter-os_shell, vm can be run locally or remotely as jupyter.

- Maths : science of exhaustion, pressing-extracting-squeezing objects-theories-fields-corpus till reaching the end-of-actions/possibilities; remain the immobile-ethereal granit-architecture, the hard-skeleton of core building-blocks made of unbreakable-stone ; the "buzzing/vibrating structural Piezzo-lamina" of theories, each vibrating state giving a different theory from the variations of the initial-unital-universal echo.

©* Linux Soft/Chris Titus Tech.

stacer : x htop.

calibre : ebook reader/creator/manager.

timeshift.

Some shell cmds

Ctrl d : exit

Ctrl L : clear.

Ctrl A Ctrl E : begin end

Alt f, Alt b : forward, back one word.

Ctrl R : reverse order history search.

more or less

ZZ : quit more.


```
du | less
tail /var/log/syslog
```

```
watch
```

* Pr Dave explains.

Stokes theorem.

$$\int_C \mathbf{F} \cdot d\mathbf{r} = \int_S \text{curl}(\mathbf{F}) \cdot \mathbf{n} \cdot dS :$$

catches how much of the vector field F goes "along" with C , or goes "in the direction of C ".

© Debian Buster. Linux.

Last `bashrc` mods and `bash_aliases` were missing : re added them (dir aliases) in `bashrc`.

Grub

Grub has never launched correctly `win$` since first install; but just found out that an `exit` cmd from the grub command line brings to `win$ bootup`.

©* Chris Titus Tech=CTT.

Multiplex term.

console shell : `tmux`.

gui : Terminator.

`sudo su`.

`df=` disk free.

```
sysctl list-unit-files
systemctl start stop status
```

history

```
!head-of-cmds  
!history-id
```

```
echo $sys-vars  
echo $winearch $shell $editor  
-> just use $TAB.
```

Keys of bash :
TAB
man

LibreOffice

Prefer the flatpak archive to get cutting edge features versions on whatever distro.

Don't use default-fonts if m $\$$ -Word piping is ahead.

- Some notes.

- 1) A bit mem translation.

- 2) 2mn paper : Arithmetic-Stokes, Log $\Omega(V)$ varieties.

19.2

- Some notes.

A bit mem translation + corresponding issues on paper.

Some latex cmds recalls : compiled in latex.tex comments.

20.2

- Some notes.

0) keep todo.

1) A bit mem translation.

2) 2mn paper : Crt reformulation for mem english.

21.2

© Tablet-pc

Put a usb-mouse: more stable than bt.

© Debian Buster.

cmd-line tab @ grub-boot prompt.

some dc cmds : Polish inv bc shell calc.

some bash : \$TAB for environnement variables.

- Some notes.

A bit mem translation + corresponding issues on paper.

22.2

® Some recent Xiv articles.

1) G.Fernandes (DiVizio UVSQ; phd Lyon). Overview (Historical+progress : MW style) of Alg ind in LMSS article.

Fp Differential Galois grps : p-adic functional alg ind th.

Malher, Carlitz, Drinfeld, Chrystol, Bottcher : finite characteristic framework; p-adic differential monodromy, hypergeometry.

2) Mattew Just. Finite grp th/N nb theory.

Some notes.

A bit mem translation + corresponding issues on paper like birational inv 0-dim issue.

©* CTT.

Lvm : old hdds.

* Christian Liedtke. Rational curves on K3 surfaces@HSE (Moscow).

normalization. Factorizing through Alb, using its univ ppty.

(Xiv paper with Jun Li both @ Stanford univ).

8.35

Tree : cooh (grape, wheat) or knowldege.

23.2

© Debian Buster.

Samsung screen : quirks on unable to resize mousepads.
-> retrieve it (antenna).

On quit, notes quirks : lack again last versions.
==> this may be a sync issue between ramdisk/physical_disk

- End mem translation.

Appendix completion: added hist-bio.

First compile buggy : needs picins.sty/ rewrite cat,code
in preamble/convert utf8.

compile cmds & options, + envir.

--> Cf memo.txt in debian@free.

in intro.tex_output lack first lines

k-var : the minus outputs a "?".

the guil renewcommand does not work : output also a "?".

in the general case it should be a torsion grp.

présenté par : written by

preamble

\frac seems to be replaced by \mathfrak

maybe avoid all the redefinitions : catcodes and
renewcommand.

® Lie algebras. wkp.

In mathematics, a Lie algebra is semisimple if it is a
direct sum of simple Lie algebras (non-abelian Lie
algebras without any non-zero proper ideals).

Throughout the article, unless otherwise stated, a Lie
algebra is a finite-dimensional Lie algebra over a field
of characteristic 0. For such a Lie algebra $\{\displaystyle \{\mathfrak{g}\}\}$ $\{\mathfrak{g}\}$, if nonzero, the
following conditions are equivalent:

$\{\displaystyle \{\mathfrak{g}\}\}$ $\{\mathfrak{g}\}$ is
semisimple;

the Killing form, $\kappa(x,y) = \text{tr}(\text{ad}(x)\text{ad}(y))$, is non-

degenerate;

$\{\displaystyle \{\mathfrak {g}\}\}$ $\{\mathfrak {g}\}$ has no non-zero abelian ideals;

$\{\displaystyle \{\mathfrak {g}\}\}$ $\{\mathfrak {g}\}$ has no non-zero solvable ideals;

the radical (maximal solvable ideal) of $\{\displaystyle \{\mathfrak {g}\}\}$ $\{\mathfrak {g}\}$ is zero.

25.2

© Android. Tested LaTeX parsers : wearLatex and QuickTex.

a) QuickTex like Redactor :

encloses input in math environment (maths mode) ie puts "input" between two "\$" :

$$\$"input" \$$$

or equivalently between two slashed brackets "\(" :

$$\backslash("input"\backslash) .$$

b) WearLatex : no enclosing.

Tested a LaTeX "suite" : PhdCreator,

c) PhdCreator : needs network cnx, ortherwise stops/ends /exits.

==> All encountered LaTeX "suites" (Verbosus, OverLeaf, PhdCreator, etc) need cloud registration; another way for developed countries to collect-steal sensitive or high-value scientific research data; besides the old-fashioned way of doing it (soft/hardware official trojans starting with pc-hardware(asia)ones to software(west) ones of operating-systems and editors

suite) = Present-and-future trend of silent data-battle not to say war; greed for infos/data in "veille tech" for dominance or fear of being left behind in the "race for progress".

26.2

© Debian Buster. TexStudio usine-a-gaz subtilities :

-> Choose adv-options in prefs to better customize it, like line nbers, size of menus-icons, has a bunch parsing cmds-macros.

-> cf if catcode issue can be fixed with char encoding option, etc.

-> For langage stuff has java client-server options; as well as cloud sync ones (svn, fixin etc) ones.

Processed some tries of them in latex.tex.

•© For mem translation, stick to pdflatex dir, with TeXes : mem, preamble, preface & intro. Corrected some typos on the previous two.

© Pushed from A806 to P9-Tablet some 1990-1991 SMF src files from NumDam repo :

® Courbes Modulaires Courbes de Shimura.

MICHEL RAYNAUD LUC ILLUSIE J. - F. BOUTOT H. CARAYOL BAS EDIXHOVEN SAN LING JOSEPH OESTERLÉ FRED DIAMOND B. MAZUR K.A.RIBET. Courbes modulaires et courbes de Shimura. Astérisque, tome 196-197 (1991)

® JOSEPH OESTERLÉ Nouvelles approches du «théorème» de

Fermat. Astérisque, tome 161-162 (1988), Séminaire Bourbaki, exp. no694, p. 165-186

® Osterle Bbki article : evokes quickly Langlands prg for modularity of Q -elliptic curve from Serre-Tate cjs about $\text{Gal}(F/Q)$ rep in terms arithm invar.

® In Asterisque Shimura monograph, good GuyHenniart Intro on Mazur-Ribet thm from Serre cjs.

© Wrote some heuristic paper notes on :

a) Pade-Dyson dioph-approx thms extensions from pts/functional to var. The latter giving a case of the former during a // process : alg-periods of alg-var approximating tr-periods of tr-var.

b) Case of Modularity of $P(V)$ from Gauss hypergeometry : modularity drops tr-deg and therefore Gmot size. (cf formula of Moebius composition, product for modular forms/functions).

--> See this for the number-field base change k/Q for Elliptic curves/ k ; how the size of the motivic Galois grp drops when down-shifting from k to Q .

27.2

Less inspired (20-27 : sleepless week).

- 2 writing processes.

1) Write to oneself, to think, setup new ideas, may be cryptic to non experts.

2) Write to expose the results of 1) with a targeted reader audience in mind, adapting the writing style to it.

* Vids of O.Wittenberg on rational pts.

a) Bertini thms @ IHP.
analog algeo of sard thm

b) Puntos racionales @ Impa.
Combine density analytic methods(Green-Tao), fibrations and descent.

© Debian Buster.

Some polar plots @ Genius graphs-ide.

1) noria-gears wheel.

$$\begin{aligned} & ((1/10)*\tanh(25*\sin(20*t)))*\sin(t) \\ & ((1/10)*\tanh(25*\sin(20*t)))*\cos(t) \end{aligned}$$

2) pinshed circle for cell mithosis-division.

$$\begin{aligned} & (\text{abs}(\cos(t))*\cos(t)) \\ & (\text{abs}(\cos(t))*\sin(t)) \end{aligned}$$

© Tired with sync-quirks : // process not saved in 26.2 versions.

- Insta

Maths is essentially the science of exhaustion of phenomena analysis. It may surprisingly apply to computer ressources that carries this activity: here all the ports of this Linux Lenovo Laptop are used, "diffing" versions of research notes on one screen, editing final versions on another, saving in two different places through all the usb ports the results; more than ten demanding programs (ide) launched simultaneously, etc...GNU-Linux Debian with its remarkable agility and completeness is definitely the way to go for maths investigations, it outperforms by

far all the proprietary dominant operating systems available (Microsoft Windows, Mac OS, etc).

- Some paper notes.

Hypergeometry : functional side, dealing with the function space generated by the Gauss

hypergeometric function, under the action of complex-analytic-groups (groups operating on analytic functions spaces) to get it "modular in the sense of catching-up/matching moduli of either nested or relatively-linked-together periods varieties".

28.2

© Steven Kleiman : how to write maths (new version of 2019 / last seen one was mid 00's).

Good example fitting those writing style advises : Lang EMS Number theory III.

==> Beware on focusing too much on the form finicky details. A perfect style paper with no original ideas is less valuable than a very clumsy style paper with new enlightening ideas.

<==

2.3

* Found a gem compendium summa on Q-pts; shedding light into recent progress in research:

Reinventing Rational points. 2019 seminar
@ IHP.

==> Trimestre or semestre organized by Emmanuel Peyre, David Harari and Alexei Skorobogatov; about 43 vids ranging from historical-overviews to cutting-edge research (perfectoid in Brauer grps).

1) Kestutis Cesnavicius. on Brauer Grp rigidity (or purity) : $Br(X)$ remains unchanged by obliterating some of its stricts subvar. of increasing codim (≥ 2 then ≥ 4).

$$Br(X) \sim Br(X-Z) , \text{codim}(Z) \geq 4.$$

Kutznesov : prg for rationality of fano 3 folds.

Purity of Brauer-Grp.

Gaber 81-04

Cesnavicius Kestutis 2017.

Kęstutis Česnavičius (Université Paris-Sud) / 27.06.2019
"Purity for the Brauer group of singular schemes For regular Noetherian schemes, the cohomological Brauer group is insensitive to removing a closed subscheme of codimension ≥ 2 . Study the corresponding statement for schemes with local complete intersection singularities, for instance, for complete intersections in projective space. Such purity phenomena turn out to be low

cohomological degree cases of purity for flat cohomology. Study the latter from the point of view of the perfectoid approach to such questions. The talk is based on joint work with Peter Scholze."

"For a noetherian regular Schm X for any closed Z subsch of $\text{codim} \geq 2$
 $H^2(X, G_m) \approx H^2(X-Z, G_m)$.

Artin Scheirer series.

The inclusion chain grps for a noeth integral regular Y
 $H^2(Y, G_m) \rightarrow H^2(k(Y), G_m)$ are torsion.

Demarche Cyril.
 Principal homogeneous spaces
 Harder Knesen Borovoi.

2) Michael Stoll on Rationnal Equations Minimality : on the other side of spectrum, getting back to hardcore reality by using computers to find out simplifications of complicated rational equations into simpler integral ones."

* Another Q-pts vids summa bringing to research level :

Puntos Racionais 2015 @

impa.

O.Wittenberg. Rational mini-courses (pts and var). Puntos Racionais 2015 @ impa.

=> Good introductory lectures on Rational corpus (varieties, connectedness, equivalence, etc) of Kollar-Japan_School-Campana; and others : bringing from grad to research level.

<==

Rational connected (RC) varieties are the closest to the projective plane P^n .

Colliot-Thélène cj. If X is RC then its rational pts are dense in its Brauer-Manin set.

$Br(K) = H^2(\text{Gal}(K_{\bar{}}/K), K_{\bar{}}^*) \sim H^2_{\text{et}}(K, G_m)$.

Evokes Lang cjs (~60's) on density of rational pts and other related questions.

Kollar Thm (~00's) on nber of rational equivalence classes for varieties defined over number fields.

Exhaustive review of rational connectedness, equivalence till mid 00's (2006-2007).

3.3

© Android P9 then Linux Debian Buster Lenovo.

Corrected chap2.tex and completed appendix.tex
Noted again sync quirks on s210229.txt : intro, OverLeaf, introduction, etc.

- Some 5mn paper notes.

1) Finalizing sketchy 010321 notes sheets (stroke foggy lines twice for readability).

2) Some tries of Brauer grp extensions to non algebraic cases.

3) Properness (algeo compacity or Tychonov?) implies that adelic space of $X = \text{product over places } v \text{ of } k \text{ of } k_v\text{-extensions of } X$ (bouquets of varieties over the span of

base fields extensions, parametrized by the set of places of k , or the down-level bouquet of absolute values of the field of definition of X : spreading out the topologies feather of X from the topological feather of its base field). Note that a place is also an equivalence class of norms on a space.

==> Only 5mn = scratch surface (as garden). Leave e-distraction to settle down for digging deeper.
 <==

4.3.
 (sleepless nite).

© Debian Buster.

1) Switched to non-graphic mode by unplugging upside-down screens.

Did not managed to stop graphical gdm-login daemon :
 pkilled them but came back again.

==> There should be a way of stopping them, I remember something like `/etc/init.d/gdm stop`.

==> Confirmation : to get rid of gui interface, on Buster :

a) login as root and
 b) `/etc/init.d/lightdm stop`

2) Got back to hard-core console without gui ; managing pkgs with aptitude and editing source files with nano; like long-time ago.

=> some quirks of nano for some utf8 char display, might be term/nano non matching/clash of char encoding.

=> Fix that issue together with size of term font-display; for a bigger one, either @kernel level or user-space one

(keybd, locales, termcap, etc).

3) Refreshed Debian pkg-infos,

4) Completed tex-live suite

langage : arabic, english, french, greek, russian; some quite heavy(english, french,greek).

graphics : epic, pictex, xypic, asymptote, etc, (locate sty | grep pic or graph)

misc : xetex, luatex, etc

5) Installed another tex-ide : texmaker, a clone or fork of TeXstudio (or inversely).

Did not find picins.sty extension for "txt-coulée around imgs", quite odd for the comprehensive Debian; even in heavy MikTeX of win\$10 Tablet; so consider converting img into eps and use basic include-graphics routines of latex-pkgs graphics, graphicx.

==> Or look for the sty file (picins.sty) from Gabel or Rolland book CDRom or simply in the wwws ; and do a db-update with mktex scripts so that tex-live suite takes it into account.

==> Or find a picins.sty substitute.

==> Drawback of Free Software : anarchic development, pkgs no longer available after one or two years; but authors warn about that in their disclaimer : "NO WARRANTY in sustainability nor suitability, ..."

6) Reinstalled python-ide idle(3.7) : quite light (< 2mo).

® Read some Le Monde articles about Maths.

"Le théorème de l'indice, Everest mathématique"

Carte blanche. Le mathématicien américain Isadore Singer est décédé le 11 février 2021 dans le Massachusetts, à l'âge de 96 ans. Avec son collaborateur Michael Atiyah, mort en 2019, il avait démontré le théorème de l'indice, célèbre parmi les mathématiciens, qui leur a valu le prix

Abel en 2004. L'importance exceptionnelle de ce théorème est attestée par le fait qu'il établit un lien insoupçonné entre deux parties des mathématiques jusque-là éloignées, l'analyse et la topologie, mais aussi par ses conséquences en physique théorique.

On pense souvent, à tort, que le rôle du mathématicien consiste à résoudre des équations. A vrai dire, il y a beaucoup de sortes d'équations. Beaucoup de celles qu'on rencontre en physique mettent en jeu des inconnues qui sont des fonctions plutôt que des nombres. On parle alors d'équations différentielles et leur étude fait partie de l'« analyse mathématique ». Il est bien rare qu'on sache résoudre ce type d'équations mais le théorème de l'indice permet de compter le nombre de leurs solutions, ce qui est bien souvent suffisant pour les applications. Atiyah et Singer associent à l'équation un objet qu'on appelle un « fibré », dont l'étude fait partie de la topologie, et sur lequel on peut lire directement le nombre de solutions. Un pont est donc établi entre l'analyse et la topologie.

Le théorème a été démontré en 1963 mais Atiyah et Singer n'en ont publié une démonstration qu'en 1968. En fait, ils ont attendu de disposer de trois démonstrations différentes, un peu comme un sommet qu'on atteint par plusieurs voies, chacune apportant une nouvelle perspective. Il ne faudrait pas croire que tout cela est apparu soudainement dans l'esprit de ces deux mathématiciens. Ils ont développé leurs idées en s'appuyant sur de nombreux théorèmes antérieurs qui ne semblaient pas reliés. Leur collaboration autour de ces thèmes a duré plus de vingt ans. Les progrès les plus importants en mathématiques sont bien souvent des synthèses : des résultats hétéroclites apparaissent tout à coup comme de simples cas particuliers d'une théorie bien plus puissante.

L'externe et l'interne

Quelques années plus tard, le lien avec la physique est apparu clairement. La « théorie de jauge » des physiciens était très proche des « fibrés » des mathématiciens. Le

théorème de l'indice devenait un outil crucial en physique quantique. On peut y voir un exemple de la « déraisonnable efficacité des mathématiques dans les sciences de la nature », pour employer une expression célèbre du physicien Eugene Wigner [1902-1995]."

then other one warning that Maths is on decline.

1) Level of youngsters : reports about maths level declining of average youngsters.

2) Nber of mathematicians : the most brilliant experienced are declining in number; Atiyah-Singer; both passed away 2021-2019 ; leaving their index theorem masterpiece; Tate, Koszul, in 2019-2020, etc.

==> How to change that :

For 1) change "prehistorical way of doing math evocated above" to a modern one (AI+ Massively //distributed systems) to attract the younger generations of digital era.

For 2) Build a multi-collaborative maths encyclopedia moderated by still alive highly experienced professional mathematicians.

<==

5.3

© Received bt-keybd from aliexpress.

-> Works fine on Android P9, but a bit buggy on Tablet win\$10.

Android P9.

- 1) Turned it into a mini-pc : nrj-saving compared to multiscreens box; but too tiny screen.
- 2) Some quirks.
 - a) last latex.tex version not the one from Debian Buster saving process.
 - b) maxima ghostly icon.

6.3

® Caucher Birkar building-blocks found in Lang EMS NB theory III in the chapter 1 introduction p15 ("Qualitative aspect of diophantine problems").

-> Lang actually says "try to make notation functorial to ideas".

==> Maybe to link with Steven Kleiman (notation functorial from denotation to conotation).

<==

Begin gathering some research tips from the present document search.txt (ie those lines); in a sketch of the rambling synthesis mentionned in the same place.

--> Added some comments to it.

==> A trend perceived is the numerous studies on K3-surfaces, both for purely algebro-geometric matters or for arithmetics ones. K3 surfaces are getting on the front scene since a decade, "making the buzz", mainly in 3 research domains.

1) Classifications, Desingularizations, of algebraic varieties.

2) Hodge theory and conjecture : trend suggests that Hodge cj may be contradicted by K3 surfaces theory.

3) in Q-pts, appears in mirror symmetry (maybe from some Hodge classes pairing) for their arithmetics.

<===

--> Do many rereads of that document to collect core/relevant data (normally thick arrows).

- 1) maths data
- 2) pc data.

--> Created corresponding tips files.

- 1) stips.txt for research from search.txt.
- 2) ctips.txt for linux console : from memo.txt, nanorc & search.txt.

7.3

© How to save e-nrj :

- 1) switch to mini-pc made up from smartphones + bt-keybd.
- 2) switch off one of the big screens.
- 3) hard core console, no gui.

© Tried TeXmaker with two screens 1 & 2 in split-view mode :

screen 1 : edit source.tex

screen 2 : preview source.dvi

Much more agile than TeXstudio, less usine a gaz.

- Office tasks.

1) Continued gathering core-notes from search.txt into stips.txt

-> Continue rereading (search.txt) to collect relevant data.

2) Done the same compiling for ctips.txt on computer sciences.

3) Played some real-physical Tetris; sorting heavy piles of maths books among cluttered shelves.

4) Finally wrote promising 5mn of maths : begining of a paper note on applications to real-world of Q-pts study.

8.3

© Hardcore console with nano; corrected some typos on chap2_e.tex

--> relearn kbd shortcuts of nano or switch to vim/emacs.

--> look for multiplexing shells : termux (i guess).

Noted again some sync jerks in chap2.tex translated versions.

Wasted again time figuring them out, by diffing all found sources files.

- Played again some real-physical Tetris; sorting heavy piles of maths books among cluttered shelves to get maths books close to the desk.

© Tediously compiled with TeXstudio memoir translation
src-file mem.tex :

- 1) correcting typos (special characters hunting);
- 2) relearning mpost compiling into latex; retrieved
picins.sty routines, replaced them
by direct img.pdf files inclusions.
- 3) Remain some quirks from bib files.

9.3

© Solaris(java) sun micros systems (now oracle) backdoor
issue (universities, institutions (research, academic,
enterprises), banks, ,etc) big systems.
suspicious nsa-coercission.

© P9

Sorted mem translation files :
created date folders.

* Puntos Racionales @ IMPA.

O.Wittenberg.
Filtrations-Descent.

Derenthal Smeets Wei +
Browning HeathBrown

Browning Mathiesen Skorobogatov (2013).

* A.Skorobogatov.

"K3 surfaces venture outside secure RC world, Rational-pts study still tractable because K3 surfaces are close to ab var (Deligne-Kuga-Satake thm) and even more can be done if the K3 surface is a Kummer surface."

10.3

- Played again some real-physical Tetris; sorting heavy piles of maths books among cluttered shelves to get maths books close to the desk.

© Noticed that Boulanger (Studio white) 21" screen is only 25w versus 50w Samsung. So swapped them, retrieved Samsung and made Boulanger secondary with Laptop main, to save 50% nrj; so 2 screens : 1 wide +1 high.

- Sorted some paper notes of 2010 (most non mathematics : biology, cycles, computers, wood-cutting, islam, iron shaping and welding, etc).

- Memoir translation typos.

reform : sanbox.

general case

Ellipses : align eqn.

appendix : obviosly.

bib : chatelet.

local_global

specific specialization

def brauer : from of.

lof : diagram

é : etale cohomology.

11.3

© Begun in Buster, continued on P9 mini-pc (tablet outputview)

Too small screen so much less convenient than normal screen or 21' upside-down.

Changed Q-edit font to better that exp

- Mem translation typos.

inex of neitri

following inclusion (brauer manin cartier).
following arrow.

comutation.

caption aside : below
another consoliation.

approx Theoretic.
retrieve considering.

size drop of a family of varieties.

* Alexei Skorobogatov @ IMPA Pontos Racionais.

"Dogma.

$X_k = X(A_k)$ computational evidences.

uk = SwinnertonDyer, Pannel Cook, Holmes; Bright Browning Loughran.

de = Elsenhans-Jahnen.

$\sum_k X_k$ because $X(A_k) \neq \emptyset$."

13.3

- // to writing technics: Reading technics.

1) Active retrieving.

Try to remember the content (thm, idea) before going to check correctness of souvenir about it in reading the part of the book containing it.

2) in the same trend, Expectative reading.

Avoid passive linear reading, but read, driven by ideas looked-for, with an anticipative approach; that is, linear reading driven by the sought-ideas and infos, ie with the hope of getting answers through them or confirming own ideas and intuitions.

3) hwto to print read/write data in brain : associate/put-in emotions in the process to dig mem paths, nodes structures in brain.

15.3

* Cesnavicius talk @ IHES Barry Mazur cf.

"Purity of etale cohomology of grp schemes : vanishing of cohomology grps for index $>$ dim R; extension of Gaber thm proof of Grothendieck cj (several versions from 1994 to 2013). Extension to complete intersection rings."

- Some commutative ring notes about that, getting back to Modules of differentials (derdiff).

1) purely algebrisation of real and complex analysis differentiation process; going towards ring theoretic ppties of schemes (flatness, regularity, etc).

2) There are numerous possible derivation modules : listed 14, among seemingly many more .

- Some real tetris to sort books on shelves.

* Alena Pirutka (-) "Diagonal Arithmetics, θ -cycles" mini course @ IMPA Pontos Racionais cf.

(-) Bielorussie, IMO, Magistere IRMA-ULM, Master&PHD P11, CNRS@P11, now Courant Institute NY.

"Equidim var, relative dim of flat morphism.

exponent (up) : codim
subscript (down) : dim.

proper inters of cycles.

equiv rel : to reduce size of those grps of cycles.

adequ -> num -> hom -> rat (finest adequ).

Cartesian product of varieties, Diagonal varieties of power of varieties, Computes some Chow grps.

rationality classification
Finner classes of varieties :

rational(r);
stably-rational(sr);
unirational(ur);
rationally connected (rc).

X sr : $X \times^m P^m$ is r for some m."

Check var jargon :
1) equidim qnd
2) integral.

© Pulled some ref on Lie Algebras.

Maths Lie Algebras - Royal Holloway
www.ma.rhul.ac.uk/~uvah099/Maths/Lie/Lie-all.pdf

Any 1-dimensional Lie algebra is abelian, so up to isomorphism, there is just one 1-dimensional Lie algebra
 SEMI-SIMPLE LIE ALGEBRAS AND THEIR REPRESENTATIONS math.

uchicago.edu/~may/REU2013/REUPapers/Ward.pdf

Any sub-algebra or quotient Lie algebra of a nilpotent Lie algebra is nilpotent. Proof. If h is a subalgebra
 NOTES TO LIE ALGEBRAS AND REPRESENTATION THEORY

wuzhengyao.oschina.io/homepage/Lie.pdf
 NOTES TO LIE ALGEBRAS AND REPRESENTATION THEORY ZHENG YAO WU
 Abstract.

Mainreference [Hum78 Par Lie Algebras in Mathematics and Physics
www.math.ru.nl/~heckman/Lie.pdf
 05:32:30 are called the special linear algebra, the orthogonal algebra and the symplectic algebra respectively

© Alena Pirutka
 "Cohomological invariants often vanish for hypersurfaces, or codim 1 subvar of global/ambient/maximal var."

© Samsung 31' (79cm) is 115w +
 Android tvbox 12x1.5=18w
 ==> Total 133w.

© Samsung 21' (53cm) is 50w.
 Boulanger 21' (53cm) 25w.
 Laptop pw 60w
 ==> Total W/O tablet 135w.
 Tablet-pc 24w.

==> Total W tablet 160w.

© Old crt ones are above 330w. $230 \times 1.5 = 345w$. Lots of rays emissions (headaches).

- How to get rid of droziness.

1) Kinesy : move, do smth not highly brain demanding but rather physical (sort piles; books; try new layouts (desk, screen, outside and inside pcs); sort the different shelves : books; journals; admin, notes papers, pcs; furnitures stacks (tools, motorcycles parts, office stuff, clothes, etc, etc).

2) Stimulants : tea, coffee, gum, vit c (mangos, oranges, limes, bananas, pinapple, etc).

3) Eat wisely, follow 3 Muhammad thirds (eat 10 bits , drink 3 gulps, breath oo), avoid garlic-verveine based preparation : blood pressure drop effect favoring sleepness.

4) Cold showers have also a kick-opening eyes effect.

4) Do something motivating (search, collect data, etc) to maintain eveil, avoid passive reading-viewing.

==> But, beware that restricting sleep has mid-term cognition issues : brain quite less efficient in compiling-structuring data; deep solving; creating content; etc.

© Restart Gabel : no sound card.
swapped pci cards in their slots, bios then jerks bipping, with a F2 resume prompt.

==> Seems to be symptoms of cmos battery too low, not giving enough voltage to keep config data : try a new one.

- Physics ... matters.

* From "L'origine de la matiere". Esprit Sorcier. Jamy Courant.

Quarks : elementary particles.
Two types Q_u and Q_d
--> I remember 6 flavors.

Nucleus:
2 kinds-sets of 3-quarks subsets, a 2-set (a doubleton, doublet; or pair in english) of triples or 3-tuples of quarks. A tagged-pair of triples, a bi-partition of triple-sets or triades. A pair of triades : Neutrons triades, Protons triades.

2-kinds.
1st kind = Protons.
2nd kind = Neutrons

Neutrons N: (Q_u, Q_u, Q_d) .
Proton P: (Q_d, Q_u, Q_u) .
Both are called nucleons.

Building block of matter : H.
 $H=(P, E)$.
E: electron.

H fusion building-block, is made up $H=(P, E)$. Nucleus (3q) of one Proton without Neutron.

Other atoms.
1) Nucleus of Protons and Neutrons (6q) ($Z=N+P$) +
-----big void----- + nested fuzzy tri-dim stripes or annuli of $E= 3q.P$

Nucleon triades and pairs are tied-up by strong nuclear force/interactions carried through gluons exchanges. The compacted space of glued nucleons : Dark domain.

E : $3q$?

N ----- E : huge void space between them, but electromagnetic interactions stills manage to cement the bipolarized structure through photons exchanges. The lacunary space is the Light domain.

So matter has a lacunary architecture (may account for mass gap); alternating of big void and ultra small compacts pieces; as the resulting structure of the fractal building-process of Cantor-like sets. Density distributions may fall into the conjectural "Q-adic" (lacunary-fractalized) geometry framework.

© Changed cmos battery : tested the 6 month old one : 2.8v; put new one that is 3.3v. Less bios jerks but still the F2 prompt complaining of pci (irq?) conflict on motherboard for network interface.
--> this cmos set-up is quite sensitive to voltage-level of those 2032 batteries.

© Swapped twice pci cards : 1st time lost xorg in linux; x-system complaining of missing screen; since I remembered xorg "pci:0:0" option for xorg-screen drivers; I swapped again pci cards to revert to original layout, that is, to go back to statu-quo-ante : this was good bet and finally all was ok.

--> This cmos battery : wk-pt of Gabel, below 2.8v, the bios system eeprom or e-programmable config-data memory has issues.

® arXiv nt 2103 serie : more q-pts.

2103.07192

\mathbb{Q} -pt on intersections of diagonal forms.

(cf Alena Pirutka talk @ IMPA Pontos Racionais).

07126

link : zeros of a pol & its malher μ .

06965

\mathbb{Q} curves Hecke characters et dioph equations.

06917

Neron models.

06910

Brauer grp of fibrations.

06822

weighted simultaneous dioph approx on manifolds.

06464

Rigidity of Euler products.

06436

Variance of closed geodesics in ball and annuli on modular surfaces.

06345

Empiric det of Feymann integrals.

18.3

- Physical tetris sorting books in cluttered shelves to

have maths ones next desk, sorted some piles paper too :
manuals booklets of e-stuff.

- Put 2nd light to duplicate desk.

© Retrieved Tablet, cleared white-screen back by
retrieving books behind it.

© Multiscreens : multi-pistes of tackling pbs; or multi-
tasks of when tackling one of them.

screen 1 : edit.

screen 2 : read or compile-output.

© The most readable setting is the double 21' upside down
: provides a better overview of files with high height
screen showing either a lot of code lines or a whole
e-book page, allowing a good scroll ratio fit (near unit)
of a one page scroll/screen scroll.

- Matter.

inerte one, living one, consciousness, theology :
moralisation of instincts.

* Alexei Skorobogatov. Puntos Racionais.

K3 surface arithmetics computational side : recent work of
Elsenhans Jahnen.

19.3

© Tablet pc.

a) set pc mode with dark theme ;
 -> on bat-devices dark mode saves a eyes & a bit nrj.

b), updated security db.
 -> fine tuned a bit update scheduler to not being bogged
 by update remind popups : finish customization.

c) Installed both geany and bluefish editors(the latter
 required www).

d) Noticed, during install process that ssd are way faster
 than hdds.

© Tried bt-kbd on android tv : works fine, tried different
 keybindings for screenshot, not found yet.

Work-layout : 1) Samsung big-screen : viewer.
 2) TabletPc or P9+bt-kbd : editor.

© Tried all win\$10 TabletPc editors :

ergonomics : Notepad++ , Bluefish.
 code : Notepad++ , Geany.

Good progress of m\$ stuff but still far behind GNU-Linux
 Debian and Mint.

- Wrote some periods heuristics notes on paper.

© Put Q-apps on Android tv : retrieved some bloat apps
 before, but those reinstalled automatically. Installed a
 new browser : this one allows pulling files.

--> See how to get rid of them in some /etc/init.d files.
 --> a pak Q-app is quite original.
 --> Try to find keybd keys for screenshot.

© Done some g-drive sorting.

®ImSc

Maths institute of Chennai (In).

20.3

* Alexei Skorobogatov talk @ IMPA Pontos Racionais.

"After exhausting natural setting landscape of Rational (connected, uni, etc) varieties framework, one might venture in the trendy land of K3 surfaces; those, via Jp-school(Kuga-Satake)-Mumford-Deligne thms, are known to be close to the theoretically well understood abelian var.

K3 surfaces are defined in terms of trivialized sheaf-cohomological spaces.

$H^1(X, \mathcal{O}_X) = 0$: trivial 1-st sheaf-cohomology grp.

$H^2(X, \mathcal{O}_X) = k$: pseudotrivial 2nd sheaf-cohomology grp.

Exples of K3 surfaces.

Quartics in P^3

Quadric \square Cubic in P^4

\square of three Quadrics in P^5

Kummer varieties, $\text{Kum}(A^r) = A^r/\tau$ with A Abelian variety, τ complex c.jg."

22.3

® Quadruple screen reading Huber Muller Stach on Periods of Nori motives simultaneously on four devices (two small for the toc; two big for pages contents).
 --> Gestative promising theory.
 --> The nuclinearisation process explicitation and its application to the periods space is the underlying fil of this monograph.
 --> This nuclinearisation process consists in a bunch of theoretical absorbtract-subprocesses.
 (absortract=absorbing-abstract non sense : the theoretical electrolyte in which the arithmetic intractable hardcorenuts are dipped into, in order to get the protected enlightening seeds; the arabic has a word for that untying process : tafsir; so the goal is tafsir-untly a variety into linear sum of building blocks). Getting to the varieties analogue of primes numbers; the building blocks, is a tedious task.

One key nuclinearising tool is direct/tensor-product; with one of its instance revealed by the Kunneth formula; that is a homology multiplication : spreading out the homology of a product of spaces in terms of the homology of the initial spaces; a kind of distributive law for the multiplication of linearizing structures that are here homology spaces.

The direct sum for the algebraist.
 The direct product for the topologist.

25.3

•© Gathering what was left after the 2009 blackout, as queried in the Gabel visit paper note:
 all Gabel maths txts seems to have been pushed here.

--> Remain to collect its pcs ones.

It might be worthy to check tex sources (mainly fiche.tex, slides.tex, critere.tex, chap1.tex and chap2.tex) to collect deep insights hidden in commented parts.

Here are relevant dirs approximatively in time order.

/home/hui/Documents/Arch/msnet/msneTmp/Maths/TeXtes/

/home/hui/Documents/Arch/mpman/Search/

/home/hui/Documents/Maths/Arch/2007/gabel/notes/

/home/hui/Documents/Maths/Arch/2007/rama/

/home/hui/Documents/Maths/Arch/2007/rama/algnb/

/home/hui/Documents/Maths/Arch/2007/rama/TeXtes/

/home/hui/Documents/Maths/Arch/2007/rama/tex/omega/arab/

/home/hui/Documents/Maths/Arch/2007/teXtes/mem/

/home/hui/Documents/Maths/Arch/200901/Jawa/TeXtes/

/home/hui/Documents/Maths/Arch/200901/Jawa/TeXtes/mem/

/home/hui/Documents/Maths/Arch/200901/Jawa/TeXtes/slides/

/home/hui/Documents/Maths/Arch/200901/Jawa/code/

/home/hui/Documents/Maths/Arch/200901/Jawa/cas/

/home/hui/Documents/Maths/Arch/200901/Jawa/docs/

/home/hui/Documents/Maths/Arch/200907/Jawa/TeXtes/

From Jawa note.txt in one of those folders.

"Rev-ision notes for mem file, the memoire source file.

1) Definition of adèles spaces, remove "l'". Make precise its topology.

2) Precise the pairing $=_K$ of the Brauer-Manin obstruction, or just give "un".

Explicitation of local fields arrows.

Rephrase the $\text{Div}(X)$ stuff.

3) Replace

V with X ,

fractions with fonctions.

inv_v with j_v .

4) Give the reference url of Bright thesis.

"

- Corrected some typos in the evocated texts (slide, critere).

Made minor changes in mem translation (chap 2.tex).

27.3

© Sorted both P9 and TabletPC latex translation sources(retrieved redundant pdf, png, mp files).

- Sorted Feb-March paper notes.

- Begun some paper notes on Tannaka formalism.

© Received usb-104-kbd : quite light compared to old keybd, plugged it to tablet together with usb-optical mouse.

=> input devices work better in usb than bt, no jerks due to radio noise jaming signals.

28.3

- Some paper notes on motives, periods spaces, transcendental degree.
 \implies there must be a deep reason why the second periods are so reluctant.
 - Made minor changes in mem translation (chap 2.tex).
- ® André bbki paper on motives.

"Restreinte aux variétés abéliennes à multiplication complexe cyclotomique, la conjecture des périodes de Grothendieck équivaut à la conjecture de Lang-Rohrlich : toute relation polynomiale à coefficients dans \mathbb{Q} entre valeurs de Γ en des rationnels provient des équations fonctionnelles de Γ ."

\implies Fermat case of criterion should be related to periods of CM-abelian varieties;
 since those periods are Γ values @ rational pts.
 \implies Ayoub theory should clarify the algebraic-to-analytic queries; it seems to be one key for tackling those issues.

29.3.21

- Some typos and addition to english memoir version.

Intro
more generally.

chap 1
genius

chap 2
be revealed

- Wrote some heuristics paper notes.

1) From Huber Mueller-Stach book on Nori motives.
On sets of torsors, actually torsors of cohomological torsors.

2) From q-app paper notes. Moduli as perturbation theory applied to arithm geom : Bouquets paradigm. A way to tackle a static intractable case of a given fixed variety is to dynamically dip it in a moduli of varieties; spreading out qualitative and quantitative characterizing-objects of the initial variety through the variety of parameters (the parametrizing variety) of the moduli.

3) From Andre bbki motives.

Motives as a double ext of Galois th :

a) ext to higher dim.
b) ext to transcendental nbers.

4) From those froms.
Gather insights periodically in micro-synthesis; otherwise piles accumulation may turn synthesis into a really tedious or impossible task.

Immediate example of that advise here :

a) Huber book : On Nori motives one key pt in nuclinarisation (linear splitting) process of varieties

is the concentration in some degree of some cohomological spaces.

b) Andre article : the double extension pt and Ayoub cplx function trick that the latter used in his functional periods cjs proof.

Don't forget paper diaries of 25.3 to 29.3.

5) From Kounehier Flament Nabonnand, Geo au 20eme siecle.

Rep mentale des formes.

Scheme : geometrisation of R-algebras by their study through charts of R-rings.

* Integral geometry. UniMontreal.

Study of geometric objects with analytic tools (cplx analysis, real analysis, probability, etc).

Famous Pbs : Sylvester (targeting a subset of a convex body), aiguille de Buffon, pie slicing, etc.

=> Looks like Q-app paper notes.

30.3

* Ugo Bruzzo. Algebraic geometry for physicists. (String th courses). Univ Munchen.

Kobayashi. Diff geom of cplx vect bundles.

Huybrecht Lehn. Moduli spaces of sheaves on surfaces.

Good insights into algebraic tools.

Functoriality of cohomological grps with respect to d-morphisms.

M in R -mod, equipped with a derivation d (nilpotent endo of order 2) gives a differential R -module, (M,d) .

A morphism between R -mods M and N , d -compatible gives a morphism of diff R -modules.

- Maths research tip.

Mathematicians can benefit clarifications from physicists, computer scientists, logicians, engineers, etc; points of view and insights :

Ugo Bruzzo.

Berndt Sturmfels.

Friedrich Schuller.

© Received last stylus : only the rubber tips works, the fine tips are useless (use those for reset pins, or recovery key of Lenovo Laptop)

© Updated nearly all softs of both phones P9 and A806.

© bt-sync img-folders.

© Sorted android tv folders.

31.3

- Some paper notes while correcting memoir translation.

Eulerian integrals giving gamma quotients.

- 1) pwr cos.
 - 2) fermat curve.
- > used Chambadal formulaire.

- Memoir english typos.

mem.tex : end chap1. a principle that geom gvrn arith.

intro diagram p4.

since μ_n is rational for odd n .

1.4.21

* Vial Charles. Chow motives talk @ IAS.

Beauville Deninger Murre. ~ 85's.

3.4

© Sorted Debian Buster src , on the go read some articles.

® Read

1) Belinson cj stuff.

Ian Nekovar, Yihang Zhu (MIT : e-pt of view on Nekovar paper), S.Deninger, Scholl (in a Collected Inventiones summa 1969-1999).

2) Martin Orr, Alexei Skorobogatov
on K3 surfaces & Shafarevich cj (Finiteness of ω).

3) Alena Pirutka theses.

- Wrote some paper notes.

1) About maths inefficiency in solving its pbs.

2) Inverting the view pt and dynamising it.

Instead of studying the set of pts of the ambient space constrained by an equation, study the variety of varieties or moduli of varieties that intercepts a given set or even a variety of points of the ambient space.

® From Barry Mazur What is a motive? AMS Bulletin.

"Think of axiomatizing a cohomology theory l in algebraic geometry over a field k as a contravariant functor $V \rightarrow H(V)$ from the category of smooth projective varieties over k to a graded abelian category H (where sets of morphisms between objects of H form Q -vector spaces) with all the properties we expect. For example, we would want any correspondence $V \rightarrow W$ (i.e., algebraic cycle in the product $V \times W$ that can be viewed as the "graph" of a multivalued algebraic mapping) to induce, contravariantly, a mapping on cohomology. More-

over, we want our category H to be an adequate receptacle for our cohomology theory, which should enjoy the standard perquisites of the usual cohomology theories, such as the Künneth formula and Poincaré duality."

4.4

* Christine Rousseau. Des polyedres a la geodiff. talk @ clubmath udem (Montreal Univ).

Th des tgs tournantes.

Boucle du plan.

image continue de $[a,b]$ dans le plan avec $f(a)=f(b)$; sans autointersection, soit sans doute, image continue et injective sur (a,b) .

$$\int \theta'(t)dt = 2\pi.$$

6.4.21

© Sorted Android tv Textes.

- Some paper notes.

1) From what is series.

A) what is a motives. Barry Mazur.

B) what is a period domain. Carlson Griffiths.

Hodge theory : Hodge structures & filtrations. Periods mapping & Moduli.

2) From those froms.

C) Research tips to get core insights: reading introductions, summaries, reviews.

1) phd as already said;

2) books :

a) preface,

b) introductions of parts, chapter, sections.

3) Articles.

4) Special articles of maths societies reviews :

a) AMS Bulletin what is?

b) SMF : Gazette Qu'est ce qu'un? Journées X-UPS : articles.

5) Rare maths articles in scientific journals and reviews (Scientific American, La Recherche, etc).

6) Vulgarisation :

a) reviews : Tangente, Quadrature, etc.

b) Ytube channels : 5mn Lebesgue, tomaths, ljj, science

etonnante, passe-science, aleph0, 2blue3brown, Prof Dave explains, etc.

© Sorted P9 Maths imgs folder into subfolders.

On A806 done the same but to 16G external sd. While sorting files and cutting-pasting them to this sd, noted some lags.

After a 45mn process, noted that thumbs were all greyed, imgs were then inaccessible, A806 reporting a bad card needing formatting.

So took it to Lenovo Laptop done a deep or low level format (fat32 4096ko), noticed then that 2G were being used : this suggest some malware built-in or actually bad-sectors partition. Inserted the card into A806, still complaining of bad sdcard, so reformated it again in A806, in vain.

This sd was extracted from Q8 mini cam and originally Escam C cam; was a cheap bought from Aliexpress. Remembered that it did some jerks in EscamC needing some reformat.

Retrieved it and put new one from Auchan. Redone the maths-img foldering from bt-pulling P9 ones.

=> Redundancy actually saved the day but not time-waste.

=> May have lost some RH pics so check g photos.

* Javier Fresan.

"Periods & transcendence". Journee X-UPS talk @ Ecole Polytechnique Laurent Schwartz maths center.

=> Rare good intro on motives.

Starts with astronomy oval perillee thm of Newton, taken

from Mme de Chatelet Principia translation, that the area swipped inside an oval by a straight line can not be algebraically dependent of the angle made by that line from the horizontal (hence time, since this angle is proportional to swipped area, from Copernicus-Kepler thm).

Evokes Huyghens, Descartes, septicisms with "oval" ctre example of singular piecewise-linear polygones, and Leibniz moderation on them, since the latter figured out that the oval (=close curve) smoothness hypothesis confort the assertion of Newton.

Then gives the pendulum example ie another physics example showing that periods are really originated from periodic phenomena.

Defines semi \mathbb{Q} -alg sets as positive sections given by \mathbb{Q} -polynomial, defines periods as integrals of rational functions over such domains.

Shows that algebraic nbers are actually periods and that periods form a ring.

- Some Typos in memt. has given

7.4

- Wrote some heuristics paper notes on galois grps ext to motives.

a) Coherence of size drops with nber of q -pts.

b) Galois $[Q_ : Q]$ Awareness.

© Lenovo Win\$8

1) Retried several times to reformat the faulty sdcard varying size of chunk allocation from 4096 to 8192, third pass with low level then quick format worked but with 3.16G size used : try to figure out that change of size (symptoms of malware and/or virus).

2) For security retrieved automated reading of removable devices.

3) Put pure black background to desktop and notepad++ to save a bit nrj.

4) bt pulled last diary file from a806.

5) The day before bt-rdb from P9 to a806.

® Read Schneider bcj article and Andre motivic galois grp talk.

Came accross Galois $[Q_ : Q]$ ideas.

- Typos memt.

intro : has given.

chap 2 end : $\mathfrak{w}(J(Vk))$.

8.4

- Continued paper notes

on links between Galois grps : classical and motivic.

a) Extension of the former to the latter. Considered :

b) a family of those.

c) also (arith or \mathbb{Q}) grps stabilizing the space of analytic functions stabilizing the ring of periods.

d) Then tackled the relation between Brauer grps and motives : etale cohomology.

* Javier Fresan. "Exponential motives" 2017 talk @ CIRM.

Nori construction : building an abelian category from a pair made of a quiver equiped with functor to Vect.

* Thomaths.

differential 1-forms and duals of finite dimensional vector spaces.

-> Ext products of this duals gives p-forms.

10.4 (late nite).

• Some heuristics paper notes, considering two future options after memt and critere.tex :

1) develop motives introduction of fiche.tex.

2) more likely, bearing in mind data loss of 2009 and

what's left, new framework of periods spaces and analytic functions theory with differential operator theory acting on their spaces.

A revolutionary D-module theory from a quite original idea of a math ytuber.

=> Not so revolutionary : amounts to take log and exp of differential operators.

* Some vids on Gamma function.

1) Mathematics Academy of Sorbonne university.

2) Completed by an egyptian lecturer one.

3) A good intro on conformal mappings @ nptelhrd.

© Received bt mouse-kbd combo. Works fine on win\$10 Tablet, better than previous one with less radio jerks.

11.04

- Wrote some notes.

1) typos on memt.

Case of the "algebraic $\sqrt{2}$ " ellipse treated : no non trivial \mathbb{Q} -pt.

==> So rewrite this section as well as the Fermat one;

since implications are a bit messed up (elaboration process).

==> Remains the $E_{(a,b)}$ for (a,b) in \mathbb{Q} ; dig deeper the extended stable criterion; this case is treated modulo the condition that the action of rational Möbius transforms grp on the hypergeometric functions space trivializes algebraic relations of fundamental periods.

2) Tangent ((dual) bundle) as linearizing process. DeRham cplx as a quite, quite rich such resulting structure.

3) Gamma values @ mid integers.

4) "Normic" diophantine equation $N(x)=m$.

12.4

© Late nite : put TabletPc upside down in Tablet mode for ytube vids in full screen.

Early Paris Dakar motorcycles preparations :

- a) rugged frame (special welds @ high loaded joints : headset (gousset); swingarm pivots, etc).
- b) airfilter on top of bike
- c) additional fuel tanks under the bike (lowering center of masses).

© Tried bt-mouse on P9 Android : does not work.

- Reformated diary notes.

* P versus NP. Passe-science.

From a query of Godel to Von Neuman, NP is the class of pbs whose solutions are easily checkable (in a polynomial time of the input data size); whereas P is the class of pbs for which a solution is obtained in a polynomial time relatively to the input data size; this data size is typically the number n of nodes of a graph.

® Pulled the english translation of an historical (1916) russian grp theory book in archiv.org, namely The Abstract Theory of grps of O.Schmidt.

- Typos.

a) search.txt

Change Stefan Schuller to Friedrich Schuller.

Joel Chaskalovic.

Neutons

untying (tafsir)

Mori-Nori motives.

benefits from Physics and computer science.

b) memt.

intro : subdivided into, being developed.

feedback to societies by giving concrete and understandable expls.

Rational points on general varieties : extension to non algebraic cases.

- Wrote some heuristics paper notes.

1) H_{et} and motives to catch Brauer grp from motivic apparatus.

Coherence of size drops with \mathbb{Q} -pts.

2) Euler characteristic in terms of transcendence degree of periods spaces/fields;
to get the arithmetic equivalent of that topological

invariant.

13.4

* Thomaths.

$d(f \cdot dx_1 \wedge \dots \wedge dx_k) = df \wedge dx_1 \wedge \dots \wedge dx_k$
 Ext diff d'une k forme gives a k+1-forme.

Une forme exacte est necessairement fermee mais la reciproque n est vraie que localement.

Poincare

Une forme fermee est localement exacte.

Th de Poincare

Une forme, definie sur un domaine D (ouvert connexe de \mathbb{R}^n ?) fermee est localement exacte sur D. Elle est globalement exacte sur tout D, si D est simplement cnx; soit si $\pi_1(D)=0$.

Exemple de simplement cnx.

Parties de l'espace euclidien \mathbb{R}^n :

((ouvert ?) Partie convexe (= Domaine ?).

partie etoilee.

Ctrexample : The punctured plane is not simply connected.

* Science etonnante. Theorie quantique a boucles.

Mecanique quantique : la quantification de l energie de l electron explique the geometrical/spatial discretization of the density-distribution : a finite number of torus-shapes or cloud-annuli called orbitals.

Les boucles tracees sur les varietes permettent d'apprécier leurs courbures.

Les distances sont quantifiees vers le bas (distance minimales prennent un nombre fini de valeurs inferieures a la distance de Planck).

Those quantified lower bounds may also explain lacunary issues observations.

© Doing the same process on different devices may seem inefficient considering sync solutions ; but syncing is risky if a node is in a cloud repo outside, since those are vulnerable to tempering, so using sync with an external node in a cloud may alter all the data of all other nodes including those of local devices after sync whereas the other tedious option allows a multi devices-commit.

Deson service

15.4

memoir translation [memt] typos.
 Replace : weither or not. cup
 With : whether CUP

17.4

® Fiber functor.

https://en.wikipedia.org/wiki/Fiber_functor

"In category theory, a branch of mathematics, a fiber functor is a faithful k -linear tensor functor from a tensor category to the category of finite-dimensional k -vector spaces.[1]"

g bot output.

" Fiber functor - Wikipediahttps://en.wikipedia.org/wiki/Fiber_functor

In category theory, a branch of mathematics, a fiber functor is a faithful k -linear tensor functor from a tensor category to the category of finite-dimensional k -vector ...

Definition · From covering spaces · From Tannakian... ·
References

fiber functor in nLabhttps://ncatlab.org/nlab/show/fiber_functor

Traduire cette page

1 avr. 2013 – A forgetful functor from a category of actions/representations to the underlying sets/spaces is

often called a fiber functor, notably in the context of

...

Idea · Properties · Tannaka duality

Fiber functor | owlapps<https://www.owlapps.net> > articles·

Traduire cette page

In category theory, a branch of mathematics, a fiber functor is a faithful k -linear tensor functor from a tensor category to the category of finite-dimensional k -vector ...

Tannakian formalism for fiber functors over tensor categories<https://arxiv.org> > pdf

PDF

de M Einollahzadeh · 2016 – k), equipped with a fiber functor F (i.e. an exact faithful k -linear tensor functor) to the category Vect_k of finite dimensional vector spaces over k .

(PDF) Tannakian formalism for fiber functors over tensor

...<https://www.researchgate.net> > publication >

308026993_...

11 nov. 2020 – PDF | In this paper we generalize Tannakian formalism to fiber functors over general tensor categories. We will show that (under some ..."

* About Tanaka, Kuga, Satake etc.

Japan mathematics history : raise since post Edo modernisation.

"En 1868, le jeune Empereur du Japon Mutsuhito est restauré par une coalition de daimyos mécontents du shogunat. Après deux siècles de paix, et une fermeture quasi-totale aux étrangers, une crise latente s'était installée. La menace occidentale a cristallisé les critiques. Cette Restauration de Meiji fait basculer le Japon dans la modernité, et en quelques années, l'Empire du Soleil levant va devenir une grande puissance mondiale.

Revenons sur la période qui s'étend de la période Edo à la Restauration de Meiji, et observons les raisons de cette transformation radicale."

<https://www.youtube.com/watch?v=MVf6vY1VQ0I>

© Huber Mueller Stach. Periods of Nori motives.

"All standard properties of cohomology are assumed to be induced by properties of the category of motives: the Künneth formula for the product of two varieties is induced by a tensor structure on motives; Poincaré duality is induced by the existence of strong duals on motives. In fact, every abelian category of motives (conjectural or candidate) is a rigid tensor category. Singular cohomology is (supposed to be) a faithful and exact tensor functor on this tensor category. Hence, we have a Tannaka category. By the main theorem of Tannaka theory, the category has a Tannaka dual: an affine pro-algebraic group scheme whose finite-dimensional representations are precisely mixed motives. This group scheme is the motivic Galois group G_{mot} . This viewpoint admits a reinterpretation of the period algebra: singular and de Rham cohomology are two fibre functors on the same Tannaka category, hence there is a torsor of isomorphisms between them. The period isomorphism is nothing but a \mathbb{C} -valued point of this torsor. While the finer points of the theory of motives are still in development, the good news is that at least the definition of the period algebra does not depend on the particular definition chosen. This is in fact one of the main results in the present book, see Chapter 11.5. Indeed, all variants of the definition yield the same set of numbers, as we show in Part III. Among those are versions via cohomology of arbitrary pairs of varieties, or only those of smooth varieties relative to divisors with normal crossings, or via semi-algebraic simplices in \mathbb{R}^n , and alternatively, with rational or only regular differential forms, and with rational or algebraic coefficients. Nevertheless, the point of view of Nori's category of motives turns out to be particularly well-suited to the treatment of periods. Indeed, the most natural proof of the comparison results mentioned above is

done in the language of Nori motives, see Chapter 13. This approach also fits nicely with the formulation of the period conjectures of Grothendieck and Kontsevich."

© Zhiwei Yun. Motives with exceptional Galois groups and the inverse Galois problem
Inventiones-Springer.

"1.1.1 Motivic Galois groups

Let us briefly recall the notion of the motivic Galois group, following [36, Sects. 1 and 2]. Let k and L be number fields. Let $\text{Mot}_k(L)$ be the category of motives over k with coefficients in L (under numerical equivalences). This is an abelian category obtained by formally adjoining direct summands of smooth projective varieties over k cut out by idempotent correspondences with L -coefficients. Assuming the Standard Conjectures, the category $\text{Mot}_k(L)$ becomes a semisimple L -linear Tannakian category (see Jannsen [22, Corollary 2]). Moreover, it admits a tensor structure and a fiber functor ω into Vec_L , the tensor category of L -vector spaces. For example, one may take ω to be the singular cohomology of the underlying analytic spaces (using a fixed embedding $k \xrightarrow{\sigma} \mathbb{C}$) with L -coefficients. By Tannakian formalism [10], such a structure gives a group scheme $G_{\text{Mot } k} \text{ over } L$ as the group of tensor automorphisms of ω . This is the absolute motivic Galois group of k . Any motive $M \in \text{Mot}_k(L)$ generates a Tannakian subcategory $\text{Mot}(M)$ of $\text{Mot}_k(L)$. Tannakian formalism again gives a group scheme $G_{\text{Mot } M} \text{ over } L$, the group of tensor automorphisms of $\omega|_{\text{Mot}(M)}$. This is the motivic Galois group of M . Of course Serre's question could be asked for other exceptional types. Although people hoped for an affirmative answer to Serre's question, the search within "familiar" types of varieties all failed. For example, one cannot find an abelian variety with exceptional motivic Galois groups (see [30, Corollary 1.35] for the fact that the Mumford-Tate groups of abelian varieties cannot have exceptional factors, and by [10, Theorem 6.25], the Mumford-Tate group

of an abelian variety surjects onto its motivic Galois group), nor does one have Shimura varieties of type E8,F4" or G2.

20.4

® Periods.

javier.fresan.perso.math.cnrs.fr

typo search.txt : Replace Carlos by Jose Ignacio.

® Periods grp.

<https://webusers.imj-prg.fr/~marco.maculan/pergamio/?p=home>

® wkp articles on Scheme, Cohomology, Etale theory.

--> en huge progress (less fr) in those key theories

entries : mathematicians woke-up?

<--.

- Schemes.

<https://fr.wikipedia.org>

[/wiki/Schéma_\(géométrie_algébrique\)](https://fr.wikipedia.org/wiki/Schéma_(géométrie_algébrique))

[https://en.wikipedia.org/wiki/Scheme_\(mathematics\)](https://en.wikipedia.org/wiki/Scheme_(mathematics))

"Jacobians were shown to be projective varieties by Weil, Chow and Matsusaka."

"The category of schemes[edit]

Schemes form a category, with morphisms defined as

morphisms of locally ringed spaces. (See also: morphism of schemes.) For a scheme Y , a scheme X over Y means a morphism $X \rightarrow Y$ of schemes. A scheme X over a commutative ring R means a morphism $X \rightarrow \text{Spec}(R)$.

An algebraic variety over a field k can be defined as a scheme over k with certain properties. There are different conventions about exactly which schemes should be called varieties. One standard choice is that a variety over k means an integral separated scheme of finite type over k . [10]

A morphism $f: X \rightarrow Y$ of schemes determines a pullback homomorphism on the rings of regular functions, $f^*: O(Y) \rightarrow O(X)$.

In the case of affine schemes, this construction gives a one-to-one correspondence between morphisms $\text{Spec}(A) \rightarrow \text{Spec}(B)$ of schemes and ring homomorphisms $B \rightarrow A$. [11] In this sense, scheme theory completely subsumes the theory of commutative rings."

"Since Z is an initial object in the category of commutative rings, the category of schemes has $\text{Spec}(Z)$ as a terminal object.

For a scheme X over a commutative ring R , an R -point of X means a section of the morphism $X \rightarrow \text{Spec}(R)$. One writes $X(R)$ for the set of R -points of X .

In examples, this definition reconstructs the old notion of the set of solutions of the defining equations of X with values in R . When R is a field k , $X(k)$ is also called the set of k -rational points of X .

More generally, for a scheme X over a commutative ring R and any commutative R -algebra S , an S -point of X means a morphism $\text{Spec}(S) \rightarrow X$ over R . One writes $X(S)$ for the set of S -points of X . (This generalizes the old observation that given some equations over a field k , one can consider the set of solutions of the equations in any field extension E of k .)

For a scheme X over R , the assignment $S \mapsto X(S)$ is a

functor from commutative R -algebras to sets. It is an important observation that a scheme X over R is determined by this functor of points.[12]

The fiber product of schemes always exists. That is, for any schemes X and Z with morphisms to a scheme Y , the fiber product $X \times_Y Z$ (in the sense of category theory) exists in the category of schemes.

If X and Z are schemes over a field k , their fiber product over $\text{Spec}(k)$ may be called the product $X \times Z$ in the category of k -schemes. For example, the product of affine spaces A_m and A_n over k is affine space A_{m+n} over k .

Since the category of schemes has fiber products and also a terminal object $\text{Spec}(Z)$, it has all finite limits."

"Muchos matemáticos consideran que los esquemas son objetos básicos de estudio de la geometría algebraica moderna. Técnicamente, un esquema es un espacio topológico provisto de anillos conmutativos para cada uno de sus abiertos, que surge a partir de pegar espectros (espacios de ideales primos) a lo largo de sus conjuntos abiertos. En otras palabras, en un espacio localmente anillado que localmente es el espectro de un anillo conmutativo. Cualquier esquema S presenta un morfismo único hacia $\text{Spec}(Z)$, el esquema asociado a los números enteros. Por tanto, un esquema puede ser identificado con su morfismo hacia $\text{Spec}(Z)$, de manera similar a cómo los anillos pueden ser identificados con álgebras asociativas sobre los números enteros. Este es el punto de partida del punto de vista relativo, consistente en estudiar solo los morfismos entre esquemas. Esto no restringe la generalidad, y permite especificar fácilmente ciertas propiedades de los esquemas. Por ejemplo, una variedad algebraica sobre un cuerpo K define un morfismo de esquemas hacia $\text{Spec}(K)$, con el cual la variedad puede ser identificada.

Un esquema es un espacio localmente anillado (X, \mathcal{O}_X) localmente isomorfo a un esquema afín, es decir para el que existe un recubrimiento por abiertos U_i tal que $(U_i, \mathcal{O}_X|_{U_i})$ es isomorfo –como espacio anillado– a $(\text{Spec}(A),$

\hat{A}), donde A es un anillo conmutativo y \hat{A} es su haz de localizaciones."

Tom Gannon: "What is a scheme ?", Notices AMS, 2017, Nr. 11, pdf

Robin Hartshorne: "Algebraic Geometry". Springer-Verlag, New York/Berlin/Heidelberg 1977, ISBN 3-540-90244-9, Kapitel II Schemes.

Yuri Manin : "Introduction into the Theory of Schemes", Springer-Verlag, New York/Berlin/Heidelberg 2009, ISBN 978-3-319-74315-8.

Ulrich Görtz, Torsten Wedhorn: "Algebraic Geometry I". Vieweg-Teubner Verlag, Springer Fachmedien Wiesbaden GmbH 2010, ISBN 978-3-8348-0676-5.

® Etale theory.

https://fr.wikipedia.org/wiki/Cohomologie_étale

https://en.wikipedia.org/wiki/Étale_cohomology

https://fr.wikipedia.org/wiki/Topologie_étale

https://en.wikipedia.org/wiki/Étale_topology

® Nisnevich topology @ wikipedia.

"In algebraic geometry, the Nisnevich topology, sometimes called the completely decomposed topology, is a Grothendieck topology on the category of schemes which has been used in algebraic K-theory, A^1 homotopy theory, and the theory of motives. It was originally introduced by Yevsey Nisnevich, who was motivated by the theory of adèles. "

"La topologie de Nisnevich est une topologie de Grothendieck sur la catégorie des schémas. Introduite par Yevsey Nisnevich pour l'étude des adèles, elle devait servir à démontrer une conjecture d'Alexander Grothendieck

et Jean-Pierre Serre.

Cette topologie est aujourd'hui utilisée en K-théorie algébrique, qu'elle rend représentable par un spectre (en), et en théorie des motifs. Elle permet également de construire l'homotopie A^1 (en), une théorie de l'homotopie purement algébrique. Une variante importante est la topologie h (en) qui raffine la topologie étale."

21.04

* Conformal mapping and Mobius transform

A Mobius transform is an non degenerate : homography, or rational linear tranformation or linear rational transform.

<https://nptel.ac.in/courses/111/103/111103070/>

* Spencer Bloch mini course «Periods in Algebraic Geometry».

<https://www.math.uchicago.edu/~bloch/>

<http://bogomolov-lab.ru/Bloch-2014/>

https://ag.hse.ru/en/video_special_lectures/

[http://www.mathnet.ru
/php/presentation.phtml?option_lang=rus&presentid=8646](http://www.mathnet.ru/php/presentation.phtml?option_lang=rus&presentid=8646)

<http://www.mathnet.ru:8080/PresentFiles/8646/8646.mp4>
 ==> dl two hrs, on www.

- Wrote a small pile of paper notes (13.4-21.4).
 - a) From Quantum grp theory (group acting on functions spaces and operators ones);
 - b) Questions about explicit motivic galois grps;
 - c) An idea on bouquets; how structures of the parametrizing variety influence the nature of the data collected through their revealing-spreading out actions.
 - d) Considering more precise trdeg conditions instead of alg-ind ones for crts.
 - e) Splitting the boundary of convex bodies V : covering of those; getting a finite union of $(\dim V - 1)$ -pieces; --> investigate that field.

21.4.21

® Good progress of wkp entries.

[https://fr.wikipedia.org/wiki/Schéma_\(géométrie_algébrique\)](https://fr.wikipedia.org/wiki/Schéma_(géométrie_algébrique))
[https://en.wikipedia.org/wiki/Scheme_\(mathematics\)](https://en.wikipedia.org/wiki/Scheme_(mathematics))

https://fr.wikipedia.org/wiki/Cohomologie_étale
https://en.wikipedia.org/wiki/Étale_cohomology

https://fr.wikipedia.org/wiki/Topologie_étale
https://en.wikipedia.org/wiki/Étale_topology

® NPTEL

Riemann sphere.

<https://nptel.ac.in/courses/111/103/111103070/>

® Javier Fresan on Periods

javier.fresan.perso.math.cnrs.fr

® Spencer Bloch on periods.

<https://www.cambridge.org/core/books/lectures-on-algebraic-cycles/2D916E452857F0BE71EAD0D5385EC4AB>

<http://www.mathnet.ru:8080/PresentFiles/8646/8646.mp4>

<https://link.springer.com/chapter/10.1007>

[/978-94-011-4098-0_5](https://link.springer.com/chapter/10.1007/978-94-011-4098-0_5)

® <https://www.jstor.org/stable/i307386?newaccount=true&refreqid=excelsior%3A7a47d2867a38f3ad970ff67f31085f18>

[https://www.jstor.org/stable/1970902?read-now=1&](https://www.jstor.org/stable/1970902?read-now=1&refreqid=excelsior%3A90b358296318f2e850c55112dd48e0f4&seq=2#page_scan_tab_contents)

[refreqid=excelsior%3A90b358296318f2e850c55112dd48e0f4&](https://www.jstor.org/stable/1970902?read-now=1&refreqid=excelsior%3A90b358296318f2e850c55112dd48e0f4&seq=2#page_scan_tab_contents)

[seq=2#page_scan_tab_contents](https://www.jstor.org/stable/1970902?read-now=1&refreqid=excelsior%3A90b358296318f2e850c55112dd48e0f4&seq=2#page_scan_tab_contents)

® Maths@digital era.

<https://www.ams.org/journals/notices/200006>

[/200006FullIssue.pdf](https://www.ams.org/journals/notices/200006/200006FullIssue.pdf)

23.4

insta

One advantage of GNU/Linux systems is to be able to switch-off the gui interface (no mouse, no graphic, no window , no images) to get back to pure text console in a "old-school mode". Here the photo shows some LaTeX source files editing on Gnu/Linux Nano editor. The benefits of pure text interfaces are multiples :

- 1) No distraction from fancy images; no internet mind-glueing scrolling pages, but internet still available to download or upload files; send and receive mail messages; and manage remote boxes, etc.
- 2) Save energy since images and videos are quite watts voracious; whereas pure black text console is not.
- 3) Being close to the core of computers, and be more likely to understand their architectures.

24.4

• `memoire_e` :

1)no blue version, retrieve "se complaire, delirium".

2) change crt hypothesis formulations.

a) alg dep in more precise terms of `trdeg`.

b) without holes : in terms of trivial first Betti cohomology or Betti nb.

c) folded : in terms of simplicial hypersurface; or V is the direct image of some Δ^2 by homeo-diffeo morphism; or in terms of positive mean curvature that allows to introduce the next periods; this means; for compact Riemann manifolds w/o boundary, via Gauss Bonnet thm, that the variety has a positive Euler characteristic; or a positive alternate sum of Betti nbs.

3) make explicit :

- a) computations of periods.
- b) arrows.

4) add

- a) a Fermat entry in the toc.
- b) jumps to addendix.
- c) new references in bib.

• search.txt : add Geogebra conics moduli; $E(a,b)$ for (a,b) satisfying parametrizing variety conditions like $a^2=b$, of generally $f(a,b)=0$.

25.4

© Debian

Installed bcm207, bcm43xx drivers : bt now works, from & to P9 but not to Tablet : jerks a lot with Tablet. wifi wii visible.

® Good txts on periods research : Fresan "Periodes & transcendence" and Ayoub & Burgos Gil intro texts in Madrid ICMA workshop on Motives.

- Wrote some heuristics paper notes.

- 1) on motives and their Galois grps : extensions of periods to either periods varieties or other categories (periods with values in other categories).

- 2) extension of criterion to "traces of moduli", cw-complex (hollow pieces).

© Rambled in Tablet Win10 MikTeX :

- 1) yap : best viewer (> ffox, edge).
- 2) built in pkg manager : about 700, asian language heaviest (250M).
- 3) sorted txts folders.

26.4

© Debian Buster.

- 1) Tried to fix the broadcom wireless issue : pulled all broadcom b43 firmwares bundles (even legacy one); one bundle actually pulled files from broadcom repo but nothing worked so far : it retrieved the b43 entry in dmesg but finally no wlan0

in devices.

Used files entries from Mint dmesg; in vain.

==> Either kernel, modules or on the fly driver-insertion.

2) Installed a bunch of soft : emacs, vim, gnome : gnome-applets, gedit and its plugins; =yacas, cantor, gap, cohomology,

© Tablet.

some ams whatis

stack, topos, amoeba, operad.

27.4

© <https://ups-cpge.fr/>
Journées X-UPS

© Un texte, un mathématicien.
<https://smf.emath.fr/>

A806

<https://www.clubic.com/antivirus-securite-informatique/logiciel-antivirus/article-880774-1-installer-antivirus-smartphone.html>

* Group theory in sciences (maths, physics, chemistry).

Ronald TEHINI

https://www.youtube.com/channel/UCJt_cscZEUuYs0VxxvL0qeg

- © memt

corrected some typos with TeXStudio; then rdb time for not saved changes.

-> two duplicated TexStudio sessions collapsed?

© Linux Debian.

a) Explored Groebner capabilities :

- tried IPython and Sage; noticed that when using IPython, python help (outside Sage) the modules db infos parsing jerks with a segmentfault; it may be starting folder issue.

- Found out Groebner modules in both Sage and Sympy; Sympy being better documented in python help.

b) Explored kernel logs for the broadcom43 drivers issue.

- Some paper notes along memt typos.

A) Mainly on gamma functions $G(z)$ (values $G(r)$ for r rational and twists by rational functions $G(f(z))$ with $f(z)$ rational function).

--> Consider the case when f is an algebraic function.

B) Raised heuristics issues about :

1) periods behaviour under different classes of maps;

2) invariance after the coincidence case; this being quite deep and surely Hodge c_j related. The topological side being transcendental.

28.4

® From Javier Fresan talk, redirected to a quite original thesis about GKZ periods c_j and volumes of compacts semi alg sets.

Juan Viu Sos. Thesis 2015 on compact domains for GKZ periods. Univ Pau/Saragoza. West Pyrenees. Euskadi.

==> The compact hypothesis surprisingly meet the wished criterion future extensions.

- memt typos change :

a) may be reviving kicks

b) consider rewriting controversial foundational remarks that may hurt the concerned generations.

© Tried to compute λ_2 :

a) Maxima : maxima, wxmaxima; android maxima, all stuck.

b) Non free Maple & Mathematica : same numerical value from Maple (app) and Mathematica (wolfram alpha cloud) with different symbolic notations.

c) Saved wolfram alpha Mathematica cloud computing sessions (most complete docs : impressive).

-> Free software beaten.

:(:(:(.

-> Dig in maxima complementary packages, and/or options of integrate routine.

-> Try with sage (same process).

- Continued corresponding paper notes.

- 1) again on gamma functions $G(z)$; how the square in corresponding periods with $n+1/2$ argument prevents from catching $G(\frac{1}{2})=\sqrt{\pi}$ as a period.
- 2) considered actions on formal GKZ periods : $P^m \dashrightarrow C$; this space has few preserving maps; few stabilizers.
- 3) raised the question of $\text{trdeg } Q(x,y)=\text{trdeg } Q(f(x,y);g(x,y))$; begun writing definitive notes on that recurrent issue.
- 4) considered the criterie.tex piecewise linear Hexagon (H) ctrex to generalized crt and the C+T one(Pie slice+line); all those are non smooth glueing ($2*4=8$ singularities for H; 4 for C+T); the other ctrex (=2) one based on a fixed second period argument of Hindry, corroborates the need of no-holes since those holes may give uncountable many values for the second period while leaving the first fixed and so undefining them; so crt gets robust either with some supplementary periods and/or some smoothness+no holes requirements.

