

## CNRS RESEARCHER IN MATHEMATICS



### ● DIPLOMAS

- JUNE 2003** Habilitation à diriger des recherches, *University of Lille 1*,  
*“Un parcours explicite en théorie multiplicative”*,  
**JANUARY 1991** PhD *Bordeaux 1*, *“Contribution au problème de Goldbach”* with J.-M. Deshouillers,  
**JUNE 1989** M.Phil. in mathematics, *Bordeaux 1*,  
**JUNE 1988** Agrégation de mathématiques, option informatique.

### ● POSITIONS HELD

- OCT 2019 - NOW** Senior Researcher, CNRS, Aix Marseille Université  
**NOV 2018 - SEP 2019** Higher Researcher, CNRS, Aix Marseille Université  
**JUNE 2016 - NOV 2018** Researcher 1st class, CNRS, Aix Marseille Université  
**OCT 1996 - MAY 2016** Researcher 1st class, CNRS, University of Lille 1  
**OCT 1992 - OCT 1996** Researcher 2nd class, CNRS, University of Nancy 1  
**SEP 1992 - SEP 1993** Visitor at the Institute for Advanced Studies, *Princeton*  
**SEP 1989 - SEP 1992** Allocataire Moniteur Normalien, *Université Bordeaux 1*  
**SEP 1985 - SEP 1989** Student at the ENS (Higher Normal School) of Saint-Cloud

### ● SOME SELECTED ACTIVITIES

- HEAD OF THE SMF PUBLISHING HOUSE** june 2010 / june 2013, deputy-president of the SMF (French Mathematical Society) june 2010 / june 2012, vice-director june 2009 / june 2010. These very demanding positions require in particular to oversee at least weekly the workflow of twelve journals/book series and to balance the workload, to help editorial committees with difficult situations, to set prices, organize sales and to coordinate the full publication process, from refereeing to dispatching and advertising.
- MEMBER OF** the ANR scientific evaluation committee Mathematics/Theoretical Comp. Science in 2014, 2015, 2020 and 2021, and mid-term evaluation committee in 2017.
- MEMBER OF** the Cneser 2003/2005, main and disciplinary sections.
- DEPUTY-DIRECTOR** of the Archimedes Institute, between Mathematics and Computer Science, June 2020 / now.
- ORGANIZER OF THE WORKING GROUP AND OF THE SEMINAR** of number theory in Nancy 93/96, co-organizer of the working group/seminar TANYAH in Lille 1998/2015, and TAPAS in Marseille from 2016 onwards. TANYAH has been the theater of more than 250 lectures. The list of lecturers includes R. Balasubramanian, J. Cilleruelo, B. Green, H. Iwaniec, J.-M. De Koninck, K. Matsumoto, J.-C. Schlage-Puchta... This platform helped train several students.
- THESIS ADVISOR** for H. Kadiri 1999–2002, A. Saldana 2006–2009, D. Berkane 2009–2012, S. Saad Eddin 2009–2013, R. Vanlalangaia 2014–2015, F. Daval 2014–2018, S. Saad Eddin (Diplôme Supérieur de Recherches) 2013–2015, N. Debouzy 2015–2018, M. H. Betah 2015–2018
- MEMBER OF THE EDITORIAL COMMITTEE** of the *IMSc Lecture Notes series*, from 2012 onwards, of the *North-Western European Journal of Mathematics*, from 2014 onwards, and of *N’Autre Ecole / Question de Classe(s)*, from 2012 onwards. I wrote both public and work-flow side of the web site for NWEJM.
- CO-ORGANIZER OF THE NUMBER THEORY YEAR** (Chennai, India): fourteen one-month courses at IMSc from sep. 2010 to june 2012, more than 20 lecturers, a couple hundred hours of lectures now online covering Transcendental Number Theory, Diophantine Geometry, Analytic Number Theory, Additive Combinatorics and Modular Forms.
- CO-ORGANIZER OF INTERNATIONAL CONF.:** (Lille) 1997, 2001, 2008, 2009, (Warszawa) 2017 and (Paris) 2019.
- MEMBER OF** the selection and hiring committee of Lille 1 from 1998 to 2010, of Clermont-Ferrand 2020, head of such a committee in Marseille 2021.
- MEMBER OF** PhD/Habilitation juries 1998, 2006, 2009, 2010, 2013, 2015, 2016, 2017–2022 (France), 2013 (Switzerland), 2016 (Australia), 2018 (Canada), 2019 (India). Head of three of them.
- MEMBER OF** library committee in Nancy, Lille and Marseille, represent. at the uni. library, 1993–2016; member of the RNBM and speaker at several roundtables on scientific publications.
- MEMBER OF** diverse committees: IT (head of), internship, doctoral, prospective...

