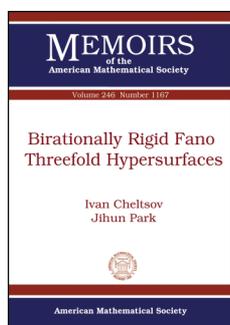


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Algebra and Algebraic Geometry



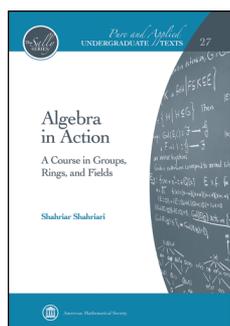
Birationally Rigid Fano Threefold Hypersurfaces

Ivan Cheltsov, *University of
Edinburgh, United Kingdom,* and
Jihun Park, *Pohang University of
Science and Technology, South
Korea*

Contents: Introduction; Smooth points
and curves; Singular points; Birational involutions; Proof of main
theorem; Epilogue; Bibliography.

Memoirs of the American Mathematical Society, Volume 246,
Number 1167

January 2017, 117 pages, Softcover, ISBN: 978-1-4704-2316-2,
2010 *Mathematics Subject Classification*: 14E07, 14E08, 14J30,
14J45, 14J70, **Individual member US\$45**, List US\$75, Institutional
member US\$60, Order code MEMO/246/1167



Algebra in Action

A Course in Groups, Rings,
and Fields

Shahriar Shahriari, *Pomona
College, Claremont, CA*

This text—based on the author's popular
courses at Pomona College—provides a
readable, student-friendly, and somewhat
sophisticated introduction to abstract
algebra. It is aimed at sophomore or junior undergraduates who
are seeing the material for the first time. In addition to the usual
definitions and theorems, there is ample discussion to help
students build intuition and learn how to think about the abstract
concepts. The book has over 1300 exercises and mini-projects of
varying degrees of difficulty, and, to facilitate active learning and

self-study, hints and short answers for many of the problems are
provided.

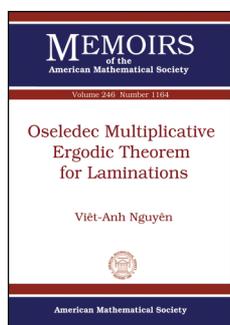
There are full solutions to over 100 problems in order to augment
the text and to model the writing of solutions. Lattice diagrams
are used throughout to visually demonstrate results and proof
techniques. The book covers groups, rings, and fields. In group
theory, group actions are the unifying theme and are introduced
early. Ring theory is motivated by what is needed for solving
Diophantine equations, and, in field theory, Galois theory and the
solubility of polynomials take center stage. In each area, the text
goes deep enough to demonstrate the power of abstract thinking
and to convince the reader that the subject is full of unexpected
results.

Contents: (*Mostly finite*) *group theory*: Four basic examples;
Groups: The basics; The alternating groups; Group actions; A
subgroup acts on the group: Cosets and Lagrange's theorem; A
group acts on itself: Counting and the conjugation of action;
Acting on subsets, cosets, and subgroups: The Sylow theorems;
Counting the number of orbits; The lattice of subgroups;
Acting on its subgroups: Normal subgroups and quotient
groups; Group homomorphisms; Using Sylow theorems to
analyze finite groups; Direct and semidirect products; Solvable
and nilpotent groups; (*Mostly commutative*) *ring theory*: Rings;
Homomorphisms, ideals, and quotient rings; Field of fractions
and localization; Factorization, EDs, PIDs, and UFDs; Polynomial
rings; Gaussian integers and (a little) number theory; *Field
and Galois theory*: Introducing field theory and Galois theory;
Field extensions; Straightedge and compass constructions;
Splitting fields and Galois groups; Galois, normal, and separable
extensions; Fundamental theorem of Galois theory; Finite
fields and cyclotomic extensions; Radical extensions, solvable
groups, and the quintic; Hints for selected problems; Short
answers for selected problems; Complete solutions for selected
(odd-numbered) problems; Bibliography; Index.

