Research School on Algebra and Arithmetic

Nangui Abrogoua University

Abdijan, Ivory Coast

September 1-12, 2025

Coordinators

N'Guessan Raymond Kre, Nangui Abrogoua University, Ivory Coast

Christian Maire, University Marie and Louis Pasteur, France

With the assistance of

Vincent Kouakou, Nangui Abrogoua University, Ivory Coast

website of the event

The *Research School on Algebra and Arithmetic in Ivory Coast* will take place at

Nangui Abrogoua University (UNA)

in Abidjan, from September 1 to 12, 2025.

This school is organized within the framework of the Africa Network for Arithmetic Geometry and Applications (ANAGA), which aims to advance arithmetic geometry across the African continent. One of the project's main objectives is to train a new generation of researchers who will, in turn, play a key role in educating future generations. This school marks an important milestone in that training process.

This event has received special financial support from the CNRS through its Residential Research Schools 2025 program.
These days will consist of four activities:

- **Research-level courses aimed at Master's students, PhD candidates, and early-career researchers**. The program will consist of three courses:
  - *The group of Brauer* by Demba Barry, Université des Sciences, des Techniques et des Technologies de Bamako, Mali.
  - *Introduction to the notion of substitution* by Nicolas Bédaride, University Aix-Marseille, France.
  - *Algorithms for algebraic curves, Jacobians, and Galois representations* by Nicolas Mascot, Trinity College Dublin, Ireland.
- **Introductory thematic lectures.**
- **Research lectures.** In particular, young researchers, especially PhD students, will have the opportunity to present their recent work.
- **A series of events to promote mathematics.**

	9:30-10:30	11-12	2:00-3:15	3:30-4:45	5:00-5:30
Sept. 1	opening				
Sept. 2					exercises
Sept. 3			meeting		
Sept. 4					exercises
Sept. 5					exercises
Sept. 6					
Sept. 8					exercises
Sept. 9	Mathematics	Outreach			
Sept. 10			Women	in Sciences	
Sept. 11					
Sept. 12					closing

A meeting is scheduled for Wednesday, September 3, from 2:00 to 4:00 p.m., bringing together the CNRS Director, the President of UNA, representatives of the French Embassy in Côte d'Ivoire, and the workshop participants.

Advanced Courses

These courses are intended for Master's students, PhD candidates, early-career researchers, and future mathematics teachers, both as part of their initial training and to help them develop a deeper understanding of the subject they will be teaching.

The program consists of three courses:

- *The group of Brauer*, by Demba Barry, Université des Sciences, des Techniques et des Technologies de Bamako, Mali.
- *Introduction to the notion of substitution*, by Nicolas Bédaride, Aix Marseille University, France.
- *Algorithms for algebraic curves, Jacobians, and Galois representations*, by Nicolas Mascot, Trinity College Dublin, Ireland.

Abstracts

Demba BARRY, Université des Sciences, des Techniques et des Technologies de Bamako, Mali.

The group of Brauer

In this course we define the Brauer group of a field and compute this group for some fields. Next, we will be interested in a famous theorem of Merkurjev that states the two torsion part of the Brauer group is generated by quaternion algebras. Some ingredients of the proof will be given without explaining the detailed proof. We will finish the course by exposing some related open questions.

Nicolas BÉDARIDE, Aix Marseille University, France.

Introduction to the notion of substitution

Symbolic dynamics is the study of subshifts. A subshift is a closed set of sequences over a finite set, called the alphabet, which is invariant under the shift map. Typically, these sequences represent the codings of orbits in dynamical systems.
We are particularly interested in subshifts of zero entropy. One way to construct such systems is through substitutions. A substitution is a morphism of monoids.
In this course, we will examine some properties of subshifts associated with substitutions and explain certain related dynamical properties.

Nicolas MASCOT, Trinity College Dublin, Ireland.