Precisely :

- a) the suggested argument by Hindry of ctrex (2) is swept-out by requiring either the variety to remain algebraic during the deforming motion or by adding a period (the mean curvature may suit and then this period may also be used to set the folded-back requirement at the same time, by imposing it to be positive).
- b) The other piecewise linear ones ctrex that I found are swept-out by requiring a smooth glueing; or adding a period.
- c) By the way, those ctrex restrict a bit the power of the criterions (less range, more hypothesis requirements).

29.4

© Tried λ^2 in jupyter-sage : also stuck. :(.

- Wrote some paper notes of attempts to catch $G(1/2)=\sqrt{\pi}$ as a period; using $B(p,q)$ pseudo character formula : $B(p,q)$ giving $G(p+q)$ in terms of $G(p)G(q)$ is a MZV-like shuffle formula.

* Some bbkis vids @ IHP on Gaussian curvatures : Vilani, Barthe.

and one X-UPS Emmanuel Russ on isodiametric inequalities.

30.4

© Tried λ^2 in maxima on Gabel : same stuck.

- Wrote heuristics paper notes .

1) Gamma then

2) Gamma and P and Q_- : inverse and direct images, then

3) Generalized Galois grps giving the structure of

rational pts on varieties :

- a) algebraic varieties.
- b) analytic or transcendental varieties.
- c) topological varieties.

1.5

- Some paper notes. See keep for the diaries.

a) For motives, relative homology, homology with compact support; with punctured spaces in mind.

b) Heuristics on deep euclidean nature of gamma periods from gamma values @ rational nbers; those special gamma periods are constrained in semi \mathbb{Q} -algebraic subsets from ambient space euclidean internal structure imposing isoperimetric inequalities; note that they themselves come from such \mathbb{Q} -algebraic subsets so they obey a nested or recursive structure pattern.

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- Keep notes.

Some Hodge-theory and general topology entries in wikipedia.

© Claire Voisin. Khaler Manifolds@CdF
<https://www.college-de-france.fr/site/claire-voisin>

© Perodes & Hodge structures.

<https://webusers.imj-prg.fr/~claire.voisin/>
<https://www.college-de-france.fr/site/claire-voisin/course-2016-2017.htm>

® Borell Sudakov isoperimetric inequality.
https://en.wikipedia.org/wiki/Gaussian_isoperimetric_inequality

A domain is an open conx subspace of a ambient topological space
 often taken as the euclidean space \mathbb{R}^n .

© Maxima
`integrate(sqrt(1+(2*sin(x)*cos(x))^2),x,0,pi/2);`

`save (filename, [m, n])` stores the values of input and output labels m through n . Note that m and n must be literal integers. Input and output labels may also be stored one by one.

® Some e-books.

<https://books.google.fr/books?id=1pQcxFYke6kC&printsec=frontcover#v=onepage&q&f=true>

<https://epdf.pub/number-theory-04-transcendental-numbers.html>

® Surfaces
<https://homepage.univie.ac.at/herwig.hauser/bildergalerie/gallery.html>

® Arithmetic fundamental groups and moduli of curves
<http://collas.perso.math.cnrs.fr/lectures.html>

An interesting pt of view from an austrian geometer (Hauser), considering rings of series as polynomial rings of infinite many variables or coordinates.

2.5

- A bit of sorting 20-21 piles : sorted by date; so shuffled the previous theme-subjects sorting. Remains some months (10.20; 02.21).
- Continued previous heuristics.

3.5

® Read some papers on Grothendieck Techmuller spaces (Schneps, Collas, Murre, etc).

- Introducing Galois th paradigms via two notions.

1) Topological spaces and their algebraic invariants expressible in grp theory terms : K-th; fundamental grps, etc.

2) Discretizations appearing through those invariants with the focus on peculiar pts : marking-tags and/or punctures on the studied topological space.

© Low nrj multiscreen code editing session with cheap chinese devices running on batteries : 2 android smartphones and a Tablet pc. Choosing dark modes/themes also help nrj savings of screen/displays.

© Some rdb's on Tablet-Win\$10 one usb port not charging; then kio-accelerometer driver quirks; done an upgrade of drivers that i interrupted because of a never ending rebooting process.

4.5

© Same devices layout.

1) on Tablet.

Keep notes from [www explore](#).

2) On smartphones.

-> Corrected some typos and rewrote controversial passage.

- Some paper notes by the way.

a) Minkowski thm from euclidean space intrinsic deep nature.

b) Adelic pts precision.

c) Compact manifolds from M.Kontsevich TelAviv Gafa talk.
Russian meeting on prospective trends.
Quite deep remarks : first one is compact manifolds =
illusion of confort.

=> This meeting has a two volumes proceeding @ Birkhauser.

* Maxim Kontsevich (IHES) : Smooth and compact. TelAviv
1999 meeting.
From Maths vision [https://www.youtube.com
/watch?v=J4zUbs2jYrIP](https://www.youtube.com/watch?v=J4zUbs2jYrIP)

=> General paradigms and heuristics.
Proceedings available @ books.google.ru of Birkhauser in 2
volumes.

1) <https://books.google.ru/books?id=kQtYL7pUWSwC>

2) <https://books.google.ru/books?id=MNpJ4voD5PQC>

* Maths vision ytube channel and lists :
[https://www.youtube.com
/playlist?list=PLP0YToNcfAwLBd8yibTtjv3aHfcbT4GBA](https://www.youtube.com/playlist?list=PLP0YToNcfAwLBd8yibTtjv3aHfcbT4GBA)

® Hypergeometry and Lamé equation
Alexa Van der Waall [nl : Utrecht Beukers student]
Picard Fuch monodromy.

• Sophie Penisson (*) : Stochastic models in genetics and
DNA sequencing. Data statistics.

(*)Polymath <http://www.sophiepenisson.com/>
cms used : <https://www.weebly.com/fr>

Lycee Angers> Cpge Nantes> Agreg> Graduate Irma
 Strasbourg/Humbolt Berlin > Phd Postdam/Inra > Ater IECN
 (Poincare univ Nancy/Elie Cartan institute) > Assistant
 Lama Creteil Marne la vallee.

Genetics & branching processes.

<https://www.youtube.com/watch?v=zDzZ08PE5R4>

Probas & statistics. Univ Gustave Eiffel MarneLaVallee /
 UPEC Creteil. (B.Maurey).

<http://lama.u-pem.fr/>

trends is statististics study on big-data dbs.

Numerous females and bleds(dir).

5.5

© Same devices layout.

- Corrected some search.txt typos.
 red = reducible.

a) the seed pts or generating pts are tagging all
 subvarieties by stamping them with the tracking DNA that
 is the ideal $I(V)=I$ defining V ; because all the
 corresponding max ideals $I_{\mathfrak{X}}$ contain I and hence are tagged
 by their originating dna-ideal.

b) put $V_I = [I, \infty[$ in the above corresponding wkp entry.

c) given C-enclosed area, given circumscribed area by a given enclosed C-Curve

Periodic trajectories of billiards-ray reflexions in an enclosed hollow surface enclosed by a given C-curve.

=> Periodic trajectories to concentrate/focus nrj beams.

*® Some basic probas-stats notes from UPEC video courses of Sophie Penisson (polymath) with a view towards primes nbers distribution.

* Scholtze @ Simon foundation.

-> Bonn = main center of german arithmetic school [Hausdorff, Max Planck, ... institutes hosting Gerd Faltings acting as a pole.

* G. Faltings - Arakelov geometry on degenerating curves talk @ IHES meeting for Ofer Gaber bday . 2018.

=> Good Old-school style of german maths : very neat talk. <https://www.youtube.com/watch?v=J7qFP-cwhQY>

® 2021 University "ranks" from Shanghai university sorting process; based on the foolish publishing gauge; I guess. (what a dumb initiative; bearing in mind the WWW University ie the Global Super University of the Internet; making such classement irrelevant anymore or in a near future).

OxBridge
Stanford
Harvard
Mit
Caltech

See 60.11.

6.5

© Same devices layout.

Again 2 rdb's with usb-wires (one plug bent then broke).
- time rasr.

Sorted some maths-data files (img , srcs & TeXtes) on bat-devices.

bt-pushed imgs A806 <-> P9.

Notepad2++ : much more customisable and smarter than MikTeX editor, but the later has a LaTeX work flow comparable to TeXStudio.

© Geogebra : semi-linear or half planes plots catching some discrete stratifications of the space of varieties.

- Some heuristics paper notes.

The moduli paradigm with discrete and transcendental stratifications (discrete invariants and period or modular ones)
the former being potentially given by the latter hence the faithfulness of periods functor.

Some basic commutative algebras ; local algebras and modules over local rings.

8.5

© Tablet PC.

Created a unprivileged (normal) user with online m\$ old hotmail account; with sync goals in mind.

- a) in Alama , user data dir is oula,
 - b) in Tablet : user data dir is oulal.
- > Check that.

Tried to dump through a hardcopy of home subdirs of admin-account to the new one normal-user, but oddily it did pull only a few files.

- > What a chaotic behaviour, m\$ win\$10 doing what it wants, ignoring user request.
- > Try share options or "public folder".
- > Or a two steps copy-del dirs.

9.5

4h15am

© A806.

Aliexpress msg system stopped displaying msgs for a while a few months ago, then after a few days; done a sweeping of the app cache-data that seemed to have fixed the issue.

© Tablet.

The work flow of MikTeX is comparable to TeXStudio but only with the use of an external editor like Notepad++; since MikTeX builtin-editor remains quite rudimentary. It is however being hassled by constant

security, drivers plugging and apps update notifications; the usb-layer generating a noisy bunch of those making the system unstable and flooding system logs.

© Nonetheless Debian Buster softs still outperform win\$10 corresponding ones by just their agility and completeness; for example, even the quite basic file manager Thunar of Debian xfce desktop-bundle has a better work flow than m\$ explorer, with way smarter toolbars and menu customizations.

9am.

- Sorted 6, 7 and 8 Mai paper notes.
- Sorted table clutter around Qadr.
- insta.

Safety park tip.

Parking in front of storefront large (mirror) glass windows allows to quickly check all the (brake) lights and turn signals, avoiding tedious winding around the bike and/or potentially hazardous contorsion of the rider to do so. When leaving the place it also allows to ensure that no one (running/playing childs/kids, old age folks, etc) is on the bike way before leaving the place.

-> Begin of insta redirecting impact on Free site (Usa :virginia, seattle, washington, etc; Slavic : Russia : Moscow, Ukraine: Kiev, etc).

-> To increase redirected flow impact; put pointers in crowded social media platforms (fb, insta, tiktok, etc).

10.5

- Continuing sorting the e-clutter around Qadr tables for future e-tinkering (hd-recovery).
- At last some paper notes from a vid of Jacob Lurie talk @IAS :

Categorical level-paradigms. (J.Lurie uses digits from 0 to 2 and calls them categorical numbers). I'd rather call them levels.

Level 1) "Nbers" with relations being "=" of "nbers".

Level 2) "Structures" or "sets of numbers", with relations being

"morphisms" between those "structures".

Level 3) "Categories" or "sets of structures"; with relations being "functors" between those "categories".

11.5

- Some paper sorting, and e-stuff on tables around Qadr.
- A few corrections of memt.

© Tablet.

Pulled all user data of admin to normal user : manually done the transfer with copy-paste but after that, the device won't restart and stalls with an empty solid-blank screen. Noticed that this appened after the system has updated an accelerometer drivers; that it diagnosed as faulty.

-> What a P-OS/POS-software.

Then tried the different keyboard function-cmds hardkeys to restart the device (sleep, dimmer, swap screen, etc).

It may be A806 hidden trojan that messed-up some files, because the TabletPc becomes more stable after retrieving A806 usb cable.

For instance all the input config were messed-up, as well as date and time.

==> Retrieved the usb cable to A806 and used bt for file transfert to this trojan agent phone; this nasty phone actually seems to build a expansion route map based on its interaction : I suspect this agent software built from AI.

Analysing its interaction devices and trying to dump its expansion seeds in them.

==> Rdb and time rasr.

==> As soon as retrieved the A806 usb cable, A806 bt malfunctioned;

and was perfectly functioning before the cable removal.

==> This nasty phone seems to force usb usage so that the expanding process has more more impact or more chance to complete, since usb has more harming capabilities than bt.

Done a clean-up of files : more steady, but still a bit unstable.

=> oulalama folder then showed-up lately : quite odd.

-> Look for reasons of all that m\$ unstable behaviours.

==> Conclusion : Gnu-Linux Debian outperforms by far m\$ also in stability.

- Managed to write 1mn of paper maths notes.

Rewrote memt typos that were cryptically written : hasty crippled handwriting = unreadable doodles.

Used calculator-notepad to write those.

12.5

- Since about 2 weeks : sleepless.
This has a negative impact on cognition and brain output : the resulting issue of permanent droziness drops down maths output far away from normal productivity; close to void.

Same consequence also on acquiring knowledge : sleepless nites -> permanent daylight droziness -> overall unclear and foggy mind; unable to structure normally input data.

Conclusion : good sleep is necessary to the brain to process and structure efficiently/correctly, input-data and infos; in order to get a corresponding relevant ouput either quantitatively and/or qualitatively.

13.5

- Mostly physical Tetris, sorting electronic clutter on tables around Qadr.

14.5

- Again physical Tetris on tables around Qadr.

© A806.

Tried Lenovo cloud (builtin in file manager) : 2 Gb, a bit laggy, some folders in chinese.

15.5

© Tablet.

intel graphics command center app = Winstore app for graphics displays settings.

- Again physical Tetris on tables around Qadr, sorting electronic bits and pieces.

16.5

© Tablet.

Retrieved some win\$store apps that are irrelevant for maths (game, tv, etc).

Found a triple redundancy of documents folder : retrieved the local non cloud one.

-> It may be wise to restore it back in order to put on clouds only output files and leave TeXtes in local non-cloud or unsynced one.

© Back to Debian (25w studio).

Upgraded pkg databases using usb tethering from P9 gsm data.

Noticed that P9 GSM bauds rates give quite faster browsing and file downloading while pulling files and archives (debian packages).

From 700 kb/s on average with the old adsl corroded copper wires twisted pair to

up to 2000 kb/s for the wireless radio P9 gsm data rate.

- Sleepless dzn + www ins rambling : less productive.

-> Try to catch back normal sleep rythm, discipline www nite crawling.

17.5

© Debian.

Finally, back again to Debian; then as soon as opened a Debian (work) session; noticed that productivity rate increased by a multiplicative factor between 2 and 3.

Despite the noticeable progress of m\$ environnement;

GNU/Linux ones as Debian are still very far ahead; the first ones, proprietary business-oriented environments like m\$ seem to never be able to catch-up their Free and Open Source competitors; this is due; in my opinion, to a deep gap between the foundational building process: the latter are developed by passionate financially-uninterested and quite diverse non necessarily professional computer scientists/engineers but random people that may include "pros or experts" and who actually use those systems thoroughly and who are building from those, their own next working environments; in a closed loop or recursion pattern process; whereas the former are built by financially interested hired employees/engineers who are paid by business oriented companies to spend time to do so (at least supposed to do so); whether they like it or not; the way they are told to; whether they agree or not. The final objective of those companies being to impose and sell their OS to devices manufacturers that finally dump the combo devices-OS to end-users; those get that bundle by purchasing it with their money and "advienne que pourra" for the suitability, stability, etc of the eastern-egg that manages and contains their personal/business/work data.

- Corrected some typos in memt.
- > Consider retrieving blue sections.
- > Eventually replace those with specific fonts.
- > Book in mind.

© Done some transferts from Tablet and phones:

pulled Books on Geometric invariant theory :

® Mumford, Kirwans, Fogarty; old classic : Geometric invariant theory.

Updated with recent ones :

® Igor Dolgachev. Lectures on invariant theory.

® Alexander Schmidt. Geometric invariant theory and decorative folds.

- Finally @last, wrote begining of paper notes about theories of those books.

18.5 Very late nite (sleepless).

- Continued preceding notes.

1) schemes basics : on schemes over various bases spaces; that is, over rings or over another scheme; note that in the case of scheme over rings R ; a scheme over a ring R is just a shortcut for a scheme over $\text{Spec } R$; ie the pair consisting of a scheme X and an arrow from X pointing down-to the base scheme, $\text{Spec } R$

2) compactification process for extended versions of the criteria. Gives a good hope to drop the "folded-back" hypothesis ; extending it to unbounded and non-compact ones.

® Read the classic Mumford-Fogarty book on invariants of alg var.

introduction : some english expressions.

time seems ripe = temps opportun;

hackneyed = usé jusqu a la corde.

18.5 morning.

- Pgn, ajz-dal@www about 2h and globally > 1y.
- Some grps of differential geometry related to periods.

Group of homeomorphisms (of the unit disk) preserving areas.

Fathi (egy-fr) thm on grps homeomorphisms, preserving areas.

Those are simple for $n \geq 3$.

®https://fr.wikipedia.org/wiki/Albert_Fathi

* Sobhan Seyfaddini talk @ IAS on Fathi theorem.

"On the algebraic structure of groups of area-preserving homeomorphisms."

®Thesis of Frederique Leroux in 2009 in Orsay, about that euclidean invariant grp simplicity thm @ <https://hal.archives-ouvertes.fr/hal-00353685/document>

Albert Fathi : Father of Max Fathi
<https://www.normalesup.org/~mfathi>

®Papers on Riemann surface deformations with Selim Ghazouani
<https://www.math.ens.fr/~sghazoua/>
 "La géométrie d'espaces de déformations de structures géométriques."

Alexander H. W. Schmitt
 "Geometric invariant theory."
<https://www.geobiologie.uni-goettingen.de/people/aschmidt/index.shtml>

® Good resource in French from Belgium ULB polytechnic center.

<https://clipedia.be/>

Neat (undergrad)-(begin grad) Introductory courses

* Ytube channel.

<https://www.youtube.com/channel/UCNwWU1hqK3q-DclufllWCfg>

® Some from

<http://sa.ge.sts.free.fr/>

19-27.5

- Paper notes.

Digital ones in g keep.

19-20.5

See Logo Manin.

Understanding Cplxity : creat vs maths & sc.
=> A lot of data/infos to bear simultaneously.

- Marzouk Brahim 19.5.21
Mathematiques recherche
19h/24h Activity since 15/09/20.
> ~250p pages published electronically @ bmarzouk.free.fr

Perspectives

Redaction e-book from memoire.
Recontacter Springer Verlag (Maison d edition Allemande)
that I left without answering them around 2010.

- Bilan Blog GS500.

Rythm de croisiere : 500 vues/mois from all over the
globe.

From Latina America Brasil, Usa Canada to all Europe (from
Norway to Portugal), Slavia (Russia, Ukraine, Latva,
Lituania, etc).

For a rare bike not produced anymore since 2007, these are
good figures, confirming that the blog has become an
international reference.

® "Murre J.P. Lectures on an introduction to
Grothendieck's theory of the fundamental group (Tata
inst., 1967)(ASIN B0006C8MRU)(400dpi)(K)(T)
(0)(186s)_MAg_.djvu"

Exceptional case = not stable (Mumford Fogarty Kirwan).

® India repo
<https://www.e-booksdirectory.com/details.php?ebook=7151>

® "Green M.L., Murre J.P., Voisin C. (eds.) Algebraic
cycles and Hodge theory (Springer, LNM1594, 1994)(600dpi)
(T)(281s)_MAh_.djvu".

* Another BlueBrown like vulgarisation ytube channel.
<https://youtube.com/c/pbsinfinitieseries>

22.5

- Since about 1 month : dzn naum.
=> Less productive.

* Lectures on GEOMETRIC INVARIANT Theory & MODULI
Radu Laza (Stony Brook University, USA)
School "Moduli of Curves" to be held from 22th February
till 4th March, 2016 in CIMAT, Guanajuato, Mexico.

Abstract: "Geometric Invariant Theory (GIT) is an important tool in the study of moduli spaces in algebraic geometry. In these lectures we will review the basic construction and properties of GIT quotients. We will also discuss some of the more recent developments including variation of GIT quotients (VGIT), the connections between GIT/VGIT and birational geometry, and the related notion of K-stability and the relationship to the existence of special metrics. We will close by reviewing some classical as well as more recent applications of GIT to moduli problems."

Standard References:

[GIT] D. Mumford et al., "Geometric invariant theory, third ed., Ergebnisse der Mathematik und ihrer Grenzgebiete (2), vol. 34, Springer-Verlag, Berlin, 1994".

[Dol] I. V. Dolgachev, "Lectures on invariant theory , London Mathematical Society Lecture Note Series, vol. 296, Cambridge University Press, Cambridge, 2003".

[Muk] S. Mukai, "An introduction to invariants and moduli , Cambridge Studies in Advanced Mathematics, vol. 81, Cambridge University Press, Cambridge, 2003."

® Surveys related to the lectures:

[Laz1] "GIT and moduli with a twist", in "Handbook of Moduli" vol. 2, Adv. Lect. Math. 25 (2013), Int. Press, 259-297.

[Laz2] "Perspectives on the construction and compactification of moduli spaces", Lectures for the school on "Compactifying Moduli Spaces" (Barcelona, May 2013), to appear in a volume of CRM Lecture Notes.

=> Slavic people (from Russia, Ukraine, etc: to Latvia, Lithuania, Romania, Czech, Hungary) ; task force of AG research : have the patience for that titanesque task.

=> CIMAT= mexican equivalent of the Brazilian IMPA .

- Polyminos = Tetris.

23.5

® Read Jacob Lurie website (phd harvard, prof @ias).

Main study : Homotopy theory.

Applying it to Categories : Categorification of theories; applying Caramello-Lafforgue paradigm on linking (homotopically?) a theory to another or more precisely; find a smart category and functor to the studied category that simplifies/solves the targeted pb of the initial category.

-> See if this underlines Fourier-Mukai process evocated by Maxim Kontsevich in a 2019 IHES talk?

<https://www.math.ias.edu/~lurie/>

Algebraic homotopy theory

<https://ocw.mit.edu/courses/mathematics/18-917-topics-in-algebraic-topology-the-sullivan-conjecture-fall-2007/syllabus/>

The Brauer group of a field κ admits a natural description in the language of Galois cohomology. If κ_{sep} denotes a separable closure of κ , then there is a canonical isomorphism $\text{Br}(\kappa) = H^2(\text{Gal}(\kappa_{\text{sep}}, \kappa); \kappa^*)$.

==> Lacks Motivational sections in his papers.

Huge LaTeX files.

a) Toposes: 1000p book on Toposes @Pup.

b) ∞ -categories with Gerby (Stack project flask cms).
File.Tex+TagFile = Lamp skeleton of a sql-lite db based
website@<https://kerodon.net>
-> like n-categories@ nlab.

24.5.21

- Some notes on Brauer grps, deriving heuristics notes on stratification from them.

® Martin Olson. (phd harvard, prof @ berkeley).
Same interest as Lurie in stratospheric theories but in algeom, and mentions more motivational pts in his paper intros than Lurie.

26.5

© Android P9.

Downloaded a Latex bundle for Termux : had to change Termux repo to a Lug @ Chinese univ of tech & science (ustc.edu.cn) since I obtained (gpg?) secure token issues from the builtin one @grimler.se (se chem phd).

Then a main quirk is the sandbox-partition of working dirs :

- 1) Qedit unable to open Termux folder files located in a root subdir (/data).
- 2) inversely Termux-nano unable to open Qedit files and generally phone normal dirs; so the time consuming trick is to open nano files in Termux dirs and paste content from Qedit files.

- Good workflow after cold shower ~22h.
 - a) added ref to memt appendix jump.
 - b) some notes on stratification.

27.5 5am.

- Typos of memt : chap1.tex & mem.bib (see below the new urls of arXiv).

Kresch-Vistoli

<https://arxiv.org/abs/math/0301249>

- Plan for/from memt into monograph.

- 1) Real life Q-pts.
- 2) Categorification : put variety within moduli.
- 3) Period functor from moduli to period space.
- 4) Stratification process, using G-hyp uniformization of the latter category (the periods space category) that

solves targeted pb of initial category.

© Tablet win\$10.

a) Tinkered notepad++ (usine a gaz) for all profiles of all m\$s.

TeX env fonts.

Lucida (sans/console) size ≥ 10 for comments.

Seguoi size ≥ 10 for main.

b) Also begun to tweak Geany editor (darkmode for nrj saving).

© Quirks on devices since about 2 weeks.

Tablet win10\$

a) ffox shutting/crashing.

b) inspected sql cache dirs, found out it is bloated by amazon db chunks. found out also doubtful header that seems to be exec code : (web)asm or bin or elf.

c) P9 privacy prompts reappearing.

d) search.pdf deleted from Free website repo.

e) keep scrambling(projectivization)/erasing phrases (partitions nbers) , pieces of phrases or words.

27.5 11am.

© Android P9.

Downloaded a heavy 1.7Gb Latex suite (tex-live) bundle for Termux : had to change Termux repo to a Lug @ Chinese univ of tech & science (ustc.edu.cn) since I obtained (gpg?) secure token issues from the builtin one @grimler.se (se chem phd).

Then a main quirk is the sandbox-partition of working dirs :

1) Qedit unable to open Termux folder files located in a root subdir (/data).

2) inversely Termux-nano unable to open Qedit files and generally phone normal dirs; so the time consuming trick is to open nano files in Termux dirs and paste content from Qedit files.

- Good workflow after cold shower ~22h.

- a) added ref to memt appendix jump.

- b) some notes on stratification.

==> Cold showers besides being eco-friendly also clarify ideas.

28.5

® Example of dense stratification arising from Brauer Manin criterion.

Damaris Schindler (Hausdorff math center @ Bonn).

"Del Pezzo surfaces of degree four violating the Hasse principle are Zariski dense in the moduli scheme" (with J. Jahnel), Annales de l'Institut Fourier 67, no.4 (2017), 1783-1807, arXiv.

29.5

* <https://www.ias.edu/video>

® Rhind papyrus (Ahmes, egyptian master scribe; ~ -1500BC, first written mathematical monograph discovered so far) @ British Museum; there is another one in the Russian Museum; but that one is more a student draft memoir.

Babylonian (square angle triangle triples : way before Pythagoras triples of greek masters, Archimedes, Eudoxe, Aristothene and Pythagoras) ~ -2000bc in Irak region.

© Android P9.

Termux mirror issue

<https://github.com/termux/termux-packages/wiki/Mirrors>

Termux has much more cmds than Terminal Emulator, turning the Android device back to its Linux origins.

Nearly all basic Linux cmds are there :

less, more, grep, wc, nl,
whois, wget, ftp.

Remain the sandboxing issue that restricts interaction with files in normal user space or usual/user dirs; even the basic "ls" is rejected from those dirs.

This issue is surely a token one; either uid of user/grp /process or basic grp/user permission token; like the magic cookies of xorg. It may be adressed with an \$env variable, something like \$TERMUX or else.

--> Try adb : to avoid the tedious copy paste from the separated workspaces.

30.5

© Sorted g-drive books repo from P9.

- Some sorting of paper notes of the week : stappled a few small bundles.

By the way, finally wrote some more paper notes :

1) categorification/stratification of Var : commutative algebra towards scheme theory.

2) plunging an algebraic variety within its projective extension; or dipping it in its projectivized moduli; or homogeneisation space.

3) compactification.

4) Some on partition nbers.

- Check if this projectivisation underlines a splitting covering process like that of scheme splitting a topological space into ring-spectrum charted pieces.

Splitting a projective variety into affine pieces covered by affine charts.

See if the projectivization is simply taking a surscheme above the studied one, with a specific arrow.

© Restarted Debian Buster on Lenovo.

® https://en.m.wikipedia.org/wiki/Rational_point

"More generally, for a scheme X over a commutative ring R and any commutative R -algebra S , the set $X(S)$ of S -points of X means the set of morphisms $\text{Spec}(S) \rightarrow X$ over $\text{Spec}(R)$. The scheme X is determined up to isomorphism by the functor $S \mapsto X(S)$; this is the philosophy of identifying a scheme with its functor of points. Another formulation is

that the scheme X over R determines a scheme XS over S by base change, and the S -points of X (over R) can be identified with the S -points of XS (over S)."

® <https://homepages.warwick.ac.uk/staff/S.Siksek/>

31.5.21

•© Plots of some high degree curves V in Geogebra.

Made some templates of a variety V with some aluminium foil and paper tales.

1) find $Cg(V)$, the center of gravity; fix it to be the origin.

2) rotate template about the center Cg ; this keeps all the periods fixed; take a pt (a,b) of V ; it describes a circle of radius $r^2=a^2+b^2$ and equation $x^2+y^2=r^2=a^2+b^2$

$x=r(1-t^2)/$

So if

© Debian Buster restarted on Lenovo.

The day before recompiled memt.

Consider two versions alternatively.

1) with blue diff marking; when the blue reaches a palier, begin

2) a no blue version, first ebauche of either a big article or a monograph.

3) retrieve controversial parts on heuristics.

• Brauer Manin grp computations : hard.

->Remembering quintics, quartics, cubics cases in Bright, Preu, Flynn, Bruin, etc works. All computations are mainly done for "trivial" cases, ie degenerate and/or simple classes cases like low degree-genus-dim alg varieties, as dim 1 curves of low degree-genus; or for dim 2, surfaces as intersections of simple higher dimension ones ; or varieties close to known ones (K3 surfaces close to abelian var); DelPezzo surface of low degree; etc. Del Pezzo, K3, etc; again varieties with "trivial" or "degenerate", cohomogico-differential invariants, as in the following paper.

<- .

® "Explicit uniform bounds for Brauer groups of singular K3 surfaces". Francesca Balestrieri, Alexis Johnson, Rachel Newton.

arXiv.org > math > arXiv:2006.14907

"Let k be a number field. We give an explicit bound, depending only on $[k:\mathbb{Q}]$ and the discriminant of the Néron-Severi lattice, on the size of the Brauer group of a K3 surface X/k that is geometrically isomorphic to the Kummer surface attached to a product of isogenous CM elliptic curves. As an application, we show that the Brauer-Manin set for such a variety is effectively computable. Conditional on the Generalised Riemann Hypothesis, we also give an explicit bound, depending only on $[k:\mathbb{Q}]$, on the size of the Brauer group of a K3 surface X/k that is geometrically isomorphic to the Kummer surface attached to a product of CM elliptic curves. In addition, we show how to obtain a bound, depending only on $[k:\mathbb{Q}]$, on the number of C -isomorphism classes of singular K3 surfaces defined over k , thus proving an effective version of the strong Shafarevich conjecture for singular K3 surfaces."

Mathematics > Number Theory

[Submitted on 26 Jun 2020 (v1), last revised 15 Nov 2020 (this version, v3)].

® <http://www.cise.ufl.edu/research/SpaceTimeUncertainty>

/Spatial3D/

1.6

- Sun and summer t°, since 3 days; sudden switch from winter to summer; after about 3 weeks of fresh-wind-rain weather (gibourees de mars en mai).

-> Noted effect of summer sunshine daylight on mood and productivity; sunlight has a metabolic/mood stimulating effect; the sun clarifies working environments and mood @ the same time.

=> more productive.

=> It is not fortuite that the brainy-nerdy Silicone Valley is located in the mediteranean climate state of California.

=> consider that in the future.

© Debian Buster.

Flipped Samsung screen back to normal horizontal position : some physical Tetris around to make the espresso machine available.

Put darkmode in all environments (desktop & apps) for nrj saving.

- Wrote some notes on tropical geometry after Sam Payne 2015 (Yale, Robotics/Nasa/etc engineer ?) talk @ IAS on Tropical geometry and moduli of curves.

The idea is to associate to degenerate fibers of a moduli a dual graph depicting the singularities layout.

- 1) vertices are associated to cnx components
- 2) edges are associated to nodes or intersections.

Then use this graph picture of the degenerate situation to derive pties of the generic smooth fibers, in a "Tropical Brill Noether theory" process.

2.6

* Some vids.

A) Ravi Vakil: "Algebraic geometry and the ongoing unification of mathematics" [Science Lecture] 2013 talk @ Abel Prize in Oslo.

Program for the Abel Lectures 2013.

1. "Hidden symmetries of algebraic varieties" by Abel Laureate 2013, professor Pierre Deligne, Institute for Advanced Study, Princeton
2. "Life Over Finite Fields" by professor Nicholas Katz, Princeton University
3. "Mixed Hodge structures and the topology of algebraic varieties" by professor Claire Voisin, École Polytechnique and CNRS
4. "Algebraic geometry and the ongoing unification of mathematics", a science lecture by professor Ravi Vakil, Stanford University.

This lecture was given at The University of Oslo, May 22, 2013 and was part of the Abel Prize Lectures in connection with the Abel Prize Week celebrations.

Abstract:

"I will try to share a glimpse of this strange unification of many different ideas. This talk is aimed at a general audience, and no particular background will be assumed.

When we look carefully at nature, we can discover surprising coincidences, which suggest deeper underlying structure. The centrality of mathematics comes in part from the fact that seemingly unrelated ideas are often unified by some grand theory, which is far more powerful than the sum of its parts. Mathematics is most exciting when different ideas come together unexpectedly to give a new point of view. This is typified in algebraic geometry, and in the work of Deligne in particular, which brings together many themes in mathematics, including geometry, number, shape (topology), algebra, and more. This magic is the reason I became an algebraic geometer. For example, the theory of Pythagorean triples (such as $(3, 4, 5)$) connects geometry to the theory of numbers by way of algebra. This ancient example grows up to be the Weil conjectures, a wondrous prediction whose proof was finally completed by Deligne."

-> Stress : Cplx embedding of Fermat Curves = Punctured pointed Multi Donuts. Smooth curve on it for real pts, dotted for \mathbb{Q} -pts.

Proba for large integer n of being square free $6/\pi^2 = 1/\zeta(2)$.

<- .

B) Mikhail Gromov, "Scale curvature" 2019 talks @ IHES & IAS .

IHES- "Old, New and Unknown around Scalar Curvature $1/4$ ".

Institut des Hautes Études Scientifiques (IHÉS).

Published on Feb 16, 2019

"Geometry of scalar curvature, that is comparable in scope to symplectic geometry, mediates between two worlds: the domain of rigidity, one sees in convexity and the realm of softness, characteristic of topology, such as the cobordism theory.

The aim of this course is threefold:

1. An overview of old and new results, mostly, but not exclusively, on the rigidity side, of manifolds X with positive and, more generally, bounded from below scalar curvatures $Sc(X)$, along with a brief introduction to main techniques.
2. Proof of new geometric comparison type inequalities for Riemannian manifolds X with lower bounds on $Sc(X)$ and on mean curvatures of the boundaries of X .
3. Discussion of open problems concerning Sc superior at 0 ."

-> Scale curvature, products of S^1 .

Classifying geom structures.

-> Link with Nottale scaling metrics on space-time?

<-.

© Updated Free repo from compiling TeXtes on Debian Buster. Transferred those to P9.

- Noticed that P9 research dirs were almost emptied together with a Baidu dir popping up since about 2 weeks.

- Refilled the sniffed dirs.

-> P9 may also be as corrupted as A806.

In fact cheap chinese high spec devices may be sophisticated traps as mentionned in the race competition for "valuable" scientific data : you think having made a good bargain, but you just bought a data sniffing agent...Billions of devices, attracting by their price,

futur nodes of the gigantic data-collecting network. On the other side of the ocean, the USA does the same with its os (ios-win\$-android) and/or combo devices-os.

So we have :

© Quirks on devices since about more than 2 weeks.

1) Tablet win10\$.

a) ffox shutting/crashing.

b) inspected sql cache dirs, found out it is bloated by amazon files db chunks. found out also doubtful header in them that seems to be exec code : (web)asm or bin or elf.

2) P9.

c) privacy prompts reappearing+research dirs sniffed +evn lbc conflict with a jscript preventing evn save options within lbc; this occurs when lbc requires a kapcha puzzle token.

3) Free.

d) search.pdf deleted from main dir in Free website repo.

3) Google.

e) keep scrambling letters (projectivization)/erasing phrases (partitions nbers) , pieces of phrases or words.

f) before that gmail harrassing with provocative spams explicit contents.

=> What a pos of digital chaos.

=> For editing serious math teXtes, consider Linux vintage boxes : restart the quartet Qadr Gabel Rama Loma, choose between Loma and Rama that have no usb and are unable to connect to the internet.

3.6

- Sorted e-stuff around Qadr and Samsung screen.
- Typos.
 - a) search.txt : drop hyypoteses; cloud repo exter.
 - b) keep maths 7 : some in this note.
-> reinclude it all in next search.txt.
 - c) English : blunder, stich.

© Android P9.

Retrieved Aliexpress app, that keeps booting without consent.

-> Left it to the A806.

4.6.21

® Cathy Consani (Alain Connes, Mathilde Marcoli).

Non commutative geometry and arithmetic : more on the p-adic side of arithmetic (p-adic L-functions; p-adic modular forms; etc).

"This research has also determined the development of the archimedean counterpart of the theory of rings of periods in p-adic Hodge theory and the discovery of the arithmetic role played by cyclic homology of schemes to recast Serre's archimedean factors of the Hasse-Weil L-function of a projective algebraic variety over a number field, as

regularized determinants."

© Debian Buster on Lenovo.

Switched to Laptop+Studio screens : what a difference in darkmode between Laptop screen & external screens, weak dpi blurring fonts output.

- Sorted e-stuff around Qadr and Samsung screen.

5.6.21 3am.

- Filled tax report.

© Replaced P9 protecting screen shield.

- Sorted e-stuff around Qadr and Samsung screen.

Morning

© Restarted Qadr, Debian wheezy.

© Debian Buster

Corrected some typos in algnb.

1pm

® Gomboc.

Arnold- Domokos - Varkonyi

<https://en.m.wikipedia.org/wiki/Gomboc>

"The gömböc (Hungarian: ['gømbøtˈs]) is a convex three-

dimensional homogeneous body that when resting on a flat surface has just one stable and one unstable point of equilibrium. Its existence was conjectured by the Russian mathematician Vladimir Arnold in 1995 and proven in 2006 by the Hungarian scientists Gábor Domokos and Péter Várkonyi."

© Franz Halter-Koch "An Invitation To Algebraic Numbers And Algebraic Functions".

ISBN 9781138583610

Published May 6, 2020 by Chapman and Hall/CRC

594 Pages 3 B/W Illustrations.

"The author offers a thorough presentation of the classical theory of algebraic numbers and algebraic functions which both in its conception and in many details differs from the current literature on the subject. The basic features are: Field-theoretic preliminaries and a detailed presentation of Dedekind's ideal theory including non-principal orders and various types of class groups; the classical theory of algebraic number fields with a focus on quadratic, cubic and cyclotomic fields; basics of the analytic theory including the prime ideal theorem, density results and the determination of the arithmetic by the class group; a thorough presentation of valuation theory including the theory of difference, discriminants, and higher ramification. The theory of function fields is based on the ideal and valuation theory developed before; it presents the Riemann-Roch theorem on the basis of Weil differentials and highlights in detail the connection with classical differentials. The theory of congruence zeta functions and a proof of the Hasse-Weil theorem represent the culminating point of the volume.

The volume is accessible with a basic knowledge in algebra and elementary number theory. It empowers the reader to follow the advanced number-theoretic literature, and is a solid basis for the study of the forthcoming volume on the foundations and main results of class field theory.

Key features:

- A thorough presentation of the theory of Algebraic Numbers and Algebraic Functions on an ideal and valuation-theoretic basis.
- Several of the topics both in the number field and in the function field case were not presented before in this context.
- Despite presenting many advanced topics, the text is easily readable."

Franz Halter-Koch is professor emeritus at the university of Graz. He is the author of "Ideal Systems" (Marcel Dekker, 1998), "Quadratic Irrationals" (CRC, 2013), and a co-author of "Non-Unique Factorizations" (CRC 2006).

"Table of Contents

- 1 Field Extensions
- 2 Dedekind Theory
- 3 Algebraic Number Fields: Elementary and Geometric Methods
- 4 Elementary Analytic Theory
- 5 Valuation Theory
- 6 Algebraic Function Fields"

Bibliography

Index

List of Symbols

Author(s)

Biography

"Franz Halter-Koch studied at Universities of Graz and Hamburg under Helmut Hasse and Alexander Aigner. He has been an Assistant Professor at University of Cologne, and a Full Professor at University of Essen and University of Graz. He has 156 research articles published in various journals. His books include Ideal Systems (Marcel Dekker/CRC Press); Non-Unique Factorizations (Chapman&Hall/CRC), and Quadratic Irrationals, (Chapman&Hall/CRC)."

6.6

© Restarted the old quartet of Linuxes boxes; Qadr, Gabel, Rama and Loma.

==> Rama and Loma seem to have CMOS battery issues; either flat or too low voltage to keep some bios configs data in eeprom.

- Sorted e-stuff around Qadr and Loma.

© Debian Buster.
updated algnb.tex
transferred it to P9.

7.6

© Android P9.

In user space edited algnb.tex then a cut-past from Qedit algnb.tex to Termux nano.

Tried to compile it in Termux env; both latex and pdflatex stop with critical error of fmt files not found.

Two options :

1) either put the required
fmt-files in tex-document current home dir.

or do a

2) (sudo) texconfig rehash : this option was chosen, and fixed the issue.

To read output back on P9 normal user dirs, used ftp and an ftp intermediate repo.

=> Try to find a dvi/ps/pdf viewer for Termux.

=> There is a option of the pkg-install cmd that ouputs available

pkgs in pkgs remote repos.

<=.

- Some remaining typos.

==> unicity in rings of algebraic integers.

<=.

© Stripped Rama off to change its CMOS battery : quite poor pos of assembly design (engineers or more accurately companies should be questioned about that).

- Continued sorting e-stuff around Qadr to expand desks for work.

© A806

Done some sorting of insta data-collecting.

- Managed to write down some heuristics on motivic Galois grps.

6am.

© Rama

CMOS battery retrieval.

-> Quite poor design of the box : had to completely strip off the box from A to Z to get the cmos battery on mainboard and find out that that this cmos battery is a welded 3v Panasonic, both connectors (board and battery) are spot welded ! What a scheduled-obsolescence pos : manufacturers should be questioned and charged about that design.

-> Measured it @ 0.6V.

-> the solution is to get or built a remote wired holder for that battery and buy a slightly more powerfull one of 3.5v or 4v to compensate voltage drop from wires.

-> By the way, noticed the functional modularity (screen, keybd, power supply, mainboard, etc) of that plastic-metal combo box. As expected, like other e-stuff, plastic parts are fragile (aging oxydation causing brittleness).

-> Plastic = the global plague.

-> Dusted off inside : found some bugs ... but those are the real "historical", "insects" or "entomological" ones.

=> Note that a CMOS issue can be skipped by booting with a boot disk : floppy, cd. etc, provided this device does not need on-the fly configs data saved in EEprom and kept by CMOS battery voltage. Generally floppys/cdrom have their config data permanently stored in mainboard ROM builtin-storage and does not required config data kept by CMOS battery.

- insta.

Changing the CMOS battery of vintage laptops.

Those "prehistoric" laptops can be kept for specific tasks from the mere editing of sensible data to routing and security benchmarking : the power of GNU Linux operating systems over proprietary ones (micro\$oft, apple, etc) is that their recent versions are tweakable to run on low resources boxes like those vintage ones.

The third photo shows that CMOS batteries can be tricky to get : manufacturers may be questioned about that poor design whose only purpose seems to force scheduled obsolescence : the average user is turned into a passive

consumer that get rids of the device in front of a quite costly repair of a trivial button battery issue. Last photo shows screws layout of the back cover of this 1995 laptop : this helps the reassembly process.

© A 806.

Sorted img screenshots db from insta.

- Some Tetris with e-stuff around gabel for desks expansion.

9.6

- 1 meal/day @ 18h = time saving; plus allows to rest correctly @ nite; avoid sleepless nites negative impacts.
=> Increase productivity.

- Some paper notes.

1) continued global-Galois grps heuristics.

2) thoughts for book intro

a) Q pts real word applications.

paper template : simplest case (square motives in square) how just the relative position can change drastically the cuts waste.

- Some physical Tetris with e-stuff for desks expansion.

© Tablet win\$10.

Tweaked Geany fonts : Tahoma 10, Verdana 10, Lucida console 10, Segui 10.

Geany has configurable parsing cmds, for parsing latex project and other code format, making it a small ide : it is a GNU software as Notepad++; and most of the smart apps available for m\$.

10.6 3am

© Tried g Classroom (Global Galois grps) : virtual courses classroom that bundles video multi-stream conference, course casting; assignement and grade management, with a smart anti-plagia parser that detects copy-pastings in homework of students.

In presentations, classroom draft mode is better, skipping podscat/channel updates notifications, foremost when coupled with evn clipper.

Converted those drafts into pdf in evn with evn print option.

© Tried also Math equation editing addons @ g-docs.

a) Equation Editor ++ (codecogs).

Type Latex code without the dollar sign in the builin editor of the addons window (widget); not all text format are available (mathbb, etc).\\
The text inserted is rendered in mathmode.
 $\int f(t)dt$

b) Autolatex.

It is similar (codecogs) to the previous but editing of equation is done within the document. A widget pops-up an

editing window once the first equation is rendered.

- Some physical Tetris with e-stuff around Gabel for desks expansion.

® Hauser series paper.

Study spaces or varieties of one-variable series.

$V = \{ y \text{ in } k[[t] \mid P(t,y) = 0 \}$; that may be considered as an infinite dimensional analogue of traditional varieties; the unknown variables being the bouquet over the base space of values of that series at the base pts.
 $\dim V = 2$ cardinal of base space of the variable $t = |T|$.

Evokes Nash contribution to that study and :

- a) Arquile series
- b) Weirstrass preparation thm.

- Some cosmogony notes.

Nber of fundamental particles (quarks and below) in observable universe $\sim 10^{81}$.

Observable universe = 13.7 billions parsecs (light-years) radius ball of space-time centered @ earth.

11.06.21 1h30 am.

* Some IHES conferences for L.Illusie june 21 bday.

- a) Kato on log geometry.

- b) Olson on flat cohomology
 -> uses google jamboard for slides.

c) Abbes (careful written notes) on Hodge-Tate filtrations.

* IHES on L functions.

J.Coates (careful written notes) and B.Perrin Riou

© Tried g jamboard with Tablet.

only the stylus with plastic pad is efficient on tablet.

* Marina Ilioupoulou talk @IAS.

Takeya pb (Fourier analysis on curved spaces)

-> good slides.

© Flipped back Tablet in horizontal position : better for vids but not for code editing.

- Some physical Tetris with e-stuff around Gabel for desks expansion.

12.6. 1h am.

- Tips.

On handwritren transparent slides, prefer black ink than blue one.

But on paper, for learning and cognition, what is hand written is better processed than what is typed, and for handwritten notes; what is written in blue ink is also better processed by the brain; as well as what is read on paperback books vs what is read on screens (e-books, webpages, e-articles, etc).

=> So take blue pens for handwritten paper notes about

paper books.

- Pgn two days + www ins ramblings : 3h.
- Some physical Tetris with e-stuff around Gabel for desks expansion.

13.6. 3h am.

- Some notes on exp towards Lie grps after reading M.Waldschmidt slides of a talk on "Transcendence of Elliptic functions" @ Arizona in 2008.
- Some physical Tetris with e-stuff around pcs for desks expansion.
- Sorted a bit
 - a) maths src dir on Debian Buster.
 - b) Netcourrier and Free mails boxes.
- Pgn two days + www ins ramblings : 3h.

14.6

- Continued clearing desk surroundings to extend workplace.

® Read Fritz Hoermann (Freiburg Uni arithmetic geometry team of Annette Hubert and Giesbert Wuhstolz) article on "formal periods" published on june 21 @ arXiv.

<http://home.mathematik.uni-freiburg.de/hoermann/>

Formal periods : developing the ring theoretic background of periods.

Main result :

Periods conjecture equivalent to the splitting of an exact sequence of motives.

Smart functional pt of view :

$\text{eval}_f : P(A) \dashrightarrow C$

$(\sigma \otimes \omega) \dashrightarrow \int_{\sigma} \omega.$

is evaluating a function on $X @ f$.

Also interested in derivator or diagrams theory and he wrote

a soft to animate maths slides made out beamer pkg (example with fractal and bsd cj) named beamermath.

<http://home.mathematik.uni-freiburg.de/hoermann/beamermath/>

- About derivator theory (that is diagram calculus).

-> I remember in early 2000 walking to a RU or Restaurant Universitaire

(since I was excluded from the Chevaleret Restaurant without a badge) with four

X students; slightly condescendant towards the banlieue maverick I was, in throwing moralising pokes to questions I asked; maverick that "par dessus le marché" also lagged their way to the restaurant with slow walking besides

asking weird questions; (I could hardly follow their paces with a totally smashed right leg); I coined while making jokes about diagram chasing after coming across some monstrous diagram @ the border of Algebraic Geometry and Algebraic Topology (So probably a K-theory monster diagram) that a fractal geometry of diagrams should be invented when dealing with those "abstract-nonsense" metastasic mathematical objects.

<-

To do : put quotes to search.txt and fix some typos (cloud nodes).

15.6

- Some paper notes on period functor, derived from memt typos correction.

© Sorted downlds dirs of both P9 and Debian Buster.

uuid @ grub cmd prompt.

bluewiz bt
interface bnp0 bounded to internet address 192.168.x.y

© Tablet win10

Put two plugins to the already usine a gaz notepad++.

- 1) an hexeditor.
- 2) a html parser.

Noticed an odd popping out of a scrambled headed tex file in Textes dir ~\$fiche.tex ; with same scrambled header as the firefox sql db chunk files.

Noticed also same weird code in db files in the newly popping out baidu dir in P9.

==> Hexedit all the weird code found both in db files of Tablet firefox cache-dirs and P9 baidu dirs.

16.6

Intensive (34°C) motorcycle roadtrip to Cottard Motos @ Maromme between Rouen and Dieppe for motorcycles stuff (15w50 Oil; oil filter, chain lube; etc).

19.6

© Android P9.

Signed in to Z-Lib (Shadow academic library).

Pulled about ten recent books (since early 2000s) on rational pts.

Pushed them to g drive.

® Read two on Galois & fundamental grps :

- 1) Jacob Stix.
- 2) Tamas Szamuely.

1) Heidelberg Meetings on Arithmetic fundamental grps.

How topological fundamental grps arose and shed new light or provided proofs of arithmetic thms.

- Some names.

Jp : Nakamura H, S Mochizuki, Hochi, of course Kashiwara.

Besides usual names (Minhong Kim, Amon Besser, etc) and those not cited from Grothendieck Teichmuller theory, new ones :

Majid Hadian
Kirsten Wickelgren
Hochi

- About Zlib.

Pushed last version of memoir; to balance the ratio and not just be a mere passive data consumer.

Examples of shadow libraries include Library Genesis, Z-Library and Sci-Hub, which are popular academic shadow libraries.

* Left a bit ytube math conferences since all vids are now heavily ads-scrambled-flooded for about 1 month coinciding with the end of the academic year; with more junk thrown on android-tv (this pos of ads-soft seems to recognize both the holidays periods and the platform and know that android-tv may reach more audience than individual smartphones, foremost in june when it is release time for pupills and students).

-> Demotivating learning experience : trying to concentrate on a research conference talk on tough maths when a harassing ad comes and cancels out brain efforts, making lose the "fil des pensees". Ytube should inject its harassing ads into other vids, not into ones of research conferences of maths or other (scientific) domains.

<- .

20.6

- Either the global arithmetic geometry motivic bloat is a genius tool that has not being fully mastered and exploited or it is general time wasting pos of misleading abstract-delirium.

There is some chance that this highly speculative path leads nowhere and deviate far away from solving concrete and basically-formulated pbs (nature of zeta values at odd arguments).

-> Read the 1991 paper of the experienced Serre about that @ <https://www.college-de-france.fr/site/jean-pierre-serre/textes-a-telecharger.htm>

-> Lucid overview + Grothendieck letters; in those letters Grothendieck speaks of motives in terms of "dreamt" theories.

® Arithmetic fundamental grps books.

Heuristics Key pts.

A) Szamuely book on Fundamental group and arithmetic.

etale k -algebra = (lim) finite separable k -extension.

Galois group of $L|k$ = Fundamental grp of $(\text{Spec}(L), \text{Spec}(k))$; $\text{Specs}()$ endowed with etale topology.

B) Jacob Stix (uni Bonn = center of german mathematics; arithmetic geometry task force with authorities poles in the names of Faltings and Scholtze)

Arithmetic fundamental grps books.

1) Reference Book based on his habilitation.

2) Heildeberg 2010 seminar reports on Arithmetic

fundamental grps.

-> Good state of the art accounting intro.
 German vs/and Japanese arithmetic geometry schools with
 the korean M.Kim (motivic-etale version of Chabauty
 proving Siegel integral-points finiteness thm).
 <- .

Gerd Faltings

"Logarithmic motives."

-> Warns on intractibility of motivic Galois grps.

Majid Hadian (phd Student of Faltings @ Bonn)

"Motives in diophantine geometry".

-> Slowly draws towards toposes.

C) USA & UK based researchers.

Arithmetic Topology.

1) Richard Hain @ Duke but originally from Australia.
<http://fds.duke.edu/db/aas/math/faculty/hain/>

Shadow lib

<https://services.math.duke.edu/~hain/papers/>

2) Dan Abramovich.

<http://www.math.brown.edu/dabramov/>

D) Young Researchers in Rational pts.

Brauer Groups.

a) Bianca Viray @ Washington.

-Some Magma code (undocumented) and pointers : Magma seems
 to be easily downlable but it is surely locked with a
 pricy key after a trying period.

-Good writing pointers.

-CoEdited a Brauer Manin obstruction book of conference reports.

b) Damiano Testa @ Warwick.
Slides on arithmetic of surfaces.

21.6

© Ploted animation of moduli of Toruses in Geogebra.

The "polar" parametrization :

```
Surface((R+r*cos(v))*cos(u),
(R+r*cos(v))*sin(u),r*sin(v),u,-6.3,6.3,v,-6.3,6.3)
```

shows up but not the "rational" one :

```
Surface((R+r*(1-t^2)/(1+t^2))*(1-T^2)/(1+T^2), (R+r*(1-
t^2)/(1+t^2))*2T/(1+T^2), r*2t/(1+t^2), T, -10,10,t, -10,10).
```

® An article on arXiv on Manin-Peyre cj (height-asymptotics of numbers of Q-pts) thesis of Radko Darda. The trends is also using higher-algebraic geometry for those estimates; ie the next level one of stacks and gerbes. By using those, the author gets directly in a row, a bunch of results for different types of family of varieties; like abelian varieties, elliptic curves, etc.
> The cost of very abstract theory is given back in its wideness of applicability.

22.6-24.6

- Wrote another pile of paper notes; something like 40p.

Centering targets for future long-article or monograph.

Targets = keys or
articulating corner stones.

Clearing out concepts; things are getting clearer; key
anchorage-pts slowly emerge from the gunky matrice of
speculative ideas (the baby theory is getting out of the
"placentaire-melasse of ideas"; it has to be wiped off
with clear epistemological water on white soft paper
tales).

-> Conclusion : don't get tempted to write bloats of
theoretical delirium (it is easy to write endlessly); but
try the harder way of immediately getting concrete results
from quickly trying to implement theoretical ideas into
computations within machines : those machines computations
force to stick to hard-core reality.

<- .

24.6

* Some vids on stacks and alg spaces.

1) India maths center, Amit Hogavati.

2) German maths center researcher (Peter Wandt or Kai Behrend).

3) Taylor Dupuy (Usa).

-> Not 100% strong expositions, felt some confusions in talks but the latter is the clearest.

-> Those monument theories are still waiting to be decorated within fancy expository books to cover their grey bulky facades with a human-tint paint ; making their brute bulkyness less frigthening.
<- .

25.6

© Debian Buster.

Some computations on Genius maths tool.
Plotting complete graphs of general varieties (the memt glued cosinus powers).

- Free website log.txt.

Human Visitors (not robots) :
Usa, Russia-Ukraine, Italy, Germany.

Robots :
us : g, m\$(seattle), semrush (boston, mit?).
ru : yandex, volia.

de : seokicks.
au & africa ripe.

26.6

* Tried vimeo & dailymotion instead of ytube, for maths vids : no harassing ads but much less contents.

- Some paper notes after reading J.L ColliotThélène 1991 article on alg cycles and K-theory @ Cime Trento.

26.6-27.6

- Wrote another pile of paper notes : about 25p.
 - Uniformization of periods spaces of varieties with G_{Hyp} .

27.6

© Laptop batteries.
 lenovo.
 dell cd600.
 ti extensa 650 cdt.

- Suggested to link youtube & maps.
 link ytube road cams vids to corresponding roadmaps.

- Stacks.
 The geodiff aspect : orbifold.
 Stacks allow to have a higher or global perspective, a scenery point of view on (diff) varieties.

© A806
 Sorted about 500 maths imgs into sdcad.

- Sorted also some paper piles of this year, the progress made comparatively to mid 00's is on structuring data : both output and input data, that is; results of research investigations (paper and e notes) and ressources ones (maths books and articles) with at least two redundant storage repos and a formated classification.

--> The progress to be made is to be more effective in outputing directly ideas into electronic form, ie latex code: after successfully figuring out the most potentially effective ideas in terms of results among the elaborated ones instead of accumulating amas of them in piles of papers; with the good ones risking to be drown and lost within the global flow. In general they can be spot by rectangular boxes around them.
 <--.

28.6 4am.

© P9.

Merged g-keep notes with files.txt in dates.txt format.
-> Posted the result in Free website.

Remain diffing keep with txts and P9 with SDA.

30.6.21

- Coupled Abstact/Applied maths.

ColliotThélène 1991 article "algebraic cycles and K-theory" @ CIME Trento and Applied maths books of 1971 :

Le Gras @ Dunod
G Hacquès @ Armand Colin (U).

© Langages used at that time for MACHINE computations :
Algol, Fortran and PL/1.

® Read texts on Motives.

- 1) Andre
- 2) Ayoub

Actually reread those (cf begin of diary around mid oct 2020).

- 1) Andre Yves talk on "Introduction to motivic Galois grps"; notes taken by Don Zagier & Herbert Gangl.

Gmot is the big thing, being the periods twistor or torsor of functors of cplxes attached to alg var; when applied to some abelian var, GPC (Grothendieck periods cj) implies alg ind of periods given by gamma values @ rat pts; when a smaller grp is chosen; it gives lin alg ind of those gamma values; resembling the one of Baker thm of lin ind of logs of alg nbers.

For computational purposes; the survey article says :

"Note that it can already be very difficult to compute ordinary Galois groups, and here we follow the same strategy: first find an 'upper bound', then try to show equality. But now the Galois groups are linear algebraic (rather than finite) groups and so one needs some classical representation theory (weights, . . .) together with invariant theory."

Then gives examples of such computations, then some constructions of different candidate categories of motives; mainly Ayoub and Nori ones.

There is a filtration or chain of motivic Galois grps; with an intermediate related to Hodge theory; a cj says that it is actually equalities.

Ayoub construction is a functional one; leading to "higher" Hopf algebras.

2) Ayoub Joseph.

"MOTIVES AND ALGEBRAIC CYCLES: A SELECTION OF CONJECTURES AND OPEN QUESTIONS."

"The reader might disagree with these statements. Indeed, it is possible to argue that Grothendieck's construction of the category of Chow motives yields a solid foundation for pure motives just as Voevodsky's construction of his triangulated category of motives yields a solid foundation for mixed motives. However, it is our personal opinion that the definition of Chow motives is ad hoc and not

propitious to further structural developments in the theory of motives, whereas Voevodsky's construction is natural – I would even say inevitable – and its true potential is yet to be unlocked. Let the future tell if this opinion is naive or not!"

® Hochschild cohomologie @ wkp.

https://fr.wikipedia.org/wiki/Homologie_de_Hochschild

"La cohomologie de Hochschild classifie les déformations infinitésimales (en) de la structure multiplicative de l'algèbre considérée, et d'une manière générale l'homologie comme la cohomologie de Hochschild possèdent une riche structure algébrique. Leur étude s'est révélée importante en théorie des cordes notamment."

© Dified Tablet files in date.txt format with their entries in search.txt; then done the same with corresponding keep ones.

-> Quite tedious, time consuming.

-> Don't accumulate simulaneously keep and dates.txt files too longly unless transferring keep ones immediately in dates.txt; or vice-versa; be cautious to not finish with a keep entry but with a lastdate.txt file commit; since those keep files are clouds files vulnerable to outside tempering.

-> The better way is to create a temp search.txt and immediately dump in it both dates.txt and keep entries. This temp search.txt used for stacking the dates.txt and keep entries; may be formatted as lastdate.txt or sdate.txt.

1.7.21

® Read Colliot-Thélène 2015 Santiago talk slides on Brauer grps.

"Theorem. For X a smooth, projective, complex variety X , the Brauer group of X is an extension of the finite group $H^3_{\text{Betti}}(X(\mathbb{C}), \mathbb{Z})_{\text{tors}}$ by the divisible group $(\mathbb{Q}/\mathbb{Z})^{(b_2 - \rho)}$, where b_2 is the second Betti number of X and ρ is the rank of the Néron-Severi group of X ."

"But it is difficult to produce explicit smooth projective models of :

- homogeneous spaces of connected linear algebraic groups
- singular hypersurfaces in projective space
- singular quadric bundles over projective space
- singular cyclic coverings of projective space.

In each of these cases, the "Brauer group of a smooth projective model" is a natural group attached to the variety, if it is nonzero, it tells us that the variety is not rational."

© Tablet : plotted some animation of the glued cosinus powers in GeoGebra.
 Could only save screenshots; the img saving options reinitializing the plot.

-> So Either

- 1) Plot 10 separate graphs or
- 2) Find a way to get the final stage output img : there are other options for img saving among others : a) Asymptote b) Tikz and c) PsTricks d) Collada e) construction html-file.
 Investigate those to include animation either in adobe pdfs of e-books/articles or slides.
- 3) Another way is taking a record of a screen-video, ie make a "screener" and convert it into a animated graphic file (gif, gpp, etc).

2.7.21.

- About 1 month of ins www rambling (alumni).
 -> Leave the past and try to regain focus; not wasting time in vain quests of past class mates from Univ and before.

- From search.txt.

nuclinearisation.

direct sums : algebraists

direct product : topologists.

Cf the Douady's book intro for that paradigm.

© P9 builtin browser.

Quirks a lot since a long time, especially downloads; so avoid it when pulling books.

® Periods.

1) Hossein Movasati (IMPA Brazil) from Sharif Univ (Iran).
Periods of Hodge loci.

<https://w3.impa.br/~hossein/>

GADEPs Seminars

(Geometry, Arithmetic and Differential Equations of
Periods) Seminars.

<https://www.youtube.com/channel/UCFywAIbx0h9vbKNv8yJqjqA>

2) Masha Vlasenko

<https://www.imath.kiev.ua/~mariyka/>

Periods and hypergeometry, Dwork theory, Zeta functions.

Coauthors : Beukers, Bloch, Brown, etc.

support

<https://mathcircle.berkeley.edu/>

* Getting out of ytube for maths vids without ads either :

1) download them with the yy trick (then save them in g drive; that may be able to stream them out) or

2) goto directly to institutions websites; some have (conferences, courses, etc) vids repos; some rare ones have even those vids together with a streaming service.

3) Try to find platforms dedicated to Sciences Research media contents.

3-4.7 1ham.

Oregon Number Theory Days: Rachel Pries, Lecture 1
(Portland State University, May 19, 2018).

Oregon Number Theory Days
21 subscribers

SUBSCRIBE

Published on Jun 22, 2018

Rachel Pries, Oregon Number Theory Days at Portland State
University, May 19, 2018.

Lecture 1: "Newton polygons of cyclic covers of the
projective line."

" An elliptic curve in characteristic p can be ordinary or supersingular. For a curve of higher genus, there are finer invariants on the Jacobian called the Newton polygon and the Dieudonne module. They give information about the Frobenius morphism. Studying cyclic covers of the projective line, we verify many new examples of Newton polygons and Dieudonne modules which occur for Jacobians of smooth curves. For the proof, we study the Newton polygon and Ekedahl-Oort stratification of PEL-type Shimura varieties and compute slopes of Frobenius on the crystalline cohomology. As an application, we give new examples of supersingular curves of genus 5-11." This is joint work with Li, Mantovan, and Tang.

Oregon Number Theory Days is a triannual number theory seminar rotating between Oregon State University, Portland State University, and the University of Oregon."

<http://people.oregonstate.edu/~petsch>

® Reread wkp entry on Hodge cj; last time was end dec20-begin jan 21.

-> Far better than last time.

-> Some thm names 1924-2016 : Lefschetz (1924), Weil, Atiyah-Hirzebruch.

(Atiyah : † 2019, uk-lebanese related to the Brown); Mumford Kleiman, Totaro, Voisin, Rosenchon Srinivas (2016).

-> Nowadays trend is using Hodge Loci, a more moduli-stacky oriented approach.

-> Noticed that LaTeX code of formulas in wkp articles can be find out hidden within img-tags of the html source code.

-> Hodge cj wkp entry far better than previous time (31.12.20 -> 5.1.21) : clearer with less foggy pts.

-> Mathematicians may have woken up; Wkp is a moving ressource, that is bettering; although not so well considered by academics, that find it unreliable and doubtful : a tighter moderation by experts in the subjects of the articles should turn it into a global reference; a kind of electronic D'Alembert-Diderot encyclopedia; this would need parternships between wikipedia and academic institutions.

<- .

© Looked for the lacking note/entry about Atiyah-Hirzebruch thm in search.txt.

-> nothing in Debian Buster.

-> nothing in P9 (add to push it to Debian; cat *.txt | grep pattern. so made an archive of P9 on the go).

-> nothing in P9 colornote.
 -> nothing in keep repo.
 -> nothing in Tablet (win\$10 beats exceptionnaly Linux-Debian Thunar with its integrated pattern search).
 => So this note must have been gone with lost sniffed/stolen P9 search dir.

* Some vids on rational pts of Banff/Birs (America maths center : Canada, USA, Mexico and ... China).

Conference "Rational and Integral Points via Analytic and Geometric Methods"
 2018 @ Mexican Oaxaca node.

Organizers.

Tim Browning (University of Bristol).

Ulrich Derenthal (Leibniz Universität Hannover).

Cecília Salgado (Universidade Federal do Rio de Janeiro).

Description.

The Casa Matemática Oaxaca (CMO) will host the "Rational and Integral Points via Analytic and Geometric Methods" workshop from May 27th to June 1st, 2018.

"The study of rational or integral solutions to systems of polynomial equations is a topic that is almost as old as mathematics itself. Such systems define algebraic varieties and a driving force, historically, has been the decidability question for the existence (or non-existence) of rational or integral points on varieties. In the event that such points exist, furthermore, it is natural to try and understand their density. The aim of this meeting is to bring together researchers in analytic number theory and arithmetic geometry to push the boundaries of these fundamental questions."

1) Alexei Skorobogatov.

"On uniformity conjectures for abelian varieties and K3 surfaces over number fields".

Starts from the boundedness theorem for the torsion of

elliptic curves/ k on the degree $[k:Q]$ (Merel-Parent) thm then evokes the extension to abelian varieties and finally to the torsion of the Galois fixed part of Brauer grps.

2) Rachel Newton. "Arithmetic of rational points and zero-cycles on Kummer varieties"

Brauer grps (alg and tr) two torsion of θ -cycles of Kummer varieties. The tools used are at least two bouquets (condensable i guess into one multibouquet)

- 1) bouquet over fields extensions.
- 2) bouquet over degrees of cycles.

4-5.7 5am.

© Sorted a bit files of Free repo into new dirs; replicating tree structures of other devices.

© Wrote some paper notes on Brauer Manin functor from Colliot Thélène slides of the 2008 Santiago talk.

- Completed diary.txt firstly in Debian Buster then in Mint Tara. Had some troubles with display manager to get the two large screen running. Bt tethering issues on Mint but better usb-layer in integrated file manager (nautilus?).

* Some screenshots from A.Skorobogatov talk @ banff 2018 Oaxaca.

® From the same author site @ <https://www.ma.ic.ac.uk/~anskor/Grothendieck.htm>

Conference in honor of Grothendieck memory @ Imperial London College in june 2015.

Mohamed Saïdi talk on "Grothendieck anabelian section conjecture."

<http://emps.exeter.ac.uk/mathematics/staff/ms220>

Abstract: "In the first half of my talk I will explain the anabelian philosophy of Grothendieck, as formulated in his famous letter to Faltings, and the two main anabelian type conjectures he formulated, including the section conjecture. I will then explain a possible approach to tackling the section conjecture: the local-global approach, via the theory of cuspidalization of arithmetic fundamental groups, and explain how this approach relates to the adelic Mordell-Lang conjecture of Michael Stoll and the Brauer-Manin obstruction. Finally I will present two new results concerning this conjecture."

* Another vid from Cirm 2016 rational pts coonference organized by the same author.

-> Cirm, Oberwolfach (MFO), CMI@MSRI, etc : mathematicians "autogeres" maths centers; often funded by private-companies and/or public, private or mixed institutions.

-> Sort those funded by military or harmful ecological industries/institutions.

as IHES (Dassault, Ministry of Defense); MFO (VW grp).

© Tweaked all Mint prgs environements to full black/dark mode for nrj saving.

5-6.7 1h30am Sleepless.

- Sleepless 24h non stop : avoid coffee/agrumes based drinks after 16h; reduce coffee below 1L.

© How to skip g-keep size limitations : switch to g-docs.

- For insights consider also abstracts of conferences talks that often summarize "the state of the art" pts of the studied theory/pb; abstracts either in slides or videos-talks webpages from institutions or general public platforms.

© Android A806.

Looked for missing Atiyah-Hirzebruch entries notes in corresponding folders with a cat|grep cmd : noticed that Terminal Emulator could access user space here; so investigated the issue of termux in P9.

© Android P9.

-> As expected found that Termux issue was just a mere token one of app permission to access device storage.

-> So fixed issue, P9 can be turned now into a full Latex capable Linux mini-pc.

-> Pulled two books of reports of Manin bday 2015 conference.

® Read some maths cv of readers, lecturers, assistant professors.

On average a medium phd student rambles in a precare situation about 5y to 10y through post-doc stays in scattered maths institutions, in a kind of "forced compagnonage"; before getting a fixed academic status

somewhere; generally a reader (mdc) one.

Some sorting of last written paper notes.

6.7 3ham.

* Some vids : first time in about 10 months watched tv news.

Some other vids on islam, mecanics, environemental docs, etc.

® Begun glimpses @ Grothendieck-Techmuller/Arithmetic Fundamental grp theory with reading Saidi Mohamed (prof @ Exeter univ) articles from ArXiv.

->

Noted important collaboration of this author (dz, then fr in bordeaux & paris, and then de in bonn, essen, etc) with jp-arithmetic geometry school during Tokyo RIMS conferences (Mochizuki, Tamagawa, Hoshi, etc).

Some other new names : Koenigmann, Pop.

In one of his arXiv articles, came accross the term of "Galois grp of elliptic curves".

<-.

-> It is an heuristic key pt for a forecoming settlement of a theory of generalized Galois grps; or Galois grps of

varieties or schemes and their derived objects like moduli, torsors, etc.

<- .

-> Another heuristic key pt for rational pt is the equivalence of the two existences :

- 1) of a rational pt on the studied object.
- 2) of a section of morphisms between the scheme theoretic associated objects.

<- .

14h.

- Sorted a bit one paper notes golden-age archive drawer.

1994-1997. Sorting them completely in chronological order will be a tedious task since those notes are on free sheets without dates (wild notes).

Found out nonetheless one or two dated piles.

One is 25.08.1994, on psi-gamma-zeta functional symmetry or invariance of $\psi(s) = \pi^s \cdot \Gamma(\frac{1}{2}s) \cdot \zeta(s)$ by the $s \rightarrow (1-s)$ mirror symmetry about $\frac{1}{2}$.

7.7

- Again physical Tetris on tables clearing space to expand desks.

- Wrote some paper notes on size of (motivic) Galois grps of varieties, after reading

- 1) Yves Andre. What is a motivic Galois grp.
- 2) Mohamed Saidi. About Grothendieck anabelian section cj.
- 3) Peter Jossen. Equivalence of Nori & André category of motives.

© Restarted Debian Linux Gabel. Sorted some src dirs; renaming arXiv files with explicit files names instead of arXiv nbers (periods), took snapshots.

Some interesting articles in this periods dir : Calabi-Yau moduli, Mirror Symetry, Computations evidences of Beillinson cjs, Finiteness of integers solutions of generalized Fermat.

=> Remain a bit of sorting.

© Tried to restart Evo router : issues with wifi part of Lan. Ethernet is ok. Found some macs scrambled : either a reset is needed and/or a again a cmos issue : t rasr & rdb.

=> See if it has a config-backup (into a (xml) file) option, if so. Reset it & reconfigure it (statically) but save config only when the Lan is totally set-up.

© Found out how to get LaTeX code of wikimedia.
: bookmark the img and edit the pointer.

® Read 2016 Peter Jossen article on Galois grps :
classical and motivic.

Functorial view pt.

1) From rational finite etale scheme (spectrum of finite extensions of \mathbb{Q} or \mathbb{Q} -Artin motives) to finite sets (finite grps, here obtained from Galois theory functor).

2) From motives to finite dim rational vector spaces.

Explicits Nori motives from Ayoub pt of view, mentions equivalence of different motivic categories (Andre, Ayoub, Nori) from quiver abstraction panoramic pt of view; in other words, within quivers theory framework.

Announces Huber Muller Stach reference book.

- Some paper heuristics notes about the previous days readings derived from the understanding of corresponding articles.

1) Investigating promising Galois functor.

