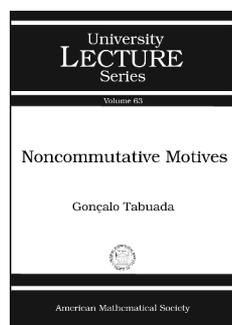


New Publications Offered by the AMS

To subscribe to email notification of new AMS publications, please go to www.ams.org/bookstore-email.

Algebra and Algebraic Geometry



Noncommutative Motives

Gonçalo Tabuada, *Massachusetts Institute of Technology, Cambridge, MA*

The theory of motives began in the early 1960s when Grothendieck envisioned the existence of a “universal cohomology theory of algebraic varieties”. The theory of noncommutative motives is more recent.

It began in the 1980s when the Moscow school (Beilinson, Bondal, Kapranov, Manin, and others) began the study of algebraic varieties via their derived categories of coherent sheaves, and continued in the 2000s when Kontsevich conjectured the existence of a “universal invariant of noncommutative algebraic varieties”.

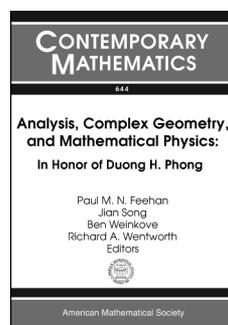
This book, prefaced by Yuri I. Manin, gives a rigorous overview of some of the main advances in the theory of noncommutative motives. It is divided into three main parts. The first part, which is of independent interest, is devoted to the study of DG categories from a homotopical viewpoint. The second part, written with an emphasis on examples and applications, covers the theory of noncommutative pure motives, noncommutative standard conjectures, noncommutative motivic Galois groups, and also the relations between these notions and their commutative counterparts. The last part is devoted to the theory of noncommutative mixed motives. The rigorous formalization of this latter theory requires the language of Grothendieck derivators, which, for the reader's convenience, is revised in a brief appendix.

Contents: Introduction; Differential graded categories; Additive invariants; Background on pure motives; Noncommutative pure motives; Noncommutative (standard) conjugates; Noncommutative motivic Galois groups; Jacobians of noncommutative Chow motives; Localizing invariants; Noncommutative mixed motives; Noncommutative motivic Hopf dg algebras; Appendix; Bibliography; Index.

University Lecture Series, Volume 63

October 2015, 114 pages, Softcover, ISBN: 978-1-4704-2397-1, LC 2015018204, 2010 *Mathematics Subject Classification*: 14A22, 14C15, 18D20; 18E30, 18G55, 19D55, **AMS members US\$35.20**, List US\$44, Order code ULECT/63

Analysis



Analysis, Complex Geometry, and Mathematical Physics

In Honor of Duong H. Phong

Paul M. N. Feehan and Jian Song, *Rutgers University, Piscataway, NJ*, Ben Weinkove, *Northwestern University, Evanston, IL*, and Richard A. Wentworth, *University of Maryland, College Park, MD*, Editors

This volume contains the proceedings of the Conference on Analysis, Complex Geometry and Mathematical Physics: In Honor of Duong H. Phong, which was held from May 7–11, 2013, at Columbia University, New York. The conference featured thirty speakers who spoke on a range of topics reflecting the breadth and depth of the research interests of Duong H. Phong on the occasion of his sixtieth birthday. A common thread, familiar from Phong's own work, was the focus on the interplay between the deep tools of analysis and the rich structures of geometry and physics.

Papers included in this volume cover topics such as the complex Monge-Ampère equation, pluripotential theory, geometric partial differential equations, theories of integral operators, integrable systems and perturbative superstring theory.

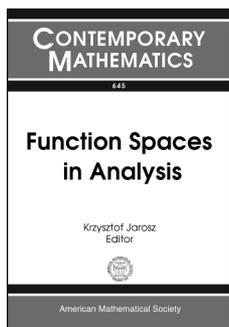
This item will also be of interest to those working in mathematical physics.

Contents: Z. Błocki, Bergman kernel and pluripotential theory; T. C. Collins and A. Jacob, On the convergence of the Sasaki-Ricci flow; Q. Dai, X.-J. Wang, and B. Zhou, The signed mean curvature measure; E. D'Hoker, Topics in two-loop superstring perturbation theory; P. Guan and X. S. Shen, A rigidity theorem for hypersurfaces in higher dimensional space forms; P. Eyssidieux, V. Guedj, and A. Zeriahi, Continuous approximation of quasisubharmonic functions; C. Hongler, K. Kytölä, and A. Zahabi, Discrete holomorphicity and Ising model operator formalism; A. Jacob, Stable Higgs bundles and Hermitian-Einstein metrics on non-Kähler manifolds; S. Kołodziej and N. N. Cuong, Weak solutions to the complex Monge-Ampère equation on Hermitian manifolds; C.-J. Liu and Z. Lu, Uniform

asymptotic expansion on Riemann surfaces; **X. Ma**, **G. Marinescu**, and **S. Zelditch**, Scaling asymptotics of heat kernels of line bundles; **L. Ni**, Parabolic frequency monotonicity and a theorem of Hardy-Pólya-Szegő; **M.-C. Shaw**, Topology of Dolbeault cohomology groups; **B. Shiffman**, Uniformly bounded orthonormal sections of positive line bundles on complex manifolds; **M. Taylor**, Poisson equations, uniformization, and geometrical optics; **V. Tosatti**, Non-Kähler Calabi-Yau manifolds; **Rakesh** and **G. Uhlmann**, The point source inverse back-scattering problem; **Y. Wang**, Local regularity of the complex Monge-Ampère equation; **E. Witten**, Notes on holomorphic string and superstring theory measures of low genus.

