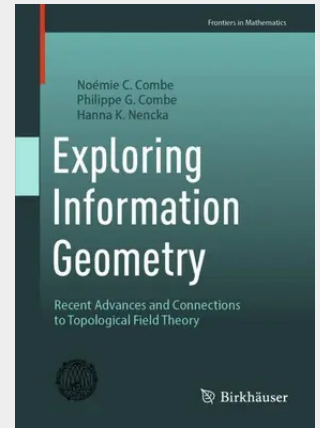


Exploring Information Geometry

Recent Advances and Connections to Topological Field Theory

This book offers a clear and accessible pathway into information geometry for advanced undergraduate and graduate students. Readers will be guided from the fundamentals of topology and differentiable manifolds to the more advanced concepts of probability geometry and Frobenius manifolds in an intuitive manner, allowing them to build their knowledge gradually. Divided into three main parts, the first provides a concise introduction to differential topology and geometry, emphasizing the role of smooth manifolds, connections, and curvature in the formulation of geometric structures. Part II is then devoted to probability, measures, and statistics, where the notion of a probability space is refined into a geometric object, thus paving the way for a deeper mathematical understanding of statistical models. Finally, the third part introduces Frobenius manifolds, revealing their surprising connection to exponential families of probability distributions and, more broadly, their role in the geometry of information. Throughout all the chapters, there are exercises to test understanding, as well as solutions to some of the more challenging problems to aid learning.

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