2) Rational pts and Sections of morphisms (mainly of etale schemes).

10.7

- Some paper notes on "universal" hypergeometric series/functions.

-> Catching exp through deformations of parameters space.

© Setting up again Evo router.

Ethernet: ok.

Wan : buggy but less than last time (cathodic rays of Gabel screen may have scrambled signals of the sitting aside router).

For wireless clients, connexion to router (wifi), stall their net access interface : they seem to send dns requests to the evo router instead of their interface, as well as including the evo router as first hop during the dumping of routing-data into their route cache. So before connecting to the router, switch off the other net access.

© Put Samsung screen upside down, it has a better resolution than studio, so maybe consider making it primary; or try to get better resolution for Boulanger studio (osd menu).

© Sorted a bit Mint Textes repo; since it is less used than Debian.

® Read viXar (alternative for arXiv, with "risky border" content) guidelines and advises.

=> The criterion may suit this repo as its cj may be classified as "very wild"; unfitting "standard polished" mainstream approach to Q-pts since its content is highly "challenging".

11.7 4h am

® Read some articles of

A) Cyril Demarche (arithmetic background from Orsay-Paris 11 arithmetic grp taskforce :

ColliotThélène, Hariri, Raynaud)

1) thesis : Brauer grps of homogeneous spaces (thesis under the supervision of D.Hariri).
 Brauer grps of torsors; varying the class of the grps of those torsors leads to different Brauer Manin sets that may coincide for specific ("degenerate" or "trivialized") classes of the studied variety that is the fixed "base space" of the different torsors.

2) first Article : Interesting idea about Brauer grp of torsors.

3) 2nd Article : Brauer grp and descent.

9h am

A level higher generalizing C.Demarche is gerbes pt of view.

2) MINSEON SHIN (Korean @ Washington with background from Berkeley arithmetic grp taskforce : Olson, Ribet, Poonen (before moving to MIT)).

THE COHOMOLOGICAL BRAUER GROUP OF A TORSION G_m -GERBE.

Wisely sticking to reality with computing abstract-nonsense objects on machines.
 (magma code of computations of Galois invariants related to varieties in products of projective spaces).

3) Shelli Manber (student/young researcher @ Berkeley).

Good refreshing explanatory notes on Brauer grps and rational pts on elliptic curves.

- Some heuristics paper notes on inductive (sums) and projective (products) limits.

=> Personal note : one common feature of torsors and motives, is that Nori motives category is made of objects that are triples; like the category of torsors of schemes ; torsors that are essentially triples constituted of

- 1) the studied space (the base or bottom space);
- 2) the "revetement" or covering space above it on which acts
- 3) a grp.

One unifying syntethic note about those facts is that a motivic Galois grp can be interpreted as the grp of a Torsor, but a torsor of higher level (hence the captial T) : the grp that acts on cohomological_complexes-valued fiber-functors or cohomological-realizations fiber-functors.
 <=

- Found viXar : alternative/shadow competitor repo vs the official arXiv @ Cornell. In viXar, no endorsement needed but content checked, NY based; gathers "frenzy" content.

"My papers are now on viXra but I am not getting any feedback. What should I do?

Getting feedback on your research can be hard even sometimes for professional academics let alone independent researchers. Here are some DOs and DONTs

- Don't send unsolicited emails about your ideas to scientists

- Don't spam blogs or forums with your ideas

- Don't be discouraged by an apparent lack of interest.

- Do create your own blog to promote your ideas

- Do look for online communities where like-minded people with similar ideas hang-out

- Do continue to learn as much as you can about the subject areas you are interested in.

- Do submit your work to a suitable journal for peer-review (but do not expect miracles)

- Above all, do continue to develop and improve your ideas or form new ones, and publish those too."

12.7

- Some paper notes on :

A] motivations to the study of rational pts.

1) Cryptography : some ideas (to the best of my knowledge : possibly quite original and innovative) of new ways of unviolably encrypting data; germs of one of the strongest encryption method ever proposed; possibly challenging and beating even future quantum computers mainframes.

2) discrete optimization pbs in real-life and industrial applications; mainly filling patterns optimization.

B] Heuristics.

3) Paradigm : "Direct Sums for the algebraist and direct products for the topologist."

Direct products : projective limits; necessarily grows (unless killed by an empty set factor); zooming-out process.

Direct sums : inductive limits; not necessarily growing; [never killed by empty set terms?]; zooming-in process.

C] Conference reports.

Some notes after reading recent rational pts conferences abstracts in dedicated institutional websites; mainly the last "Reinventing rational pts" one @ IHP 2019 together with its related events @ CIRM.

* Non maths : some vids of Pakistani truck mechanics replacing; wheels axles and bearings; straightening essieux; swapping parts of huge rear differentials and totally resetting them ; like here "gettho mechanics" on the ground without fancy workshops facilities and fancy tools; only bare hands and bare handtools; but with impressive know-how.

-->

The lack of fancy tools and fancy workshops facilities is balanced by great skills.

<--.

13.7

* Peter Jossen (eth zurich) 2018 talk @ Leiden (nl) Algebraic geometry seminar (intercity ?).

(Leiden seminar : Camera too far away from board).

1994 : Serre paper "Cj & pptides of Galois grps and motivic Galois grps."

2021 : ctxt changed. Now we have available an unconditionnal (no need Hodge cj anymore); motivic category.

® Read Eisenbud-Harris, Schemes : the langage of modern algebraic geometry.

=>

Functor of points : given a scheme V and a "unital" object u , the functor of points of V is just $\text{Hom}(u, V)$; it allows a category shift, the studied space V is replaced by the morphisms to it. This process gives a second layer or higher level one from a recursive procedure : a functor from the category of schemes to the category of functors, that assign to a given scheme X its functor of pts.

-> This the famous relative pt of view.

<-.

Hence the geometrisation of the space of functors, and when the covering space of a torsor of scheme-related object is the geometrised category of complexes-valued functors, the torsor obtained above this given scheme-object is the motivic torsor when this scheme-related object is chosen to be the motive $M(V)$ associated to the studied scheme V ; the acting grp of the Torsor being the motivic Galois grp of V .

<=.

® Read Perrin Riou algebra arithmetic and maple.

-->

Basic cryptography is from factorization in Z and its reduced finite rings, F_p or Z_n . This finite setting suits the discrete environment of computing machines. So the algebraic and arithmetic geometries that fit this framework are those over Z and its finite reduced rings Z_n or fields F_q with $q=p^n$ (prime power).

<--.

- Some Tetris with books and dictionaries.

© Again A806 aliexpress msgs system issues : empty local database of msgs system.

14.7

© Read an article of Alvaredo on codes from algebraic varieties.

-> The concerned varieties are elliptic curves and K3 surfaces defined over finite fields, the codes are built from morphisms between those varieties. So my ideas evocated above constitute a totally different approach from that.

<- .

- Less inspired but still wrote some paper notes on algebraic geometry codes; refining new approaches to them.

15.7

© Debian Sarge on Gabel.

Put a "new" folder in maths folder with recent files.

Continuing sorting src files.

- Wrote some paper notes : continuation of last paper notes on algebraic geometry codes; refining new approaches to them; two trends emerge from that.

1) Multidimensionality by chunking input data ("prehash") into chunks lists and input those chunks into finite product of traditional 0-dimensional encryption engines : increases robustness by a factor equal to a factorial (of a power of an integer) .

For that multidimensional deployment , two options :

a) either recursive process introducing recursive periodicity; weak pt of that process is bad computability; ie laggy/slow algorithm.

b) The other way skips recursive process to just use mere products of 0-dim maps.

2) The second trend based on integers pts of varieties defined over \mathbb{Q} is the really innovative one, possibly giving unbreakable codes.

- Reread memt; some left typos :

1) intro : check integral scheme; should be scheme defined over "anneaux integres"; not necessarily over "rings of integers".

Brauer grp : replace X by V for coherence of notations throughout the memoir.

2) p7 Develop "properness" requirement for a "Tychonov like argument" for adelic pts.

How $V(A_k)$ the adelic variety or set of adelic pts of V , is built from the product of the $V(\mathbb{O}_k)$; the integer pts of the $V(k_v)$, the $V(k_v)$ being the pts of the completions of k , at the places v of k .

3) p9 Check $H^2_{\text{et}}(V, G_m) = H^2_{\text{et}}(V, \text{Spec } \mathbb{Z}[t, 1/t])$.

4) p12 among many reasons -> among many other facts.

5) Bigger Brauer Manin sets from pairing with subgroups (ie smaller grps) of the Brauer grp of V .

=> It would be interesting to investigate filtration of adelic pts obtained by applying this contravariant functor that sends a subgroup of the Brauer grp to the corresponding Brauer Manin set; an analogue of the classic Galois theory functor that sends a subgroup of the Galois grp to corresponding intermediate field extensions.

=> On controversy side :

1) retrieve, the computational motivations;

2) about controversies :

Arithmetic geometers often repeat that Nori has never written papers on motives.

This is not true : found out at least two papers (one in compositio) about arithmetic fundamental grps; those references were found in a paper of H.Esnault together with a vietnamese mathematician.

1) M.Nori. On the representation of the fundamental grp. Compositio math 33 1976 p29-41.

2) M.Nori. The fundamental grp scheme; proc. indian Acad. Sci. 1982 p73-122.

==> Typical denying attitude of (white) mathematicians towards others (non white : indians and asians, etc) when those (non white) have smarter ideas than them.

==> See the reaction of the german arithmetic geometry school towards the japanese one after S.Mochizuki result on abc cj.

6) piece-wise piecewise.

17.7.

- Convinced by applicability of Q-pts in daily life pbs and computer sciences, begun thinking of writing a monograph with gathering research notes.

Starting with layout/structure, mimicking memoire one.

1) Introduction about motivations for the study of the presence of rational pts.

2) Review of known results.

3) Expose new approach.

Cite extended versions of criterions.

4) Give the proof elaborated in feb 2021, of the extended criterion for alg curves of genus ≥ 2 using Faltings finiteness thm. Explain that the case of alg curves or varieties was not the sought goal, but the sought goal was extensions to transcendental and more general varieties.

5) Study examples of extensions.

Extensions to :

a) Transcendental enclosed domains.

b) Enclosed convex domains.

- c) Enclosed compact-connected.
- d) Compact connected without boundary.

6) Express criterions hypothesis in terms of homological invariants.

a) enclosed : positive mean curvature, this hypothesis is expressible in terms of Betti numbers or Euler characteristic for compact connected complex surfaces; so for those varieties, it is expressible in terms of positivity of the alternate sum of dimensions of homological objects.

b) no holes : simple connectedness or trivial fundamental grp, $\Pi^1(X)=0$.

18.7

- Some other heuristics paper notes.

a) Trying to put a geometric structure (curvature) on the family of motivic Galois grps; this should reflect heterogeneity of the structure of the Q-pts; ie gives some meaning to the coined "arithmetic shape" of a family of varieties.

b) Exploring period equivalences of varieties; ie faithfullness or injectivity of the periods functor :

$$\alpha) p(V) \sim_k p(W).$$

$$\beta) \text{trdeg}(k(p(V))) = \text{trdeg}(k(p(W))).$$

γ) V and W are k -equivalent.

δ) The k -pts of V and the k -pts of W have the same structural-nature.

$$V(k) \sim_k W(k).$$

ε) $G(V) \sim_k G(W)$.

c) The glueing of powers of cosinus : split it into 4, transcendental or analytic pieces, ie analytic varieties.

-> Are there schemes equivalents for analytic varieties?

-> Surely with sheaves of analytic functions.

© Android P9.

Saved P9 TeXtes to USB stick through usb-OTG.

=> Save other data this way (pictures database).

19.7

- Some paper notes on :

a) Galois grps.

=> need of a Galois grp theory for periods/varieties expressed in simpler terms than motivic ones.

=> The structural-nature of those groups, when defined

over a field k ; should reflect the structural-nature of the k -points of the variety.

b) Other on the zentrum of R -algebras of endomorphisms of R -modules.

© Synced some folders with g-drive.

a) Tablet : books.

=> Tablet sync may be reduced only to One-Drive.

b) P9 : books, Qpts, Brauer, Cas, GeoArith, Whatis, HypGeo.

® Some readings

1) Japan team paper on Jacobians of Fermat quartics, with computer verifications using Singular software (code included in article).

"THE ARITHMETIC OF A TWIST OF THE FERMAT QUARTIC
YASUHIRO ISHITSUKA, TETSUSHI ITO, AND TATSUYA OHSHTA"
Abstract. "We study the arithmetic of the twist of the Fermat quartic defined by
 $X^4 + Y^4 + Z^4 = 0$ which has no \mathbb{Q} -rational point. We calculate the Mordell–Weil group of the Jacobian variety explicitly. We show that the degree 0 part of the Picard group is a free $\mathbb{Z}/2\mathbb{Z}$ -module of rank 2, whereas the Mordell–Weil group is a free $\mathbb{Z}/2\mathbb{Z}$ -module of rank 3. Thus the relative Brauer group is non-trivial. We also show that this quartic violates the local-global property for linear determinantal representations."

2) Other one on Heegner pts (David Lilienfeld @ Montreal.ca).

20.7

© A806.

The phone entered a boot loop while browsing; it could boot up again only when its usb is plugged into another device. After that issue, retrieved micro-sdcard, fearing for its content : found it unreadable with both adapters (usb and bigcard). On Lenovo win-8 and Mint : the micro-sd drive letters pops out a few milliseconds then disappears; on Mint it stays but says there is no devices attached to it.

Maths pictures tediously sorted last time lost : normally redundancy in g-photos & p9 should make 95% of the micro sdcard imgs data available; for maths Srcs files (articles & books), the ratio should be closed to 75%.

=> Conclusion : either

a) the phone boot-loop scrambled/fryed the micro-sdcard; so this device may hide a really harmful software; remotely triggered from the suspicious app telephone (it is the app that has the most permissions from read bookmarks of browsers; turn-on wifi & bt with full networks access, download files in background, change system settings, format sdcards, by-pass other apps priority; control vibration; modify cache data, etc, etc); plus, when phone becomes unstable; stopping this small app brings back stability. So use carefully this device (no usb to other devices other than battery charging systems) for non sensible tasks (instagram, aliexpress, watching vids, web searching & browsing) but not for editing or saving sensible stuff. Noticed also some battery indicators jerks (from one value to another).

or

b) micro-sdcards are actually unreliable (this is at least the fifth or sixth issue with micro-sdcards).

==> Measures to take when some time is left for that :

- 1) Locate teleyphone app; retrieve it; if unaccessible normally, get it by adb-ing the phone to an old pc left for tinkering.
- 2) Hexedit the app to get its code; together with other suspicious jars containers.
- 3) try to locate in hex-dumps; servers locations to catch origins of possible evildoers.
- 4) Inspect the battery that may give first signs of decay.

Anyway :

- 5) Avoid micro-sdcards for sensible data.
- 6) Try to find vids about data recovery from them (ukrainian geeks based in canada).

=> Most stable memory storage devices, so far are nand-flash chips of :

- 1) ssds of pcs,
- 2) smartphones,
- 3) usb-sticks.

Global conclusion.

For sensible data avoid using :

- 1) micro-sdcards.
- 2) disks devices : hdds, and optical ones.
-> Use them for junk-buffer storage or as third redundancy.
- 3) Only plug usb of A806 into battery charging devices (charger or battery packs) or obsolete pcs left for tinkering/security benchmarking.

21.7

© P9 and Linuxes.

Synced totally maths Srcs files; through usb cable with Debian Buster Lenovo; except books folder, left to g-drive.

Usb bauds.

P9 -> Debian : ~ 200k/s.

Debian -> P9 : ~ 5k/s.

=> Noticed also than just-deleted files in P9 still appear in files manager of Linux boxes; but not in files managers of P9.

=> Try to figure out those issues

1) the asymeric usb-bauds rate : it may come from the recently installed thunar usb-layer.

2) the ghosts files : a cache-issue of files allocation tables; or a (hidden) redundancy of P9 data.

© Synced Debian-Lenovo Arch folder to usb-stick.

Usb bauds : Debian -> stick ~ 800k/s.

- Wrote some paper notes on :

a) Motivic Galois grps of elliptic curves.

b) Criterion extension to top spaces, setting an analogue of Curvature for top spaces/domains.

22.7

- Continued the preceding paper notes on :

a) Motivic Galois grps of elliptic curves.

b) Criterion extension to top spaces, setting an analogue of Curvature for top spaces/domains (compacts connected).

and

c) investigations about the strengthening of stable criterion by adding one period to the periods array; for the case of compact connected Riemann manifolds (surfaces) without boundary, this finally amounts to simply adding π to the periods array.

23.7

® Reread Fresan paper on periods used in his 2018 X-ups talk on periods.

-> Good intro to the subject from solid undergraduate level up-to graduate-researcher level; wide overview of the theory of periods; with a final chapter introducing to motives and GPC (Grothendieck period cj); ending with an overview of alg ind theory of periods (Chudnowsky for elliptic curves; Chowla-Selber for gamma values @ \mathbb{Q} -arguments); finishing with Ayoub functional thm related to differential Galois grps.

- Wrote some heuristics paper notes about motivic Galois grps (higher categorical approach : motivic topos) on the "lancée" after this reading.
- Fixed Rideaux with tape.
- Made hard cover of Atiyah-Mc Donald book photocopy.

24.7

© A806 Android KitKat.

Tried to figure out the boot-loop issue.

-> Inspected battery since the battery level showed is erratic.

-> Found out it is a 2013 4V 2500mAh unit.

-> Ordered a new one @ aliexpress; since this 8y age surely explains its erratic output : it has completed its life-span.

-> Aliexpress now includes a VAT (=TVA) tax in prices since July 2021.

* on Tablet, a vid of Pierre Deligne 2009 talk on motives @ IHES. (digged out of dailymotion IHES shadow library).

-> The speaker insisted on the fact that motives were not the main goal of Grothendieck; but rather their categorical aspect.

- Continued Global Galois grps heuristic investigations paper notes.

25.7

© Linux Lenovo.

a) Got back to GNU-Linux Mint; to spread-out hdd wear on partitions; releasing e-stress on Debian Buster one.

b) Sorted Document folders.

c) Added last versions of maths texts.

-> Noted some jerks of integrated file explorer.

- Digged out, of clutter of photocopy-archives of paper-books, two folders.

A) first with two Yves Andre texts :

1) The Reference SMF monograph : Introduction aux motifs. 2004.

2) Plus one of his paper from a 1993 nb-theory seminar talk in Paris on "Geometric motivic interpretation of

p-adic values of G-functions." (cf DiVizio thesis).

B) Surprisingly found the 1994 SMF paper of J.P Serre about motives. "Introduction aux pptes conjecturales des motifs", in the batch.

26.7

- Sorted paper notes of July 2021.
- Wrote some complements to motives theory about Global Galois grps in last batch of them.

© Tablet Win\$10.

After watching on ffox the end of Pierre Deligne 2009 talk on Motives @ IHES (Grothendieck colloquium) in the shadow video archive of IHES @ dailymotion ; the tablet got stuck.

Inspected the app that hanged the system by using 100% of cpu : Office app.

==> Odd : I have never used this app since the begining.

Wanted to stopped it : required adm status; so logout to login as admin;
then the device got totally stuck during relogging : it refused to boot-up. Stopped it; and restarted it.

It refused again to boot; after a long way of fights; finally got uefi boot options (this seems to need 3 successive on-off); tried the proposed option of fixing what prevented the booting : did not work; the system telling that it failed to fix the issue.

Again, tedious procedure to get back to uefi boot menu : tried to restore system from its last good img snapshot point.
==> Refused to boot.

Relaunched tedious procedure to get again uefi : done a system reset preserving apps
=>again, no reboot possible.

Repeated again the tedious reset procedure without the apps preserving.
==> finally got the boot working correctly.

==> Noticed during those endless rebooting steps a small window opening of a batch-like script; like the one that opens when double clicking on a executable file (either binary or script, batch or else) in the file manager. The same window that appeared during the last accelerometer driver issue.

==> m\$ and/or its incompetent engineers that build win\$10 should be questionned about that : why a never used app (Office) broke down the whole os ?

==> This personally definitely puts m\$ win\$10 into the already guessed category of unreliable operating systems.
<==.

27.7

- Continued paper notes on Global Galois grps.

© Resetted some system prefs on Tablet win\$10 : since usb-layer was always quirky with aliexpress input-devices usb-hubs; put input-devices into the bt layer (wireless mouse & kbd).

- From search.txt

Tracking Tablet quirks.
=> 03.05.21 and 11.05.21

typos
1991-> 1994 Serre .
Quotes in J.Lurie Brauer grp.

© Created a photo folder in g-drive to dump A806 screenshots.

28.7 Sleepless.

© Android Phones.

Sorted some folders to clear them out : bt and dwnload of both phones (P9 and A806).

A806.

Sorted completely the TeX memt folder.
=> Try phone combinations : dialing codes can actually alter system settings through call-phone app (teleyphone).

P9

Hexedited db files of the odd baidu folder that oddly popped out some weeks ago.

© Linux Mint.

Synced completely TeX folder with the same one of P9.

® Read slides of Masha Vlashenko on Dwork theory (hypergeometric aspect) and Zetas functions of varieties.

==> The important heuristic pt is that those Zetas functions attached to varieties; as analytic and transcendental objects, actually encode a lot of discrete arithmetic data about the studied variety; linking two ontological totally or extremely different domains of mathematics, (in other words, two domains of opposed nature) : complex-analytic functions and finite integers arithmetic.

<==.

- Reread memt : "since" repetitions in second part.

29.7-31.7 Sleepless.

- Some paper Books physical Tetris : replaced Pc and bikes journals by maths paper books.
- Some paper notes, on Global Galois grps with connections to Shimura varieties.

1.8

* Yves Andre 2017 spring talk @ MSRI on Andre-Oort conjecture, during the Galois Theory and Periods seminar of March 2017.

->

Gives precisions for Newton Principia Lemma XXVIII oval issue : Arnold and Manin showed that the oval must be smooth (C^∞) around 1990; about 3 centuries after Leibniz and Huyghens 1691 letters exchange about that.

Mentions GPC researchers for elliptic periods namely the two german W's : Wolfart and Wustholz.

" Question (J. Wolfart): for which (a, b, c) are there ∞ ly many $\lambda \in \mathbb{Q}^-$ with $F(a, b, c; \lambda) \in \mathbb{Q}$?

Answer (Wüstholz-Wolfart-Cohen-Edixhoven-Yafaev): iff Δ finite or arithmetic.

['if' due to Wolfart. 'Only if': 3 steps:

i) Wüstholz (special case of PC): Q -linear relations between periods of abelian periods come from endomorphisms

$\leadsto (\lambda, F(a, b, c; \lambda) \in Q] \Rightarrow J_{n,a,b,c,\lambda}^{\text{new}} \sim F_{b,c}$

ii) for $P \setminus \{0, 1, \infty\} \rightarrow A^g : \lambda \mapsto J_{n,a,b,c,\lambda}^{\text{new}}$

$\text{Im}(\varphi)$ special iff Δ finite or arithmetic.

iii) $A^0 \leadsto \text{Im}(\varphi)$ special iff $J_{n,a,b,c,\lambda}^{\text{new}}$ has CM for ∞ ly many λ 's.]"

-> The conjecture of the talk became a thm in 2015 by the work of two teams comprising Pila, Ullmo, Zannier, Edixhoven, Tsimermann, etc. This cj relates the density of special points of Shimura varieties (ie varieties parametrizing isogenies classes of abelian varieties) to abelian varieties with lots of "special symetries", ie with prescribed structural endomorphisms. The 2015 proof resulted from another cj proof; namely P.Colmez cj on Falting Heights on moduli of CM ab var.
<- .

• After 10 months of maths conferences vids; two kinds of talks emerge :

1) the blinding technical/theoretical ones.
-> Nearly nothing is left after watching them.

2) the enlightening panoramic-overview ones.
-> Permanent insight gain; enlightenment engraving a better memory footprint.

© on Android Tv.

Sorted

- 1) one src folder.
- 2) g-drive imgs folders but not their contents.

- Some e-physical Tetris, moving e-clutter stuff around Tablet and Qadr, to clear out space for desk expansion and paper books access.

2.8

® Read M.Olson grp schemes slides of Hangzhou 2020 Abelian Varieties talk.

Foundational definitions recalls.

"By Yoneda's lemma, giving a scheme G/S the structure of a group scheme is equivalent to giving a factorization of its functor of points

$$\begin{array}{ccc}
 & & \text{(Groups)} \\
 & \wedge & | \\
 & / & | \text{ forget} \\
 & / & \vee \\
 \text{(S-schemes)}_{\text{op}} & \rightarrow & \text{(Set)}
 \end{array}$$

Therefore an equivalent definition of an (abelian) group scheme is a contravariant functor from S-schemes to (abelian) groups such that the induced functor to sets is representable.

This will usually be the preferred way of describing group schemes."

Then gives numerous examples; from algebraic grps to multiplicative grps; through abelian varieties.

Main references on ab var are ab var texts of D.Mumford : Tata Lectures book and Inventiones papers of mid sixties (1960-1967).

Plus the recent book of G.Van Der Geer & B.Moonen.

* <rtsp://videos.msri.org/data/000/028/096/original/3-Mattes.mp4>

3.8

- Continued physical Tetris in sorting bookshelves : retrieved all Pcs and bikes magazines replacing them by paper books.

© Tweaked a bit Tablet Pc upgrade settings.

- Wrote some paper notes on Q -pts of transcendental arcs : managed to apply criterion by building an enclosed variety from a transcendental arc by some simple symmetrisations procedures; the key pt is to keep those procedures intrinsically related to the initial arc. The overall result is a criterion for the presence of rational pts on transcendental arcs.

4.8

© Linux Lenovo.

Swapped Studio and Samsung for better resolution of hdmi on the latter over lesser resolution from old vga plug on the former.

Made the first one primary display.

- Sorted e-clutter around them, put lamp @ left corner to get a desk nest on big table : writing corner.

® Read Yves Andre slides of Andre-Oort cj MSRI talk.

Begun rereading one of his supervised Phd thesis, namely Cristiana Bertolin thesis, on alg ind of 1-motives elliptic periods.

- Completed research diary log txt and pushed it into Free.

- Some paper notes on grp theory endofunctors : Derived, Normalizer, Unipotent grp.

* Japan in Motion.

a) PHD students mostly end as high level "salaryman", ie companies high level office employees (companies "soldiers" or "samurai"); some in manufacturing plants; as over qualified fabrication employees.

b) Odons : hand made thick flat noodles.

- Some paper notes on ads notebook.

5.8

- Done Suzuki GS 500 oil and filter change.

Remember : when working from above (back not crawling on the ground); click-socket do not need rotation switch for upside-down bolts, but rigid wrench do.

Forgot : Alu foil on pipes, Knee sleeves.

-> After 3 weeks of research; a good bike ride + some meca (oil and filters change), refreshes the brain : no need of fancy holidays abroad. Doing something totally "abroad" has nearly the same effect.

® Humphreys Coxeter grps : Jacobian matrix criterion for ald ind of polynomials.

- Focus on torsion aspect of grp th.

- Todo :

a) Change html code names of search.txt to hassle wget requests.

b) Fix hand bag.

7.8

© Android TV.

- Put two new browsers.

- Associated bt-keybd for Termux use : bt-kbd has no <, > and |.

- Used dailymotion-app to watch the conference vid of :

* Pierre Deligne 2012 talk @ IHES on motivic periods.

Begins with some recalls on motivic framework.
Mainly treats motives related to MZVs and F.Brown thm on their \mathbb{Q} -lin relations and (2,3) generators.

Cohomologie relative et filtrations de Hodge.

Hodge theory.

- 1) Hodge decomposition. (Classical).
- 2) Hodge filtrations. --> More significant. (Recent trend). <--

Motivic MZVs.

M : algebre graduee --> See if Reflection grp thm apply. <--.

Bi-torsors.

Motivic periods = periods above classical ones.

- Some paper notes on grp theory : reflection grps. Two investigations paths linking those to \mathbb{Q} -pts arouse.

Recall that those are grps of symetries about hyperplanes of the usual euclidean space.

1) As such, they intervене in the symetrisation process to get enclosed varieties from pieces of curves, mostly transcendental arcs.

2) Their polynomial invariant algebras/representation theories may be lifted to the motivic framework. Note by the way that this theory of polynomial invariants associated to grps acting on finite dim vector spaces concern mostly finite grps.

-> Check for an eventual extension of Mollien formula to infinite grps by considering an infinite sum or serie of functions instead of a finite sum over the elements of the studied group; finite sums that gives the Hilbert-Poincare series of the group-invariant subalgebra of the symetric algebra of the vector space representation.
 <- .

© Linux Mint Lenovo.

Some quirks with Samsung screen again : a showroom mode with a screensaver of brand/technology logos popped out on it; I had to ramble in the www to get rid of that :

--> press both (volume down & menu) buttons for a few seconds.

8.8

® F.Brown slides about motivic periods from a 2016 Talk @ Duke Univ (Gergen lectures).

Same type of talk as André : clear panoramic view with lots of deep heuristics.

-> The purpose of motivic periods is to retrieve structural data about basic periods (space) by lifting those basic ones up-to the motivic setting. The motivic framework being more intrinsic allows to reveal more

explicitely (alg) structural relations shaping their space landscape; such landscape shapes are hints that are finally dropped down into the initial periods setting.

<- .

=> Le cadre motivique étant ontologiquement plus primitif/instrinseque permet de dégager des patterns structurant les surespaces batit au dessus des espaces issus de l'espace étudié; ces patterns constituent des indicateurs, empreintes ou traces-de-contours des relations structurales entre les objets initiaux issus des espaces construits à partir de l'espace étudié.

<=.

® Read also V. Zooneykind papers from his thesis on Grothendieck Teichmuller grps; since those are conjectural symmetry grps of motivic multizetas periods.

All the texts before those papers contain good insight intros : 1-motives; fundamental grpoid of stacks, etc.

=> Good heuristics intros from "human readable" maths style; before releasing the "theoretical machinery beast" in the sequel of the papers.

<=.

9.8

- Some thoughts on issues about source (articles, papers, books) data.

- 1) Saving and organizing them locally is a huge time-consuming task; besides that, depending on the storage

medium; it can also be as tedious to get them back; so it is a double loss of time.

2) Leaving them to the Internet (in the wild or in a cloud) has the advantage of not bothering about the storage media issues; and being quickly available; resulting on a double time gain; but at the cost of independence : an internet access is needed; no internet access = no data sync and also internet sources are intrinsically unstable : I have just browsed the bookmarks to sources files before the 2009 blackout; to find out that most of them are now broken links; cloud services are also not all reliable either in the long term or in terms of data tempering.

==> The best solution is two clouds and two local corresponding syncing.

3) When publishing cutting edge or innovative ideas; some dishonest researchers that come across the smartest of them; might develop from them theories and make fruitful discoveries and then be tempted to not acknowledge the origin of the initial triggering ideas, foremost if those come from unestablished persona (pre-phd students, precary post-phd young researchers; independants, etc). This was one reason of Grothendieck leaving the mathematical community; I personally think that he was partially right.

==> the highly competitive maths research environment has turned some maths researchers into "pillars" or "thieves" of ideas; not to say crude words.

==> One promising positive pt of the ideal future gigantic AI/big-data/Quantum Hypervisor e-Math Machina/Mainframe is to make possible to spot those thieves by the AI cross analysis of the footprints they leave in the Internet together with the analysis of their productions and social interactions.

==> For now, it may possible to train scientific detectives and hence create a new activity that may be

hired/paid by institutions to cleanse their recruitments lists from those "bad guys".

==> Note that this thief attitude may be found at the scale of countries; where open or more likely undercover agents and/or agencies do strictly the same; through what is called in french "veille stratégique" departments; in the nowadays Internet era, this may be achieved through the release of "strategic oriented bots" or "intelligency crawlers" or simply "stealth agents (hardware : asia or software : usa) within devices".

- Some typos.

a) memt : inspiring -> pioneering.
 ode -> ordinary differential equations.
 ideal math world -> in ideal cases of varieties.
 biography : all paper notes before 1993 were trashed.

b) search.txt
 statitistics -> statistics 4.5.21
 repetition of 1.5.21 log.
 Burgos Trivialaization.
 Ayoub GKJ a) for 1).
 Pure motives $V \times Y$.
 other folders (motives, periods, russian).
 Bouquets-above-object philosophy.

- Some paper notes on motivic heuristics and criterion birational invariance.
 The mean-pt issue is not trivial @ all; considered hypergeometry approach.

10.8

* Ytube vlogs of new maths nerds (PHDs , young researchers).

Desk settings : Smartphone + Writing tablet (quite thin)+ Laptop + Screen Display. Mostly Apple stuff.

-> The trend is leaving paper for Writing tablets that are enhanced versions of older graphics Tablets (wacom); the latter were just mere "dumb" input devices connected to boxes but not full smart autonomous Android devices as the former.

-> Writing tablets : avoid paper notes piles cluttering space, eco friendly at first sight (like e-cars, may be not so eco-friendly in the long term). But if it breaks down :

research activity stuck unless data saved somewhere regularly, Whereas paper + pen : never stuck and no-privacy issue.

=> The solutions is having two devices.

* F. Brown talks @ 2014 ICM Seoul (1) + 2017 HIM (Hausdorff Institute of Maths) (2).

Motives as triples : disembodied integrals.

Relative Hdr : $\text{Hdr}(X,Z)$ exact modulo closed , but vanishing on Z (1). $\text{Hdr}(X,D)$ Exact only on D (2) ?
-> not clear.

Regarding motives, the orator says preferring previous Deligne-Ihara realisations setting over new ones of Ayoub/Andre/Nori, for more flexible relations available between objects in this old-school setting.

11.8

- After nearly one year (~10 months) of getting back to maths; with the perspective allowed by the decade deconnection; I noticed :

1) how maths departements of universities shape future trends of math developements; by orienting new comers in research towards what those "officials" think will be the most promising and fruitfull paths.

2) once again; the long term aspect of math progress as in motives maturation; low dim manifolds classification, etc, etc. To me this lagging is mostly due to the inefficiency of the prehistorical way of doing maths research still dominating nowadays. It is a pity that the brilliant minds of this demanding intellectual activity do no work together to settle a new modern way (using future quantum computers AI-mainframes) of doing maths research to prove or disprove quickly the vast amount of conjectures waiting @ the gate-doors of theoretical realms/theories.

3) change of life style from Family pt view : for them, going back to maths has accentued the already "autistic", "bear" or "wild" side of personality with maths meditations isolating even more from any social interaction; but they also noticed a positive accentuation of its already hyperactive side.

Termux : wanted to convert some postscript files into adobe acrobat ones; but ps2pdf was missing; so had to reinstall ghostscript pkg; unfortunately same key-ring issue with repository, so changed mirrors of sources.list files manually from Shangai university to a Beijing university repo; after ghostscript pkg reinstall, got some issues with the gs (GhostScript) parser on the postscript file : ps2pdf quirkling with errors; seems to be libraries links issues because the same procedure worked well in Debian Lenovo.

=> a lacking db hash (footprint) update may be the pb.

12.8

® In D.Mumford "Introduction to complex projective alg varieties" book, the preamble contains a relevant list of commutative alg thms needed for the theory.

- Fixed multi-pen compass with juvamine tube caps.
- Some paper notes on hypergeometry and the structure of periods.

14.8

© Tablet win\$10.

a) Retrieved all Office pos-apps since it was them that screwed up the system last time.

b) Done the same for other irrelevant pos-apps : X-box games, Music players, etc.

* Some vids on MZVs.

C.Dupont 2019 talk @ X-UPS.

H.Gangl 2015 talk @ Cambridge.

- Fixed porte-plume cap with glue and black duct-tape.

15.8

© Android P9.

Pulled from z-lib some books on moduli of alg var :

1) S.Mukai "Moduli of alg var" 2002 Nagoya courses.

-> The motivic version of that book should actually give stratifications by motivic galois

(sub) grps that might answers all the current cjs on MZVs.

2) Gieseker Gokhale "Moduli of alg curves" 1982 Tata Lectures.

-> Expository monograph on Deligne-Mumford projectivity thm of moduli of alg curves

of a given genius in the footsteps of Mumford famous lectures in India.

- Some motivic investigations on how to catch motivic Galois grps; from representation (or tanakian) side of the theory through invariant (under [finite] grp actions) sub algebras of finitely generated algebras.

© Debian Buster Lenovo.

Looked in vain for some exe (notepad++ and miktex) on usb sticks and win\$8 partitions :

Two lexars (8G 16G), and Cibox (8G) : a lot of multi redundancy of archives.

-> Those data should be optimized if some time is found for that.

Win\$8 partitions.

-> The main part should have a disk sweeping (tmp folders bloat).

© Tablet win\$10.

So redownloaded ffox, notepad++, geany, and miktex.

Reinstalled them from admn account.

=> Installation in user account would have been wiser.

16.8

Morning 7h15.

- Some paper notes investigating a motivic version of Mollien thm :

a) confirmation of the preceding intuition of its possible extension to infinite grps in wkp/research papers after a quick Internet search (extension to infinite grps through Haar measures).

b) Interpretation of this extension in terms of mean value along a family of grps.

c) Lift to the motivic framework.

- Some investigations on hypergeometric cplx function spaces : found only cplx analysis articles (mostly indians) on Hardy spaces.

® Some introductory papers of C.Dupont on motivic MZVs from X-UPS talks.

-> Same clear style as J.Fresan X-UPS talks on periods : the targeted audience is UPS.

® Some jp research papers and books : Hanamura, Mukai, etc

•
-> Mukai book on moduli is a must read.

17.8

® On Teichmuller theory : Collas-Maugeais paper on Galois theory of moduli of marked spaces
Pierre Lochak/Leila Schneips overviews. (2012).

© Tablet Win\$10.

Checked system wide install of previous softs.

Tweaked update settings : retrieved automatic update.

In case of future os-upgrade to Linux : booting from a usb stick.

Settings -> Update & Security -> Recovery -> Reboot options.

- Rambled a bit around the www.

Noticed some trends among a minority of researchers :

Phd/chasse de research funds -> Squats de departements /chasse de research post-phd funds puis ensuite chasse de publishing collabs for bloating journals around the world ("feeding the beast").

The publishing bloat should be reconsidered : I would rather qualify it as a "spam" activity; publishing plethore of (discutable) papers; just to publish and "gain" career/social status pts; to become a future referee of those journals...

To me, this contributes to the general inefficiency of maths in solving its deep conjectures : compromising attitude for/by "social" corruptive immiscions.

For people who are supposed to be driven by clear neat structures unveiling; this dark-chaos generating attitude (contributing scarcely to big break-throughs and even preventing progress) is a nonsense.

==> A refoundation of maths activity is in need : a new e-quantum-AI-Bourbaki; the "big quantum AI-mathematician" authority.

- Some typos in search.txt.
trivilaization (burgos).

18.8

© Shelly Manber slides on Brauer-grps.

"Since $\text{Br}(-) = H^2_{\text{et}}(-, G_m)$, it is a contravariant functor. For any morphism between two schemes, say $\bullet : X \rightarrow Y$, we denote by $\hat{\bullet}$ the corresponding map of Brauer groups, i.e. $\hat{\bullet} : \text{Br}(Y) \rightarrow \text{Br}(X)$.

Proposition 3.1. Let $A \in \text{Br}(X)$. Then we have the following commutative diagram:

Proof. The exactness of the bottom row is highly nontrivial. It relies on class field theory and can be found in [Ser79]."

20.8

- Some paper notes on :

a) MZVs structure : motivic Hopf Algebra. Since coming from genus 0 curves motives, they generate a quite algebraically degenerate periods space nearly \mathbb{Q} -linear.

b) Rational points monograph plan : from memoire translation,

1) rewritting it in a more academic way, making it more precise and less speculative;

2) retrieving controversies of non maths parts : future of maths activity and maybe bio.

=> Eventually put that in appendix.

3) Adding stable criterion proof (elaborated last winter in dec 20 - feb 21) for plane alg curves of genus > 1 from Faltings finiteness thm, plus bonus on Fermat quick "proof" from folklore cj on alg ind of odd-zeta values.

==> The GPC is a quite powerfull arithmetic cj; sweeping out an impressive bunch of arithmetic geometry pbs like Fermat one.

21.8

- Continuing Mzv investigations (Zagier wkp).

Some intersection nbers of alg cycles on Hilbert surfaces as Fourier coeff of modular functions attached to them.

© Android phones, DebianBuster Lenovo.

a) Tried to compute MZVs with smartphone apps (maxima, geogebra) : no dedicated function.

b) Then inspected Debian Buster (maths genius, xcas) : no dedicated function.

c) Finally found dedicated functions in pari-gp.
Installed gp-pari doc pkg to have precisions on them.

--> Debian Pkg manager needs repo update : apt-files renaming to oldstable for security updates, Maybe because since 14 Aout 21, Bullseye is the new stable version and not Buster anymore : try either change mirrors locations or names or wait for a few days (servers overload token/queue issue after the release of a new version).

22.8

- Some paper notes on Feb-2021 criterion applied to plane alg curves case using Faltings finiteness; trying to reprove it from scratch upon memories to settle it in brain : the process is actually not as fluent as expected.

© Android P9.

Inspected Maple and Python Pydroid 3 (mpmaths, numpy) apps for Mzvs : nothing but last one has a few basic

special functions implementation (zeta, gamma, etc).

23-24.8.

Late nite to 24.8 (since 10 days, sleepless from 1h30 am till 6h45; waking up @ about 7h15).

© Android P9.

Inspected again Pydroid 3 Python app (sympy, scipy) for Mzvs : nothing but both have exhaustive special functions implementation (Airy, Beta, Bessel, Eta, Gamma, Zeta, etc) as oppose to 'numpy , mpmaths) who has only very basic special functions implementation..

- Some paper notes precisising proof of stable criterion applied to plane alg curves and Motivic framework of Mollien thm (16.8).

==> Nested process or recursion applied to motivic grps spaces.

- A bit of physical Tetris to bring-back maths-books around desk; as they were in past maths-era before the 2009 black-out; moving away others ones (chemistry, physics, etc).

® Reread some parts of Huber, Mueller-Stach, Periods of Nori motives book.

=> One main pt of this book is the equivalence proofs of the different categories of the realisations of periods.
=> Besides that, historical and state of the art are other pts of interest together with an exhaustive bibliography; with a fair account of Nori papers.

25.8.

Zagier wkp.

- Zagier collaborated with John Harer to calculate the orbifold Euler characteristics of moduli spaces of algebraic curves, relating them to special values of the Riemann zeta function.[8]

Zagier found a formula for the value of the Dedekind zeta function of an arbitrary number field at $s = 2$ in terms of the dilogarithm function, by studying arithmetic hyperbolic 3-manifolds.[9] He later formulated a general conjecture giving formulas for special values of Dedekind zeta functions in terms of polylogarithm functions.[10]

He discovered a short and elementary proof of Fermat's theorem on sums of two squares.[11][12].

* Some vids of Minhyong Kim on Effective Mordell thm in Dec 2020 @ SMRI (Sydney).

" Minhyong Kim: Recent progress on the effective Mordell

thm. @ Sydney Mathematical Research Institute - Dec 8, 2020 SMRI Algebra and Geometry Online.

Abstract: In 1983, Gerd Faltings proved the Mordell conjecture stating that curves of genus at least two have only finitely many rational points. This can be understood as the statement that most polynomial equations (in a precise sense)

$$f(x,y)=0$$

of degree at least 4 have at most finitely many solutions. However, the effective version of this problem, that of constructing an algorithm for listing all rational solutions, is still unresolved. To get a sense of the difficulty, recall how long it took to prove that there are no solutions to

$$x^n+y^n=1$$

other than the obvious ones. In this talk, I will survey some of the recent progress on an approach to this problem that proceeds by encoding rational solutions into arithmetic principal bundles and studying their moduli in a manner reminiscent of geometric gauge theory."

=> Arith Top framework. Grothendieck Teichmuller theory.

Slides of same talk @ AWS March 2020 give good overview and heuristic insights from clever "debroussaillage" of theories.

=> The orator leaves the road of Classical/oldschool Arithmetic Topology to take the direction of the fashion and trendy theoretical physics spaces (Mirror symmetry; BF-Donaldson spaces, etc).

© Debian Lenovo.

- a) debian.txt : some cmds for the next upgrade to "bullseye".
- b) Synced articles with P9 srcs (not books).
- c) Got back to ipython exploring special functions module (named "special") docs through contextual help : sympy and scipy seem to share the same exhaustive special (function) module.
- d) From checking Minhyong Kim expls given in his slides.

Some primes nbers investigation in gp-pari :
rediscovered this comprehensive nb theory soft, having
even ascii-plotting capabilities.

β) Some plots of elliptic curves in genius-maths tool.

26.8

Again, no sleep; so done some books repos syncing :

© Android phones.

a) bt-synced P9 and A806 (the latter has less files).

then

b) synced P9 and g-drive : 258 items = 840.5 MB.

© Debian Lenovo.

Starting sorting usb-sticks data.

a) LeXar 8g.

```
total 40
drwxr-x---+  3 root  root  4096 Aug 26 13:36 ..
drwxr-xr-x   3 hui   hui   4096 Nov  6  2018 Debian9_4
drwxr-xr-x   7 hui   hui   4096 Sep  1  2018 Win8
drwxr-xr-x  10 hui   hui   4096 Sep  1  2018 P9
drwxr-xr-x  11 hui   hui   4096 Sep  1  2018 A806
drwxr-xr-x   5 hui   hui   4096 Apr 15  2018 Mint18_3
drwxr-xr-x   2 hui   hui   4096 Jul 10  2017 LOST.DIR
drwxr-xr-x   7 hui   hui   4096 Oct  8  2015 NotePro
drwxr-xr-x   5 hui   hui   4096 Aug 30  2014 HPN
drwxr-xr-x  10 hui   hui   4096 Jan  1  1970 .
```

A806

Mostly innocent files from automn 17 up to winter 18, not that much; with whatsapp ones.

P9

Idoine, whatsapp.

NotePro

Idoine, nearly nothing except archive of q audio.

Mint 18-3

Idoine : nearly nothing.

Debian 9_4

Idoine, plus meca imgs.

HPN

Idoine except dropbox, msnetmp, fujitsu.

Win 8

The heaviest from 2013 to 2018 : lots of data of the meca era, evn, plus computer (casio, oldpcs, etc), freecad, electronics, some maths, wechat.

==> Removed suzuki.pdf redundancies. Space available = 2.5Gb.

==> Since it is laggy on usb-3 port and was intensively used in r/w during that period, Avoid it for future heavy/critical storage.

b) Cibox 8g. Remain 2.7 Gb.

Seems to be a clone of Lexar 8g, except Win evn dbs.

Has permissions restrictions : only r (no w).

=> Confirm comparison (diff) and Copy those dbs to Lexar 8g.

=> Then format it.

c) Cibox 4g.

Empty.

d) Lexar 16G. Remain 2.7 Gb.

Seems to be the most complete and recent; resembles Lexar 8g except SDA and Debian 10.3.

==> Compare (tree structure then files) with Lexar 8g.

==> Remove heavy files redundancies then keep it with Lexar 8g.

-> SDA/Documents/Maths and P9/Documents/Maths have a lot.

total 92

```
drwxr-x---+  3 root  root  4096 Aug 26 14:55 ..
drwxr-xr-x   4 hui   hui   8192 Jul 21 18:48 Debian10_3
drwxr-xr-x   2 hui   hui   8192 Jul 18 08:48 LOST.DIR
drwxr-xr-x   3 hui   hui   8192 May 16 19:32 SDA
drwxr-xr-x   2 hui   hui   8192 Jan 21  2021 System Volume
Information
drwxr-xr-x   4 hui   hui   8192 Nov 21  2020 Mint18_3
drwxr-xr-x  11 hui   hui   8192 Sep  1  2018 P9
drwxr-xr-x  11 hui   hui   8192 Sep  1  2018 A806
drwxr-xr-x   3 hui   hui   8192 Jun 20  2018 Debian9_4
drwxr-xr-x   3 hui   hui   8192 May  9  2018 Win8
drwxr-xr-x   5 hui   hui   8192 Aug 30  2014 HPN
drwxr-xr-x  12 hui   hui   8192 Jan  1  1970 .
```

α) Retrieved HPN dir.

β) Full sync with P9 (books) & Debian (TeXtes, articles).

==> Recheck redundancies since TeXtes of Debian contains already archives of other devices; the way to get around those checks about redundancies (from recursion effect of cross archiving through devices) is to maintain a single archive or db file.

=> Remain 4.1 Gb.

- Some paper notes on Arithm topology heuristics, some computation investigating rational pts then integer pts of elliptic curves defined over Z ; of yesterday.

From finding Q -pts on a non projective cubic (degree 3) to finding Z -pts on a projective sextic or bi-cubic (degree 6).

27.8

© Checked availability of LeXar 16G in P9 with OTG, Debian and Android TV.

On Android TV :

® Alexei Skorobogatov Torsors book.

--> Formal intro and his counter example to Brauer Manin criterion on Bi-elliptic surfaces; using a witty mixture of classical alg geom (resultant, determinant, etc) and the theoretical heavy machinery developed in the first chapters.

--> This book can be viewed as a comprehensive deployment or developed-settling of the corresponding Brauer-Manin criterion ctrexample paper.

® On Android P9 (late nite early morning 4h30 am).

Two books with good insights intros.

1) Hulsbergen "Cjs in Arith Geometry" 1992 : mainly class field theory and L-functions.

From classical nber fields to motivic L-function.

2) Borceux Janelize (be : Louvain?) "Galois theories" 2001 on Galois Theory.

From classical Galois grp of solving alg equation, to Galois field theory;
to Galois cohomologies then to motivic aspect to finally end with the highest panoramic view of category theories (toposes).
Mentions A. Magid.

Late nite.

Claire Glanois 2017 talk on Kummer zetas values or primitive root (μ_n) zeta values periods @ MSRI Periods and Galois theories seminar.

She relates the motivic structure underlying basic relations among those nbers (Q-linearity, Shuffle, stuffle, etc); the goal is to use Hopf co-apparatus of the motivic structure of their motivic lifts to find out patterns/sketchs relations and then pull those downto alg/lin relations "in the real world" of cplx nbers.

--> Kummer periods are twisted extensions of classic MZVs.

24h Sleepless.

© Glanois Claire (*) phd thesis.

(*) X, phd P6 under F.Brown, Post-phd MaxPlanck, Usa, CN now but in cs (AI neural net).

In accordance with yesterday MSRI vid, insights in intro.

© Debian Lenovo.

Dist upgrade From Buster to Bullseye (last was 11.20).
 Waited that family gone before using full bandwidth of router : avg 600kb/s with max speed=820 kb/s. Whereas P9
 Gsm bauds : avg = 2.5mb/s with max @ 4.8mb/s

Updated sources.list repos a few times before getting no quirks with apt-update.

Added proposed-updates repo entry.
 Done update and upgrade of current Buster.

Updated source.list repos to Bullseye entries.
 Then updated and dist-ugrade to Bullseye.
 -> About 1h for whole process.

A bit harsh on hdd : a latency of one week between current

update and next dist-upgrade would have been better.

Now Bullseye installed, slicker than Buster, but still a bit outdated. For example :

Geogebra is 4.0 whereas last version available is 6.0.

Mozilla ffox (although faster) is 78.x whereas last version available is 91.y

Relaunched chromium, but got sync quirks.

29.8

Again almost 24h sleepless.

- Sorted Aout paper notes.

© Debian Bullseye.

Inspected distro new version of softs, most of low latency ones are still a bit outdated; but high latencies ones (open scad, etc) are up to date.

Retrieved ffox ext "dark reader" since found a way to get black layout in settings.

Retrieved amz ext in both ffox & chromium.

© Android P9.

Updated most of main apps.

© Tablet Win\$10.

Retrieved ffox "dark reader" and amz ext, retrieved amz ext also in chrome.

- A bit a sorting e-stuff around pcs.

30.8

Slept 3h45.

© Tablet Win\$10.

a) Entered UEFI ("bios") : Megatrend (UpperLeft corner key) fo find a way more comprehensive menu compared to previous (now legacy) bioses.

Retrieved "quite boot" to spot boot infos.

b) Some automated plots of integral cubics in Geogebra 6.0

c) Fixed after a long struggle quirks on dates.txt; from early morning sync both in Free and g-drive : gncntns scrambling usual rasr.

© Debian Bullseye Lenovo.

Inspected ipython, and Sage; noticed a quirk after triggering Sage from launcher of main xfce menu (it may be a check pt issue).

Python version used by both Sage and ipython is now 3.9 (it was 2.7 previously in buster).

- Noted on paper files redundancies to be cleaned-up.

1) memoire src files (img) both in P9 and Debian Textes/TeX dirs.

2) motifs and periods dirs : since motives and periods are

quite interlaced; redundancies
are numerous.

3) 16g usb-stick : since its contains all boxes backups;
with some boxes-backups containing backups from others
boxes.

® Some news articles about maths trends.

https://www.lepoint.fr/debats/aux-etats-unis-les-mathematiques-en-peril-28-08-2021-2440483_2.php

https://www.lepoint.fr/high-tech-internet/hypermind-quand-les-ordinateurs-deviendront-ils-bons-en-maths-23-07-2021-2436555_47.php

31.8

Slept 4h.

© Tablet win\$10.

Move it away from maths books, to the left part of desk.
Reset big usb-hub kbd and mouse.

® Begining of P.Deligne 2012 Bbki seminar paper on $(2,3)$ -
Brown MZV thm.

--> One of the must read Bbki seminar paper.

* Minhyong Kim talk on Effectiveness of Mordell with
arithmetic of 1-bundles.

Selmer grps enters this category ; as defined by kernels of localization maps involving principal bundles on/of elliptic curves; one interest of those Selmer grps is that they are effectively computable (p prime).

A lot of Arithmetic pbs can be formulated in terms of the study of the imgs of maps involving principal bundles.

1.9

© Linux Lenovo.

a) Synced note txts with P9.

b) Updated current Mint 19.

From 19.1(Tara) to 19.2 (Tricia) to 19.3 (Ulyana).

Tricia
 ffox is 91.2
 Updated chrome : 86.3.

Ulyana.
 python is 3.6
 Inspected soft repo : mintstore Geogebra version is 4.34
 as Debian bullseye. Geogebra.fpkg (flatpak) is 6.0 but the
 tgz.archive weights 650Mb and then a huge 2.3Gb when
 deflated.

c) Tried to upgradet to 20.1 Ulyana; done a simulation
 with mintupgrade.
 Some minors quirks with too new version of 3 pkgs, one of
 wich is
 a dummy pkg

d) Compared some Bauds to theoretical :

USB.
 1.0
 1.5 mb/s

1.1
 13 mb/s

2.0
 480 mb/s

3.0	3.1	3.2
5gb	10gb	20gb

4.0
 40gb

-> This may explain asymetry :
 type A is 2.0
 type C is \geq 3.0

ISA

VEISA

PCI

PCIe (1.2.3.4)

4-8-16-32-64 lanes (bus width).

PCIe 4.0

largest bus width gives a max bauds of ~ 50 Gb/s.

AGP

- Some paper notes in small notebooks.

Back to basics : integers [gcd, pts on cubics : surfaces and curves (elliptic)].

- Some Physical Tetris : swapped maths and pc books of right desk.

- Sorted a folder of paper book photocopies :

Hulsbergen "Cjs in Arithmetic geometry" Birkhauser;
 Kulikov "AlgGeo III" (Russian EMS) Springer; Lawden
 "Elliptic integrals" Springer; Mordell "Diophantine
 equations" A.P, etc.

2.9

© Linux Lenovo Mint.

Logged as admin; redone simulation upgrade to 20.1 Ulyana
 : same minor quirks with 3 pkgs versions.

Tried to fix it with mintupdate menu (downgrade foreign
 pkgs) : not working but found out it is possible to fix

those with synaptic (downgrade the requeststed pkgs).

-> Another way may be to wait a few days to let dependencies refresh.

© Win\$10 Tablet.

Moved it again to right desk ; but was unable to use it with bt input-devices , found out that bt was missing in system settings from a lacking of bt-intel drivers.

What a pos of os. Had to ramble to find out how to fix this drivers missing.

Then voice assistant output kept flooding a msg loop : this win\$10 on this device is a real catastrophe.

=> Nearly punched and slamed the device across the room : what a pos-os.

=> Since bt was fine last time : the question is to find what did append to the drivers.

=> Drivers issue : after accelerometer (bad win\$10 auto update, that broke the wholesystem down) this is the second driver issue.

=> By wanting to make an autonomous-os (system auto-update : drivers, security, apps, etc) supposedly easing user lives; a totally pos-unstable os is released :

3 system breakdowns for win\$10 in about 6 months in this device : compare that to Gabel Linux Debian with 0 breakdown in about 20y of intense use. No comment.

=> This may also be a us-strategical tactic : us-os scrambling chinese brands devices to turn consumers away from those and bring them back to usa brands (hp, dell, apple, compaq, etc); those being more shielded against such issues.

=> e-Overall gncn rasr : goal of gncn; scrambling to generate rasr of a3ml, downgrade targets/keep backward.

- However, managed to write down some maths notes on moduli of varieties, on how their study tends to corroborate or recover a recursive/nested process pattern.
- Some Physical Tetris : continuing swapping maths and pc books of right desk.

4.9

© Android P9.

a) Tried some os and coding apps.

b) Both Linux UserLand and Compiler apps seems to be clients connecting (via ssh) remotely to servers who actually run the "wanted" prgs and send back outputs. => sophisticated ssh clients, like remote desktop management apps; or Linux graphic clients (a graphic-client that connects to a remote Xorg server).

c) Sorted imgs folders a bit.

- Fixed and tested 2 ink pens : mediocre and untidy, compared to normal pens.

- Managed to quickly write 5mn maths on paper notes on moduli :

- lifting a variety up-to a moduli, pushing (by slicing it with a section) a moduli down to a variety.
- basic integers arithmetics.

5.9

* Minhyong Kim Dec 20 Sydney talk.

p57-sq.

Arithmetic principle bundles.

==> Link to torsors?

© Linux Mint Lenovo.

Upgraded Mint from 19 to 20; gradually from 19.1(Tara,) 19.3(Tricia) to 20.1(Ulyana).

Quite lengthy process more than 2h (Debian < 1h with ... much more pkgs installed).

The download bundle was about 1.5Gb, whereas Debian Bullseye was about 750mb.

Switched mirrors from LinuxMint (usa) to ircam (fr) ones to get better bauds.

Tedious process, quite harsh on hdd; after trying to fix some quirks of mintup(date/grade), that forced numerous apt-cache loads/remove/reloads.

Repos are now pointing to ubuntu servers.

ffox is 91.02.

- Bought some paper stuff @ Action P.
- Wrote down on paper the right procedure for future Mint upgrades.
- Also managed by the way to write in a hurry 5mn of maths, precisising some pts of process for definitive answers about some Q-pts issues.

6.9

© Debian Linux Lenovo.

® Pulled some articles and the update (10.20 to 04.21) of ColliotThelene-Skorobogatov book on Brauer-Grothendieck grps.

==> After a diffing the update seem to be the same as the first one.

7.9

Day : done a whole maintenance for the GS 500; cleared its corner a bit; as well as red trolley to put tools and parts.

Done also maintenance of compressor : drained residus out.
 ==> Brain refreshing efficient session doing something
 totally different (matter paradigm against world of ideas
 and concepts) : it really helps to gain perspective on
 math deep thinking.

Nite

© Linux Lenovo.

Inspected grub; both Debian & Mint have 3 kernels
 available but surprisingly
 Debian ones are much more up-to-date : nearly last
 available ones about 5.10;
 Mint about 5.4

Noted them on paper carf notepad.

8.9

- Some paper notes again on moduli; the p -adic world
 (geometry, topology, topological ring structure) : what
 weird spaces are those \mathbb{Q}_p . Local-Global principle.

© Debian Linux on Lenovo.

Found ways to dark customize ffox, pocket; as well as
 chrome, keep, gmail.

--> this releases screens stress on eyes.

Noticed how both browsers were heavily draining cpus;
 chromium more than ffox.

- Noticed also that links on blogspot "about" page were
 missing.

--> This may reveal either security flaws on Google
 blogger (surely api related or from

dynamic pages rendering engines; "cgi" like issues) or security breaches on smartphones likely cookies session-tokens sniffing.

9.9

® Pulled some good articles on arXiv on Q-pts (mathematicians rentrée?).

a) Wittenberg Harpaz on RC intricacies related to Schinzel hypothesis.

b) D.Loughram Abkari, etc; on Serre cj about Q-pts of conics.

Most are collected works ≥ 4 authors :

1 or 2 with academic status; the others are "outcasts" with gmail addresses.

W. McCallum, W. Stein, J. Voight, Rational and Integral Points on Higher Dimensional Varieties. Lecture notes for ARCC workshop held at AIM in Palo Alto, December 11-20, 2002. <https://aimath.org/WWN/qptsurface2/>

- Again wrote some paper notes on using periods moduli to get stratifications conditions of most Q-thms hypothesis.

$(V/V(k)) (k) = \emptyset$.

11.9

- Some paper notes on criterion applied to plane alg curves.

12.9

- Continuing paper notes on criterion applied to plane alg curves; in the foot steps of last winter ones; found out an issue about getting enough real alg pts : fixing it might need conditions on oddness of degrees (relative to variables or absolute) of the curve.

© Restarted Debian Sarge Gabel.

I) Reread notes.txt of 2008 : contain deep insights; some of the present 2021 come-back ones are resurgence of those past-era ones; pity is the lacking of the last versions of those txts remaining in the stuck hdds.

=> Think of salvaging those with learning deeper techniques than previous ones.

II) Sorted some src files (mostly mid'00s) :

Thesis folders contains good intros with insights.

a) Azaiz (Zagier) on Modular forms : they have Q_- -Taylor developpements @ CM pts.

b) Cali (Kraus) on Fermat quartics : even this small degree 4 case is intricate.

c) Some articles of Serre; notably for societies (AMS, Gazette)+ the historical GAGA one.

d) A ps.gz paper of Connes-Marcoli on motives and renormalization.

© Debian Linux Lenovo.

Explored Sage resource from online manual :

Has comprehensive routines for arithmetic geometry; mainly oriented towards elliptic curves (schemes, hyperelliptic-curves, etc); ellipticcurves routines are impressive : the soft computes instantally ranks of elliptic curves /Q (I guess, using a database).

"In Sage, an elliptic curve is always specified by (the coefficients of) a long Weierstrass equation

$$y^2 + a_1 xy + a_3 y = x^3 + a_2 x^2 + a_4 x + a_6.$$

INPUT:

There are several ways to construct an elliptic curve:

* "EllipticCurve([a1,a2,a3,a4,a6])": Elliptic curve with given a-invariants. The invariants are coerced into a common parent. If all are integers, they are coerced into the rational numbers.
"

Noticed that text-console uses ipython; whereas the last tested ones was jupyter based (i guess).

© Win\$8 Lenovo.

Restarted it from grub with the "exit" trick.
 Done a system clean : retrieved about 1Gb (mainly win\$8
 update files; hopefully not
 the ones for the 8.1 upgrade).

13.9

- Continuing paper notes on criterion applied to plane alg curves : considered Chow grps for extensions of classical lines sweeping technique.

® Read P.Vojta article of Trento summer 91 seminar : mixing diophantine approximation with arithmetc geometry and complex analysis; good example of the term "arithmetico-diophantine geometry", coined in memoire. Starting up with historical (Liouville, Dyson, Roth, Siegel) finiteness thms on diophantine approximations of alg nbers by \mathbb{Q} -pts, and Thue integral finiteness thm (1909). Then Siegel discrete ones on integers matrices. Introduces index weighted variables : variables are sorted this way; by weighting them.

© Debian Linux Lenovo.

a) Found out how to tweak xfce :

```
~/config/xfce4/panel/launcher-9$ cat 15243330191.desktop
```

```
[Desktop Entry]
```

```

Version=1.0
Type=Application
Exec=exo-open --launch TerminalEmulator
Icon=utilities-terminal
StartupNotify=true
Terminal=false
Categories=Utility;X-XFCE;X-Xfce-Toplevel;
OnlyShowIn=XFCE;
Name=Terminal Emulator
Comment=Use the command line
X-XFCE-Source=file:///usr/share/applications/exo-terminal-emulator.desktop

```

b) Sage session

Relaunched browser interface : as in last Buster, it is based on Jupyter. Done some elliptic curve tests.

```
E=EllipticCurve([1,2]), E, rank(E);
```

- Finally finishing with some written paper notes.

14.9

- Continuing investigating Chow grps; I would call those "pre-motives".

Extract from wkp :

"The theory of Chow groups of schemes of finite type over a field extends easily to that of algebraic spaces. The key advantage of this extension is that it is easier to form quotients in the latter category and thus it is more natural to consider equivariant Chow groups of algebraic spaces. A much more formidable extension is that of Chow group of a stack, which has been constructed only in some special case and which is needed in particular to make

sense of a virtual fundamental class.

History[edit]

Rational equivalence of divisors (known as linear equivalence) was studied in various forms during the 19th century, leading to the ideal class group in number theory and the Jacobian variety in the theory of algebraic curves. For higher-codimension cycles, rational equivalence was introduced by Francesco Severi in the 1930s. In 1956, Wei-Liang Chow gave an influential proof that the intersection product is well-defined on cycles modulo rational equivalence for a smooth quasi-projective variety, using Chow's moving lemma. Starting in the 1970s, Fulton and MacPherson gave the current standard foundation for Chow groups, working with singular varieties wherever possible. In their theory, the intersection product for smooth varieties is constructed by deformation to the normal cone."

- In continuation of Vojta 1991 Trento paper on how complex analysis techniques may apply to arithmetico-diophantine geometry; read a bit "Topics in Nevanlinna theory" of Cherry-Lang : Covering space; looking for uniform bounds of their ramification degree.

==> Degree. To be related to my preceding paper notes on (alg) pts on alg curves/ \mathbb{Q} ; where the degree was enough to get a bound and an attained limit of the increasing series of nbers fields generated by the coordinates of the intersection pts of the curve with different families of sweeping \mathbb{Q} -lines (paramatrized by $\mathbb{Q} : (\text{the } (0x_n) (0y_n), \Delta(tn); \text{ with } x_n, y_n \text{ and } t_n \text{ in } \mathbb{Q})$ in a fibrations/ \mathbb{Q} -intersection process.

15.9

- Fixed with skin cream + tape, Arithmetic Geometry Trento Springer LNM book "froissées" pages from jamming it in a backpack with grocery food pkgs.

® Scrolled quickly golden-age small paper nbooks of 1990-1995, when aged 19y-24y.

Fermat : 04.1993 -> 07.1993

Premises genesis of criterion in δ -form : 07.04.1994 and 07.09.1994.

First mention of Motives : 14.7.1994 in a query.

- Some paper notes on elaborated form of criterion : periods space and stratifications.

Choosing the right electrolyte space to dip the studied variety into; and how the period functor (=functor/function/map) maps it to another space of same nature as the initial studied variety ambient space (a k^s ; with $s=r+m$; r space of fundamental periods; m "discrete periods" or integers invariants); how the periods functor allows to stratify the electrolyte space; giving the space of candidate varieties (not) having (non trivial) Q -pts as peculiar strata (liquid phases). In a recursive way a classifying process may also be applied to those classifying spaces of periods since they are of the same nature (live in the same category) as the varieties that they were built from.

Finding pts of transcendental varieties that are alg dep / Q .

16.9

- Some 2mn paper notes morning.
- Short 100km GS500 ride : whole afternoon.

© Android.

A) Linux Apps ports.

-VimDroid : vim port that has a LaTeX ide-addon.

-PariDroid : gp-pari.

B) Malwares.

P9 : Repondeur spams +3318830736, seems to send stealth sms.

Android TV : the same ads pops up in all 3 browsers.

17.9

- Some 2mn paper notes morning.

- Out whole afternoon.

Bought some paper nbooks @ Action P.

18.9

© Debian Linux Lenovo.

Formatted UTF8.txt

- Continuing paper notes on :

a) series of nber fields generated by coordinates of intersection pts of sweeping Q-lines with an alg Q-curve.

b) stratification by periods : intersection of alg Q-var with transcendental part inside polyhedron-domains defined by discrete periods part from constraints on discrete invariants required by (Q-thms) hypothesis .

* Some vids from Orsay center.

a) LeGall (Yor, Dynkin, Jenkins) on Brownian Motions (graphes, marches et arbres aleatoires)

b) Raynaud and Bourgeois on Geometry (Alg and Symplectic).

® Wkp entries.

a)GeoAlg AlgGeo.

Late 2h30

b) Geometric Algebras : Clifford algebras (uses in theoretical physics) gathering both scalar and vectors of vector spaces, together with products of those (vectors*vectors, usual scalar*vectors, etc).

c) GeoArith ArithGeo.

d) Faltings thm.

e) Soren Arakelov : another Shafarevich student;
brilliant, but got personal issues.

® E.Bombieri, "On Mordell conjecture" Ann of Pisa Scuola Superior 1991 (~ fr "Ann de l'ENS").

Scrolled begining of proof of Faltings thm.

Simplifiying Vojta 1989 one : no sophisticated Arithmetic-Geometry intersection theory; that is, no Gillet-Soule Riemann-Roch intersection theory nor Arakelov theory.

But using rather classic ones :

a) Height stuff : Dyson, Siegel, etc.

b) Divisors (diagonal): Mumford, Vojta.

20.9

A.Parshin 1970 IMU presentation is the only paper read so far that gives precise requirements (non constance over field extension) for Mordell cj (Faltings thm).

=> 1950-1975 : serious (russian) maths.

21.9

© Android.

A) P9.

a) Termux.

Tried to install pkgs (vim), when updating the database got a link issue of "makelink"; then noticed that all pkgs installed since the last mirror swap; give this "makelink" error.

This may come from the fact that those pkgs binaries in this new cn mirror were compiled with/for intel x64 boxes not for arm ones.

==> Try swap again mirrors to see effect on binaries.

Installed by the way man pkg, this one does not quirk as much as vim or ghostscript.

b) Installed Apps.

Vimdroid with a ref manual; then
Paridroid.

B) A806.

a) Plotted some Fermat surfaces with Grapher app.

b) Tried Tinku Tara maths editor : saves eqn in pdf, jpg.

c) For quick tables of values of functions, the other Android Graphing 3d app is a good option; the Casio CP400 also does that quickly, and also P9 Android small Mathematics app.

d) Found a way to get a global darkmode (saving eyes and nrj) : in display menu; there is an invert LCD option,

this requires retrieving all dark-mode options specific to each used app.

e) Sorted.

local : imgs folders, in internal nands this time and not in microsd.

remote : a bit Free and g-drive repos.

f) Browsed nickname in www : seems that left-away pinterest account was hacked by evil/malpeople; hungary black-magic-sorcery-vampire-satanic-gothic-celtic white-supremacist pos crew, I suspect the same crew that scrambled the evn account and its dine note a few years ago. Djlgnctns that are organised in networks acROSS the west : local ones (neighbours teens). Hesitated a bit before considering elaborating a one punch large-scale attack against them : i have no time for this waste of nrj.

C) P9

Consider retrieving heavy app g-sheet.

* Rewatch Vids for Q-pts.

Minhyong Kim.

Yuri Tchinkel.

Andrew Wiles.

Maybe also the Brauer experts :

J.L ColliotThélène; A.Skorobogatov

Olivier Wittenberger.

B.Poonen

And last Q-pts conferences : CIRM, IHP, Banff, MSRI, IAS, etc

• Some paper notes on :

a) Arakelov-Faltings theories for arithmetic finiteness.

b) Arakelov heuristics : Adelic; p-adic or Q_p -geometry.

c) Russian school from Kolmogorov to Skorobogatov.

22.9.

© Win\$10 Tablet.

Sorted maths search g-photos till 02.21.

Customized a bit notepad++ : black mode for eyes and nrj savings.

© Linux Debian-Lenovo Bullseye.

Customized a bit TeXstudio : black mode of windows for eyes and nrj savings.

Created a gp-pari folder.

- Some paper notes :

a) Some typos of mem.tex on a5 paper.

b) a quick proof of insufficiency of the mean-pt requirement alone; as expected considering the already checked insufficiency of only two fundamental periods alone. Robust criterion needs at least : mean pt + 3 periods.

23.9

© Linux Debian-Lenovo Bullseye.

Retweaked TeXstudio (tinkering settings) : black mode of editor/viewer for eyes and nrj savings.

Synced gp-pari folder to P9.

- Some paper notes :

a) Continued fixing typos of mem.tex on a5 paper.

b) on the way; digged about rational/algebraic values of ordinary transcendental functions (trigonometric) from memoire surfaces cases.

c) tackled a bit Fermat periods.

d) continued scheme study in (extending the base field of varieties : both for memoire and about Faltings-Mordell finiteness)

e) Hermite-Minkowski thm; as the nber field case of the Falting-Mordell finiteness thm.

24.9

- Todo.

- a) Extract notes from paper nbooks.
- b) Warn about Maths genius tool "isRational" function.
- Bt is less energetic (bauds & range $\leq 10m$) but more robust against interferences than wifi.
- Verbalisation des theories : fixation cognitive reinforced from involving different neuropaths than the ones involved in writing or typing.
- Lbs@hands : sporty.

25.9

- 7h30 Continuing paper notes on alg geometry and nber fields.

© Linux Debian Lenovo.

TeXstudio :

- New version of memoire, added graphics, corrected typos till criterion statements, bettered structure of statements and titles of parts.

- Tested img insert macro, seems to :
bug a bit with caption.
be able to inserts jpg, png and pdf.

-> Remains subspaces of euclidean. caption : Full cosine powers.

26.9

No sleep.

- Continuing paper notes on alg geometry and nber fields (3h am).

© Android P9.

Looked for "isRational" in gp-pari : nothing.

Looked in maxima : a bunch.

27.9

© Android P9. 4h30 am.

Memoir typos.