Contemporary Mathematics, Volume 644

August 2015, 359 pages, Softcover, ISBN: 978-1-4704-1464-1, LC 2014050310, 2010 *Mathematics Subject Classification*: 31C10, 32J25, 53C07, 35R01, 53C44, 53C55, 53C80, **AMS members US\$84**, List US\$105, Order code CONM/644



Function Spaces in Analysis

Krzysztof Jarosz, *Southern Illinois University at Edwardsville, IL*, Editor

This volume contains the proceedings of the Seventh Conference on Function Spaces, which was held from May 20–24, 2014 at Southern Illinois University at Edwardsville.

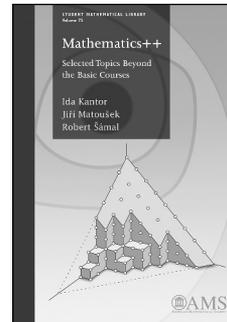
The papers cover a broad range of topics, including spaces and algebras of analytic functions of one and of many variables (and operators on such spaces), spaces of integrable functions, spaces of Banach-valued functions, isometries of function spaces, geometry of Banach spaces, and other related subjects.

Contents: **M. Abel**, On algebraic properties of the spectrum and spectral radius of elements in a unital algebra; **M. Abel**, Automatic continuity of surjective homomorphisms between topological algebras; **J. T. Anderson**, Characterization of holomorphic and meromorphic functions via maximum principles; **F. Botelho** and **J. Jamison**, Hermitian operators on $H_{\mathcal{H}}^p(\Delta^n)$; **J. A. Chávez-Domínguez** and **T. Oikherberg**, Some notions of transitivity for operator spaces; **J. Craig**, **J. F. Feinstein**, and **P. Patrick**, Removability of exceptional sets for differentiable and Lipschitz functions; **D. E. Edmunds** and **J. Lang**, Generalizing trigonometric functions from different points of view; **G. O. S. Ekhaguere**, Partial W^* -dynamical systems and their dilations; **J. F. Feinstein**, **S. Morley**, and **H. Yang**, Swiss cheeses and their applications; **O. Hatori**, Isometries on the special unitary group; **T. Høim** and **D. A. Robbins**, Amenability as a hereditary property in some algebras of vector-valued functions; **P. Jain**, **M. Singh**, and **A. P. Singh**, Weighted norm inequalities for Hardy type operators on monotone functions; **K. Jarosz**, Norms on normal function algebras; **A. Yu. Karlovich**, Maximally modulated singular integral operators and their applications to pseudodifferential operators on Banach function spaces; **S. G. Krantz**, Smoothness to the boundary of biholomorphic mappings: An overview; **K. Lee**, A multiplicative Banach-Stone theorem; **D. M. Luan** and **L. H. Khoi**, Weighted composition operators on weighted sequence spaces; **M. Mathieu** and **M. Young**, Spectral isometries into commutative Banach algebras; **O. Méndez**, Eigenvalues and eigenfunctions of the $p(\cdot)$ -Laplacian. A convergence analysis; **T. Miura**, Surjective isometries between function spaces; **D. C. Moore**, Endomorphisms and the Šilov representation; **R. Rahm** and **B. D. Wick**, The essential norm of operators on the Bergman

space of vector-valued functions on the unit ball; **S. K. Srivastava** and **U. Singh**, Trigonometric approximation of periodic functions belonging to weighted Lipschitz class $W(L^p, \Psi(t), \beta)$; **J. Wermer**, Analytic structure of polynomial hulls.

Contemporary Mathematics, Volume 645

August 2015, 301 pages, Softcover, ISBN: 978-1-4704-1694-2, LC 2015000884, 2010 *Mathematics Subject Classification*: 46B04, 46E10, 46E15, 46E25, 46E30, 46H05, 46J10, 46J15, **AMS members US\$84**, List US\$105, Order code CONM/645



Mathematics++

Selected Topics Beyond the Basic Courses

Ida Kantor, *Charles University, Prague, Czech Republic*, **Jiří Matoušek**, *Charles University, Prague, Czech Republic, and ETH, Zurich, Switzerland*, and **Robert Šámal**, *Charles University, Prague, Czech Republic*

Mathematics++ is a concise introduction to six selected areas of 20th century mathematics providing numerous modern mathematical tools used in contemporary research in computer science, engineering, and other fields. The areas are: measure theory, high-dimensional geometry, Fourier analysis, representations of groups, multivariate polynomials, and topology. For each of the areas, the authors introduce basic notions, examples, and results. The presentation is clear and accessible, stressing intuitive understanding, and it includes carefully selected exercises as an integral part. Theory is complemented by applications—some quite surprising—in theoretical computer science and discrete mathematics. The chapters are independent of one another and can be studied in any order.

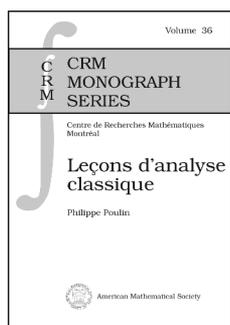
It is assumed that the reader has gone through the basic mathematics courses. Although the book was conceived while the authors were teaching Ph.D. students in theoretical computer science and discrete mathematics, it will be useful for a much wider audience, such as mathematicians specializing in other areas, mathematics students deciding what specialization to pursue, or experts in engineering or other fields.

