



## **EMS Series of Lectures in Mathematics**

Edited by Andrew Ranicki (University of Edinburgh, U.K.)

*EMS Series of Lectures in Mathematics* is a book series aimed at students, professional mathematicians and scientists. It publishes polished notes arising from seminars or lecture series in all fields of pure and applied mathematics, including the reissue of classic texts of continuing interest. The individual volumes are intended to give a rapid and accessible introduction into their particular subject, guiding the audience to topics of current research and the more advanced and specialized literature.

Previously published in this series:

Katrin Wehrheim, *Uhlenbeck Compactness*

Torsten Ekedahl, *One Semester of Elliptic Curves*

Sergey V. Matveev, *Lectures on Algebraic Topology*

Joseph C. Várilly, *An Introduction to Noncommutative Geometry*

Reto Müller, *Differential Harnack Inequalities and the Ricci Flow*

Eustasio del Barrio, Paul Deheuvels and Sara van de Geer, *Lectures on Empirical Processes*

Iskander A. Taimanov, *Lectures on Differential Geometry*

Martin J. Mohlenkamp and Maria Cristina Pereyra, *Wavelets, Their Friends, and What They Can Do for You*

Stanley E. Payne and Joseph A. Thas, *Finite Generalized Quadrangles*

Masoud Khalkhali, *Basic Noncommutative Geometry*

Helge Holden, Kenneth H. Karlsen, Knut-Andreas Lie and Nils Henrik Risebro, *Splitting Methods for Partial Differential Equations with Rough Solutions*

Koichiro Harada, *"Moonshine" of Finite Groups*

Yurii A. Neretin, *Lectures on Gaussian Integral Operators and Classical Groups*

Damien Calaque and Carlo A. Rossi, *Lectures on Duflo Isomorphisms in Lie Algebra and Complex Geometry*

Claudio Carmeli  
Lauren Caston  
Rita Fiorese

# Mathematical Foundations of Supersymmetry



European Mathematical Society

Authors:

Claudio Carmeli  
Dipartimento di Fisica  
Università di Genova  
Via Dodecaneso, 33  
16146 Genova  
Italy  
E-mail: [claudio.carmeli@gmail.com](mailto:claudio.carmeli@gmail.com)

Lauren Caston  
RAND Corporation  
1776 Main Street  
Santa Monica, CA 90407-2138  
USA  
E-mail: [lcaston@rand.org](mailto:lcaston@rand.org)

Rita Fioresi  
Dipartimento di Matematica  
Università di Bologna  
Piazza Porta San Donato 5  
40126 Bologna  
Italy  
E-mail: [fioresi@dm.unibo.it](mailto:fioresi@dm.unibo.it)

2010 Mathematics Subject Classification: 58-02; 58A50, 58C50, 14M30, 17A70, 32C11, 81Q60

Key words: supermanifolds, supersymmetry, superschemes, Lie superalgebras

ISBN 978-3-03719-097-5

The Swiss National Library lists this publication in The Swiss Book, the Swiss national bibliography, and the detailed bibliographic data are available on the Internet at <http://www.helvetica.ch>.

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in other ways, and storage in data banks. For any kind of use permission of the copyright owner must be obtained.

© 2011 European Mathematical Society

Contact address:  
European Mathematical Society Publishing House  
Seminar for Applied Mathematics  
ETH-Zentrum FLI C4  
CH-8092 Zürich  
Switzerland  
Phone: +41 (0)44 632 34 36  
Email: [info@ems-ph.org](mailto:info@ems-ph.org)  
Homepage: [www.ems-ph.org](http://www.ems-ph.org)

Typeset using the authors'  $\text{T}_\text{E}\text{X}$  files: I. Zimmermann, Freiburg  
Printing and binding: Druckhaus Thomas Müntzer GmbH, Bad Langensalza, Germany  
∞ Printed on acid free paper

9 8 7 6 5 4 3 2 1