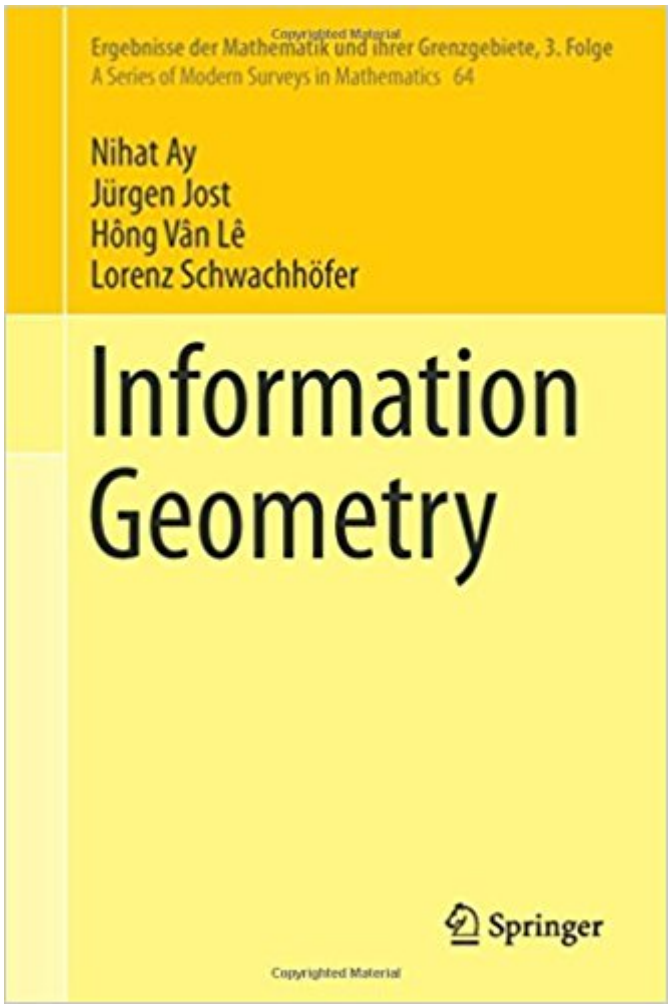
# Information Geometry (Ergebnisse Der Mathematik Und Ihrer Grenzgebiete. 3. Folge / A Series Of Modern Surveys In Mathematics)



## Synopsis

The book provides a comprehensive introduction and a novel mathematical foundation of the field of information geometry with complete proofs and detailed background material on measure theory, Riemannian geometry and Banach space theory.Â  Parametrised measure models are defined as fundamental geometric objects, which can be both finite or infinite dimensional. Based on these models, canonical tensor fields are introduced and further studied, including the Fisher metric and the Amari-Chentsov tensor, and embeddings of statistical manifolds are investigated.This novel foundation then leads to application highlights, such as generalizations and extensions of the classical uniqueness result of Chentsov or the CramÃ©r-Rao inequality.Â  Additionally, several new application fields of information geometry are highlighted, for instance hierarchical and graphical models, complexity theory,Â population genetics, or Markov Chain Monte Carlo.  The book will be of interest to mathematicians who are interested in geometry, information theory, or the foundations of statistics, to statisticians as well as to scientists interested in the mathematical foundations of complex systems.

## Book Information

Series: Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge / A Series of Modern Surveys in Mathematics (Book 64)
Hardcover: 407 pages
Publisher: Springer; 1st ed. 2017 edition (August 26, 2017)
Language: English
ISBN-10: 3319564773
ISBN-13: 978-3319564777
Product Dimensions:  6.1 x 0.9 x 9.2 inches
Shipping Weight: 1.7 pounds (View shipping rates and policies)
Average Customer Review:  Be the first to review this item
Best Sellers Rank: #952,945 in Books (See Top 100 in Books)  #118 inÂ Books > Science & Math > Mathematics > Geometry & Topology > Analytic Geometry  #119 inÂ Books > Science & Math > Mathematics > Geometry & Topology > Differential Geometry  #150 inÂ Books > Computers & Technology > Programming > Software Design, Testing & Engineering > Structured Design

## Customer Reviews

Nihat Ay studied mathematics and physics at the Ruhr University Bochum and received his Ph.D. in mathematics from the University of Leipzig in 2001. He was a Postdoc at the Santa Fe Institute and