This item will also be of interest to those working in algebra and algebraic geometry, number theory, and geometry and topology.

Contents: Measure and integral; High-dimensional geometry and measure concentration; Fourier analysis; Representations of finite groups; Polynomials; Topology; Index.

Student Mathematical Library, Volume 75

September 2015, 353 pages, Softcover, ISBN: 978-1-4704-2261-5, LC 2015016136, 2010 *Mathematics Subject Classification*: 14-01, 20Cxx, 28-01, 43-01, 52Axx, 54-01, 55-01, **AMS members US\$39.20**, **All Individuals US\$39.20**, List US\$49, Order code STML/75



Leçons d'analyse classique

Exposition d'un cours fait par Paul Koosis à l'Université McGill, Montréal

Philippe Poulin, *United Arab Emirates University, Al Ain, Abu Dhabi, United Arab Emirates*

Ce livre est basé sur un cours de deuxième cycle donné en 2005–2006 par M. Paul Koosis, professeur émérite à l'université McGill. Il traite de sujets soigneusement choisis par le professeur à l'intention de ceux qui, plutôt que de rechercher un catalogue exhaustif de résultats techniques et abstraits, veulent être initiés aux découvertes les plus essentielles et prolifiques de l'analyse classique du vingtième siècle. Analyse harmonique, quasi-analyticité, zéros des fonctions entières (dont une preuve inédite du théorème de Levinson–Cartwright), approximation pondérée, principe d'incertitude, mesures harmoniques... les résultats saillants et géniaux de l'analyse classique sont présentés dans un style soigné, rigoureux et détaillé, préparant les étudiants à des études plus poussées ; et au service du lecteur qui, connaissant les bases de la théorie de la mesure et de l'analyse complexe, désire suivre le merveilleux développement de M. Koosis et accroître sa connaissance du sujet.

Je reconnais les choix et le style de Paul Koosis, et j'aime beaucoup les deux. Le titre est volontairement modeste et hors-mode; ce qui fait l'originalité du livre est que, sous l'apparence du "classique", il échappe complètement aux modes actuelles. Il ne me paraît pas avoir d'équivalent, en aucune langue. C'est un beau cadeau au français...

—*Jean-Pierre Kahane, Université Paris-Sud Orsay, France*

This book is based on a graduate course given in 2005–2006 by Paul Koosis, Emeritus Professor at McGill University. It addresses topics carefully selected by Prof. Koosis and is intended for those who, far from seeking an exhaustive catalog of technical and abstract results, prefer to be initiated in the most essential and prolific discoveries of the 20th century in classical analysis. Harmonic analysis, quasi-analyticity, zeroes of classes of entire functions (including a new proof of the Levinson–Cartwright theorem), weighted approximation, gap theorems, harmonic measures, and other gems of classical analysis are presented in a rigorous, detailed, and elegant style. This work prepares students for more advanced studies and serves readers who, aware of the basics in measure theory and complex analysis, wish to follow Prof. Koosis in his marvelous development of the subject.

I recognize the choice and style of Paul Koosis, and I greatly appreciate both. The title is intentionally modest and out of fashion; the originality of the book is that, under the guise of the "classic", it completely avoids the current fashions. It does not appear to me to have its equivalent in any language. It is a beautiful gift to the French language...

—*Jean-Pierre Kahane, Université Paris-Sud Orsay, France*

Titles in this series are co-published with the Centre de Recherches Mathématiques.

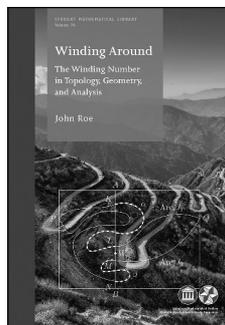
Contents: *Première partie Automne 2005:* Fonctions harmoniques et sous-harmoniques; Quasi-analyticité: le critère de Carleman–Ostrowski; Fonctions entières de type exponentiel: leurs zéros; *Seconde partie Hiver 2006:* Mesures rapidement décroissantes à l'infini, lacunarité de leurs transformées de Fourier; Mesures harmoniques; Problème de Dirichlet; Introduction aux longueurs

extrémales; Annexe A. Compléments; Annexe B. Devoirs; Bibliographie; Index.

CRM Monograph Series, Volume 36

September 2015, approximately 173 pages, Hardcover, ISBN: 978-1-4704-1993-6, 2010 *Mathematics Subject Classification:* 30-02; 30D20, **AMS members US\$87.20**, List US\$109, Order code CRMM/36

Geometry and Topology



Winding Around

The Winding Number in Topology, Geometry, and Analysis

John Roe, *Pennsylvania State University, State College, PA*

The *winding number* is one of the most basic invariants in topology. It measures the number of times a moving point P goes around a fixed point Q , provided that P travels on a path that never goes through Q and that the final position of P is the same as its starting position. This simple idea has far-reaching applications. The reader of this book will learn how the winding number can

- help us show that every polynomial equation has a root (the fundamental theorem of algebra),
- guarantee a fair division of three objects in space by a single planar cut (the ham sandwich theorem),
- explain why every simple closed curve has an inside and an outside (the Jordan curve theorem),
- relate calculus to curvature and the singularities of vector fields (the Hopf index theorem),
- allow one to subtract infinity from infinity and get a finite answer (Toeplitz operators),
- generalize to give a fundamental and beautiful insight into the topology of matrix groups (the Bott periodicity theorem).