Pure and Applied Undergraduate Texts, Volume 27

April 2017, approximately 655 pages, Hardcover, ISBN: 978-1-4704-
2849-5, LC 2016036490, 2010 *Mathematics Subject Classification*:
00-01; 20-01, 13-01, 12-01, **AMS members US\$92**, List US\$115,
Order code AMSTEXT/27

Analysis



Oseledec Multiplicative Ergodic Theorem for Laminations

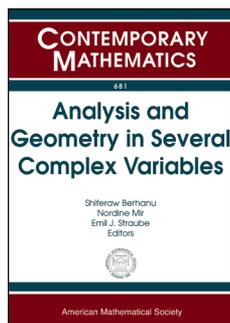
Viêt-Anh Nguyễn, *Université Paris Sud, Orsay, France*

Contents: Introduction; Background; Statement of the main results; Preparatory results; Leafwise Lyapunov

exponents; Splitting subbundles; Lyapunov forward filtrations; Lyapunov backward filtrations; Proof of the main results; Appendices; Bibliography; Index; Glossary of notation.

Memoirs of the American Mathematical Society, Volume 246, Number 1164

January 2017, 174 pages, Softcover, ISBN: 978-1-4704-2253-0, 2010 *Mathematics Subject Classification*: 37A30, 57R30; 58J35, 58J65, 60J65, **Individual member US\$45**, List US\$75, Institutional member US\$60, Order code MEMO/246/1164



Analysis and Geometry in Several Complex Variables

Shiferaw Berhanu, *Temple University, Philadelphia, PA*,
Nordine Mir, *Texas A&M University at Qatar, Doha, Qatar*,
and Emil J. Straube, *Texas A&M University, College Station, TX*,
Editors

This volume contains the proceedings of the workshop on Analysis and Geometry in Several Complex Variables, held from January 4–8, 2015, at Texas A&M University at Qatar, Doha, Qatar.

This volume covers many topics of current interest in several complex variables, CR geometry, and the related area of overdetermined systems of complex vector fields, as well as emerging trends in these areas.

Papers feature original research on diverse topics such as the rigidity of CR mappings, normal forms in CR geometry, the d-bar Neumann operator, asymptotic expansion of the Bergman kernel, and hypoellipticity of complex vector fields. Also included are two survey articles on complex Brunn-Minkowski theory and the regularity of systems of complex vector fields and their associated Laplacians.

Contents: B. Berndtsson, Real and complex Brunn-Minkowski theory; C. Campana, P. L. Dattori da Silva, and A. Mezzani, Properties of solutions of a class of hypocomplex vector fields; M. Çelik and Y. E. Zeytuncu, Analysis on the intersection of pseudoconvex domains; D. Chakrabarti and R. Shafikov, Distributional boundary values: some new perspectives; G. Della Sala, B. Lamel, and M. Reiter, Infinitesimal and local rigidity of mappings of CR manifolds; M. Derridj, On some systems of real or complex vector fields and their related Laplacians; P. Ebenfelt, On

the HJY gap conjecture in CR geometry vs. the SOS conjecture for polynomials; P. Gupta, Lower-dimensional Fefferman measures via the Bergman kernel; M. Kolar, I. Kossovskiy, and D. Zaitsev, Normal forms in Cauchy-Riemann geometry; S. Seto, Bergman kernel asymptotics through perturbation.

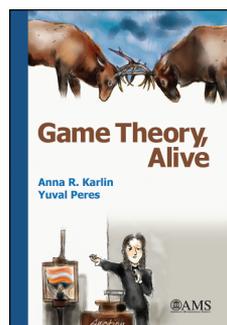
Contemporary Mathematics, Volume 681

February 2017, 184 pages, Softcover, ISBN: 978-1-4704-2255-4, LC 2016041074, 2010 *Mathematics Subject Classification*: 32H02, 32H40, 32T25, 32U05, 32V20, 32V40, 32W05, 32W10, **AMS members US\$88.80**, List US\$111, Order code CONM/681

Discrete Mathematics and Combinatorics

Game Theory, Alive

Anna R. Karlin, *University of Washington, Seattle, WA*, and
Yuval Peres, *Microsoft Research, Redmond, WA*



We live in a highly connected world with multiple self-interested agents interacting and myriad opportunities for conflict and cooperation. The goal of game theory is to understand these opportunities.