**SIEVE THEORY:**

- ON ŠNIREL'MAN'S CONSTANT, Ann. scuola sup. di Pisa 21 (1995) p. 645–705.
- ADDITIVE PROPERTIES OF DENSE SUBSETS OF SIFTED SEQUENCES, with I. Z. Ruzsa, J. T. N. Bordeaux 13 (2001), p. 559–581.
- EIGENVALUES IN THE LARGE SIEVE INEQUALITY, Funct. Approx. 37 (2007), p. 7–35.
- IMPROVING ON THE BRUN-TITCHMARSH THEOREM, with J.-C. Schlage-Puchta, Acta Arith. 131 (2007), p. 351–366.
- EIGENVALUES IN THE LARGE SIEVE INEQUALITY, II, J. T. N. Bordeaux 22 (2010), p. 181–196.
- ON BOMBIERI ASYMPTOTIC SIEVE, J. Number Theory 130 (2010), p. 1155–1189.
- ON LONG  $\kappa$ -TUPLES WITH FEW PRIME FACTORS, Proc. Lond. Math. Soc. 104 (2012), p. 158–196.
- ADDITIVE ENERGY OF DENSE SETS OF PRIMES AND MONOCHROMATIC SUMS, with D.S. Ramana, Israel J. of Mathematics 199 (2014), p. 955–974.
- ADDITIVE PROP. OF DENSE SUBSETS OF SIFTED SEQUENCES, Bull. Lond. Math. Soc. 45 (2013), p. 677–682.
- MONOCHROMATIC SUMS OF SQUARES, With G. Prakash & D.S Ramana, Math. Zeit. 289 (2018), p. 51–69.
- MODULAR TERNARY ADDITIVE PROBLEMS WITH IRREGULAR OR PRIME NUMBER, With G. Kasi Viswanadham, Proc. Steklov Inst. 314 (2021), p. 211–247.

**EXPLICIT ESTIMATES ON PRIMES OR ON MOEBIUS FUNCTION:**

- EXPLICIT BOUNDS ON EXPONENTIAL SUMS AND THE SCARCITY OF SQUAREFREE BINOMIAL COEFFICIENTS, with A.Granville, Matematika 43 (1996) p. 73–107.
- SUR UN THÉORÈME DE MERTENS, Manuscripta Math. 108 (2002), p. 495–513.
- SHORT EFFECTIVE INTERVALS CONTAINING PRIMES, with Y. Saouter J. Number Theory 98 (2003), p. 10–33.
- EXPLICIT ESTIMATES FOR THE SUMMATORY FUNCTION OF  $\frac{\Lambda(n)}{n}$  FROM THE ONE OF  $\Lambda(n)$ , Acta Arith. 159 (2013), p.113–122.
- ELEMENTARY EXPLICIT BOUNDS FOR TWO MOLLIFICATIONS OF MOEBIUS FUNCTION, Funct. Approx. 49 (2013), p.229–240.
- FROM EXPLICIT ESTIMATES FOR THE PRIMES TO EXPLICIT ESTIMATES FOR MOEBIUS FUNCTION, Acta Arith. 157 (2013), p.365–379.
- EXPLICIT ESTIMATES ON SUMMATORY FUNCTION OF MOEBIUS FUNCTION WITH COPRIMALITY RESTRICTIONS, Acta Arith. 165(2014), p.1–10.
- EXPLICIT ESTIMATES ON SEVERAL SUMMATORY FUNCTION INVOLVING MOEBIUS FUNCTION, Math. Comp. 84 (2015), p. 1359–1387.
- EXPLICIT ESTIMATES: FROM  $\Lambda(n)$  TO  $\Lambda(n)/n$  IN ARITHMETIC PROGRESSIONS, with D. Platt, 2015, 15 pp, Exp. Math..
- CHOWLA'S CONJECTURE: FROM THE LIOUVILLE FUNCTION TO THE MOEBIUS FUNCTION, Lecture Notes 2213 (2018), p. 317–323.
- ON THE MISSING LOG-FACTOR, Lecture Notes 2213 (2018), p. 293–315.
- QUANTITATIVE STEPS IN AXER-LANDAU EQUIVALENCE THEOREM, Acta Arith. 187 (2019), p. 293–315.
- EXPLICIT AVERAGE ORDERS: NEWS AND PROBLEMS, Proc. of N.Th. Week 2017, Banach Pub. 118 (2019), pages 153–179.