$V_K(k) = V(k)$.

$V(0_K)$ integers pts of $V(K)$.

One of the notorious.

The first author name.

From the natural inclusion into the adelic space.

From the already cited theory of torsors.

First de Rham coho grp.

we give it for information describing the process of elaboration.

"digital or computers era".

the criterion must be strenghten to get a more powerfull.

Pythagorean.

- > Put future of maths in appendix.
- > Include new books refs in bib.
- > Retrieve the blue ink.

- Cleared mem folders.

© Tablet Win\$10.

* Yuri Tschinkel vid @ Cheltsov ytbe channel.
Rational pts, curves & varieties.

Looked in vain for the talk slides, so took snapshots of them from vid. In one of these shots @ begining :

" There is no effective way to tell wether or not a cubic surface/ \mathbb{Q} admis a \mathbb{Q} -pt."

- Cleared mem folders.
- Retweaked a bit notepad++ (usine-à-gaz) : black mode o preserve eyes and save nrj.

28.9

© Tablet Win\$10.

a) Tweaked security settings, allowed :

Containers
Sandboxing
App guard.

b) Relunched system updates; but stopped it : everlasting

process.

c) Tweaked Geany to save eyes & nrj, chosen settings :

Dark color theme + Lucida console 10.

Spyder Dark theme + Verdana 12.

d) Grinded USB Type-C adaptator to fit to charger-jack.

© Linux Debian Lenovo.

Installed USB PC-keybd (intl-ru 104-keys) : keystrokes outputs are shuffled.

-> It seems that two kbd layouts can not be used together : one must stick to one unique layout@a time.

-> Just mimick/glance @ Laptop keybd layout to get right keystroke outputs from second keybd.

- Sorted e-stuff under desks : put measure-tools in toolbox.

-> add e-meters and calipers.

https://en.m.wikipedia.org/wiki/Algebraic_set

29.9

® Some articles on Galois :

A) inverse pb.

- a) B.Deschamps, Habilitation (Univ du Maine 72 @ Le Mans) on corps ordonnables.
- b) Les galoisiennes (C.Armana, M.Rebolledo, Lara Thomas) on abelian varieties.

B) cohomologies.

- a) Samir Eksala on $H^3(K)$ for a nb field K .
- b) K.Ribet on representations.

- Wrote some paper notes on

0) A.

1) general mathematics : the issue of infinity.

2) the discrete condition : number of variables of V , $n(V) > d(V)$ degree of V ; and the fact that the first discrete invariant $n(V)$ is intrinsic; therefore not expressible in terms of periods.

30.9

No sleep.

© Linux Debian Lenovo; Sarge Gabel.
 Corrected some memoire typos.
 man bash line 2590
 -> cmd line keyshortcuts.

© Tablet Win\$10.

Found a way to get eyes & nrj saving dark-mode on adobe

files viewers (browsers and yap) : just invert lcd (like a806 option); this needs turning-off specific dark-modes of each app and desktop settings.

- Sorted, cleared e-stuff around desks after rdb kwa : put tools in toolbox; moved paper mails & sticky-notes.
- Some paper notes on schemes; key pts of future monograph versions of memoire.

© Android phones.

Storage is shortening.

-> Optimize : reduce size of imgs, del duplicates or files with light diffs history, compress, cloud push, etc.

-> On the go; reorganize data.

- a) Lift TeX srcs : mem etc.
- b) date in mem.pdfs
- c) Put maths imgs dir in src.

1.10

© Android P9.

Pin-lock Privacy loop (sim + android anti-thief) : seems to heavily sms flood, maybe the remote-managing contacts.

- > Restart phone + stop android privacy daemon).
- > Retrieve its sms permission.
- > Reset it.
- > Eventually stop it.

- Memoire typo : Pythagorean.

© Android Phones.

Internal Nand storage of both phones is shortening.

-> Optimize :

- a) reduce size of imgs,
- b) del duplicates or files with light diffs history,
- c) compress,
- d) cloud push,
- e) etc.

2.10

© Android phones. (late 3h am).

a) A bit of sorting of memoire files in phones and g-repos.

-> Put new date format m210930.

b) Found inverse lcd display option for P9; oddily seems to drain bat.

- Some paper notes on corps valués then posted both updated memoire and research log.

4.10

Again nearly no sleep.

© Android P9.

- Reorganized TeXtes folders by lifting them in tree.

- Sorted a bit repos : Free and g-drive.

-> Think of optimizing devices repos : choose two and synced them, leave others blank, or with tmps.

© Linux Debian Lenovo.

- Put some stickers on ru-keybd but retrieved them : found applet for keybd switch.

- Explored arch dir.

Ⓢ For values of transc function @ alg pts: D.Marques (Br) paper on last available archive. Jawa Jan 2009.

-> Think of structuring them to avoid redundancies from cross devices backups.

-> Choose 2 mains to sync : a device+a stick.

-> One arch folder in one device gathers other devices non redundant file, then synced to stick.

Ⓢ Android TV.

Sorted files a bit.

- Paper notes on adelic spaces, e-history.

0-dim adelic spaces are monsters built from partial products : infinite of Z_p x finite of Q_p are the building blocks.

Multi or higher dim-ones are the adelic varieties built from varieties $/Q$ through bouquets along the same spaces of partial products.

4-5.10 nite.

Ⓢ Turned laptop upside down .

Swapped screens layout : all @ left side to free right part of desk for writing paper notes.

- Sorted Vilette early 2000 notes on paper bookmark pages (marques pages cartonnés).

=> memories : reveal knowledge addiction, taking notes even on subway tickets.

> 5 cardboards spots remains.

-> Sort big one or use bags.

- Some vrb quotes.

redundant knowledge, reinventing the wheel, sticking to mainstream = no breakthrough.

- Talk, Phd or interview defense.
- print intro & conclusion into brain.
- eliminate not purpose data; to not
- overflow audience.
- exercise alone by voice recording.
- focus on audience receptivity

5.10

- Continuing notes on adelic spaces and alg geometry.

® Read some good overviews on Q-pts :

1) A.Sutherland slides of an introductory 2013 MIT course on Arithmetic geometry from a link of wkp Q-pts entry.

2) A.Chambert Loir "LA CONJECTURE DE MORDELL: ORIGINES, APPROCHES, GÉNÉRALISATIONS" fresh arXiv article (Oct 21) on Mordell thm (Preliminary Bkki ?).

6.10

- Made some natural black ink for pens filling cartridges since only blue ones are available in all visited stores so far (Lidl, Auchan, Carf, Action).
- Some paper notes on p-adics, general maths (inefficiency of mathematics in solving its pbs).
- Sorted a bit book shelves (retrieved e-stuff with cardboard boxes, brought back admin papers, etc).

7.10.

Nearly no sleep.

* Yuri Tschinkel "Effective arithmetic geometry" @ Simmons CS Inst.

Begins with a bio of Whittaker, gives a thorough account of research state, mostly from his co-signed articles (Jean-Louis Colliot-Thelene, Maxim Kontsevich, Andrew Kresh, Taklu Bigash, Andrew Sutherland, Booker, etc).

As the last vids, slides are missing so took snapshots.

- Forgot to drink coffee : noticed dual sleepy effect of no sleep+ no caffeine.

© Android A806.

a) Sorted a bit g-Drive A806Photos dir.

b) BT-synced most of maths imgs with P9.

-> Sort imgs in folders :

1) Src = those collected in internet.

2) Search = those produced (snapshots of screens, vids & pdfs ; cas outputs, etc).

- Sorted again a bit books shelves (retrieved e-stuff with cardboard boxes).

® Read a few parts of search.txt that is now becoming huge (about 390 ko, 11500 lines, 400p).

=> Split it into periods.txt like s20092101.txt, etc.

=> Gathered some TeXtes typos:

-> search.txt itself : fonction is endofunction.

-> mem.tex : look for pioneer.

9.10

© Gabel Debian Linux Sarge.

Inspected bash code prgs dirs of coding era (2007-2009) : an install.bz2 (tad.sh) and various bash prgs; like q.sh and ogg.sh (ogg files conversion script).

Ogg files encodings : rates.

1) bitrates from 16kb/s to 128kb/s.

2) Sample rate : 44100Hz, 22050Hz.

=> tad.sh does not catch right times in October : 1 hour shift.

=> q.sh does not show very short surahs.

==> I remember correcting all those bugs in last versions stuck in wrecked hdds.

==> Consider get those back by learning deeper recovery techniques; than the ones tried so far :

==> Build a dust-free box (aquarium, plexiglass, etc); maybe not so urgent since I have opened up all those stuck hdds in normal dusty room place.

11.10

- Begun the long process of collecting piles of notes from paper nbooks (40% done) of this first year coming-back to maths, by type of A4 and A5 nbooks:

- a] blank or no-lines.
- b] lines.
- c] 5x5mm squares.
- d] etc

© Tablet Win\$10.

- a) BT keybd works intermittently : 1/2 attempts; when connected the signal is not correctly sent, since it lags a lot.

-> It may be a battery issue since when a battery pack is plugged to it; it is better.
-> Another trick is to turn it on and off.
-> Seems also to be coupled to a signal issue : the screens around bt-emitters may jam the transmission of bt; those screens acting as shields.

b) Tried wget in PowerShell : does not work correctly; PowerShell seems to lack network binding; but got a notification on it :

" Try the new cross-platform PowerShell <https://aka.ms/pscore6> "

-> Sophisticated Physing?

12.10

- Continued extracting notes from nbooks, stapled some batches.
-> Small paper wasted (1/2 side).
-> Contains non math misc notes : travel, theo.

© Tablet Win\$10.

a) Reset Tablet corner.

b) Installed G-drive app TxT editor (grant access).

c) Extracted Npad & Geany xml.conf files dirs, and zipped them.

© Debian Linux Lenovo.

- Synced notes dir with P9.

13.10.

© Android phones.

- Sorted diary notes folders.
- Synced P9 lastone.txt with Keep, then corrected typos in it.

14.10

- GS500 Bike ride + a bit of maintenance : good brain refreshing reboot.

=> Good brain refreshing reboots through material paradigms :

- a) Bike or bicycle rides + maintenance.
- b) Physical Tetris sorting e, recycle or tool stuff (beit,cave).

- Some paper notes on precise formulation of Faltings thm.

15.10

- Some paper notes on the pair of $\mathbb{Z}[i]$, $\mathbb{Q}[i]$; of Gaussian number field and integers; some others on the basic or fundamental scheme of arithmetic geometry, that is $\text{Spec } \mathbb{Z}$.

16.10

- Continued paper notes on $\mathbb{Z}[i]$, $\mathbb{Q}[i]$; general topology, commutative algebra and applications of those to schemes; with intermittent reflexions on the issue of infinity in mathematics.
- Some physical Tetris swapping pc books with maths ones, on right desk to get close access to them.
- Also enhanced the natural made black ink with some black ink from a small bottle of a printer refill kit : good tip to get about one liter of rather good quality black ink nearly for free.

17.10

- Some paper notes on the basic or fundamental scheme of arithmetic geometry, that is Spec Z .

a) How the 0-dim adelic space or the space of adeles of Q is an "exponentiation" of Spec Z .

b) How all usual schemes are all down-rooted into Spec Z ; making prime numbers the "source" of all day-to-day or standard maths.

c) How all maths can be expressed in terms of maps; giving the key pt of reducing its whole corpus into logic tree-graph theory; a map being determined by its graph (a subset of a src-space \times but-space; or a tree : roots = src, leaves = but ; tree-skeleton or network = map).

© Tablet Win\$10.

a) Same bt-keybd issue : plugging a battery pack fixes it a bit.

b) Used g-drive paired Text editor app to edit last diary.txt in g-drive cloud.

=> Found out that the last saved one @ 2h45 am on A806 was lacking; maybe sniffed by this trojan-phone; like it did for notes about alg ind in early spring; or it may be a breach issue from one of the paired maths apps (those have access to g-drive).

® A fresh arXiv article on Finite Fermat from Jose de Oliveira (br); his articles are often coauthored with

Saeed Tafazolian, an iranian expat in br; maybe in touch with Hussain Mossavati of Impa.

==> The key pt evoked in this paper is the shift of view-pt : the article seeks extremal Fermat varieties; those catching upper and lower Weil-bounds of the number of rational fq-pts; asking for a plan to get those extremal varieties for general families of varieties.

==> I verbally answered their queries; in terms of motivic Galois grps; the nb of rational pts being directly linked to the size of the motivic Galois grps of the studied family of varieties.

=> Wrote it down a bit. Schemification, Betti-DeRham discrete pairing with discrete measures.

=> Add quotes "" and shortcuts in next search.txt :

cs = computer sciences.
 dir = directory.
 vrb = verbally, verbosely.
 trdeg = transcendental degree.

18.10

- Some paper notes along schemification of criterion; trying to figure out the 0-dim case or (nber) fields case; especially periods interpretations in this (nber) fields setting.

© Android A806.

Noticed some quirks when saving A806 to g-drive through

bt-gsm tethering from P9; that

- 1) ftp is not accessible.
- 2) files are not correctly updated in g-drive nor actually transferred.

© Debian Gnu/Linux Lenovo.

In the overall year of getting back to maths; Debian Gnu/Linux not surprisingly ends-up being the best system for maths research tested so far : the most reliable; secured and complete.

19.10

® On hypergeometry, a paper of Fresan-Jossen answering (negatively) a cj of Siegel, on the alg generating of a class of E-functions by a peculiar class of hypergeometric ones.

=> The key pts are :

- a) a category shift towards the spaces of differential operators; stabilizing those classes of functions.
- b) Use of category theory to get the wanted result through a strict category inclusion.

- Some paper notes trying to transpose Siegel result of this Fresan-Jossen paper and the related cj disproof tools (category tool) for Q-pts study :

a) families of varieties having the concerned classes of functions (E-functions and the [generating] class of peculiar hypergeometric ones) as periods.

b) Meaning of the generating class of this peculiar class of hypergeometric ones means in terms of varieties.

c) Sought Gauss-Manin connections :

Connections = Variation of De-Rham cohomology.

From 2007.1387 arXiv paper :

" The Gauss-Manin connection of a family of hypersurfaces governs the change of the period matrix along the family. This connection can be complicated even when the equations defining the family look simple."

© P9, A806 and Debian Linux Lenovo.

- Reset tree structure of Docs folders making Maths one primary.

19.10

- Sorted last batch of paper notes; added a few ones on number fields; and some on schemification of criterion towards fields, showing-up the awaited alg-tr dichotomy; also going towards continuous-grps theory applied to the motivic Galois groups of families of varieties.

20.10

® The beginning of a fresh (= today) article of the indi pair Barghava-Shankar. Those often co-sign papers; mostly on asymptotics relatively to the height of families of elliptic curves/ \mathbb{Q} .

This one treats asymptotics of the moments of the size (cardinal) of the 2-Selmer grps attached to those elliptic curves ; they give an explicit upper bound (15) along the footsteps of a conjecture by Poonen-Rains in the general case (p-Selmer).

There is also a reference to their famous paper on asymptotics of the corresponding ranks.

=> Key pts are :

a) the explicit parametrization of elliptic curves/ \mathbb{Q} given in the beginning by a pair of integers (I,J).

b) the pragmatic explicit "multi-variables forms" approach used by Manjhul Bargava; reminding traditions of the uk-school of arithmetic geometry (Cassels, SwinnertonDyer, HeathBrown, etc).

- Barghava Shankar references.

[25] J. Milnor and D. Husemoller. Symmetric bilinear forms. Springer-Verlag, New York-Heidelberg, 1973. Ergebnisse der Mathematik und ihrer Grenzgebiete, Band 73.

[26] J. Nakagawa. Binary forms and orders of algebraic

number fields. *Invent. Math.*, 97(2):219–235, 1989.

3] M. Bhargava. Most hyperelliptic curves over \mathbb{Q} have no rational points. arXiv preprint arXiv:1308.0395, 2013.

[27] V. Platonov and A. Rapinchuk. Algebraic groups and number theory, volume 139 of Pure and Applied Mathematics. Academic Press, Inc., Boston, MA, 1994. Translated from the 1991 Russian original by Rachel Rowen.

- Some paper notes on

- 1) figuring out the Fourier transform of differential operators found in yesterday Fresan-Jossen paper.

- 2) heuristics for \mathbb{Q} -pts study in the inversion of pt of view : considering varieties catching given pts; instead of studying pts of a given variety.

21.10.21

© Tablet Win\$10.

Put ftp plugin to npad.

® Read

- 1) Some articles in german Documenta on Malher legacy.

2) Analysis Situs an academic site on low dim algebraic topology, in the footsteps of Poincaré, maintained by Henri de StGervais a polycephale Poinbaki or Bourcaré of Lyon region.

- Last two days : wrote a fairly large amount of paper notes something like 40p.

=> Next search.txt :
Add UTF8 section and quotes.
Plus other abbrev shortcuts.

22.10

- Last two days : wrote a fairly large amount of paper notes something like 20p.

® Read some foundational articles.

- MATHS INCONSISTENCY.

Inconsistent mathematics is the study of the mathematical theories that result when classical mathematical axioms are asserted within the framework of a (non-classical) logic which can tolerate the presence of a contradiction without turning every sentence into a theorem. Jul 2, 1996

Inconsistent Mathematics <https://plato.stanford.edu/entries/mathematics-inconsistent/>

<https://plato.stanford.edu> > entries > mathematics-inconsistent...

About featured snippets

-

Feedback

People also ask

What does it mean that math is inconsistent?

Inconsistent mathematics is the study of commonplace mathematical objects, like sets, numbers, and functions, where some contradictions are allowed. ... A contradiction is a sentence together with its negation, and a theory is inconsistent if it includes a contradiction.

Inconsistent Mathematics | Internet Encyclopedia of Philosophy

[https://iep.utm.edu > math-inc](https://iep.utm.edu/math-inc)

Search for: What does it mean that math is inconsistent?

What is mathematical consistency?

Search for: What is mathematical consistency?

What is mathematical consistency of a model?

The semantic definition states that a theory is consistent if it has a model, i.e., there exists an interpretation under which all formulas in the theory are true. This is the sense used in traditional Aristotelian logic, although in contemporary mathematical logic the term satisfiable is used instead.

Consistency - Wikipedia

[https://en.wikipedia.org > wiki > Consistency](https://en.wikipedia.org/wiki/Consistency)

Search for: What is mathematical consistency of a model?

Is math ever wrong?

Mathematics certainly can be wrong in that a mathematician presents a faulty theorem with an error in its proof, and it passes the scrutiny of peers and is commonly accepted as true. Of course after a time the error will be found and the necessary corrections made.

Is Mathematics always correct? - Philosophy Stack Exchange

23.10

2h30 am.

* Yuri Tschinkel on Rational varieties and pts.

Important pt developed with Kontsevich
G-varieties or varieties equipped with a grp action.

© Cloud.

Side data to consider when refreshing memory.

a) Google : books, keep, photos, drive, ytube, etc.
4gb of 15gb

b) Ebn : notes.

c) Mozilla : Pocket.

d) M\$: One drive, notes, photos, etc.
645mo of 5gb.

- Sorted a bit last days paper notes.

24.10

© Debian Linux Lenovo.

2ham Updated mem.tex

- Corrected a critical typo p27 and some minor ones.

Morning

- Rewrote some passages, added an appendix part; structured it with sections; moved controversial future part into one of them.

Afternoon

- Forest intensive vtt ride : steep muddy climbs, bulbs collects.

- Finished sorting last days paper notes.

25.10

© Helped dig trench outside for optic-fiber, then retrieved old isp-box; installed new one that has less functionalities, in first floor : so no more usb-charging station, nor reliable wire rj45 connections (android tv;

Laptop) any more.

-> Wireless signal is weak upstairs @ east corner.

-> P9 gsm tetherings (bt,wifi) are better.

Late nite (2am).

* Yuri Tschinkel. Rational geometry @ Andrei Cheltsov
ytube.

Equivariant (birat) geometry :

classification of conj classes of finite subgrp of
 $\text{Bir}(\mathbb{P}^n)$,

the variety of equivalence classes of birational var as
the Cremona grp (subject of Chelstov book).

Equiv birat types (Kontsevich, Kresch, Tschinkel).

G-inv variety.

V-U : boundary.

26.10

© Debian Linux Lenovo.

Updated :

a) mem.tex correcting typos.

-> make it more precise to figure out possible hidden
flaws; by giving details steps of assertions.

-> typo : memoire (end).

b) search.txt : 12700 lines, about 440p.

27.10

3am

* Yuri Tschinkel. "Rational geometry : \mathbb{Q} -pts and varieties." @ Andrei Cheltsov ytube.

-> Took last snapshots : pushed them in g-drive.

Cremona & Burnside grps.

Modular symbols coming from discrete grps attached to modular forms. Hecke Algebras formalism.

© Android tv.

Ytbe playlists as complete as Android phones, but playlists accessed from browsers on all devices are not complete : ytube may have not the same cache-data/streaming servers for browsers than apps.

- Some paper notes for mem.tex on finite process for HP varieties.

28.10.21

Nearly no sleep.

© Android P9 then Debian Linux Lenovo.

- Chasing (location) typos of mem.tex in search.txt.
- Created a new dedicated file logfile : tm.txt for Typos of Mem.tex.
- Put it in usual format tmYYMMDD.txt.

Contains typos pointer data :

- a) date/location for paper ones.
- b) date/content for e-ones. with format tmYYMMDD.txt.

- Put it in search folder.

- Updated

- a) mem.tex : corrected minor typos and done minor additions.
- b) search.txt

- Sorted last batch of paper notes (page nb).
- Wrote paper notes : important conceptual jumpsteps of criterion on fundamental periods
 - a) definitions : fundamental or arithmetical or a mix of that.
 - b) introduction of new invariants : nb of such fundamental

periods, sorted by (grps) partitions.

29.10

© Debian Linux Lenovo.

- Quirks on TeXstudio ; does not start (segmentation fault).

-> Cache data issue : deleted a file.ini and package data cache (sql). in cache folders to get it back running.

- Put both search and memoire in Free repo.

30.10

© Android phones.

Late nite 23H-4H.

A] Formated search.txt into pdf with ffox.

0) reduced font size from 19pt to 11pt : 450p to 255p to not scare or frighten potential audience.

ffox has 2 outputs possible :

1) print ; a lot of formats, chose letter.
-> try others : tabloid, portfolio, etc.

2) save as.

B] Pushed both to Free repo.

C] Updated home page.

D] Sorted txts of g-drive and free root dirs.

Morning

- Some paper notes on arithmetical invariants.

© Debian Linux Lenovo.

-Found out why TexStudio previous quirk causing SegFault errors : one empty entry in ini.file; the one of pointer to last opened file.

® Read some wkp good articles on arithmetic.

1) rational pts (en,fr) : contains a bit of schemes (q-pt

as sections of arrows, base change, etc).

2) Hasse Principle or Haße Principle or (HP) : paragraph on uk arithmetic geometry school of multi-variable forms (Cassels, HeathBrown, Hooley, etc); using a lot (for asymptotics of nb of Q-pts) :

3) Hardy-Littlewood (uk) Circle methods (where's Ramanujan??!! this should be Hardy-Littlewood-Ramanujan!) : analytic tools to study asymptotics of series through their generating functions behaviour on the unit circle.

4) Hasse/ Haße bio : odd behaviour, since born with jewish origins but signed 1930's german ns jewish-discriminating decrets.

-> Noticed ffox a bit scrambling color renderings of Free home page : no visible txt.

© Win\$10 Tablet.

BT :

1) keybd jerks a lot ; either lags or signal scrambled gives a stuck keypressed cmd; jamming inputs with characters floods.

2) tethering does not work.

- Wrote other paper notes on multi-variables forms, notably the $nv(V) \gg d^\circ(V)$ coarse stratification of space of varieties.

-> Find out periods expression of those invariants.

31.10

Late nite (0-4am).

- Corrected some typos on diary.txt.

* Watched some vids on writing punctuations and Learning techniques.

-> Feynman duck method = Verbalisation : practise by giving conferences or courses to an imaginary audience (toys), for instance; addressing a plastic duck.

=> Update this method to fit digital era : give conferences/courses talks to the anonymous Internet crowd by either podcasting or live-stream them.

Morning

- Some paper notes on hypergeometry or periods uniformization by hypergeometric functions. Some attempts on Fermat curves; obtained partial results in terms of twisted hypergeometric integrals :

$$\int (1+x)^n \sqrt{(1+x^{2^n})} dx$$

with $\int \sqrt{(1+x^{2^n})} dx$ being quasi-hypergeometric.

Late nite.

- Mem typo.

Breathing ¶ spacing in intro. V.

Say one more in this particular case.V.

-> Try to find exact reference of Bright paper on Brauer grp of diagonal quartic surfaces.

1.11

© Win\$10 Tablet.

Done all updates; then tinkered both bt-ppties of Debian and m\$ to pair them but m\$ BT tethering still stuck towards Debian: bluez plugin notification complains of "ip-config not found".

-> Waste of time : goal of gnctns.

=> Next time : try to unpair and to pair again those

boxes.

© Debian Linux Lenovo.

® Reread

A) Sertoz Article on periods of hypersurfaces :

Extends already established computations for curves to higher dimensional varieties; some key pts :

0) Considers computations of periods from middle or centered homology. Evokes Hodge filtrations.

1) Introduces periods vectors and matrix from it; with

2) Uses of Griffiths–Dwork reduction technique ; essentially reduction of forms modulo exact ones.

3) Monodromy of Picard-Fuch ODE satisfied by arrays of periods of varieties parametrized by cplx nbers and forming families of varieties; evokes associated Gauss-Manin connections.

B) HP wkp entries.

- Some paper notes on :

1) To Dos : to read and to do.

-> Use Social Network platforms (Instagram, etc) to post mem relevant extracts.

2) continued hypergeometry or periods uniformization by hypergeometric functions : attempts of theoretical formulation.

-> Trace back search.txt to see what was attempted before.

Marzouk Brahim - Rational Points On General Varieties.pdf

Quantum computers.

Fields of investigations : branches of theory.

2.11

Nearly no sleep.

© Android phones.

a) Collected data on insta, ytube; mainly non maths (motorcycle, iron tools, pcs, sociology, psychology, etc).

b) Some screenshots on recent arxiv.paper on Spec of adeles rings by Alvaro Serrano Holgado of Salamanca University (sp).

Morning.

- Some paper notes on the issue of infinity in mathematics.

How ancient greek Euclidean school of geometry was lured by the illusion of continuum of the line, plane and ambient space.

Back to Q-pts, trying to figure out a list of reference books.

-> Do not lose focus.

® Read

1) Hussein Mossavati, "Hodge Headache" text, mainly first part on infinitesimal schemes; applied to Fermat schemes.

-> Retrieved uncommon bibliography.

2) Bjorn Poonen Q-pts book.

Takes from undergraduate and brings up-to research levels.

Good distinctive insights of the two topological inclusions of $V(k)$ within

- a) $\prod V(k_v)$ with product topology and
- b) $V(A_k)$ adelic topology.

Introduces Schemes with case of Fermat ones; like Mossavati text.

Relates some foundational issues (cardinals of categories, universes, etc) in Appendix.

3.11

© Changed isp-box location, retrieved it from inside drawer and reinstalled outside : gained 15-25 dBm signal strenght.

© Android Phones and TV.

Collected IG data on A806.

* Some vids

- Kenneth Ribet @ Numberphile interview on FLT : insists on crucial role of deformation theory, after pointing out "modularity contagious aspect" maybe referring to rigidity applied to the (moduli) variety-space of (isogeny classes) of elliptic curves.

=> See also deformation theory that have a differential trace, ie that is expressible in terms of monodromy; generally by uplifting initial objects to theirs families; those constituting the upper level objects; example Monodromy of Hodge structures; Gauss Manin cnx, etc. Andre articles provide good examples of that type.

- Yuri Tschinkel @ Clay Institute node of Gottingen presentation.

Reviews history of Gottingen maths center from 17th century (Gauss, Minkowski, etc) to end 1950, concludes with a letter around 1955 of Carl Luidwig Siegel (when he was there) to Lewis Mordell, bulliying Serge Lang for the contents ("intractable abstract nonsense") of the latter newly published books on nb theory.

=> Lang books are fairly gentle and digest : what would it be if Siegel had to review Grothendieck-school bulky encyclopedic SGAs and EGAs ?!

- Sorted some paper notes, wrote some on schemes and irreducibility of topological spaces.

4.11

© Android Phones and TV.

Collected IG data on A806.

* Watch some ytube vids, mainly arithmetic geometry.

1) Christofer Simmons ytube list on Arithmetic geometry (114 vids).

Watched two of them :

a) Nick Katz on Finite Arithmetics.

Starts with historical overview from Fermat (1640) to Schmidt and Hasse (1950)

Then relates modern theory :

Recalls Weil cjs on cardinality of pts of varieties defined over finite fields; successive treatments of attached RH.

b) William Schwalm on classical elliptic functions.

Exposes "trig" parametrization or amplitude representation of classical elliptic functions.

2) One vid on 75th-bday of Keio University and interview of Keinichi Banai, head of the arithmetic geometry group.

-> Take screenshots of smart presentation slides included

in vid.

- Some paper notes, wrote some key ones on foundations. Finally found out after long thoughts, how to handle unconfort of infinite/continuum/physics/reality paradigms; those being related to thoughts on quantized aspect of time as well as non-differentiability of spaces of physics : treat N as an axiom of Logic Model theory; freely (libre arbitre) chosen to build upon models of all standard maths and sciences corpuses that mankind still use in this present time to apprehend reality.

-> Now that freed from that burden, considered proceeding ahead in (number) theories but keeping this key foundational pt in mind.

5.11

© Android Phones.

Took vids snapshots of yesterday :

- a) Keinichi Banai @ Keio.
- b) Nick Katz @ Abel prize.

® Some arXiv article.

The $3x+1$ Problem: An Overview
Jeffrey C. Lagarias

This paper is an overview and survey of work on the $3x+1$

problem, also called the Collatz problem, and generalizations of it. It gives a history of the problem. It addresses two questions: (1) What can mathematics currently say about this problem? (as of 2010). (2) How can this problem be hard, when it is so easy to state?

<https://arxiv.org/abs/2111.02635>

- Some paper notes.

a) Started to write down a list of Q-pts books, read one entry of them :

b) Brauer grp part of Manin Cubic forms.

=> Smart insights scattered along the whole book.

6.11

Morning

- With figs collected in garden, made some Hot sauce fig for winter drinks (figs+chilli).

- Retrieved 12h all the six plugs of isp-box : about 75 watt /h saved.

- Watched a bit Salon TV (TNT) for the first time in two years.

-> Garbage broadcasted, ads floods (some channels are just ads interrupted by program), resulting in a double loss : pollution of environment to produce and broadcast pollution of the soul with junk data bloating brain through ears and eyes with overflow of trash stimuli : real plague. Only Arte, LCP and La 5 FrInfos, save a bit

this situation; RMC decouverte, is now too heavily plagued by ads every 15mn.

-> Unfortunately Ytube now does the same : the strategy of attracting preys with good free contents and trapping them to feed the beast with ads and more lurkly their attention.

© Android Phone P9.

Begun sorting img folders; finally chose the partition

a) collected from internet.

b) produced (mainly sessions screenshots : vids, cas, reading).

with some overlapping in case of mutual enlightening .

© Linux Mint Lenovo.

a) Restarted it to sync notes and src files.

b) Put the two layout kbd : note that choices are not available at the first boot prompt; but they are available to relog after a suspend.

• Some paper notes on various topics :

a) Desk/top setup

b) Nick Katz Abel Prize vid on Arithmetic geometry over F_p .

c) Criterion hypothesis, birational invariance.

- Sorted last week paper notes.

Done some physical Tetris, swapping desk lamps (outlets) layout.

8.11

- Some paper notes on various topics :

A] Birational invariance of alg relations of periods.

B] Cell automata.

C] A on B.

9.11

- Same paper notes as yesterday on

a) evaluation of measures transformation under birational maps by Jacobian matrix determinant twist of initial measures $\mu \rightarrow \mu * \text{Jac}(f)$ as previous Fermat periods;

b) cell biology; etc.

Done some physical Tetris : put solar-led lamp on soldering-station base; and phone on millimetric gauge base.

10.11

Morning

- Same paper notes as yesterday.

Afternoon

© Computers.

a) Heavy physical Tetris : Moved away e-stuff bulky furnitures of NorthEast corner; tidy wall L; and moved into it the old computer desk.

b) Retrieved concerned prehistoric 1989 computer (8086 cpu, 8Mhz clock, 640k ram, 360k floppy, 20mb hdd) and refreshed it.

c) Retrieved also its old printer (heavy type-writer style without ink cartridge but a soaked ribbon) and refreshed it.

d) Retrieved 50m ethernet cable : plugged it into isp-box downstairs to test download speed of fiber; found about a 15x factor; from 700kb/s to 11mb/s on Lenovo Linux Mint with a wget request.

e) Noticed Linux Mint Lenovo slightly overestimates file size : maybe uses 1000bytes instead of 1024bytes for a 1k.

11.11

Morning

GS 500 light maintenance & ride : cold & fresh but sunny.

Afternoon

- Continuing paper notes on birational invariance/maps /geometry.

12.11

- Same paper notes as yesterday.

© P9 : begun sorting pictures folders using preceding partition.

* Finished N.Katz vid on Weil cjs.

Key pts among others.

- a) deg of pol (numerator, denominator) as Betti number of the cplx associated var.
- b) number of pts in power extension fields as alternate sum of trace of Frobenius map acting on compact support homology grps (Lefschetz Trace Formula or LTF).
- c) det of those Frob maps as absolute values of the zeros of the pols den & num.
- d) characteristic pols of those Frob maps as den & num pols of the fractional function zeta.
- e) Steenrod local systems.
- f) Homology/ \mathbb{Q} as standard homology/ $\mathbb{Q} \otimes \mathbb{Q} \mathbb{Q}$.

13.11

© Sorting P9 img folders.

- Some paper notes as yesterday plus continuing others on :

Rational functions.

- a) their effect on periods maps (invariance).
- b) the zeta functions of smooth varieties over finite fields ending up being just rational functions;

encapsulating invariants data of the variety.

c) Pade approximants (rational functions) better than Taylor-Lagrange ones (polynomials) in some cases; sticking more longly to initial function.

d) Conway game of life associated generating functions are rational functions.

e) Laurent terms or building block of Laurent series.

f) Basic meromorphic maps :

g) Moebius transforms as the simplest ones in quotient of linear/affine or degree 1 polynomials; then seeing a) for them.

h) ...

14.11

© Sorting P9 img folders.

- Some paper notes of schedules on maths and others activity; some other on transcendental extensions, like $Q(\pi \pm 1/\pi)$ strictly included in $Q(\pi)$.

15.11

© Sorting P9 img folders.

- Wrote some paper notes on GPC.

16.11

© Finished sorting P9 img folders.

-> Remains search folder.

-> Uses the first as inspiring starting hints.

- Wrote some paper notes on GPC, then

® Read corresponding entry in Huber-Wustholtz Nori book.

© Debian Linux Lenovo.

Corrected some typos in memoire :

a) found out how to encapsulate file infos in output file (author, subject, etc), by guessing/tinkering hyperref pkg options in preamble.

- > Try secure features of contents.
- > Put refs in bib.
- > Make coherent sections code in title.tex.

b) Retrieved blue parts.

c) Remains : projective adeles, version forgotten , most interesting examples, made up, here come.

17.11

Roughly as yesterday.

- Wrote some paper notes on GPC and motives, how those were/or inspired $K_0(R)$ or rings of varieties to get a hopefully fruitfull category shift.

© Read corresponding entry in Huber-Wustholtz Nori book. A key point in introduction : "linear and more algebraic relations of periods are hard".

-> Indeed, we do not even know if some fundamental constants like e or γ are periods or not.

© Debian Linux Lenovo.

a) Corrected some typos in memoire.
Remains : projective adeles, made up, here come V .

b) Noticed that gvfs triggers Thunar overloads when accessing usbfs of P9.

18.11

© Android P9.

- a) Turned-off mobile antitheft daemon, to get rid of privacy-pin login loops.
- b) UpLoaded Memoire to Google books and Z-lib.
- c) Pulled from the latter repo some books on intersection theory (Fulton, Gunthmann) and topology.

© Debian Linux Lenovo.

- a) Corrected some typos in memoire.
- b) Done some physical Tetris by changing screen settings for a switch to the two big ones; put Studio one on right; with LateX coding and reading books in mind.

19.11

- Wrote some paper notes on GPC and motives, cursing on maths inefficiency while browsing arXiv; the Publish or Perish pressure stress on researchers seeking to get status or to preserve it, has real disaster effects. Bunch of papers and not a single deep breakthrough.

-> Try to remain humble and avoid that criticizing attitude while not bringing neither such breakthrough in an academic way.

-> Instead consider converting the memoir into a less elusive and more academic monograph; making it more precise in the formulation of its statements; making it "more mathematic" : it carries a few "very wild" and coarse seed-ideas; some potential germs of deep breakthroughs that need academic varnishing and polishing.

20.11

Gloomy day; so done some sorting early morning 5h am.

© Androids phones.

Sorted P9 Brauer and Periods folders; retrieving redundancies.

Synced them to A806 (95% Periods).

Morning 7h30 am.

- Wrote some paper notes on

a) heuristics of Brauer grp, precisely the category shift that switch view-points from Manin galoisian formulation to Grothendieck etale one.

b) j and J , the first is just the second twisted by the usual trigonometric exponential $\exp(2i\pi z)$.

$$j(\tau) = J(\exp(2i\pi\tau)).$$

c) 24 of Ramanujan τ function giving by the same twist or composition with the standard trigonometric exponential function; the Δ function being its associated modular form (Timothy Gowers Abel Prize vid on P. Deligne collected work : there is a quirk on the value of $|q|$ in his talk and slides).

--> check any relation with the 24 of Yau thm on generating function built from the number of n -nodal curves on $K3$ surfaces.

* Some vids of D. Zagier talks.

1) ICPT AbduSalam center (it) on Betti nbers : finding manifolds whose sequences of Betti nbers catch a given sequence of integers, in the spirit of the Table of Integers sequences of John Conway and all. Joint work Matthias Kieck.

Key pts are

a) Orientable/ Non orientable dichotomy.

b) The Euler characteristic as the bullet-proof topological invariant of topological manifolds.

2) IHES on modularity, periods and MZVs.

-> High flow rate in his talks, speaking quite rapidly : switched to 75% speed to catch key pts.

21.11

Gloomy day; so done some sorting early morning 5h am.

© Androids phones.

Sorted P9 pcs folders.

- Done some physical Tetris by changing screen setup; pushed Studio one against m\$ irrelevant-books wall; put some e-stuff behind it ; to get back some desk writing space.

- Pulled some papers on Q-pts.

a) Cesnavicius slides on Brauer grps @ AWS 2015 : they are pbs slides consisting in step by step clarifications of theories (def, thms, etc). Evokes Tsen thm. Treats Lindt ctrex, etc. Refs are mostly the mid 20th french algebraic geometry school seminars notes; both GA's (S and E) of Dieudonne-Grothendieck-Serre IHES Bures era.

b) Bolognesi-Pedrini 2019 paper on Motives and rationality of cubic fourfolds : treats more rationality of varieties, and dimensions of their associated motives; than questions about rational pts. An example of motives in action, for classification purposes. Contains very recent references that were retrieved.

- Wrote some paper notes on key heuristics points, from differential manifolds equipped with differential forms to topological manifolds equipped with measures.

22.11

Morning

- Some paper notes on Nodal curves or bean curves; curves having a positive curvature piece (folded-back piece, spot, hernie, noeud, node, nodule or bean) to apply criterions on those pieces that fit criterions hypothesis :

=> All versions of criterions apply surprisingly well on nodal elliptic curves/Q.

Done some computations with Maple Android app.

Old school Software : MacCauley2, Simath.

© Android P9.

-> Release memory of devices by considering keeping only monthly search.txts. Note that for historical tracing or tracking; keeping all dates.txt may be handy.

-> Think of scrambling file names of Free repo to confuse wgetters that may leave no log entry (ghost log).

Afternoon

- Done some physical Tetris by moving vintage pcs with their peripherals down under desks.

© Debian Linux Lenovo.

Memoire typos.
rule out

Renew refs with recent books in bib and thanks to Free software, Android included.

23.11 Ma

- Done some physical Tetris by moving screens against wall to finally get large desk writing space.

-> Think of sorting big bookshelves (green classeurs).

® Read S.Zhang newly released article on ArXiv.

-> Extension of Height pairings to products Surfaces x Curves. Good European style article : clear. Since uses "we"; S.Zhang = BourbaChine ?

- Some synthesis paper notes on previous heuristics : Criteria cjs, GPC and Hodge cj may actually turn out to be interlinked.

24.11 Me

Some paper notes on :

a) motives : the GPC and trdeg .

b) memoire typos.

Ⓜ Read quickly Diophantine stuff :

1) A romanian trio books on dioph pbs @ Springer & Birkhauser.

-> Challenging undergrad concrete pbs in the spirit of competitions and contests like Putnam, IMO = Olympiads, Concours General, etc.

αριθμος = arithmos = Symbol in greek.

Διοφαντος = Diophante.

2) Hindry Silverman, Diophantine Geometry.

-> Classic height theory and introduction to modern one with last part on open-pbs.

25.11

- Some paper notes on motives (base or bottom space of period torsors).

© Linux Debian Lenovo.

® Reading day on motives :

a) Huber Muller-Stach.

-> Reference book, gathering all background theory needed for the categories of motives and periods.

b) André articles : 2016 Bbki, Whatis, 2014 Letter to Bertolin.

-> Clever insights with good recent bibliography in Bbki one.

-> Retrieved Bbki bib.

• Updated search.txt

a) some typos.

b) set lines separators : day = 10, month = 15, year= 20; till 01.21.

© Mini & micro boards.

Mini ITX Pico ITX.

26.11

© Linux Debian Lenovo.

® Some wkp entries.

- a) motives.
 - b) hologies.
 - c) Poincare Duality.
- $$H^i(V) \sim H^{n-i}(V).$$

Deligne Princetown site (letters to Serre).

-> Key-pts of products.

tensor, cartesian, down to sets and finally $\{\}$. Standard integer product : cardinal of the product sets.

27.11

© A806 Android.

Insta

Posted about Berlekamp algorithm

Retrieved some data.

Noticed quirks when posting through bt-tethering.

Servers seem to depend on isp and device.

© Linux Debian Lenovo.

® Read some wkp entries.

1) non maths : g genesis.

2) Berlekamp entry. There is a better algorithm; of an earlier duo. Kantor-Zassenhaus.

-> Tried to get source code in Arch folders of Debian Lenovo in vain, I remember it involved testing divisibility by polynomials with coefficients lying in squares of F_p .

-> Either gone with lost hdds or more likely hidden in one 5-1/4" floppy of that era.

28.11

© Tablet Win\$10.

Updated notes folders.

- Sorted paper notes, wrote some topological hology ones.

© Linux Debian Lenovo.

- Updated search.txt : finished spacing it, added nov 21.

® From www big-browser.

1) wkp.

Roth thm on dioph approx entry; there is another Roth, named Leonard ; the uk alg geometer, one of the author of (Roth and Semple "Alg curves" classic book); the first Roth is german (Klaus).

2) AWS conferences entries on

a) Q-pts on higher dim varieties 2018 and

b) Topology and Q-pts 2016 : Ravi Vakil (Stanford) notes; focuses on Euler characteristic pties; regularisation @ ∞ from Thom thms.

29.11.21

Linux Debian Lenovo.

- Some quick paper notes on motives with key-pts of scrolled articles and research tips :

1) Ayoub : two Zurich ones Motivic Periods and Galois grps.

=> In the Composio Article on GPC, check the shift from general differential forms to algebraic ones; giving the shift from general de-Rham cohomology to algebraic de Rham cohomology; in the spirit of Hodge cj saying that some general topological cycles can be "equivalently" twisted to algebraic ones.

-> See approximations by polynomials or rational functions of general smooth or at least sufficiently regular functions, applied to multipliers of volume-differential forms or measure-differential forms.

-> See partition of unity for domains splitting.

2) Andre : same three ones.

-> Collected bibs of both authors : by cross-referencing them; key-articles and reference books are sorted out. This is the obvious way of gathering key-references; by cross-matching bibliographies.

® Read some www quotation entries.

R Borchers.

"I was pretty pleased with it at the time but after a few years I got a bit disillusioned, because it was obvious that nobody else was really interested in it. There is no point in having an idea that is so complicated that nobody can understand it. I remember I used to give talks on vertex algebras, and usually nobody turned up. Then there was this one time when I got a really big audience. But there had been a misprint, and the title read "vortex algebras", not "vertex algebras". The audience was made up of fluid physicists, and when they realised it was a misprint, they weren't interested either in what I had to say."

Horace Lamb Quotation of the day @ St Andrews.

"A traveller who refuses to pass over a bridge until he has personally tested the soundness of every part of it is not likely to go far; something must be risked, even in mathematics."

© Tried to src the code of Berlekamp algorithm; just found a preliminary version of it : it may be hidden in one of the piles of floppys (5.25" & 3.5").

30.11

Morning

- Some paper notes on

A) periods :

a) of varieties, how some subsets are actually trivially linked; for example by linear relations in the case of compact, connected (closed) Riemann surfaces w/o boundary.
-> Done some GeoGebra plots.

b) the nbers-set aspect; raising questions that were not encountered so far.

c) the Galois action on them.

d) Same structural uncommon queries about the hypergeometric side.

B) noticed that ViXar NT recurrent papers were on claiming solving "notorioua cjs" : RH, Goldbach, Collatz, Fermat, BSD, etc.

C) the exponential growth of Linux Kernels following Moore law : the recents winter 2021 generic ones are above 300Mo!

-> I remember compiling some specific ones with only modules for the Ti 350CDT Laptop weighting about 5 mo around 2005 and others around 2007 for the Dell D600 Laptop before the blackout weighting about 25mo; the resulting bundle.o kernel giving a quite swift boot.
<- .

Caching : dns, arp, etc.

Protocol : serial SPI (miso, mosi).

Afternoon

© Linux Debian Lenovo.

About 3 weeks getting back to Debian Linux on Lenovo; as already said; this oddily favors studies, oddily increasing productivity.

-> Awesome Operating system ahead of all that was tried.

- Corrected typos on memoire.tex considering index insertion.

- Rearranged search.txt, minor addings.

- Retrieved diagonal quartic surfaces urls of M.Bright paper, pulled some articles and his coauthored draft book on surfaces on his website.

-> thesis @ Cambridge in the spirit or tradition of OxBridge arithmetic geometry schools of London area (Birch-SD-Cassels-HeathBrown); and the late A.Baker who replied harshly to one of my 2004 repeated emails (the first ones were merely... ignored); as opposed to the Japanese arithmeticians; who, although their mathematical superiority to Baker stuck @ classical mathematics level, and my maverick situation; answered right-away quite gently and politely to the first email; cf preceding posts on the "((white) (mathematicians)) disease" of some rare pontes that are status settled; compensating their (mathematical) sterility and/or frustration with condescendant reactions; note by the way, that an overflow of email queries flowing from everywhere around the world may be treated like that : ignored then harshly replied upon insistance of the asking person.

<-.

01.12.21

- Continuing same important structural notes on hypergeometry, periods and motives.

© Began Bright-Luijk-Testa book on \mathbb{Q} -pts of Surfaces introduction.

=> K3 surfaces trend. Those K3 surfaces being the trendy studied objects of both arithmeticians and algebraic geometers (Hodge theory focusing on those surfaces for Hodge c_j $c_{\text{tr}}(X)$).

<=.

© Linux Debian Lenovo.

Corrected mem.tex

Chasing compilation quirks.

Added in bibtex M.Bright quartic url.

2.12

© Linux Debian Lenovo.

a) Some folders rambling.

-Memoire fr of 2007-Arch folders versions :

22.05.2007 in M2 folder

13.06.2007 in TeXtes folders.

=> Arch/202007/jawa contains some good insights notes in txts folders.

b) Corrected mem.tex.

Chasing compilation quirks.

Put new books bibtex entries.

=> G books has :

a) bibtex entries.

b) many versions of each book with free samples.

=> Try all of them to complete the sought book from the hopefully non overlapping different versions free samples.

© Android Phones.

Sync phones Notes folders.

- Some paper notes on Berlekamp algorithm (resultants, matrices, etc).

Other deep insights dissiminated in small spots; along randon notes; like the shining white pebbles in the dark forest (of maths elecubrations) of the Grimm fairytale.

3.12

® ArXiv key article on statistics of Q -pts on hyperelliptic Curves by B.Creutz and N.Srinivatsa (nz-au); mainly done with Magma.

==> Numerous relevant tables; confirming Brauer-Manin obstruction exclusiveness c_j for Curves; by using the Brauer Manin sets obtained from the 2-torsion subgroups of the Brauer grps $Br(C)$.

<==.

© Linux Debian Lenovo.

Corrected mem.tex

Chasing compilation quirks.

Studied makeindex pkg to index-out important words in future versions.

* Science etonante on Godel incompletude thm.

-> Key pts are

a) Godel breaking all idillic dreams of Hilbert on axiomatic systems; bringing back to reality and relativity of mathematics; nowadays standard maths are built upon a freely commonly-chosen axiomatic system; giving one model among others.

-> Although seeming efficient in the modelisation of phenomena of applied sciences, I think that the ZFC-AC evoked standard model is "cracked"; the whole gigantic corpus monument of current mathematics has a quite serious

crack growing from the infinite-axiom impact on one of its foundational basement walls.

<- .

b) Godel incompleteness thm trick relies upon a category-shift from the category of predicates and logic formulas to the category where those predicates and formulas apply, namely the arithmetic one; each logical formula being encoded into a series of natural numbers or integers.

- Some paper notes.

1) on that vid, guessing out the link of Godel incompleteness thm to the Deligne-version based on an existence thm or presence of a point on a certain Logic topos.

2) Sorted last notes by page numbers from p55 to p95.

4.12

© Linux Debian Lenovo.

Corrected mem.tex

Chasing compilation quirks.

Put first entries of index and proceeded its inclusion (multi-steps compilation process like bibtex and metapost).

* Blockchain @ MathAdult Ytube chan (La Rochelle University).

- Some paper notes on that.

Blockchain analysis : chain data structure relying on hash-functions

robustness (one-to-one or injective hash map); weakness and improvements. The chain links are hash outputs. Hash functions use recursiveness or self-iteration on input data; increasing robustness by generating complexity; in order to attain injectivity or non-collision of its outputs.

==> Those hash-prints (empreintes) can be used to track every piece of data (hash-tagged by those functions) exchanged on the Internet resulting in databases of Tracking-DNA or data-trackers of the Internet data.

==> By also tagging users or grps of them, this may be used to create a biased or stratified Internet or a stratified Global Digital experience; the dominants (Gafas or their countries) filtering the good for them and their supporters and leaving the remaining junk to specificied targets to keep them backwards, so that they consolidate their dominion. They can also achieve this goal by scrambling the Digital Experience of those users with/on their products; ruining or at least slowing down their workflow.

- Beware of winter dehydration trap : as $t^{\circ} \downarrow$, thirst is not sensed, yet body needs its normal water supply.

® Read some wkp entries.

Memoir.

The term 'memoir' has been used in an academic context to describe an essay on a learned subject. Examples include explanatory texts accompanying geologic maps.

Un mémoire est un document permettant d'exposer son

opinion concernant un sujet donné.

Un mémoire est une « dissertation adressée à une société savante, ou pour l'obtention d'un examen » (Le Petit Robert, 2014 « 2. Mémoire » (masculin))

Des mémoires sont des autobiographies ou des recueils de souvenirs.

--> So the memoire rocambolesque appendix is not that irrelevant.

<--.

5.12

Morning

- Some paper notes.

Afternoon.

© Linux Debian Lenovo.

Some minor updates on : txts and memoire+index entries.

Typos of det.tex on paper.

Cette formule instead of cette derniere.

Retrieve underlines and rewrite some phrases.

* Vids on Q-pts on LG big-screen Oled TV.

1) again Wittenberg @ IMPA Pontos Racionais 2015.

=> Rationality paradigm : the Rationality of a variety in terms of the presence of Rational curves ON the variety favors the presence of rational pts.

-> Sounds like a lapalissade but the heuristic is that it gives a 2nd level view pt : rational curves on varieties as rational pts of varieties-of-varieties; or maybe something like rational subvarieties on varieties as rational pts of varieties-of-varieties.

2) Campana @ IHP Reinventing Q-pts 2019.

=> classification including transcendental curves on varieties.

3) Besson : from Poincare to Perelman @ SMF "Un texte, un mathématicien" (BNF).

An (en)closed surface S (compact/bounded without boundary) is either :

a) the sphere (genus-0 or 0 holes)

or

b) the connected sum of a finite number n of tori (n -holes or genus n).

-> A genus n -curve = Connected sum of n genus 1-curves, or elliptic/ab varieties; in the spirit of motives and the GPC.

© Android P9.

Hassles : Again smartcard service keeping requiring pin; losing a non negligible time.

Plus ... ytube ads overflow scrambling the vid experience.

=> cf post on biased digital experience.

6.12

© Julian Lawrence Demeio (Pisa, Orsay, Bonn) thesis (advisor D.Hariri) on Some Brauer Manin sets/lifts of covers.

a) Contains an intro with clever background theoretical insights.

b) Refines some Brauer Manin sets with lift-covering apparatus.

Answers queries of participants of a 2019 workshop.

c) Dense text in small characters, barely fit even the biggest screens : retrieved by the way the bibliography.

- About Brauer theory.

=> Nevertheless, the theory seems agonizing to me : it's been nearly a century that those Brauer (arigid) algebraic over-elaborated intricacies are being developped for Q-pts study with a very poor "retour sur investissement theorique".

This theory, in its present state seems to release tediously its last breaths, approaching now its dead end; it has become too fat to remain vivid; it will not survive the agility of forecoming alternatives.

It may need an energetic bashing quake; either a motivic and/or anabelian geometry reformulation to shake it seriously and vigourously and make it leg/hatch efficciently quick concrete broad-range results; or

it may need a reviving kick by delegation/adaptation /implementation into future quantum computers mainframes;

its algebraic-rigidity aspect fitting those future computers powerful capabilities.

=>

<==.

7.12

© Android P9.

-Free

a) Sorted main dir.

b) Corrected this date.txt, pulled from main dir
orange.jpg, a photo for curves over surfaces as well as
powers.jpg, a picture from insta of the graphs of the
basics powers x^n .

- Some paper notes.

a) From applying criterions on symmetrized graphs of the basic power functions.

-> The current stable one applies very well to the first small integer values of $n \leq 2$. Then all tested CAS are stuck in period computations.

b) Wrote some heuristics from that case, on varieties,

then on related motives; how algebraic varieties and classical motives are "rational" or "integer" degenerate cases of exponential hence transcendental varieties/motives.

® Read

1) SwinnertonDyer overview on Diophantine Equations. Seems from 2000-2003 according to bib references dates.

Pragmatic style of OxBridge brit/uk arithmetic geometry school; good balance of classical and modern treatment.

--> As Serre, Wiles, Andre, etc : experience accumulated over the decades.

2) Wu Han arXiv paper on Brauer Manin obstructions over fields not containing $\mathbb{Q}(i)$.

Exhibits a curve over a number field, violating HP, by computing 2-torsion part of the Tate-Shafarevich group of its jacobian.

-> Contains clear theory recalls of main pts in the article introduction as the one of Oct 2020.

-> I think that asians will lead maths just before its ending; and the beginning of the speculated AI-maths era <- .

© Tablet win\$10.

- Hassles when bt-keybd plugged in.
Key-pressed scrambling keybd input, note it may be espresso machine sharp edge pressing them.

- Then Pocket servers down : Data center down?

- Data centers : knowledge, infos and data entrepots, reserves, ressources factories or data plantations farms; or mines. Quite strategical ressources, because knowledge is invaluable, so they constitute future lands of conquests and confrontations in the Digital World or Universe, either peacefull and healthy concurrence or more likely furious underground battles to have the "mainmise" or control of the "precious" data.

8.12

© Linux Debian Lenovo.

a) Memoire

Sorted updates after nearly one year : 57 versions in P9.
39 in Debian.

Added again some minor additions, plus Free Software tribute, including Android, Grapher Free, Math Grapher 3D, GeoGebra, Maxima, Genius maths tool.

Typos remaining. Done.

Debian wink -> handshake.

Classification

Neglected.

narly

an hypothetical.

structures shape (complexities).

b) Search.txt : about 370 chunk files with format dates.txt of diary logs merging into 450p in search.txt.

- Some paper notes of Log V, birational invariant motives, symmetrized powers "onions" or "bulbs".
- A Non sujet au tps donc non sujet à la Causalité.

9.12

- Some paper notes on motivic birational issues.

© Android P9.

® French memoire.tex.

Read last left 2007 available version remaining after the 2009 blackout. I do not remember if there are other lacking versions after the blackout.

Files remembered with lacking versions are other ones : critere.tex, slides.tex and unfortunately all theory txts files.

=> first part of fr memoire : rather good to medium introductory text; very little clumsiness; because it is mainly recalls of the well established theory of Brauer

grps.

2nd part : lots of left clumsiness issues both in formulation and in style; because it is a totally original part; I have never met something like those ideas in all the mathematics read so far.

Style issue in lacking of Breathing Spaces (bs).

bs : Cette obstruction.. C'est Yuri Manin qui..

bs & add.

Tout le grp en question. Add : sans doute est ce un grp de torsion ds le cas general, donc egal a sa torsion.

Manin etudiant (rm eleve) de Shafarevic.

G-morphisme : replace by morphisme G-equivariant.

Hasse; dans ce cas.

titre indicatif, montrant le cheminement
oublier de suite : reconsiderer.

Voici un enonce un peu plus restrictif, aux hypotheses un peu plus fortes

a oublier : reconsiderer.

Flowing graphs: graphs along texts.

© Tablet win\$10.

Cleaned some redundancy in mem folders, surely from slipping mouse-pointing.

* Some vids @ Carmin TV.

Maria de los Angelos Chara (ar) : Goppa codes.

Arne Smeets (be) : Campana curves C are pairs (C,d) with d divisor on C .

10.12

© Linux Debian Lenovo.

Corrected last typos of mem.tex, added some software credits.

11.12

- Some paper notes on Zariski density of Q -pts.

® Read @ G books (PlayBook app then website).

Samples of

1) Arithmetic Geometry of CollioThelene SwinnertonDier
Vojta 2007 CIME.

=> This e-book actually contains the preceding paper of

SwinnertonDyer on Q-pts guessed out to be from around 2000-2003; this electronic book is in the spirit of the paper book version of the same summer CIME school of 1991 that I have.

2) Etale homotopy of Torsors. LMMS series, article of ColliotThelene and Skorobogatov on open extensions of torsors.

=> G-books : to get complete books either go to authors webpages to check for preliminary versions, or try desktop versions of g-books or g-scholars ("oulama"="scholars" in arabic) websites.

© Linux Debian Lenovo.

Updated search.txt

Pushed both updates of search.txt and memoire to Free.

12.12

- Some paper notes on :

1) key pts of next versions of memoire, some typos and corrections plus... additions :

a) all criterions in index;

b) optimistic : positive hints of stable criterion from nodal (elliptic) curves; powers cases; Faltings thm case

:

2) again some investigations on Faltings thm + criterions : there is a quirk for both about a limit of a series of nber fields; that needs settling down and a bit of deep thoughts; however, what comes out so far from today quick paper notes is that the only requirements of algebraicity of the mean-pt ensures algebraic dependency of some fundamental periods.

==> Need a bit of brain refresh and/or some rest to sort that out, especially the series of nber fields built from the algebraic pts of the curve; rubbing a bit harshly against Faltings thm.

- A drawing of Nori in tyrolian costume singing "uployoyoli".

=> Try to gather all those punwords and drawings, and recover talks ones with the quite funny translate outputs of ytube captions-robots, like in N.Katz Abel Prize talk on Weil cjs, "Poincare duality" transcribed into "Punk Radio allottee" by ytube caption-robot.

3) Rational and integral subvarieties issues for criterions.

==> Found out that g had quickly indexed memoire in z-lib after a query containing "marzouk brahim rational points"; notably in russian and indian z-lib mirrors.

© Linux Mint Lenovo.

Light update of notes and mem folders : only last ones were synced.

-> Consider that option for other devices.

Noticed that Mint ffox-pkg is set to auto-update in the elf-executable, so it seems unswitchable : the present one is now 95.0.

13.12

Morning.

© Tablet win\$10.

® Read some articles on Brauer grps and memoire.

- Some paper notes on that :

1) key pts of next versions of memoire, some typos and corrections plus additions.

a) Put index cmds in preamble.

bs : in a second part we propose a cj.

when looking for those q-pts.

rm : corner of arithmetician toolbox.

qrk : of into adelic space.

b) Put "I" pronoun in appendix and search.txt

2) Graphs issues :

a) coulee.

-> Either find a pkg dedicated or subroutines of already present ones.

b) crop of powers.

c) y-arrow of circle.

3) Afternoon : Chap2.tex.

Put defs in introductory paragraph.

-enclosed replaced by closed and when differentiable by positive curvature.

-clustered, strongly connected by trivial π_1 .

© Linux Mint Lenovo.

Scrolled Brauer grp in search.txt, spotted typos on the go @ lines :

5153 : capital J and j differs by a trig exponential twist.

8705 : cold showers.

4) criterion formulation. Sizes issues :

a) Comparison of $\text{Br}(V)$ and $G(V)$ sizes : both decrease with Q-pts.

b) Size of arithmetic or fundamental periods array : another invariant depending of previous ones; so may need a kind of order or recursion.

5) Brauer grps, some functorial notes.

Br should be contravariant.

If $W \otimes \rightarrow V$ then $\text{Br}(V) \otimes \rightarrow \text{Br}(W)$.

-> Coherent with Q-pts.

14.12

© Debian Linux Lenovo.

a) Corrected some memoire typos of yesterday and added criterions pointers to index db.

b) Pushed it into Free repo.

=> Push it also into g books and z-lib.

© Tinkered a usb-led lamp that fried. Thought that leds were in series but found actually a // assembly.

A tiny capacitor may be faulty.

15.12

Morning.

- Some too few notes (begun when rdv Y was_time : rdb, rzn qal).

® Reading afternoon.

1) JaPan arXiv paper of Takashi Suzuki on Arithmetic duality thm.

--> Evokes Saito and Kato works on Brauer theories; Bloch-Kato ext apparatus for polylogs; derived and triangulated categories, sites but not topos, K2-ideles, etc, etc.

-> Quite dense and complete, more like the introduction of a foundational monograph than a article.

-> Retrieved by the way some bib refs : Weibel K-theory book and others.

2) A bit of Colliot-Skorobogatov Brauer grp book.

© Tablet win\$10.

BT Tablet win\$10 tethering from P9 to Tablet : lags a lot, but oddily not from P9 to Debian Linux Lenovo.

-> Try to find why.

© Android P9.

Still timewasting hassles with SIM pin loop request.

From Keep note.

Each Gafa is a real threat : greedy-agressive on data, each app relaunching itself or others; turning the smartphone into a robust data sniffing and spying machinery; an agent of a monstrous octopus or gorgonne; everytime, you cut one of its tentacles vaccuuming-data, it regenerates through the other tentacles. Under the smiling cover of cool californian campus start-up faces, hide ugly, voracious and intrusive data-beasts; whose only underlying goal is growth and dominion over the digital world; together with other us data monsters, simulating concurence in front of the rest of the world; they in fact collaborate through national agencies to preserve usa interests and predominance.

-> Tech is not innocent. Keep ... that in mind.

-> Alternative (Europe reaction ??? After so many decades of passive and submissive attitude; when will it finally wake up ???) : Open Hardware + Open Software + Decentralization (peer-to-peer or massively-distributed data-networks) seems a more just and democratic option to throw @ the face of those who pretend defending it; but turn out to be one of its worst threats in having imperialistic and tyranic temptations.
<--.

-> Retrieved Ytbe app from this phone, cutting away one tentacle of the ugly g hydre.

16.12

* Skorobogatov @ SD († 03.20) memorial tribute in Cambridge.

On diagonal quartic surfaces; begins by digging into the mine of those K3 surfaces. The vid seems not to be available on ytube.

Morning

- Very few paper notes, mainly on motives while scrolling search.txt as a time-machine session : winter exhaustion from successive gloomy/no-light days.

=> It is another evidence (proof by retrieval) of stimulating effect of natural light of sunny places : think of that for future : Nice, PACA; Spain, Costa del Sol or better Morocco, Agadir, back to the origins; or the Middle East and San Diego... in the last option; reluctantly.

-> By the way, I think usa officials will never let me enter their country.

- Noted also after about one year getting back to maths that Elliptic curves theory has become the "superstar" of nt, reaching nearly the status of an industry; as BSD huge notoriety suggests.

-> Why ? : economy and money strategical views of cryptographic applications to the whole (digital) economy.

-> What a pos motivation.

This is also maybe why I am totally uninterested in this cj; note that by the way, that its proof will, at last, give legitimacy to nearly all computer algebra systems that assume it to output the rank of elliptic curves/ \mathbb{Q} .

<==

17.12.

- Chalk spread on blackboards are calcified (carbonate de calcium), fossiles of microscopic algae : teachers, professors, researchers; phd students are spreading calcified skeletons of dead micro-algae on blackboards;

antediluvian ocean graveyard dust, being revived in spreading knowledge, before closing the cycle and going to dustbins or diluted in the water of wiping ... sponges.

wkp.

"Les Coccosphaerales ou Coccolithophorales (du grec kokkos «pépin», λίθος «pierre», φορος «porter») sont un ordre d'algues unicellulaires microscopiques appartenant à la classe des Prymnesiophyceae au sein du groupe des Haptophytes. L'accumulation de leur squelette fossilisé est le composant majoritaire de la craie. Elles font partie des Coccolithophoridés. "

© After a year or so Yahoo swept out all data of the account even the content of archives and files folders. Only a few contacts remains.

-> Cf previous post on biased internet.

18.12

© Tablet win\$10.

Some ytube vids.

* Emmanuel PEYRE Bourbaki talk of 05/11/2016 - 4/4 @ IHP
1,156 views
Streamed live on Nov 5, 2016

Description.

Emmanuel PEYRE - "Progrès en irrationalité" (d'après C. Voisin, J.-L. Colliot-Thélène, B. Hassett, A. Kresch, A. Pirutka, Y. Tschinkel et al.)

" C. Voisin a inventé une nouvelle méthode pour prouver que des classes de variétés ne sont pas stablement rationnelles, c'est-à-dire que leur produit avec un espace affine n'est pas rationnel. Cette méthode repose sur la décomposition de la diagonale dans le groupe de Chow et sur des propriétés de spécialisation de cette décomposition. Parmi ces nouvelles familles, mentionnons les revêtements doubles de l'espace projectif de dimension trois ou quatre ramifiés le long d'une hypersurface quartique très générale et les solides quartiques très généraux. Ces méthodes permettent également de démontrer que la rationalité ne se conserve pas par déformation, même au sein d'une famille de variétés lisses de dimension quatre."

==> Good bbki exposé with smart balance concrete-example/theory.

- Starts from down-to-earth example of a surface fibered into cubics, in fact fibered in elliptic curves, this example is due to Manuel Ojanguren (an elliptic curve rotated about the x-coordinates axis); then "déroule" the theoretical machinery over it or "passe l'exemple au rouleau compresseur theorique".

- Takes the option of functions fields for the 4 types of rationalities (Rational, StablyRational, Unirational, RationallyConnected).

- Gives the obvious implications that are always true then list ctrex to the corresponding converse ones.

Colliot-Thelene SwinertonDyer SanSuc 1985.

Artin Mumford 1971.

And finally C.Voisin based on Diagonal Decomposition of Chow.

- Recalls definition of Chow grps as cokernels of degree-

maps defined on divisors classes; and then finally the Chow Diagonal Decomposition.

--> One smart motivic remark emerging from the bunch of trivial cohomological invariants of the introduction surface example : those degeneracies are probably all rulled out by a single trivial motivic invariant :

-->

I say : "one motivic invariant to rule them all".

<--

<==

© Tablet win\$10.

FTP plugin of npad++.

%CONFIGDIR%\Cache\%USERNAME%@%HOSTNAME%

19.12

© Debian Linux Lenovo.

Synced Keep #10 with dates.txt; some corrections on controversial remarks.

20.12

© Debian Linux Lenovo.

Synced src articles with P9 and some imgs with A806.

Corrected this date.txt.

® Read some articles of E.Peyre. "Liberte et accumulation."

Distribution of rational curves and \mathbb{Q} -pts, in the footsteps of the contemporary Arithmetic geometry "Russional" School (Shafarevich, Manin, Batyrev, Tschinkel, etc).

-> Gives original ideas (liberte of \mathbb{Q} -pts : a criterion allowing to separate good distribution-loci, from "sticky crumpy" subvarieties; ie loci of distribution-degeneracies or pathologies).

21.12

Morning.

© Android P9.

Updated date.txt

Afternoon.

- Brain refresh, in two ways : ideas and t°.
- GS500 ride @ cold 2°C but sunny.

Nite

© Debian Linux Lenovo.

Synced src Q-pts articles with P9.

® Logic Predicates.

wkp [https://en.m.wikipedia.org/wiki/Predicate_\(mathematical_logic\)](https://en.m.wikipedia.org/wiki/Predicate_(mathematical_logic))

In logic, a predicate is a symbol which represents a property or a relation. For instance, the first order formula $P(a)$, the symbol P is a predicate which applies to the individual constant a . Similarly, in the formula $R(a, b)$ the predicate R is a predicate which applies to the individual constants a and b .

© Debian Linux Lenovo.
Synced src with Linux Mint.

Back to nano : refreshing memory of keybd shortcuts.

-> Edit a memo of Gnu/Linux shortcuts :

A) Txt tool.

a) Core cmdline :
bash, troff, less, etc.

b) Text editors :
nano, vim, emacs, etc.

B) Gui tools.
thunar, mousepad, gedit, etc.

- Fought a bit against gimp, digging in config files (size & location of open file dialog window).

© Android P9.
Sorted a bit imgs folders.

® Read an arXiv article of MATTHEW J. NORTHEY AND PANKAJ VISHE.

Treats regions of the space of projective and complete varieties, given by a Birch inequality making them included in HP ones.

This uses the trendy successful methods of analytic nt (combinatorial and distribution or density nt of Green-Tao, etc) applied, for instance in density or distribution of rational pts and diophantine approximations.

23.12

Morning

-> Add nt, ctrex, def, ext in search.txt abbreviations.

* Some vids on T-TV.

1) Hector Pasten (latin america) talk on abc @ IAS around 2018.

Smart overview on the different approaches of this deep structural cj (additivo-multiplicative deep structural relation of Z).

- Begins with classical $a+b=c$ formulation then proceeds to projective space interpolation approach.

2) C.Soule on Arakelov geometry @ IHES.

First talk : give basics results of Soren Arakelov theory.

--> T-TV : does not catch hotspots from phones.

® From an Insta account of a young german PHD.

SGB (stochastic gradient descent) methods in deep-learning.

SGB : essentially predicting patterns from applying gradient methods to huge random samples of large-scale dbs.

=> Recent theory that took-off with the rise of the giants data-beasts; quite demanded now, since those methods allow to guess trends of market places from large-scale dbs analysis; turning out to be critical strategic tools helping the owner of those markets to make more profits : what a pos application of that theory.

=> Note that fortunately it has other applications like img reconstruction, simulation of physics phenomena, deep-learning, etc.

24.12

- Went out nearly half-day so almost nothing.

Late nite.

© Android A806.

Some imgs processing : collecting from insta, sorting, saving.

© Debian Linux Lenovo.

Some minor additions and corrections to this txt.

- Some too few paper notes.

Applying criterions to regular polygons previously found with A806 Phone.

25.12

© Android A806.

Some imgs processing : collecting, sorting, saving.

© Android P9.

Same imgs processing : collecting, sorting, saving.

- Some paper notes.

Applying criterions to regular polygons, seeing effect of basic transformations of the plane on independency of periods;

Begun verifying invariance of criterion for some elementary transformations : rotations, Moebius maps, etc.

© Debian Linux Lenovo.

Fought again against gimp : found by try-and-guess, how to resize and move open-dialog windows/boxes :

Alt F8 = resize.

Alt F7 = move.

-> Those keys seems to work for all open-dialog windows of the xfce system gui.

-> The other way of tinkering rc files does not work : gimp ignores them, so a cmd line option should force it to take them into account.

* Some vids.

1) A.Skorobogatov talk on diagonal surfaces @ SD memorial.

Good overview. Says that diagonal surfaces allows a process like variable separation of ODE.

2) E.Peyre. Canal U. Nombres et hazards :

Introduction to density and distributions theory from historical diophantine pbs.

- Some screenshots on K-theory book of C.Weibel and S.Manber Brauer grp introduction.

Weibel book is exhaustive : a chapter on motives, p525-sq.

26.12

As yesterday.

® Reading Princeton University stuff of Voedvosky, Weibel & al on K-theory and motivic cohomology then :

- Some paper notes on criterion invariance under basic transformation of the ambient space.

27.12

Woke-up early 4h am.

* Some vids

1) on the continuum hypothesis : recent breakthrough (Aspero, Schindler).

2) Another one on new neural networks design : infinite stripe shape from small depth but quasi infinite width-length maybe suiting large-scale dbs : AI-team of g.

Morning.

- Continuing paper notes on criterion invariance under basic transformation of the ambient space, tackling a peculiar example.

-> Found out quickly by examining search.txt, last spring 27.04.21 corresponding ones.

==>

Hence the interest of keeping an e-diary.

<==.

© Put A806 on soldering base to

* Quick zap among a bunch of videos of Reinventing Rational pts @ IHP 2019 trimestre; to put faces on recent arXiv articles authors.

-> A806 too small screen to view blackboard notes of conferences but sufficient to get the streaming audio content like podcasts of radio stations, conferences, etc; with a bt-soundsystem.