Algorithms for algebraic curves, Jacobians, and Galois representations

We will give an algorithmic introduction to plane algebraic curves, with many explicit examples. We will then present Makdisi's algorithms, which make it possible to compute efficiently with the Picard group of a curve. As an application, we will show how to compute explicitly mod ell Galois representations occurring in the étale cohomology of curves and surfaces..

Introductory thematic lectures

In keeping with the open nature of our program, we have included three thematic introductory talks.

- *Combinatoire du mot de Thue-Morse ternaire* $\mathbf{t}_3$ *: complexité abélienne et mots de retour*, by Idrissa Kaboré, Nazi Boni University, Burkina Faso.
- *Une introduction à la Géométrie énumerative tropicale*, by Winnie Ossete, Marien Ngouabi University, Republic of Congo.
- *An introduction to model categories*, by Hermann Soré, Nazi Boni University, Burkina Faso.

Monday, September 1

3:30-4:30 Idrissa Kaboré

Tuesday, September 2

2:00-3:00 Idrissa Kaboré

Thursday, September 4

2:00-3:00 Hermann Soré
3:30-4:30 Hermann Soré

Friday, September 11

2:00-3:00 Winnie Ossete

Abstracts

Idrissa KABORÉ, Nazi Boni University, Burkina Faso.

Combinatoire du mot de Thue-Morse ternaire $\mathbf{t}_3$: complexité abélienne et mots de retour

Dans cet exposé, nous introduirons d'abord les définitions et notations de base en combinatoire des mots. Ensuite, nous présenterons des propriétés combinatoires du mot de Thue-Morse ternaire. Il s'agit du mot infini $\mathbf{t}_3 = 012120201120201120201\cdots$ *engendré*

par le morphisme $\mu_3 : 0 \mapsto 012,\ 1 \mapsto 120\ 2 \mapsto 201$.
Plus précisément, nous décrirons d'abord la structure des facteurs triprolongeables à la fois à droite et à gauche du mot $\mathbf{t}_3$ *puis nous déterminerons de manière explicite sa fonction de complexité abélienne. Ensuite nous étudierons les facteurs biprolongeables à la fois à droite et à gauche du mot* $\mathbf{t}_3$. *Enfin nous montrerons que tout facteur non vide de* $\mathbf{t}_3$ *admet* 7, 8 *ou* 9 *mots de retour.*

Winnie OSSETE, Marien Ngouabi University, Republic of Congo.

Une introduction à la Géométrie énumerative tropicale

Hermann SORÉ, Nazi Boni University, Burkina Faso.

An introduction to model categories

This talk aims at giving a short introduction to the theory of model categories due to Quillen.
The first part recalls the different categorical tools needed for the construction of $\boldsymbol{HoC}$, *the homotopical categoie associated to* $\boldsymbol{C}$.
The second part applies the previous study for endowing the category $\boldsymbol{DGMod}_R$ *of differential graded* R*-modules with a model category structure.*

Bibliography

[1] W. G. Dwyer and J. Spalinski, *Homotopy theories and model categories*, Handbook of algebraic topology (Amsterdam), North-Holland, Amsterdam, 1995, pp. 73–126.
[2] D. G. Quillen, *Homotopical algebra*, Lecture Notes in Mathematics, **43**, Springer, Berlin, New York, 1967.

Research lectures

Scientific Committee

Demba Barry, University of Bamako, Mali
Tony Ezome, École Normale Supérieure de Libreville, Gabon
Vincent Kouakou, Nangui Abrogoua University, Ivoray Coast
Winnie Ossete, Marien Ngouabi University, Republic of Congo
Hermann Soré, University Nazi Boni, Burkina Faso

Tuesday, September 2

3:30-4:00	Charles Tougma
4:15-4:45	Bénédicte N'zi

Wednesday, September 3

4:00-5:00	Abdoulaye Maïga
5:15-5:45	Karim Sankara

Friday, September 5

2:00-2:30	Moustapha Camara
2:45-3:15	Pingdwindé E. D. Nikiema
3:30-4:00	Abdoulaye Dicko
4:15-4:45	Konan Mathias Kouakou