**L-SERIES / PRIMES IN ARITHMETIC PROGRESSIONS:**

- PRIMES IN ARITHMETIC PROGRESSIONS, with R.Rumely, Math. Comp. 65 (1996) p. 397–425.
- APPROXIMATE FORMULAE FOR  $L(1, \chi)$ , Acta Arith. 100 (2001), p. 245–266.
- APPROXIMATE FORMULAE FOR  $L(1, \chi)$ , II, Acta Arith. 112 (2004), p. 141–149.
- A PURELY ANALYTICAL LOWER BOUND FOR  $L(1, \chi)$ , Annales Mathématiques Blaise Pascal 16 (2009), p. 259–265.
- COMPARING  $L(s, \chi)$  WITH ITS TRUNCATED EULER PRODUCT AND GENERALIZATION, Funct. Approx. 42 (2010), p. 145–151.
- AN EXPLICIT DENSITY ESTIMATE FOR DIRICHLET  $L$ -SERIES, Math. Comp. 85 (2016), p. 325–356.
- PRODUCTS OF PRIMES IN ARITHMETIC PROGRESSION AND PARITY BREAKING, with A. Walker, J. T. N. Bordeaux (2016) p. 219–225.
- PRODUCTS OF PRIMES IN ARITHMETIC PROGRESSION, with Priyamvad Srivastav, App. by O. Serra, I.J.T.N. 16 (2020), p. 747–766.
- FAST MULTI-PRECISION COMPUTATION OF SOME EULER PRODUCTS, with S. Ettahri & L. Surel, Math. Comp. 90 (2021), p. 2247–2265.
- SAGE LIBRARY: COMPUTING LATTICE INVARIANT EULER PRODUCTS, (2020), 533 lines.
- ACCURATE COMPUTATIONS OF EULER PRODUCTS OVER PRIMES IN ARITHMETIC PROGRESSIONS, Functiones et Approximatio 61 (2021), p. 33–45.

**ARITHMETIC OF INTEGER MATRICES:**

- AVERAGE ORDERS OF MULTIPLICATIVE ARITHMETIC FUNCTIONS OF INTEGER MATRICES, with G.Bhowmik, Acta Arith. 66 (1994) p. 45–62.
- A TURÁN-KUBILIUS INEQUALITY FOR INTEGER MATRICES, with G. Bhowmik, J. Number Theory 73 (1998) p. 59–71.
- ALGEBRA OF MATRIX ARITHMETIC, with G. Bhowmik, J. of Algebra 210 (1998) p. 194–215.
- RATIONALITY OF THE ZETA FCT OF SUBGROUPS OF ABELIAN  $p$ -GROUPS, Pub. Math. Debrecen 90 (2017), p. 91–105.