at the Redwood Center for Theoretical Neuroscience, UC Berkeley. Â Since 2005, he has been group leader at the Max Planck Institute for Mathematics in the Sciences in Leipzig, heading the Information Theory of Cognitive Systems group. His research interests are information geometry, complexity and information theory, mathematical learning theory, embodied cognitive systems, graphical models and causality, and robustness theory. Nihat Ay is Professor at the Santa Fe Institute and honorary Professor of information geometry at the University of Leipzig.Â JÃ  rgen Jost studied mathematics, physics, economics and philosophy in Bonn 1975-1980. He received his Ph.D. in mathematics in 1980, and was a Postdoc at IAS Princeton, UC San Diego, CMA Canberra and Bonn, a Professor at Ruhr University Bochum 1984-1996, and has been a Director of the Max Planck Institute for Mathematics in the Sciences, Leipzig, since 1996. He is an Honorary Professor of Leipzig University, external member of the Santa Fe Institute. He received the DFG Leibniz Award in 1993, and an ERC advanced grant in 2010. His research interests are Riemannian geometry, geometric analysis, dynamical systems, information theory, network analysis, mathematical biology and neurobiology, mathematical economics and complex systems theory.HÃ´ng VÃ¢n LÃª studied mathematics at the Moscow State University and received her Ph.D. in mathematics in 1987 and her DrSc in mathematics in 1990. She was a Postdoc at the Moscow State University, the International Center for Theoretical Physics (ICTP) in Trieste, the Max Planck Institute for Mathematics in Bonn, a Heisenberg Fellow at the Max Planck Institute for Mathematics in Bonn, the Henri PoincarÃ© Institute in Paris, the Newton Institute in Cambridge and Leipzig University, a research associate at the Max Planck Institute for Mathematics in the Sciences in Leipzig, foreign Professor at the Abdus Salam School of Mathematics in Lahore, visiting Professor at the Vietnam National University for Sciences in Hanoi. She was awarded the Moscow Mathematical Society prize in 1990, the ICTP prize in 1991, and a DFG Heisenberg fellowship in 1994. Since 2005 she has been a senior researcher at the Czech Academy of Sciences Institute of Mathematics. Her research interests are Riemannian geometry, symplectic topology, representation theory, differential topology and information geometry.Lorenz SchwachhÃ¶fer studied mathematics and computer science in Darmstadt, New Orleans (Tulane) and Philadelphia (UPenn) where he received his Ph.D. in 1992. He was a Postdoc in St.Louis (Washington Univ.), Bonn (Max Planck Institute for Mathematics) and Leipzig University where he completed his habilitation in 1998. He was a Professor (ChargÃ© de cours) at ULB Brussels (2000-2003), and since 2003 he has been a full Professor at TU Dortmund University. In 2010, he received the Royal Academy of Science (Belgium) E. Catalan prize. His main research interests are in differential geometry and differential topology, representation theory and information geometry.

Information Geometry (Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge / A Series of Modern Surveys in Mathematics) Rigid Geometry of Curves and Their Jacobians (Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge / A Series of Modern Surveys in Mathematics) Fundamental Algebraic Geometry (Mathematical Surveys and Monographs) (Mathematical Surveys and Monographs Series (Sep.Title P) Commercial Ship Surveying: On/Off Hire Condition Surveys and Bunker Surveys Parlamentarische Demokratie in der EuropÃ¤ischen Union: Der Beitrag des EuropÃ¤ischen Parlaments und der nationalen Parlamente (German Edition) Modern Geometry â • Methods and Applications: Part I: The Geometry of Surfaces, Transformation Groups, and Fields (Graduate Texts in Mathematics) (Pt. 1) Fractal Geometry and Dynamical Systems in Pure and Applied Mathematics I: Fractals in Pure Mathematics (Contemporary Mathematics) Taxicab Geometry: An Adventure in Non-Euclidean Geometry (Dover Books on Mathematics) Der Ruf der Tagesfische und andere Geschichten - Deutsch als Fremdsprache Die Operette Â«Der lustige KriegÂ» von Johann StrauÃ : Werkgeschichte und Rekonstruktion der UrauffÃ hrungsfassung (German Edition) Die grÃ¶Ã te TÃ¤uschung der Menschheitsgeschichte: Die Enttarnung der institutionalisierten Gewalt (German Edition) Harry Potter und der Stein der Weisen (Die Harry-Potter-Buchreihe) (German Edition) Das Oslo Experiment: Mit 30â ¬ am Tag unterwegs in einer der teuersten StÃ¤dte der Welt (German Edition) Algerien;: Kunst, Kultur und Landschaft. Von den Statten der Romer zu den Tuaregs der zentralen Sahara (DuMont Kunst-Reisefuhrer) (German Edition) Abenteuer Auswandern. Mein Leben auf Grenada: Strand, Meer und Lebensfreude: Der paradiesische Alltag in der Karibik (German Edition) Looking for Information: A Survey of Research on Information Seeking, Needs, and Behavior: 4th Edition (Studies in Information) Looking for Information: A Survey of Research on Information Seeking, Needs, and Behavior (Studies in Information) Fundamentals Of Information Systems Security (Information Systems Security & Assurance) - Standalone book (Jones & Bartlett Learning Information Systems Security & Assurance) Gauge Field Theory and Complex Geometry (Grundlehren der mathematischen Wissenschaften) Modern Calculus and Analytic Geometry (Dover Books on Mathematics)