Saturday, September 6

2:00-2:30	Edjabrou Kablam
2:45-3:15	Pierre Brou
3:30-4:00	Abdoulaye Assane
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Monday, September 8

2:00-2:30	François Tanoé
2:45-3:15	Euloge Tchammou
3:30-4:00	Ephraim Poncho-Kotey
4:15-4:45	Cyrille N'Cho Akafou

Tuesday, September 9

2:00-3:00	Tony Ezome
3:30-4:00	Lassina Dembelé
4:15-4:45	Salif Ouedraogo
5:00-5:30	Jean-Roland Guiye

Thursday, September 11

3:30-4:00	Salifou Nikiema
4:15-4:45	Yacouba Sanou
5:00-5:30	Laré Ousseni

Friday, September 12

2:00-2:30	Vincent Kouakou
2:45-3:15	Lawson Latevi
3:30-4:00	Médard Ballo

Abstracts of the research lectures

AKAFOU N'Cho Cyrille, Université Félix Houphouët-Boigny, Ivory Coast

Asymptotic stability of $ASS_A(\frac{A}{I_n})$ for strongly noetherian filtrations $f = (I_n)_{n\in\mathbb{N}}$

Let A be a noetherian ring, and $f = (I_n)_{n\in\mathbb{N}}$ be a strongly noetherian filtration on the ring A. We generalize the Artin-Rees Lemma to strongly noetherian filtrations. This allows us to show that if the ideal I_1 contains a $f-superficial$ element of order one which is regular, then the sequence $(ASS_A(\frac{A}{I_n}))_{n\geq 1}$ stabilizes.

ASSANE Abdoulaye, University Nangui Abrogoua, Ivory Coast

Ratliff-Rush filtration induced by a good filtration

In this lecture, we introduce the notion of Ratliff-Rush filtration associated with an good filtration which generalize the notion of Ratliff-Rush closure of an ideal introduce by L.J. Ratliff and D.Rush. We establish a semi prime operation in the class of good filtrations which is a refinement of the prüferian closure of filtration.

BALLO Médard, Université d'Abomey-Calavi, Bénin

Les algèbres de Leibniz-Poisson non commutatives

Les algèbres de Leibniz-Poisson non commutatives généralisent les algèbres de Poisson classiques en permettant un produit associatif non commutatif et un crochet de Leibniz qui n'est pas forcément antisymétrique. Ces structures associent une algèbre associative non commutative à un crochet bilinéaire liant ces deux opérations par une règle de Leibniz généralisée. Elles offrent un cadre algébrique riche pour modéliser des phénomènes où les symétries classiques sont rompues, notamment en géeométrie non commutative et en théeorie des déformations, ouvrant de nouvelles perspectives en physique mathématique.

BROU Kouadjo Pierre, Université Nangui Abrogoua, Ivory Coast

Une nouvelle Synergie entre l'Intelligence Artificielle et la Découverte Mathématique

L'intelligence artificielle est en train de redéfinir son rôle dans la recherche mathématique, évoluant d'un simple outil de calcul formel vers un véritable partenaire cognitif. Cette communication explore comment l'IA peut catalyser la découverte en algèbre en agissant comme un "mathématicien augmenté". Nous présenterons trois axes de synergie. Le premier est l'IA comme moteur de découverte, capable d'analyser de vastes ensembles de données d'objets algébriques pour y déceler des structures cachées et formuler des conjectures inédites, comme l'illustrent des avancées récentes en théorie des représentations. Le second est son rôle d'optimiseur de stratégies, où l'apprentissage par renforcement apprend des heuristiques supérieures aux méthodes classiques pour des problèmes algorithmiques fondamentaux, tels que le calcul des bases de Gröbner. Enfin, nous discuterons de la fusion entre l'IA et les assistants de preuve formels, où les modèles d'IA guident le chercheur dans la construction de démonstrations rigoureuses. À travers ces

axes, nous montrerons que l'IA ne remplace pas l'intuition de l'algébriste, mais l'amplifie, lui permettant d'explorer des territoires mathématiques d'une complexité jusqu'alors inaccessible.

