

EMS Press New Books 2025



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We have published over 260 books in mathematics since 2003, in both print and digital formats. Our books programme is mainly organised in series, including monographs, graduate texts, collected volumes, lecture notes as well as textbooks. Presented here are new additions to our programme in 2025.

The Regularity Theory for the Mumford–Shah Functional on the Plane

Camillo De Lellis (Institute for Advanced Study, Princeton, USA),
Matteo Focardi (Università degli Studi di Firenze, Italy)

EMS Monographs in Mathematics

ISBN 978-3-98547-089-1 | eISBN 978-3-98547-589-6 | 266 pp. | Hardcover | €69 | \$75

This monograph provides a detailed, up-to-date account of the *Mumford–Shah functional*, a key tool in image segmentation, focusing on the planar case. Beginning with existence results for minimizers, it delves into the structure and smoothness of discontinuity sets using ε -regularity techniques. The authors revisit foundational literature

and introduce arguments to clarify and advance current understanding of the minimization problem. Several consequences of the ε -regularity theory are also investigated, in particular leading to different characterizations of the Mumford–Shah conjecture.

From Differential Geometry to Relativity

Levi-Civita's Lectures on the Absolute Differential Calculus, 1925–1928

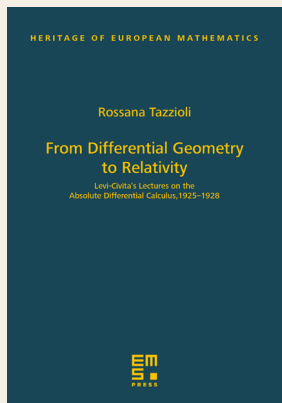
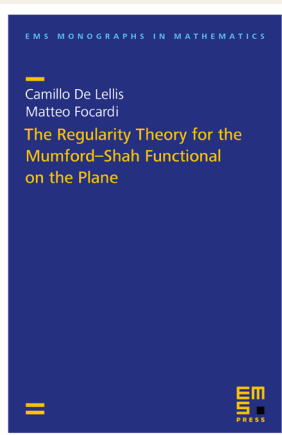
Rossana Tazzioli (Université de Lille, Villeneuve d'Ascq, France)

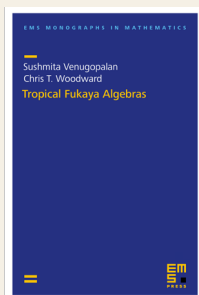
Heritage of European Mathematics

ISBN 978-3-98547-092-1 | eISBN 978-3-98547-592-6 | 535 pp. | Hardcover | €99 | \$109

This volume explores the scientific legacy of Tullio Levi-Civita, using his lectures on tensor calculus to illuminate key developments in differential geometry, relativity, and Italian mathematical pedagogy from 1870 to 1930. It traces how Levi-Civita's teaching and research intertwined, emphasizing his role in shaping tensor calculus and its applications in Einstein's theories. Drawing on extensive archival

material – including unpublished correspondence and collaborations with figures like Enrico Fermi – the book offers new insights into his influence on students, international scholars, and the early Italian theoretical physics community. It will appeal to historians of mathematics, mathematicians, physicists, and readers interested in the foundations of modern geometry.





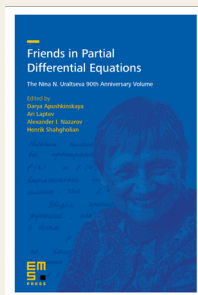
Tropical Fukaya Algebras

Sushmita Venugopalan (Institute of Mathematical Sciences, Chennai, India),
Chris T. Woodward (Rutgers, The State University of New Jersey, New Brunswick, USA)

EMS Monographs in Mathematics

ISBN 978-3-98547-093-8 | eISBN 978-3-98547-593-3 | 377 pp. | Hardcover
€ 79 | \$ 89

This book develops a tropical version of the Fukaya algebra of a Lagrangian submanifold. In particular, the book contains a study of the behavior of pseudoholomorphic disks with Lagrangian boundary conditions under multi-directional neck-stretching, corresponding to a multiple cut operation on a symplectic manifold. The limit objects under the neck-stretching, called broken disks, consist of pseudoholomorphic maps, as well as certain tropical graphs. The results are applied to give various computations of disk potentials, such as those of Lagrangians in cubic surfaces and flag varieties. It will interest readers working at the interface of symplectic geometry, mirror symmetry, and tropical geometry.