## HARMONIC ANALYSIS / DISCREPANCY:

- ALMOST PERIODICITY OF SOME ERROR TERMS IN PRIME NUMBER THEORY**, with J. Kaczorowski, Acta Arith. 106 (2003), p. 277–297.
- ANALYSE DE FOURIER DES FRACTIONS CONTINUES À QUOTIENTS RESTREINTS**, with M. Queffelec, Ens. Math. 49 (2003), p. 335–356.
- FIBONACCI NUMBERS AND TRIGONOMETRICAL IDENTITIES**, with N. Garnier, Fibonacci Quat. 46/47 (2008), p. 56–61.
- GEOMETRY OF SPACES OF FUNCTIONS WITH PRIME FREQUENCY**, with P. Lefèvre and E. Matheron, Acta Math. Hung. 143 (2014), p. 75–80.
- TAUBERIAN OSCILLATION THEOREMS & DISTRIBUTION OF GOLDBACH NUMBERS**, with G. Bhowmik and J.-C. Schlage-Puchta, J.T.N. Bordeaux 28 (2016), p. 291–299.
- DISCREPANCY ESTIMATES FOR SOME LINEAR GENERALIZED MONOMIALS**, with R. Hofer, Acta Arith. 173 (2015) p. 183–196.
- MODIFIED TRUNCATED PERRON FORMULAE**, Ann. Blaise Pascal 33 (2016), p. 109–128.
- DISCREPANCY FOR GENERALIZED POLYNOMIALS**, with A. Mukhopadhyay & G.K. Viswanadham, Monath. Math. 187 (2018), p. 343–356.
- VARIANT OF TRUNCATED PERRON FORMULA/PRIMES IN POLYNOMIAL SETS**, with D.S. Ramana, I.J.N.T. 16 (2020), p. 309–323.
- PRODUCTS OF THREE PRIMES IN LARGE ARITHMETIC PROGRESSIONS**, with R. Balasubramanian & P. Srivastav, to appear in I.J.N.T. (2022), 16pp..

## POLYNOMIAL VALUES / NUMBER FIELDS:

- ON SUMS OF 7 CUBES**, with F. Bertault et P. Zimmermann, Math. Comp. 68 (1999) p. 1303–1310.
- NOMBRE DE RACINES D'UN POLYNÔME ENTIER MODULO  $q$** , with M. Branton, J. T. N. Bordeaux 10 (1998) p. 125–134.
- AN EXPLICIT SEVEN CUBE THEOREM**, Acta Arith. 118 (2005), p. 375–382.
- AN ASYMPTOTIC SEVEN CUBES THEOREM**, Manuscripta Math. 124 (2007), p. 59–75.
- COUNTING IDEALS IN RAY CLASSES**, with Sanoli Gun & Jyothsna Sivaraman, I.J.N.T. (2022), 21 pp..

## PROBLEMS WITH DIVISORS OR ARITHMETICAL FUNCTIONS:

- THE NUMBER OF RATIONAL NUMBERS DETERMINED BY LARGE SETS OF INTEGERS**, with J. Cilleruelo and D.S. Ramana, Bull. Lond. Math. Soc. 42 no 3 (2010), p. 517–526.
- EXPLICIT UPPER BOUNDS FOR THE REMAINDER IN THE DIVISOR PB**, with D. Berkane et O. Bordellès, Math. of Comp. 278 (2012), p. 1025–1051.
- EXPLICIT AVERAGES OF NON-NEGATIVE MULTIPLICATIVE FUNCTIONS: BEYOND MAIN TERM**, with Akh. P., Coll. Math. 147 (2017) p. 275–313.
- QUOTIENTS AND PRODUCTS OF THIN SUBSETS OF THE POSITIVE INTEGERS**, with J. J. Cilleruelo and D.S. Ramana, Proc. Steklov Inst. of Math. vol 296 (2017), p. 52–54; transl. in Tr. Mat. Inst. Steklova 296, 58–71 (2017).
- TAIL OF A MOEBIUS SUM WITH COPRIMALITY CONDITIONS**, with Akh. P., Integers (2017) 6 pp.
- THE NUMBER OF RATIONALS DETERMINED BY LARGE SETS OF SIFTED INTEGERS**, , Proceedings - Mathematical Sciences (Indian Academy of Sciences) (2022) 13 pp.

## COMBINATORIAL PROBLEMS:

- A STRONGER MODEL FOR PEG SOLITAIRE**, Mathematics Newsletter, vol. 32, (2022) p. 35–49.