This book presents a rigorous introduction to the mathematics of game theory without losing sight of the joy of the subject. This is done by focusing on theoretical highlights (e.g., at least six Nobel Prize winning results are developed from scratch) and by presenting exciting connections of game theory to other fields such as computer science (algorithmic game theory), economics (auctions and matching markets), social choice (voting theory), biology (signaling and evolutionary stability), and learning theory. Both classical topics, such as zero-sum games, and modern topics, such as sponsored search auctions, are covered. Along the way, beautiful mathematical tools used in game theory are introduced, including convexity, fixed-point theorems, and probabilistic arguments.

The book is appropriate for a first course in game theory at either the undergraduate or graduate level, whether in mathematics, economics, computer science, engineering, or statistics. The importance of game-theoretic thinking transcends the academic setting—for every action we take, we must consider not only its direct effects, but also how it influences the incentives of others.

Game theory's influence is felt in a wide range of disciplines, and the authors deliver masterfully on the challenge of presenting both the breadth and coherence of its underlying world-view. The book achieves a remarkable synthesis, introducing the reader to the blend of economic insight, mathematical elegance, scientific impact, and counter-intuitive punch that characterizes game theory as a field.

—Jon Kleinberg, *Cornell University, 2006 Nevanlinna Prize winner*

A game theory textbook by people who love ... games! It covers many classic as well as recent topics of game theory. Its rigorous treatment, interspersed with illuminating examples, makes it a challenging pleasure to read.

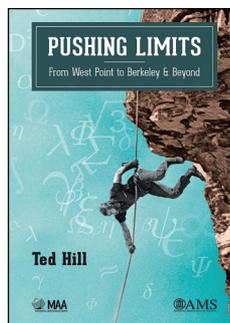
—Sergiu Hart, *The Hebrew University of Jerusalem*

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

Contents: *Analyzing games: Strategies and equilibria:* Combinatorial games; Two-person zero-sum games; Zero-sum games on graphs; General-sum games; Existence of Nash equilibria and fixed points; Games in extensive form; Evolutionary and correlated equilibria; The price of anarchy; Random-turn games; *Designing games and mechanisms:* Stable matching and allocation; Fair division; Cooperative games; Social choice and voting; Auctions; Truthful auction in win/lose settings; VCG and scoring rules; Matching markets; Adaptive decision making; Linear programming; Some useful probability tools; Convex functions; Solution sketches for selected exercises; Bibliography; Index.

April 2017, approximately 396 pages, Hardcover, ISBN: 978-1-4704-1982-0, LC 2016038151, 2010 *Mathematics Subject Classification:* 91A10, 91A12, 91A18, 91B12, 91A24, 91A43, 91A26, 91A28, 91A46, 91B26, **AMS members US\$60**, List US\$75, Order code MBK/101

General Interest



Pushing Limits

From West Point to Berkeley and Beyond

Ted Hill, Georgia Tech, Atlanta, GA, and Cal Poly, San Luis Obispo, CA

Pushing Limits: From West Point to Berkeley and Beyond challenges the myth that mathematicians lead dull

and ascetic lives. It recounts the unique odyssey of a noted mathematician who overcame military hurdles at West Point, Army Ranger School and the Vietnam War, and survived many civilian escapades—hitchhiking in third-world hotspots, fending off sharks in Bahamian reefs, and camping deep behind the forbidding Iron Curtain. From ultra-conservative West Point in the '60s to ultra-radical Berkeley in the '70s, and ultimately to genteel Georgia Tech in the '80s, this is the tale of an academic career as noteworthy for its offbeat adventures as for its teaching and research accomplishments. It brings to life the struggles and risks underlying mathematical research, the unparalleled thrill of making scientific breakthroughs, and the joy of sharing those discoveries around the world. Hill's book is packed with energy, humor, and suspense, both physical and intellectual. Anyone who is curious about how a maverick mathematician thinks, who wants to relive the zanier side of the '60s and '70s, who wants an armchair journey into the third world, or who seeks an unconventional viewpoint about some of our more revered institutions, will be drawn to this book.