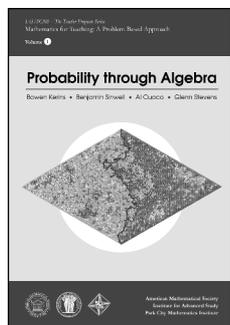
All these subjects and more are developed starting only from mathematics that is common in final-year undergraduate courses.

Contents: Prelude: Love, hate, and exponentials; Paths and homotopies; The winding number; Topology of the plane; Integrals and the winding number; Vector fields and the rotation number; The winding number in functional analysis; Coverings and the fundamental group; Coda: The Bott periodicity theorem; Linear algebra; Metric spaces; Extension and approximation theorems; Measure zero; Calculus on normed spaces; Hilbert space; Groups and graphs; Bibliography; Index.

Student Mathematical Library, Volume 76

September 2015, 269 pages, Softcover, ISBN: 978-1-4704-2198-4, LC 2015019246, 2010 *Mathematics Subject Classification:* 55M25; 57M05, 47A53, 58A10, 55N15, **AMS members US\$39.20**, **All Individuals US\$39.20**, List US\$49, Order code STML/76

Math Education



Probability through Algebra

Bowen Kerins, *Education Development Center Inc., Waltham, MA*, **Benjamin Sinwell**, *Pendleton High School, Anderson, SC*, **Al Cuoco**, *Education Development Center Inc., Waltham, MA*, and **Glenn Stevens**, *Cambridge, MA*

Designed for precollege teachers by a collaborative of teachers, educators, and mathematicians, *Probability through Algebra* is based on a course offered in the Summer School Teacher Program at the Park City Mathematics Institute.

But this book isn't a "course" in the traditional sense. It consists of a carefully sequenced collection of problem sets designed to develop several interconnected mathematical themes, and one of the goals of the problem sets is for readers to uncover these themes for themselves.

The specific themes developed in *Probability through Algebra* introduce readers to the algebraic properties of expected value and variance through analysis of games, to the use of generating functions and formal algebra as combinatorial tools, and to some applications of these ideas to questions in probabilistic number theory.

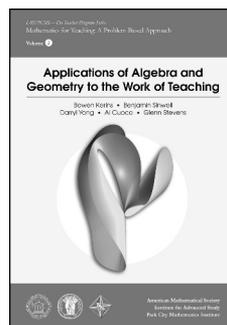
Probability through Algebra is a volume of the book series "IAS/PCMI-The Teacher Program Series" published by the American Mathematical Society. Each volume in that series covers the content of one *Summer School Teacher Program* year and is independent of the rest.

Titles in this series are co-published with the Institute for Advanced Study/Park City Mathematics Institute. Members of the Mathematical Association of America (MAA) and the National Council of Teachers of Mathematics (NCTM) receive a 20% discount from list price.

Contents: Problem sets; Facilitator notes; Teaching notes; Mathematical overview; Solutions.

IAS/PCMI-The Teacher Program Series, Volume 1

October 2015, approximately 175 pages, Softcover, ISBN: 978-1-4704-1925-7, 2010 *Mathematics Subject Classification*: 00-01; 00A07, **AMS members US\$23.20**, List US\$29, Order code SSTP/1



Applications of Algebra and Geometry to the Work of Teaching

Bowen Kerins, *Education Development Center Inc., Waltham, MA*, **Benjamin Sinwell**, *Pendleton High School, Anderson, SC*, **Darryl Yong**, *Harvey Mudd College, Claremont, CA*, **Al Cuoco**, *Education Development Center Inc., Waltham, MA*, and **Glenn Stevens**, *Cambridge, MA*

Designed for precollege teachers by a collaborative of teachers, educators, and mathematicians, *Applications of Algebra and Geometry to the Work of Teaching* is based on a course offered in the Summer School Teacher Program at the Park City Mathematics Institute.

But this book isn't a "course" in the traditional sense. It consists of a carefully sequenced collection of problem sets designed to develop several interconnected mathematical themes, and one of the goals of the problem sets is for readers to uncover these themes for themselves.

The specific theme developed in *Applications of Algebra and Geometry to the Work of Teaching* is the use of complex numbers—especially the arithmetic of Gaussian and Eisenstein integers—to investigate some questions that are at the intersection of algebra and geometry, like the classification of Pythagorean triples and the number of representations of an integer as the sum of two squares.

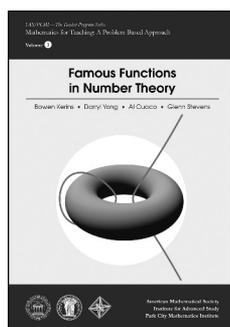
Applications of Algebra and Geometry to the Work of Teaching is a volume of the book series "IAS/PCMI-The Teacher Program Series" published by the American Mathematical Society. Each volume in that series covers the content of one *Summer School Teacher Program* year and is independent of the rest.

Titles in this series are co-published with the Institute for Advanced Study/Park City Mathematics Institute. Members of the Mathematical Association of America (MAA) and the National Council of Teachers of Mathematics (NCTM) receive a 20% discount from list price.

Contents: Problem sets; Facilitator notes; Teaching notes; Mathematical overview; Solutions.