## ● PAPERS BEING PROCESSED

- A modular analogue of a problem of Vinogradov*, with S. Drapeau, S. Ganguly & A. Ratnadeep, submitted 2020, 11 pp.
- Exponential sums over primes with multiplicative coefficients*, with K. Viswanadham, submitted, 2021, 45 pp.
- Notes on restriction theory in the primes*, submitted 2021, 15 pp.
- Addendum to A Modified Truncated Perron Summation Formula*, submitted 2021, 3 pp.
- Product of primes in arithmetic progressions, II*, with R. Balasubramanian & P. Srivastav, submitted 2022, 20 pp.
- A higher order Levin-Fainleib Theorem*, with A. Sedunova & R. Sharma, submitted 2022, 13 pp.
- Representing ideal classes of ray class groups by product of prime ideals of small size*, with Jean-Marc Deshouillers, Sanoli Gun & Jyothsna Sivaraman, submitted 2022, 35 pp.

## ● LARGE AUDIENCE

**ESTIMATION DE L'ORDRE MOYEN D'UNE FONCTION ARITHMÉTIQUE PAR LA MÉTHODE DE CONVOLUTION**, with P. Berment, RMS 212 (2012), 15pp.

**GOLDBACH ET LES SOMMES DE NOMBRES PREMIERS**, La Recherche 213 (2013), p. 68-71.

**PRIME NUMBERS: EMERGENCE AND VICTORIES OF BILINEAR FORMS DECOMPOSITION**, Newsletter of the EMS 90 (2013), p. 18-27.

**NOMBRES PREMIERS: ILS CACHENT UN ORDRE SECRET**, Conseiller de R. Ikonicoff, Sciences & Vie 1189 (2016), p. 74-77.

**LARGE AUDIENCE** conferences in primary (!) and secondary schools, in colleges/univ. in France and India. Coordinator for Maths en Jeans and Hippocampe traineeship. Mathematical stands in several places.

## ● BOOKS (AND TWO BOOK CHAPTERS)

*Cent et Un ans après Hadamard et de la Vallée-Poussin*, a chapter in “Les nombres – Problèmes anciens et actuels” (collection Mathématiques – Ellipses) (2000) p. 91–101.

*Variations modernes sur la suite des nombres premiers. De la densité des  $\sin(p)$  lorsque  $p$  parcourt l'ensemble des nombres premiers*, lulu.com, 2006, 105 pp.

*Arithmetical aspects of the large sieve inequality*, with the collaboration of D.S. Ramana, Harish Chandra Research Institute Lecture Notes 1 (January 2009), Hindustan Book Agency, 201+8 pp.

*Un parcours explicite en théorie multiplicative*, Éditions Universitaires Européennes, 2010, vii+100 pp.

*A sketch of H. Helfgott's proof of Goldbach's Ternary Conjecture*, in “Goldbach's Conjecture: Selected Topics” by M. Rassias, Springer 2016.

*Excursions in Multiplicative Number Theory*, book with the collaboration of P. Moree and Alisa Sedunova, Birkhäuser Advanced Texts Basler Lehrbücher 2022, 333+XXII pp.

## ● HIGH LEVEL COURSES

- 2005 Lille “Initiation au crible de Selberg”,
- 2005 HRI (Allahabad, India) “On the large sieve inequality”,
- 2008 HRI (Allahabad, India) “On the weighted sieve”,
- 2009 HRI (Allahabad, India) “On Bombieri's approach to the weighted sieve”,
- 2009 Lille “Initiation au grand crible”,
- 2009 Tunis (Tunisia) “On the Hoheisel Theorem”,
- 2010 IMSc (Chennai, India) “Introduction to the notion of local models and pseudo characters, with applications”,
- 2011 IMSc (Chennai, India) “On the weighted sieve”,
- 2011 IMSc (Chennai, India) “On the parity principle”,
- 2012 Nouakchott (Mauritania) “Average values of multiplicative functions: the elementary approach”,
- 2013 Monastir (Tunisia) “Séries de Dirichlet et transformées de Mellin en théorie analytique des nombres”,
- 2013 Nouakchott (Mauritania) “Average values of multiplicative functions: the analytical approach”,
- 2014 Lethbridge (Canada) “Selected topics in Analytic Number Theory”,
- 2016 IMSc (Chennai, India) “Montgomery's sieve”,
- 2020 KSOM (Kozhikode, India) “Topics in Multiplicative Number Theory”,
- 2022 ISI (Kolkata, India) “On the Transference Principle for Primes. Enveloping Sieve, Majorant Property and some Examples”.



