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D. R. Adams, L. I. Hedberg

## Function Spaces and Potential Theory

The subject of this book is the interplay between function space theory and potential theory. A crucial step in classical potential theory is the identification of the potential energy of a charge with the square of a Hilbert space norm. This leads to the Dirichlet space of locally integrable functions whose gradients are square integrable. More recently, a generalized potential theory has been developed, which has an analogous relationship to the standard Banach function spaces, Sobolev spaces, Besov spaces etc., that appear naturally in the study of partial differential equations. A surprisingly large part of classical potential theory has been extended to this nonlinear setting.

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## An Introduction to Complex Analysis

This senior undergraduate/graduate level textbook has been designed for an introductory course in complex analysis for students in the applied sciences. It follows the proof-theorem approach while presenting the material as 50 class-tested lectures.

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## Lectures on Morse Homology

This book presents in great detail all the results one needs to prove the Morse Homology Theorem using classical techniques from algebraic topology and homotopy theory. Most of these results can be found scattered throughout the literature dating from the mid to late 1900's in some form or other, but often the results are proved in different contexts with a multitude of different notations and different goals. This book collects all these results together into a single reference with complete and detailed proofs.

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## Control of Partial Differential Equations

Cetraro, Italy 2010, Editors: Piermarco Cannarsa, Jean-Michel Coron

Scientific editor: P. Cannarsa, Università di Roma "Tor Vergata", Rome, Italy; J.-M. Coron, Université Paris VI CNRS UMR 7598, Paris CX 06, France

2012. XIII, 344 p. 66 illus., 49 in color. (Lecture Notes in Mathematics / C.I.M.E. Foundation Subseries, Volume 2048) Softcover  
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## Topics in Banach Space Theory

The geometry of Banach spaces is a rich, beautiful, and rewarding subject. In this book the authors emphasize the isomorphic theory of Banach spaces and techniques using the unifying viewpoint of basic sequences. The book is suitable for a semester-long graduate course and it will become a standard reference and textbook in the area.

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Translated by: F. Aicardi

Do formulas exist for the solution to algebraical equations in one variable of any degree like the formulas for quadratic equations? The main aim of this book is to give new geometrical proof of Abel's theorem, as proposed by Professor V.I. Arnold. The theorem states that for general algebraical equations of a degree higher than 4, there are no formulas representing roots of these equations in terms of coefficients with only arithmetic operations and radicals.

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This self-contained textbook provides the basic, abstract tools used in nonlinear analysis. The text discusses key results such as the Banach contraction principle, a fixed point theorem for increasing operators, local and global inversion theory, and more.

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## Modelling and Optimisation of Flows on Networks

Cetraro, Italy 2009, Editors: Benedetto Piccoli, Michel Rascle

Scientific editor: B. Piccoli, Rutgers University - Camden, Camden, NJ, USA; M. Rascle, University of Nice Sophia Antipolis Laboratoire J.A. Dieudonné, Nice, France

2013. XIV, 497 p. 141 illus., 32 in color. (Lecture Notes in Mathematics / C.I.M.E. Foundation Subseries, Volume 2062) Softcover  
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## Ramanujan's Lost Notebook

### Part I

In the spring of 1976, George Andrews of Pennsylvania State University visited the library at Trinity College, Cambridge, to examine the papers of the late G.N. Watson. Among these papers, Andrews discovered a sheaf of 138 pages in the handwriting of Srinivasa Ramanujan. This manuscript was soon designated, "Ramanujan's lost notebook." Its discovery has frequently been deemed the mathematical equivalent of finding Beethoven's tenth symphony. The "lost notebook" contains considerable material on mock theta functions and so undoubtedly emanates from the last year of Ramanujan's life.

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An Introduction to Nonlinear Analysis

Transl. French: S. Wilson, Rutherford Appleton Laboratory, Oxfordshire, UK

This book offers a self-contained, rigorous and concise review of the mathematical tools needed to study optima and equilibria, as solutions to problems in economics, management sciences, operations research, cooperative and non-cooperative games and more.

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D. Bao, S.-S. Chern, Z. Shen

## An Introduction to Riemann- Finsler Geometry

In Riemannian geometry, measurements are made with both yardsticks and protractors. These tools are represented by a family of inner-products. In Riemann-Finsler geometry (or Finsler geometry for short), one is in principle equipped with only a family of Minkowski norms. So ardsticks are assigned but protractors are not. With such a limited tool kit, it is natural to wonder just how much geometry one can uncover and describe? It now appears that there is a reasonable answer. Finsler geometry encompasses a solid repertoire of rigidity and comparison theorems, most of them founded upon a fruitful analogue of the sectional curvature.

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Mathematics, Toronto, ON, Canada

## Pell's Equation

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Foreword by: O. Faugeras, INRIA Sophia-Antipolis-Méditerranée, Sophia Antipolis, France; J. Janin, Université Paris-Sud, Orsay, France

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## Séminaire de Probabilités XLIV

As usual, some of the contributions to this 44th Séminaire de Probabilités were presented during the Journées de Probabilités held in Dijon in June 2010. The remainder were spontaneous submissions or were solicited by the editors. The traditional and historical themes of the Séminaire are covered, such as stochastic calculus, local times and excursions, and martingales.

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2012. XI, 440 p. 101 illus. (Springer Optimization and Its Applications, Volume 62) Hardcover  
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Book I

Transl. German: J. Blanton

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Coauthor: C. Evertsz, M. Gutzwiller, Foreword by:  
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This book is developed from lecture notes of William S. Massey's undergraduate and graduate courses at Yale over a period of several years. Professor Massey has published many research articles on algebraic topology and related topics.

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