IAS/PCMI-The Teacher Program Series, Volume 2

October 2015, approximately 205 pages, Softcover, ISBN: 978-1-4704-1924-0, 2010 *Mathematics Subject Classification*: 00-01; 00A07, **AMS members US\$23.20**, List US\$29, Order code SSTP/2



Famous Functions in Number Theory

Bowen Kerins, *Education Development Center Inc., Waltham, MA*, **Darryl Yong**, *Harvey Mudd College, Claremont, CA*, **Al Cuoco**, *Education Development Center Inc., Waltham, MA*, and **Glenn Stevens**, *Cambridge, MA*

Designed for precollege teachers by a collaborative of teachers, educators, and mathematicians, *Famous Functions in Number Theory* is based on a course offered in the Summer School Teacher Program at the Park City Mathematics Institute.

But this book isn't a "course" in the traditional sense. It consists of a carefully sequenced collection of problem sets designed to develop several interconnected mathematical themes, and one of the goals of the problem sets is for readers to uncover these themes for themselves.

Famous Functions in Number Theory introduces readers to the use of formal algebra in number theory. Through numerical experiments, participants learn how to use polynomial algebra as a bookkeeping mechanism that allows them to count divisors, build multiplicative functions, and compile multiplicative functions in a certain way that produces new ones. One capstone of the investigations is a beautiful result attributed to Fermat that determines the number of ways a positive integer can be written as a sum of two perfect squares.

Famous Functions in Number Theory is a volume of the book series "IAS/PCMI-The Teacher Program Series" published by the American Mathematical Society. Each volume in that series covers the content of one *Summer School Teacher Program* year and is independent of the rest.

Titles in this series are co-published with the Institute for Advanced Study/Park City Mathematics Institute. Members of the Mathematical Association of America (MAA) and the National Council of Teachers of Mathematics (NCTM) receive a 20% discount from list price.

Contents: Problem sets; Facilitator notes; Teaching notes; Mathematical overview; Solutions.

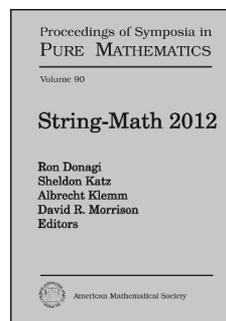
IAS/PCMI-The Teacher Program Series, Volume 3

October 2015, approximately 216 pages, Softcover, ISBN: 978-1-4704-2195-3, 2010 *Mathematics Subject Classification*: 00-01; 00A07, **AMS members US\$23.20**, List US\$29, Order code SSTP/3

Mathematical Physics

String-Math 2012

Ron Donagi, *University of Pennsylvania, Philadelphia, PA*, **Sheldon Katz**, *University of Illinois, Urbana-Champaign, IL*, **Albrecht Klemm**, *Bethe Center for Theoretical Physics, Bonn, Germany*, and **David R. Morrison**, *University of California, Santa Barbara, CA*, Editors



This volume contains the proceedings of the conference String-Math 2012, which was held July 16–21, 2012, at the Hausdorff Center for Mathematics, Universität Bonn. This was the second in a series of annual large meetings devoted to the interface of mathematics and string theory. These meetings have rapidly become the flagship conferences in the field.

Topics include super Riemann surfaces and their super moduli, generalized moonshine and K3 surfaces, the latest developments in supersymmetric and topological field theory, localization techniques, applications to knot theory, and many more.

The contributors include many leaders in the field, such as Sergio Cecotti, Matthias Gaberdiel, Rahul Pandharipande, Albert Schwarz, Anne Taormina, Johannes Walcher, Katrin Wendland, and Edward Witten.

This book will be essential reading for researchers and students in this area and for all mathematicians and string theorists who want to update themselves on developments in the math-string interface.

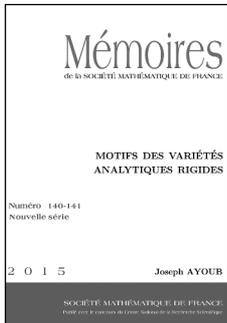
Contents: *Plenary talks:* **S. Cecotti**, The quiver approach to the BPS spectrum of a $4d\mathcal{N} = 2$ gauge theory; **R. Donagi** and **E. Witten**, Supermoduli space is not projected; **M. R. Gaberdiel**, **D. Persson**, and **R. Volpato**, Generalised moonshine and holomorphic orbifolds; **A. Marian**, **D. Oprea**, and **R. Pandharipande**, The first Chern class of the Verlinde bundles; **A. Schwarz**, **V. Vologodsky**, and **J. Walcher**, Framing the di-logarithm (over \mathbb{Z}); **A. Taormina** and **K. Wendland**, Symmetry-surfing the moduli space of Kummer K3s; **A. Torrielli**, Secret symmetries of AdS/CFT; *Contributed talks:* **I. Adam**, On the marginal deformations of general $(0, 2)$ non-linear sigma-models; **S. Alexandrov**, **J. Manschot**, **D. Persson**, and **B. Pioline**, Quantum hypermultiplet moduli spaces in $\mathcal{N} = 2$ string vacua: A review; **D. Andriot**, Non-geometric fluxes versus (non)-geometry; **C. I. Lazaroiu**, **E. M. Babalic**, and **I. A. Coman**, The geometric algebra of supersymmetric backgrounds; **N. Carqueville** and **D. Murfet**, A toolkit for defect computations in Landau-Ginzburg models; **W. Donovan**, Grassmannian twists, derived equivalences, and brane transport; **P. Fleig** and **A. Kleinschmidt**, Perturbative terms of Kac-Moody-Eisenstein series; **H. Fuji** and **P. Sułkowski**, Super- A -polynomial; **M. Huang**, On gauge theory and topological string in Nekrasov-Shatashvili limit; **A.-K. Kashani-Poor**, AGT and the topological string; **M. V. Movshev** and **A. Schwarz**, Generalized Chern-Simons action and maximally supersymmetric gauge theories.