CAMARA Moustapha, University Assane Seck of Ziguinchor, Sénégal

Le Théorème de Riemann-Roch

Le mathématicien Bernhard Riemann $(1826-1866)$ *s'intéressait au problème de détermination de tous les diviseurs positifs équivalents à un diviseur* D *sur une surface compacte. Pour ce faire, il a étudié la dimension de l'espace vectoriel complexe*

$$\mathscr{L}(D) = \{f \mid f \text{ est méromorphe et } div(f) + D \geq 0\}.$$

Il démontra que, lorsque X *est compacte de genre* g*, on a l'inégalité*

$$\dim \mathscr{L}(D) \geq \deg D + 1 - g.$$

Son étudiant Gustav Roch $(1839-1866)$ *compléta le théorème qu'on nomme maintenant théorème de Riemann-Roch pour les courbes algébriques :*

$$\dim \mathscr{L}(D) - \dim \mathscr{L}(K - D) = \deg D + 1 - g,$$

où K *est un diviseur appelé diviseur canonique. L'objectif de cette présentation est double : d'une part, exposer une démonstration du théorème de Riemann-Roch à travers le langage de la cohomologie des faisceaux ; d'autre part, mettre en lumière quelques-unes de ses applications.*

DICKO Abdoulaye, University Norbert Zongo, Burkina Faso

On the Trace of Algebraic Numbers

In this talk, we focus on the study of traces of algebraic numbers in order to connect it with the knowledge of number fields. This subject is very important since the notion of trace is a fundamental tool in algebra as it provides a way of distinguish algebraic integers from general algebraic numbers. On the over hand, it also allows for a classification of field extensions by means of the traces of algebraic numbers.
This study thus offers fundamental knowledge of number fields with a view to conducting future research on number theory.

DEMBELÉ Lassina, King's College, London, UK (online)

Title and abstract to be announced

GUIYE Neangnehi Jean-Roland, Université Nangui Abrogoua, Ivory Coast

Opérations de clôtures conservant le monoide nul et quasi-graduation sur un semi-anneau

Dans ce travail, nous explorons une nouvelle approche de la notion d'opération de clôture sur un semi-anneau, en nous intéressant particulièrement à celles qui conservent le monoïde nul. Cette étude s'inscrit dans le prolongement des travaux du Dr. Essan, qui a

introduit la notion d'opération de clôture dans un cadre plus général. Cette approche ouvre la voie à la définition d'une nouvelle classe de quasi-graduations sur les semi-anneaux, permettant de dégager des propriétés inédites et potentiellement fécondes pour la théorie des semi-anneaux et leurs applications.

EZOME Tony, École Normale Supérieure de Libreville, Gabon

Some algorithmic aspects of function fields extensions

Let $X/\mathbb{F}_q$ be a curve, and $\tau : Y \longrightarrow X$ an abelian unramified cover. From [1], We develop an effective class field theory to study some evaluation and interpolation problems.

Bibliography
[1] J.-P. Serre, Algebraic groups and class fields, Graduate Texts in Mathematics, vol 117, New York etc.: Springer-Verlag, 1988.

KABLAM Edjabrou Ulrich, Artificial Data Intelligence Developer, Abidjan, Ivory Coast

Cryptanalyse à l'Ère de l'IA : une Étude Comparative des Attaques sur RSA, ElGamal et les Courbes Elliptiques.

