



# Information Geometry and Population Genetics [ The Mathematical Structure of the Wright-Fisher Model /

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Mathematical statistics

Human genetics

Global analysis (Mathematics)

Geometry

Distribution (Probability theory)

Mathematical and

Computational Biology

Statistical Theory and Methods

Human Genetics

Analysis

Probability Theory and Stochastic Processes

Monografía

The present monograph develops a versatile and profound mathematical perspective of the Wright-Fisher model of population genetics. This well-known and intensively studied model carries a rich and beautiful mathematical structure, which is uncovered here in a systematic manner. In addition to approaches by means of analysis, combinatorics and PDE, a geometric perspective is brought in through Amari's and Chentsov's information geometry. This concept allows us to calculate many quantities of interest systematically; likewise, the employed global perspective elucidates the stratification of the model in an unprecedented manner. Furthermore, the links to statistical mechanics and large deviation theory are explored and developed into powerful tools. Altogether, the manuscript provides a solid and broad working basis for graduate students and researchers interested in this field

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