Proceedings of Symposia in Pure Mathematics, Volume 90

October 2015, approximately 341 pages, Hardcover, ISBN: 978-0-8218-9495-8, LC 2015017523, 2010 *Mathematics Subject Classification*: 11G55, 14D21, 14F05, 14J28, 14M30, 32G15, 53D18, 57M27, 81T40, 83E30, **AMS members US\$96**, List US\$120, Order code PSPUM/90

New AMS-Distributed Publications

Algebra and Algebraic Geometry



Motifs des Variétés Analytiques Rigides

Joseph Ayoub, *Institut für Mathematik, Universität Zürich, Switzerland*

A note to readers: This book is in French.

In this work, the author extends the theory of motives, as developed by Voevodsky and Morel-Voevodsky, to the context of rigid analytic geometry over a complete nonarchimedean field.

The first chapter deals with the homotopical approach of Morel and Voevodsky. In this chapter the author discusses the construction of the motivic stable homotopy category of rigid analytic varieties and a complete description of this category in terms of algebraic motives when the base field has equal characteristic zero and its valuation is discrete.

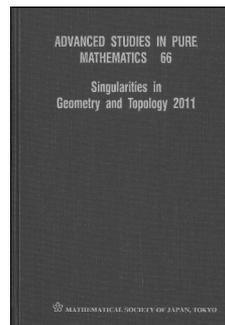
The second chapter deals with Voevodsky's approach based on transfers. In this chapter the author discusses the construction of the triangulated category of rigid analytic motives, and an extension to rigid analytic geometry of a large number of Voevodsky's fundamental results such as his theory of homotopy invariants presheaves with transfers.

The present work is a lot more than just a mere copy of the classical theory and the reader will find a lot of results that are new and specific to rigid analytic geometry.

A publication of the Société Mathématique de France, Marseille (SMF), distributed by the AMS in the U.S., Canada, and Mexico. Orders from other countries should be sent to the SMF. Members of the SMF receive a 30% discount from list.

Contents: Go to www.ams.org/bookstore.

Mémoires de la Société Mathématique de France, Number 140/141
June 2015, 386 pages, Softcover, ISBN: 978-2-85629-811-4, 2010 *Mathematics Subject Classification*: 14C15, 14C25, 14F20, 14F35, 14F42, 14G22, **AMS members** US\$72, List US\$90, Order code SMFMEM/140/141



Singularities in Geometry and Topology 2011

Vincent Blanlœil, *Université de Strasbourg I, France*, and Osamu Saeki, *Kyushu University, Fukuoka, Japan*, Editors

This book contains original and survey papers on Singularities in Geometry and

Topology, which resulted from the Sixth Franco-Japanese Symposium on Singularities, held in Fukuoka, from September 5–10, 2011.

Though singularity theory originated in the 19th century, this field of research became more popular in France after Heisuke Hironaka came to Paris. Then, many collaborations between Japanese and French mathematicians started, and the conferences on Singularities in Geometry and Topology continue to develop this collaboration between France and Japan.

This volume consists of two survey articles and 12 research articles whose topics include algebraic curves and varieties, line arrangements, mixed polynomials, algebraic local cohomology classes, stable maps, and mirror symmetry.

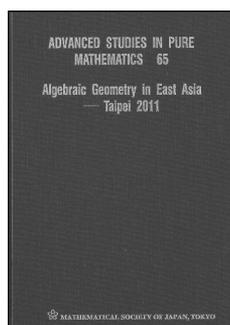
This item will also be of interest to those working in geometry and topology.

Published for the Mathematical Society of Japan by Kinokuniya, Tokyo, and distributed worldwide, except in Japan, by the AMS.

Contents: *I. Survey Articles:* M. R. Gonzalez-Dorrego, Smooth double subvarieties on singular varieties. II; T. Yamamoto, Survey of apparent contours of stable maps between surfaces; *II. Research Articles:* C. Beddani, Valuations divisorielles et connexité en codimension 1; A. Degtyarev, The Alexander module of a trigonal curve. II; A. Dimca, Monodromy of triple point line arrangements; K. Inaba, On fibered links of singularities of polar weighted homogeneous mixed polynomials; H. Ishida, On classes in the classification of curves on rational surfaces with respect to logarithmic plurigenera; A. Katanaga, The links specific to hypersurface simple $K3$ singularities; M. Kawashima, On $(4,3)$ line degenerated torus curves and torus decompositions; K. Nabeshima and S. Tajima, On the computation of algebraic local cohomology classes associated with semi-quasihomogeneous singularities; V. K. Nguyen, Some geometric-arithmetic aspects of separated variable curves; M. Oka, Mixed functions of strongly polar weighted homogeneous face type; T. Okuda, Singular fibers in barking families of degenerations of elliptic curves; A. Takahashi, Mirror symmetry between orbifold projective lines and cusp singularities.