... *captivating memoir reveals an intriguing character who is part Renaissance Man, part Huckleberry Finn. Fast-paced and often hilarious ... provides some penetrating and impious insights into some of our more revered institutions.*

—**Rick Atkinson, three-time Pulitzer Prize winner, author of *The Long Gray Line***

Ted Hill is unique in having both a very exciting internal mathematical life ... and an action-filled, adventurous, external life. ... his natural gift, very rare for mathematicians, of story-telling, [makes this] a page-turner.

—**Doron Zeilberger, Rutgers University, winner of MAA Ford Prize, AMS Steele Prize, and ICA Euler Medal**

Thoughtful, funny, evocative, Ted Hill, takes us through a life well-lived ... an intensely personal story that will appeal to every profession—and to every generation!

—**General Wesley Clark, former NATO Supreme Commander**

Ted Hill is an original. Mathematician. Adventurer. Activist. His life has seen both his mind and body tested to extremes ... insightful, entertaining and—in a very good way—unlike any other book you will ever read by a mathematician.

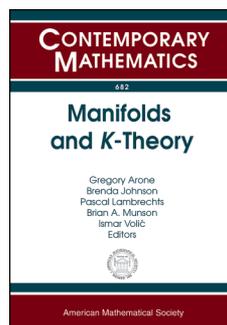
—**Alex Bellos, author of *Here's Looking at Euclid and The Grapes of Math***

This book is co-published with the Mathematical Association of America.

Contents: Photo section; Day of the handshakes; The star years; Out of the gates; Preparing for war; Vietnam; Return to reason; The Fulbright interlude; *Berzerkeley*; The apprenticeship; *Eurekas*; The global math guild; The math *Ohana*; The Penn State syndrome; Permanent sabbatical; Postscript.

April 2017, approximately 334 pages, Hardcover, ISBN: 978-1-4704-3584-4, 2010 *Mathematics Subject Classification:* 01A70, **AMS members US\$36**, List US\$45, Order code MBK/103

Geometry and Topology



Manifolds and K-Theory

Gregory Arone, University of Virginia, Charlottesville, VA, Brenda Johnson, Union College, Schenectady, NY, Pascal Lambrechts, Université Catholique de Louvain, Louvain-La-Neuve, Belgium, Brian A. Munson, United States Naval Academy, Annapolis, MD, and Ismar Volić, Wellesley College, MA, Editors

This volume contains the proceedings of the conference on Manifolds, K-Theory, and Related Topics, held from June 23–27, 2014, in Dubrovnik, Croatia.

The articles contained in this volume are a collection of research papers featuring recent advances in homotopy theory, K-theory, and their applications to manifolds. Topics covered include homotopy and manifold calculus, structured spectra, and their applications to group theory and the geometry of manifolds.

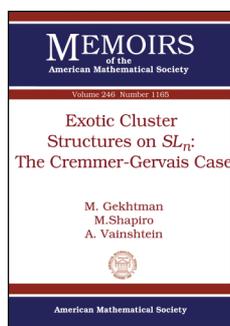
This volume is a tribute to the influence of Tom Goodwillie in these fields.

Contents: G. Arone and M. Ching, Manifolds, K-theory and the calculus of functors; J. E. Bergner and P. Hackney, Diagrams

encoding group actions on Γ -spaces; **S. Chang, S. Weinberger**, and **G. Yu**, Contractible manifolds with exotic positive scalar curvature behavior; **E. D. Farjoun** and **Y. Segev**, Relative Schur multipliers and universal extensions of group homomorphisms; **T. G. Goodwillie**, Scissors congruence with mixed dimensions; **J. R. Klein** and **S. Tilson**, On the moduli space of A_∞ -structures; **J. Noel**, Nilpotence in the symplectic bordism ring; **K. E. Pelatt** and **D. P. Sinha**, A geometric homology representative in the space of knots; **M. Szymik**, Brauer spaces for commutative rings and structured ring spectra; **H. L. Tanaka**, Bridgeland stability, 2-Segal spaces, and the Ran space of the line; **S. Tillmann** and **M. S. Weiss**, Occupants in manifolds.