28.12

Early morning again (5h am).

Morning.

- Continuing paper notes on criterion invariance under basic transformation of the ambient space :

a) treating basic transformation issue : essentially by the same patch-procedure of adding periods; for instance the mean pt of SV.

b) introduction to the notion of equidimensionality of periods ; alg relation should be considered after ensuring equidimensionality; $w(V)$ $\lambda(V)$.

Computing $w(V)$ for basic curves : needs probabilistic/distribution style integration techniques.

c) Some typos-corrections on memoire.

® Quick glances @ arxiv nt. Retrieved two articles :

1) a russo-chinese paper of Tschinkel-Yang-Zhang on

Burnside grp.

2) Another one of Milne on Hodge-Tate cjs for abelian varieties.

* Some vids of SD memorial @ Cambridge.

a) Beginning of T.Browning on Campana pts and

b) nearly half of M.Bright talk on Brauer-Manin theory.

29.12

© Android P9.

Noticed overheating battery while forgetting to switch it off connected.

Put it on soldering-base with bt-keybd : some minor corrections to this txt.

- Some paper notes on key-pts of Brauer-Manin theory.

® Reading Milne Etale Cohomology.

Chap 1) Etale topology.

Chap 4) Brauer grp.

Gives the insight that Brauer grp classifies non algebraic or transcendental 2-cohomological classes of divisors.

Proves injection of Brauer-Azumaya into Brauer-etale;

evokes Giraud categorical approach (gerbes, stacks).

Ⓜ Quick glances @ arxiv nt. Retrieved one indian article on Thue norm equations.

Prajeet Bajpai @ Vancouver.

Algebraic numbers, Galois number fields, diophantine approximation, linear forms.

Some names : Bugeaud, Laurent, Vojta, Matveev, Bennet.

Contains exhaustive computations with tables of results @ the end.

Uses LMFDB (L-function and modular database).

© Debian Lenovo.

Corrected memoire from preceding paper notes.

* Finished M.Bright talk @ SD Cambridge memorial.

Mainly K3 surfaces investigations, as the general present trend seems to force everyone to follow nowadays.

Evokes Kato log-theory, Bloch-Kato Brauer grp filtrations when switching to p-characteristic.

-> Those K3 surfaces appear to be the "ctrexample avengers", killing negatively a bunch of cjs, as the ones used to answer negatively to a SD question.

P.Cartier said in his 2015 StPete Euler-Institute MZVs talk; that those K3 surfaces may even provide a ctrexample to Hodge cj through suggestions of Andre Weil.

<- .

Took screenshots.

Skorobogatov tirant la couverture du "moi-je" in the end.

30.12

- Not that much today, woke up late 8h45; for the first time in nearly two years.

==> Better shape after sommeil reparateur.

© Some sorting data.

g-drive : complete root directory

P9, Tablet and Debian Lenovo : imgs and articles.

© Debian Linux Lenovo.

Noticed after try and guess, some weird ctrl-keys outputs with the russian kbd :

Ctrl > or Ctrl ; : opens a prank emoji table 😊.

Ctrl / : select all.

- Some thoughts.

A good mathematician proves slowly things, a fake mathematician tries to convince quickly in order to lure everybody but finally only self-cheats.

- Some paper notes on periods, inverting paradigm.

31.12

- Again woke up around 8h45.
=> Noticed a reviving effect : feels much less tired than previous months with generally only less than 5h sleep/day.

Went out half-day so nearly nothing.

- * Some vids on Tablet and comments on Debian Linux Lenovo.

1) J. Fresan on Hodge theory and o-minimality.

-> Recalls Hodge filtration starting with Poincare upper plan, the modular space of elliptic curves, that is the receptacle of the classifying parameter τ .

Evokes Griffiths, Green, periods maps.

2) Some vids on Complex geometry @ Geometry & Tacos seminar :

- a) J.P Demailly; complex geometry expertise.
- b) Aryan Javanpeykar (Hyperbolicity Lang cj),
- c) P.Griffiths interview by Green (Ahmed Suleyman ytbe).

-> a) : Green-Griffith hyperbolicity cjs, Chern currents on bundles over/on/of complex varieties.

b) grp-less varieties : roughly without alg grp as subvar; expressible in terms of only constant maps from alg grp to the var.

For curves

grp-less \Leftrightarrow hyperbolic $\Leftrightarrow g > 1$.

For other types of var, the equivalences are cjtural.

Interesting considerations on arith hyperbolicity; by introducing the integral or base-ring apparatus; leaving the context of base-fields to base-rings.

\Rightarrow This is then Arithmetic stuff, when leaving fields for rings.

c) In the last interview vid of Green, Griffiths evokes his classical approach of algebraic de-Rham from previous investigative work of Picard.

d) A vid of M.Artin who reveals that chemistry was his first interest before maths; and that a manipulating referee-advisor provoked him, teasing his ego; so that this incident lead him to prove fundamental thms in his thesis.

\Rightarrow All mathematicians are small "knowledge-tyrants".
the greed for their field-knowledge dominance blind them from the real-knowledge.

- Very few paper notes : inverting paradigm, the group scheme $\text{Spec } \mathbb{Z}[t, 1/t]$.

® Some wkp entries.

One of the longest entry ever read in wkp, both in english and french.

-> Reason for such long-passionate entries for this "obvious" thm?

<- .

Here is less than 1/10 of the english one.

Jordan curve theorem.

"Let X be an n -dimensional topological sphere in the $(n+1)$ -dimensional Euclidean space R^{n+1} ($n > 0$), i.e. the image of an injective continuous mapping of the n -sphere S_n into R^{n+1} . Then the complement Y of X in R^{n+1} consists of exactly two connected components. One of these components is bounded (the interior) and the other is unbounded (the exterior). The set X is their common boundary.

The proof uses homology theory. It is first established that, more generally, if X is homeomorphic to the k -sphere, then the reduced integral homology groups of $Y = R^{n+1} \setminus X$ are as follows:

$$H \sim q (Y) = \{ Z , q = n - k \text{ or } q = n , \{ 0 \} ,$$

otherwise . $\{\displaystyle \{\tilde{H}\}_q$
 $(Y)=\{\begin{cases} \mathbb{Z} , & q=n-k \text{ or } \\ \}q=n, \{0\}, & \text{otherwise} \end{cases}\}$
 $\{\displaystyle \{\tilde{H}\}_q(Y)=\{\begin{cases} \mathbb{Z} , & q=n-k \text{ or } \\ \}q=n, \{0\}, & \text{otherwise} \end{cases}\}$
 $\end{cases}\}$

This is proved by induction in k using the Mayer–Vietoris sequence. When $n = k$, the zeroth reduced homology of Y has rank 1, which means that Y has 2 connected components (which are, moreover, path connected), and with a bit of extra work, one shows that their common boundary is X . A further generalization was found by J. W. Alexander, who established the Alexander duality between the reduced homology of a compact subset X of R^{n+1} and the reduced

cohomology of its complement. If X is an n -dimensional compact connected submanifold of \mathbb{R}^{n+1} (or S^{n+1}) without boundary, its complement has 2 connected components.

The root of the difficulty is explained in Tverberg (1980) as follows. It is relatively simple to prove that the Jordan curve theorem holds for every Jordan polygon (Lemma 1), and every Jordan curve can be approximated arbitrarily well by a Jordan polygon (Lemma 2). A Jordan polygon is a polygonal chain, the boundary of a bounded connected open set, call it the open polygon, and its closure, the closed polygon. Consider the diameter δ of the largest disk contained in the closed polygon. Evidently, δ is positive. Using a sequence of Jordan polygons (that converge to the given Jordan curve) we have a sequence $\delta_1, \delta_2, \dots$ presumably converging to a positive number, the diameter of the largest disk contained in the closed region bounded by the Jordan curve. However, we have to prove that the sequence $\delta_1, \delta_2, \dots$ does not converge to zero, using only the given Jordan curve, not the region presumably bounded by the curve. This is the point of Tverberg's Lemma 3. Roughly, the closed polygons should not thin to zero everywhere. Moreover, they should not thin to zero somewhere, which is the point of Tverberg's Lemma 4.

The first formal proof of the Jordan curve theorem was created by Hales (2007a) in the HOL Light system, in January 2005, and contained about 60,000 lines. Another rigorous 6,500-line formal proof was produced in 2005 by an international team of mathematicians using the Mizar system. Both the Mizar and the HOL Light proof rely on libraries of previously proved theorems, so these two sizes are not comparable. Nobuyuki Sakamoto and Keita Yokoyama (2007) showed that in reverse mathematics the Jordan curve theorem is equivalent to weak König's lemma over the system RCA_0 .

`{RCA}}_{0}} {\mathsf {RCA}}_{0}}.`
"

=> The entry goes from Jordan initial thm of 1900s up to modern computer assisted formal proofs.

=> Note that a copy-paste from a browser gives some LaTeX code.

01.01.22

- Some paper notes on commutative algebra.

About yesterday Jordan thm.

=> The curves of the thm are called Jordan curves, they end up exactly fitting extended criterions requirements.

Note the definition of those Jordan curves as the images of continuous injective maps from S^1 to R^2 .

"Injective" prevents self-intersecting nodes generating nodal-beans on the curve.

=> For future version of memoire :

1) distinguish the inner bordering variety from the outer one.

2) for generalized criterion : the gluing procedure might match schemes gluing inner constructions.

-> See wkp entries of Stokes and algebraic de Rham.

<=.

-> Sought also what Internet says about $\text{Spec } Z[t, 1/t]$.

Found out $\text{Spec } Z[t, 1/t]$ as a grp scheme explicited in Group scheme paragraph of Qin Liu book "Algebraic Geometry and Arithmetic curves" p298 sq.

$G_m \sim \text{Spec } Z[t, 1/t]$ can be generalized to $\text{Spec } Z[T_{ij}, 1/\det(T_{ij})] \sim GL_n$, the first one being the initial case corresponding to $n=1$; just as R^* is the special initial case of $GL_n(R)$ when the number of variables or dimension n is taken to $n=1$. Those multiplicative spectra are sheafified or spread out over a base scheme S , using the notion of fibered products over S .

=> In this book an historical ironical collision.

Section 7.2 "Weil divisors" contains a "Van-Der-Waerden purity" thm.

-> A.Weil was of jewish origin rambling around Europe to flee from anti-jewish persecutions of WWII; Van-Der-Waerden from NL, has accepted german national socialism in the begining while he was in Leipzig before fleeing back to NL.

Maths have no feelings nor morality and do not care; like a cold-blooded and heartless machine : maths care only about results and thms; that's it.

I hope that future deep-frost supraconductive quantum computers mainframes will definitively kill maths and free-up mankind : maths only deserve those frost-based future cold-machines.

pos of science.

<=.

=> Contains Cech cohomology applied to schemes with a prior treatment of coherent sheaf theory, apparently using Serre coherent sheaves theory; based on coverings or glueing (recouvrements).

This book is another leave of the SGA/EGA tree.

<==

* Some vid.

Alena Pirutka: "Stable rationality" - Lecture 3 @ CIRM.
Feb 10, 2017

Centre International de Rencontres Mathématiques

Abstract: "Let X be a smooth and projective complex algebraic variety. Several notions, describing how close X is to projective space, have been developed: X is rational if an open subset of X is isomorphic to an open of a projective space, X is stably rational if this property

holds for a product of X with some projective space, and X is unirational if X is rationally dominated by a projective space. A classical Lüroth problem is to find unirational nonrational varieties. This problem remained open till 1970th, when three types of such examples were produced: cubic threefolds (Clemens and Griffiths), some quartic threefolds (Iskovskikh and Manin), and some conic bundles (Artin et Mumford). The last examples are even not stably rational. The stable rationality of the first two examples was not known.

In a recent work C. Voisin established that a double solid ramified along a very general quartic is not stably rational. Inspired by this work, we showed that many quartic solids are not stably rational (joint work with J.-L. Colliot-Thélène). More generally, B. Totaro showed that a very general hypersurface of degree d is not stably rational if $d/2$ is at least the smallest integer not smaller than $(n+2)/3$. The same method allowed us to show that the rationality is not a deformation invariant (joint with B. Hassett and Y. Tschinkel).

In this series of lectures, we will discuss the methods to obtain the results above: the universal properties of the Chow group of zero-cycles, the decomposition of the diagonal, and the specialization arguments."

Recording during the thematic meeting "Algebraic Geometry and Complex Geometry " the January 26, 2017 at the Centre International de Rencontres Mathématiques (Marseille, France).

- Some ideas on paper notes about that :

a) Stably rational as a kind of Morita equivalence instance, or a division equivalence relation instance like the tensor one of central simple algebras for the Brauer grp of fields :

$$A \sim_k B \iff \exists m, n : A \otimes M_n(k) \sim B \otimes M_m(k)$$

V stably rational \iff There exist m, n such that $V \times P^n$ is rational, that is; such that $P^n \times V$ is birational to some

P_m

V stably rational $\Leftrightarrow \exists m, n : P_n \times V \sim P_m$.

b) Equidimensionality for fibrations or varieties : all fibers have the same dimension, that is; the dimension of the fibers is constant. Giving equidimensional bundles.

For $\dim=2$ and $\text{degree}=2$: quadric surfaces bundle;

For $\dim=1$ and $\text{degree}=2$: conics (curves) bundle.

2.1

© Android P9.

® Investigated CAS computation of cohomology of schemes with coefficients in sheaves; found nearly nothing about machine computations of étale cohomology.

\Rightarrow Seems to be an output of the biased Internet; the country that reaches this breakthrough of easily computing sophisticated étale cohomologies will have an advantage over the others.

- Retrieved by the way, some articles from the first pointers.

-> Note from the rare and outdated outputs, the Us-De competition; as the bots crawling the memoire site @ Free; those bots are mainly us and de bots.

<- .

- Read them in

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1) Greg Smith @ Berkeley arXiv article on $\text{Ext}(V, M, N)$ computation.

According to bib refs, seems to be around 1998. Computations of Exts. Groebner basis and syzygies on MacAuley2.

To an element of the module $\text{Ext}^1(V, M, N)$ corresponds a sheaf.

2) Mike Stillman @ Cornell. Conference/Mini Course summary.

Same trame as the first one; nearly nothing new. MacAuley2 around 2000.

3) J.Jin @ MaxPlanck Bonn. Explicit computation of etale cohomology of curves.

This is the only recent (2017) paper dealing with etale cohomology but with coefficients in \mathbb{Z}_n , through \mathbb{F}_p .

Computational stuff related to Weil study of varieties over finite fields and Lefschetz trace formula for counting points of some of those varieties namely curves over finite fields.

=> Gives algorithms strategies but not a single line of code; confirming the first remark.

4) Gert Martin Greuel @ KaiserSlautern Univ. Computer algebra, Alebraic geometry, Singularity theory.

=> Monodromy computations.

=> According to bib refs : around 2000.

An extract :

"The monodromy of a morphism $f : X \rightarrow S$ between complex spaces or algebraic schemes/ \mathbb{C} , which we suppose to be a differentiable fibre bundle outside the discriminant $\Delta \subset S$, describes the action of the fundamental group of $S \setminus \Delta$ on the cohomology $H^*(X_t, \mathbb{C})$ of the general fibre. The Gauß-Manin connection may be considered as an algebraic description of the monodromy action by means of differential forms.

Finally, the mixed Hodge structure is an analytic structure on $H^*(X_t, \mathbb{C})$ generalising the Hodge decomposition of compact, smooth algebraic varieties. These concepts have many applications and were widely studied in the global situation for proper maps as well as in the local situation for isolated singularities, for a survey see [35]. Here we shall only consider the local case.

Let $f \in \langle x_0, \dots, x_n \rangle$ be a convergent power series (in practice a polynomial) with isolated singularity at θ and $\mu = \dim \mathbb{C} \langle x \rangle / \langle f, x_0, \dots, x_n \rangle$ the Milnor number of f . Then f defines in an ε -ball B_ε around θ a holomorphic function $f : B_\varepsilon \rightarrow \mathbb{C}$, and, by a theorem of Milnor, there exists a small δ -disc S_δ in \mathbb{C} around θ such that $f : B_\varepsilon \setminus X_\theta \rightarrow S_\delta \setminus \{0\}$ is a C^∞ -fibre bundle, so that the general fibre $X_t = f^{-1}(t)$, $t \neq 0$, is homotopy equivalent to a bouquet of μ n -dimensional spheres."

=> Contains good german-style pragmatic key-pts as well as pragmatic-theoretical recalls; confirming once again that computations on machines force to stick to hardcore reality avoiding stratospheric theoretical delirium giving the gigantic polluting melasse of theories in thousands of research papers that drowns and chokes to death most of mathematicians, inexorably sinking in the

abysses of the enlarging corpus of their investigations fields; like the lethal-growth of a star entering its death stage.

Here the death of prehistoric maths will be signed by future big AI/Quantum mainframes.

=> Note also the term "bouquet" used; hopefully with the same meaning as in this search.txt of objects (of the same type) spread-out over a fixed base-object.

=> Morphisms as fibre bundles over the open complement in the base space of some closed singularity locus.

Late nite.

* A vid of a talk S.Lemaire @ IHP on DNA-data storage.

Synthesis of chunks of full DNA helices to store data. The reading back of this bio-data is done by sequencing those chunks : NanoGen Oxford is a sequencing device the size of big usb-key, pluggable into laptops.

DNA data storage was already achieved but only on half-helices; mainly by us researchers supported by the us gigantic data beasts companies (g, m\$, etc)

==> Environnement friendly perspective but huge cost hurdles in processing (write) the bio-data.

Evokes the nowadays terrific environmental costs of WORN data (WriteOnceReadNever): thousands of PetaOctets of insignificant/irrelevant data mostly stored but barely read. Like video-games sessions, dumb videos, etc.

==> Mankind stupidity when left free to do whatever it feels like.

==> There should be an authority that regulate this irresponsible childish attitude of putting online

"nimportequoi", irrelevant or trash data.

3.1

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Continue reading Greuel text of yesterday.

=> Contains some lines of code in Singular environment; so got back to terminal looking for Singular entries in Debian.

Db-located singular entries, found :

a) a chunk of last saved files before 2009 blackout; nearly nothing; the interesting files are in the stuck hdds.

b) Sage and Emacs integration stuff for singular.

Then a way to get it running, the trick is to respect the uppercase S in the prompt :

```
singular > nothing.  
Singular > launches the cmd line.
```

=> Confirmation at Singular prompt that Gert Greuel is one

of Singular maintainers and that Kaiserslautern Univ is Singular alma mater with east collaboration (ir, tu, ksa).

4.1

Late nite around 0h45.

Some vids.

1) Neuro/Brain/Cognitive sciences course of Nancy Kanwisher @ MIT.

2) Lectorum (russian platform @ StPete).

a) Jean Louis Colliot (mini-)courses and talks.

b) Jason Starr (stony brooks nyc) talk on rationality.

c) Nikolai Durov. Topological models of algebraic varieties.

-> Researcher @ StPete Steklov Institute : 2 phds (1 ru, 1 de @ Bonn with Faltings).

Coder : vk (Brother of Pavel Durov (vk founder)), telegram, decentralized distributed blockchains data-networks.

Evokes relations between two categories Sch/Var and Top/os . Functor from Var/Sch to Top/os . Then a passage to anabelian geometry.

Topos as generalized topological spaces.

Universal covering of sheaves.

-> A must see for general overview of foundational aspect of AG with an obvious "Faltings style".

3) Porowski (Nottingham) talk @ Insibria Univ (it) on Grothendieck anabelian cj.

-> Slides.

4) J.F Quint talk @ IHES on Reutner thm.

Joint Work Y.Benoist.

Extension du thm de Ratner sur l'adhérence des orbites des pts de variétés sous l'action d'un grp.

Application des chaînes de Markov et autres résultats récents en théorie des marches aléatoires.

Names : Furstenberg, Ratner, Margulis and other specialists of dynamical systems on varieties.

With extension to arithmetic grp thms.

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Inspected the present cohomology pkg from its doc folder `/usr/share/doc/cohomalg-common$`

-> Again german stuff : allows to compute cohomology of sheaves of/on line bundles on toric varieties.

-> The doc is cryptic but comes with a subfolder of examples.

- Extract of the ... extracted manual.gz :

"In order to derive the Stanley-Reisner ideal, which is a required input for the program, you may want to take a look at

TOPCOM :

<http://www.rambau.wm.uni-bayreuth.de/TOPCOM/>,
which can also enumerate all possible fans for a given set of vertices.

The Maple script package

SCHUBERT :

<http://folk.uib.no/nmasr/schubert/0.996/>,
can be used to compute intersection numbers and further geometrical quantities of toric varieties, however, the software is somewhat dated at this point.

Furthermore, there is the package

PALP :

<http://hep.itp.tuwien.ac.at/kreuzer/CY/CYpalp.html>,
which is useful for computing invariants of hypersurfaces, Mori cone vectors etc.

You may also want to take a look at the

SAGE

Library: <http://www.sagemath.org/>,
of freely available mathematical software.

Finally, the environment Macaulay2 :

<http://www.math.uiuc.edu/Macaulay2/>,
which allows similar computations, was heavily used during the development process.

Example:

The following example for a Calabi-Yau 4-fold is taken from the paper arXiv:0912.3524 and describes a compact complete intersection Calabi-Yau 4-fold used in the construction of F-theory GUT vacua.

The toric data of the ambient space (found in table B.1 of the aforementioned paper) is specified by the following variable:

```
Example4Fold = {
(*Coordinates*){v1, v2, v3, v4, v5, v6, v1s, v7, v8, v9,
v10},
(*Stanley Reisner*) {{v3,v9},{v5,v9},{v7,v10},{v1,v2,v3},
{v4,v1s,v8},{v4,v7,v8},{v4,v8,v9},
{v5,v6,v1s},{v5,v6,v10},{v1,v2,v6,v1s}},
(*Equivalence Relations*){{3, 3, 3, 3, 0}, {2, 2, 2, 2,
0},
{1, 0, 0, 0, 0}, {0, 0, 1, 0, 0}, {0, 0, 0, 1, 0},
{0, 1, 0, 0, 0}, {0, 1, 1, 0, 0}, {0, 0, 1, 0, 1},
{0, 0, 1, 0, 0}, {0,-1,-1, 1,-1}, {0, 0, 0, 0, 1}}
};
```

The 4-fold is given by the intersection of two divisors in the ambient space, which are specified in the variable

```
ComplInt = {{6, 6, 6, 6, 0}, {0, 0, 2, 1, 1}};
```

and the actual command for the computation of the Hodge diamond is then

```
CohomologyOf["HodgeDiamond",Example4Fold,ComplInt,"Calabi-
Yau"];
```

which takes around 20 seconds on a current desktop computer and computes 264 intermediate ambient space line bundle cohomologies via `cohomCAlg`.

The full Hodge diamond as well as the Betti numbers and the Euler character are then printed in a very readable form :

110000505000001
 111545241115
 1 6756 χ = 6768
 00000050500011

4.3.7

Endomorphism bundle of the tangent bundle of a subvariety."

=> The key-pt to keep in mind is the input-data type : generally a finite nber of polynomials with integer coefficients or an array of arrays of integers; that is, a matrix of integers.

Search for :

- a) Reiner-Stanley ideals.
- b) Hodge diamonds.

<=.

- Some heavy physical Tetris.

Retrieved old big ViewSonic CRT 21" square screen of 15kg/30lbs.

Put Big Samsung 32" flat screen instead of ... 5kgs.

5.1

Late nite.

* Some ytbe vids.

1) A g presentation of AI by tensorflow.

Colorful gigantic screen presentation but too superficial and not that enlightening.

Typical g childish show-style : "cal-campus coolness facade" or infantilisation of users to better harvest the ressource they actually turn out to be for them; "poudre aux yeux" pour mieux moissonner leurs donnees" as R.Stallman suggested about them.

Cf R.Stallman "google is evil" GNU page and preceding posts on us data-beasts.

By the way, retrieved two key pts :

a) desired-outputs as input of AI knowledge db : training phase of AI engine for recognition or pattern-searching algorithms.

b) Python .pynb code-file @ github for a running demo : img recognition (courte paille or stone-paper-scissors games).

2) More relevant Nancy Kanwisher talk vid on NeuroSciences and brain cognition @ MIT.

a) olfaction does not pass through thalamus gateway like other sensorial "routing cables".

b) visual sector is located in rear part of the cortical upper-layer (region corticale de la vision).

==> I think I remember that the sectorisation of the cortical layers is now being reconsidered; the old partitioning map is not relevant anymore because such a fixed and rigid structure does not fit recent brain activity imaging results; the brain has much more flexible, synchronous and // fonctionning patterns giving

its quasi miraculous resilience and plasticity.

<==.

c) "reptilian-bios" or primitive brain layers (cerebellum, stem)+(hypo-thalamus/campe, amygdale), supposedly serving only basic vital biological functions (the "bios") may have actually cognition capabilities (intelligent bios or uefi).

Siege of Motion coordination, fear (amygdale) or survival stress responses. Mid term memory.

d) Less than 20 W to perform a quite huge amount of simultaneous complex tasks.

=> Machines challenged.

d) Consciousness : not sorted out, still mysterious. The only less doubtful fact is its switching (veille/sommeil) location @ the reptilian root part.

==> I think it will never be understood, its approach being under A control. A menant fermement toutes les sommites scientifiques en empoignant fermement sa creation par le toupet proprio-receptif.

<==

Late morning.

- From previous nite vids about Brain vs AI.

==>

In term of cognition in data-processing of knowledge-dbs during learning-solving stages; injecting a tiny or small amount of chaotic data in dbs may trigger the spark for a fruitful uncommon and original solution coming from the process of analogy-association applied to previously solved pbs: this gives the learning graal; ie the

learning-solving process applied to learning-solving processes; the notorious "learn-to-learn" applied to/or "learn-how-to-solve" marotte.

I think that gafa are able to use or have already used AI engines specialized in tactical pbs or games maybe on dedicated mainframes to establish a strategy that ensures their growth, settling their dominion over the Internet; a specific network of machines trained to output a strategy in order to dominate the much larger remaining networks of other machines; incorporating market-laws/evolution or predictive algorithms; predator-prey/cooperation rules; tech prospective, etc.

Search for that if bored by maths but avoid too much paranoid speculations.
<==.

- Memories of AI coding.

1) Turbo Prolog in early 90's : I remember that the code ran quite, quite fast; the fastest running code ever experienced.

2) Some Lisp in early 2005 : I remember the bunch of (()) in coding sessions; "logic predicates" or "tree-graph" style coding nearly as tricky as stacky RPN Postscript coding sessions.

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-Tried Samsung 32" screen : prevents eyes fatigue with oversized fonts at the cost of resolution. Good for vids; browsing and editing.

-> Horizontal position not suitable for reading books and articles or LaTeX viewers.

-Pulled some articles on Reiner ideals, all the stuff oddily dates back to 1997-2000; nearly nothing after.

6.1

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1) Back to maths after the previous AI-Brain-Cognition interlude.

2) Memoire corrections.

Eclaircir with Breathing Spaces; structurer pour un style plus academique.

BS

- Separate Faltings-Mordell thm by quoting it.

- 1) First tool. HP.

2) Second tool. Brauer Manin thm.

Also in cohomology proof : maybe more explicit and put numberings. maps from G^n to $A : \text{Hom}(G^n, A)$.

Enonces

Definitions of criterions requirements.

3) Updated and posted the search.txt file @ Free.

-> Almost 500 pages : consider splits/forks into years or semesters.

4) P9 Notes folders contains about 490 txt files.

-> Consider keeping only monthly ones.

5) Pulled some ArXiv asian articles.

1) A kr one on MZVs.

2) A jp one on Zeta.

6) Explored Arch folder of 2003-2005 from Gabel : search folders contain worthy notes mostly in french showing investigation process.

=> Those are must-read and to include in some future teXtes.

- Some paper notes on fibered spaces and fibre bundle (espaces chevelus).

7.1

Morning

Went out half a day, so nearly nothing.

Nite

Posted tips on insta : as always when posting; the result is scrambled by cropping quirks; so had to repost imgs, making the experience penible and time wasting.

-> Cf the post of scrambling internet.

Late Nite : mainly cables e-tinkering.

-Tried different cables layout on 32" Samsung :

-> hdmi 2 port gives a lesser resolution than hdmi 1; this one is shown on ocd as hdmi 1/dvi.

-Type-C one on Tablet avoid the grinded adaptator.

8.1

Early Morning 5h30.

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Collected misc insta data and pushed it into g-drive.

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1) Created a AlgNT in src folder.

Pushed nb fields articles into it.

-> Consider following standard classifications for

folders.

AG = algebraic geometry

NT = number theory...

2) Memoire corrections. V.

Introduction

three thousand years

for that metric associated to v .

Although ... answer.. Particular (insert : "classes of") varieties.

When it is known that "the studied varieties" have lots of ...

:" the underlying goal of this memoire is ...

Algebraic part.

Replace t by T in Spec of etale Brauer.

G-morphism

of G as in the following ... "arrow".

Criterion part.

is its "inner" bordering.

Late nite.

* Some ytube vids.

1) Maynard 2017 talk on primes numbers P @ IAS.

Given $A \subset \mathbb{Z}$, studies density of $A \cap P$.

2) Porowski Anabelian talk Sep 2021 @ Insibria (it).

Nottingham (Kim previous position)

Anabelian GC for etale fund grp.

This etale fund grp gives Galois grp when applied to dim 0 case; like the motivic Galois grp.

A cj on faithfullness of functor sending a scheme to its etale fundamental grp : can a scheme be recovered from its etale fund grp?

Names : Grothendieck, Tamagawa, Mochizuki.

->

For criterions, look for faithfullness of the various functors involved :

- a) Periods one,
- b) the Brauer grp.
- c) Motivic Galois grp.

<-.

9.1

® Read a bit A.Skorobogotov Torsors book.

- Some paper notes pointing-out similitudes between :

- a) fiber bundles.
- b) covering spaces.
- c) torsors.

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Explored Sage scheme theory capabilities.

From a db locate, opened docs found in /usr/share/doc

=> Surprisingly a lot of capabilities in terms of functions and basics-cmds; with cohomology ones for toric varieties.

Toric varieties consist in a simpler class of alg var; that are suitable for computation; hence their constant appearance in CAS; they are rational as their singularities.

They have application in discrete geometry: lattices pts in polytopes, polyhedra and convex bodies.

* Resume of preceding ytbe vids.

1) W. Porowski on Anabelian geometry.

Insists on the function field aspect; ie scheme defined over such fields; building hyperbolic varieties over such fields that catch faithfulness of etale fund grp functor.

2) N. Durov on Topological Models in AG.

Raises faithfulness issues of

a) Sections and rational pts.

Do different rational pts from different fields give "same" sections ?

b) etale fund grps.

Then switches to topos to get partial results for that faithfulness goal.

10.1

Late nite

® Read a bit of W.Fulton Toric book; since those toric varieties have pervaded CAS for their tractable computationability.

=> The foggy link to criterions is their convex-geometry aspect.

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Searched cohomology with db-locate.

Found 3 entries.

- a) singular.
- b) sage p-group.
- c) GAP.

-> One new one (GAP) : seems to be cohomology grps $H(Z,G)$ ie cohomology grps when a grp G is seen as a Z -module.

-> Conclusion : the most tractable in terms of I/O is the (us) Sage implementation, the others (de) ones are more

cryptic-esoteric (closeness by untractibility).

- Updated memoire typos tm.txts from 16.11.21 to 06.01.22

11.1

Early morning.

- Some paper notes :

About inefficiency of prehistorical way of doing maths :

-> Glossary of varieties, something like 3 dozen ~ 36 qualificatives/adjectives for varieties/schemes; a bunch of inutile vocabulary bloating mind of mathematicians.

-> Preciosity of sophisticated jargon hiding inefficiency to answer elementary questions; like :

1) Does

$$\sum_{i \leq m} X_i^{n_i} = t^m$$

has a non trivial rational pt for t rational, $m > 10$ and $d = \max_i (n_i)$ close to m ?

2) Are e and π algebraically independent?

3) Is y (Euler constant) irrational ?

4) Is $1/\pi$ a period ?

- Consider memoire maths contents cm.txts as cm220111.txt for criterion elaboration.

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For msri vid (vmath) from Android TV browser: dwnld vid to see it, the embeded streamer is inoperant in the browser app.

* Geoffroy Horel (Paris13). Galois action on Operads @ Msri : Hot Topic on Galois grps of periods.

Introduces the Grothendieck-Teichmuller tower from a geometric scheme $V \times_{\mathbb{Q}} \mathbb{Q}_\infty$ with example of

$$V = Gm-\{1\} = P^1-\{1,0,\infty\} = Mo,4$$

and its etale fundamental grp. $Gal(\mathbb{Q}_\infty, \mathbb{Q})$ acting faithfully on it; turns out to be a subgrp of $Aut(\pi_{1_et}(V \otimes_{\mathbb{Q}} \mathbb{Q}_\infty))$.

Eludes the base-pt issue; that seems to need being a rational pt of the scheme.

I think I remember that the Techmuller tower is built from a series of etale fundamental grps $\pi_{1_et}(V_n, \mathbb{Q})$ or $\pi_{1_et}(V_g, \mathbb{Q}_n)$.

-> more likely etale fundamental grps of $V_{g,n} = Mg,n \times_{\mathbb{Q}} \mathbb{Q}_\infty$
 Mg,n moduli space of genus g curves with n punctures;
 $\pi_{1_et}(Mg,n \times_{\mathbb{Q}} \mathbb{Q}_\infty)$.
 <- .

Switches from etale fundamental grps to homotopy types, this category switch avoids the choice of base pt for the fundamental grps; then introduces operads.

Operads = generalisation of grps. n-ary operators.

Starts from Tree-graph or operato-representation of a grp; an element of the grp being identified to its action by composition or left-multiplication on the whole grp.

Then extends that to action on finite products of the whole grp, each element of the inial grp being tagged by an index indicating on which "coordinate" it acts on.

12.1

* Some vids on ytbe.

1) J.Harris talk @ Harvard (Yau seminar) on rationality.

Rational parametrisation as a way of getting rational points.

2) O.Wittenberg on Weil cj @ IHP Math Park.

=> Contains recalls on complex analysis (Riemann ζ), algebraic topology (homology), etc :

Homotopy of maps, loops, spaces.

Homotopy is easy to define but hard to compute (open problems for n-spheres).

Homology is the converse : hard to define but gives easy discrete computations.

Simplicial or Betti Homology.

F field. $H(\Omega, F)$ quotient space of boundaries-subspaces modulo cycles-subspaces from derivation-boundary map along complexes of those subspaces.

Defines derivation on simplicial F-vector spaces of Ω , indexed by the dimension of base simplices that are traced/cycled on Ω by maps from usual real simplices.

Long exact sequence for U and V open subsets of Ω :

$$\begin{array}{ccccccc} \dots & & & & & & \\ H_p(U \cap V) & \longrightarrow & H_p(U) \times H_p(V) & \longrightarrow & H_p(\Omega) & \longrightarrow & \\ H_{p-1}(U \cap V) & \longrightarrow & H_{p-1}(U) \times H_{p-1}(V) & \longrightarrow & H_{p-1}(\Omega) & \longrightarrow & \\ \dots & p=1 \dots n & & & & & \end{array}$$

\Leftarrow .

- On reading search.txt to compile the criterion theoretical contents cm.txts from keywords mem, exten, criter.

Some paper notes on

1) periods quotients : defining a "quasi-projective" period space extension.

\Rightarrow Precise for memoire that faithfulness of periods maps/functors is about particular periods or extended ones and not the usual ones of the Betti-de Rham pairing, Kontsevich-Zagier or Grothendieck-Periods-Cj. This extension consists into, at least two stages :

1) from periods to quotients of periods.

2) the nber of such periods, or the lenght-width of the periods arrays/matrices; from two to ∞ the ones or series in a refining process : the more, the finner the encoded data.

\Leftarrow .

2) General facts on varieties, topology, etc.

\Rightarrow Tower or matrioshka of nber fields for

a) Mordell-Faltings and

b) criterions applied to polytopes.

\Leftarrow .

3) Some speculations on "generalized or topological" schemes.

® Pulled some papers.

a) Horel notes of MSRI talk.

-> cf B.Colas talk on Picard-Fuchs monodromy or Zoonekynd thesis.

b) O.Debarre notes on periods maps and domains; in the spirit of Griffiths periods maps.

\Rightarrow Bibliography.

13.1

® Read a bit papers pulled yesterday.

- Pulled some other papers on Arxiv.

a) Tim Santens (be-nl @ Hausdorff Center) text on Brauer criterion for families of diagonal quartics in the spirit of M.Bright works and generally the brit/uk school of arithmetic geometry.

b) A korean tex on diophantine inequality extensions again for some family of subvars; in the spirit of Schmidt subspace thm.

* Wojciech Porowski: "Introduction to anabelian geometry"

After recalling the notion of the étale fundamental group of a scheme, we will discuss how various properties of a hyperbolic curve can be reconstructed from its fundamental group.

<https://m.youtube.com/watch?v=ikalrqtLc5U&t=193s>.

<https://utge.lakecomoschool.org/>

14.1

Went out half-day, so nearly nothing.

- A few lines on paper :

Algebraic toruses; category shift especially the bouquets or "scheme above" or relative pt-of-view : the morphisms of the source category being the objects of the goal one.

© Android tv.

Updated that diary text with bt-keybd : editing/handling the box is not that easy since the keybd layout is switched to us one and editing apps are rudimentary.

See how to get it back/change keybd layouts on Android TV.

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Found a way to catch recent files.

-> Just open Chrome and upload a photo in g-photos.

- After reading diary.txt; especially the computer-related math stuff and maths in general. I think being too reactionary/maverick/critisizing should be reconsidered; not to the point of fitting the trend mould (you can not change the deep nature of someone, being a maverick, out of institutions; never conform nor submit to organisations); but temper the revolutionary/wild deep inner-side should be a wiser, more humbling and maybe more fruitful way of approaching maths; although I still think that machines will ultimately sign the death of this pos of science.

15.1

- Some paper notes.

- 1) A few schemes heuristics.
- 2) Criteria future formulations.

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Collected some data @ instagram.

Pushed it into g-drive.

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Some minor corrections of memoire.

- Some on paper : the fourth example, finding first order degeneracies like Q-pts on the diagonale.

16.1

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Collected some data @ instagram.

Pushed it into g-drive.

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Some minor corrections of memoire.

- Some notes on paper :

A) $\text{trdeg}_Q Q(P(V))$,

cases of

a) Galois grps of rational polynomials,

b) a transcendental exponential curve : symmetrized graph of $x^{-\ln x}$; with compactification tackled but to be continued, etc.

B) Some homology notes : functoriality, to be completed.

17.1

- Continued homology notes on paper.

Functoriality : Endomorphisms of homology coming from endomorphisms of spaces; giving infos about the actions of those endomorphisms on the space (fixed points, stabilisators, etc).

Lefschetz and Brouwer thms.

Ⓢ Read some papers.

a) O. Wittenberg ICM22 rationality paper.

-> Quite prospective with speculations about future

developments ("it should", "it would ") like the memoir.

b) V. Zoonekynd stratospheric thesis on Techmuller towers.
(topos, 2-categories, etc).

-> Felt some unpleasant loop-back logic quirks about toposes : their definition are set theoretic, but they give the category of sets as a special case of toposes; actually a "punct" special case; like the $\mathbb{0}$ -ring when the $1=0$, or more generally " $\mathbb{0}$ -object" in usual categories; as the degenerate object \emptyset in set theoretic categories.

* O.Wittenberg on Weil cjs.

<https://m.youtube.com/watch?v=gkIOKxUQWJ4>

18.1

- Sorted last batch of paper notes.

® Read some papers.

a) J.L Colliot-Thelene on rank jumps of abelian varieties fibered above smooth varieties.
(= families of elliptic curves indexed by a finite family of parameters that is a finite nber of parameters).

Deals of density of rk-jump fibers; ie density of pts whose fibers gives those jumps from the generic rk value.

b) AMS "whatis" entries (orbifolds, operads, toposes,

etc).

Conclusion.

-> A bunch of facts and implications : cf preceding remarks of this way of tackling rational pts. Exhaustivity at the cost of clarity. In mathematics there is at least one certitude : deep breakthrough comes from a simplifying and clarifying theory originated in a few seminal innovative ideas.

Nonetheless those rank jumps and drops are reminding me of the ideas that I threw away in the memoir conclusion about size-drops of the size of motivic Galois grps from the generic one, of a family of motives or varieties.

There are two seemingly opposite ways of interpreting rks of elliptic curves : a big rk means a lot of generators; despite seemingly increasing the nber of rational pts and hence leading to degeneracy inferences; big rks should be interpreted, on the contrary, as going towards more structural constraints, more complexity for the grp of rational pts. I remember J.Tate insisting on the fact that the record breaking rks were obtained from curves having Z-pts as generators.

<- .

19.1

Morning 7h30.

- Some foundational paper notes on motives and elliptic curves;
reading the most recent paper book I have (a copy tediously made page by page @ BPI Beaubourg around 2005-2007 I guess) of Y.Andre Motives book (panorama et syntheses) of 2004. A pain for the eyes because of small fonts; since the copy was shrunked to save paper and money; but the contents is encouraging in terms of ideas; fitting those theoretical thoughts I managed to reset during this year of getting back to maths.

==> Retrieved on paper notes a list of pages to read.

- Wrote important foundational notes on paper about elliptic curves and varieties; peculiarly about the too coarseness of Galois-Grothendieck grps to fully capture the fine rational ppties of those varieties.

* Rewatched N.Katz Abel talk on Weil-cjs and crossed it to O.Wittenberg one @ IHP maths park.

=> This is a good technique to fix corpuses of theories in the brain; by cross-referencing quite diverse/different ressources that enlighten each other.

<=.

* Rewatched also Melody Chan (Brown univ) mini courses @ CIMAT 2016 (mx) on Tropical geometry aspects of degeneracies of moduli spaces of varieties.

* Tropical geometry.

Moduli (parametrized curves) : from combinatorial intersections ppties at degenerating values of the parameter, that give "degenerate cases", trying to pull back those ppties to the whole moduli from those simpler "degenerate" situations.

Framework : on discrete valuations fields, aka non archimedean ones.

$A=C((t))$: Laurent power series.

$C\{\{t\}\} = C((t))_ = \text{Frac}(A)_ = \sqcup C((t^{1/n}))$ Puiseux series.

$C\{\{T\}\} = C[[T]]_ = \cup C[[T^{1/n}]]$.

=> The key structuring object that shapes tropical theory is the discretization tool of valuation. This goes along discretization (lattices & polytopes) aspect of toric varieties : the underlying feeling is that all that discretization-linearisation framework is driven by the potential implementations into computers of varieties studies. Linearisation => Linear programming => DATA sciences => Modern era beast. Big DATA = The modern-era knowledge beast.

<=.

=> Try to moderate anti-machines aversion to not fall in paranoid mode by

letting the reactionary-wild inner side take control and lead to ...a beast attitude. Not loving tech, machines and all the sciences behind them is a not a reason for such extreme reactions.

<=

® Read some math bios @ StAndrews.

Kantorovich (ru prodigy : phd @ teenage, linear programming and economics), Clebsh (de), Birkhoff (us).

© Debian GNU-Linux Lenovo.

a) Updated.

-ffox from 78.x to 91.y and chromium from 90.z to 97.t.
-libreoffice

-jdk, perl and python.

b) Installed.

Cantor backends for Sage, Maxima and Python.

20.1

Morning.

- Some notes on tropical geometry; after watching some vids.

* Crossed reference yesterday Melody Chan @ CIMAT tropical vids with the ones of Bernd Sturmfeld @ MPI Bonn.

© Debian GNU-Linux Lenovo.

Tried Cantor backends : Python and Maxima are ok; Sage seems to quirk.

Located conf files with an updatedb-locate.

Found first entries :

```
/home/hui/.cache/cantor/knewstuff/prepared
/home/hui/.config/cantorrc
/home/hui/.local/share/cantor
/home/hui/.local/share/cantor/examples
/home/hui/.local/share/kxmlgui5/cantor
/home/hui/.local/share/kxmlgui5/cantor/cantor_shell.rc
```

=>

The second one contains last window-configurations.
The last one is an xml confile, but does not contain any
blackmode option.

<=.

21.1

Went out half-day, so nearly nothing.

- Collected some refs and pointers in Internet.

=> Saved them in ffox pocket.

- Pulled some articles on prismatic cohomology : Barghatt and Scholze theory. Seems to be driven by same goal than motives : packing different p-adic tools into one gimick-multitool; enlarging settings of p-adic study of varieties to a p-adic geometry by applying the spreading out (as a prism spread out a ray of light into its wavelenghts components) principle (bouquets or sprays over an object) to the base-ring into a "eventail" of semi-rings.

- Pulled some papers, talk slides and mini courses of J.L Colliot Thelene, Ielena Pirutka (Ярославль), O.Wittenberg.

® Some entries in wkp and n-lab.

- Toposes.
-
- Quivers.
- n and ∞ -categories.

22.1

Some mechanics maintenance (rr340), so nearly nothing.

© Tinkering Android P9 internals.

Files names : ContextData.xml, Alvin2.xml, mtknfcdata.txt, imemleakDBG.txt, imembufDBG.txt, 2.p2p.txt, ZZ_INTERNAL, db.fatal.02.JE.dbg

Alvin2.xml

```
<?xml version='1.0' encoding='utf-8' standalone='yes' ?>
<map>
<long name="timestamp" value="1420070408747" />
<string name="UTDID">VKS0CLX6KJMDALvDqaL9Pc5d</string>
<long name="S" value="186654998" />
```

```
<long name="t2" value="1475478881797" />
<string name="UTDID2">VKS0CLX6KJMDALvDqaL9Pc5d</string>
</map>
```

ContextData.xml

```
?xml version='1.0' encoding='utf-8' standalone='yes' ?>
<map>
<string
name="K_1171477665">55BB7E886FECCA7FA90B2DBAE4847F8EB2CC9B
7DB4DC0886FA165025C2E152CC</string>
<long name="t2" value="1475478881816" />
</map>.
```

Analyse of a mtk file hex-dump.

© Synced some data to Debian Linux Lenovo from both phones.

- Do not forget to precise in future version of memoire than the meticulously chosen periods are extended or generalized ones, and not just the usual ones from Betti-deRham pairing; they include as in the mean pt of varieties definition, quotients of those classical periods. Those are not a innocent class periods since that even the elementary $1/\pi$ is not known to be a classical period.

* Bernd Sturmfels Tropical Geometry @ MPI Bonn-Leipzig.

Description

Tropical Geometry - Lecture 1 - Plane Curves | Bernd Sturmfels.

Twelve lectures on Tropical Geometry by Bernd Sturmfels (Max Planck Institute for Mathematics in the Sciences | Leipzig, Germany) We recommend supplementing these lectures by reading the book "Introduction to Tropical Geometry" (Maclagan, Sturmfels - 2015 - American Mathematical Society) Lecture I - Plane Curves | August 19, 2020

Chapters: 00:00 Introduction 00:41 Tropical Polynomials
 07:03 Proposition 1.3.1 14:48 Figure 1.3.4. | Biquadratic
 Curves 17:55 Bézout's Theorem 28:14 Theorem 1.3.3. |
 Stable Intersection 33:51 1.4 | Amoebas and their
 Tentacles 44:18 1.5 | Implicitization 47:28 Questions

Tropical geometry is a combinatorial shadow of algebraic geometry, offering new polyhedral tools to compute invariants of algebraic varieties. It is based on tropical algebra, where the sum of two numbers is their minimum and the product is their sum. This turns polynomials into piecewise-linear functions, and their zero sets into polyhedral complexes. These tropical varieties retain a surprising amount of information about their classical counterparts.

23.1

Again some mechanic maintenance, so nearly nothing.

- Some paper notes :

a) Application of Q-pts (more elaborated than the sempiternelle cryptographic one).

b) Deep ones on the dual paradigm of varieties study.

c) Other ones the two types of periods extensions.

® Read

1) O.Wittenberg 2014 habilitation : key overview paper exposing state of the art of research on Q-pts till 2014; with mentioning plethora of cjs on the way of being answered.

Key pts.

-> Colliot Thelene influence is obvious : Chow theory, algebraic cycles, etc : Thesis advisor ?

-> One key pt is the structural invariant of Euler characteristic of coherent sheaves over a good scheme together with an interesting discrete invariant named indices of schemes or varieties.

-> Another one is the part on anabelian machinery applied to Q-pts (GSC or Grothendieck section cj) with Bloch-JapanSchool references (Kato, Saito, Mochizuki, etc)

-> Retrieved bibliography pages on paper.

2) Annette-Huber Periods monographs, on 1-motives (with G.Wustholz) and Galois grps.

Completes smartly the book on Nori motives : clarifying cross-references.

24.1

Early morning 7h.

- Some paper notes on foundational mathematics, namely

higher categories; or the category of categories; trying to define a "solving" higher category theory : finding ways of simplifying a pb through category shifts; for that goal, put a complexity or solvability measure on a pb and then find the minimising category for it. Those steps appears related to logic toposes; logic theory and formal-proofs theory linked to computer sciences.

==> an AI machine may elaborate then scan those shifts to track the better ones; giving an optimisation procedure applied to pb-solving categories.

<==.

The key pt is finding the right categories shifts since the initial pb may require the merging of several category shifts into a "bigger" one; in a kind of spreading out or "bouquet" principle applied above the initial category hosting the studied pb. "Schemes above the studied scheme" principle : here Pts are either pbs or the categories hosting those pbs.

This key pt may be considered as a "higher pb", giving a higher category above the considered solving-categories in another nested/recursive process related to the famous marotte "find out how to find out".

Afternoon.

- Some paper notes on motives untying the content of A.Huber Galois paper, here a some landmarks.

-Names cited : Fr BOST/CHARLES; It Andreatta, Barberi-Viale, Bertapelle.

-GPC is stated in p16 sq.

-Mentions special algebras related to pairings : Hopf, cogebbras and bigebbras; some extended objects : semi-torsors and GPC for all motives; conservativity c_j , Chow motives, t-structure and an interesting proposition linking irrationality of odd zeta values to fullness of a subcategory of motives.

=> t-structures related to t-riangulated categories?

Ends with transcendental applications of some subcategories of motives : Artin and Tate motives, Wustholtz-Baker thms, etc.

© Debian Linux Lenovo.

First steps rediscovering GAP; once again a german soft.

Maintainer : Berhendt, Janvic.

=> Most deep maths softs/prgs in Debian are german ones.

=> GAP is a quite impressive usine-a-gaz; since it incorporates a programming langage (declarative near Pascal) and the possibility of including librairies. In the same model as the Sage parser, that is built upon Python and incorporates others maths softs; with Python built upon C and GNU C librairies, that includes bunches of libs as multiprecision C computation and core-linux ones.

25.1

Morning 8h.

- Continuing paper notes on

a) pb-solving categories.

Complexity-Contracting functors, next-level category from recursive procedure of applying the same pb-solving process to pb-solving categories; like the topologisation of the space of topological spaces.

In the trend of ideas of pb-solving categories :
 Invariants = category shifters or pb-solving complexity-contracting functors.

b) Some other notes on motives.

c) important one on memoire precision : fV is not a semi-algebraic set defined from V ; but it is rather of topological nature; so that primarily, the corresponding period is not a classical one, directly defined from the Betti-DeRham pairing.

Note that if we allow a higher dimensional pt-of-view, it becomes via Green-Riemann formula; such a classical period.

© Debian Linux Lenovo.

Gap.

Long term soft : begun De Achen around 1990 then St andrews uk.

Explored integrated shell.

Grps inputs : for finite grps as subgrps of S_n .

First steps rediscovering GAP; once again a german soft.

Most of docs are in structured txts located in subdirs of `/usr/share/doc/gap`

=> Idea of algebraic varieties db-soft.

Input : alg equation.

Output : invariants.

Are there soft that output $J(C)$, $\text{Alb}(V)$ and their $\mathbb{W} : \mathbb{W}(E), \mathbb{W}(J(C)), \mathbb{W}(\text{Alb}(V)); \text{Br}(V), \text{Gmot}(V) ?$

Do Tables-db of those grps for simplest V exist somewhere ???

<=.

-> I think that Magma can now output some $\text{Br}(V)$ but since there are thesis consisting in computations of Brauer grps, I think that this soft can only output those grps for very peculiar simple varieties.

-> I think that Sage can output $\mathbb{W}(E)$ for nearly all E/Q .

-> I reread an article from Nature about P.Scholze use of Lean (m\$ code verifiyer) as a proof-assistant for one of his results. Those verifying softs seem requiring step-by-step inputs to confirm the initial submitted proof; this may be quite time consuming before getting the requested confirmation.

- Noted, that since the on-line publishing of memoire in z-lib and g-books; a bunch of specialized crawlers (us-de-ru) are regularly hitting the Free site originally hosting it.

® Read Claudio Pedrini (Genova) articles on motives of K3 surfaces from a Clay Institute monograph.

-> In the spirit of the paper with Bolognosi : motives in action, applied in K3 surfaces study.

<https://arxiv.org/abs/2201.09304>
Anderson theory.
A-motives.

26.1

Early morning 7h15.

- Important heuristic and structural paper notes on varieties related to memoire and criterions.

* Some vids starting from old ffox pointers.

1) G.Maltisionitis on ∞ -groupoids @ Grothendieck ENS lessons (Savoirs).

Functorial shift by adding a bar to an arrow.

2) J.Ayoub talk on Motivic etale cohomology @ ICM Seoul 2014.

Covering overlapping-coherence by fiber products.
Derived apparatus.

Afternoon.

- Continuing structural paper notes.

27.1

Early morning 7h15.

- Some paper notes on important structural heuristics of varieties related to memoire and criterions.

Hodge c_j query raised from non injectivity of periods maps.

Galois grp sizes.

* Some talks vids.

0) J.Hartmann on U-invariants and local-global principle @ IAS.

Anisotropy and fields invariants : Kaplansky.

1) Y.Andre on Perfectoids @ IHES.

2) B.Bhatt on Derived de Rham cohomology @ IAS.

Smooth case then sing one; via several ways (Tubular embeddings of Hartshorne; Illusie cplxes L_x) then derived geometry one.

3) M.Bharghava on Density of square free integers.

-> density theory and criterions mean pt, are related.

® Some entries @ wkp.

a) Derived theory.

-> Pulled some books on g-playbooks and some Hubris introductory articles of V.Zooneykind on K-theorie and etale fundamental grps.

b) Hodge th.

For certain classes of cplx varieties, adding structural refinings to classical de-Rham filtrations from Kahlerianity of those studied varieties; giving Hodge filtratons.

Hodge c_j is about algebraicity of topological cycles appearing in those filtrations.

Other topological c_j s on the way as Lefschetz c_j s.

For all those c_j s : distinction between integral vs rational versions.

28.1

Went out half-day, so nearly nothing.

- Collected some refs and pointers in Internet.

* Some Ytube vids on Hodge cj.

a) Kinertia.

Took some screenshots : papers of Hodge (around 1940); Atiyah-Hirzebruck (around 1960), Grothendieck (around 1968) and Deligne Cattini Kaplan (around 1995).

b) Dan Freed @ UT.

29.1

- Some paper notes from yesterday vids.

Duality

cycles : alg--continuous.

Euclide : pts--lines.

© Android A806.

Some plots of transcendental cycles.

® Read Maxima and Sage docs.

Categories for Algebraic Stacks by Kai Behrend.

<https://play.google.com/store/books/details?id=1M7UCQAAQBAJ>

Categories for Algebraic Stacks
Kai Behrend.

<https://play.google.com/store/books/details?id=1M7UCQAAQBAJ>

* Mathtube.org

30.1

Slept 7h for the first time since a quite long time.

--> Moderate sleep has a reviving & repairing effect on the brain and body; as sunny weather.

<--

- Nearly nothing, just some readings.

a) Deligne Clay Institute paper on Hodge cj.

Not that enlightening but one key pt is the extension of de-Rham complexes by using generalized functions (distributions I guess) as multipliers or coefficients of the base forms.

b) Kai Behrend long monograph about Derived ℓ -etale cohomologies on stacks of AMS memoirs.

A section on Toposes or Topoi another ones on stacks; the main goal of this monograph is the extension of the Lefschetz Trace Formula (LTF) to stacks by using the derived l -adic cohomologies machinery on those.

-> More explicit introductory notes on these concepts in the author website.

© Debian Linux Lenovo.

First steps rediscovering GAP; once again a german origin soft.

-Longterm soft : begun Achen (de) around 1985 then St-Andrews (uk); recently joined by Kaiserlautern (de) and Colorado (us).

-Kernel built in C.

-Explored integrated shell.

-Grps inputs : for finite grps as subgrps of S_n .

-This group-theory soft has a maintainers ... grp.

31.1

- Nearly nothing on paper notes, but a few heuristics lines after the last readings :

a) objects from a family/moduli/stacks with peculiar specific or intrinsic pties/symetries are detected as singular pts, fitting the general degeneracy paradigm of

criteria; degeneracies corresponding to size drops of the mtv Galois grps.

b) See how varieties corresponding to singularities of moduli spaces are actually fitting this trend of ideas : the nature of the detected degeneracy in the moduli/stack/family is related to the nature of the invariants used for building those ambient, electrolyte, echantillonneur or living spaces that are those moduli/family/stacks. This nature may be an object of a new kind of categories, something like "qualitative categories"; and the qualitative functor sending nature of invariants to nature of the studied pties/degeneracy may be one or "the big-thing" of contemporary maths.

Note by the way, to stick to hardcore reality through AI/Computer sciences, that categories are just oriented graphs (edges=arrows or morphisms and vertices=objects) maybe carquois or quivers generalizing those (non oriented?).

Category theory origin = Samy Lane (Samuel.Eilenberg-Saunders.MacLane) algebraic topology of 1945-1950, note the double S tragically and ironically reminding of WWII era that enfanted ... faisceaux ... of Leray.

c) invariants : the simpler or the "coarser", the more track-data is lost from initial objects.

d) some basics ones on finite grps.
 \Leftarrow .

© Debian Linux Lenovo.

Explored GAP and done some syncing between devices.

* Quick zapping of ytube vids on stacks :

a) new ones from Jared Alper online courses;

b) Kai Behrend @ PIMS,

c) Amit Hogadi (a researcher, incarning India school of theoretical maths).

1.2

- Same paper notes as yesterday.

a) Categorifications of pbs : fundamental grpoids of stacks, higher level equivalent of fundamental grp of top space.

b) Formulations/Nature of periods spaces for next criterions/memoires. Hypergeometry. Galois grps. Definitively sweeping out the algebraic case.

c) Coarsing/refining hypothesis : refining/coarsing criterions hypothesis spaces/categories; that is the classes of criterions-applyable varieties or criterions applyability categories ; in clear words the classes that

fit the different versions of criterions.

® Some readings.

a) Walter Rudin books on analysis : partition of unity, derivability of measures.

b) An ArXiv article of R.Parimala on period-index and u-invariants.

* Some various vids.

a) Brian Lehmann talk on rationality @ Pims PRIMA 2021.

Classical aspects (divisors and invariants built from linear tools).

b) Subojhoy Gupta talk on Techmuller spaces @ Tata ICTS Bangalore.

S compact complex connected surface (2-manifold).

$$\chi(Sg, b) = 2 - 2g - b$$

b = nber of boundary components.

Putting hyperbolic structures on those surfaces; and studying them; then study the Techmuller spaces classifying (?) those.

? Moduli/Classifying (holomorphic equivalence I guess) spaces of those hyperbolic surfaces.

? Each pt of Techmuller spaces being the class of some complex compact hyperbolic surfaces for that holomorphic \sim .

Like moduli spaces of algebraic curves of genus g , with marked or punctures pts.

Bermuda or pants as the result of sewing two hyperbolic hexagonal pieces of tissu along alternating edges.

c) A few IHES talks.

2.2.22.

Today is Even day or "2day is the 2 day" : wrote a few paper notes.

- on maths academic trends : fitting the mould, fearing the ridicule, sterile submissive-respect to pontes and institutions, idolatry of the corpus and its "masters"; and above all, lack of "libertarism" (a la Grothendieck) in the way of attacking pbs.

==> Again instead of critisizing, try to bring concrete answers to pbs; and consider instead

a) apply last methodology recalls to self, like avoiding

α) just minor corrections to txts, and
 β) accumulating piles of sketchy and obscure notes on paper;
 to prefer

b) producing regularly clear synthesis papers.

<==.

© Debian Linux Lenovo.

a) Sorted last batch of diaries both paper and txts.

-> noticed in Debian an odd jump in diary.txt size; a 1.6k diff, seems to be the second time just after saving the file in TabletPC.

-> Check that by hexediting a file and a fresh carbon-copy from TabletPC.

-> Noticed also that ffox can not save files anymore; even after upgrading it.

© Android P9.

-> Noticed also same size jerking with P9 phone : modified versions of files.txt from TabletPC, popping-out in Q-edit.

==> Chinese-devices instability or periodic release of national data-sniffing agents ?

==> Biased digital devices ? (cf scrambling experience).

b) Updated something like 15 key-pkgs (C maths libs, python bundles, ghostscript, etc).

® A lot of wkp entries.

Universal cover : the covering space is simply connected.

From GAP : Finite grps, Classification thm of simple ones, etc.

3.2

- Nearly nothing on paper notes, but a few heuristics lines.

Some investigation of endo-functors of the varieties category : Birational desingularization of a variety. Transcendental embeddings of a variety into its Albanese/Jacobian variety.

© Win\$10 TabletPC.

Inspected TabletPC files after yesterday jerk notice : found in file size entry on right-clicking for ppties, two sizes :

- 1) one labelled "file size";
- 2) the other labelled "file size on disk" slightly bigger (~ 1.6k).

=> I suspect an injection of either a worm or a signature chunk, so that every saved files in this TabletPC is being tagged; surely for syncing issue; since the device ssd is synced to OneDrive : pos of os.

Noticed also that the Tablet scrambled file.txt also affected other one on P9, and that those files have executable tags when inspected in Debian; they also jerk the Linux diff cmd.

=> Use those external devices in one way : Debian to them and not the other way around.

=> Inspect and monitor on a regular basis carefully the hexdumps of those suspect files.

4.2

Morning 7h.

- Some paper notes on hypergeometric uniformization; trying to catch hidden Galois grps.

- Went out half-day, so nearly nothing, just a few notes on paper.

© Win\$10 TabletPC.

Pulled 5 plugins for npp (analyse, compare, folders, hexeditor, html renderer).

® Books intros.

Dieudonne Intro of histoire des maths (herman) : smart view on theories.

Birgen Iversen on complex hyperbolic geometry : quite original book layout.

5.2

Early Morning 7h30.

- Mostly structural paper notes on memoire and criterions.

=> Daily log also on paper, to kick data-sniffers away.

© Win\$10 TabletPC.

Tried npp compare plugin.

6.2

Early Morning 7h30.

- Mostly structural paper notes on memoire and criterions.

=> Daily log again on paper.

Some mechanics : forming draining hoses to fit engines cases.

® Pulled some Hypergeometry papers mostly from Bloch-Vlasenko.

7.2

Early morning. 7h.

- Mostly structural paper notes on memoire and criterions : investigating how to link the modular Brauer grp $Br(K_V)$ to G_V .

-> I think I caught some glimpses into structural pieces of G_V ; this needs more unveiling, but what emerges from that first quick investigation is a subtower (tower of subgrps) of GL_n .

=> Put detailed daily-log also on paper to frustrate data-sniffers.

© Debian Linux Lenovo.

Changed the redundancy/backup-device to avoid the last day quirks.

® A lot a wkp entries.

Projective bundles, CSA, Brauer-Grothendieck grp, Motivic geometry, etc.

8.2

Early morning 7h.

® Play books

a) J.L Colliot Thelene overview paper of CIME Arithmetic Geometry Summer School 2007.

=> State of the art on Q-pts up to 2007.

=> CIME Summer school : Mediteranean Italian Summer ...
What a wack to today gloomy IDF weather of early february.

b) An article on Extended Brauer grp (2 categories) of ...
4 spanish researchers (univ of Vigo-Madrid-Compostela)
from a Eu/Belgian BxL Conference report book edited by
CRC/M.Dekker around 1999 :

Rings, Hopf Algebras and Brauer grps.

edited by S.Caenapeel (Bxl).

About 200e in g-books !?! => What a nonsense!

=> Article on Brauer grp of braided categories. Mentions
Majid work.

® M.Vlasenko uk-slides on Motives.

==> confirms guesses of yesterday, especially last
examples. I think that algebraic case of Q-pts can now be
swept out; through ideas of the last weeks.

<==

Reforme maths

Bac : pourquoi les maths pourraient revenir dans le tronc
commun en première et terminale

<https://www.europe1.fr/societe/bac-pourquoi-les-maths-pourraient-revenir-dans-le-tronc-commun-en-premiere-et-terminale-4092458.amp>

- Some physical Tetris, removing espresso machine that held verticalized laptop and put Dremel holder instead, turning it into a lamp and wires support on the go.

-Memoire typos : Correct Cr and Ca.

9.2

Nothing today.

- Morning : done a fairly complete maintenance of the GS500 motorcycle; before
- Late Afternoon : a good ride on highways (cold freeze by wind+speed after sunset).

==> Good refreshing (in both meanings) reboot of the brain; whacking hammers, maintaining engines and plowing ground for crops instead of hitting those ridiculous keybd-strokes : communists of soviet-block countries sending the Intelligensia work in farms during cold-war era; may not be that silly.

<==

10.2

Not that much : referenced the last read g-books.

- Corrected this diary.txt.

® Read Bloch-Vlasenko article.

Local systems, Frobenius maps : reminds me of N.Katz Abel talk on Weil cjs.

Monodromy, Linear differential operators (equations) along paths between their singular pts (homotopy).

=> One notion retained is motivic gamma function.

=> See if the same notion for hypergeometric functions exists.

=> Search for "motivic Hypergeometric functions" : I remember a paper of F.R Villegas about that.

* Some MSRI DAG (Derived Algebraic Geometry) vids.

a) Benjamin Antieau talk on Picards and higher stacks @ MSRI.

==> Smart evolutionary intro applied to "maths species".

From P_n to Picard Stacks to Higher stacks.

b) J.Lurie on Character Theory and Tempered Cohomology.

=> Clearer.

c) P.Scholze on Condensed mathematics.

=> ?

=> Brilliant talks but this young leading generation also seems to have been "piegee-empotee" by the theoretical aspect of maths corpus; as the preceding young generations since post WWII. Only experienced mathematicians; "les

vieux renards" (Serre, Manin et compagnie) have the "wide panoramic wisdom"; often incarnated in prudent sceptic opinions, as opposed to the bold emphatic triumphalism of the youngsters.

Aller dans la meme direction et suivre les traces des ouvreurs, pour franchir une dune ou une colline escarpee, mene generalement a l'enlissement. Sortir des sentiers battus, certe isole du grpe; mais peut permettre de vaincre le sommet quite a risquer de se perdre.

- Some quick structural paper notes on criterions : the shortest draft since 1.5y.

11.2

- Went out half-day, so nearly nothing, just a few paper notes on :

1) fundamental grp : homotopy equivalence.

2) higher generalisation of that "deformorphism" paradigm : universality ppty; with considered entity as "attracting pole" or "base" or "initial object".

3) periods : one important idea about their intrinsic nature.

- ® Read a bit two intros of g-books corresponding to the

free sample parts.

1) Another book of S.Caenapeel on Brauer grps of graded rings/algebras edited by M.Dekker/CRC.

2) E.Spanier. Algebraic topology. Springer. (Mac-Graw Hill-Addison Weisley reprint).

==> Those two readings suggest the existence of an alternative type of maths ressources; the less notorious but quite worthy one of the discreet maths-craftsmen (les maitres-artisans de l'ombre); giving another pt-of-view, often ignored by the front-scene trendy-sparkling maths "jet-set" ressources.

<==.

12.2

- Nearly nothing, but some paper notes on :

1) structural formulation of criterions.

2) various heteroclite theoretical pts.

Gathered maths vids src pointers in ffox, mostly institutions videos platforms to shortcut the desormais unsuitable ads-bloated ytbe.

* Watch some ytube vids mainly on Periods and Motives @

IHP and HIM.

13.2

- Same as yesterday, but after reading hypergeometric chapter of Lebedev book, the criterion uniformization intuition seems conformed. Cf entries in search.txt, confirming the sweeping out of algebraic case.

=> The paper notes of last days are confirmations of criterion preceding intuitions. It may be possible that I have actually digged out the cornerstone of some important breakthrough, in this memoire; that gives a quite original fruitful link between two relatively separated branches of nt, namely transcendence theory and rational pts.

<=.

--> The $E_{a,b}$ extended criterions dubious case of early days and 25.10.21 is also swept out : the third period (curvature) being an algebraic multiple of the second, so that a trivial alg dependency saves the case. This is due to the trivial alg effect of Mobius twists (Pfaff relations) on Gauss hypergeometric function.

<--

® A bunch of wkp entries on theoretical maths last two days : from topos, to stacks, grpoids, hypergeometry, etc.

14.2

Morning 7h30

- Some paper notes on :

1) hypergeometry.

2) theoretical thoughts : schemification (Schemification + sheafication of AG); then stackfication and toposication = nested Categorification of AG.

Ex :

Scheme \approx coherently glued spectra of rings along open sets of a topological space, the studied underlying space. It is equipped with a corresponding-compatible sheaf of rings.

Stacks \approx glued schemes for the etale topology = glued (glued spectra of rings). Stacks are originated in classifications investigations for schemes; they were introduced for schemes-classifying purposes : the classification may be relative to actions of grps on those schemes; or other equivalence relations from invariants (perties/values/etc) functors on those schemes, etc.

Higher stacks \approx glued stacks.

3) Some memoire typos.

® Read some intros of books, articles, wkps entries.

> Cf detailed contents in paper notes for key refs.

1) Two intros of books.

Martin Olson. Stacks.

Goro Kato. Heart of cohomology.

2) Hypergeometric function @ wkp.

Fairly exhaustive entry with refs like :

-Pearson (ox) Hypergeometric computations, mainly from analytic continuation and monodromy.

-Roger Bateman. Higher Transcendental functions.

3) Mick Allen (Oregon) ArXiv article on supercongruence of (truncated) hypergeometric functions.

"In particular, we investigate a number of supercongruences

between truncated hypergeometric series and Fourier coefficients of modular forms which were recently conjectured by Long [17]."

-> Some names : Long, Noriko, Yui, Watkins, Villegas. Magma implementation.

<http://magma.maths.usyd.edu.au/watkins>

-> Reminds me of Zagier work linking for a variety V , its L -function (Taylor?) coef expansions to Fourier coefficients of modular forms attached to some peculiar Shimura varieties related to initial L -function variety, maybe Shimura variety of the Jacobian/Albanese of V .

15.2

Morning 7h.

- Some paper notes : roughly as yesterday on hypergeometry and foundational aspects of AG.

® Found an interesting web-page on Motives and periods, namely Periods and motives 2018 seminar @ Simons institute.

=> Pulled abstracts of talks of the usual periods-motives grp of researchers (Andre, Ayoub, Viale-Andreatta, Fresan, Jossen, Lin, etc)

<=

-> This institute points to the Future by gathering research in computational aspects of fundamental disciplines like maths, data-sciences, physics and med-bio-gen.

<- .

® Read talks abstracts of

1) Peter Jossen on exponential motives.

-> Seems to correspond to specific twists of classical motives.

2) Jie Lin on automorphic motives.

- Dug in a pile of golden-era paper notes (1992).

Something like 500p out-of about 1500p are relevant : handwritten in quite thin-tight-dense style; nothing revolutionary but systematic carefull proofs of basic

group theory (finite grps, symmetric grps, etc) including topological grp theory.

-> Quite dense style : now difficult for my eyes.

16.2

Morning 7h.

- Some paper notes, roughly as yesterday. Hypergeometry : Uniformization by hypergeometric functions. Foundational : if infinite sets of integers are not allowed, I suspect that Godel incompleteness is swept away.

® Reread M.Lieblich papers on stackification of Azumaya algebras; and some abstracts of talks of Andre bday 2022 conference @ IHP.

a) Joseph Ayoub - Zurich. "Anabelian representations of the motivic Galois group".

"Given a variety X over a field k embedded into \mathbb{C} , the motivic Galois group acts on a quotient of the algebraic completion of the fundamental groupoid of X (\mathbb{C}). We will discuss a motivic version of a theorem of Pop characterising the motivic Galois group via these actions."

b) Bas Edixhoven-Leiden(† 2020). "Yves Andre, and the torsor of Poincare".

"I will present 2 applications of the Poincare torsor in areas that interest Yves Andre. The first is that of the Andre-Oort and more generally Pink-Zilber conjectures for complex mixed Shimura varieties. The second, partially p-adic, is the geometric version of the quadratic Chabauty method for finding all rational points on a curve of genus at least 2."

17.2

Morning 7h.

® As yesterday, some various paper notes but begun with some ArXiv reading; an article of Balestieri--Berg on Brauer obstructions for θ -cycles.

-> Confirms previous thoughts about that aspect of Brauer theory (Demeio and Colliot Thelene last ArXiv articles). I think that for \mathbb{Q} -pts, this theory is reaching its limits.

Limits of a theory are reached when it becomes too fat, too intricate and sophisticated, so when it loses its initial agility, mostly in failing to attain its concepts-clarifying goals anymore; those concepts clarifying goals being crucial for immediate pbs-solving breakthroughs.

-> Needs to rebirth into a new one with a "higher" categorified pt of view (stacky, motivic and/or anabelian) or into a future implementation within quantum bits of next generation nitrogen-cooled supraconductive Quantum

mainframes.

<- .

® Read article of J.Ayoub on Ihara-Oda-Matsumoto cj related to MtvS and fundamental grps.
<http://user.math.uzh.ch/ayoub/>

-> Ref bib are complete up-to-date.