Advanced Studies in Pure Mathematics, Volume 66

May 2015, 282 pages, Hardcover, ISBN: 978-4-86497-026-6, 2010 *Mathematics Subject Classification*: 57-06; 14-06, 32-06, 58-06, **AMS members** US\$52, List US\$65, Order code ASPM/66



Algebraic Geometry in East Asia—Taipei 2011

Jungkai Alfred Chen, *National Taiwan University, Taipei, Taiwan*,
Meng Chen, *Fudan University, Shanghai, People's Republic of China*,
Yujiro Kawamata, *University of Tokyo, Japan*, and
JongHae Keum, *Korea Institute for Advanced Study, Seoul, South Korea*, Editors

Algebraic geometry is a traditional and fast-developing research area in East Asia. There are many world-leading algebraic geometers, and an increasing number of active mathematicians in related areas, in East Asia, including China, Japan, Korea, Taiwan and Vietnam. The purpose of the Algebraic Geometry in East Asia conference series is to provide a platform for algebraic geometers in or near East Asia.

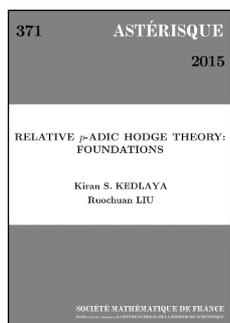
This volume contains the proceedings of the conference on Algebraic Geometry in East Asia, Taipei, which was held in November 2011 at the National Center for Theoretical Sciences (NCTS) in Taipei. The volume contains two survey articles and nine research articles. It provides the latest advances in algebraic geometry research in East Asia.

Published for the Mathematical Society of Japan by Kinokuniya, Tokyo, and distributed worldwide, except in Japan, by the AMS.

Contents: **J. A. Chen**, Three dimensional divisorial contractions; **Y. Kawamata**, Variation of mixed Hodge structures and the positivity for algebraic fiber spaces; **W. K. Cheong**, From GW invariants of symmetric product stacks to relative invariants of threefolds; **W.-Y. Chang**, ADHM sheaf theory and wallcrossing; **Y. Gongyo**, Remarks on the non-vanishing conjecture; **C. D. Hacon**, Singularities of pluri-theta divisors in Char $p > 0$; **J.-M. Hwang**, Dual cones of varieties of minimal rational tangents; **J. Keum**, \mathbb{Q} -homology projective planes with nodes or cusps; **Y. Lee** and **F. Polizzi**, Deformations of product-quotient surfaces and reconstruction of Todorov surfaces via \mathbb{Q} -Gorenstein smoothing; **K. Oguiso**, Free automorphisms of positive entropy on smooth Kähler surfaces; **M. Reid**, Gorenstein in codimension 4: the general structure theory.

Advanced Studies in Pure Mathematics, Volume 65

May 2015, 227 pages, Hardcover, ISBN: 978-4-86497-024-2, 2010 *Mathematics Subject Classification*: 14-06, **AMS members US\$43.20**, List US\$54, Order code ASPM/65



Relative p -adic Hodge Theory: Foundations

Kiran S. Kedlaya, *University of California, San Diego, La Jolla, CA*, and
Ruochuan Liu, *University of Michigan, Ann Arbor, MI*

The authors describe a new approach to relative p -adic Hodge theory based on systematic use of Witt vector constructions and nonarchimedean analytic geometry

in the style of both Berkovich and Huber. They give a thorough development of φ -modules over a relative Robba ring associated to a perfect Banach ring of characteristic p , including the relationship

between these objects and étale \mathbb{Z}_p -local systems and \mathbb{Q}_p -local systems on the algebraic and analytic spaces associated to the base ring, and the relationship between (pro-)étale cohomology and φ -cohomology. They also make a critical link to mixed characteristic by exhibiting an equivalence of tensor categories between the finite étale algebras over an arbitrary perfect Banach algebra over a nontrivially normed complete field of characteristic p and the finite étale algebras over a corresponding Banach \mathbb{Q}_p -algebra. This recovers the homeomorphism between the absolute Galois groups of $\mathbb{F}_p((\pi))$ and $\mathbb{Q}_p(\mu_{p^\infty})$ given by the field of norms construction of Fontaine and Wintenberger, as well as generalizations considered by Andreatta, Brinon, Faltings, Gabber, Ramero, Scholl, and, most recently, Scholze.

Using Huber's formalism of adic spaces and Scholze's formalism of perfectoid spaces, the authors globalize the constructions to give several descriptions of the étale local systems on analytic spaces over p -adic fields. One of these descriptions uses a relative version of the Fargues-Fontaine curve.

This item will also be of interest to those working in number theory.

A publication of the Société Mathématique de France, Marseilles (SMF), distributed by the AMS in the U.S., Canada, and Mexico. Orders from other countries should be sent to the SMF. Members of the SMF receive a 30% discount from list.

Contents: Go to www.ams.org/bookstore.

Astérisque, Number 371

May 2015, 239 pages, Softcover, ISBN: 978-2-85629-807-7, 2010 *Mathematics Subject Classification*: 11G25, 14G20, 14G22, **AMS members US\$76.80**, List US\$96, Order code AST/371

Discrete Mathematics and Combinatorics



De la Géométrie Algébrique aux Formes Automorphes (II)

Une collection d'articles en l'honneur du soixantième anniversaire de Gérard Laumon

Jean-Benoit Bost, *Université Paris-Sud, Orsay, France*, **Pascal Boyer**, *Université Paris 13, Villetaneuse, France*, **Alain Genestier**, *Université de Lorraine, Vandœuvre-lès-Nancy, France*, **Laurent Lafforgue**, *Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France*, **Sergey Lysenko**, *Université de Lorraine, Vandœuvre-lès-Nancy, France*, **Sophie Morel**, *Princeton University, NJ*, and **Báo Châu Ngô**, *University of Chicago, IL*, Editors

This volume contains the second part of the proceedings of the conference held at Paris-Sud University, Orsay, from June 25– June 29,

2012, to celebrate Gérard Laumon's 60th birthday. The range of subjects covered reflects the diversity and richness of the works and interests of Gérard Laumon: étale cohomology of schemes and stacks, l -adic sheaves and Fourier transform, character sheaves, classic and geometric Langlands correspondence, Grothendieck–Lefschetz trace formula, Arthur–Selberg trace formula, Shimura varieties, Higgs fibre bundles and Hitchin fibration.

