



# Analysis and Geometry of Markov Diffusion Operators (Grundlehren der mathematischen Wissenschaften)

*By Dominique Bakry, Ivan Gentil, Michel Ledoux*

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**Analysis and Geometry of Markov Diffusion Operators (Grundlehren der mathematischen Wissenschaften)** By Dominique Bakry, Ivan Gentil, Michel Ledoux

The present volume is an extensive monograph on the analytic and geometric aspects of Markov diffusion operators. It focuses on the geometric curvature properties of the underlying structure in order to study convergence to equilibrium, spectral bounds, functional inequalities such as Poincaré, Sobolev or logarithmic Sobolev inequalities, and various bounds on solutions of evolution equations. At the same time, it covers a large class of evolution and partial differential equations.

The book is intended to serve as an introduction to the subject and to be accessible for beginning and advanced scientists and non-specialists. Simultaneously, it covers a wide range of results and techniques from the early developments in the mid-eighties to the latest achievements. As such, students and researchers interested in the modern aspects of Markov diffusion operators and semigroups and their connections to analytic functional inequalities, probabilistic convergence to equilibrium and geometric curvature will find it especially useful. Selected chapters can also be used for advanced courses on the topic.

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### Review

“This impressive monograph is about an important and highly active area that straddles the fertile land occupied by both probability and analysis. ... It is written with great clarity and style, and was clearly a labour of love for the authors. I am convinced that it will be a valuable resource for researchers in analysis and probability for many years to come.” (David Applebaum, *The Mathematical Gazette*, Vol. 100 (548), July, 2016)

### From the Back Cover

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### About the Author

Dominique Bakry held his first research position at the CNRS at the University of Strasbourg, and since 1988 has been a professor at the University of Toulouse. Moreover, since 2004 he has been a senior member of the Institut Universitaire de France. He was editor of the journal *Potential Analysis*. His research interests center on probability, analysis of Markov operators, differential geometry and orthonormal polynomials.

Ivan Gentil held his first position at the University of Paris-Dauphine in 2003 and since 2010 has been a professor at the University of Lyon. His research interests center on analysis, probability, partial differential equations and functional inequalities such as logarithmic Sobolev inequalities.

Michel Ledoux held his first research position at the CNRS, and since 1991 has been a professor at the University of Toulouse. Since 2010 he has been a senior member of the Institut Universitaire de France, having been a junior member from 1997 to 2002. He has been associate editor for various journals including the *Annals of Probability and Probability Theory and Related Fields*, and is currently chief editor of the *Electronic Journal of Probability*. His research interests center on probability theory and functional analysis, measure concentration, diffusion operators and functional inequalities, random matrices, probability in Banach spaces.

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