18.2

Early morning. 7h.

- Went out half-day cycling under a rainy storm; so nearly nothing, just a few paper notes on higher categories, the naive ones and the more elaborated cw-simplicized ones; the latter being one instance of more sophisticated topologisations processes of categories.

Things to refresh : natural transformations, morphisms between functors, etc.

But beware "aux sirenes de l'abstraction sterile"; it may be wiser to stick back to hardcore pbs/reality ; like computing objects of theories instead of elaborating mind-polluting bloating abstract non-sense obscuring (missing totally the genuine initial goal of clarifying) and then leading nowhere. As S.Lang wrote in one of his books (Elliptic Curves?) introduction "writing endlessly is not a threat" but is actually quite easy.

==> So for that purpose, updated and pulled some maths softs.

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Updated browsers (ffox & chromium each about 200Mo : getting fatter @ each svn-git). I remember some ffox versions (mozilla) weithing about 25mo in early 2000.

ffox is 91.6 esr fork (esr is for academic/institutions, a bit outdated but robust, following Debian stability-requirement spirit) updated version is normally 97.1.

Installed and explored a bit some maths softs :

a) MacAuley2 for AG (Eiseinbud-Grayson-Stillman UCB-MIT?).

Like Singular but more ergonomic, less cryptic.

Inspected the output of a db-locate of installed files using keyword "Maccauley2" :
in terms of sophistication of objects, its seems more exhaustive than Singular.

Note that to launch the cmd-line : type "M2" at the prompt for "M-acauley-2".

It has an integrated help, again more ergonomic-intuitive than Singular; like the online help.

It also comes with a prg langage to complete-tweak-enhance it; this dvt is done mostly by an international team of package providers.

Parser-Interfaces documented : TeXmacs, emacs.

I remember testing this suite, a bit before the blackout of 2009; files output are stuck somewhere in one of the wrecked hdds.

As for all CAS tested, completion is available @ prompt.

b) SciLab : multipurpose CAS oriented towards engineering/simulation (INRIA fr).

c) Installed cantor-parser backend for SciLab.

d) gnuplotutils.

® Some heteroclite reading : books, conferences reviews and wkp entries.

19.2

Early morning 7h.

- Some paper notes on hypergeometry : trying finding some hidden structures in hypergeometric functions arguments; I suspect just from some quick elementary computations; that this process will end-up being quite tricky; if unfeasible, because the underlying-structure is layered or covered by a thick carpet weaved from chapelets of gordian knots : the only hopefully fruitfull methods to unty those glimpsed intricate echeveaux would require to swap to the (future or to be built) geometric-motivic side.

Similarly to the exponentiation paradigm of mtv (evocated earlier in this diary) : the whole nb theory consists in trying to grasp/understand the quite obscure additivo-multiplicative interaction and find out why and how the sum and the product subjugates/messes-up each-other.

® Some heteroclite readings : books, conferences reviews

and wkp entries.

20.2

Early morning 7h.

- Some paper notes on foundations : some stratospheric ones (measure on categories for pb solving) in the spirit of Deligne topos thm on Godel incompleteness :

A pb is unlikely solvable \Leftrightarrow its solving-categories form a negligible structure of 0-measure ie a skinny structure (cf Baire maigre-spaces).

® Some quite various readings : some wkp entries pushed to mozilla-pocket; an article on topos from math-physicist, some articles intros.

* Some vids.

1) Motives and Hodge theory (Ayoub-Fresan).

2) Cirm.

Keiji Oguso. Grps actions on (projective Rational) manifolds.

Jujiro Noguchi. Complex manifolds and rational pts. (abc).

Cirm building.

21.2

Early morning 6h30.

- Some paper notes on heuristics/methodology :

- 1) transcendence and alg independance of nbers obtained (as values) from transcendental functions and the inverse image of "rational" pts of moduli (or grassmanian for lin cases) and stacks.

- 2) Practise in seeing hidden structures behind the apparence of simple objects.

© Tested a bit Macauley 2. Has a bunch of code-examples in .m2 files located in /usr/doc/Macauley2: mainly for specific classes of varieties.

Noticeable ones are computations of : sheaves, ext, primary decompositions, rationality, toric, etc.

=> To do :

- a) color-code for notes (also on paper).
- b) CAS computation of memoire.
- c) Consider replace LibreOffice by TeXmacs.

® Some quite various readings, same as the days before.

22.2

"To-day" is Another "2-day" 22.2.22.

Early morning 6h30.

- Some quick sketchy paper notes on transcendence heuristics : on how Galois mtv grps size gives depth of periods uniformization; those both invariants reflecting directly the inner patterns structure of the studied object (moduli, scheme, varieties, etc).

® Quite various readings, same as the days before.

* Various vids.

23.2

Early morning 6h30.

- Some quick sketchy paper notes on hypergeometry, notably

a) structuration of hypergeometric functions :
parameters, arguments and whole functions; and

b) their motivic interpretation: series of approximating motives.

=> This is the "geometric scanner", seeing-through objects/principles/proofs of classical transcendence and diophantine approximation theories; their inner/intrinsic /skeleton geometry; maybe in the spirit of Grothendieck motivic vision.

c) Introduction of new notations : tensor product action, hypergeometric arguments, etc.

® Quite various readings, same as the days before.

-Turkia Hypergeometric seminar of 2005.
Uniformization problematic,
links to Hodge filtrations and

its symmetries (mirror of $n : k$ vs $n-k$; $2n : n$ vs n):

Toric varieties, moduli of K3 surfaces.

Noticed the dutch hypergeometry school (Beukers, Loeinenga, Stienstra, ... from Utrecht, Leiden, etc).

-An arXiv article.

Mounir Hajli (ma in Shangai, phd Maillot P6) : Arakelov geometry side (height).

24.2

Early morning 6h30.

- Some quick sketchy paper notes on algebraic independence, transcendence degree, etc.

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1) Investigated Macauley2 parsers.

a) Sage may be a possible one : check that.

b) TeXmacs.

CNRS (INRIA?).

Not included in recent Debian (quite odd) but has a dedicated repo for Debian (and a few other distros), to be added to apt-src.

I remember of it in Gabel Debian-Linux-Sarge : quite heavy in src and on cpus, instability used to hang a lot the system; this may be the reason why it was not included in Debian; since Debian maintainers are quite finicky regarding stability.

2) Inspected Maxima, has a pkg named affine, that has sheaf computations routines.

It must be lisp-compiled before use.

® Quite various readings, same as the days before.

=> See ffox (pocket, history).

25.2

Early morning. 7h.

- Went out half-day; so nearly nothing; just a few foundation lines on algebraic independence/transcendence : Zorn lemma and hence AC.

® Quite various readings, same as the days before.

=> See ffox (pocket, history).

26.2

Early morning. 7h.

- Done some meca maintenance so nearly nothing. Fixed rr340 pads : with time those wear unevenly and move @ each braking; so they periodically need adjustment. Fixed also broken rear mudgard.

MR12 race fuel degrades when sitting; becoming gunky and sticky, so the whole fuel system needs a flush with regular sp98 after sitting a few weeks.

- Just some lines on paper notes of schedule : priority pts for criterions of future memoire/monograph.

® Quite various readings, same as the days before.

=> See ffox (pocket, history).

27.2

Sleepless early morning 3h30.

- Some quick sketchy paper notes on Relative Singular-Simplicial hologies, continued till noon.

* Some ytube vids on this : found a chan named Visual maths.

-> Presentation using Xournal.

© Inspected TexMacs for m\$: installer of 120Mo.

28.2

Early morning. 7h.

Some paper notes

1) As yesterday : relative hologies and motives/hypergeometric uniformization.

2) Bilan of

a) recent books on Q-pts.

Ponnen and CT Sko.

--> Both on algebraic Brauer theory :

b) Some remarks on ctrex (HassePrinciple, BrauerManin).

Conclusion

--> No new approach, and even less books on new approach.

c) Maths population : general, to nt to Q-pts.

=> Q-pts : quite tiny-unsignificant in terms of human preoccupations; but those Q-pts actually rule out the world economy; securing its main basements that are transactions.

© Debian Linux Lenovo.

-Looked for Maxima affine.

-Updated this month diary against keep.txt

® Pulled

-some algebraic topology refs from g play-books : Wallace,

Bredon, etc.

Chrononologically classified the available paper ones :
Wallace, Spannier, Massey GTM1, Dold, and Massey GTM2.

-An arXiv article from a trio (Bonn?) on diamonds, stacks
and ∞ -categories;
extending six functors/operations formalism.

1.3

Early morning. 7h.

- Some paper notes as yesterday : relative hologies,
algebraic independences; only some very basics.

2.3

Early morning. 6h15.

- Some paper notes as yesterday : relative hologies, algebraic independences; only some very basics.

* Some vids on Stockolm Hodge theory and motives conference of oct 21.

1) J.Ayoub.

Arithmetic topology, etale fundamental grp and motivic galois grp.

2) J.Fresan.

On a ctrex of an E-function not generated from a class of hypergeometric ones.

--> accounts for his paper with P.Jossen on that question of Siegel. The given ctrex relies on a specific exp twist of a quadratic diff form.

3.3

Early morning. 6h15.

- Some quick notes on B5 recycled paper on yesterday vids, especially the second one on periods. Some notes on methodologies.

© Some other ones on regexps and sed on carf recycled nbook; finishing with engines ones (multifuel).

Afternoon : handcut some ivy, plowed soil a bit.

4.3

Early morning. 6h15.

- Some very quick paper notes as yesterday on periods.

=> The ctrex of an E-function not generated from a class of hypergeometric ones goes against hypergeometry principle of uniformization of the corresponding geometric objects (whose periods are interpolated/caught by those classes of functions).

But I still think that hypergeometric uniformization

strongly holds for algebraic varieties defined over \mathbb{Q} and actually that hypergeometry underlines the motivic structure of those.

So that there should be an equivalence paradigm between hypergeometry and geometry of motives.

® Begun Fresan-Jossen book on exponential motives.

-> This monograph may be a smart sequel of the bavarian motives book.

-> Those exponential motives are extensions through transcendental/special/exponential twists of classical ones. The corresponding periods gives a larger class of periods; reminding me of last part of Kontzevich-Zagier seminal 2001 paper on periods.

=> Can those twists be obtained from the classical ones from torsors? If so, the fundamental issue would be the nature of those eventual torsors. I suspect classical torsors do not suit but extended ones might.

=> The key object are pairs (V, f) of varieties V equipped with a potential f on them.

=> Are there links to the exponentiation ideas sketched on paper and mentionned here in this diary in dec 21?

5.3

Early morning 4h45.

Sorted some screenshots on A806.

® Continued arXicle (= article of arXiv) on 6-operators formalism.

Names : J.Ayoub (thesis), Gallauer Martin, David Hansen, Lurie, Scholze, Zheng.

-Read a smart introductory text (Milan 2021 Summer School) of Gallauer about that.

Keywords Push-pull operation : push forward, pull back.

Products ; cap and cup.

Meyer-Vietoris sequences (Vietoris=clit).

® Some Linux book ; Mon systeme Linux, nearly no code, rather for introduction on hardware interface architectures.

Visited past-era ffox bookmarks ; most personal webpages are now broken links, even software and articles/book srcs.

© Debian Linux Lenovo.

Synced with src with P9.

Found out builtin sed docs : `cd /usr/share/doc/sed`

6.3

Early morning 5h.

Same thing as yesterday : sorted some screenshots on A806.

© Debian Linux Lenovo.

Inspected built in doc on regexp ; less documented ...
than "less" and sed.

zgrep, zless for zipped txts.

- Some paper notes on biologie vegetale : how the silent green living may actually develop intelligent behaviour close to animal cognitive habilities. Intelligence verte, mostly based on its intrinsic decentralized architecture (inner and outer networks). Double Heads Green Wormy Arachnoid/Medusa. Green synapse between air and soil.

7.3

Morning 7h.

Fixed broken torch.

- Sorted piles of paper notes : 10.21, 11.21, 12.21, 1.22, 2.22.

-> Something like 500p.

-> Paper notes amount to ~2500p since the coming back in Oct 20.

==> Prefer start a pile/month than accumulating a mountain of notes then sorting them after a trimester or semester.

==> Avoid wasting paper of Nbooks (1/2 side write).

==> Check them for they often contain non math misc notes as found in 10.21 batch : travel, theo, etc.

® Quite various readings : bios@MacTutor, D.Hariri talks slides, wkp, etc.

8.3

Early morning 6h15.

- Compared 10.21 pile contents against search.txt : seems to match each other.

==> Keeping diary.txt is actually a good habit.

==> Consider leaving the other habit of paper bloating : stopping the paper bloat may be a wiser option to force synthesis.

* Some ytbe vids.

- Niels Borne (Lille) 2017 talk @ ICPT (india) on Nori uniformisation of stacks.

==> Hypergeometry link ?

- Jarod Alper (Washington) online courses on stacks.

The Goal of the courses is Deligne Mumford thm on moduli of stables genus g curves, asserting that this moduli constitutes a smooth proj stack of dim $3g-3$, admitting a coarse moduli space representative.

® Pulled some articles/slides of A.Vistoli (eNS Pisa) and N.Borne.

• Pushed search.txt (~570p) diary into Free site.

Early morning. 4h.

© Some sorting of A806 imgs.

=> Noticed quirks in search.txt, mainly appearing in letters swaps : as it gets bigger, it is more likely altered during transfers; alteration is also favored by the series or chain of transfers.

=> As for the paper bloat, consider other options : splitting it, then sweep bloated dirs, keeping only search.txts and deleting intermediate.

=> Typos : "I have never met something like those ideas."

- Some paper misc notes.

Exponentiation issue : shift of eqn from X^n to X^x , x^x .

Link to exp mtvs?

Uniformization issue.

® Some diverse reading

1) Nori papers and bio : Mumbai (Seshadri), Berkeley (Cal).

Representation of the fundamental grp of varieties.

then

2) Vistoli-Borne recent stacky-gerby version allowing dropping of base pts.

then

3) D.Mumford Tata Abelian varieties.

Analytic (Cplx Lie grp) --- Algebraic (grp schemes).

Contains appendix on Tate ab-var morphism-thm in finite field setting, as well as

another one on Lang-Mordell finitess-generation thm.

10.3

Done some GS500 maintenance, went out half day; so nearly nothing.

sp98 is about $2.25e/l$: never seen that in Fr till now.

* Some vids : Joel Merker Complex Geometry talk @ maths-philo ENS.

Jordan Thm, Cantor-Osgood intricate dim-measure-pathos ctrex curves.

Obtained by a passage a la limite, like transcendental nb obtained as period, the integral being that infinite process. Pathos comes from infinity applied to a recursive process.

Infinity source of ctrex, intuition-contradictive concept generator.

-> See if last Brauer-Manin criterion ctrexes come from that sort of process.

The Falting-Mordell quirky nb field does.

11.3

Went out half day cycling; so nearly nothing.

- Some paper notes : criterions over C . For k nb field, $V(k)$ non empty implies $\text{Coeff}(V)$ alg dependent. Reciproque.

12.3

- Some paper notes : on yesterday issue and some on residue formula that does not give a standard period; so investigated about that, for extended criterions related to the intrinsic nature of varieties.

Memoire typo.

The Brauer grp of periods of V .

-> add some words on Hypergeometry : Uniformization through arguments spaces of hypergeometric functions, those spaces carrying motivic skeletons or being the motivic geometry substrat space.

Interesting paradigm : Geometry of coefficients spaces ---

Geometry of the corresponding (family) of varieties. It is a Newton(polygon)-Galois (theory) paradigm.

* Some vids :

1) Rene Thom cobordism theory (INA-CNRS ~ 1991) and other rare INA-CNRS vids like the interview of

2) Jean Benabou (Categorician from ma-j) about its atypic career; giving historical insights on category theory in Fr from 1960 to recent decades.

Benabou insists on reticences of the fr school to categories contrary to anglo-saxons and ... some other eu ones like Belgium (Borceux, Caenappeel, etc).

-> I think that those cat will have their revenge launched by the us-can cat force (Joyal, Olson, Lurie, etc).

-> Try to collect those valuable vintage INA-IRCAM/CNRS vids or at least pointers to those.

13.3

- Like yesterday, some quick paper notes on both fundamental and homology grps of top spaces. Those invariants or simplifying-shifters of categories, are related; tackled a bit their relative finess-coarseness stratificating nature.

Memoire typo.

The Brauer grp of periods of V .

Hypergeometry: Uniformization by the spaces of arguments of hypergeometric functions, those spaces carrying or being the motivic geometry substrat spaces.

* Finished R.Thom and J.Benabou vids.

® Read a bit R.Thom paper book "Modeles mathematiques de la morphogenese".

-> Flying above maths part relating the first theories investigated by the author (stabilite et geometrie differentielle); the other part relates his investigations on theorizing-formalizing biology.

14.3

Early morning 5h.

® Pulled an arXicle paper of Han Wu on local-global principle failure for integral pts on curves, more precisely on stackified ones.

-> Stackification may be a way of kicking the big butt of the now fatty Brauer theory.

Since stacks main advantage is carrying more structure than schemes and torsors; in a sense, they extend torsors by taking into account, in one shot, all the possible grps actions on a fixed scheme or moduli of those : bouquets along grp-schemes (actions) over the studied

moduli/schemes.

- Afternoon

Routed network wires through walls by drilling holes through them.

Received a warning of Y (versailles) to cut funds complaining of absence at a 15.12.21 rdv, although I was present at it : bug in adm or how some are grassly paid to hassle others that are hardly striving and surviving with a tiny fund.

Some of my working days are 20h active, the average being about 17h 7days/week; I bet that theirs must not exceed 5h or 8h, 5days/week.

15.3

* Some Ytbe vids.

1) again another J.Fresan talk on exp motives @ Cirm : varying the conferences talks on the same subject and by the same orators often gives different clues in each talk on the same subject; so that those different verbalisations complete each other.

Sorted out some heuristics : abelianisation of categories by adding just enough morphisms, here it is done by taking quivers; this trick allows adding enough morphisms to get an ab cat.

Another pt is the tannakason by tensorization to get structuring-grps (here mtv grps) by the Tanaka-representability thm of tensors cat.

2) Marie Manceau on mathematical models of morphogenesis @ IHP.

Modelisation of the generating of Phenotypic patterns in biology (Flock of a bird feather).

- Some paper notes.

A) To tackle Q-pts there are two corpuses :

- 1) the classical Brauer one for alg varieties and
- 2) the new periods one introduced by the memoire criterions that handles a much wider class of varieties.

=> I think that the second one after its motivic mue or metamorphosis (hatching the mtv Brauer grp of periods) might take over and even phagocyte then digest the first.

B) Other misc notes, on how Cauchy-residue formula is an instance of Stokes thm, etc.

® Came across key articles on hypergeometry of Masanori Asakura (Hokkaido).

-> introduces hypergeometric fibrations.

16.3

® Read a few Asakura arXicles on hypergeometry.

-> Asakura, Otsusbo, Terasoma : another names from jp to include on the hypergeometry lists.

* Some ytube vids

1) CNRS-INA on H.Cartan career, with J.P Serre interventions.

-> The ENS clan/tribe.

2) Victoria Hoskins 2019 talk on mtvs of stacks @ CIRM.

17.3

• Some paper notes on yesterday vids : Tate mtvs, derived cat, flatness, monomial varieties.

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Dug into arch folders (msnet 2003!), pulled zeta part of the fr version of ramble.txt from ramble.mws; linking

Fermat to alg ind of odd-zeta values.

® A.Youcis weblog on flatness and torsors then some wkp entries.

18.3

Went out half day; so nearly nothing.

- Some quick paper notes : flatness.

Before getting some real one with a flat tire.

19.3

Half slept : pulled @ 2h am a few books from e-pdf, z-lib is now being copyright drained-restricted either through isp, browser drm, or else.

© Mostly old books (1985-1995).

- 1) one of Y.Andre on G-function and geometry (1989).
- 2) Some on rationality (Kollar, Mori) of the same period.
- 3) Some on Q-pts around same period (Faltings 1984, Kollar, etc).

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Sorted imgs folders, finally chosen to mv imgs from research folder to pictures one.

20.3

® Introduction and periods part of Andre book on G-functions.

And some wkp related entries.

-> Hodge theory : cycles, filtrations. Variations of those through connexions (Gauss, Manin), Picard-Fuch ode. Cf Fresan thesis @ P13.

-> New generations Ayoub-Fresan-Jossen-Gallauer-etc are clearer than previous ones on both those pre-motives and (next) motives theories.

This is the clarifying process : a theory gets mature when it is clarified through assimilation by successive generations of mathematicians.

-> Nuclinearisation paradigm of motives is already sous-jacent in Hodge structures.

- Some quick paper notes on both those maths theories and diary.

-> Consult them, as well as ffox pocket.

21.3

Early mornings this month (5h).

When asked about activity : My job or "mon business" is knowledge; artisan-du-savoir, mon materiau est le savoir.

- Some paper notes on both maths theories as yesterday and diary.

-> Consult them, as well as ffox pocket.

® Some post wwII bios @ St Andrews-wkp.

Hirzebruch (de) : Bonn pillar of german math after WWII.
Lothar Goetsch advisor.

Kodaira (Jp-us) : apports to Grothendieck and Deligne for proofs of Weils cjs.

22.3

As yesterday.

* Nearly finished Hoskins CIRM vid on mtv of curves line bundle stack.

® Some readings : Hartshorne AG, and Vlasenko mtv Galois grp slides.

- Some quick paper foundational notes after consulting those srcls.

-> Key pts on geometries :

a) AG : how the commutative-algebra ground gives the topology.

b) hypergeometry (hypergeometric uniformization)---mtv relations.

-> Found out some quirks of notations for basic low dim mtvs : $Q\{n\}$ named Tate twists (Voedvoski derived category approach) in vid and $Q(-n)$ named Lefschetz in slides.

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-> Done some syncs and imgs sorting of Android P9.

23.3

As yesterday, but almost sleepless (3h am).

- Some quick paper foundational notes :

Investigated mtv category, tensor structure, Hology tensor functor and mtv galois grp as its automorphism grp. So that there is 2 approachs to mtv galois grp :

a) The hology \otimes -functor automorphism grp.

b) The tannakian representabiliy grp from tanakian nature of the mtv category.

A query about a possible isomorphism coming from (\oplus, \otimes) mutual shuffle in the spirit of previous months notes about $(x,+)$ mutual messing-up paradigm.

Some pointers and todos on B5 paper of this week 17.3.

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Pulled some articles of Y.Andre on mtv grps.

24.3

As yesterday, again almost sleepless (3h am).

- Some quick paper foundational notes :
 - a) A key remark on hypergeometry uniformization and obstruction.
 - b) Investigating $K\theta$ or ring of varieties.

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Pulled a few articles on those $K\theta$ (Kutznetsov, Talpo, etc).

25.3

Went out half day; so nearly nothing.

- Some quick paper notes on :

- a) K_0 , then
- b) some on criterion formulation about trdeg .

26.3

Early morning 7h.

- Some quick paper notes on criterion formulation and some related to trdeg :

$\max\{ \text{trdeg}_k(k(v) \mid v \in V) \}$ for both alg var $V=V$ and transcendental $V=P(W)$ consisting in $v=P(w)$ with w alg var in a moduli/family W of alg vars.

Afternoon.

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- Typos of search.txt

® Some gerbes litterature : wkp entries and an arXicle of Bertolin-Galuzzi on Brauer grps and stacks.

-> wkp : Good refs, wkp is getting better with time since one year and half of getting back.

-> arXicle : retrieved the bib, with some names : L.Breen

and J.L Brylinski 1990s, Hoobler and M.Hakim 1970s.

- Some physical Tetris : desk expansion by moving away old crts.

27.3

Early morning 5h.

Nearly nothing but some plowing for crops, this week-end.

- Some quick paper notes, containing diary data.

Listed available paper refs for category/hologies.

1- J.P Lafon Formalismes fondamentaux.

2- C. Weibel Homological algebra.

® Some entries in :

1) in n-lab : topos, stacks and gerbe.

-> The n-lab as wkp gets better wih time, especially its .

2) some golden era 1992-1995 nbooks.

-> Avis excessifs et preremptoires, in lots of spots; as here, some faraway from truth : this lack of measure and ponderation is the trap of being fully free and unrestricted, so in order to avoid that excessive trend; try to mimick the wisely pondered and magnanime views of experienced pillars (Deligne, Serre, etc); foremost after

coming back from a decade interruption and being an average below medium-level mathematician although gifted by A through rare genius flashes.

<- .

28.3

Again early morning (6h=5h DST).

* A good serie of vids of Seidon Alsaody (ir ?) from finnish univ of Uppsala on schemes.

- Some quick paper notes after this vid and some more heuristic ones on limits :

a) projective : intersection, direct product, coker, fiber product.

b) inductive : union, sum, ker, produit amalgame, tensor product.

-> Less inspired : the brain and knowledge are like the sponge and water; when the sponge is saturated with water, it hardly absorbs any more water. This is why the brain absorbs less efficiently knowledge as it is aging, because it gets saturated by data-memories-worries etc; whereas a fresh naive teenage brain is able to quickly absorb a huge amount of data, filling-up its growing structural networks.

<- .

29.3

Late nite 1h.

® Some introductory entries on categories :

a) wkp : derived, fibered, etc;

with pointers to

b) n-lab : n, quasi and ∞ -categories.

then from ffox-pocket suggestions @ gathering those pointers

c) Bartosz Adamliwski (haskell, C++-svn coder) blog/book on "Categories for the programmer".

Sorted out some names along that "brouting" :

Akhil, Joyal (ca), Khan, Lurie, etc.

-->

the last c) one comforts the fact that Physicists/Applied or Computer Scientists views often enlight pure theoretical corpuses of maths.

This also illustrates the tiny-chaos enlightening principle : introducing locally or punctually, a tiny-amount of chaos in (the space of) pts of views sheds

light globally on the whole discipline.

<--.

==>

The first reading entries are instances of the categorisation or categorification of ...category theory; hence an instance of the monstrous complexity-generating recursion or fractal processes.

The big question : Does the categorisation apply to those categorisation recursive processes, or in others words can those processes be formalized by themselves ?

<==.

® Some various srcs.

a) wkp entries on equivariance : rather complete (en).

b) a grad course of Lurie on Sullivan thm.

c) an interesting arXicle of Heath-Brown on distribution of Z-pts on conics.

• Some quick paper notes on :

a) categories : punctualisation, or base-pointing categories.

b) new approach for the pb raised by H.B arXicle.

30.3

Again woke-up @ 1h30 am.

- Some quick paper notes continuing yesterday ones :

- a) categories : punctualisation, or base-pointing categories.

- b) new approach for the pb raised by H.B arXicle.

- c) tropical geometry applied to the space of graph representations of the distributions of Z or Q -pts.

- d) sheaves of modules on a scheme : base rings of the sheaves-modules coming-from or moving-along the rings of the scheme structural sheaf.

© Debian Linux Lenovo.

- Minor corrections to memoire.

- Mfpic axis quirk of this metapost-font drawing pkg.

- > Seems to need pkg "graphics", so examine preamble.tex and see the difference with "graphicx".

- > db-locate mfpic.

```
/usr/share/doc/texlive-doc/latex/latex-graphics-companion
/inputs/mfpic.sty
/usr/share/texlive/texmf-dist/metafont/mfpic
/usr/share/texlive/texmf-dist/metafont/mfpic/grafbase.mf
/usr/share/texlive/texmf-dist/metapost/mfpic
/usr/share/texlive/texmf-dist/metapost/mfpic/dvipsnam.mp
/usr/share/texlive/texmf-dist/metapost/mfpic/grafbase.mp
/usr/share/texlive/texmf-dist/tex/generic/mfpic
/usr/share/texlive/texmf-dist/tex/generic/mfpic/mfpic.sty
/usr/share/texlive/texmf-dist/tex/generic/mfpic/mfpic.tex
/usr/share/texlive/texmf-dist/tex/generic/mfpic
/mfpicdef.tex
/usr/share/texlive/texmf-dist/tex/generic/tex4ht/mfpic.4ht
/usr/share/texlive/texmf-dist/tex/latex/mfpic4ode
/usr/share/texlive/texmf-dist/tex/latex/mfpic4ode
/mfpic4ode.sty
/usr/share/texlive/texmf-dist/tex/latex/mfpic4ode
/mfpic4ode.tex
```

Plugged-in old usbcam : recognized by kernel but no capture prg available.

31.3

Again woke-up @ 1h am.

* Some ytube vids :

- Alsaody AG course @ Finnish univ.

- Lurie talk on Derived geometry @Houston Grasp courses
- one summing ICM Fields awards from 1936 to 2014.
- Others non maths : mainly engines and motorcycles.

© Debian Linux Lenovo.

- Minor corrections to memoire.
- Introducing the term "fundamental periods" for a future distinguish with the deRham-Betti pairing ones.

- A few others on paper.

- Pulled some litterature :

2 algorithmic NT books (Shoup-Galbraith).

And some talk slides :

Zucker-Brown on Mazur Galois rep pbs,

Mike Stoll on some Fermat type equations , $x^2+y^3 = z^{11}$, that I would call "Niagara falls" ones arising from the high value of one exponent-power term.

© Linux Mint Lenovo.

Done some syncs from P9 of txts and memoire, and some imgs to P9.

The usbcam is also recognized by Mint but here capture are possible through vlc.

=> Mint is less scientific doted than Debian but slicker, close to propriatory Mac\$ and win\$.

<=.

1.4

Went out half day cycling in the snow ; so nearly nothing.

Late evening.

- Some quick paper notes on criteria formulation :
 - a) periods patching and trdeg .
 - b) effect on uniformization depth.

2.4

Woke up 0h.

- Continued quick paper notes on criteria formulation.

© Debian Linux Lenovo.

- Restarted Laptop screen.
- Some issues in Firefox with evn extension : hangs system.
- Minor corrections to memoire.

® Some wkp entries on fundamental classes.

$H_t(M, \partial M; Z)$; for (compact) connected n -dimensional manifolds.
 $t = \text{top dimension}$.

M orientable $\Leftrightarrow H_t$ cyclic (of rank 1).

\Rightarrow So the fundamental adj chosen for criteria periods is not so inappropriate.

\Rightarrow Cf last comments lines of memoires (fr,en) teXtes.

3.4

Woke up 4h.

- Continued quick paper notes on criteria formulation.

Simple connectedness : local-global.

© Debian Linux Lenovo.

- Some issues in ffox with evn extension : hangs system.
Noticed that wkp saved pointers in pocket are cached, and those cached version displays LaTeX code of the entries.

Db located graphics

- > /usr/share/texlive/texmf-dist/tex/latex/graphics/
- > graphicx seems to be a subpkg of graphics (svn?).

- Updated tm.txts
6.1.22 to 23.2.22

4.4

Woke up 4h.

- Some quick synthesis paper notes on criteria formulation.

® Rambled in institutes sites : CNRS, Jean Leray (Nantes), EMS (European Math Society).

-Noticed a trend in webpublishing : a lot of us-can matheux chosed github.io for their personal websites.

-Pulled an introductory txt on tropical geometry from a Nantes graduate student MscThesis.

=> Conclusion on alternative srcs.

-> Small editors : CRC, M.Dekker, Birkhauser, Wiley, Wadsworth, McGraw Hill, Plenum, WorldScientific.

-> For academic src : Institutions (university, institutes, etc) servers.

 Introductory : MscThesis repos.

 Advanced : PhdThesis repos.

 More advanced : arXiv repo.

<=.

© Debian Linux Lenovo.

Unstable old usb-mice signal : rdb then changed it for a new one.

Looked for regex copies @ 00-10 Linux notes in green folder : some copies of book pages on metapost, kernel modules, bash pipes.

-> Right desk corner needs sorting.

5.4

Woke up 4h.

- Finished quick synthesis paper notes on criteria formulation.

© Debian Linux Lenovo.

Some minor corrections to memoire criterions.

-> Dropping simple connectedness for boundaryless, since criteria requirements apply to varieties V like the hollow torus T or tire tube; in that case fV is the solid torus or 0-ring or donut; this variety T is eligible to computations of all possible periods, yet T is not simply connected.

-> After recompilation same mfpic quirks as Dec 20; so looked for that issue in search.txt.

Found one in 201204.txt or Dec 04 2020 entry but oddly with no fixing steps.

So look up for that in db-locate, then other devices (phones) and paper notes.

-> Pulled pkg docs in TeX official ftp repos, saved some in evn.

-> After digging further into some mpost and latex logs found out a version issue between graphbase and some TeXlive distro tex files. Maybe after last Debian update.

=> See versions of corresponding pkgs with apt-update.

==> Rasr for a detail.

6.4

Woke up 4h.

© Debian Linux Lenovo.

-> Pulled tex cmds entries with bash-history and made a texhist.txt

=> Use another pkgs even if they just allow to include external img.files; with no img coding.

- Looked for the pkg issue in paper notes of 11.20, 12.20, 01.21.

-> the Dec 2020 pile is oddily thin.

+> Quite messy notes but with hidden maths gems as before the coming back. The progress compared to past era is time-stamping organisation but remains progress to be made in clarity of note taking. Some pc ones are hardly decypherable.

+> Too much scattered : nbooks, paper, npads, sticky notes, ads, etc.

Some pulled research papers.

Jack Thorne (uk, Harvard, Cambridge).
One early paper on explicit \mathbb{W} computations,
plus
The thesis of one of its student, Jef Laga.

7.4

Woke up @ 4h.

© Posted on ig a maths quirks from ytube.
Retrieved some img-data.

- Some paper notes on Q-pts memoire criterions applied to toruses.

8.4

Woke up @ 4h.

Went out half day cycling in ice stormy freezing cold rain

; so nearly nothing.

- Some paper notes on Q -pts memoire criterions applied to toruses : curvatures.

9.4

Woke up @ 4h.

© Debian Linux Lenovo.

Some files sorting docs and download.

- ® - Some wkp stuff on curvatures.
 - Abstracts of talks of Andre bday forecoming conference on periods.

* Some bbki vids.

2021 Dupont-Fresan on a proof of a Zagier cj along Belinson one on values of polylogarithms @ integers.

- Continued paper notes on Q -pts memoire criterions applied to toruses : curvatures, trying to obtain a more intrinsic trdeg formulation.

-> Trdeg formulation of criterions seems the way to go for Q -pts, since it is birationally invariant :

$$\text{Trdeg}_Q Q(x,y) = \text{Trdeg}_Q Q(F(x,y))$$

for any Q -birational map $F: \mathbb{C}^2 \rightarrow \mathbb{C}^2$.

<- .

10.4

Woke up @ 4h.

- Continued paper notes on formulation of memoire criterions : Q -pts location and natural relations between the two functors : Trdeg and Periods .

So absorbed, that forgot today was voting day.

© Debian Linux Lenovo.

Memoire criterion formulation : minor corrections and addings.

Quirky (rasr) from img insertions : retrieved the circle mfpic-coded.

Hexedited the corresponding mem.1 eps file : weird prolog header.

Registered to Y.Andre bday periods conference.

11.4

Woke up @ 4h.

- Some paper notes on typos of search.txt while waiting for registration till 10h30.

-> No mail received but could assist directly to conference in IHP site.

* Live@IHP.

Last 10mn of P.Scholtze : Extended analytic geometry to the p-adic (prismatic/perfectoid ?) settings.

J.Ayoub : Reinterpreting mtv grp in derived and t-terms.

-> In the two talks : importance of adjoint functors.

© Debian Linux Lenovo.

Synced some files with P9.

Tips of system.txt more complete.

update texlive distro.

create tmp img dir for fig.texs and compile-mp them.

try asymptote xypic and pstricks pkgs.

consider a 0-img memoire .

LaTeX code of formulas in wkp articles can be find out

hidden within img-tags of the html source code.

-> Cut cnx on partially load page.

-> bookmark the img and edit the pointer.

-> Note that a copy-paste from a browser gives some LaTeX code.

Gather criterion interest/goal : 21.12.20 + sticks.

12.4

Woke up @ 4h.

* Waited in vain @ 9h for IHP conference live.

So watched diverse ytube vids : bbki-ihp, ihes, etc.

- julien roque : picard fuch monodromy.

- andre joyal : ihes crash course on topos.

-> algebraization of a space : morphism to a ring, then pulling back from this morphism, commutative algebra equations of the target ring to the initial space; defining in this way, "algebraic flavored" subspaces of initial or source space.

-bbki 2020.

tristan riviere : Sobolev space, riemanian geometry.

javier fresan : o-minimality. monodromy. gauss manin cnx. hodge structures. modular or periods domains.

- Some quick paper notes : normed-spaces and symmetric compact convex of \mathbb{R}^n .

13.4

Woke up @ 4h.

© TabletPC and P9.

Looked for mfpic (metafont pic) quirks in P9 and Tablet.

-> Tablet (ssd) is quicker than Laptop (hdd) for txt searches.

=> Found an odd hex-code bloated txt file in P9 and Tablet.

=> That with scrambled data suggests a worm diggin an e-tunnel out of data storage undergrounds.

=> Here a resumé.

Tex tips of system.txt are more complete than others txts.

To insert imgs with mfpic.

2 formats : metafont or metapost chosen in mfpic usepkg option.

```
begin{document} source.tex
opengraphsfile{source}
Enclose mfpic code with \begin{mfpic} \end{mfpic} at imgs
locations enclosed by begin{figure} end{figure}.
closegraphsfile{source}.
end{document}
```

compile it with latex.
 this generates a source.mp file.
 mpost it.
 this generates a bunch source.i (i from 1 to nb of imgs)
 postscript files.
 recompile source.tex with latex to include those.

The other way is to create imgs.tex in a separate img dir
 and do the preceding procedure on them, then retrieve the
 generated imgs files (pdf, ps) and include them in source
 file with `\includegraphics` cmd of `graphicx` pkg enclosed
 with `\begin{figure}[h t or p] \end{figure}`

Cf details in tex.txt

To do.

- update texlive distro.

-create tmp img dir for fig.texs and compile-mp them.

- try asymptote, xypic and pstricks pkgs.

=> Mfpic seems obsolete, not maintained since 2012.

=> consider a 0-img memoire to definitely get rid of
 this graphic pos time waste.

LaTeX code of formulas in wkp articles can be find out
 hidden within img-tags of the html source code.

-> Cut cnx on partially load page.

-> bookmark the img and edit the pointer.

-> Note that a copy-paste from a browser gives some LaTeX
 code.

graphic quirks (mpost, picins, mfpic)

5.12.20

19.12.20

19.2.21

23.2.21

4.3.21

8.3.21

<=.

-Created a tex.txt gathering that.

As already mentionned : e-waste of time. On one side, time gain for txt processing and on the other side, tracking-fixing quirks is a huge loss of time.

- By the way, this allowed to dig out recent-past gems.

a) Criterion interest/goal : P9 21.12.20.txt

=> Gather that to the usb-sticks ones.

b) Some in latex.tex on Brauer grps.

=> Always inspect tex src files for their commented content.

* Waited in vain @ 9h for IHP conference live.

-> An empty room with a standing still img (some women discussions in the background : staff ?)

® Some wkp entries on simple connectedness : locally simply connected.

- Some paper notes on refining criterions hypothesis.

Strongly locally simply connected = each proper part admits a simply connected neighborhood.

+

Compact differentiable (at least C^1) without boundary.

in other words, "closed" differentiable and strongly locally connected but not globally simply connected.

Extension to unbounded vars.

1) Projectivisation.

2) Riemann sphere. Already tackled for curves in 20-21, n-th root or multivalued change of variable for differential forms.

3) ? idea gone from disturbing door knock.
-> Birational blow-down, bringing down ∞ ?

14.4

Woke up @ 4h.

© Linux Debian Lenovo.

- updated pkg-repo, pulled some doc on metapost.
- chmod -x all doubtful wormy txt files from Tablet and P9 that have exec permissions.

- Some paper notes on refining criterions hypothesis.
-> Surprisingly good suitability to torus T , after patching with mean curvature, equivalently adding π to periods and not by Gauss Bonnet formula giving Euler Poincare χ in terms of Gaussian curvature, since $\chi(T) = 0$.

15.4

Woke up @ 4h.

- Some paper notes on refining criterions hypothesis : curvature.

Newman mean.

© Tablet PC win\$10.

Located worm chunk of data in system.txt.

Hexedited it and took snapshots.

-> It may be the repetitive extra 1.6k extra size detected previously from this Tablet.

-> TabletPc is scrambled (from A806 usb-autoexec cdrom?) since doubtfull files are always from it.

* Some vids.

Alain Connes on Grothendieck views of the mathematical world : Grothendieck revealed shamelessly crude truth.

-> A.Grothendieck dared to say what he thinks.

-> Topos is the cornerstone of maths.

Javier Fresan : finished bbki o-minimality thm of Bakker-Klingler-Tsimerman; asserting that periods map to modular quotient is definissable in a certain class of sets.

Ran,exp.

-> Theory of computable nbers applied to higher dim case of varieties (semi alg, U, Π , proj lin), first order logic (\forall, \exists) (+, x, and, or, <, =); close to computer logic and tropical geometry semi-linear spirit.

-> See also Viusos for periods and other recent ctrex monsters of transcendental nb theory : Chaitin constant (well named) and Yoshinaga non period.

16.4

Woke up @ 2h.

- Some paper notes on refining criterions hypothesis : curvature.

© P9.

Some sync with Tablet.

Pushed notes and mem folders to Free repo.

* Some vids. Bbki and motorcycle mechanics (chain sprockets).

17.4

Woke up @ 4h.

- Some paper notes on refining criterions hypothesis : curvature. means.

© P9.

Sorted notes and mem folders in Free repo.

* Some vids. Aleph0 and motorcycle mechanics (chain sprockets).

18.4

Woke up @ 4h.

- Some paper notes on refining criterions hypothesis : curvature. means.

Maple computations.

® Some wkp entries on o-minimality : links to computability and logic.

* Some vids. Aleph0 and Fields awards candidates : a noticeable nb nb-theorists (2 women Matomaki, Viashnova; Thorne-Tsimmermann, Copin fr, Bhatt in, but mostly russian; all roughly having same previous honors) motorcycle mechanics (chain sprockets).

© Linux Debian Lenovo.

- Begun read mfpic doc pkg pulled last time.
- Digging doc from texlive cmds --help.
- texconfig rehash (rebuild ls-R files with mktexlsr).

19.4

© Linux Debian Lenovo.

Continued investigating texlive graphics.

-> TikZ alternative to mfpic.

Created a fig dir in last mem dir.

Put mfpic files.tex in it. Compiled both in latex and pdflatex.

-> pdflatex seems to better render pdf than dvipdf applied to latex.dvi compiled files.

-> Before inserting those files back into source.tex, crop them with gimp zealous crop for size issues since they are one page output files.

-> Finally got graph quirks fixed.

- A too few paper notes on general topology : borders.

® Read some mathoverflow post on arithmetic geometry: stacks.

And cited articles of Behrend-Noohi on Deligne-Mumford ones.

20.4

- Some paper notes on criterions formulation : $N(\text{Top Var}) > N(\text{An Var}) > N(\text{Alg Var}) > N(\text{Q-Alg Var})$, uniformization of N .

-> cf search.txt @ length, lenght, width.

© Linux Debian Lenovo.

- Continued investigating texlive (graphics) with db-locate.

==> Huge bunch of files, especially fonts.

==> Globally the full Lenovo Laptop hdd of 1 To is close to 45 million files with its triple operating systems

15.335.424 files for Debian.

- Pushed memoire and search.txt diary to Free.

21.04.

© Android phones.

Pushed memoire to g-books and z-lib.

A806

Quirk ig : redirecting/poping to securing page (took snapshots).

Then

P9 : mobile antitheft loops with data scrambling-missing.

- 1) keep first entry of diary atelier.
- 2) some vids snapshots.

• Some paper notes around criterions :

- euclideanity, in terms of universal semi-algebraicity of the space(s) of Vars.

- extension from Diff-Var to Top-Var : done to Measured Top Var, from diff forms $\omega = f dx_i dx_j \dots$ to measures $d\mu$.

- typos, correction memoire.

put enumerates : Brauer theory extension. Advantage of criterions.

© Linux Debian Lenovo.

Pulled some rare books @ zlib on euclidean spaces.

Naber, Gregory L, Topological methods in Euclidean spaces (1979).

Frank Jones, Lebesgue Integration on Euclidean Spaces (2001).

22.4

Went out half day so nearly nothing.

- Some paper notes on criterions extensions : From DiffVar to MesTopVar, euclidean spaces, measures.

23.4

- Some paper notes.

- on foundations : maths models inversion paradigm

(continuum-finite).

- on criterions : uniformization of nber of fundamental periods, trivial pt issue.

- begin clearing out trivial pt issue.

® Read some vulgarisation articles : Scholtze (no notes) perfectoids, AI, etc.

-> one bit of Langlands prg solves FLT.

-> Alg nt : essentially generalized reciprocity laws.

24.4

- Some paper notes :

- on foundations : classifications or stratifications of a category by invariants , relative finesse between invariants.

- on criterions : while tackling memoire examples, made important step clearing out trivial pt issue. Smooth, singular cases.

- Memoire corrections and typos.

Chap 2.

Take general parameter a (a not in \mathbb{Q}) and apply criterions.

Totally degenerated <- fully Totally degenerated

Appendix : add.

no gps.

while digging deeply in engine mechanics phenomena and engineering, lead to maths roots.

* Watch some vulgarisations vids :

-Mickael Launay on Conway knots thm and their polynomial invariants of Jones and Alexander.

-Science4all on fractal monsters.

© Linux Debian Lenovo.

Pulled some articles on Dwork hypergeometry and two Grothendieck school pavés (SGA4 and 10 exposes).

25.4

- Googled memoire version of april 2022 after posting it in g-books and z-lib.

-> Despite its preliminary form, comes third in google search results for "rational points on general varieties" just after B.Poonen and J.L Colliot but before wikipedia and ens : took snapshots of that.

-> Put links to search.txt in memoire to drain audience from g-book to site and make statistics.

* Some course vids.

1) C. SOULÉ - ARITHMETIC INTERSECTION Institut Fourier.

<https://www.canal-u.tv/chaines/ifourier/2017/c-soule-arithmetic-intersection-part1>

-> stuck-servers link.

<https://m.youtube.com/watch?v=vgQ-MNVOAw8>

-> But ytube one works fine : powerfull big us data machinery slams down french weak and laggy institutional servers.

2) finished Mickael Launay vid on Conway knot thm and Jones-Alexander invariants then some numberphile vid of Conway.

-> both Conway and Jones passed away last two years.

© Linux Debian Lenovo.

Made some corrections to memoire.

-> Consider inserting previous version of cardio example in comments.

© A806.

Quirk Q audio as Gabel : inspect audio files.

® Read a bit of Grothendieck school pavés : Brauer grp of 10 exposes and topos of SGA4.

-> Mastery of Grothendieck panoramic view can be witnessed in his Brauer grp txt style.

26.4

- Retrieved recommandé @ post office : Y funds will be cut at least one month; possible recours by engaging procedures but I do not want to loose time arguing against ambient state stupidity (cf loss of time, nrj and money for naturalisation issue in same talk elevation circumstances after perceving provocative words from institution representants, cf also same past issue from P7 maths head dpt).

-> Think of alternatives in case of an eventually global cut : either two-wheelers and relaunch motorcycles project and drop maths a bit, or find another country to continue, France or any other country is not the center of the world; the digital era and globalization having erased any such pretention by their decentralizing effect on the planet.

<- .

© Linux Debian Lenovo and Android phones.

Memoire corrections : corrected some typos and some addings.

In rewriting, with trdeg formulation, mean-pt queries aroused : considering possible drop of its algebraicity requirement.

-> Having at least a non trivial Q-pt often makes this requirement unnecessary, dull or redundant, at least for Q-alg var.

-> Look in search.txt for that.

- Some paper notes about that and including the mean-pt in array of periods.

27.4

- Same paper notes as yesterday, investigating mean-pt queries, plus some deep ones on categories of Var. While searching in ... search.txt for that, it inspired a few synthesis notes.

Dug out 9-13.8.21 notes in 8.21 paper pile.

-> Sempiternelle effleurage de concepts, not going deep enough, denotes a lack of concentration (a perturbing environment : devices eternal quirks, dogs barking, door bells, phones ringings, noisy neighbours, etc).

-> Some pc notes.

-> ecological issue of paper waste by only writing one side.

=> Prefer very early mornings or last part of nites for better environnement.

Pulled a relatively decent amount of integrals in ig.

-> Db issues :

1) notes folder is being cluttered by more than 570 txt files.

=> Make archives : compression.

2) same for img files.

28.4

® Read some wkp entries on Langlands prg.

-> I can smell in this prg scents of motivic uniformization questions.

© Debian Linux Lenovo.

Some addings and Corrections to memoire : quartics, enumerate layout.

29.4

Went out half day, so nearly nothing.

- Some quick paper notes on criterions : parameters paradigms, trdeg formulation, setting vocabulary.

30.4

- Some quick paper notes as yesterday on criterions : parameters paradigms, trdeg formulation, setting vocabulary. Finding more symmetric expressions for periods of varieties.

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® Some wkp entries on elliptic integrals, some Brauer synthesis from ColliotThelene.

- A few typos and minor correction to memoire.

1.5

- Nearly nothing, too few paper notes on elliptic integrals, and general formulation of criterions.

® Some wkp entries elliptic integrals, algebraic independence.

-> cf ffox-pocket for the last 2 weeks.

2.5

Went out half day for id, so nearly nothing.

* Some CIRM vids on periodic trajectories inside polygons, and on 1-motives periods (Huber) .

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- A few typos and minor corrections to memoire.

3.5

® Some chapter entries on elliptic integrals and functions in :

- a) russian EMS NT IV of Nesterenko Feldman. p154 and p204-290 : ω/π transcendental of p154 thm3.13.
- b) Silverman AEC p169.

- Nearly nothing, a few paper notes on elliptic integrals, and general formulation of criterions after previous readings : elliptic integrals of AEC that seems redites.

© Debian Linux Lenovo.

- A few typos and minor corrections to memoire.

4.5

- Nearly nothing, a few paper notes on elliptic integrals, and general formulation of criterions after previous readings : figuring out one elliptic integrals pb of AEC that seems redites of 04-07 past era.

-> I suspect either an error from enonce or the habit of authors to put in pb sections some cjs or tests esprit critique with false enonces.

-> Some maxima sessions about that, took snapshots.

```
expand((a*x+b)*(c*x+d)*((a-c)*x+b-d)*((a-c*g)*x+(b-g*d)));factor(coeff(%o1,x,0)); factor(coeff(%o1,x,1));
```

```
factor(coeff(%o1,x,2));factor(coeff(%o1,x,3));factor(coeff
(%o1,x,4));
```

```
expand((1-x^2)*(1-(k*x)^2));
```

-> Found out 240 possible cases for that AEC pb, tested by hand a dozen that all quirked.

5.5

- Same paper notes as yesterday after reading "Rational Pts on EC" (p35 pb 1.15) by Tate and the same author, this confirmed intuition : there is a quirk in AEC pb formulation.

® Read about same elliptic subjects in :

- a) Shafarevich AGII p215-233 and
- b) Cassels Lectures on EC introduction.

-> The latter insists on the genus as a classifying arithmetic invariant for curves, Tate-Silverman insist rather on degree.

=> Remember that genus and degree are linked by the genus formula of smooth proj curves, coming from formula of Riemann Roch thm on divisors.

® Finished with the systematic treatment of Dale Husemoller EC p182-195 with hypergeometry link.

6.5

Went out cycling half day, so nearly nothing.

- Same paper notes globally as yesterday : birational maps dropping the degree of algebraic varieties, precisely plane algebraic curves.

® Read about same elliptic subjects in Hellegouarch "Invitations to Fermat-Wiles mathematics" : historical background emphasis, since the author restablishes his contribution to the elliptic curve trick of Fermat equation resolution.

7.5

- Same paper notes globally as yesterday : almost sorted out the AEC pb of the ellipse length, Tate 1961 Harverford course notes of "Rational Pts on EC" being the best formulation.

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Usb-layer instability with both keybd and mouse jerking (Rdb on orange-mouse) : recurrent issue.

® Read part of slides of Colliot Thelene survey talk on rational pts @ Steklov 2017.

8.5

Fixed black-mouse by retrieving wheel from orange-one and superglued it into place for tight fit.

- Same paper notes globally as yesterday : criteria apply well to obvious case of graphs of polynomials.

® Diverse readings :

a) Kempf Abelian integrals 1979.

b) Deligne Milne Oggus seminal motives article 1982, reference of Deligne paper on Hodge cycle and periods integrals.

then rambled in Arch 2007

c) remaining notes.txt are quite good : think of getting-back data of wrecked Hitachi hdd and make something out of them.

d) one Y.Andre article on motives and K-grps : smart insights.

=> Intuition of wrapping BSD-Weil-RH into motivic clothing evoked in early 2021 notes is being confirmed here.

9.5

- Same paper notes globally as yesterday : some criteria and elliptic integrals paradigms within hypergeometry.

- Memoire typos.

Retrieve trivial pt "rule out" in Fermat.

$V^{\bullet}(k)$ non trivial pt of $V(k)$.

© Android P9.

Quirks a lot, keeping instability with same sim pin loops : begun rdb.

-> Retrieved remote ctrl.

* Some vids on elliptic integrals plus others on etale K-theory.

© Tablet Pc.

Begun memoire minor addings and corrections.

© Linux Debian Lenovo.

Continued memoire minor addings and corrections. Left TexStudio to mousepad.

Then same quirks-reboot with P9 connected as with A806

during 2021.

-> Big Rdb : do not plug phones with usb to see if it fixes issue.

10.5

- Same paper notes globally as yesterday : some criteria and elliptic integrals paradigms within hypergeometry setting.

© Linux Debian.

Lenovo.

-Continued memoire minor addings and corrections.

-Left mousepad to gedit, the latter being more complete in options.

-Retrieving P9 phone from Laptop-usb restored stability of Debian, proving last assumption.

Sarge.

Found a moduli.txt of 2003 in math folder.

11.5

- Same paper notes globally as yesterday : some criteria and abelian integrals paradigms within hypergeometry setting.

Some Maxima computations.

```
integrate(1/(1-(a*sin(x))^2)^(3/2),x,0,2*pi);
integrate(1/(1-(a*sin(x))^2)^(3/2),x,0,4*asin(1));
```

© Linux Debian Lenovo.

-Continued memoire minor addings and corrections.

-Memoire typos.

The wished invariance of the
the main point will be simplifying
general non integer parameter

12.5

- Done some mechanics maintenance and then an intensive roadtrip to Rouen_Maromme_Barentin for GS500 parts and oil, so nearly nothing but a few words in keep for memoire criterion.

-> Good brain refresh by both doing hardcore mechanics and flying on highway to get a broader sight than just the blinding secluded one of maths investigations on desk and computer screens.

13.5

Some paper notes on criterion paradigms : genus-0 and topology.

Went out cycling half day, so nearly nothing, again just a few words in keep for memoire criterion.

* A CNRS old vid of 1987 on maths-computer science interactions with Jean Bourguignon, Jean-Pierre Serre, Henri Cohen and P.Chemla; as usual those old-school CNRS vids are enlighting.

-> Serre insisted on machines computations as a way to generate large database for guessing patterns purposes, so like experiments-generating tools, possibly pointing out and revealing cjs; as it was the case for BSD in mids 1950.

-> Bourguignon insisting on mutual feedback between computer simulations and theoretical investigations.

-> Henri Cohen gave a good analogy : computers (mainframes) are mathematicians "particules accelerators" of physicists; note by the way, that in recent years, simulations on machines have virtualized those monumental physicists experimental devices.

14.5

Came back to routine desk and computers.

- Some quick paper notes on :

a) criterion functors of trdeg , motives and period endofunctors.

b) Birat invariance of those.

c) Intro to analytic var from Cartan- Dolbeaut books.

-> Key pt is valuate discretization : valuation order of power series. Distinguo between poles and essential singularities.

© Linux Debian Lenovo.

-Continued memoire minor addings and corrections.

15.5

- Tried to fill-up pens by drilling tiny holes and using seringe with homemade ink : too thin so messy leaks for gel-ink pens.
- Some paper notes on issues of same birat invariance and countable alg dep of (E, π) .

-Memoire typos .

drastically, this is an instance of how the periods encodes the underlying symetries of a variety, here the degenerate symetric varieties are detected by the complexity drop of the periods tuple.

16.5

- Tried to fill-up pens drilling tiny holes and using seringe with homemade ink : ok for regular-ink pens.

-> Good technique to upcycle pens instead of throwing them away and buy new ones.

=> Key pt for inks : viscosity.

- Same paper notes on : birat invariance and countable alg dep of (E, π) .

© Android phones.

-Continued memoire minor addings and corrections (edit on A806, compile in P9).

17.5

- Sorted paper notes of 03-05.22 and some A806 folders @ 3h am.

- Some paper notes, figuring out for n -times ($n \geq 5$, at least) alg ind of $(E(k), \pi)$ for $k = \frac{1}{2}\sqrt{2}$, the unique k in $[0,1]$ satisfying $k=k'$, or the unique equimodulus or normal modulus case. Using :

- 1) Legendre relation. Giving alg dep of (E, K, π) for all moduli then

- 2) Alg ind of (E, π) from that of (K, π) .

- 3) Value of K @ the normal modulus : alg quotient of $\Gamma(\frac{1}{4})$ and $\sqrt{\pi}$.

- 4) Alg ind of $\Gamma(\frac{1}{4})$ and π recently proven by Nesterenko.

© Linux Debian Lenovo.

-Continued memoire minor addings and corrections.

18.5

3am.

- Sorted P9 Phone folders @ 3h am.
- > As yesterday, chasing duplicates of imgs, tex.

© Linux Debian Lenovo.

- Rdb mice : fixed mouse was ok a while and then broke @ same wheel spot.
- > Weak pt of cheap plastic mouse.
- Continued memoire minor addings and corrections.

* L.Lafforgue 2016 talks on topos and syntactic categories for Nori motives @ IHES.

-> Lengthy series of vids (about 8h).

19.5

3am.

- Sorted Phone and g-drive folders @ 3h am.
- Some paper notes on criterion paradigms : genus-0 and topology.

© Linux Debian Lenovo.

- Continued memoire minor addings and corrections.

* L.Lafforgue 2016 talks on topos and syntactic categories for Nori motives @ IHES.

20.5

3am.

© Android.

Sorted Phone folders @ 3h am.

-> As before, chasing duplicates of imgs, tex.

- Went out cycling half day, so nearly nothing, again just
- Some paper notes on memoire criterion paradigms : curves, genus-0, arithmetic and topology.

* L.Lafforgue 2016 talks on topos and syntactic categories for Nori motives @ IHES.

21.5

3am.

© Android.

Pulling some img from IG as gas-lighting for triggering inspiration.

- Same paper notes on memoire criterion paradigms : curves, genus-0, arithmetic and topology.

-> Clearing out concretely (= on equation) goals of AG :

- for an hypersurface = trying to get normic or monomials varieties.

- for a polynomial in n-variables of degree d, finding N-linear forms f_i such that $P = \sum f_i^{d_i} + \text{constante}$.

- Fixed reliure of D.Mumford book on cplx varieties with glue.

® Read both its introductions and that of the Red book.

Also a poly of AG-Algebra course of Joseph LePotier dating back to 1977-1985.

=> Grothendieck-Bourbaki style.

* L.Lafforgue 2016 talks on topos and syntactic categories for Nori motives @ IHES.

Lamport.

Difference programing-coding : like writing-typing.

Programing involves ideas.

22.5

3am.

© Android.

Pulling some img from ig as gas-lighting for triggering inspiration.

* L.Lafforgue 2016 talks on topos and syntactic categories for Nori motives @ IHES.

-> For Nori motives.

Arithmetics come from the quivers D .

Ofer Gaber rmk on derived apparatus required to take into account torsion of cplxes.

® Some wkp entries on derived theories.

- Some paper notes on derived theories from wkp.

© Linux Debian Lenovo.

-Continued memoire minor addings and corrections.

23.5

© Android phones.

Sorted folders of Phones and g-drive @ 3h am.

-Continued memoire minor addings and corrections (edit on A806, compile in P9).

-Memoire typos.
 no more birat simplification.
 bavarian Nori motives.
 in order to give the reader the bang.
 or the topological invariants intervening in Weil cjs
 both statement and proof.

® ArXicles.

Quadratic forms : Roussel Sylvain. Lam-Scharlau books

Korean Harmonic nbers : Conway-Guy.

- Some paper notes on memoire criteria formulations :
 approximating varieties of topological ones.

© Debian Linux Lenovo.

-LaTeX editing.
 Separate img files folder, then included graph files
 output.
 -> Advantage = separate contents, especially for big-
 source project : if a change is required in graph; no need
 to edit huge src file but only small graph one.
 -> Drawback = less quality result of inncluded output
 graph files.

=> Compromise : for graph files, use a separate folder
 for mpost code of mfpic graphs.tex then include them in
 main source with `\include{graphs.tex}`

24.5

© Android phones.

-Sorted folders of Phones and g-drive @ 3h am.

-Continued memoire minor addings and corrections (edit on A806, compile in P9).

* Some vids.

Vincent Lafforgue @ CIRM (Laurent Lafforgue bro @ clermont Univ).

Grp representations, Langlands prg, Chtoukas (=thing) of Drinfeld.

® Weibel homology book.

- Some paper notes.

Sheaves : Structural (schemes) and coherent-constructed (bundles on schemes).

Category from Weibel book.

homology = measure of obstructions, defects, default as a linear remaining.

No obstruction-residu = when the linear remaining is zero.

Some category pts : small categories with the concept of class for non small ones.

Maps : oriented graph interpretation leading to the combinatorial quivers.

Category = special quivers, hence a combinatorial nature.

Memoire computations : cospower periods. Exploring Legendre relation formula.

- Some physical tetris.
- Fixed one bent drawer under heavyweight of piles paper notes.

- Dugged out from it two golden era folders : blue cardboard and black plastic.

blue = 1994-1995 then 1999-2000 then 2003-2004.

black = 1994-1995.

25.5

3am.

© Android phones.

- Memoire typos.

tuples

as far Newton.

Next criteria versions.

- > Prove countability.

- > Non integer-rational-algebraic parameters.

- > criteria (p51).

- Maxima : cut paste to Keep or save session into mxm.txt.

© Linux Debian Lenovo.

-Continued memoire minor addings and corrections

* Embeded ytube vids have no ads.

-> So go to institutions platforms to get them.

® Nesterenko Philipon books on Alg ind.

Miyake on modular forms.

- Some paper notes on Philipon polynomial thm and other on category homotopy.

- Some physical tetris.

Fixed the other bent drawer under heavyweight of piles paper notes.

Swapped big-folders : put research ones on top for easy access.

26.5

1ham.

- Inspected blue folder of golden era.

1994-1995 : Polygonal and perfect nbrs. Criterion Genesis from $\delta(V)$ to

1999-2000 : algebraic independence of $P(V)$. An application with a series of rational pts on some ellipses.

Waldschmidt and Baker Letters.

2003-2004 = 1999-2000 redites, same preoccupations.

® Caramello paper with Lafforgue, BarberiViale on classifying topos of Nori motives.

-> Bibliography.

-> Caramello @ LesMoulins-Tolbiac site (bnf) P7.

* Some vids.

-Mechanics : Nhra top-fuel and motomag (Thierry Muller) on twingles.

-L.Lafforgue on topos@Jean Leray institute.

Again long vid (~2h30).

Topos as a theory vastly generalizing grp theory, merging it to other theories. Major theoretical step as was grp theory in 19th.

Generalizing or widening strength of topos come from spreading out effect of pre/sheaves (bouquets).

Pts of a topos $T = \text{Funct}(\text{Sets}, T)$.

Sets : initial or simplest topos.

=> But topos are highly set-theoretic or highly based on ... sets. Again, felt here a weird loopback quirk : how a general foundational concept can be based on one of its simplest instance, specialisation, realisation or presentation?

-> Graph theory.

• Some physical tetris.

Moved away mechanics big-folders of book shelves downto fixed drawers.

27.5

Went out half day so nearly nothing.

- Some paper notes on categories and topos.

* Continued L.Lafforgue on topos@Jean Leray institute of Nantes Univ.

Starts from classical topos, those coming from common maths domains (sets, grp/cohomology theory, etc).

-> Slowly drawing to Logic Topos (classifying topos) of Categorical Logic and model theory, that underlines previous Caramello paper on syntactic categories.

-> Morita, Algebras and cogebbras, Connes-Consani "frequency topos".

28.5

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Memoire minor corrections and addings on cospower.

Some plots : Extensions to rational exponents.

Updated search.txt.

=> Bilan of one year. April 2021 to May 2022.

Memoire : +13p.
 Diary log : +300p.
 Paper notes : +600p.

=> Balance that, more Latex, less paper.

® Some readings :

a) Vincent Zoonekynd introductory article on fundamental groupoids.

b) Wkp entries on sheaves, cogebres, bigebres.
 -> sheaves = presheaves + constructibility by merging-gluing the coherent pieces obtained from restrictions to covering components.

- Some physical tetris.
 Moved away e-manuals and Pc big-folders from desk shelves to drawers.

- Some paper notes : q-pts of cospower alg case.

29.5

1am.

- Some paper notes : memoire typos. Countability proof

sketch for the pair of periods assertion.

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Memoire minor corrections and addings.

® Some articles of Nesterenko Philipon book. 1996.

=> Look for progress surveys since then.

-> Websites of Brownawell, Bertrand, Waldschmidt, Nesterenko, Philipon, Gramain, Diaz, Laurent, etc.

30.5

- Some paper notes.

a) Criteria extensions/broadening principle to top-spaces.

b) Plan for memoire next versions (monograph?).

Typos : By spliting (newline). Ca for circles.

c) Family or moduli above a parameter space or the principle of dipping studied variety within a moduli : another broadening principle instance.

For the ellipses-circles case : quartic surface of k^4 fibered in plane conics.

© Android Phones.

Some plots on Geogebra on those moduli, algebraic curves.

=> Put timeline in preamble of search.txt diary.

- Some physical Tetris around desks, sorting books shelves.

31.5

3h am.

- Some paper notes on criterion.

a) Broadening principle : extending champ d'investigation to have more chances to detect or dig out traces of underlying patterns.

b) Other digging out of deep heuristics : Nf relatively to class of varieties and within such a class as an arithmetic cplxity gauge.

c) Top var and Q-pts. Approximating simplices like n-gones for plane vars.

© Android Phones.

Pulled a classic : mid 1950's R.Godement "theorie des faisceaux".

-> Grothendieck literary style.

-> An instance of faisceaux maturation of this post-wwII

french-school golden era; like motives maturation of
2000-2020.

© Debian Linux Lenovo.

- Put timeline in search.txt diary.

line 3658 2021

line 16518 2022

- Memoire minor corrections and addings.

1.6

Tinkered metal bits in ceilar so nearly nothing.

- Some paper notes on criterion : just a few lines as yesterday on n-gones.

* A vid of L.Lafforgue on Grothendieck influence in modern maths.

2.6

- Some paper notes on criterion : just a few lines as yesterday on n-gones.

* Finished L.afforgue vid on Grothendieck legacy.

-> Took notes.

© Debian Linux Lenovo.

-Updated browsers.

-Pulled some pkgs : gap extensions, xfractint, hjr and povray.

-> Cf those in /var/log/apt/history.logs

-Retrieved French latex pkg, since it bloats db with redundant doc-manuals (translations of en ones).

3.6

Went out half day so nearly nothing.

- Some paper notes as yesterday on criterion and n-gones, some on modules-modeles paradigms notions like representability : representability as a way of structurizing families of objects mostly from and into moduli via an algebraic or more generally a geometric entity.

® V.Zoonekynd writings (articles and thesis) on stacks, topos and fundamental groupoids.

-> Bib contains refs on classifying topos (Ian Moerdjik).
-> The fonts used are better for the eyes with less reading fatigue.

4.6

* Android Phones.

- Cleaned-up browsing cache data of all 6 browsers for tracing back and debloating purposes : removed manually one by one about 3k pointers.

-> Remain some residu in P9 ffox-β.

- P9 notes folder has now 600 diary txt files.

- Some paper notes as yesterday on criterion.

a) For n-gones $S=(S_i)$: mean pt issue, if $S_ = 1/n \sum S_i$ then $Cg(S) \neq S_$ and $Cg(S) \neq \text{Isobar}(S)$.

b) Some elliptic integrals computations : divisions and other twists formulae.

c) addings, typos of memoire and search.txt diary.

5.6

© Android Phones.

Some typos of fiche.tex
realisations of artinian motives.
 $Lf(s, \chi)$

and search.txt
extended periods, mean pt
-> generalized periods.

Q-edit : press home to get rid of virtual-kbd.
file:///storage/emulated/0/Documents/Notes/220527.txt
file:///storage/sdcard0/Document/search031020.txt

- Some paper notes as yesterday on criterion.

a) For n -gones $S=(S_i)$: if $S_- = 1/n \sum S_i$ then $S_- =$
 Isobar(S).

b) Some trivialities on links between Q -pts and Q -lin dep.

© Debian Linux Lenovo.

Minor corrections and addings : Memoire and fiche.

6.6

© Android Phones.

Pulled some books on z-lib on elliptic integrals,
 functions and curves namely
 Lawden, Silverman, Byrd-Friedman.

- Some paper notes on memoire : G_n periods and sketch of countability proof.

© Debian Linux Lenovo.

Pulled other books on tables of integrals to complete
 periods db , namely
 Brychkov, Gradshteyn-Ryzhik.

Memoire minor corrections and addings.

7.6.22

© Android P9 Phone.

Synced books and q-pts folders with g-drive.

Memoire minor corrections and addings, compile and edit on one phone only.

Memoire typos.

Algebraically dependent pair.

generalized periods.

- Nearly no paper notes : just a few lines on discrete Betti De Rham pairing related to DNA encoding and some others on different extensions of motives.

© Debian Linux Lenovo.

Continued memoire minor corrections and addings.

Graph files.

® Read bits of books.

a) Tate-Silverman classic on Rational pts of elliptic curves.

-> Memoire audience and informal style are close to that book spirit.

b) Fresan-Jossen on exponential motives.

-> Importance of pro-finite, derived and limit processes to build those from classical ones starting from the Betti-deRham cohomology functor on filtrated or gauge-stratified pieces of a variety equiped with a potential, this potential giving this slices-filtration.

8.6

© Android P9 Phone.

Memoire minor corrections and addings, compile and edit on one phone only.

Some issues with mp cmds and same bizarre error code.

® Read bits of books.

a) B.Poonen Q-pts, mainly appendix on universes and categories.

b) Fresan-Jossen on exponential motives.

- Some paper notes : quick ones on category theory (bi and 2-categories), and others on set theory. Building all day-to-day maths by just giving the empty set.

© Debian Linux Lenovo.

Pushed diary and updated memoire @ Free.

9.6

1ham

© Android TV

Sorted g-drive and tv-box folders.

- Some paper notes on memoire : corrections, typos.

Morning.

© Debian Linux Lenovo.

-Continued memoire minor corrections and addings.

-Started new batch of diary.txt after yesterday search.txt upload.

=> For future versions, look for bilans from search.txt with keywords

as "bilan", "come-back", "synthesis".

=> Found out some litterary-lenghty ones around 21 Dec 2020.

=> Look also for them in blue and orange sticks and keep.

-Pulled a pave ICM90 report and some articles on Gauss-Manin

cnx and rapid decay cohomology (BLOCH, ESNAULT, HIEN, SATO).

® Completing Huber-MullerStach bavarian Nori motives book.

- 1) 1-motives Hubert-Wustholz article.
- 2) Fresan-Jossen Exponential motives.
- 3) Nesterenko alg ind of ICM90.

10.6

Went out half day so nearly nothing.

- Some paper notes about previous readings.

Exp mtvs from Fresan-Jossen book : decay comes from $\exp(-f)$ twist of classic periods of V to get exp periods of V equiped with a potential f , ie exp periods of the object (V, f) .

Measure of transcendence from Nesterenko ICM90 report.
 \Rightarrow Those solene^l, official and institutional events surveys articles or reports are in general good overviews for the state of the art of a domain.

Determinant of periods matrix from both srcs. New original potential.

© Android P9.

Corrected typos and some addings to memoire. Compile and edit on one phone only.

Pushed it to g-drive then Android TV.

11.6

- Some paper notes.

Theoretical ones on $\text{Spec } k[t, 1/t]$, etale topology, Schemes and MtvS.

minor typos of memoire.

© Debian Linux Lenovo.

Pulled some arXicles on mtvs from Fresan-Jossen exp mtvs book : Nori ones from Fresan-Jossen in 2018; KZ ones from Huber-MullerStach in 2014.

=> Already pulled.

Visited C.Sabagh Mixed Hodge Structures book page.

12.6

- Some paper notes.

Theoretical ones one etale cohomology; higher Brauer grps, Gerbes, Topos and stacks.

© Android P9.

-Quirks P9 folders : with pdf files not appearing in thunar.

Checked wkp article for Topos then corresponding entry of nov 2020 in diary log of search.txt : different definition than the one found in nov 2020, for which a stack was a peculiar topos whereas the present one, it is now the reverse : a topos is a peculiar stack.

=> This is how wkp is spreading confusion and why it is not fully trusted by mathematicians.

-> n-Lab entry is better but still making the same approximation, with quite numerous definitions, the n-one popping out as the clearest.

=> corrected search.txt accordingly introducing Stokos or Topstack = the merging of Stack-Topos.

- Got back to hardcore reality leaving abstract-nonsense time-wasting bloat to tackle concrete cases of memoire with some Gamma computations.

© Debian Linux Lenovo.

Memoire typos and addings.

Algebraically dependent pair.
generalized periods.

13.6

© Android P9.

Some arXicles of Keiho Matsumoto (Tokyo Tech Institute) on derived invariants and integral Riemann-Roch, Gysin triangles, Higher K-theory, etc.

-> Some names, Breen, Binda, Kahn, Saito.