This item will also be of interest to those working in number theory.

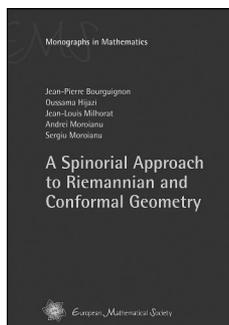
A publication of the Société Mathématique de France, Marseilles (SMF), distributed by the AMS in the U.S., Canada, and Mexico. Orders from other countries should be sent to the SMF. Members of the SMF receive a 30% discount from list.

Contents: Go to www.ams.org/bookstore.

Astérisque, Number 370

May 2015, 304 pages, Softcover, ISBN: 978-2-85629-806-0, 2010 *Mathematics Subject Classification*: 05E05, 11G15, 11G18, 14C30, 14D05, **AMS members US\$117.60**, List US\$147, Order code AST/370

Geometry and Topology



A Spinorial Approach to Riemannian and Conformal Geometry

Jean-Pierre Bourguignon, *Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France*, **Oussama Hijazi**, *Université de Lorraine, Vandœuvre-lès-Nancy, France*, **Jean-Louis Milhorat**, *Université de Nantes, France*, **Andrei Moroianu**, *Université de Versailles, St. Quentin, France*, and **Sergiu Moroianu**, *IMAR, Bucharest, Romania*

The book gives an elementary and comprehensive introduction to Spin Geometry, with particular emphasis on the Dirac operator, which plays a fundamental role in differential geometry and mathematical physics. After a self-contained presentation of the basic algebraic, geometrical, analytical and topological ingredients, a systematic study of the spectral properties of the Dirac operator on compact spin manifolds is carried out. The classical estimates on eigenvalues and their limiting cases are discussed next, highlighting the subtle interplay of spinors and special geometric structures. Several applications of these ideas are presented, including spinorial proofs of the Positive Mass Theorem or the classification of positive Kähler–Einstein contact manifolds. Representation theory is used to explicitly compute the Dirac spectrum of compact symmetric spaces.

The special features of the book include a unified treatment of Spin^c and conformal spin geometry (with special emphasis on the conformal covariance of the Dirac operator), an overview with proofs of the theory of elliptic differential operators on compact manifolds based on pseudodifferential calculus, a spinorial characterization of special geometries, and a self-contained presentation of the representation-theoretical tools needed in order to apprehend spinors.

This book will help advanced graduate students and researchers to get more familiar with this beautiful, though not sufficiently known,

domain of mathematics with great relevance to both theoretical physics and geometry.

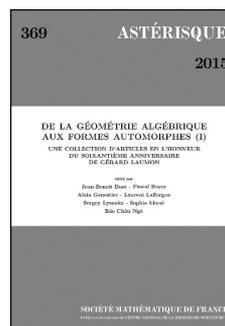
A publication of the European Mathematical Society (EMS). Distributed within the Americas by the American Mathematical Society.

Contents: Go to www.ams.org/bookstore.

EMS Monographs in Mathematics, Volume 6

June 2015, 462 pages, Hardcover, ISBN: 978-3-03719-136-1, 2010 *Mathematics Subject Classification*: 53C27, 53A30; 53C26, 53C55, 53C80, 17B10, 34L40, 35S05, **AMS members US\$69.60**, List US\$87, Order code EMSMONO/6

Number Theory



De la Géométrie Algébrique aux Formes Automorphes (I)

Une collection d'articles en l'honneur du soixantième anniversaire de Gérard Laumon

Jean-Benoit Bost, *Université Paris-Sud, Orsay, France*, **Pascal Boyer**, *Université Paris 13, Villetaneuse, France*, **Alain Genestier**, *Université de Lorraine, Vandœuvre-lès-Nancy, France*, **Laurent Lafforgue**, *Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France*, **Sergej Lysenko**, *Université de Lorraine, Vandœuvre-lès-Nancy, France*, **Sophie Morel**, *Princeton University, NJ*, and **Bào Châu Ngô**, *University of Chicago, IL*, Editors

This volume contains the first part of the proceedings of the conference held at Paris-Sud University, Orsay, from June 25–June 29, 2012, to celebrate Gérard Laumon's 60th birthday. The range of subjects covered reflects the diversity and richness of the works and interests of Gérard Laumon: étale cohomology of schemes and stacks, l -adic sheaves and Fourier transform, character sheaves, classic and geometric Langlands correspondence, Grothendieck–Lefschetz trace formula, Arthur–Selberg trace formula, Shimura varieties, Higgs fibre bundles and Hitchin fibration.

A publication of the Société Mathématique de France, Marseilles (SMF), distributed by the AMS in the U.S., Canada, and Mexico. Orders from other countries should be sent to the SMF. Members of the SMF receive a 30% discount from list.

Astérisque, Number 369

May 2015, 374 pages, Softcover, ISBN: 978-2-85629-805-3, 2010 *Mathematics Subject Classification*: 11F23, 11F70, 11F72, 11G18, 11R39, **AMS members US\$98.40**, List US\$123, Order code AST/369