## ● STUDENTS

1999/2003 (PHD)– HABIBA KADIRI

<http://www.cs.uleth.ca/~kadiri/>

*Une région explicite sans zéro pour les fonctions  $L$  de Dirichlet.*

2005 (M.PHIL)– JOSEPH BASQUIN *Autour du théorème de Brun-Titchmarsh.*

2006 (M.PHIL)– PATRICK LEMAIRE

*Petits intervalles contenant des premiers dans une progression arithmétique donnée.*

2006 (M.PHIL)– AMANDINE SALDANA

*Un théorème de Levin-Fainleib pour le crible d'Eratosthènes-Legendre.*

2006/2009 (PHD) – AMANDINE SALDANA

*Séries de Dirichlet à deux variables et distribution des valeurs de fonctions arithmétiques.*

2009 (M.PHIL) – VINCENT DEVINCK *Around an idea of Bombieri on the Selberg sieve.*

2009 (M.PHIL ENS CACHAN) – PERRINE BERMENT

*Estimation de l'ordre moyen d'une fonction arithmétique par la méthode de convolution.*

2010/2012 (PHD) CO-DIRECTOR A. DJEBBAR – DJAMEL BERKANE

*Valeurs moyennes de quelques fonctions arithmétiques.*

2010/2013 (PHD) – SUMAIA SAAD EDDIN

[http://www.researchgate.net/profile/Sumaia\\_Saad\\_Eddin](http://www.researchgate.net/profile/Sumaia_Saad_Eddin)

*On two problems concerning the Laurent-Stieltjes coefficients of Dirichlet  $L$ -series.*

2013/2015 (DIPLÔME SUPÉRIEUR DE RECHERCHES) – SUMAIA SAAD EDDIN

*Sur deux questions de théorie analytique des nombres.*

2014/2015 (PHD) – RAMDINMAWIA VANLALNGAIA

<http://www.hri.res.in/people/Mathematics/ramdinmawia>

*Fonctions de Hardy des séries  $L$  et sommes de Mertens explicites.*

2014/2017 (PHD) CO-DIRECTOR B. MARTIN – FLORIAN DAVAL

2016 (M.PHIL NOUAKCHOTT) – LEMINE INEJIH *Autour de l'inégalité de Polya-Vinogradov.*

2015/2018 (PHD) – NATHALIE DEBOUZY *Nb presque premiers jumeaux sous une conj. d'Elliott-Halberstam*

2015/2018 (PHD) CO-DIRECTOR M. A. BEDDI – MOHAMED HAYE BETAH

*Un théorème de Gallagher pour la fonction de Moebius.*

## ● EDITORIAL ACTIVITIES

IN THE EDITORIAL  
COMMITTEE OF

THE IMSC LECTURE NOTES SERIES

<http://www.hindbook.com/index.php/imsc-lecture-notes-series>

*A series of lectures notes from the Institute Math Science in Chennai.*

THE NORTH WESTERN JOURNAL OF MATHEMATICS

<http://math.univ-lille1.fr/~nwejm/>

*A high-level mathematical journal open to all areas of pure and applied mathematics including history of mathematics.*

N'AUTRE ÉCOLE / QUESTIONS DE CLASSE(S)

<http://www.questionsdeclasses.org/larevue/>

*In french. Une revue pédagogique, éducative et sociale.*

## ● ADDITIONAL ACTIVITIES

PARIEMACS

<https://ramare-olivier.github.io/ServeurPerso/GP-PARI/index.html>

*Two Emacs modes written to use jointly Emacs and Pari/GP.*

MATHEMATICAL GAMES

<https://ramare-olivier.github.io/Jeux/IndexJeux.html>

*Six games are being presented and partially analyzed.*

THE EMT-TME PROJECT

<https://tmeemt.github.io/Chest/>

*Fully explicit results in multiplicative number theory are often scattered through the literature. The aim of this project and site is to present an annotated bibliography in order to keep track of the current knowledge.*

## ● LANGUAGES

FRENCH : Native

ENGLISH : Fluent

GERMAN : Basic knowledge