Cette communication présente une étude comparative de la cryptanalyse des systèmes à clé publique RSA, ElGamal et ECC. Nous analysons les fondements et les limites des attaques classiques basées sur la théorie des nombres, telles que GNFS et le Calcul d'Indices. En parallèle, nous proposons des variantes innovantes où l'IA sert d'outil d'optimisation et d'exploration. Nous étudions l'application de l'apprentissage par renforcement pour accélérer la factorisation et le calcul de logarithmes discrets, ainsi que l'usage de l'apprentissage profond pour les attaques par canaux auxiliaires sur ECC. Cette analyse met en lumière la synergie entre algèbre et IA pour ouvrir de nouvelles perspectives en cryptanalyse moderne.

KOUAKOU Konan Mathias, Université Félix Houphouët Boigny, Ivory Coast

Structures algébriques des Corps finis

Abstract to come.

KOUAKOU Vincent Kouassi, Université Nangui Abrogoua, Ivory Coast

Explicit Construction of a Parametric Family of Elliptic Curves of Rank 4 via a Quadratic Extension

We present an explicit one-parameter family of elliptic curves defined over $\mathbb{Q}(t)$ possessing at least four independent rational points, where the fourth point is defined over a quadratic extension. By specializing at $t_0 = -842/35$, we compute the Néron-Tate height pairing matrix of these points numerically using SageMath, establishing their linear independence and hence the curve's rank of at least 4. This construction builds upon interpolation

techniques and explicit extension field definitions, contributing a concrete example in the study of high rank elliptic curve families.

LATEVI Lawson, AIMS Ghana, Ghana

Crossed Modules of Semisimple Hopf Algebras

Let $\left(E \xrightarrow{\partial} G, \triangleright\right)$ *be a crossed module of groups with* $\partial : E \to G$*, a group morphism and* $\triangleright$*, a left group action of* G *on* E *by automorphism. Let* X *and* Y *be finite groups on which* G *acts by automorphisms, and let* $f : Y \to X$ *be a* G*-equivariant group morphism i.e* $g \in G$ *and* $y \in Y$ *, then* $f(g \triangleright y) = g \triangleright f(y)$*.*
The goal of this talk is to prove that $\left(\mathscr{F}_{\mathbb{C}}(X) \otimes \mathbb{C}E \xrightarrow{\partial} \mathscr{F}_{\mathbb{C}}(Y) \rtimes \mathbb{C}G, \triangleright\right)$ *is a crossed module of semisimple Hopf algebras where :*

- $\mathscr{F}_{\mathbb{C}}(X)$ *and* $\mathscr{F}_{\mathbb{C}}(Y)$ *are algebras of complex continuous functions on the finite groups* X *and* Y *respectively*
- $\mathbb{C}E$ *and* $\mathbb{C}G$ *are group algebras*
- $\rtimes$ *is a semi-direct product.*

MAIGA Abdoulaye, École Normale Supérieure de Bamako, Mali

Fast 2-adic Canonical Lift of Ordinary Genus 2 Curves

Let p *be a prime and* $\mathfrak{A}_{g,\Gamma_0(p)}$ *be the Siegel moduli space with* $\Gamma_0(p)$*-level structure. There exists a general statement of the* Kronecker conditions *on the ordinary locus of* $\mathfrak{A}_{g,\Gamma_0(p)}$*, which extends the well-known result in dimension* 1 *under the same name due to T.Satoh. Using Igusa arithmetic invariants and Richelot* $(2,2)$*-isogeny algorithm, we extend the method [1] of computing the canonical lift of ordinary genus* 2 *curves in characteristic* 2*. We introduce a Newton method for lifting efficiently the Verschiebung over* $\mathbb{Z}_q$*. Further, one can use this method to compute the characteristic polynomial of genus 2 curves and to lift modular forms associated with these curves in quasi-quadratic time complexity.*
We give a detailed description with the necessary optimisations for an efficient implementation.