-> Bibs are complete.

-> ArXicles file format is yymm.nxiv

- Found out while rambling among research & phds srcs that trendy alternatives for scientific writings are Pandoc with Markdown.

->The latter as LaTeX is a Plain text markup syntax language for academic writings oriented towards online publishing, in the spirit of wiki/cms; so it is soupler than LaTeX for the output cycle.

Other alternatives are TexWord and Oxbridge software suite (aster, training prg).

-> Markdown reminds me of troff, manpage, sgml, docbook, docml and docsgml stuff around 05s.

-> Personally the best ascii or plain-text flavored format for writing is the one of manual documentation (man-pages) of GNU Linux systems.

- Some paper notes on abstract-nonsense and some more relevant ones on elliptic integrals. $dE/dk \neq E(k')$ with $k'=\sqrt{1-k^2}$.

Tackling 3d-surfaces : cylinder.

© Debian Linux Lenovo.

Memoire typos and addings.
Put equiperiodic graph.

14.6

- Some paper notes.

Tackling 3d-surfaces : cylinders need patching periods tuples, some addings and typos notes about that for memoire criterion.

© Debian Linux Lenovo.

Diffed ok s220614 to s220608.
Memoire minor typos and addings.

® A bit of the bavarian book on periods of Nori mtvs.

15.6

© Android P9.

Sorted mem folders.

® A bit of the bavarian book on periods of Nori mtvs.

- Some paper notes.

Tackling 3d-surfaces : cylinders case is fixed by patching periods tuple with one more period.

Some lines on elementary algebraic facts about transcendental degrees.

© Debian Linux Lenovo.

Memoire minor typos and addings.

16.6

Outdoor all day so nearly nothing.

® Just a few lines on alg ind while reading M.Waldschmidt Tucson survey of 2008.

Some extracts from

" $k \subset K \subset L$.

The union of a transcendence basis of K over k and of a transcendence basis of L over K produces a transcendence basis of L over k .

Hence

$\text{tr deg } k L = \text{tr deg } k K + \text{tr deg } K L$."

To Gelfond Statement. p19.

"In a 1934 CRAS paper Hadamard reports Gelfond statement of relative transcendence of e and π ".

-> What is relative transcendence? Does it mean that e and π are alg ind? This assertion, to the best on my knowledge has not yet been proved.

17.6

Went out half day so nearly nothing.

© Android Phones.

Pulled some papers on alg ind @ M.Waldschmidt webpage.
=> Most of them are survey papers but those are rather exhaustive and regularly updated.

- Some quick paper notes on that subject.

18.6

- Some paper notes on :
 - minor typos and addings on memoire.

© Tablet Pc.

Sorted folders and src files.

® Misc readings.

- A few M.Waldschmidt slides of surveys.
- Intro of P. Jossen Mtv Galois grps.
- Ams WhatIs perv-sheaves : jerky or quirky sheaves with vanishing hology grps at negative indexes.

- Also minor typos and addings on memoire after merging

keep note to 220618.txt :

-> Put title before name for next uploads playbooks.

"Since the trdeg inv... under bir, make sure that the trdeg of the field ... is the same or also inv...

$\Gamma(\frac{1}{4}) \pi$

Nesterenko Chudnovski.

src mathematicians : that bother themselves to put the results of their work online."

19.6

© Debian Linux Lenovo.

Memoire minor typos and addings.

Noticed a quirk from last sync with p9 : lack 220615 folder.

=> the usb-layer for data-storage is a real calamity. Either scrambles data during transfers or spreads worm/mal /spy/steal-ware through dfu/dsu underneath hotplug process.

=> Main canal used for the global-data war.

® Continued misc readings.

a) P. Jossen Mtv Galois grps.

-> Introduction sets problematics.

Exact and split sequences of mtv Galois grps,
 $G(k_)$, $G(k)$.

Goal : Equivalence Nori-Andre mtvs.

Mentions Donu Arapura.

-> Starts by resetting Nori quivers apparatus.

-> Contains exhaustive refs bib till 2015.

b) wkp enry on local systems.

- Reread some corresponding pointers in search.txt with "heuri" keyword :

"13.7.21

=>

Functor of points : given a scheme V and a "unital" object u , the functor of points of V is just $\text{Hom}(u, V)$; it allows a category shift, the studied space V is replaced by the morphisms to it. This process gives a second layer or higher level one from a recursive procedure : a functor from the category of schemes to the category of functors, that assign to a given scheme X its functor of pts.

-> This the famous relative pt of view.

<-.

Hence the geometrization of the space of functors, and when the covering space of a torsor of a scheme-related object is the geometrised category of complexes-valued functors, the torsor obtained above this given scheme-object is the motivic torsor when this scheme-related object is chosen to be the motive $M(V)$ associated to the studied scheme V ; the acting grp of the Torsor being the motivic Galois grp of V .

<=."

-> Add "Nori" to "This monograph may be a smart sequel of the bavarian motives book".

20.6

© Android A806.

A python script for random q-outputs.

- Some paper notes on criterion formulation; Galois mtv grp, trdeg and alg ind paradigms.

© Mint Linux Lenovo.

Updated pkg-db and three pkgs (ffox to 101.1, gvfs, one lib).

chmod -x some folders : notes and tex.

21.6

- Same paper notes on paradigms from criterion formulation; Galois mtv grp, trdeg and alg ind.

a) Morita equivalence on mtvs to force periods inverse.

b) Arithmetic equivalence.

c) Building blocks of periods of arithmetic mtvs : gamma periods.

© Mint Linux Lenovo.

Updated pkg-db then all pkgs.

Sorted folders after chmod -x them.

- Memoire typos.

. Termux, Qedit...

src articles, mathematicians community past present.

22.6

- Some paper notes on de Rham cohomologies but nearly nothing due to an update quirk of Debian from lagging fr-servers repos.

Noted on the fly some typos of search.txt @ lines 9387 "ouputs" and 12135 "ne week".

© Debian Linux Lenovo.

sdaII 418.863 files out of 1.533.657.

-Updated pkg-db then all pkgs through xterm > su > synaptic.

The upgrade entered an update-loop (>4) of grub-mime-linux_img pkgs install because of some non-retrievable pkgs (one was tzdata) causing time and hdd stress.

--> to get out this loop : enter "no" to synaptic-prompt asking to "continue by ignoring non-retrievable pkgs".

==> Next time try :

a) to update all pkgs only by chunks of 10-15 ones to avoid servers repos queue issues.

b) cmd-line apt-get for more option during procedure.

--> Mint update was slicker as its appearance but Kernels are again oddly more up-to-date for Debian (5.10.8 and 4.19.17) than Mint (5.4.0-120, 5.4.0-107, 5.0.0-32, 4.15.0-123 and 4.10.0-38).

<-- .

-Upgraded the 15 left quirky pkgs, including tzdata, chromium-101.0 and a kernel linux-img.

- Removed older 5.4.19 kernel.
- Cleared pkg-cache.

23.6

- Some paper notes on singular, simplicial and de Rham homologies.

--> How profusion of jargons makes a corpus less clear.
 Jargon pedantic bloat = slowing progress.

<--

So, tried to uncover or more precisely recover underlying mtv simplifying paradigm, managed to capture a glimpse of Grothendieck intuitions.

Topological ground of de Rham : cnx components for H_0 , simple connectedness for exact=closed, de Rham 1931 iso thm $H^d \sim H_b$ Betti Cohomology (singular) for compact orientable manifolds.

® Some various readings.

1) wkp entry on Mayer-Vietoris Sequence.

-> Merging homologies of a space from hopefully simpler ones of its smaller pieces : splitting-glueing or divide and

conquer principle.

2) 3 arXicles.

a) A paper of a Berkeley cal-team (Betts-Corvin-Leonardt) about effective Chabauty-Kim evaluations of the nb of rational pts $\#C(Q)$ for Curves of genus $g > 2$ (hyperbolic type) over nb fields.

b) Another cal(tec) one popping-out on BSD of Flach and Burungale.

--> Contains exhaustive bib.

--> I remember Flach (Mathias) contrib to FLT.

c) A paper on w.a for Chatelet surfaces of Nihara and Roven.

© Debian Linux Lenovo.

-Dug in system with locate-db for troff, docbook, sgml.

-> The last two have the more complete pointers.

-Tared the bunch of 625 diary notes files :

11M to 5.1M in Xplore-zip Android.

11M to 4.4M in Thunar-7zip Debian Linux.

-Some minor corrections to memoire.

24.6

Went out half day so nearly nothing.

- Some quite general paper notes on Q-pts : methods and inversion of pt-view.

© Android phones.

Minor corrections to memoire in keep.

© Debian Linux Lenovo.

Sorted books folders.

® Some various readings.

a) wkp entries on local-systems, conections.

b) Andre book on mtvs.

25.6

- Some quite general paper notes on Q-pts : sections and inversion of pt-view.

© Debian Linux Lenovo.

-Dug in system with locate-db for docs on ... pandoc : found one entry in Sage doc folders and a series in Python (formatting-filters implementation in Python) ones.

pandoc : converter of markup typesetting langages written in haskell (lisp derivative, used to code whatsapp) for instance, converts latex \leftrightarrow markdown, or latex \leftrightarrow html, html \leftrightarrow sgml, etc.

-> zotero (competitor of the late scrapebook) is now more a ref-bib db-oriented system, allowing transfer to bibtex.
-> See 14 june 2022 paper notes p65 for citing db-ref softs.

-> Mendeley, Endnotes, Keynotes.

-> svg : inkspace.

- Searched db-locate for haskell : mostly emacs.mode docs and files.

® Pulled some arithmetic geometry books in z-lib :

1) three very recent (>2018) ones.

us-ams

a) Balakrishnan, Elkies, Hassets : Computational arithmetic geometry.

b) Bucur, ZureckBrown : Computational analytic nt.

asia-ws

c) Wei Nakamura : Arithmetic geometry nt.

d) Alvaredo Robledo online g-book : introductory text, read a bit of it like a novel, as Stewart-Tall Algebraic nbers theory book.

2) one less recent of 2013.

This less recent is faraway the most relevant one, Turk-French Summer School of 2009 (Galatasarai-Lille-Paris) survey book on Arithmetic Topology : Galois grps and arithmetic geometry, edited by P.Debes, M.Emsalem, M.Romany and M.Uludag.

=> Pulled resume.

1st article is a recall on stacks theory by J.Bertin of Fourier institute, settling down the base needed for the sequel of the book.

* A talk of V.Hoskins @ CIRM on "Quivers representations and grp actions on moduli spaces" research paper.

26.6

- Some quick paper notes on :

1) Q-pts motivations

Why study rational pts on general varieties?

Why care about knowing if a var has no q-pt?

--For alg var defined over q , it answers dioph pbs.

If a variety has no q -pts, it has necessarily no z -pts.

--Discrete or rational optimisation issues.

-Tilling

Filling optimally a space with a regular-pattern tile of rational measure.

How to place the first tile in order to get :

- a) the least cuts or the most complete tilling.
- b) the most symmetrical (about the center) tilling.

-Maximizing the nrj of ray beams trapped in a given inner-region enclosed by the studied var mirror.

--Etc, etc.

2) on category theory.

* Another talk of V.Hoskins @ Gear Network on the same "Quivers representations and grp actions on moduli spaces" research paper.

"Group actions on quiver varieties and applications
215 views · 4 years ago

Gear Network
158 subscribers

Description
Group actions on quiver varieties and applications

2018 Mar 14
Vicky Hoskins (Freie Universität Berlin)

Abstract: We study two types of actions on King's moduli spaces of quiver representations over a field k , and we decompose their fixed loci using group cohomology in order to give modular interpretations of the components. The first type of action arises by considering finite groups of quiver automorphisms. The second is the absolute Galois group of a perfect field k acting on the points of this quiver moduli space valued in an algebraic closure of k ;

the fixed locus is the set of k -rational points, which we decompose using the Brauer group of k , and we describe the rational points as quiver representations over central division algebras over k . Over the field of complex numbers, we describe the symplectic and holomorphic geometry of these fixed loci in hyperkaehler quiver varieties using the language of branes. This is joint work with Florent Schaffhauser."

then

"Victoria Hoskins: On the motive of the stack of vector bundles on a curve
2.4K views · 3 years ago

Centre International de Rencontres Mathématiques
24.5K subscribers

2018

Jul 6

Abstract: Following Grothendieck's vision that a motive of an algebraic variety should capture many of its cohomological invariants, Voevodsky introduced a triangulated category of motives which partially realises this idea. After describing some of the properties of this category, I explain how to define the motive of certain algebraic stacks. I will then focus on defining and studying the motive of the moduli stack of vector bundles on a smooth projective curve and show that this motive can be described in terms of the motive of this curve and its symmetric powers. If there is time, I will give a conjectural formula for this motive, and explain how this follows from a conjecture on the intersection theory of certain Quot schemes. This is joint work with Simon Pepin Lehalleur.

Recording during the meeting "Gauge Theory and Complex Geometry" the June 19, 2018 at the Centre International de Rencontres Mathématiques (Marseille, France)".

Mentions Allister King papers.

=> The replay confirms the fact that seeing different talks vids of the same exposed subject enlightens the understanding : the orator gives new insights about the same content in each different conference places.

<=

® Various readings.

0) Some parts of the turk-french book on Arithmetic Geometry around Galois theory.

1) Pulled the only 3 arithmetic arXicles of first year 1991. For comparison now it is about 3000/y in nt.

Minhong Kim (?) and Sutherland (Stony Brook NY) on roots of polynomials

P.Stiller (Austin Texas) on Elliptic surfaces.

K.Ribet (Berkeley) on Tanyama cj, the popping-out one.

There was a fourth one of Asharon Sheyla, but on an arithmetic-logic cj of Tarski.

2) Some wkp entries on haskell, type-theory, and computer sciences.

-haskell (inference and statically typed, lazy-footprint langage) named after Haskell Curry a us-logician. Student of P.Bernays (sw logician) and D.Hilbert.

-> Compiler is GHC for Glasgow Haskell Compiler, maybe Haskell origins were scottish.

-Proof-theory french school : Thierry Coquand, Maurice Nivat and Gerard Huet.

Coquand and collabs have elaborated Coq, a proof-verifying soft-suite, written in gallina.

-> Recently used to verify Feit-Thompson simple grps and the 4-colour thms .

© Debian Linux Lenovo.

- Pulled markdown and pandoc, with some related plugins.
-> Relatively light bundle of pkgs.

27.6

© Debian Linux Lenovo.

Pulled a small-ide for markdown : formiko.

-> Tested with various rendering : markdown seems particularly suited for weblogging.
-> Lacks some input/output formats in that small ide.

- Some quick paper notes.

-A list of those markdown-parsers and static web-site editors.

-On n -categories : categorical-filtrations indexed by $n \in \mathbb{N}$, from the indices n of the n -categories.

-Categorisation :

Galois theory : from fields-automorphisms paradigm of Classical Galois theory to Autofunctors of categories, through schemes-automorphisms.

Homotopy theory : from homotopy of loops of classical topological spaces, to homotopy of categorical loops. A path starting from a fixed category, going along categories and finishing back to the starting fixed one or base category. Higher fundamental grps.

-Slicing convex bodies or solids along curves, giving the least sectional area or surface.

Fr institute carmin vid (ihp, ihes, fourier)

- Memoire typos.

birational : § after criteria citations, circles Ellipses.

add : acording..nature of the chosen "generalized" periods.

retrieve : Gnu/linux.

® Various readings.

0) Some parts of the turk-french book on Arithmetic Geometry & Galois theory.

-> Found some coquilles in first part.

1) Some wkp entries on haskell, type-theory, and computer sciences.

2) End of Lang Algebra of 1993 on hologies : complexes, resolutions, derived functors, etc.

-> The bbki spirit is obviously there, revealing that the author was a longterm member of this grp.

<-.

28.6

© Debian Linux Lenovo.

Pulled the very few articles on motives of stacks, maybe because it seems a quite recent theory.

Names : Donu Arapura, Kai Behrend, Anjeet Dhillon.

® Some diverse readings.

0) Some parts of the turk-french book on Arithmetic Geometry & Galois theory.

1) Intros of articles on mtvs of stacks.

2) Some wkp entries : line bundles, bundles.

3) Some bios : Artin family (Emil=father and Mickael=son) a relative-ly common situation (Cartan, Schwartz, Nash, etc).

• A very few paper notes : how categorised objects are usually clearer.

29.6

- Done some motorcycle mechanics maintenance and went-out half day, so nearly nothing.

© Android phones.

® Some arXicles intros.

See ffox-pocket.

30.6

- Just a few paper notes on criterion mean-pt hypothesis necessity.

-> To be sorted out.

© Android phones.

Rdb with jerking while sorting img folders.

© Debian Linux Lenovo.

Pulled Daniel Huybrecht and Manfred Lehn book on geometry of moduli spaces of sheaves and a few papers of Victoria Hoskins.

® Some diverse readings.

0) Huybrecht-Lehn book on moduli spaces of sheaves intro.

1) Victoria Hoskins papers.

Education : Oxford, Phd (F.Kirwan). AG : Moduli and Narasimhan Filtrations.

Co-authors S.PepinLeHaleur (ens, p7), Schausenhauer.

2) MacTutor Bios.

1.7

Went out half day so nearly nothing.

- Just a few paper notes on criterion mean-pt hypothesis necessity : sorted out mean-pt issue for first example.

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-Pulled some AG books on z-lib.

Friedman Robert, Algebraic surfaces and holomorphic vector bundles.

Le Potier J, Vector bundles on alg-var,

Birger Iversen, Cohomology of sheaves,

Jurgen Jost, Compact Complex Riemann surfaces.

-> bundles : hairy or varietes chevelues.

© Android P9.

Sorted src folders, pushed some articles and books to g-drive.

® Read a bit of Friedman and LePotier books.

2.7

- A few lines paper notes : universes, couples. Intersection nb.

© Android P9.

Sorted src folders.

Pushed some articles and books to g-drive, then sorted it a bit.

© Debian Linux Lenovo.

Some admins-papers remotely.

® Read a bit of Friedman and SGA4 books.

3.7

Morning

© Android phones then Debian Linux Lenovo.

Pulled Okonek-Schneider-Spindler fiber bundle book of 1978.

-> Typewritten, so quick fatiguing for the eyes.

® Mainly reading fiber bundle books (Friedman, Okonek,

Huybrecht) and wkp articles (Chern classes, Chow grps, characteristic class; Euler, Thom, Stieffel-Withney classes, Principal bundles, Classifying spaces and topos).

- Then Coming back to some paper notes, after a week of reading books, articles and papers. I feel more comfortable with writing than constraining myself to read what others have written; despite the fact that reading litterature is a prerequisite for any math activity.

-> Mainly a commutative algebra warm-up to relaunch the brain outputing ideas machinery, plus some notes about writing style of maths books after this reading week.

=> Conclusion : from the Bbki style of linear logic "rouleau compresseur" full of numbered formula to pure phrasing style with nearly no formula, focusing more on exposing ideas and principles.

=> Find a good balance between the two extremes.

4.7

- Started with paper notes :
 - continuing warming-up with mainly classical ring-theory (units and maximal ideals : for classical ring-theory, critical hypothesis are ring-commutativity and sets-AxiomOfChoice in the form of Zorn lemma; most of classical

ring-theory relies on those two).

A first step towards non-commutative setting would be to consider alg-var over $M_n(k)$.

$P(M,N) = 0$ with $P = \sum a_{ij} X^i Y^j$ together with M, N and $a_{ij} \in M_n(k)$.

- Some settling-down notes about q-pts study for future memoire/monograph : sorted out principles used so far by maths nerds for the study of those q-pts.

® EoM classes entries of yesterday wkps ones :
(characteristic then Chern, Euler, Thom and Stieffel-
Withney classes; Principal bundles; Classifying spaces.)

© Debian Linux Lenovo.

Python : exploring routines of file management modules with Idle ide and html docs included in Debian Python bundle.

```
pprint
open('file', 'w' or 'r' )
```

Hesitating with Bash, but Bash seems more convenient, since it is included as a basic management prg in all gnu-linux-based systems.

Bash.

Checked left versions q and td of 2008 : data are in audio folder.

-> Gabel versions are of early 2009.

```
cat snb.txt | grep -m 1 -A 10 -B 10 [^vnb]
```

-> Note the regexp between brackets [].

5.7

- Same paper notes as yesterday ; concrete aspects of q-pts study and clearing out the principles behind their study.

A concept to be sorted out : recursive/nested structures and q-pts.

© Android Phones.

Sorted folders and pushed some data to g-drive, sorted it a bit.

® Various stuff.

a) Some maths : veille of arXiv nt.

b) Some bios.

c) Evernote time-machine : exploring 2014 scientific folders.

© Debian Linux Lenovo.

Bash

Examined td : contains much more arithmetic routines than q.

-> For instance modular arithmetics to use for qrnd.

6.7

- Some paper notes on a first approach to fractal objects for the criterion.
-> Good intuitions on need of Hausdorff theory.

® So read wkp-eom entries on Hausdorff theory (measure, dimension, etc).
-> Geometric measure theory.

* Some vids on imu-fields awards.
-> Cf keep notes.

Fields 22 (fin).

1) James Maynard (gb).

Diophantine approximation and primes nb distribution (gaps between clusters).

2) Maria Viavoska (ukr)

Fourier Analysis and geometrical optimization (higher dim packings, Leech lattices functions after Cohn-Conway-Elkies-Hales).

3) June Huh (kr-us).

Combinatorics/Hodge theory/topology : Dowling-Wilson, Rota and Mason cjs.

Spaces whose geometry entangles untractable cases.

4) Hugo Duminil-Copin (fr).

Probability, physics particles statistics and dynamics.
Ising models and percolation (magnetic statistics).

© Robin Raspberry worm : propagate through lnks and usb-keys.

7.7

- Only a very few paper notes on Hausdorff and geometric measure theory, being constantly interrupted by the environment : with summer holidays the daylight-environment becomes quite noisy, with noises from neighbours being there allday long and tinkering, causing a continuous barking of the dogs, followed by nuisances from youngsters @ nite partys or hanging around lately in the street.

This place was very quite in the 1985s, and now since about 10y, with the high increase of built houses in the surroundings, the quietness has drastically degraded, the trend is quite obvious with automotive traffic : in the 1985s a few scarce cars would pass during the whole day; now, it is a continuous noisy and polluting flow.

-> Urbanisation calamity.

© Debian Linux Lenovo.

Wrote some bash for qrnd.

8.7

Went out half day cycling, so nearly nothing.

© Debian Linux Lenovo.

Bash

Gathered last available 2009-versions of td and q from Gabel, pulled them here and in phones then in remote repos.

9.7

- Went out early morning (5h45) cycling with no gps, no

phones, no nothing but a bottle of 25cl of water; tempted again by deep-forest explorations for water wells as in the past; so nearly nothing.

© Debian Linux Lenovo.

- Bash.

Wrote some lines of code for qrnd.

-> Coding and even programing = mathematician relaxing hobby.

10.7

© Debian Linux Lenovo.

- Bash.

Wrote again some lines of code for qrnd.

Corrected pieces of shs db-part in it.

Pushed it to P9.

=> Noticed that, within P9 Termux, bash-scripts do no execute outside Termux init/home dirs, restricting by trapping or sand-boxing them inside those starting dirs.

11.7

© Android P9.

Sorted main dirs of g-drive and Free repos.

Looked in g-maps for springs, streams in nearby forests.

==> Nothing, even non-forest ones do not appear (Aulnay road entrance, Cauchoiserie sente).

==> Tech forgets the essential.

- Wrote some paper-notes outside maths on theoretical physics.

-> Unifying deep structure of matter, or how some dynamic distributions encode or shape the whole Universe.

=> Remaining issues : finiteness; nature of void, time, then more metaphysics ones of soul-breathing or living entities; free-will, cognitivity and morals.

* Some mechanics vids on engines.

One of numberphile interview of June Huh on

combinatorial topology starting from Euler characteristic formula on polyhedra.

© Debian Linux Lenovo.

- Bash.

Wrote again some lines of code for qrnd.

Created grand, a menu-version one.

12.7

© Android Phones.

Pushed q-dbs from P9 to g-drive then pulled it to A806.

Tried script on A806.

=> Same issue of bash-scripts sandboxing in A806.

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® Quick come-back to maths.

- Darda-Yasuda arXicle on height on MD-stacks.

- Some wkp entries : limits, colimits. Categorical cones : appears to me as
to be linked to 2-limits = extensions to categories of limits usually defined on objects of such categories.

13.7

- A very little paper notes on theoretical physics; summer canicule : upstairs temp reached 45°C, high temp is exhausting for the brain.

© Debian Linux Lenovo.

-Upgraded browsers and all up-gradable packages since those were not too many (~ 15) : chrome version is up-to-date (102). ffox-esr one is still outdated (91.1).

-Partially installed q, manually (without install script).

Issues :

1) available ogg-decoders are gui-ones, so they quirk when invoked by bash : tried Quodlibet then installed and tried mplayer, the latter is better allowing a cmd-line trigger through a no-gui option, with keystrokes-ctrls.

-> Find a lighter cmd-line ogg-decoder.

2) sed quirks.

14.7

- Very few paper notes but throwing away ideas on nested structures from last week ones.

© Debian Linux Lenovo.

testing q.

-> found out it is ok for $nb > 9$, but bugs for $nb < 10$.

® Some quick readings.

Bios. Mirzakhani or a unique far-east etoile filante, an iranian female version of Galois.

-> Started with graph-combinatorics, then studied Modules of closed geodesics on Riemann-surfaces.

15.7

Went out half-day cycling, so nearly nothing.

- Again, very few paper notes but throwing away some ideas on prime nbers.

* Some vids of nb-phile on primes.

Haran, Maynard and another-one (gb).

16.7

© Debian Linux Lenovo.

Bash q.

Wrote some lines of code and fixed q-quirks (a few lacking

db-files).

Pushed audio-data to Free.

Long interruption from circonstances.

```

-----
-----
|                               =====
|
-----
-----

```

30.7

Back again at last a bit to desk.

-> The race for wordly purposes (admin non-sense, cupid brainless materialism) exhausts, alienates, develops and feeds the global-stupidity, the one that pervades 95% of digital-networks.

"Alhakoumou takathour hta zortoum al makabir."

* Some maths vids the nite before : ytbe arithmetic geometry.

31.7

- Some very few paper notes to restart brain activity : a few corrections and typos to memoire.

© Debian Linux Lenovo.

Bash q.

Fixed q-quirks (a few lacking db-files) in shs nb=40 (db-quirk).

2.8

cosec = $1/\sin$.

sec = $1/\cos$.

* Some ytbe vids.

a) A vid of Wei Zhang @ Princeton on Q-pts on intersections of quadrics.

b) Another noticeable one of a slides-talk of Caleb Springer on The Structure of the Group of Rational Points of an Abelian Variety (CTNT Online, June 12-14, 2020).

<https://ctnt-summer.math.uconn.edu/ctnt-conference-2020-online/>

(Preprint) The Structure of the Group of Rational Points
of an Abelian Variety over a Finite Field:
<https://arxiv.org/abs/2006.00637>

Website: <http://personal.psu.edu/cks5320/>

4.8

- After another admin non-sense running period, back again to desk.

-> Received again a warning letter from Y. The underlying feeling

is that they are determined to cut funds.

-> Think now of alternatives : going abroad or relaunch side-activity (bikes).

® Pulled an arXicle of Nishioka-Tanaka on alg ind of an infinite nb of values of two entire functions at algebraic nbers.

-> The two functions are quite specific and have rapid-decay coefficients. The link to criteria is tiny, maybe the ellipses case.

=> The important fact retrieved is the existence of infinite trdeg extensions of \mathbb{Q} from an infinite family of alg ind nbers, that is strongly-uniformized, meaning that the family comes from values @ alg nbers of the SAME transcendental function.

- Some paper notes on that.

5.8

- Went out half-day so nearly nothing : as yesterday some very few notes on those infinite trdeg extensions.

6.8

- An afternoon theoretical physics prg on Arte : Quantum physics, Einstein-Hawking cosmogony and black-holes.

-> Fall most of the time asleep berced by the monotone voice of the narrator but retrieved some points.

=> Some paper notes giving an interpretation of the scale discrepancy in behaviours of quantum physics phenomena (freezing of the fog from interaction interferences).

® Pulled a summary of some nt-summer conferences @ uconn (usa).

7.8

- Some quick paper notes : finally back to criteria and memoire with birational invariance issue from the first two examples.

8.8

- Same quick paper notes as yesterday on criteria birational-trdeg($\text{Pa}(V)$). issue : needs of another period; because arrived to the plausible fact if $r \in \mathbb{Q}$ then $E(r^\wedge)$ is likely not equal to a rational function of π .

® Pulled an arXicle of Colliot-Thelene on intersections of quadrics in lots of variables, in the spirit of Heath-Brown results, extending some recent articles.

9.8

- Again very few paper notes on that periods criteria issue of birational-trdeg(Pa(V)).
- A few gravitational ones about black holes and their possible interpretations.

® Diverse readings : wkp, eom.

10.8

- Very few notes on conceptual maths : objects, their different realisations through the different types of studied interactions. Ontological sheaves/bouquets.

® Diverse readings : wkp, eom.

11.8

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Push-Updated diary and memoire to free.

® Diverse readings : wkp, eom.

=> ffox pocket.

13.8

- Nearly nothing : fixing cycles and sorted about 4y of admin papers, all day.

® Diverse readings : wkp, eom.

=> ffox pocket.

14.8

- Very few paper notes : Hasse-Minkowski thm.
- ® Diverse readings : wkp, eom.

15.8

- Very few paper notes : Hasse-Minkowski thm, Hensel lemma, Brauer grp. Motivic approach in p-adic geometry setting via criterion.

® Diverse readings : mctutor bio of Cayley doing math research instead of writing report-txts while working for a gvt official adm institution.

16.8

- Very few paper notes : nested structures and iterated periods. Approach via motives and fibration-moduli.

17.8

- Very few paper notes : nested structures and iterated integrals. Cauchy formula for iterated anti-derivative.

® Diverse readings : mctutor bio of Sergei Fomin; as Kantorovich, Fomin was another russian prodigy (uni @ 16y).

18.8

- Very few paper notes : investigated nested structures and integrals of compositions.

=> Cf change of variable paradigm.

® Diverse readings : mctutor quotes.

19.8

- Went out half-day so nearly nothing : answered to Y letter by email.

=> A few ideas in keep : investigate rationality-density, in terms of motives.

® Diverse readings @ mctutor :

bios : Sergei Fomin as Alexei Kantorovich : ru prodigy, univ @ teenage.

Quotation From Blaise Pascal :

[I feel] engulfed in the infinite immensity of spaces whereof I know nothing, and which know nothing of me, I am terrified The eternal silence of these infinite spaces alarms me.

Pensées (1670)

20.8

- Very few paper notes : some basics on p-adic fields and rings.

-> Noticed a relative decay of output since may 22 admin hassles : those are surely impacting unconsciously.

=> This needs to be definitively fixed to regain peace of mind : leave France or drop math a bit to relaunch (motor)cycles project.

21.8

- Fixing cycles all morning so very few paper notes : some subtleties on p-adic fields (Zariski vs Standard topologies).

® Diverse readings on p-adic theory : wkp, eom.

->> Found an unknown ressource : proofwiki.org.

=> This platform gives proofs of relatively basics facts.

22.8

- Some few paper notes restoring slowly the past pace : the important functor sending a variety to its function field; so this is a category shift from $\text{algVar}(k)$ to fields extensions of k .

Luroth pb of field extensions then translated into Unirational- \rightarrow Rational variety implication.

Other issues : Galois and Noether inverse pbs.

\Rightarrow Luroth in terms of trdeg : Inequality to equality as in the Grothendieck periods tredeg inequality (Andre-Ayoub periods).

- Some memoire typos : Philip Griffiths. The wider will be the required tuple of fundamental periods. Hopefully simpler.
Quotients of periods. x .

® Diverse readings on rationality : wkp, eom.

23.8

® Some various readings.

a) Arxicle.

The conjugate uniformization via 1-motives.
 This mirrors a mixed Hodge theory construction of the
 inverse uniformization map for complex semi-abelian
 varieties.

b) wkp, eom.

24.8

® Some various readings.

a) Frank Morgan book on Geometric measure theory.

This theory extends diff geo through measure theory to
 non-smooth manifolds, for optimization (Didon, Minimal
 surfaces, isoperimetry) and varational pbs.

-> as intuited, allows extension of diff geo to more
 general spaces like non smooth (topological) spaces,
 introducing Hausdorff measures. Suitable for criteria to
 tackle weird topological spaces cases.

b) wkp, eom.

- Some paper notes on that.

25.8

® Some various readings continuing yesterday one on geometric measure theory.

-> The reference book of this theory seems to be Herbert Federer (us from WWII austria emigration). Quite exhaustive of early 70s, with cohomological tools introduced in the end but with bizarre notations.

26.8

- Memoire criteria typos.

Goal merges for 1st time extension to topological x .
spaces via gmt (geometric measure theory). x .
simple algebraic ... plane conics. x .
Put equations in equiperiodic. x .

* Ytube.

a) Luc Illusie interview @ IHES.

H.Cartan student (Analytic sheaves & geometry, Homotopy);
then Grothendieck (AG). IHES e-sga scribe. Then commutes
in 91 maths-pole of IHES-Orsay-X. Collaboration with
O.Gabber (Purity of intermediate extensions and Macpherson
Cohomology. Local uniformization. Finiteness of Etale
cohomology over excellent schemes.)

b) Olivier Wittenberg on Pontos Rationais @ IMPA.
Fibrations methods.

27.8

© Android P9.

Zipped search files. Both formats : 13M.

© Debian Linux Lenovo.

A few typos and corrections to memoire.

28.8

© Debian Linux Lenovo.

- A few typos and corrections to memoire. x.

history of at least three thousand
years for algebraic varieties.

Number theory.

* Random ytube vids.

Nemean
69K subscribers

Description

Researchers Use Group Theory to Speed Up Algorithms –
Introduction to Groups

This is the most information-dense introduction to group theory you'll see on this website. If you're a computer scientist like me and have always wondered what group theory is useful for and why it even exists and furthermore don't want to bother spending hours learning the basics, this is the video for you. We cover everything from the basic history of group theory, over how and why subgroups partition groups, to the classification of all groups of prime order.

Laszlo Babai's talk can be found at: <http://people.cs.uchicago.edu/~laci>

0:00 Intro

1:42 Abstract Algebra

4:28 Group Theory

8:01 \mathbb{Z} \mathbb{Q} \mathbb{Z}_n D_n

14:29 Proofs

18:58 Subgroups & Cosets

25:31 The Theorem

29:11 Classification of Groups of Prime Order

18:48

How Karatsuba's algorithm gave us new ways to multiply
Nemean•681K views

:58

Group theory, abstraction, and the 196,883-dimensional
monster
3Blue1Brown•2.3M views

20:08

Fast Inverse Square Root – A Quake III Algorithm
Nemean•3.3M views

10:48

Un voyage proposé par Arte, au pays des maths ; épisode :
l'hypothèse de Riemann
Claire Lommé•57K views

13:19

The Biggest Project in Modern Mathematics
Quanta Magazine•1M views

9:43

Physics without Forces | Lagrangian Mechanics #SoME2
mindmaster107•46K views

18:57

Why the Soviet Computer Failed
Asianometry•1.3M views

10:47

Les 20 symptômes du Syndrome d'Asperger (adulte)
Bilan psychologique Paris•431K views

29.8

- Some paper notes on grp cohomology, properness-adelic space product identification issue, hp for linear spaces.

® Wkp-eom, Serre Coh Gal on that : grp coh as derived functor or Ext grps.

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- A few typos and corrections to memoire.

30.8

- Same paper notes on properness-adelic space product identification : sorted out issue, Matiasevic-Robinson-Putnam.
- Memoire criteria : put fields assumptions into intro.

31.8

- Same paper notes on properness-adelic space product identification.

® An article of B.Conrad on that subject about Weil-Grothendieck adelic spaces, towards Ninsevich topology.

Books : Colliot-Thelene-Skorobogatov Brauer grps and Lang EMS on that.

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- A few typos and corrections to memoire.

1.9

* Same paper notes on properness and adelic spaces.

® Wkp-eom, mactutor : Choleski, Gorenstein.

2.9

• Went out half day so nearly nothing, just quick questions on paper on this week subject.

Some memoire typos. x.

merging local rings.

$A_k \subset \prod k_v$

3.9

- Same paper notes on Brauer grps.

=> No direct approach for varieties.

4.9

* Ytbe : Human stupidity.

Most research AG Arithmetic vids : 150 views/2y.

Dumb vids on stupid violent/insane pranks : 250k views/m.

Human knowledge.

Brain : 2.5peta .

Overall : 250exa.

(x 1k : giga,tera,peta,exa,zeta,iota)

- Brauer grp.

No satisfactory direct def for varieties.

Usual Path :

1) fields - 2) fraction fields of globally regular functions or Azumaya algebras (dynamic or spreading-out algebras along pts).

Refs.

-Lang EMS NT IV : foggy.

-Colliot-Thelene_Skorobogatov Brauer grp book is better : this book seems built from glueing colab articles like the one on Brauer grps of Schemes.

"In

Section 3.5 we prove a theorem of Grothendieck that the Brauer–Grothendieck group $\text{Br}(X)$ of a regular integral scheme X is naturally a subgroup of the Brauer group of its field of functions F . In particular, $\text{Br}(X)$ is then a torsion group."

-A good balance Colliot-Thelene_Skorobogatov vs Lang : B.Poonen Q-pts book.

-See also Preu bib thesis.
H1 and H2 computation.

a) Clark P.L., On the Brauer group.

b) Hoobler Richard.T., A cohomological interpretation of Brauer groups of rings, Pacific Journal of Mathematics.

c) Gounelas Frank, The Brauer-Manin obstruction, Oxford Student seminar.

d) Gundlach Fabian, Brauer Manin obstruction for sums of two squares and a power. Bachelor arbeit dissertazion. Munchen.

Miranda R., The Basic Theory of Elliptic Surfaces, ETS Editricem Pisa, 1989.

Khuri-Makdisi K., Asymptotically fast group operations on jacobians of general curves, Mathematics of Computation 76, no. 260, 2007,

Kaplan M., Computeralgebra, Springer, Berlin, Heidelberg, New York, 2005

Kersten I., Brauergruppen, Universitätsverlag Göttingen, Göttingen, 2007

Gabber O., Some Theorems on Azumaya Algebras in Ed. Kervaire M., Ojanguren M., Groupe de Brauer, Springer Verlag, LNM 844, Berlin, Heidelberg, New York, 1964, pp.

129-209

Garibaldi S., Serre J.-P., Cohomological invariants, Witt invariants and trace forms in
 Garibaldi S., Merkurjev A., Serre J.-P., Cohomological Invariants in Galois Cohomology, AMS, ULS 28, Providence, 1972, pp. 1 - 100.

Auslander M., Brumer A., Brauer groups of discrete valuation rings, Nederl. Akad. Wetensch. Proc. Ser. A 71, 1968, pp. 286 - 296

Auslander M., Goldman O., The Brauer group of a commutative ring, Transactions of the AMS, Vol. 97, No. 3 Dec. 1960, pp. 367 - 407.

Yang Cao, Sous-groupe de Brauer invariant et obstruction de descente itérée,
 April 24, 2017. Preprint, arXiv:1704.05425v2.

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- Memoire typos. x.
 applied to the localizations of the function field of the variety.
 environments.

5.9

® Reading the above mentionned Brauer grp new srcs.

==> Rereading same srcs after a long-period anchors and

consolidate knowledge, as
 multiplying srcs that complete eachother their
 insights to build solid overviews.

© Debian Linux Lenovo.
 A few typos of memoire.

6.9

- A very few paper notes on adelic spaces.

© Debian Linux Lenovo.

A few typos of memoire.

foundation
 foundational
 fundamental but no fundamental.

® Reading the above mentionned Brauer grp new srcs.

7.9

- Some egg shaped surfaces from ig.

First versions of criteria apply well.

® Reading the above mentioned Brauer grp new srcs.

--> F.Gounelas notes : contains clever insights and analogies like the important one

etale morphism for alg var <-----> smooth maps for diff manifolds, already in Milne EC.

8.9

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A few typos of memoire.

9.9

Went out half day so nearly nothing.

© Debian Linux Lenovo.

A few typos of memoire.

10.9

© Debian Linux Lenovo.

Updated some pkgs (browsers, jdk).

A few typos of memoire and adding lastnames to bibs and textes.

11.9

- Some foundation paper notes investigating overviews insights on abstract theories : cohomology, sheaves.

12.9

- Some memoire typos.

by the grp scheme.
the most important ontological

define notion before introducing it.
prove assertions like the ones from arrows.

in section nodes @ kv ... and then by mapping the
resulting cohomology grps sequence into the nodes of the
first one through cft .

This is an instance of the effectivity of the cohomology
tool, one might event use the terms of powerfull
linearization machinery.

Manin pt of view. Why? Because the motivic Galois grp in
mind.

Hasse (map).

Exact sequences
the sum over all places .

Cohomology : synthesis of existence or non existence
classical thms.

Calculus ones of p-adic both analysis and geometry. x.
multiplicative units
by the grp scheme, $GL_1 = G_m$.
the most important ontology x.

define notion before introducing it.
prove assertions like the ones from arrows.

cite reference Chudnvoski, Vojta, Preu, Sertoz : put
weblinks huber, ctsko.

rigidity of br- alg : fits cas

floor the way around : deepest.

moduli approach : var satisfying hp then br-manin obst to hp

hypergeometry : uniformization.

geometric and motivic interpretation : legendre relation.

quadric cubics : degree.

bir desc : category scan/shift to find dropping-complexity objects.

reduction of pb to checking applicability of reduction principle.

- Asso Traces (espgg) : service com vulgarisation.

Isafil twitter : six strategies les plus efficaces pour le travail personnel drive google.

® Reading various srcs (wkp, wom, Milne webpage)

investigating overviews insights on abstract etale theories : cohomology, sheaves.

-> Milne online lecture notes on etale cohomology : emphasizes more on heuristics than in the pup book.

-> As confirmed by personal experience, Using language without formula favors the emergence of underlying principles and concepts.

13.9

- Very few paper notes (again circumstances) : putting on papers some ideas and investigations overviews of last

theoretical readings.

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A few typos of memoire.

14.9

- Very few paper notes : GL and Gm grp schemes.
- ® Corresponding wkp and eom entries.

15.9

- Very few paper notes : GL and Gm and grp schemes investigations.
- ® Corresponding wkp and eom entries.

16.9

Went out half day so nearly nothing : continuing yesterday notes.

® Corresponding wkp and eom entries.

17.9

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Memoire typos : Calculus ones of p-adic analysis and geometry. multiplicative units by the grp scheme, $GL_1 = G_m$.

® Corresponding wkp and eom entries.

18.9

- Very few paper notes : some remarks on purity of Brauer grp and more generally cohomology.

® Corresponding wkp and eom bunch of entries : different dimensions (Krull, topological, algebraic), regularity, noetherianity.

=> Wonder if trying to assimilate the plethora of pedantic jargon is worthy or not, seems poudre aux yeux thrown away to hide weakness in facing real concrete simple questions.

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Memoire typos : mostly first part.

-> recall Brauer-Gmot links : tensor, cohomology, torsors.

19.9

- Very few paper notes : same as previous ones.
- Memoire typos and corrections.

Exact sequences. x.
the sum over all places.x.

Cohomology : synthesis of existence or non existence classical thms.

Calculus ones of p-adic both analysis and geometry. x.
multiplicative units. x.

by the grp scheme, $GL_1 = G_m$.
 the most important ontology. x.

rigidity of br- alg : fits cas. x.
 floor, the way around : deepest.

moduli approach : var satisfying hp then br-manin obst to
 hp

hypergeometry : uniformization.
 geometric and motivic interpretation : legendre relation.

quadric cubics : degree.
 bir desc : category scan/shift to find dropping-complexity
 objects.
 reduction of pb to moduli-one of checking applyability of
 reduction principles.

---> To do.

- a) Define notion before introducing it.
- b) Give proofs or sketches for assertions like the ones
 from arrows.
- c) Cite reference Chudnovski, Vojta, Preu, Sertoz : put
 weblinks huber, ctsko.

20.9

- Very few paper notes : as yesterday.

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Memoire minor typos and corrections.

to give some rough idea x.

$V(K)$ of K -pts x.

21.9

As yesterday : a very little paper notes.

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Memoire minor typos and corrections.

22.9

As yesterday : a very little paper notes mostly on vids below.

© Android tvbox.

-Some vids on Q-pts conference talks.

a) Reinventing Q-pts IHP 2019.

Yuri Zharin and Julia Brandes.

b) Andrew Kresch 2006 Clay institute.

Lind Reichardt 1940 ctrex to hp.

$$2y^2 = u^4 - 17v^4.$$

Has no non trivial Z-pts (Q-pts) but has Qp-pts for all p.

- Sorted g-drive and tvbox repos.

23.9

- As yesterday : a very little paper notes, theoretical issues.

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Memoire minor typos and corrections.

24.9

- As yesterday : a very little paper notes except maybe some original ideas on theoretical issues of qualitative pts of moduli.

- Memoire minor typos.

in section nodes @ kv ... and then by mapping the resulting cohomology grps sequence into the nodes of the first one through cft . x.

This is an instance of the effectivity of the cohomology toolkit, one might event use the terms of powerfull linearization machinery generating quickly results via cohomology sequences interpretation of classical cft theorems. x.

Manin pt of view. Why? Because the motivic Galois grp in mind. x.

Hasse (map). x.

25.9

- Very few paper notes : Br functoriality. Lind Reichardt ctrex.

® Read a bit Gille-Samuely CSA book.

-> Sticks to concrete computations avoiding theoretical bloat.

26.9

- Nearly no sleep (hol cat was).

© Android Phones.

Graphed the Lind-Reichardt ctrex (Maple, Grapher Free).

-> Seems : Unbounded. Resembles Chatelet and Euler-Fermat surfaces.

- Memoire minor typos.

scattered names : Ambrus V Pal, new gen : Arne Smeets, Anthony Varilly-Alvarado, Olivier Wittenberg, Bianca Viray,

® Taken From "Rational and integral points on higher-dimensional varieties" workshop summary by Browning Tschinkel

-> contains recent progress.

27.9

- Memoire typos.

Meticulously chosen generalized periods. x.

The key Grothendieck notions. x.

integral pts or var : Z -pts or Z-var. x.

- Some paper notes.

Z-pts, Br_0 , potential density, Q-equivalence.

® Various srcs.

a) B.Mazur paper on Q-density in a AST91 survey of a Q-conf in summer 1991 @ Luminy.

b) An exhaustive 60p survey (John Voight, Williams : McAlum, Stein) of a 2002 AIM conf on Q-pts of high dim var.

=> Key pts retrieved :

$Br/Br_0(V)$ finite for some specific V like smooth RC ones
: allows a finite computable determination of the Brauer Manin set.

Closeness of this set from the continuity of the Brauer Manin pairing.

So that the closure of k-pts is contained in it, leading to

the Colliot-Thelene cj of their density in it.

-> Contains also glossaries and open pbs.

28.9

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- Memoire typos.

Added some captions to curves.

- some corrections to search.txt

® Various readings : wkp, eom, mctutor.

29.9

© Debian Linux Lenovo.

- Memoire typos.

p-adic geom an, in the case of $k=Q$.

powerful.

cubics : insert them between conics and quartics.

-> I remember present versions applied well to the node component of nodal elliptic curves.

Symmetrize Fermat curves.

- Recent Brauer grps computations of diagonal quartics in

2019 Gvirtz-Skorobogatov paper.

Damian Gvirtz-Chen

<https://github.com/dgvirtz/diagonalquartics>.

=> Quartics after conics and cubics.

* Swinnerton-Dyer obituary conference @ Newton Institute.

<https://www.newton.ac.uk/event/neww01/>

Barry Mazur.

<https://www.newton.ac.uk/seminar/30042/>

- Again assaults of outside-circumstances scramble as usual investigations.

30.9

- Went out half day so nearly nothing, noticed that season change and gloomy weather with less day affects productivity.

=> Think of sunny places.

- Just a few lines on paper notes.

--> To do : complete Diary.txt empty or lite entries from 1.9 to now and after from paper notes.

1.10

- Very few paper notes : rdb impossible to write something, with all neighbours cutting wood, haies and blowing leaves since 9ham.

The one next door is particularly noisy with this repeated strategy : goes away, leaves the portal open, calls a garden society that highly disturbs all the neighborhood, while they are outside.

-> That, with the noisy-automotive continuous flow push to leave this place or switch to nite mode (not healthy).

- Diary : complete last weeks with paper notes.

® Some various readings on wkp, eom :

a) Motives, K-theory (bloaty wkp entry) .

Retrieved some key pts : Tate-Safarevich grps and their relation to Galois Cohomology and Brauer Manin Local-global principle.

Cassels-Tate pairing as a case of Brauer-Manin set pairing.

Critical role of Galois Cohomology : def of Selmer grps and derived functor of the first Galois cohomology grp of $H(V,G)$, this first Cohomology grp that gives the

G-invariants functor : $V \rightarrow \text{Fix}_G(V) = V^G$; sending a variety to its fixed pts under the grp G -action.

This grp can also be expressed in terms of Ext grps since we have

$$H^i(G, M) = \text{Ext}_G^i(Z, M) \text{ for all } i \geq 0,$$

where the functor Ext is taken in the abelian category of G -modules.

b) then Grothendieck bio.

-> Felt close to his views but not so radical to mess-up physically the maths community.

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- Memoire typos.

Jacobian variety
proposition (give back).

2.10

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-Pulled some books on Brauer grp.

a) Old ones of mid 70s, early 80s : Yamada. Kervaire-

Ojanguren.

b) Recent one of 2010 Gorchinsky-Shramov : first chapters contains insightful prerequisites.
the bib is exhaustive.

-> Z-lib has been banned from french dns, so had to use alternative srcs.

- Sorted paper notes 0622 -> 0922 in two stacks 06-07.22 and 07-08.22.

6.10

- Memoire typos.

K of $k : K$.

points of $V(K) : \overline{V}_K$.

As an application (example) of those tools (use) in the Brauer theory .

In the same way the adelic space encapsulates the formulation of the hp.

Galoisian.

bridge notions Br-Gmot : Etale cohomology.

Cassels.

a 3 fold fibered over a curve.

Goro Azumaya.

Amenable var.

in 1998.

related to curvature.

brauer grothendieck.

qualitative property strata.

this reduction principle of Hasse.

Picard grp def.

® Brauer bib.

Gounelas.

Richard S. Pierce. Associative algebras, volume 88 of Graduate Texts in Mathematics. Springer-Verlag, New York, 1982. Studies in the History of Modern Science, 9. Pie02.

Gorchinsky Shramov.

Grégory Berhuy, An introduction to Galois cohomology and its applications, London Mathematical Society Lecture Note Series, vol. 377, Cambridge University Press, Cambridge, 2010. With a foreword by Jean-Pierre Tignol.

Manin cubics.

Beneteau : cyclic algebras, loops.

L. Beneteau, Problemes de majorations dans les quasigroups distributifs et les groupes de Fischer, Actes du Coll. Alg. Appl. et Comb., Grenoble (1978).

7.10

® Pulled ICM 1970 reports : Actes du congres de Nice 1970 Tome 1-2.

-> Quite tedious to get those since the ban of z-lib from french isp dns, but worthy as already guessed.

Tome 1 p401 Contains Manin contrib on adelic Brauer theory applied to hp obstruction, that became later the Brauer-Manin obstruction to hp.

The ref is

Y. I. Manin. Le groupe de Brauer-Grothendieck en géométrie diophantienne. In Actes du Congrès International des Mathématiciens (Nice, 1970),

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Updated browsers ffox is 102.3 (106.1 in win10), chromium is uptodate (106.9)

8.10

® Books on algebra.

-Poonen Q-pts. p189 (203).

An Azumaya algebra over k is a k -algebra that becomes isomorphic to an $r \times r$ matrix algebra for some r after finite separable base extension.

-Kervaire Ojanguren report of a 1981 Swiss (comté de Vaud) conference on Algebra and Arithmetic.

contains O.Gaber thesis on Brauer-Grothendieck morphism from $\text{Br_Azu}(V)$ to $\text{Torsion}(H^2_{\text{et}}(V))$.

and Spencer Bloch seminal paper on Arithmetic K-theory.

9.10

- Some foundational paper notes, trying to grasp a global overview of theories instead of blindly diving inside them.

® Arithmetic Algebra.

Some young researchers papers and slides : Ure (torsion of $\text{Br } E$), Manber, Gounelas, Pagano, Varilly-Alvarado.

Srcs : Milne Serre for them.

K3 : Kahler Kodaira Kummer.

Books : Colliot-Thelene- Skorobogatov, Poonen.

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- Memoire typos.

Q-pts study as old as maths.

hp formulation simplification.

$V(A_k) \neq \emptyset \Rightarrow V(k) \neq \emptyset$

Going-up moduli, inversing pt-view. strata. filtrations.
 $\text{pt-A}_k(V) \neq \emptyset \Rightarrow \text{pt-k}(V) \neq \emptyset$.

" \Rightarrow " may have an interpretation in terms of existence of a section.

Interest of A_k : finite computation pb.
 k : not known to be a finite computation pb.

hp
 Drop cplxity of pb from "not known to be finite" to "finite", in the spirit of np-p complete cj.

Pb solving = cplexity drops from either local shifts of objs within same cat (endofunctors) dropping locally cplxity.
 Or global shifts to other outside cats, dropping globally cplexity.

- Spotted e-thefts.

From chinese P9 phone : noticed data thief tempering in this diary.txt about memoire criterion typos.

Lacks in 6.10 entry :
 $2EK - K^2 = \frac{1}{2}\pi$,

Ryzhik Gradshteyn ref p913 formula 8.129 (M0130) for value of K at normal modulus

and some other lines on motivic geometry and Hypergeometry uniformization interpretations of Legendre relations plus ideas on category shifts dropping pb cplexity.

--> As the thefts of 2020 on exp and 2021 on search, targets only interesting data.

From chinese Tablet : the device as both chinese phones,

turns-on alone to scan nearby wireless networks, spotted it by its scrambling of bt-mice signals.

==> Noticed a periodicity of a few months of this phenomena : the chinese devices like stealth-agents seem to wake-up for that regular data-thief activity. Note that it can also be triggered by usa through their os (android-m\$).

10.10

- As yesterday some foundational paper notes.

® Various readings : Colliot-Thelene-Skorobogatov, Gorchinsky-Shramov, wkp-eom.

* Some vids.

Replay Poonen 2008 talk @ Simons on cohomological obstructions to Q-pts, presenting his result on torsors-based finer-filtrations of Q-pts and its ctrex to the descent-obstruction.

Varilly-Alvaredo on K3 surfaces.

Some ICM22 ones.

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Memoire minor typos.

11.10

- As yesterday some foundational paper notes.
- © Various readings : Olson stacks, wkp-eom.

12.10

- As yesterday some foundational paper notes.
- © Debian Linux Lenovo.

Memoire minor addings and typos.

- © Various readings : Yamada on Schur subgroups of Brauer grps.

13.10

- A very few paper notes as yesterday, looking for deep heuristics on Brauer theory.
- Pulled some related papers of Poonen and one of its phd (Corwin) on functor or space of obstructions to \mathbb{Q} -pts.
- A 2000 paper on family of hp contracting curves, obtained as a rational perturbation of the cubics of Lind and Cassels-Guy.
- > Importance of Jacobian (Abelian) varieties and Fibrations into Elliptic curves : allowing a complexity drop of the pb to the more tractable/computable cases of Elliptic curves.

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Memoire minor addings and typos.

Goro Azumaya. x.
 Amenable var then ppties. x.
 ending-up derived sequence. x.

14.10

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Pulled classics on Local fields : Serre, Cassels and Fesenko-Vostokov.

15.10

- Some quick paper notes on previous abstract considerations (Brauer grps, Azumaya algebras).

© Sorted srcs dirs of P9, zipped txts and synced to g-drive.

- Memoire typos.

Lind-Poonen : on one side the "space of criteria" on the other side the space of varieties or moduli stratified by those criteria. x.

© Debian Linux Lenovo.

Memoire minor addings and typos.

16.10

© Debian Linux Lenovo.

Zipped txt folders.

® Various readings.

The two Skorobogatovs : Colliot-Thelene BrGrps and Torsors. Bright Martin on Brauer Manin in families.

17.10

- Some foundational paper notes : inversing view-pt for qualitative strata.

® Various readings.

Same as yesterday, collecting bibs.

Colliot-Thelene Steklov 2018 slides : contains explicit examples.

Uematsu, T.: On the Brauer group of diagonal cubic surfaces.

© Debian Linux Lenovo.

Memoire minor addings and typos.

18.10

- Memoire typos.

in 1998. x.

related to curvature. x.

brauer grothendieck.

qualitative property strata. x.

this reduction principle of Hasse.

Picard grp def.

® Various readings.

Same as yesterday, plus F.Chatelet 1950s txts.

Chatelet Albert --> Chatelet Francois --> Andre Neron -->
Colliot-Thelene.

© Debian Linux Lenovo.

Memoire minor addings and typos.

19.10

- Memoire typos.

mid50 golden age. x.

extension of scalars. x.

® Various readings.

Skorobogatov minicourse 2013 TCCS. p12.

"A sheaf of \mathcal{O}_X -modules F is a sheaf on X such that for any open subset $U \subset X$, $F(U)$ is a module over $\mathcal{O}_X(U)$."

--> ok.

"A sheaf of \mathcal{O}_X -modules F is locally free if X can be covered by open subsets U such that $F|_U$ is a free \mathcal{O}_U -module."

--> Should it be : " $F|_U$ is a sheaf of free \mathcal{O}_U -modules" ?

20.10.

- Memoire typos.

Find nearly no proofs but ideas. x.

nor even less pretention to originality. x.

encompass \rightarrow integrate. x .

For citation, among the many means...are fibrations,
descent. x .

* Continue vid of Tony Alvaredo Varilly talk @ vantage on
Arithmetic of K3 surfaces.

\Rightarrow K3 surfaces belongs to the Intermediate category as
elliptic curves in the cases of curves.

\Leftarrow .

$g=0$

$\rightarrow g=1$. for curves.

$g>1$

reflects.

$kc < 0$

$\rightarrow kc = 0$ for surfaces

$kc > 0$

K3 Moduli classification.

E.Brakkee thesis (20) advisor : Huybrecht.

- New Brauer-Manin phds.

Steven Cunnane (Skorobogatov).

Wolff (Alvaredo).

-Pulled vantage slides. Alvaredo Viray Elkies Costa.

<https://www.math.ens.psl.eu>

Zoé Chatzidakis - Liste de Publications

© Debian Linux Lenovo.

-Pulled vantage slides. Alvaredo Viray Elkies Costa.

Quirks.

-ffox pocket : lacks urls of march 21 (Kodaira thms and
vantage conf) .

-> Unfocused 16mo or Unreliable data-server : look for alternative.

-USB-layer again since one month when the P9 phone is plugged.

22.10

- Quick foundational paper notes on memoire criterion stratifications, higher Brauer (stack).

© Debian Linux Lenovo.

- Memoire typos. x.

For the case of non algebraic var.

Geometry of Numbers* (Lattice, sieves and approximations)

Analytic. x.

Surfaces being an intermediate case. x.

Note also that even within those dimensional families strata, are complexity stratifications either, like the genus one in the case of curves. x.

finer conditions x.

1st tool Hasse principle based on the adelic space

2 tool brauer manin set

3 tool torsor

- Blog typos. x.

collets -> flare
 IN inlet hose
 caption :both last two.

® Various readings.

Lurie : higher Brauer grp for Lubin-Tate theory.

Lieblich.

Darda : higher heights on stacks.

wkp, eom.

Topos and stacks.

23.10

® Various readings.

An article on E-function (E. Delaygue Lyon) :
 -> aFb with polynomial arguments = E-function.
 -> Beuker thm of algebraic dep lifts : the annoyance is
 the homogeneous
 constraints.

- Some paper notes on that plus on memoire : typos and

quick foundational remarks on stratifications, obvious link with Harpaz-Schlack π -top 2018 paper from the basic fact that :

Each reverse inclusion of the filtration defines a strata of varieties verifying this reverse inclusion.

-> Check if it is a homotopization of the obstructions.

-> but Memoire criterion one : Simpler and more direct uniformization of stratifications. A structure on both of those.

© Debian Linux Lenovo.

- Memoire typos.
- Put the partial synthesis @ "consolidation". x.
- Maybe introduce discrete filtrations.
- Cite readers (ReadEra, DocumentViewer).

24.10

© Debian Linux Lenovo.

Sorted a bit bib folder : zips.

- Memoire typos.

A few addings.

- Typos search.txt
- Homtopization varieties 2^n

® Same phd readings on Stacks, topos.

Lieblich Max. Topoi-Gerbe : Brauer.

Darda Radko. Stacks : more concrete Heights.

==> Stacks fits filtrations and their strata. So look for Motivic related objects to stacks, Brauer and heights.

* A few recent vids (spring 22).

Margaritha Pagano (Leiden : M.Bright) on unramified Brauer-Manin.

Ozlem Semi on Mtv of nber fields.

25.10

© Debian Linux Lenovo.

- Memoire typos.

Changed layout in preamble.

-> Browse e-books for inspiring layouts.

A few addings.

® Pulled Grothendieck-Serre correspondances.

- > Quite tedious to get since the ban of Z-lib.
- > tor soft.

26.10

© Debian Linux Lenovo.

- Memoire typos

-> Here in chap2 intro. Motivic Geometry. Arithmetic Geometry. x.

Put definitions : V^\bullet . enclosed(avoid proper) and clustered.

critical theoretical part ... establish x.

down to earth testing. x.

- Updated search.txt

® Some various readings.

a) Arxicles.

Angus McAndrew on a Galois desc cj in the motivic context.
-> K3 surfaces.

LoughramRomeSofos on Q-pts counting.
-> K3 surfaces ... again.

b) MZV Papers.

Brown and Lochak-Mathes-Schneps on elliptic MZV.

=> Underneath algebraic structure of uniformizing argument-spaces.

Abstract Grp theory acting on them (modularity, automorphy) : pro-unipotent parts.

27.10

© Android P9

Pulled Ozlem slides on Mtv of nb fields.

-> Intro on automorphy and a Langlands grp related to Gmot.

Goes through standard cjs with some simple examples.

Algebraic cycles, Kunneth-issue.

® Various readings on wkp : moduli, Grothendieck-techmuller.

-> cf pocket and evn.

- Some paper notes on all that and typos of memoire/website.

-> memoire french version contains a typo on ellipsoid volume.

Excavated random 2003 paper notes for comparison : quite messy suburb-train writing, hardly readable with no dates. Huge gap with now structured notes. But as usual, gems hidden in that gangue :

ln V

Fermat link to dzeta.

© Quirks : gdrive, pocket and p9.

> A gigantic worm is digging its e-tunnel.

p9

Found mtvs folder emptied.

=> resynced with Debian.

pocket

lack entries on limits.

g-drive

lacks last synced src + imgs folders.

-> Adugnctn 5 sah rasr.

=> BT sync imgs phones.

=> Avoid clouds as Richard Stalman advised.

=> e-fast.

=> Paper.

© Debian linux lenovo.

Reid site @ warwick.

2003 Book dedicated to SD.

-> Retrieved an article of Per Salberger (Chalmers) about Brauer-Manin on θ -cycles.

© Gabel Linux Sarge.

Some random NT arXicles of that computer era.

A misc folder containing epistemologic papers.

28.10

- Went out half day so nearly nothing.
- Same paper notes on elaguage of jargonized corpus.
Fruitful objects are complex or composed ones :

pairs

(V, f) potential of exp mtvs.

(U, φ) Cartier divisor representative.

triple

$(V, W @ G)$ torsor.

(V, W, i) Nori mtvs.

® Various readings.

Moduli (fine/coarse isotransform/transform of representability natural-transformation),

1-motives of Bertolin Thesis about size drop of MumfordTate-group, so a special case of Gmot size drop.

B.Toen (Lurie coauthor) web page on stacks categorifications : pace = 1 monograph /y.

29.10

- Quick paper notes on cplexity : bio comparison, plus some memoire related ones (π , arcsos Φ) , and typos.

- birat of circles-ellipses.
- trdeg for surfaces.
- uni-modularity. x.
- Sertoz thesis.
- rather continue. x.

® Misc readings, binged first chapters of :

Lang EMS book.

LMA I-II.

30.10

- Some paper notes as yesterday on $(\pi, \arcsin \Phi)$: Alg ind cj of \mathbb{Q} -linearly ind logs of alg nbers (a sequel of Schanuel cj).

Recall Hermite-Lindemann th

$\alpha=(\alpha_i)$ finite family of cplx nbers.

HYP : (α) alg.

THEN : (α) \mathbb{Q} -lin ind \Rightarrow $\exp(\alpha)$ \mathbb{Q} -alg ind.

© Debian Linux Lenovo.

Memoire addings and typos.

® Misc readings : Fresan-Jossen monograph and Waldschmidt surveys.

31.10

- Some quick paper notes on criterion applied to a chopped cone.

-> Even the first version of the stable criterion applies well.

® Misc readings : an arXicle of Bertolin-Philippon on Weil

motivic pairing.

1.11

- Some paper notes on criterion higher dim cases, Lie algebras and Lie grps.

© All devices - A806.

Compressed teXtes folders.

® Various readings (papers, slides, book) : Fresan-Jossen, Bertolin.

© Debian Linux Lenovo.

Memoire addings and typos.

-> A trick to get LateX code from wkp : load the page and disconect instantly.

2.11

- Some quick paper notes on Topos, Grothendieck-Teichmuller theory, modularity, and others on criterion : loops case, and some typos.

© Tablet win10.

Compressed some teXtes folders.

=> Huge task of sorting all that devices-redundant data.

© Debian Linux Lenovo.

Memoire addings and typos.

-> Noticed less usb-quirks since the unplugging of P9 from usb.

-> External usb-device are main src of evil-spy-datathief malware.

3.11

- Some quick paper notes on Bernouilli nbers and other on criterion : loops case, fields generated by their pts, and some typos.

- Dived into early paper notes of come-back in nov 2020 for loops (a time-loop for loops) : intermediate between past era <2003 and now, less messy than past-era but less

organized than now.

=> Pragmatism of sempiternal advise : Drop paper and go directly to TeX at each worthy written lines, otherwise insights and results will be burried under piles of paper.

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Looking for better readability layout of memoire in past-
era file critere.tex

-> document class : a4paper article .

-> 10-11-12pt

=> critere.tex : Small well written tex with insights for criterion.

® Various readings : Vincent Zooneykind on stacks, Ken Brown on Hopf Algebras, Claire Glanois thesis on Kummer MZVs.

4.11

Went out half day so nearly nothing.

- Some quick paper notes on Algebras (CSA, Hopf) and other on criterion : loops case, fields generated by their pts, and some typos of both memoire and critere.tex.

© Debian Linux Lenovo.

Typos on search.txt

® Various readings : Vincent Zooneykind on moduli, wkp-eom on Hopf work.

A few minority-representatives.

Salim Tayou (i). Density of some Hodge-Tate Loci.
Ma : thesis Ens-Orsay mid 2015 (advisors : Charles-Chenevier)

Mounir Hajli (ma in Shangai, phd 2009 : Maillot P6) :
Arakelov geometry (height).

Nadir Matringe
Grps Automorphy. Thesis early 2000 : P.Gerardin.

Ahmed Alhemeiri. ias. Space Time physics.

Fouad El-Zein. Introduction à la théorie de Hodge mixte.

Driss Essouabri.

AbdelMajid Nitaj.

Zoghman Mebkhout. Les six operations de Grothendieck.

Boudjemaa Anouch. kw.

Najib Idrissi. (eu. algebraic top.)

Mohamed Mohakher. (p8 laga. Modularity automorphy.)

Hamza Yousouf. gre.

Ahmet Tatar. sa.

Sharifi Romyar (us-cal Arithmetic Geometry).

Laghibi (Amiens. Quadratic forms, Witt theory).

Mohamed Abouzaid (us-ma Floer theory, Fukaya category)

5.11

1am

* Some recent vids (2021).

Ken Brown on Hopf Algebras @ Africa Maths Center = AMC.

-> Noticeable AMC (Nairobi) : hope for Africa.

0.Wittenberg on Inverse Galois Pb (igp) @ IAS PCMI Park.

Description.

3/3 Around the inverse Galois problem, Olivier Wittenberg, Institut Galilée-Univ Sorbonne Paris Nord.

PCMI A Program of the Institute for Advanced Study.

Lecture part 3 Olivier Wittenberg, Institut Galilée – Université Sorbonne Paris Nord. Title: Around the inverse Galois problem.

"The inverse Galois problem asks whether any finite group

can be realised as the Galois group of a Galois extension of the rationals. This problem and its refinements have stimulated a large amount of research in number theory and algebraic geometry in the past century, ranging from Noether's problem (letting X denote the quotient of the affine space by a finite group acting linearly, when is X rational?) to the rigidity method (if X is not rational, does it at least contain interesting rational curves?) and to the arithmetic of unirational varieties (if all else fails, does X at least contain interesting rational points?). The goal of the lecture series will be to provide an introduction to these topics."

=> Both vids contains good insights.

For IGP : how torsors with $\text{Spec}(k)$ as a base can be used for Noether-Grunwald-Galois Inverse pbs.

Rigidity thm. (Fried, Matzat, Thompson, Belyi, Zwynna)
 Finite grp thm in the trend of the one that confirms Sporadic monsters as Galois grps.

7am

- Some paper notes on those vids, plus other on criterion (polygonal-loops).

© Debian Linux Lenovo.

Changed memoir layout : 11pt in document class.

=> No effect with report and book class.

Initial preamble.

```
%\documentclass[a4paper,twoside]{report}
```

```
%\documentclass[a4paper,twoside,11pt]{report} : no change.
```

```
%\documentclass[a4paper,11pt]{report} : no change.
```



```
%\documentclass[a4paper,11pt]{book} : adds blank pages
between chapters but no change in readability.
%\documentclass[a4paper,12pt]{article} : scrambles fig
layout (diagram), no change in readability.
```

6.11

- Nearly nothing : too disturbing circumstances this weekend.

When in peace from people in summer : environment was not favorable.

When environment is good now : people hassle.

With retrospect, the precious peace-of-mind that always and ever terrificly lacked till now, is the main prerequisite for deep thinking.

By the way some paper notes on the recent Grothendieck Arithmetic Topology category coming from the theorisation or synthesis of the category shifts between Algebraic Galois theory and Galois grps on one side and Topological covers and Poincare Fundamental grps on the other side.

® Various readings : wkp Hilbert thms (irreducibility and 90).

90 : Triviality of first Galois cohomology grp, $H_1(G, k^*) = \{1\}$.

irreducibility : irreducibility persistence after specialisation of $Y=y$ in Q for P in $Q(Y_i)[X_j]$.

7.11

Early morning.

- Memoire typos.

Soon after the elaboration of the Hasse principle (around 1925) the first contradicting var were found around 1940 in the form of genus 1 or cubic curves. x.

Thirty years later (around 1970) the Brauer Manin obstruction explained almost all those curves contre-examples. x.

By spreading out to varieties the double-sheaf or bow-tie of fields tied-up at the base field with fields extensions on the top of the knot and subfields at its bottom; those fields allow to build a double-bouquet or double-sheaf of varieties tied up at the studied one : on the top are extended var corresponding to fields ext of the base field and at the bottom are reduced subvar corresponding to subfields of the base field.

A bow tie.

A topo on those bouquets. dble siwak.

Giving the recent Arithmetic Topology.

- Late morning : a few paper notes on those double-sheaves and others on criterion for polygonal loops.

® Various readings : Vincent Zoonekynd text on the Fundamental Grpoid of a topos, explaining higher pt-view generalizing Grothendieck Arithmetic Topology synthesis.

Angelo Vistoli arXicle.

"Let k be a field, X a variety with tame quotient singularities and $x \in X(k)$ a rational point. In a recent joint paper with A. Vistoli we have shown that the geometric properties of the singularity of X in x may force x to lift to a rational point of a resolution of singularities, e.g. if the local fundamental group of X in x (which is finite since X has quotient singularities) has order prime with $\dim X$!. In this paper we analyze completely such geometric properties of singularities in dimension 2.

These facts have applications in the study of the fields of moduli of varieties, and yield an enhanced version of the Lang-Nishimura theorem where the smoothness assumption is relaxed. "

8.11

Early morning.

- Some quick paper notes on complexity (bio vs maths) and other on criterion applied to half-transcendental loops L : plane-polygons or piecewise-linear loops with $L(Q) = \emptyset$.

® Various readings : Mumford red book, slides of A. Beauville on alg equations, starting from -1800 Babylonian tablets going through Arabs, scarmiching Italians and finally french-german, a striking

Gabel=Galois-Abel episode of how establishment mediocrity can ruin the lives of geniuses.

9.11

Early morning.

- Some quick paper notes on criterion and alg ind (additivity), other on the needs of two theories : Alg ind and Periods nb-theory.

® Various readings : arXicles of us NT Computational school, in the spirit of B.Poonen (A.Sutherland, D.Zywina, Voight, etc) mainly EC and Galois. Huge us-industry from EC-BSD chasers. A popping one (H.Goodson) on degeneracy of MT grp of Abelian var.

Some pts retrieved about abvar.

-> AbVar and ECs are the tractable var used to approach general ones, with the industry they have generated from the enriched structure (grp) they carry.

-> Crucial role of Galois rep that are arrows from $\text{Gal}(K|k) \dashrightarrow \text{GL}(V-Ec)$

-> Even for MT grps as subgrps of $\text{GL}(V-Hdg)$

V-Hdg Hodge structure associated to an AbVar defined over C .

-> Explicit Torsion subgrps of $EC|k$ following Mazur thm on $EC|Q$.