Contemporary Mathematics, Volume 682

February 2017, 259 pages, Softcover, ISBN: 978-1-4704-1700-0, LC 2016041075, 2010 *Mathematics Subject Classification*: 18F25, 19D10, 52B45, 55P43, 55P65, 57R19, **AMS members US\$88.80**, List US\$111, Order code CONM/682



Exotic Cluster Structures on SL_n : The Cremmer-Gervais Case

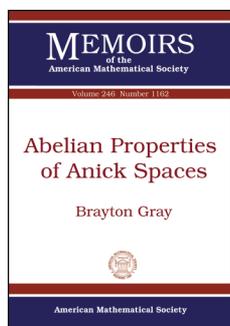
M. Gekhtman, *University of Notre Dame, IN*, **M. Shapiro**, *Michigan State University, East Lansing, MI*, and **A. Vainshtein**, *University of Haifa, Israel*

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

Contents: Introduction; Cluster structures and Poisson-Lie groups; Main result and the outline of the proof; Initial cluster; Initial quiver; Regularity; Quiver transformations; Technical results on cluster algebras; Bibliography.

Memoirs of the American Mathematical Society, Volume 246, Number 1165

January 2017, 94 pages, Softcover, ISBN: 978-1-4704-2258-5, 2010 *Mathematics Subject Classification*: 53D17, 13F60, **Individual member US\$45**, List US\$75, Institutional member US\$60, Order code MEMO/246/1165



Abelian Properties of Anick Spaces

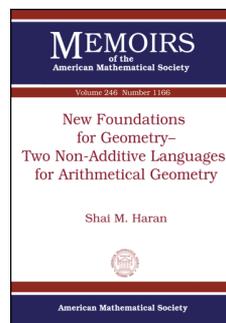
Brayton Gray, *University of Illinois, Chicago*

Contents: Introduction; Abelian structures; Whitehead products; Index p approximation; Simplification; Constructing γ_k ; Universal properties; Appendix A. The Case $n = 1$ and the Case $p = 3$; Bibliography; List of symbols.

Memoirs of the American Mathematical Society, Volume 246, Number 1162

January 2017, 111 pages, Softcover, ISBN: 978-1-4704-2308-7, LC 2016055094, 2010 *Mathematics Subject Classification*: 55Q15, 55Q20, 55Q51; 55Q40, 55Q52, 55R99, **Individual member US\$45**, List US\$75, Institutional member US\$60, Order code MEMO/246/1162

Logic and Foundations



New Foundations for Geometry—Two Non-Additive Languages for Arithmetical Geometry

Shai M. J. Haran, *Technion-Israel Institute of Technology, Technion Haifa, Israel*

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

Contents: Introduction; *Part I. \mathbb{F} -Rings:* Definition of \mathbb{F} -Rings; Appendix A; Examples of \mathbb{F} -Rings; Appendix B; Geometry; Symmetric geometry; Pro - limits; Vector bundles; Modules; *Part II. Generalized Rings:* Generalized Rings; Ideals; Primes and spectra; Localization and sheaves; Schemes; Products; Modules and differentials; Appendix C; Bibliography.

Memoirs of the American Mathematical Society, Volume 246, Number 1166

January 2017, 202 pages, Softcover, ISBN: 978-1-4704-2312-4, **Individual member US\$45**, List US\$75, Institutional member US\$60, Order code MEMO/246/1166

Mathematical Physics



It's About Time

Elementary Mathematical Aspects of Relativity

Roger Cooke, *University of Vermont, Burlington, VT*

This book has three main goals. First, it explores a selection of topics from the early period of the theory of relativity, focusing on particular aspects that are interesting or unusual. These include

the twin paradox; relativistic mechanics and its interaction with Maxwell's laws; the earliest triumphs of general relativity relating to the orbit of Mercury and the deflection of light passing near the sun; and the surprising bizarre metric of Kurt Gödel, in which time travel is possible. Second, it provides an exposition of the differential geometry needed to understand these topics on a level that is intended to be accessible to those with just two years of university-level mathematics as background. Third, it

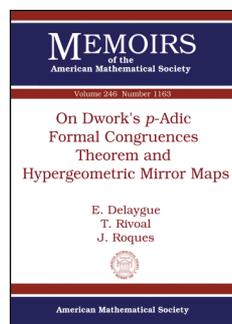
reflects on the historical development of the subject and its significance for our understanding of what reality is and how we can know about the physical universe. The book also takes note of historical prefigurations of relativity, such as Euler's 1744 result that a particle moving on a surface and subject to no tangential acceleration will move along a geodesic, and the work of Lorentz and Poincaré on space-time coordinate transformations between two observers in motion at constant relative velocity.

