

## EMS Tracts in Mathematics 17

## EMS Tracts in Mathematics

Editorial Board:

Carlos E. Kenig (The University of Chicago, USA)

Andrew Ranicki (The University of Edinburgh, Great Britain)

Michael Röckner (Universität Bielefeld, Germany, and Purdue University, USA)

Vladimir Turaev (Indiana University, Bloomington, USA)

Alexander Varchenko (The University of North Carolina at Chapel Hill, USA)

This series includes advanced texts and monographs covering all fields in pure and applied mathematics. *Tracts* will give a reliable introduction and reference to special fields of current research. The books in the series will in most cases be authored monographs, although edited volumes may be published if appropriate. They are addressed to graduate students seeking access to research topics as well as to the experts in the field working at the frontier of research.

- 1 Panagiota Daskalopoulos and Carlos E. Kenig, *Degenerate Diffusions*
- 2 Karl H. Hofmann and Sidney A. Morris, *The Lie Theory of Connected Pro-Lie Groups*
- 3 Ralf Meyer, *Local and Analytic Cyclic Homology*
- 4 Gohar Harutyunyan and B.-Wolfgang Schulze, *Elliptic Mixed, Transmission and Singular Crack Problems*
- 5 Gennadiy Feldman, *Functional Equations and Characterization Problems on Locally Compact Abelian Groups*
- 6 Erich Novak and Henryk Woźniakowski, *Tractability of Multivariate Problems. Volume I: Linear Information*
- 7 Hans Triebel, *Function Spaces and Wavelets on Domains*
- 8 Sergio Albeverio et al., *The Statistical Mechanics of Quantum Lattice Systems*
- 9 Gebhard Böckle and Richard Pink, *Cohomological Theory of Crystals over Function Fields*
- 10 Vladimir Turaev, *Homotopy Quantum Field Theory*
- 11 Hans Triebel, *Bases in Function Spaces, Sampling, Discrepancy, Numerical Integration*
- 12 Erich Novak and Henryk Woźniakowski, *Tractability of Multivariate Problems. Volume II: Standard Information for Functionals*
- 13 Laurent Bessières et al., *Geometrisation of 3-Manifolds*
- 14 Steffen Börm, *Efficient Numerical Methods for Non-local Operators.  $\mathcal{H}^2$ -Matrix Compression, Algorithms and Analysis*
- 15 Ronald Brown, Philip J. Higgins and Rafael Sivera, *Nonabelian Algebraic Topology. Filtered Spaces, Crossed Complexes, Cubical Homotopy Groupoids*
- 16 Marek Janicki and Peter Pflug, *Separately Analytical Functions*

Anders Björn  
Jana Björn

# **Nonlinear Potential Theory on Metric Spaces**



European Mathematical Society

Authors:

Anders Björn  
Department of Mathematics  
Linköpings universitet  
SE-581 83 Linköping  
Sweden

E-mail: anbjo@mai.liu.se

Jana Björn  
Department of Mathematics  
Linköpings universitet  
SE-581 83 Linköping  
Sweden

E-mail: jabjo@mai.liu.se

2010 Mathematical Subject Classification: 31-02, 31E05; 28A12, 30L99, 31C05, 31C15, 31C40, 31C45, 35B45, 35B65, 35D30, 35J20, 35J25, 35J60, 35J67, 35J70, 35J92, 46E35, 47J20, 49J10, 49J27, 49J40, 49J52, 49N60, 49Q20, 58C99, 58J05, 58J32

Key words: Boundary regularity, capacity, Dirichlet problem, doubling measure, interior regularity, metric space, minimizer, Newtonian space, nonlinear, obstacle problem, Perron solution,  $p$ -harmonic function, Poincaré inequality, potential theory, Sobolev space, upper gradient

ISBN 978-3-03719-099-9

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 author's T<sub>E</sub>X files: I. Zimmermann, Freiburg  
Printing and binding: Beltz Bad Langensalza GmbH, Bad Langensalza, Germany

∞ Printed on acid free paper

9 8 7 6 5 4 3 2 1