Bibliography

[1] A.Maïga and D.Robert, *Towards computing canonical lifts of ordinary elliptic curves in medium characteristic*, Accepted for publication to Designs, Codes and Cryptography, 2025.

NIKIEMA Pingdwindé Eric Didier, Université Nazi Boni, Burkina Faso

Répétition abélienne dans les mots

La répétition abélienne dans les mots est une extension au cadre commutatif de la notion classique de la répétition dans les mots. Cette extension est basée sur une relation d'équivalence communément appelée équivalence abélienne*. Dans notre exposé, nous donnons le nombre moyen de carrés abéliens que contient un mot binaire abritrairement long; puis, nous montrons dans quelles conditions les puissances abéliennes sont évitables.*

NIKIEMA Salifou, Université Lédéa Bernard Ouedraogo, Burkina Faso

On families of irreducible polynomials with constraints on height, Mahler measure, and Graeffe transforms

A family of polynomials refers to an infinite collection of polynomials with integer coefficients, typically defined in a parametric form. Constructing such a family in which all elements are irreducible is a major challenge, especially when constraints are imposed both on their coefficients and on the location of their complex roots. In this article, we present explicit families of irreducible polynomials of height equal to 1*, whose Mahler measure is strictly greater than* 1*, and whose Graeffe-Dandelin transforms have prescribed heights. More precisely, we construct a family of irreducible polynomials that provides an affirmative answer to a question recently raised in the literature: does there exist an infinite number of irreducible polynomials P, of height equal to 1, such that* $\mathrm{M}(P) > 1$*,* $\delta(P) = 1$*, and the Graeffe transform $\mathscr{G}P$ also has height 1?*

N'ZI Ahou Bénédicte, Université Nangui Abrogoua, Ivory Coast

A New Infinite Family of Congruent Numbers Constructed by Quadrilateral Product

We study a large family of integers defined by the form

$$D(m,n) = mn(m+n)(m+2n),$$

where $\gcd(m,n) = 1$*. Exploiting the theory of elliptic curves, we relate these numbers to the property of being congruent, i.e., the area of a right-angled triangle whose sides are rational. We demonstrate the existence of an infinity of congruent numbers in the family, characterized by the strictly positive rank of the elliptic curves associated with $D(m,n)$. This result coexists with the existence of values for which the curve has zero rank and $D(m,n)$ is not a congruent number, highlighting the arithmetic richness and diversity of behaviours in this family. Our analysis combine theoretical and numerical methods, and opens perspectives towards a fine classification of congruent numbers within the family $D(m,n)$.*

OUEDRAOGO Salif, Université Thomas Sankara, Burkina Faso

Algebraic Structures of Arithmetic functions

The ring $\mathbf{A}$ *of arithmetic functions consists of all functions* $f : \mathbf{Z}^+ \longrightarrow \mathbf{C}$*, equipped with pointwise addition and the Diriclet convolution product defined by*

$$(f * g)(n) = \sum_{d/n} f(d)g(n/d), \qquad \forall f, g \in \mathbf{A}, \forall n \in \mathbf{Z}^+$$

Arithmetic functions occupy a central role in number theory, underpinning both classical results and ongoing raechearch questions . The ain of this presentation is to develop rigorous algebaic frame work of the study of this ring. This investigation lies at the intersection of two major areas of mathematics. This work will also incorporate new directions that have the potential to inspire new resarchs in number theory.

OUSSENI Awaou Laré, IMSP, Bénin

Anneau des entiers des corps multi-quadratiques et leurs applications

Cette présentation retrace notre travail de Master sur l'anneau des entiers des corps multi-quadratiques. Dans cette présentation nous donnerons un aperçu de clarification des notions de corps quadratiques, biquadratiques, triquadratiques et multi-quadratiques ainsi que leurs applications en géométrie notamment la construction à la règle et au compas. Ensuite nous parlerons de la notion de base intégrale des corps multi-quadratiques et quelques exemples d'applications en cryptographie, et les implications sur les équations diophantiennes. Supervision de Japhet Odjoumani.