The book is aimed at advanced undergraduate mathematics, science, and engineering majors (and, of course, at any interested person who knows a little university-level mathematics). The reader is assumed to know the rudiments of advanced calculus, a few techniques for solving differential equations, some linear algebra, and basics of set theory and groups.

Contents: *The special theory:* Time, space, and space-time; Relativistic mechanics; Electromagnetic theory; *The general theory:* Precession and deflection; Concepts of curvature, 1700–1850; Concepts of curvature, 1850–1950; The geometrization of gravity; *Historical and philosophical context:* Experiments, chronology, metaphysics; Bibliography; Subject index; Name index.

April 2017, approximately 410 pages, Hardcover, ISBN: 978-1-4704-3483-0, LC 2016038198, 2010 *Mathematics Subject Classification:* 83-01, 01-01, **AMS members US\$60**, List US\$75, Order code MBK/102

Number Theory



On Dwork's p -Adic Formal Congruences Theorem and Hypergeometric Mirror Maps

E. Delaygue, *Université Claude Bernard Lyon 1, Villeurbanne, France*, **T. Rivoal**, *CNRS and Université Grenoble Alpes, France*, and **J. Roques**, *CNRS and Université Grenoble Alpes, France*

Contents: Introduction; Statements of the main results; Structure of the paper; Comments on the main results, comparison with previous results and open questions; The p -adic valuation of Pochhammer symbols; Proof of Theorem 4; Formal congruences; Proof of Theorem 6; Proof of Theorem 9; Proof of Theorem 12; Proof of Theorem 8; Proof of Theorem 10; Proof of Corollary 14; Bibliography.

Memoirs of the American Mathematical Society, Volume 246, Number 1163

January 2017, 94 pages, Softcover, ISBN: 978-1-4704-2300-1, LC 2016055098, 2010 *Mathematics Subject Classification:* 11S80; 14J32, 33C70, **Individual member US\$45**, List US\$75, Institutional member US\$60, Order code MEMO/246/1163



香港中文大學
The Chinese University of Hong Kong

Department of Mathematics

Founded in 1963, The Chinese University of Hong Kong (CUHK) is a forward-looking comprehensive research university with a global vision and a mission to combine tradition with modernity, and to bring together China and the West.

The Department of Mathematics in CUHK has developed a strong reputation in teaching and research. Many faculty members are internationally renowned and are recipients of prestigious awards and honors. The graduates are successful in both academia and industry. The Department is highly ranked internationally. According to the latest rankings, the Department is 39th in the Academic Ranking of World Universities, 27th in the QS World University Rankings and 28th in the US News Rankings.

(1) Associate Professor / Assistant Professor

(Ref. 16000267) (Closing date: June 30, 2017)

Applications are invited for a substantiable-track faculty position at the Associate Professor / Assistant Professor level. Candidates with strong evidence of outstanding research accomplishments and promise in both research and teaching in Optimization or related fields in Applied Mathematics are encouraged to apply.

Appointment will normally be made on contract basis for up to three years initially commencing August 2017, which, subject to mutual agreement, may lead to longer-term appointment or substantiation later.

(2) Research Assistant Professor

(Ref. 1600027V) (Closing date: June 30, 2017)

Applications are invited for a position of Research Assistant Professor in all areas of Mathematics. Applicants should have a relevant PhD degree and good potential for research and teaching.

Appointment will initially be made on contract basis for up to three years commencing August 2017, renewable subject to mutual agreement.

For posts (1) and (2): The applications will be considered on a continuing basis but candidates are encouraged to apply by January 31, 2017.

Application Procedure

The University only accepts and considers applications submitted online for the posts above. For more information and to apply online, please visit <http://career.cuhk.edu.hk>.