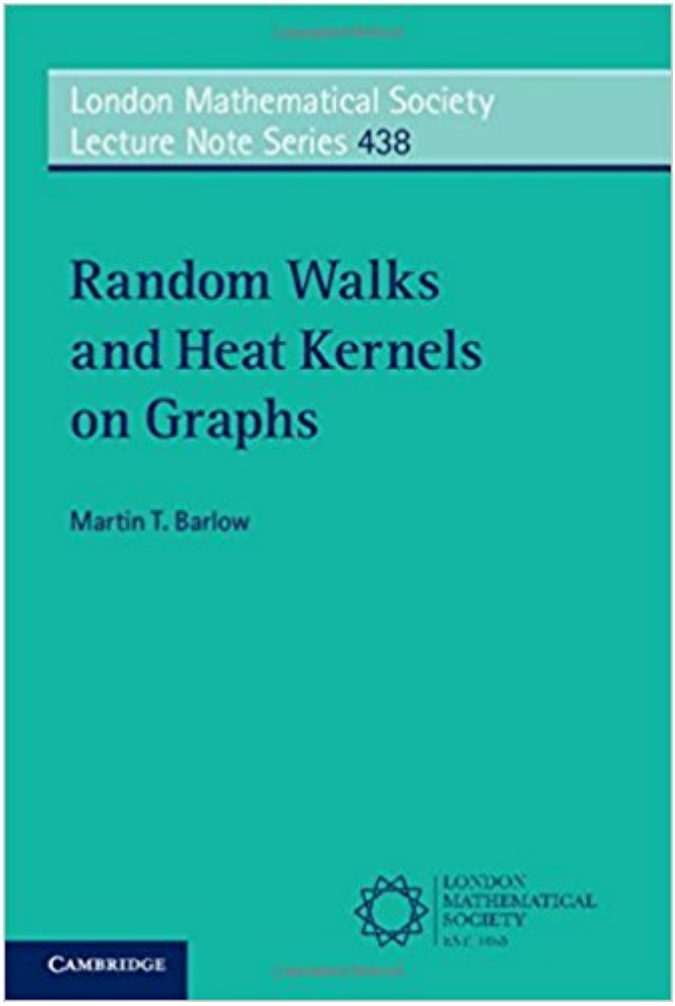
Random Walks And Heat Kernels On Graphs (London Mathematical Society Lecture Note Series)



Synopsis

This introduction to random walks on infinite graphs gives particular emphasis to graphs with polynomial volume growth. It offers an overview of analytic methods, starting with the connection between random walks and electrical resistance, and then proceeding to study the use of isoperimetric and PoincarÃ© inequalities. The book presents rough isometries and looks at the properties of a graph that are stable under these transformations. Applications include the 'type problem': determining whether a graph is transient or recurrent. The final chapters show how geometric properties of the graph can be used to establish heat kernel bounds, that is, bounds on the transition probabilities of the random walk, and it is proved that Gaussian bounds hold for graphs that are roughly isometric to Euclidean space. Aimed at graduate students in mathematics, the book is also useful for researchers as a reference for results that are hard to find elsewhere.

Book Information

Series: London Mathematical Society Lecture Note Series (Book 438)
Paperback: 236 pages
Publisher: Cambridge University Press; 1 edition (April 17, 2017)
Language: English
ISBN-10: 1107674425
ISBN-13: 978-1107674424
Product Dimensions: 6 x 0.6 x 9 inches
Shipping Weight: 12.6 ounces (View shipping rates and policies)
Average Customer Review: Be the first to review this item
Best Sellers Rank: #793,184 in Books (See Top 100 in Books) #85 inÂ Books > Science & Math > Mathematics > Applied > Stochastic Modeling #113 inÂ Books > Science & Math > Mathematics > Applied > Graph Theory #2405 inÂ Books > Textbooks > Science & Mathematics > Mathematics > Statistics

Customer Reviews

This introduction to random walks on infinite graphs, in both discrete and continuous time, gives a systematic account of transition densities, including useful but hard-to-find results. The book is aimed at researchers and graduate students in mathematics who have a basic familiarity with analysis and some familiarity with probability.

Martin T. Barlow is Professor in the Mathematics Department at the University of British Columbia.

He was one of the founders of the mathematical theory of diffusions on fractals, and more recently has worked on random walks on random graphs. He gave a talk at the International Congress of Mathematicians (ICM) in 1990, and was elected a Fellow of the Royal Society of Canada in 1998 and a Fellow of the Royal Society in 2005. He is the winner of the Jeffrey-Williams Prize of the Canadian Mathematical Society and the CRM-Fields-PIMS Prize of the three Canadian mathematics institutes (the Centre de recherches mathÃ©matiques, the Fields Institute, and the Pacific Institute for the Mathematical Sciences).