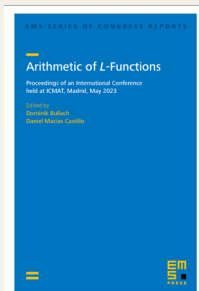
Friends in Partial Differential Equations

The Nina N. Uraltseva 90th Anniversary Volume

Editors: D. Apushkinskaya (RUDN University, Russia),
A. Laptev (Imperial College, UK and Sirius University, Russia),
A. I. Nazarov (St. Petersburg Dept. of Steklov Inst. of Math. and St. Petersburg State University, Russia),
H. Shahgholian (KTH, Sweden)

ISBN 978-3-98547-094-5 | eISBN 978-3-98547-594-0 387 pp. | Hardcover
€ 89 | \$ 95

This volume honors Nina N. Uraltseva on her 90th birthday, gathering contributions from colleagues and collaborators working in areas central to her legacy. The chapters reflect current advances in elliptic and parabolic partial differential equations, variational inequalities, and free boundary problems – fields where Uraltseva's work has been foundational. Topics include regularity theory, bifurcation phenomena, geometric and degenerate equations, and applications from transportation networks to population models. The volume also features a biographical overview of Uraltseva's influential role in the mathematical community. It is intended for researchers in analysis, PDEs, and applied mathematics.



Arithmetic of L -Functions

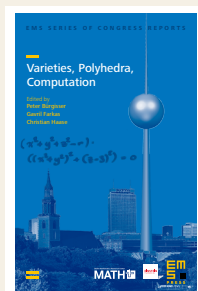
Proceedings of an International Conference held at ICMAT, Madrid, May 2023

Editors: Dominik Bullach (University College London, UK), Daniel Macías Castillo (Institute of Mathematical Sciences, Madrid, Spain)

EMS Series of Congress Reports

ISBN 978-3-98547-084-6 | eISBN 978-3-98547-584-1 | 366 pp. | Hardcover
€ 89 | \$ 95

This volume presents articles from a 2023 conference at ICMAT (Madrid), on the connections between special values of L -functions and algebraic invariants of Galois representations. Covering themes such as Iwasawa theory, Euler systems, p -adic L -functions, reciprocity laws, and étale cohomology, current advances in algebraic number theory and arithmetic geometry are discussed, as well as work on special L -values in positive characteristic, highlighting emerging directions in global function field arithmetic. It offers to researchers and advanced students both technical results and comprehensive overviews of active research topics.



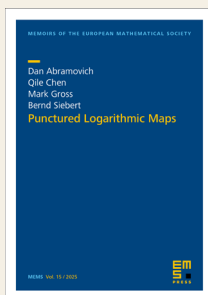
Varieties, Polyhedra, Computation

Editors: Peter Bürgisser (Technische Universität Berlin, Germany), Gavril Farkas (Humboldt-Universität zu Berlin, Germany), Christian Haase (Freie Universität Berlin, Germany)

EMS Series of Congress Reports

ISBN 978-3-98547-096-9 | eISBN 978-3-98547-596-4 | Hardcover
€ 99 | \$ 109

This volume collects contributions from the thematic Einstein semester on algebraic geometry that took place in the winter semester 2019/2020 in Berlin, Germany and was devoted to interactions of algebraic geometry with other fields as well as applications with a potential impact from/on algebraic geometric methods. Following the semester's topics, the present volume includes a selection of important survey and research articles by leading researchers in the field, which will be of interest to both young and experienced mathematicians working in algebraic geometry and its applications.



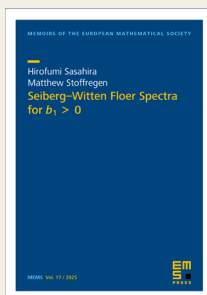
Punctured Logarithmic Maps

Dan Abramovich (Brown University, Providence, USA), Qile Chen (Boston College, Chestnut Hill, USA), Mark Gross (University of Cambridge, UK), Bernd Siebert (The University of Texas at Austin, USA)

Memoirs of the European Mathematical Society

ISBN 978-3-98547-086-0 | eISBN 978-3-98547-586-5 | 164 pp. | Softcover
€ 69 | \$ 75

This memoir develops a foundational theory of punctured logarithmic maps, a tool in algebraic geometry that helps in studying how curves behave near “infinity” or along divisors. These maps are central to modern approaches to logarithmic Gromov–Witten theory and tropical geometry. The authors construct moduli spaces for such maps, establish a framework for computing intersection-theoretic invariants, and prove gluing formulas essential for breaking complex computations into simpler parts. The results have various applications in enumerative geometry and mirror symmetry.



