Kenji Nakanishi (Kyoto University, Japan) and Wilhelm Schlag (University of Chicago, USA)
Invariant Manifolds and Dispersive Hamiltonian Evolution Equations (Zurich Lectures in Advanced Mathematics)

ISBN 978-3-03719-095-1. 2011. 258 pages. Softcover. 17 cm x 24 cm. $48.00

This monograph is based on recent research by the authors and the proofs rely on an interplay between the variational structure of the ground states on the one hand, and the nonlinear hyperbolic dynamics near these states on the other hand. A key element in the proof is a virial-type argument excluding almost homoclinic orbits originating near the ground states, and returning to them, possibly after a long excursion.
These lectures are suitable for graduate students and researchers in partial differential equations and mathematical physics. For the cubic Klein–Gordon equation in three dimensions all details are provided, including the derivation of Strichartz estimates for the free equation.
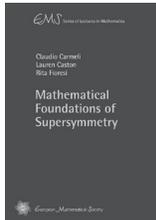
Claudio Carmeli (University of Genova, Italy), Lauren Caston (RAND Corporation, Santa Monica, CA, USA) and Rita Fioresi (University of Bologna, Italy)
Mathematical Foundations of Supersymmetry (EMS Series of Lectures in Mathematics)

ISBN 978-3-03719-097-7. 2011. 300 pages. Softcover. 17 cm x 24 cm. $58.00

Supersymmetry is a highly active area of considerable interest among physicists and mathematicians. It is not only fascinating in its own right, but there is also indication that it plays a fundamental role in the physics of elementary particles and gravitation. The purpose of the book is to lay down the foundations of the subject, providing the reader with a comprehensive introduction to the language and techniques, with a special attention to giving detailed proofs and many clarifying examples. It is aimed ideally at a second year graduate student. After the first three introductory chapters, the text divides into two parts: the theory of smooth supermanifolds and Lie supergroups, including the Frobenius theorem, and the theory of algebraic superschemes and supergroups.
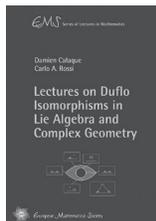
Damien Calaque (ETH Zurich, Switzerland) and Carlo A. Rossi (Max Planck Institute for Mathematics, Bonn, Germany)
Lectures on Duflo Isomorphisms in Lie Algebra and Complex Geometry (EMS Series of Lectures in Mathematics)

ISBN 978-3-03719-096-8. 2011. 114 pages. Softcover. 17 cm x 24 cm. $32.00

Duflo isomorphism first appeared in Lie theory and representation theory. It is an isomorphism between invariant polynomials of a Lie algebra and the center of its universal enveloping algebra, generalizing the pioneering work of Harish-Chandra on semi-simple Lie algebras. Later on, Duflo's result was refound by Kontsevich in the framework of deformation quantization, who also observed that there is a similar isomorphism between Dolbeault cohomology of holomorphic polyvector fields on a complex manifold and its Hochschild cohomology. The present book, which arose from a series of lectures by the first author at ETH, derives these two isomorphisms from a Duflo-type result for Q-manifolds. All notions mentioned above are introduced and explained.
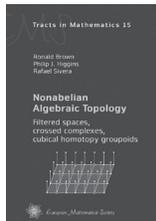
Ronald Brown (Bangor University, UK), Philip J. Higgins (Durham University, UK) and Rafael Sivera (Universitat de València, Spain)
Nonabelian Algebraic Topology. Filtered Spaces, Crossed Complexes, Cubical Homotopy Groupoids (EMS Tracts in Mathematics Vol. 15)

ISBN 978-3-03719-083-8. 2011. 703 pages. Hardcover. 17.0 cm x 24.0 cm. $118.00

The main theme of this book is that the use of filtered spaces rather than just topological spaces allows the development of basic algebraic topology in terms of higher homotopy groupoids; these algebraic structures better reflect the geometry of subdivision and composition than those commonly in use. Exploration of these uses of higher dimensional versions of groupoids has been largely the work of the first two authors since the mid 1960s.
The structure of the book is intended to make it useful to a wide class of students and researchers for learning and evaluating these methods, primarily in algebraic topology but also in higher category theory and its applications in analogous areas of mathematics, physics and computer science.

Marek Jarnicki (Jagiellonian University, Kraków, Poland) and Peter Pflug (University of Oldenburg, Germany)
Separately Analytic Functions (EMS Tracts in Mathematics Vol. 16)

ISBN 978-3-03719-098-2. 2011. 306 pages. Hardcover. 17 cm x 24 cm. $78.00

The story of separately holomorphic functions began about 100 years ago. During the second half of the 19th century, it became known that a separately continuous function is not necessarily continuous as a function of all variables. At the beginning of the 20th century, the study of separately holomorphic functions started due to the fundamental work of Osgood and Hartogs.
This book provides the first self-contained and complete presentation of the study of separately holomorphic functions, starting from its birth up to current research. Most of the results presented have never been published before in book form.
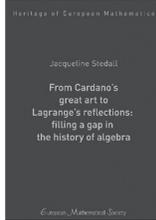
Jacqueline Stedall (University of Oxford, UK)
From Cardano's great art to Lagrange's reflections: filling a gap in the history of algebra (Heritage of European Mathematics)

ISBN 978-3-03719-092-0. 2011. 236 pages. Hardcover. 17.0 cm x 24.0 cm. $88.00

This book is an exploration of a claim made by Lagrange in the autumn of 1771 as he embarked upon his lengthy 'Réflexions sur la résolution algébrique des équations': that there had been few advances in the algebraic solution of equations since the time of Cardano in the mid sixteenth century. That opinion has been shared by many later historians. The present study attempts to redress that view and to examine the intertwined developments in the theory of equations from Cardano to Lagrange. A similar historical exploration led Lagrange himself to insights that were to transform the entire nature and scope of algebra.
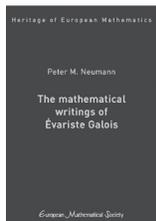
Peter M. Neumann (The Queen's College, Oxford, UK)
The mathematical writings of Évariste Galois (Heritage of European Mathematics)

ISBN 978-3-03719-104-0. 2011. 422 pages. Hardcover. 17.0 cm x 24.0 cm. $98.00

Although Évariste Galois famously died in 1832 at the age of twenty, his ideas, when they were published 14 years later, changed the course of algebra. He invented what is now called Galois Theory, the modern form of what was classically the Theory of Equations. For that purpose, and in particular to formulate a precise condition for solubility of equations by radicals, he also invented groups and began investigating their theory. The present work contains English translations of almost all the Galois material alongside a new transcription of the original French.