-> Albert classification of AbVar : Type I, II and III.

10.11

- Same paper notes as yesterday.

© Debian Linux Lenovo.

Memoire typos and addings.

11.11

- Went-out half-day so nearly nothing.

Some paper notes on past Hex-polygone and Alg Ind related issues.

-> for criterion more than just birational invariance but rather alg invariance :

$\alpha=(\alpha_i)$ finite family of cplx nbers.

$\text{Trdeg}_Q f(\alpha) = \text{Trdeg}_Q (\alpha)$: for f not only birational but algebraic|Q.

$\text{Trdeg}_{Q'} (\alpha) = \text{Trdeg}_Q (\alpha)$ because $\text{Trdeg}_Q Q' = 0$.

12.11

- Nearly nothing : again disturbing circonstances this weekend, but less than 5.11.

- Some abstracts collected in Keep.

© Nesterenko-Philipon LMN introduction.

- Same paper notes on bir-alg ind theory as yesterday plus some on this LMN intro.

-> Transcendental techniques.

Combines alg ppties of functions mostly from D_{mod} -ODE-Monodromy lin ppties and zeros order estimates of polynomials of those functions from multihomogeneous algebra elimination techniques.

Uses either :

- Alg var close to some fixed pts.

- boundeness of order of approx of alg nbers by rationals.

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- Looked for Torus in search.txt for criterion :

Begining of April 22 : 8-14 lines 20600-20900.

13.11

- A few paper notes on basic grp theory : S_n Symetric grp and SL_n .

G finite can be embeded in $S_{|G|}$ and SL_n , hence IGP focus on SL_n .

The interest of SL_n is its algebraicity.

® Some wkp entries.

"Un polygone est dit simple si deux côtés non consécutifs ne se rencontrent pas et deux côtés consécutifs n'ont en commun que l'un de leurs sommets[4]. Un polygone simple est toujours non croisé.

Il forme alors une courbe de Jordan, qui délimite une partie bornée du plan, appelée son intérieur. On appelle aire d'un polygone simple l'aire de son intérieur."

-> Note the terms : "Jordan curve" and "simple".

14.11.

- A few paper notes on

-polygones and criterion : even the simplest ones are quite intricate (measure-additivity pb of triangulations).

=> Needs to express angular shifts in terms of periods, maybe something linked to winding nbers of cplx geometry.

=> For Hex one : the extension datum may be the mean of vertices distances to mean pt, same need of expressing that datum in terms of periods for an eventual extension to

smooth var.

- A few general ones of relative-pt of view or dynamisation via parameters moduli or family, it seems to me to be the case of Feynman integrals trick.

- A few on memoire typos.

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® Two arXicles.

One of one gb-uk EC school (Dockchister) BSD chasers on parity rk cj in the footsteps of BSD cj.

S.Kleiman on Picard Scheme : 15p worthy historical perspective from Euler-Abel, Jacobi-Riemann-Clebsch, italians Castelnuovo-Severi, to french Weil-Serre-Chevalley and Japanese Nagata-Igusa-Matsusaka to finally Grothendieck.

All started with periods ... and elliptic functions with addition formula (inverting elliptic integrals). So that periods rooted the subject.

=> Periods : roots of both AG.

$$p(C) = 1/2 (d(C)-1)(d(C)-2) - \text{nodes}(C) - \text{cusps}(C).$$

$$p(C) = 1/2 (d(C)-1)(d(C)-2) - \text{sing}(C).$$

15.11

- A few paper notes on polygons and criterion : when does $Cg(\Gamma) = \text{Isobar}(\{\Gamma\})$.

=> It seems that Q-pts are trickier for non-smooth patchings than for smooth ones : singularity generates complexity for rational pts study unless the smoothness break-pts directions are algebraically related ie the break-pts or singularities loci differ or diverge from one another algebraically.

© Debian Linux Lenovo.

® Pulled shelves on Hypergeometry looking for periods uniformization.

-Japanese : Aomoto-Kita, and popping ones of Yoshida@Vieweg and

-Uk : a vintage 1967 book of Lucy Slater from Bayley courses notes.

-Recent monographs of Ghazani-Pirio.

==> Hypergeometric corpus is huge, since dating back at least to Gauss.

<==.

-Some books on Arithmetic Geometry and Quantization.

-Some rare Articles of Drinfeld on Hopf Algebras.

- Very few paper notes on Hypergeometry Uniformization.

Tried to trace back this prevalent intuition crawling in search.txt.

=> My guess is around 2005-2007 before the e-blackout of 2009, when was written the note "Words cerca research" with this line "...one interest of hypergeometric function is that a bunch of transcendental and algebraic functions can be written as special cases of hypergeometric functions...."

-> It may be worthy to salvage the stuck hdds in order to answer that more clearly, and also extract some buried gems on the go.

<=

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- While rambling erratically in the www for that hypergeometry uniformization, from Polygons spaces and modularity (Goncharov, Wolf, Dumas, Labourie, Lofti, Fock) @ UIC, came across BIRS meeting on Quantum Physics and Arithmetics, with a talk of Fang-Ting of Louisiana Uni, a tw-expat researcher on hypergeometry.

-> Pulled some papers and slides of this tw-researcher :

-one with another tw-Yifan popping out, on algebraic twists of hypergeometric function coming from ... modularity.

-another one with J.Hoffman on hypergeometric motives with case of Fermat type ones.

* A vid of J.B Bost on heights in ArithG.

17.11

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® Continued exploring hypergeometry srcs, from yesterday bibs of Fang Ting papers : came across R.Vidunas arXicles on twists of Gauss function.

-> Pulled some entries : oriented to CAS computation

Then from R.Vidunas to Calabi-Yau ARG and Physics with Noriko Yui a jp-expat in ca :

* Some vids @ CIMAT. Took snapshots : Hodge diamonds. EC are CYs.

® Finally a paper of V.Zudilin on Hypergeometry and CY.

-> Some modular L-function having special hypergeometric values, reminds me conclusion of Salerno (phd student of Villegas) vid.

18.11

• Went out half day, so nearly nothing.

Just a few paper notes on uniformization and qualitative space of criteria.

© Android P9.

-Pushed last memoire update of 10.11.22 to g-books and Free.

Synced src to g-drive.

- Ramble.txt in french (maple8 diary file) contains also some pepites.

=> Data collecting for monograph :

- Ramble.txt (2001-2005 maple8).
- Left notes.txt (2007-2009) of Jawa.

<=.

© Debian Linux Lenovo.

® A bunch of wkp entries on modularity.

19.11

• Some quick paper notes on criteria heuristics foundations and formulations.

Others on Modularity.

® Various readings : eom Modularity, Manin-Marcolli on spectral homotopy.

-> smash-products : some queries on paper.

Some articles of Bost (Arakelov ICM), Golychev (Hypergeometry monodromy).

20.11

- Some quick paper notes on AG-ARG foundations and criteria formulations, notably on

N_f dependence on moduli/families of var.

Cg requirement as base-pt.

© Debian Linux Lenovo.

Pocket quirks in all ffox but not in app.

Searches in ... search.txt.

-typos : Manin switch siwtch, never met ideas.

-Entries of "formulation".

1927

1_11_20

5797

20_02_21

7829

24_04_21

14254

1_11_21

14818

20_11_21

® Various readings : wkp on topology (smash-products, joints and suspensions)

-> Welding-merging subspaces by identification of

subspace/components.

21.11

- Memoir typos.

brief memoir : short memoir.
 curves strata : curves case.
 Poonen 3-fold ctrex.

-For inspo : just read memoire or search.txt

$Cg(f(V))$ in terms of $trdeg$.
 geometric interpretation of E, K .

© Debian Linux Lenovo.

Pulled articles on mtvs in B.Khan site.

=> Not cited in mtvs litterature.

22.11.22

- Some paper notes on foundations of pb-solving, grounded surely close to Topos theory roots.

Others on criteria filtrations by N_f , number of

fundamental periods.

Trying some moduli stratification drawings or graphic representations (pics).

- Some Memoire typos.

Centroids of cvx bodies.

Remind definition of E for equiperiodic.

Detail integrals computation.

- To do.

-Subdir in research. (hypgeo, brauer, bib).

-Go back and forth to what was left before 09 (05 ramble.txt of maple8).

-Color code for paper notes and eventually e-notes.

Green : memoir.

Blue-Black : threads switch.

* Some recent arithmetic vids.

B.Gross. Q-pts on hyperelliptic curves. (Toronto).

-> mentions recent work of M.Bargava on moduli-distributions of the trendy Arithmetic Statistics new theory.

B.Mazur : why study arithmetic of curves ? (Cambridge Archimedean).

C.Demarche : Sums of squares (SMF : une question, un chercheur).

® Some basic course notes on abvar.

Benjamin Schraen.

<https://www.imo.universite-paris-saclay.fr>

/~benjamin.schraen

23.11

- Nearly nothing : sorted evn-db for market analysis to look for a recent bike after 12 years.

Just quick paper notes on algebraic cycles, graphs of morphism.

Linear series, divisors = attaching a (huge) grp to a variety V .

=> The ones from functions on V are the key ones because they encapsulate data of the studied varieties, so they are often used as sampler or basis.

Category shift to GROUP, linearizing the theory when the GROUP is abelian.

® Various readings : L.Lafforgue, B.Mazur.

24.11

- Nearly nothing : just a few paper notes on Linearization paradigm and a few others on criterion and polygons trying to link those to marked or pointed varieties.

® Some quick readings : Annette Huber-Giesbert Wustholz on

1-motives.

-> Tried to restablsh Gmot, not so obvious.

=> Work it out till it is automatic.

25.11

- Went out half day, so nearly nothing.

Just a few anotations of previous paper notes on uniformization and qualitative space of criteria.

® Some quick readings : Yves Andre on Gmot.

26.11

- Just a few anotations of previous paper notes on uniformization and qualitative space of criteria.

® Some quick readings : Jean Louis Colliot-Thelene and Yonathan Harpaz.

x : Spec $k \rightarrow X$

x^* : pull back.

27.11

- A few paper notes on Gluing paradigm or principle (topological welds). Other on criteria foundations plus memoire typos.

28.11

- Some quick paper notes on Hodge theory, categories and some on criteria base-pts considerations.

® Some quick readings :

Jean Benabou (ma Categorician). Original ideas often taken by others mathematicians that do not give credit.

Yonathan Harpaz thesis, Jacob Lurie monographs ("Maths of categories").

-> Extensions of AG-AT, incorporating investigating tools of Category theory together with Derived and/or Homotopy theories.

Contains exhaustive bibs.

Kontsevich, M. and Y. Soibelman. Deformation Theory.
 Unpublished book available
 at <http://www.math.ksu.edu/sõibel/Book-vol1.ps>.

29.11

- A few paper notes on functors and higher natural ones above the latter.

Trying sorting out new notions related to Arithmetic shape.

® Some quick readings : a few parts of paves from this week mtvs to yesterday.

Conclusion of this week reading session.

=> Paves after paves, billions of theoretical pages since Euclid and what about ... $\zeta(5)$? We still have not proved that it is likely transcendental : what a shame.

The intrinsic nature of some representants of the most fundamental objects of mathematics, namely numbers are still escaping the net of billions of theoretical pages of thousands of mathematicians since the begining of the discipline.

This reminds me of Ytbe that grows at a terrifying rate with only a tiny bit of worthy content.

=> Writing is healthier than reading.

30.11

- Again a few paper notes after a simple query of a student that stuck B.Mazur in his vid on \mathbb{Q} -pts on curves.

=> In the spirit of last week investigations for criteria : polygons and marked curves.

® Some refreshing readings : A.Huber paper on Galois grps of periods, extending Galois theory.

wkp on projective modules.

1.12

- A few paper notes on fundamental grps, and others on criteria, precisising polygon case.

- Funds have been cut with navigo : so this will affect in short or midterm, the sequel in a direct or indirect manner.

2.12

- Went out half day, so nearly nothing : no peace of mind + gloomy weather (darkness allday long).

Just a few lines on singularities, and Noether lemma giving a vast amount of results mainly in AG, from Alg to Etale; like

-For an infinite base field, any var of dim $d > 0$ is uncountable.

-For some gentle fields and var defined on them,

Any alg var is birational to an hypersurface

3.12

- Record breaking of paper notes : one line. Hilbert thms.
==> Looking longly for bikes to solve funds issue.

4.12

- A very few paper notes on writing style, criterion : looking for the meaning of total degeneracies (algebraicity) of periods.

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-Memoire typos and addings.

-Excavated Jawa 07 and Msnet 04 archives : the latter a bit clumsy are more relevant since Jawa hdd broke-down trapping the interesting content.

-In Msnet Search folders are some worthy TeXtes notes.

in origin.dvi

contains some EC computations on j -invariant related to periods.

contains also some bibs entries : Rizhik.

in caslimit.dvi

Remarque : pour "algébriquement indépendants", on convient que si un des termes est algébrique, l'autre ne l'est pas.

-> Consider that (src) for next versions of criteria.

5.12

- A very few paper notes : meaning of algebraicity of periods, Stokes thm.

Duality for fields extensions : deg (multiplicative) and trdeg (linear) via exp.

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-Memoire typos and addings.

6.12

- A very few paper notes : alg ind, Legendre relation, mean-pt of memoire cardioid, some typos of search.txt (innocent, crierion).

® Some wkp readings and Beilinson-Goncharov.

=> Values of L-functions, nuclinearisation via MtvS as MZVs, but this process for MZVs is even more rigid, so rigid that it ends-up being a twist of a linear-combinatorics process.

7.12

- A very few paper notes : necessity of mean-pt requirement, countability, cosmogony.

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Extracted some pieces of notes from previous last available archives.

=> Jawa 2007. Explicit mention of hypergeometric uniformization, whereas just evoked in Gabel 2004.

8.12

- Nearly nothing : looking for bikes to solve funds issue.

Just a few paper notes on countability, and cogitations on previous archives extraction : found-out today some heuristics that annulation of L-funct should be related to size-drop of Gmtv. Cf Belinson cjs.

© Came across newgen of uk-phd Mzv-students of Brown :
Keilthy and Charlton.

10.12

- A very few paper notes on : Uniformization and a
generality principle.

© Deligne : MtvS, HypG (Mostow-Goncharov)

11.12

© Debian Linux Lenovo.

-Memoire minor typos and addings.

12.12

- A very few paper notes on smooth and non-smooth gluing : seems a quite potent seminal starting-pt for a theory. Reworked famous circlearc-line case of past era.

® Various reading : Villegas on HyperG mtvs, Cartier-Fresan on IHES history.

Villegas Roberts paper : mtvs as $H(Q(t),t)$. Q rational function tagging family, t tagging var in family. Contains Magma scripts and refs for mtvs.

13.12

- A very few paper notes on criterion extensions : finite sets, var, new period (mean distance-Cg).

® Quick reading : Brown thesis intro, on Mzvs and moduli space of marked curves.

==> n-marked pts : introduction of finite discrete (combinatorial) Algebra (Grothendieck-Techmuller), suiting discreteness of Mzvs parameters.

<==

14.12

- A very few paper notes on criterion extensions new period (mean distance-Cg), Monodromy of HypG ODE from retrieving some HypG formula from wkp and eom, for cos powers and other alg identities.

® Quick // reading : both Brown and Zooneykind thesis.

15.12

- A very few paper notes on criterion extensions : poly-(pts/gon/hedron) and generally P.L or piecewise-linear var with criteria-cplxity/nber of periods paradigm. poly-pts = finite set.

® Quick reading : wkp on Hypergeometry and Siegel paper book on Geometry of numbers.

16.12

- Went out half day, so nearly nothing but a very few paper notes on criterion extensions : single pieces of arcs.

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-Memoire minor typos and addings.

* Random vids.

Michel Talagrand on Kolmogorov chains (min-max and measure theory).

Curtis McMullen on Hyperbolic Moduli theory (counting).

17.12

- A very few paper notes on criterion extensions : new invariant $\text{tr}_C(V)$ for each class C of var V .

* Random vids. Nov 22 seminar on Cplx var @ Cirm.

-Inder Kaur on Hodge c_j for sing var.

-Loic Faisant on K -rings of var and mtvs.

18.12

- A very few paper notes on criterion refinement : striking back to n-gons.

=> Important pt : it seems that an alg var can not be too closely approximated in terms of periods by those of n-gons; analogously to alg nbers dioph approx thms, saying that alg-nbers can not be too closely approximated by Q-nbers; both being finiteness results consequences.

* Random vids.

O.Benoist @ BNF about 17th Hilbert pb on positive pols as sums of squares.

Names : Lagrange, Minkowski-Hilbert, Taussky, Artin, Pfister.

Culminating to Ax and Voedvosky on Milnor cj.

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-Memoire minor typos and addings.

19.12

- A very few paper notes on criterion finiteness issues of yesterday.

- Sorted paper notes of Oct-Nov 22 : 70p.

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-Memoire minor typos and addings.

20.12

- A very few paper notes on criterion previous finiteness issues : new way of propagating algebraic pts (de proche en proche) instead of sweeping or radiating rational-slopes lines. I remember that I already considered this way in past-era around 2005.

A few memoir typos and addings.

® Quick reading on Brauer grp of real var : Demeyer-Knus and Nikulin.

=> $2_Br(V)$ and $(\mathbb{Z}/2)^s$ where $s=nc(V)$.

21.12

- A very few paper notes on previous finiteness issues : n-gons and Faltings thm reformulation.

* Random vids.

Daniel Bertrand : Pellian polynomials. CIRM 2018.

Isabelle Gallagher (P7) : Turbulent NavierStokes.BNF.

22.12

- A very few paper notes on previous finiteness issues ; symetries paradigm on global cplxity drops.

® Quick readings.

Daniel Bertrand : Galois ODE and transcendence.

James Ax : Schanuel cj (1971 Annals of maths @ jstor : snapshots)

Jacob Tsimerman : Ax-Schanuel thm.

23.12

- A very few paper notes on previous issues : recursivity iteration in symetries paradigm and depth in terms of cplxity-drops exponents.
- Random related reading : Sylvain Corvisier on dynamical systems (iterations).

24.12

- A very few paper notes on previous issues : mixing recursivity thoughts of yesterday to hypergeometry (both levels). Deep heuristics.

-First tentative of defining criteria space as image of a functor, from Vars to ... functors on Vars. Vars being the category of special classes (or categories) of studied var.

-Thoughts on functional cases.

Ayoub thm on (GPC) for series of periods depending on a parameter.

Function field cases of both AG (Arithmetic, Algebraic), often emerging from modulisation or globalisation (dipping a var into a family of vars depending on a parameter t)

Ax-Schanuel and generally alg ind of E and G-functions.

==>

Functional-cases of cjs are often proven before base-cases.

A deep breakthrough would be the formalisation of the possibility of going the other way (functional-to-base) in this category shift.

Functional setting : Relaxing fixed-or-rigid constraints of frozen-base case by functional dynamisation with "more degree of freedom " drops complexity of pbs.

-> When applied to AG-categories, this paradigm gives Derived AG-theories.

<==.

- Random readings.

Sylvain Corvisier : slides and papers on dynamical systems.

Elise Goujard : mathematical models of img sampling.

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Excavated a bilan of Dec 2020 from USB-sticks : quite pretentious and immodest theoretical babblings leading nowhere as in the past era.

=> Go back to computations on machines to stick to hard-core reality.

25.12

- A very few paper notes on putting structures on categories (a la Lurie) and first attempts of defining pb-solving-complexity.

-> Quite embryonnary : The complexity of the pb of ... defining pb-complexity is huge.

Quick readings : Jean Louis Colliot-Thelene recent papers and slides (Shenzen).

* Random vids : Laure StRemond (BNF) on Boltzmann irreversibility.

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A very few memoir typos : adding separation between sections.

26.12

- A very few paper notes on computability : looking for Q-pts on a var vs Determining alg relations between periods (criterion).

=> After quick considerations : Criterion is better modulo numerical determination of periods (cf Sertoz thesis ODE method).

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- Checked log of Free site : noticed internationalisation of hits (australia, venezuela, india, honk-kong, nl, uk, etc) since the publication of memoir in g-books in spring 22.

=> add link to it in memoir.

- Checked some entries in search.txt on "computability".

$Br/Br_0(V)$ finite for some specific V like smooth RC ones : allows a finite computable determination of the Brauer Manin set.

Closeness of this set from the continuity of the Brauer

Manin pairing.

So that the closure of k -pts is contained in it, leading to the Colliot-Thelene conjecture of their density in it.

=> Consider this for memoir additions.

27.12

- A very few paper notes on computability of criterion :

a) how the criterion is a quite powerful and deep linearization of the problem of finding Q -pt on (alg) vars, from the obvious but critical fact of that of alg dep, indeed alg dep issues are hidden linear (monomial) ones.

b) Boundedness of deg of alg dep => Partially Algorithmically finite.

⊕ Quick readings :

a) wkp : ARG, Hilbert 12th problem from Kronecker Jugendtraum and Kronecker-Weber theorem, Ab extensions.

=> Typo of Jugendtraum in memoir.

=> Link of discrete case of criterion to Cyclotomic fields and Gauss regular n -gons theorem.

b) Giuseppe Ancona (Huber coauthor). Habilitation on motivic Chow-class map of alg cycles and papers on abelian motivic.

G. V. Chudnovsky. Algebraic independence of values of exponential and elliptic functions. In Proceedings of the International Congress of

Mathematicians (Helsinki, 1978), pages 339–350. Acad. Sci. Fennica, Helsinki, 1980.

28.12

- A very few paper notes on criterion and Gauss regular n -gons : not so easy as it appeared at first sight, partial conclusion.

* Random vids : Yujiro Kawamata on birational DAG @ Harvard 2017.

(jp Minimal-prg expert researcher@Tokyo, advisor Itaka).

-Took some paper notes and screenshots a few days later.

-The main retrieved facts for criteria :

Zariski factorisation of a birational map between surfaces, through Castelnuovo (-1) -curves contractions.

Blow-up/Blown-down flip/flop.

Serre functor.

® Quick readings.

a) wkp : minimal prg (Birkar thm), Kodaira dim.

b) Guisepe Ancona (Huber coauthor). Habilitation.

=> Synthesis and perspectives on prg of MtvS and Chow alg cycles.

29.12

- A very few paper notes on criterion linearisation : Siegel lemma does not apply since it concerns linear relations over Z or nb fields.

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A very few memoir typos : the modern economy. x.

derdiv : lemme ci-dessus.

30.12

- Went out half day, so nearly nothing but a very few paper notes on criterion applied to a special case of Gauss n-gons.

® Some Quotations from MacTutor.

Eugene Paul Wigner

"The miracle of the appropriateness of the language of mathematics for the formulation of the laws of physics is a wonderful gift, which we neither understand nor deserve.

The Unreasonable Effectiveness of Mathematics,
Communications in Pure and Applied Mathematics 13 (1960)"

Charles Hermite

"Analysis takes back with one hand what it gives with the other. I recoil in fear and loathing from that deplorable evil: continuous functions with no derivative"

Willard Van Quine

"Just as the introduction of the irrational numbers ... is a convenient myth [which] simplifies the laws of arithmetic ... so physical objects are postulated entities which round out and simplify our account of the flux of existence... The conceptional scheme of physical objects is [likewise] a convenient myth, simpler than the literal truth and yet containing that literal truth as a scattered part."

Max Born

"It is natural that a man should consider the work of his hands or his brain to be useful and important. Therefore nobody will object to an ardent experimentalist boasting of his measurements and rather looking down on the 'paper and ink' physics of his theoretical friend, who on his part is proud of his lofty ideas and despises the dirty fingers of the other.

Experiment and Theory in Physics"

Jacob Bronowski

"I find both a special pleasure and constraint in describing the progress of mathematics, because it has been part of so much speculation: a ladder for mystical as well as rational thought in the intellectual ascent of man. The Ascent of Man."

Émile Borel

"One grain of wheat does not constitute a pile, nor do two grains, nor three and so on. On the other hand, everyone will agree that a hundred million grains of wheat do form a pile. What then is the threshold number? Can we say that

325,647 grains of wheat do not form a pile, but that 325,648 grains do? If it is impossible to fix a threshold number, it will also be impossible to know what is meant by a pile of wheat; the words can have no meaning, although, in certain extreme cases everybody will agree about them. Probability and Certainty."

Georg Cantor

"The essence of mathematics lies in its freedom."

Alfred Clebsch

"Research may start from definite problems whose importance it recognizes and whose solution is sought more or less directly by all forces. But equally legitimate is the other method of research which only selects the field of its activity and, contrary to the first method, freely reconnoitres in the search for problems which are capable of solution. Different individuals will hold different views as to the relative value of these two methods. If the first method leads to greater penetration it is also easily exposed to the danger of unproductivity. To the second method we owe the acquisition of large and new fields, in which the details of many things remain to be determined and explored by the first method."

A film synopsis, reminding me maths-dpts visited in past-era.

"Lepetit commence par visiter les lieux, découvrant un contexte plutôt anarchique et vieillot, tout comme l'architecture du magasin, qui multiplie couloirs et bureaux mal adaptés. Après ce premier contact, il est cependant persuadé que le principal problème réside dans le manque de motivation du personnel et son éparpillement."

31.12

- A very few paper notes on criterion alg-dep/linearisation issue :
Inversion of view-pt, the kernel-ideal of $k[X_i]$ annihilating a tuple (p_i) of periods.

® Some wkp relative Commutative Algebra recalls :
polynomial rings, domains, transfert ppty, etc :

Domain (ring theory), a nontrivial ring without left or right zero divisors.

Integral domain, a non-trivial commutative ring without zero divisors.

=> "commutative".

1.1.23

- As yesterday a very few paper notes on the evaluation issue for alg relations, culminating to a mtvic perspective; and a few others on Kawamata talk key-pts.

© Android P9.

- Memoire typos.

Rational points on general varieties - Marzouk Brahim.

Arihmetic.

Hereafter : in the sequel.

Computer and Data Sciences.

Scheme : in the end of the day, you enters a finite nber of integers for the equation.

infinite Sets.

Relocate : maths started.

Condition for alg dep degree boundness.

-Geogebra plots.

Cosinus implicit.

$\cos(x)+\cos(y)=0$.

$\cos(x)+\cos(y)-2 \cos(z)=0$.

$\cos(x)+\cos(y)+\cos(z)=0$.

2.1

Nearly nothing : fixed window broken oculting-persienne.

- Some few paper notes on linking classic nb-theory (additive nb theory, sums of primes, Schinzel-Dickson, etc) pbs to Q-pts and mtvs.

=> As a past era redite, I suspect most fruitful category-shifts are to (finite) grps.

3.1

- Some few paper notes on linking classic nb-theory to mtvs and Z-pts.

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memoire typos.

birational and more generally algebraic transforms.
Theory of Periods and their algebraic ind.

Found-out why ffox-pocket quirks : db-servers are amazonas ones.

® CUP 2022 catalog.

Reduction Theory and Arithmetic Groups, Joachim Schwermer,

CUP 2022

Algebraic Number Theory for Beginners, John Stillwell, CUP 2022

Point-Counting and the Zilber-Pink Conjecture, Jonathan Pila, CUP 2022

Transcendence and Linear Relations of 1-Periods, Annette Huber, Gisbert Wüstholz, CUP 2022

The Mordell Conjecture: A Complete Proof from Diophantine Geometry, Hideaki Ikomai, Shu Kawaguchi, Atsushi Moriwaki, CUP 2022

Computational Cryptography: Algorithmic Aspects of Cryptology, Joppe Bos, Martijn Stam, CUP 2022

The Genesis of the Langlands Program, Julia Mueller, Freydoon Shahidi, CUP 2022

Zeta and L-Functions of Varieties and Motives, Bruno Kahn, CUP 2022

Review by Maksym Radziwili of The distribution of prime numbers by Dimitris Koukoulopoulos

4.1

- Some few paper notes on Classical Transcendence Th : Liouville nbs, Irrationality measures, Finiteness and infiniteness in Diophantine Approximations.

=> Last one is close to Baire-Borel-Lebesgue

topological measure th.

® Kawamata arXicle related to his talk on Derived Birational Geometry.

=> Derived shift = For equivalences, the effect of this category-shift to the bounded derived (category) of (quasi)-coherent sheaves is coarsening or loosening.

Analogous shift : vars to fiber-bundles on vars.

5.1

- Some few paper notes on sorting equivalences for criteria trdeg arguments :

equivalence -> birational equivalence -> alg equivalence.
regular map -> birational map -> alg map.

® Random wkps with convexity and Fenchel-Legendre conjugaison. Periods and (GPC) :

"It is also known that Schanuel's conjecture would be a consequence of conjectural results in the theory of motives. In this setting Grothendieck's period conjecture for an abelian variety A states that the transcendence degree of its period matrix is the same as the dimension of the associated Mumford–Tate group, and what is known by work of Pierre Deligne is that the dimension is an upper bound for the transcendence degree. Bertolin has shown how a generalised period conjecture includes Schanuel's conjecture."

"A related conjecture on abelian varieties states that the period matrix of A over number field has transcendence degree, in the sense of the field generated by its entries, predicted by the dimension of its Mumford–Tate group, as in the previous section. Work of Pierre Deligne has shown that the dimension bounds the transcendence degree; so that the Mumford–Tate group catches sufficiently many algebraic relations between the periods. This is a special case of the full Grothendieck period conjecture."

"A theorem due to Siegel states that if X is a compact, connected, complex manifold of dimension n and $K(X)$ denotes the field of (globally defined) meromorphic functions on it, then $\text{trdeg}_{\mathbb{C}}(K(X)) \leq n$."

6.1

- Went out half-day so nearly nothing but some few paper notes on sorting equivalences for criteria trdeg arguments.

® Lafon 1973 Commutative Algebra book related to that : original approach.

Some wkps on derived theories : categories shifts allow profusion of settings. One very interesting paradigm : replacing an arrow between two objects by a space (of such arrows).

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Pulled some Lang books : Algebra pave and Introduction to algebraic functions.

7.1

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Some typos and addings to memoire.

- A very few paper notes on that : n-th redite on trying simplifying ellipsoid periods.

* Random vids @ MathsNetKorea ytube.

-Kawamata on SOD decomposition.

-Reid AG introductory course.

® Begun Lang book on algebraic functions.

=> contains the linearizing Rieman-Roch theory applied to Fermat-curves.

8.1

- Same very few paper notes on that : n-th redite on trying simplifying ellipsoid periods.

Some typos and addings to memoire.

9.1

- Again same very few paper notes on that : n-th redite on trying simplifying ellipsoid periods.

Spent most of morning looking for workshops and bikes to solve funds issue.

10.1

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Some typos and addings to memoire.

- A very few paper notes on that : explicit formula for $\text{tr}(\text{Ellipsoid})$, Gauss-Bonnet formula for extension fixing memoire version.

11.1

® Pulled classics on Algebra.

BBki treatises, Miles Reid introductory books, Brookes tripos notes.

-> Reid books prologues and epilogues contain quite worthy insights, in colloquium style.

- Nearly nothing on paper : separability and nilpotent freeness.

-> Spending a lot of time this winter looking for bikes to relaunch workshop and solve funds issue : this will probably sign the agony of maths come-back.

12.1

- Nearly nothing on paper : Gauss-Bonnet formula trivializing alg dep of periods.

® A few paragraphs of classics on Algebra pulled

yesterday.

=> Bbki is easy to read with its systematic nearly mechanic way, applying fully the "linearisation principle" even to its exposure-style.

13.1

- Went out halfday so very few paper notes (early morning)
: some rmks after reading Andre survey papers on Gmot.
Seems that (GPC):

==> gives bnd for alg dep of periods, so the partial computability of criteria.

==> Links polynomial ideal of $\ker(\text{ev_period})$ and alg cycle on powers of var in case of smproj vars.

==> alg ind of π and odd zeta values when applied to mixed Tate mtvs.

® Andre Gmot survey papers.

14.1

- As yesterday with very few paper notes (early morning) : some rmks after reading Andre survey papers on Gmot.

Two pts.

1) Ideal var annihilating periods.

2) unsuccessful attempt to bypass linear restriction of 1-mtv Wuhstolz thm, by considering the potentially relevant and seemingly not considered so far, $P^2(M)$.

* A short ytbe playlist on that.

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Some typos in search.txt :

mahematics

remaing

it is clarified by assimilation from successive : through-
by from-by

® Andre Gmot survey papers and wkps on categories.

=> Andre switch from Pmot(M) to Spec Pmot(M) between Bolletino 2008 survey paper and Whatis 2018 notice (Zagier-Gangl notes).

15.1

- As yesterday with very few paper notes (early morning) : mtvic Galois and grp actions terminology. Algebraic cycles and correspondences.

=> Restarted engines-enhancement investigations to relaunch workshop for solving funds issue, so progressively leaving mathematics.

® Some arXicles : Bloch-Sertoz on computation of Hodge structures.

=> Sticking back to machine computation.

=> A relevant ref-bib with a popping-out article on computation of periods algorithms by Pierre Lairez (INRIA-Saclay) .

=> Pulled the latter arXicle.

16.1

- As yesterday with very few paper notes (early morning) : Stokes formula or the most important formula of all (Motivic) standard Mathematics.

© Tested ChatGPT OpenAI bot : quite impressive, nearly frightening; what a gap since mid 85s emacs-psychanalyst bot tried in early 00s. Even today AI based modern-economy ChatBots (customer-service, hotline, gafa assistants, etc) recently tested are far behind.

=> Threat for all mid-intelligence services jobs

(accueil, customer-service, renseignements, hotline, etc) and mid-creativity ones (product-design, market campaign, pubs-ads and logos design, websites, etc), mid-cplexity tasks when coupled to robotics (drivers jobs : taxi, train, trucks, planes, boats); jobs in farms, manufactures, industry, etc....to army robots soldiers (what a pos application).

G released a red-alert to tackle Musk-Altman OpenAi chatGPT, with a project relying on their DeepMind AI uk-company, the Go AI-beast creators that recently managed to defeat for the first time human Go-champions (Kr Sedoul in 2017).

<=

17.1

- As yesterday with very few paper notes (early morning) on particularly eloquent category shifts in action : Calabi Yau mirror symetry (Abouzaid, Fukaya, Kontsevic, Perutz, Sheridan, Soibelman) with inner shifts inside major-shifts (symplectic-dag).

* T.Perutz 2013 IAS talk about that.

=> Pulled slides.

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=> Engines-enhancement investigations (Porsche recent-engines pbs) to relaunch workshop for solving funds issue, so progressively leaving mathematics.

18.1

- As yesterday with less and less paper notes : computations aspect of periods, I think it is the way to go.

=> Some names to references : Emre Can Sertoz (Bloch, Sturmfeld, Mossavati, Lairez coauthor), Lairez, Saef El Dine (polynom).

=> Sertoz-Lairez : db of quartics Picard grps rks.

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Got back to emacs and Lisp to tackle AI.

19.1

- As yesterday, very scarce paper notes on algorithms for periods computations.

=> Techniques viewed so far are all based on very classic algebra and calculus corpus (Euler, Hermite, Gauss, etc) even newer Gauss-Manin cnx methods with Picard-Fuch ones seems rudimentary.

® Some AWS reports on periods, arithmetic of vars.

-> Those Arizona Winter Schools AWS are quite well presented (web-site with vids, slides and courses notes).
See :

2022 AWS.

Srinivansan : Heights.

"The main property of height functions is that there are only finitely many points of bounded height and degree on any given variety. Understanding how quickly the number of points grow as the height grows for various classes of varieties is an active area of research in number theory today! As an application of the theory of heights, we will prove the Mordell--Weil theorem for elliptic curves, namely that the set of rational solutions to cubic equations such as $y^2 = x^3 - 2x + 2$ is finitely generated".

Nagloo: Introduction to model theory with applications.

"Model theory is a branch of mathematical logic dealing with abstract structures, historically with connections to other areas of mathematics. The developments, over the past several decades, have allowed for a strengthening of those connections as well as new striking applications to areas such as diophantine and analytic geometry, algebraic differential equations, and combinatorics. This course will serve as an introduction to the basics of model theory, with a view towards some of the above applications."

20.1

- Went out half-day so nearly nothing but continuation on algorithm/computation aspect of periods-criteria :

(GPC) \rightarrow \mathbb{Q} -pts of hyperplanes \leftrightarrow \mathbb{Z} -pts of hyperplanes.

Bounded height of $P^2(V)$ = Bounded coeff of $P(V)$ so :

Bounded height of $P^2(V)$ + (GPC) \Rightarrow Computability of criteria, and therefore Hilbert 10th pb for \mathbb{Q} .

- Memoire typos :

Maybe add adress of site and email, and after intro, the fact that in extreme-orient and asia maths-traditions, intuitions and original ideas \geq technical proofs.

Expand some litterary \S /sentences into maths-syntax.

21.1

- Very scarce paper notes \mathbb{Z} -pts and \mathbb{Q} -pts of periods-hyperlanes : max ideals of $\mathbb{Q}[x_1 \dots x_n]$

\Rightarrow Looked longly for past-era met student maths-people : the most brilliant ended up well-integrated socially and economically, but odly the ones that now intellectually pop-out were not the best-grades ones, but rather the deep-thinkers that did not fit the competitive system of

that time nor its nowadays social-counterpart of today, by less successfully fitting it again.

<=

22.1

- Nearly nothing : patched a few tire-tubes and done some winter-plowing.

Some paper notes words on holonomy : roughly ODE with polynomial coefficients.

® Retrieved some basics courses notes of Keith Conrad @ uconn (Brian Conrad twinbro) :

-> worthy pointers to math-nightmares : false proofs that were accepted by math-community and rampant during years in theory corpuses, like Grunwald thm (contradicted and later fixed by Wang) or Dhen lemma.

=> An AI-Bbki hypervisor would prevent such facheuses situations.

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Updated browsers and some libs.

Pulled a list of prg and maths software.

23.1

- Very few paper notes on criteria : possibly original ones on two filtrations (periods choice and subgrps of G_{mot}), the latter may be related to the coined "qualitative space of criteria ".

Some other paper notes on setting-up ideas on M_{tvs} .

24.1

- Nearly nothing on paper : some basics on alg extensions.

Noticed two factors that reduces maths productivity :

- a) coffee reduction (from toxic 75cl/d to less than 15cl/d).
- b) winter luminosity reduction.

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Pulled ref (EMS IV p293) in origin.tex (msnet arch 04) of Chudnovski 1977 thm on alg ind of periods of cm-elliptic functions with alg invariants.

CM favors Q -pts : having CM drops-down trdeg , so favors Q -pts.

25.1

- A very few paper notes on MtvS after reading Bakker-Timmerman paper on mtvs related to Hodge structures. Mentions Andre extended periods c_j to mtvs over transcendental basis.

=> so the $K=P(V)$ base-choice of the memoir conclusion is not so dull and may actually be a fruitful path, leading again to considerations on $P^2(V)$.

<=.

- A few queries : how automorphism grps of (fiber) functors can be varieties over Q ? Guess : representability.

26.1

Nearly nothing : mounted new tires with patched tubes.

- Again a few scarce paper notes on MtvS. About last query : good guess confirmed by reading an article of Bertolin on 1-mtvS.

-Looked longly in vain for 1997 IMJ preprint of Andre :

Quelques conjectures de transcendance issues de la géométrie algébrique.

=> Confirms that "the older the rare-stuff, the harder to get it now".

27.1

- Nearly nothing : went out half-day. Some scarce paper notes on MtvS.

® Read again Andre papers.

=> Absolute mtvic Galois grp as a pro-finite limit analogous to the classical absolute Galois grp of \mathbb{Q} ., that is a pro-finite limit of Galois grps of finite Galois extensions of \mathbb{Q} .

* Random vids.

Minsky 2019 @ IHES on mapping-class-grp.

Ayoub 2018 @ HIM on Gmtv.

28.1

- A very few paper paper notes on criterion applied to highly transcendental curves :

$$\rho(\theta) = \cos(f_n(\theta)) \text{ with } f_n = \cos(f_{(n-1)}).$$

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A Sage session looking for grp-cohomology of schemes : nothing since schemes corpus is not fully implemented.

Tried to compute some jacobians : quirks a lot, even for simple hyperelliptic curves. The Debian (bullseye) Sage bundle is from april 2020, maybe the next ones are better.

29.1

- A very few paper notes on criterion applied to highly transcendental curves.

-> Measure of transcendence. Extensions.

® A few reading on mapping-class-grps : seems to be worthy since it is a bridging theory (ArithmeticTop-DiffGeo) in the spirit of Grothendieck-Teichmuller theory.

30.1

- A very few paper notes on some hyperelliptic curves and their jacobians.

© Debian Linux Lenovo.

Some jacobians testing on Sage : most quirks.

® Misc wkps entries.

Quotation of the day

From Lloyd Williams

"It is my considered opinion that the system practiced in the universities of North America of trying to educate young men and young women by herding them together in rooms and lecturing to them is a failure. If you will throw the good and the ambitious student on his own, help him but not spoon-feed him, he can accomplish twice as much and do it twice as well as he can under the conditions that largely obtain in our universities."

31.1

- A very few paper notes on some hyperelliptic curves node components for criteria, testing periods computations on Maxima and MapleOnline.

© Android P9.

Maxima stuck for (λ, μ) of $y^2 = x(x^2 - 1)(x - 2)$.

Maple online : ok for μ . stuck for λ .

-> After 20y no much progress.

Maxima λ session.

```
integrate(sqrt(1+diff(sqrt(x*(x^2-1)*(x-2))),x)^2),x,0,1);
```

```
integrate(sqrt(1+(diff(sqrt(x*(x^2-1)*
(x-2))),x)^2),x,0,1);
```

```
(%i2) diff(sqrt(x*(x^2-1)*(x-2)),x);
```

```
2(x-2)x^2+x(x^2-1)+(x-2)(x^2-1)^2(x-2)x(x^2-1)
```

```
(%i3) (diff(sqrt(x*(x^2-1)*(x-2)),x))^2;
```

```
(2(x-2)x^2+x(x^2-1)+(x-2)(x^2-1))^2(x-2)x(x^2-1)
```

```
(%i4) integrate(sqrt(1+(diff(sqrt(x*(x^2-1)*
(x-2))),x))^2),x,0,1);
```

```
∫01 (2(x-2)x^2+x(x^2-1)+(x-2)(x^2-1))^2(x-2)x(x^2-1)+1 dx.
```

© Debian Linux Lenovo.

Some basic hyperelliptic curves jacobians testing on Sage
: most quirks.

-> Fed-up with that : requested a Magma trial @ their
website.

® Pulled some Saveedra Rivano classics on Tannaka
formalism.

Quotation of the day

From Werner Heisenberg

"I think that modern physics has definitely decided in
favor of Plato. In fact the smallest units of matter are
not physical objects in the ordinary sense; they are
forms, ideas which can be expressed unambiguously only in
mathematical language."

On this day in 1884, Sofia Kovelevskaya gives her first university lecture in Stockholm. This was the first regular lecture by a woman at a research institution in any field in modern times. August Strindberg, the Swedish author, wrote in a local paper :

"A female professor is a pernicious and unpleasant phenomenon - even, one might say, a monstrosity."

=> No comment. The same white-supremacists idiots thought that no colored people could provide any progress to human knowledge.

1.2

- A very few paper notes on Picard functors, Jacobians : link to Brauer grp. Torelli thm, Hodge structures.

=> Torelli thm = faithfulness/injectivity of Jacobian functor restricted to unidimensional vars (curves).

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-Inspected Jupyter.

-Read Sage docs through its html manual.

=> Bridges the Computer-Sciences python-concept of class-of-objects to the mathematic concept of categories.

=> Variables Coercission or souple-looseness of python (variables).

2.2

- A very few paper notes on Picard functors, Jacobians : linearising paradigm.

-Some memoire addings.

Now a few words about Brauer grps. In maths an object is often understood through its interactions, so what matters are arrows and their higher versions that are functors. To get core data about an object, nuclear arrows are favored, arrows to nuclear-objects are simpler and more prone to extract the quintessence of the studied object. If a specific structure of the studied object is targeted, arrows that respect it are again chosen within those nuclear ones.

Here for a field k , the algebras-over k are the embodied arrows, since an algebra over k is just the gift of a ring morphism from k ; the nuclearity of arrows is obtained by restraining to simple and central algebras, that are algebras with both trivial two-sided ideals and center.

® Misc wkps entries.

Quotation of the day
From Bertrand Russell

"Boredom is a vital problem for the moralist, since at least half the sins of mankind are caused by the fear of it."

3.2

- Went out half-day, so nearly nothing but again a few paper notes on Picard functors and Jacobians.

-Some typos of search.txt.

-A few rants on CAS private companies : their online engines are still stuck in front of relatively elementary algebraic integrals; in 20y, nearly no progress has been made.

-> Who cares?

4.2

- Some paper notes on addressing the algebraic integrals issue.

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Synced search.txt with keep notes.

* A vid of Lucia Caporaso @ SNS (italian normale sup) on Rational pts and varieties.

5.2

- Some paper notes on the worthy genus dichotomy for curves over nb fields seen yesterday and maybe original other ones on Fenchel-Legendre equality applied to periods for some addition formulae.

© Debian Linux Lenovo.

Synced search.txt with keep notes.

6.2

- Same paper notes on adressing the algebraic integrals issue : Fenchel-Legendre equality applied to periods. Other ones on basic scheme theory.

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-Synced search.txt with keep notes.

-Memoire typos.

Added Brauer grp foundational rmks.

7.2

- Same paper notes on adressing the algebraic integrals issue : Fenchel-Legendre equality applied to periods. Other ones on basic scheme theory.

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-Parsed search.txt : about 800p.

8.2

- Some paper notes on isomorphism classes of varieties : dependence on base-fields generating stratifications/sheaves of/on moduli.

Other ones on categories : functor sending an object A to the associated "sheaf" or bouquet of categories along submonoids of $\text{end}(A)$.

© Debian Linux Lenovo.

Parsed search.txt and pushed it @ Free.

9.2

© Debian Linux Lenovo.

Pulled a book on Finite Automata of Eric Pin (P7 maths-logic-computer IRI lab).

11.2

® Computational aspect of curves Jacobians in recent texts of youngsters : Balakrishnan, Ezome, Gajovic, Hashimoto, Hast.

- Hashimoto-Morisson paper on Chabauty-Coleman method based on Coleman integrals.

"Due to a minor bug in the code of Balakrishnan and Tuitman for computing local coordinates at very infinite points, which in certain cases yields a Runtime Error instead of computing the coordinates, we sometimes choose the next largest possible prime."

=> Chabauty-Coleman method and integrals : bridging concept of Brauer-theory and (mtvic) Periods one.

12.2

Nearly nothing : looking for bikes to tackle funds issue.

- Just a few paper notes on : Galois theory on theoretical complexity, possibly original ideas close to Topos theory applied to theories like Godel incompleteness revisited by Deligne. Some on Chabauty-method synthesis, others on covering and reductions related to the first ones on complexity.

13.2

- Just a few paper notes on killing the beast :

implementation of theoretical complexity; category shifts and theoretical complexity, possibly original ideas close to Topos theory applied to theories but incorporating dynamical systems.

Chabauty-Coleman method and descent techniques bridging Brauer-to-Periods and Motives.

=> descent = twists-covering (recouvrement twisté; like recouvrement ouvert-etale), close or equal to twisted-torsors covering of Brauer theory, giving the Brauer-descent set, between the rational set and the Brauer-Manin one.

® Coleman bio († 2014 @ 52y of fibromyalgie).

=> around 1990, fixed a gap in Manin proof of Mordell-Weil for curves over function-fields.

14.2

- Nearly nothing : mechanic maintenance most of the day.
=> Leaving maths to solve funds issue.

- Just a few paper notes continuing yesterday ones, plus others on Coates-Kim non-abelian extension of Chabauty methods through Arithmetic Fundamental Grps and others about Raynaud proof of Manin-Mumford cj on absence of intermediate jacobians.

15.2

- Nearly nothing : some mechanic maintenance in the morning and went out the rest of the day to dewinterize the bike (high revs on highway to clean carbs).

-Just a few paper notes as yesterday : (finite) theories, (finite) langages.

16.2

- Nearly nothing recupering from yesterday bike escapade.

-Just a very few paper notes on P_* and iterated P /iterated integrals.

18.2

- Very few paper notes in early morning on $P^n(V)$ and iterated P /integrals.

® CIRM recent feb23 seminar on ARG applications (arithmetic statistics).

-> new trend of arithmetic statistics, probably impelled by/towards big-data statistics methods.

-Pulled some slides and abstracts.

-Bosma Cannon on Magma.

-> W.Stein contributed to Magma (modular forms) before forking to Sage.

-> Similar initial objects as Sage, en locurrence ... magmas.

* Random vids.

Harpaz on Hoschild cohomology in category setting.
Durand on Automata and Big Data.

19.2

- Very few paper notes on how to dynamically generate $P(V)$ then $P^n(V)$.

New type of pts : $V(Q\text{-Alg})$ and $V(Q_)$: adding steps in Gmot size-drops.

Specialisation of parameters in construction of $P^n(V)$.

20.2

- Same very few paper notes on how to dynamically generate $P(V)$ either "modulilly" or homotopically, in both cases, an algebraic dynamisation is favored among the plethora of ways of doing that, because of arithmetic goals.
Specialisation of parameters in construction of $P^n(V)$.

® Pulled the spanish book of Fresan-Gil on MZVs @ Fresan website.

=> As previous books (exp-mtv and ups-periods) : clear exposition with
exhaustive refs (Hopf Algebras : Waterhouse, Cartier and Sweedler).

21.2

- Same very few paper notes as yesterday plus extension of criteria to Alg-dep pts where it makes sense, ie for general vars like transcendental ones.

® Some wkps on Hopf Algebras.

-> Interest of Hopf Algebras = amenable Representation.

The path "Grps -> Hopf Algebras -> Rep" applied to grp-sch is particularly relevant for Gmot that is genuinely defined from ... Rep of Tannaka formalism.

22.2

- Some very few paper notes on Hopf Algebras : Shuffle and words Automata.

=> Marcel-Paul Schützenberger.

® Berstel website on Schützenberger.

McTutor From Carl Jacobi

"It is true that Fourier had the opinion that the principal aim of mathematics was public utility and explanation of natural phenomena; but a philosopher like him should have known that the sole end of science is the honor of the human mind, and that under this title a question about numbers is worth as much as a question about the system of the world."

Quotation of the day
From Francis Galton

"I know of scarcely anything so apt to impress the imagination as the wonderful form of cosmic order expressed by the "Law of Frequency of Error." The law would have been personified by the Greeks and deified, if they had known of it. It reigns with serenity and in

complete self-effacement, amidst the wildest confusion. The huger the mob, and the greater the apparent anarchy, the more perfect is its sway. It is the supreme law of Unreason. Whenever a large sample of chaotic elements are taken in hand and marshaled in the order of their magnitude, an unsuspected and most beautiful form of regularity proves to have been latent all along."

Quoted in J R Newman, The World of Mathematics (New York 1956).

23.2

- Same very few paper on Hopf Algebras : enriched algebra structure with co-operations.

A possible original idea : 3D-alphabet or space-building blocks or geometric motives.

25.2

® Some Magma scripts collecting : SeonShin, Bright.

=> Bright ones on diagonal quartics are well documented.

® Some wkps on Weierstrass pts on Jacobians.

Garcia, Arnaldo; Viana, Paulo (1986). "Weierstrass points on certain non-classical curves".

McTutor quote.

"Technical skill is mastery of complexity while creativity is mastery of simplicity." Chris Zeeman. Catastrophe Theory, 1977.

26.2

- Same very few paper on Hopf Algebras : enriched algebra structure with co-operations.

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Inspecting McCauley2.

McTutor quote.

From J Willard Gibbs.

"Mathematics is a language." At a Yale faculty meeting

27.2

- Some very few paper notes on Modulisation by parametrized-grp-actions : strata by grps-actions.

$GL_n \subset GL_n/GL_n \subset Bir_n$.

® Pulled some graduate courses on alg Topology of P.Guillot @ Strasbourg.

28.2

- Same very few paper notes on birational stuff.

Grps action on ambient spaces k^n .

$GL(k)$ Linear forms $L \subset$ Quotients of $L_k \subset Bir(k)$.

$Bir(P^n) = Cr(n)$ is Cremona grp.

® Some wkps and eoms on birational geometry.

On going classification, like Brauer-Manin theory, easy cases of small dim treated.

=> Manin († in Jan 23 @ 85y).

Minimal model = "simplest" representant in birational class.

Uk-Jp schools (Birkar-Hacon-Kernan, Mori-Kawamata-Matsuki-Karu) and Kollar, Clemens, Abramovich, Griffiths.

1.3

- Same very few paper notes on birational stuff.

Filtrations of vars-moduli by decreasing birational complexity (from general-type to Fano close to P^n).

Jargon

Fano var $V = -K_V$ ample.

Dell Pezzo surfaces = Fano vars of dim 2, or surfaces that are Fano.

Maybe a new concept for periods spaces : inverse of P functor.

2.3

- Some very few paper notes on trivialities about exterior and tensor algebras, then Sato-Tate c_j on nb of pts of curves defined over finite fields.

=> Repartition or distributions of pts of reductions over finite fields.

3.3

Went-out half day so nearly nothing but

- Same very few paper notes on Sato-Tate c_j (gradually proven and extended recently by French and Us modular schools).

* A few vids on recent (fev23) CIRM Saga semesters.

-C.Maistret on Euler factors of curves of higher genus.

=> "Pari-Magma computation outputs are either wrong or do not terminate. But new theoretical progress should fix that with some recent work of Dookchister-Muselli".

-R.Schoof on Tate-1967 query about simple finite flat grp-scheme over Z . (reminds me of Brauer-grp finiteness c_j of Artin for some schemes defined over Z).

4.3

- Some very few paper notes on last CIRM vids :

B.Romano on Lie algebras and families of alg curves, along Bargava recent paper on Statistics Arithmetic methods applied to certain families of ab-var.

-> Understanding Q -pts and Selmers grps of families of vars via the category shift to related representations and orbits counts on them.

=> SAGA seminars @ CIRM confirm recent trend :
 Statistics-Data of/from computations of invariants of families of var, feeding the future AI knowledge database, from which AI engines may extract patterns hinting towards hidden structures and therefore new theoretical progress. Note by the way, this was this very process that lead Birch and SD to the formulation of their cj in the late 60s.
 <=.

5.3

- Diving into AI.

Neural networks, deep ones, supervised learning, training period of engine (breakin or rodage) during which the confirmation-check procedure feeds back the knowledge db, this key confirmation-checkin may be performed by another concurrent neural network in a kind of two players game.

Generative AI.

Confirms that small bits of randomness noise to start-up the generating recursive process are the key seeds of creativity. Discrete dynamical systems.

- Some quick paper notes on ideas of applying that to the LMFDB : the speculative conclusion of memoire might turn out to be not so dull.

6.3

- Continuing diving into AI, plus quantum-computing issues, q-bits and algorithms (Shor and Grover algorithms), going towards memoire conclusion.

=> Main hurdles of today's Quantum boxes (IBM Q-one, he-cooled) : quantum decoherence delays affecting output rendement, most boxes have less than 3mn of quantum-coherence duty time. Main two technologies : optic and atoms.

=> Perceiving applications of AI to models of Universe (Uchu, Millenium) with correlation-curves comparisons between models and observations being the confirmation-check procedure. Models are simulations of solutions of the N-body (N^∞) pb, simulations are used since this pb is

not solvable for $N \geq 3$.

7.3

- Some very few paper notes on group-rings : category-shifts pt-of-view with filtrations from/through/along Hom base-categories.

® Some related wkps and eoms.

Prophetic quotation.

From Lajos Martin.

"I want to glance at the influence of the flying machine on the life in future. New life conditions will develop: the transportation will depend less on the railways ... society will insure itself with new international contracts and agreements." Inaugural address at Kolozsvar University (1872).

8.3

- Some very few paper notes on Cartier duality, polynomial symmetries (ontological query).

9.3

- Some ontological paper notes on Mellin transform and periods functions : $\Gamma = M(\exp)$. Others on AI, Neurosciences and Cosmogony.

® Some related wkps.

Proof assistants : Coq-OCAML.

10.3

- Some ontological paper notes on Euler factors and L-functions : when an object leads to types (classification), a good query is to find out deeper structural reasons for those types.

11.3

- Some paper notes exploring AI and putting down possibly original ideas.

Back to criteria.

The rational box pb. Some geometrical investigations.
Related cylinders plots (GeoGebra).

12.3

- A few paper notes on Interpolations or putting structures on heteroclitic data. Linear regressions, covariances.

Other on criteria : approximating studied var by specific vars.

® McTutor quotes.

James Joseph Sylvester

"The world of ideas which it [mathematics] discloses or illuminates, the contemplation of divine beauty and order which it induces, the harmonious connexion of its parts, the infinite hierarchy and absolute evidence of the truths with which it is concerned, these, and such like, are the surest grounds of the title of mathematics to

human regard, and would remain unimpeached and unimpaired were the plan of the universe unrolled like a map at our feet, and the mind of man qualified to take in the whole scheme of creation at a glance."

Aderemi Kuku

"I like to tell young people in Africa that I grew up in Africa like any of them. ... So that shows that the sky is the limit for everybody who aspires."

Louis Mordell

"Neither you nor I nor anybody else knows what makes a mathematician tick. It is not a question of cleverness. I know many mathematicians who are far abler than I am, but they have not been so lucky. An illustration may be given by considering two miners. One may be an expert geologist, but he does not find the golden nuggets that the ignorant miner does."

13.3

- Possibly deep paper notes on ... Deep Learning Networks : applying them to ... their own architectures, to build their own experience memory-db and getting a minuscule step towards AC or "Artificial Conscience" or "Learning to Learn" marotte.

14.3

- A few paper notes on convexity.
Krein-Milman and separation thms by hyperplanes,
extensions to vars.
Wavelets filters to detect density edges before applying
the latter.

© Debian Linux Lenovo.

Looking for AI pkgs. Prgs : Autoscale, Caffe, and the
antediluvian Lisp and Gprolog. Libs : python, lua, R.

® Related wkps.

From Albert Einstein.

"Everything that is really great and inspiring is created
by the individual who can labor in freedom."

=> If your mind is thoroughly accaparated or constantly
hassled by surviving issues, you are likely not producing
anything brilliant nor being successful; for the simple
physiologic fact that those issues occupy a significant
part of your neural networks that would otherwise be
devoted to the more "noble" investigations.

<=.

15.3

- Nearly nothing, continuing yesterday paper notes on separation thms (scale and qualitative partitions/filtrations), linearisations paradigm. Tensor products and concatenation of q-bits.

AI : $\text{gradient}^2 = \text{propagation of gradients}$. Signal wave.

© Debian Linux Lenovo.

Some search.txt typos.

Abs Galois grp : profinite limit along

AI : Python libs, TensorFlow and Keras.

16.3

- Continuing yesterday paper notes and getting back to criteria : systematic study of P functor, depends on dipping process.

Guess for previous rational-box pb = no solution.

© Android.

Some GeoGebra plots. Cylinders (plane sections and calotte spherique). 4D cone.

17.3

- Went out half-day cycling in storm so nearly nothing. Engines study.

* Some CIRM vids.

A.Bourdon minimal degree torsion class in isogeny families.

Data Stats in Biology : M.Delattre and E.Khun.

18.3

- Nearly nothing, recupering from yesterday but some notes on Grothendieck thm on de-Rham Cohomology and other on cosmogony nested-fractal structures.

® Burgos-Gil Fresan sp-book on Mzvs.

=> Clear exposition and tafsir : future reference book.

19.3

- Same paper notes on homology after Grothendieck thm. Applying criteria to cylinders (plan et calotte). The first is a degenerate case of the second : period complexity drops.

* Short vids on Coding langages. C-java.

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Exploring g-bash entry.

gfan = groebner.
gio = remote file managment.

20.3

- Same paper notes as yesterday.

* Random Vids.

S.Mallat 2020 IHP talk on AI oscillation between (rational-logic) inference and empiric data analysis (geometry).

M.Vlashenko 2018 CIRM talk on mtv Gamma.

21.3

- Some paper notes on monodromy and fundamental grps.

* Random Vids.

Ondelettes : Image compressions from discrete Fourier basis.

AI recent break-throughs.

Engine : Volvo tough old-bricks (B-series) and European recent flops vs Toyota-Lexus tops.

22.3

- Same paper notes on monodromy and fundamental grps.

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Exploring AI softs pkgs. Libs : Python, Lua and R.

23.3 Rmd.

- Some paper notes on symetries of polynomials, query for nested-structures.

© Debian Linux Lenovo.

Exploring AI softs pkgs.

24.3

- Some paper notes on symetries of polynomials : exploring cylindrical, spherical symmetries.

© Some notes on langages from vids : C, C++, Lua.

25.3

- Some notes on Coleman cj about endomorphism algebras of abvar after recent Fite CIRM talk.

-Mostly computer sciences and engines (HTML, AMG engines).

26.3

- Same as previous days, plus cosmology.
Product of curves, Euler-Fermat variants (GeoGebra).

27.3

- Fiber products, plus ignored or uncommon swept-surfaces from generating curves (more considered in industry CAD, intricate)

Mostly AI notes : neural nodes (semi-linear maps = matrix + trigger. Non semi-linear = matrix+sigmoid).

28.3-31.3

- L-functions : L_J division by L , Dirichlet thm and BSD.

Old computers (ENIAC, EDVAC) and newer AI ones applied to $\text{rk}(EC)$.

1-4.4

- Notes on zeta and analytic continuation (germs and Riemann surfaces)

Prolog jargon.

5-7.4

- Notes on period functor and maybe a new arithmetic type from periods resulting of its evaluations.

8.4

- Notes on periods, maybe another original arithmetic type, genus-coherence in case of curves.

9.4

- Notes on Brauer and Gmot.

10.4

- Notes on trdeg , Prolog and first-order logic theories.

12.4

- Notes on Euclidean algorithms and Continued fractions : Archimedeanity of \mathbb{R} , \mathbb{N} to \mathbb{R} through floor function.

13.4

- Notes on Continued fractions, 1st-order logic.

15.4

- Notes on Selmer and III grps. Optimal transport.

16.4

- Notes on optimal transport (moving distributions @ least cost).

17.4

- Notes on L-functions (zeros @ critical strip/line encode arithmetics) and Selmer grp theory, as tools to get rks of EC.

19.4

- Notes on grp cohomology and others on FFT applied to polynomial multiplications algorithms (complexity reduced from n^2 to $n\text{Log}(n)$).

20.4

- Notes on CSA leading to Lie brackets.

21.4

- Notes on Lie brackets.

22.4

- Paper notes on Lie algebras.

-Mostly mechanics and electronics (gearboxes synchro, antenna).

23.4

- Paper notes on Lie Algebras, Prolog, Stratified etale

homotopy.

-Mostly mechanical ones (Ford first ecoboost engines issues).

24.4

- Paper notes on Lie Algebras, relativite restreinte (time dilation and contraction).

25.4

- Paper notes on ZFC, Lie algebras.

26.4

- Paper notes on Lie algebras : periods of abelian varieties and exponential uniformization.

27.4

- Some quick notes on alg cycles and simplices.

-Mostly engines electronics.

28.4

- Hodge cycles and c_j . Annulation or Q -triviality of periods of Hodge cycles (Deligne thm).

-Mostly engines and tech notes.

29.4

- Some paper notes on $P^2(V)$ and generalisation.

But mostly automotives electronics (Can bus, JA1939, LIN bus, OBD).

30.4

* Vadim Voedvosky ICM98 talk on Alg Homotopy Theory.

-> Clear and simple : great minds are inclined toward simplicity.

- Investigating Dold-Thom theory.

1.5

- Continuing Dold-Thom hology investigation.

Some basic recalls reading Spanier book.

-Mostly engines and tech notes.

2.5

- Sorted all this year paper notes in month piles : about 300p.

Last year same period were about 700p.

® Read Dupont-Fresan recent ArXicle on motivisation of Polylog, in the footsteps of Hodge variations motivisation by Deligne, Ramakrishnan, Goncharov, Bloch.

-Mostly engines and tech notes.

6.5

- Some paper notes on $\zeta(3)$ and new arithmetic types of nbers.

=> check link to a recent cn paper on period degree.

Other important notes on Brauer and Mtvic Galois grps, other on related higher Lie Grps/Algebras.

-Mostly engines and tech notes.

7.5

- Some paper notes on new arithmetic types of nbers : fitting zeta values in those, those are in $P^2(Q)$.

Others on Variation of Hodge Structures from Griffith-Harris book.

-Mostly engines and tech notes.

8.5

- Some paper notes on new arithmetic types of nbers.

Pulled some refs on Hodge Theory, mostly classics.

-Mostly engines and tech notes.

9.5

- Very few general paper notes : Differential Topology.

In the end the ruler is Topology from order of R.

® Hodge Theory.

J.Steenbrink and C.Peters then Kashiwara Saito D-modules.

Siegel

Elliptic functions and uniformization.

10.5

- Some paper notes on :

Monodromy and ODE.

Connexion.

Q-pts of mtvs and algebraicity of their periods.

Cplx functions.

® Hodge theory : Impa.

11.5

- Some paper notes on :

Determinants of periods matrix of mtvs giving Legendre relation.

13.5

- Some paper notes on :

Determinants of matrix periods.

Cohomology from Homology by applying contravariant Hom functor to Homology.

Cup products corresponding to ext products.

De Rham thm.

14.5

- Some paper notes on Variation of Hodge structures.

® Movasati(Hodge) and Klingler(ICM18).

15.5

- Some paper notes on :

Universal covers.

Fiber bundles.

Hypercohomology as derived functor of global-section functor, its inputs are cplxes.

Injective object : monomorphism attractor.

-Localisation of categories.

-New Schools (tame, derived, big-data AI)

16.5

- Some paper notes on Lefschetz (1,1) thm.
Grothendieck (mid 60s) thm : $Hdr \approx Hadr$.

Fundamental grps.

Maybe original ones on dep of periods and alg cycles on products, plus other ones on structuring Hyperg functions.

® Jp books on that : Aomoto-Kita. Yoshida.

Sertoz-Lairez : separation of periods. Ranks of Picard grps.

Fresan-Gil

GPC \rightarrow Zagier \rightarrow (π , odd-zeta).

® Impa (Duque) on VHS algebraicity giving Hyperg relations.

18.5

- Some paper notes on Chern and characteristic classes :

invariants on invariants.

® Impa on Hodge : Mosavati-Vilaflor refs complete.

19.5

- Some paper notes on localisation of CSA category, thought original process ones, but actually found out it is standard one of category theory.

Differential Topology : merges the two theories, but Topology rules them all.

DeRham thm (1940) is an example of that principle.

(GPC) and Hodge c_j are instances of transcendence ruled or constrained by arithmetic rigidity.

20.5

- Some paper notes on $mtvs$, VHS and MVHS : period mapping applied to them, like the one of Griffith periods domain theory leading towards Shimura varieties.

-Periods are the key ingredients of Hodge Theory : periods are the gauge or measure used to detect Hodgecity of a cycle.

21.5

- Some paper notes on VHS and Griffith transversality : $F_p(t)$ in $F_{p-1}(t_0)$.
- ® Continued Grothendieck Deligne classics on Hodge theory.

22.5

- Some paper notes on birational invariance of criteria : mean-pt algebraicity hardly conserved. Computations on simple example. (Maxima, Wolfram).

Grp actions on both objects and objects-invariants.

- ® Continued Grothendieck Deligne classics on Hodge theory : articles rather cryptic since skipping arguments proofs by referencing to outside sources.

23.5

- As yesterday, various paper notes on how simple birational maps on simple examples can complexify quite brutally periods and mean-pts, illustrating algebraic/arithmetical rigidity.

Moving-up one power of a term : all the topology is boulders.

cf grapher algcurve.

$$7(XY)^2 - 4(XY^2 + X^2Y) + X^2 + Y^2 = 0$$

$$7(XY)^2 - 4(XY + X^2Y) + X^2 + Y^2 = 0$$

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Tweaking wxMaxima layout : night mode to reduce eyes fatigue.

24.5

- A very few paper notes on local-global and gluing principles. Some grp cohomology for Br. Grps actions on both objects and their invariants.

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Some memoire typos.

26.5

- A very few paper notes on various types of mean-pts and bir maps.

27.5

- Some paper notes on computing different types of mean-pts for the memoire curves (cardio), and effects of bir maps.

28.5

- Finally sorted mean-pt birational invariance issue : the idea was creeping for a long time in past paper notes in several places. Found traces of that in a 2003-2004 pile.

-Done a search in search.txt for that with a few key-words on paper.

-Excavated corresponding paper notes.

-What seems birationally invariant is the trdeg of the global overall set of fundamental arithmetic periods; and on the go, a way of creating stratifications of spaces of vars is by fixing the nature of some subsets of this global set.

-Some paper heuristic notes on that.

29.5

- As yesterday.

Done a search in search.txt for criteria with a few selected few key-words on paper.

Excavated corresponding paper notes.

=> As usual, rare gems hidden in impressive gangue of hundreds of pages.

Some very few synthetic paper notes.

3.6

- Some paper notes on mtvs and Galois grps : notably the automorphism grp of the main fiber functor.

4.6

- Some paper notes on exp.

5.6

- Some paper notes on bir-invariance of Gmtv (EC and Ab var). 0-dim case of Galois grps.

Kontsevich-Batyrev thm on bir-inv of Hodge nbers of CY manifolds goes in that direction.

7.6

- Some paper notes on criteria formulation.

8.6

- Some paper notes on criteria formulation, Brower degree.

-> Conforted by period nature of :

- values @ alg nber of generalized hyperge function.
- leading Taylor coeff of L-f of mtv over Z.

10-12.6

- Some paper notes on criteria formulation, tensorial cplxity and matrix.

14.6

- Some paper notes on mtvs.

16-18.6

- Some paper notes on category theory : abelian, derived functor.

19-23.6

- Some paper notes on k-theory, Gmtv.

24-27.6

- Some paper notes on inverse Gmtv.
- ® Villegas-Roberts hyp-mtv (uses Hodge).

28.6

- Some paper notes on Lie grps and algebras, to Gmtv.

29.6

- Some paper notes on Galois grps.

30.6

- Some paper notes on k-pts k-relations : found old traces of that in 2003-2004 paper notes.

1.7

- Some paper notes on Nber fields, Chow grps.

2.7

- Some paper notes on Topos and T-pts of S-schemes.

5.7

- Some paper notes on investigating the link between the different uniformizations (criteria and hypergeometry). Stratification and direct sums.

6.7

- Some paper notes on comodules coactions.
- ® Ayoub Hopf algebras.
Fresan-Gil mzvs : ref book on both mtvs and mzvs.

8.7

- Some paper notes on precisising hypergeometric uniformization in memoire.
-> a few addings.

9.7

- Pulled a shelf on Hopf Algebras(Abe, Bucarest Uni, Milnor-Moore).
- ® Fresan-Gil mzvs : t-structures.

10.7

- Some paper notes on :

Derived functor.

Co-algebra : Co-(algebras, modules, action).

Hopf algebra = coalgebras with an extra endomorphism.
-> origin in homology of Lie grps : Hans Hopf.

Decomposition jargon : filtrations, grading, resolution, etc.

® Underwood : applications of Hopf algebras to automata.
 Bucarest Hopf-team : global overview.

wkp Octopus : 3 hearts and 9 brains (1 central, 8 secondary in tentacles).

11.7

- Some paper notes on trying to put a coproduct on hypergeometric functions.

® MacLane Homology (coalgebras) and Lang Algebra (derived functors).

12.7

- Some paper notes on Picard-Fuchs ode.

Twist of ode - twist of solutions.

® Vidunas on special relations of Gauss hypergeometric function.

13.7

- Some paper notes on Generalized hypergeometry. Some

types of generalized hypergeometric functions are modular in nature.

® Belkale-Brossnan on Igusa Zetas (twist by cplx-powers).
Brown-Dupont on Hypergeometric mtvs.

14.7

- Some paper notes on defining generalized periods versus extended periods.

15.7

- Some paper notes on $P^n(V)$ /iterated integrals and periods filtrations (ontological choice of variables).

17.7

- Some paper notes on zeta values : dimorphy (odd-even) for expressions and relations. Holonomy, D-modules.

18.7

- Dug-out paper archives. Found in 2003-2004 pile

- 1) Inclusion of $Cg(V)$ into $P(V)$.
- 2) k-relation k-pts issue.

® Aomoto : Hypergeometry.

19.7

- Some paper notes on Hypergeometry :

- 1) linearisation of period-products.
- 2) rep of exp by alg-twist (dug in old papers around 2006).

© Vilenkin. Miller.

20.7

- Some paper notes on Uniformization.

21.7

- Some paper notes on K-theory : links to periods and mtvs.

-> Recent result of K-grps of F_p using higher-algebra and oo-cat.

(Antiau, Nikolhaus, Klausen, Wandel).

24.7

- Some paper notes on Lie grps and Hypergeometry : special grps.

25.7

- Some paper notes on Hypergeometry : links with MZVs.
- ® Deligne, Brown, Ebisu, Long.

27.7

- Some paper notes on Hypergeometry : uniformization by equiperiodicity to a twist of Fermat.

28.7

- Some paper notes on Hypergeometry, periods and Dihedral grps : maybe a possible answer to the antique Perfect nber pb.

30.7

- Some paper notes on Hypergeometry, periods.

30.7

- Some paper notes on Hypergeometry, periods : analogue of alg-nber should be normalized periods.

1.8

- Some paper notes on extended Hypergeometry : extension to var rep.

2.8

- Some paper notes on extended Hypergeometry : stability of period functor and Appel-Lauricella.

3.8

- Some paper notes on Hypergeometry : confluent or generalized.

4-5-6.8

- Some paper notes on Hypergeometry : structure on both preceding spaces.

7.8

- Some paper notes on pts to pursue for future memoire ; programme or schedule.

8.8

- Some paper notes on Automorphy and Modularity : the key-link concept to hypergeometry is grps.