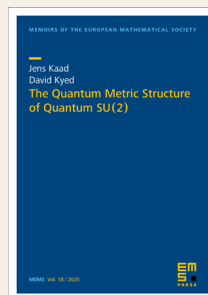
Seiberg–Witten Floer Spectra for $b_1 > 0$

Hirofumi Sasahira (Kyushu University, Fukuoka, Japan), Matthew Stoffregen (Michigan State University, East Lansing, USA)

Memoirs of the European Mathematical Society

ISBN 978-3-98547-087-7 | eISBN 978-3-98547-587-2 | 151 pp. | Softcover
€ 69 | \$ 75

This memoir constructs the Seiberg–Witten Floer spectrum – a refined invariant from topological quantum field theory – for 3-manifolds with first Betti number $b_1 > 0$, under conditions that their spin^c structure’s first Chern class is torsion and a triple-cup product vanishes. This extends earlier work that applied only to manifolds with $b_1 = 0$. Using analytical and homotopy-theoretic techniques, the authors define Bauer–Furuta maps between spectra for 4-dimensional cobordisms, leading to intersection-form inequalities across manifold boundaries. They also compute examples of the new invariants and conjecture their relation to monopole Floer homology.



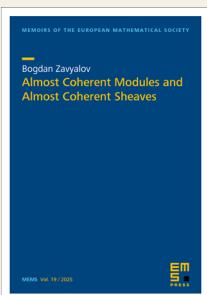
The Quantum Metric Structure of Quantum SU(2)

Jens Kaad (University of Southern Denmark, Odense, Denmark), David Kyed (University of Southern Denmark, Odense, Denmark)

Memoirs of the European Mathematical Society

ISBN 978-3-98547-091-4 | eISBN 978-3-98547-591-9 | 127 pp. | Softcover
€ 69 | \$ 75

This memoir offers a comprehensive treatment of quantum metrics on the compact quantum group SU(2), a central object in noncommutative geometry. It explores how to define and study “distance” in a quantum setting, using tools like spectral triples, the Berezin transform, and quantum Gromov–Hausdorff convergence. The authors establish continuity results and develop explicit metric structures that illuminate the geometric features of quantum SU(2). The work connects operator algebras, quantum geometry, and mathematical physics in a precise and structured way.



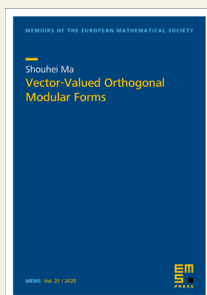
Almost Coherent Modules and Almost Coherent Sheaves

Bogdan Zavyalov (Princeton University and Institute for Advanced Study, Princeton, USA)

Memoirs of the European Mathematical Society

ISBN 978-3-98547-088-4 | eISBN 978-3-98547-588-9 | 314 pp. | Softcover
€ 69 | \$ 75

This memoir advances the theory of almost mathematics, extending key concepts like coherence from classical algebraic geometry to the “almost” setting. It introduces almost coherent modules and sheaves on schemes and formal schemes, and shows that foundational results – such as proper mapping, GAGA, and duality theorems – admit meaningful analogues. A central application is to p -adic nearby cycles, providing a new proof of Scholze’s finiteness result for étale cohomology in rigid-analytic geometry.

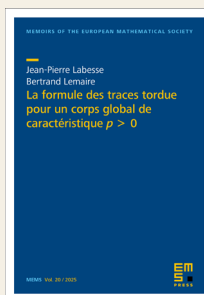


Vector-Valued Orthogonal Modular Forms

Shouhei Ma (Tokyo Institute of Technology, Japan)

Memoirs of the European Mathematical Society

ISBN 978-3-98547-095-2 | eISBN 978-3-98547-595-7 | 155 pp. | Softcover
€69 | \$75



La formule des traces tordue pour un corps global de caractéristique $p > 0$

Jean-Pierre Labesse (Aix-Marseille Université, Marseille, France), Bertrand Lemaire (Aix-Marseille Université, Marseille, France)

Memoirs of the European Mathematical Society

ISBN 978-3-98547-090-7 | eISBN 978-3-98547-590-2 | 219 pp. | Softcover
€69 | \$75

This memoir develops the theory of modular forms that take values in vector spaces for orthogonal groups of signature $(2, n)$. It introduces key geometric structures such as Hodge bundles, and analyzes modular forms using tools like Siegel operators, Fourier–Jacobi expansions, and integrals. The work leads to vanishing theorems for low-weight forms, including the sharp result that holomorphic tensor fields must vanish when their degree is below $n/2-1$. This study deepens the connections between modular forms, algebraic geometry, and representation theory.

This memoir extends to the setting of global fields of positive characteristic (that is, function fields over finite fields) the twisted trace formula theory, originally developed over number fields in the *Friday Morning Seminar* (IAS Princeton 1983–1984) and later written up by Labesse and Waldspurger. This work lays the groundwork for future developments toward the stabilized form of the twisted trace formula over function fields, which is essential for many arithmetic and representation-theoretic applications.

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