PONCHO-KOTEY Ephraim, University of Ghana, Ghana

Some Aspects of Discrete Logarithms in Quasi Polynomial Time in Finite fields

The presentations will largely be focused on the work by Thorsten Kleinjung and Benjamin Wesolowski. They proved that the discrete Logarithm problem can be solved in a quasi-polynomial expected time in multiplicative group of finite fields of fixed characteristics.

SANKARA Karim, Université Nazi Boni, Burkina Faso

On the inverse Galois problem for Hilbert p-class field towers with splitting condition

In this talk, we begin by reviewing the inverse Galois problem in its classical form. We then discuss how this problem can be extended to the context of Hilbert p-class field towers. Finally, we present a recent result obtained in collaboration with Maire, in which we address the inverse Galois problem for Hilbert p-class field towers with splitting at a finite set S of prime ideals. This work generalizes a result previously established by Hajir, Maire, and Ramakrishna.

SANOU Yacouba, Université Nazi Boni, Burkina Faso

Complexité des mots du billard dans le carré et le cube

Le billard mathématique modélise le mouvement d'une boule libre dans une région donnée (carré, cube, $\cdots$), soumise uniquement aux rebonds sur les bords en respectant la réflexion "miroir". Nous pouvons coder la trajectoire d'une boule dans le billard par une suite infinie sur un alphabet fini selon les côtés rencontrés lors des rebonds. Dans le cas du carré, une trajectoire de direction minimale est codée par un mot sturmien : mot de complexité $n+1$. Dans le cas du cube, nous montrons que si la direction initiale est totalement irrationnelle, le nombre de facteurs distincts de longueur n apparaissant dans la suite est exactement n^2+n+1.

TANOE François Emmanuel, Félix Houphouët Boigny University, Ivory Coast

Relations between congruent numbers and congruent matrices of order 2

After a brief introduction to congruent circulant matrices of size 2, we establish a relationship between these matrices and congruent numbers containing the factor $u^2 + v^2$ via pseudo-Pythagorean rational numbers. Statistics are also provided. Joint work with Vincent Kouassi Kouakou.

TCHAMMOU Euloge, IMSP, Bénin

On an exponential Diophantine equation involving powers of consecutive terms of the Padovan sequence

In this presentation,we find all Padovan numbers which are sums of same powers of consecutive Padovan numbers. So, we investigate the Diophantine equation

$$A_n^x + A_{n+1}^x + \cdots + A_{n+k-1}^x = A_m,$$

where A_i is the i^{th} term of the Padovan sequence $(A_n)_{n\geq 0}$ given by

$$A_0 = A_1 = A_2 = 1 \text{ and } A_{n+3} = A_{n+1} + A_n, \quad \text{for all } n \geq 0.$$

Our proofs combine techniques on Diophantine approximation, namely the theory of linear forms in logarithms of algebraic numbers, Baker's method, and the reduction techniques involving the theory of continued fractions due to Dujella-Pethő, as well as the usual properties of the Padovan sequence.

TOUGMA Charles Wend-Waoga, University Thomas Sankara, Burkina Faso

On Integer-Valued Polynomials over Algebras

Let D be a domain with quotient field K and A a D-algebra. The ring of integer-valued polynomials on the D-algebra A is

$$\mathrm{Int}_D(A) = \{P \in K[X],\ P(A) \subset A\}$$

Our talk first presents the motivations for studying such rings, their key properties and recent extensions to skew polynomials. We then focus on number fields to summarize two of our research papers that offer solutions of two problems raised on Pólya fields. Finally, we present our current research projects, some of which are carried out in collaboration with others authors.

Promotion of Mathematics

We schedule a series of events to promote mathematics:

- Mathematics popularization activities (morning of September 9),
- Outreach activities on the gender gap in science (afternoon of September 10).

The program is under development.

Participants

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