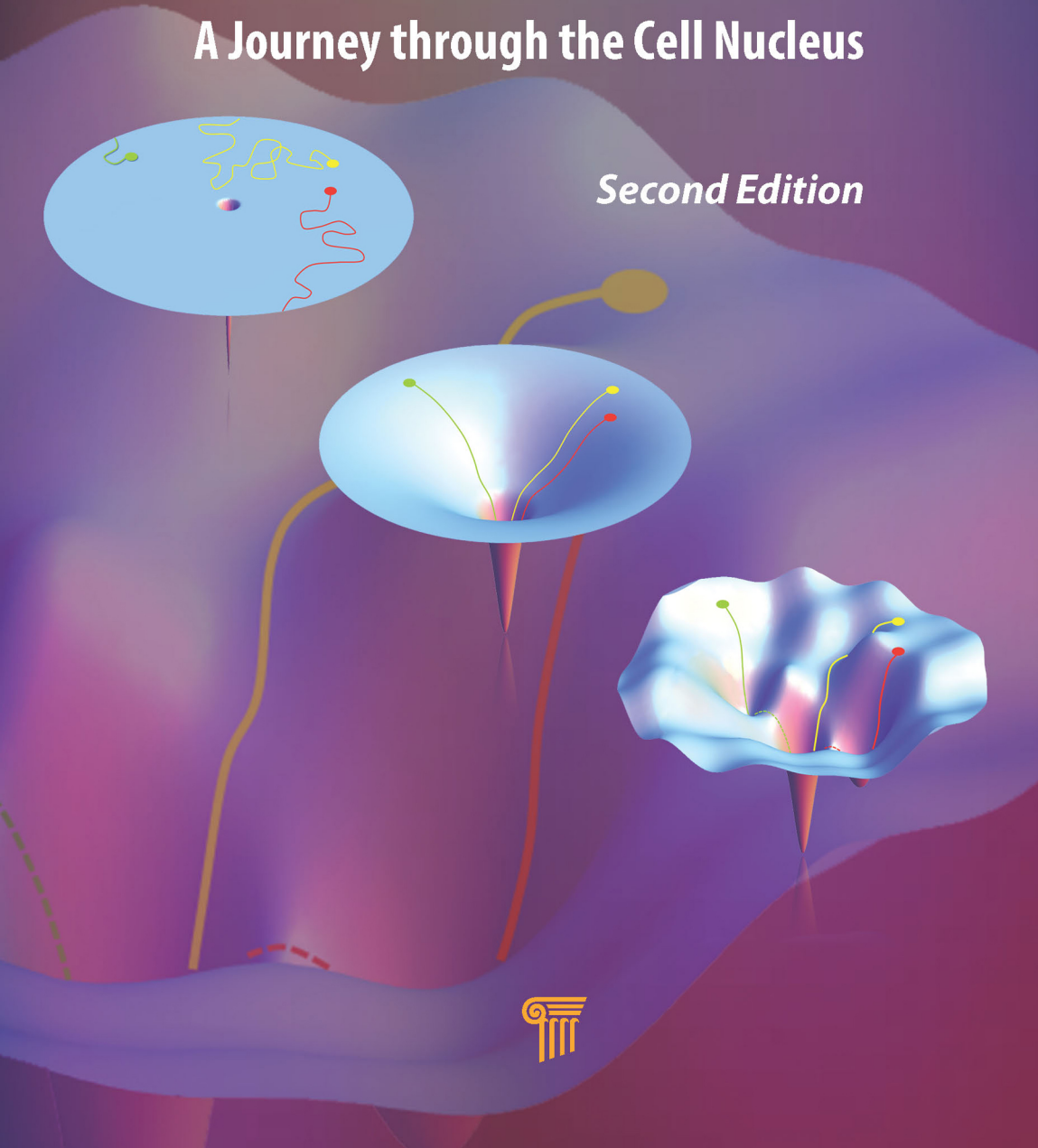


Helmut Schiessel

Biophysics for Beginners

A Journey through the Cell Nucleus

Second Edition



“Helmut Schiessel’s Biophysics for Beginners is an excellent text for anyone interested in understanding the workings of the cell nucleus from the perspective of physics. The book is unique in providing a deep, authoritative introduction to the physical principles that underlie our current understanding of the packaging and processing of the nucleic acids and proteins within the nucleus and in introducing the reader to key biological questions.”

Prof. Wilma K. Olson
Rutgers, the State University of New Jersey, USA

“The book by Helmut Schiessel is a welcome timely addition to the growing but still badly insufficient literature on modern biological physics. This field of science is traditionally difficult for students and teachers alike: students lack either knowledge of physics or background in biology, or both. The attractive feature of the book is that it is self-contained: it starts with a concise description of the main ideas and facts of molecular biology and then continues to introduce the main concepts of statistical physics and polymer physics. Both physics and biology introductions are solid enough for the student to start using these ideas. Do not miss this book!”

Prof. Alexander Grosberg
New York University, USA

“This is a most welcome book showing beautiful applications of physics to polymers in cells. It will clearly be useful as a basis to teach biophysics and more generally to all physicists interested in the properties of cells and their nucleus, and also to biologists interested in the physical properties of biopolymers.”

Prof. Jean-François Joanny
Institut Curie, France

“Teaching an introductory course in theoretical biological physics is a major challenge. The lecturer not only needs to introduce a diverse set of theoretical concepts from different areas of physics, but also needs to provide a thorough introduction to molecular biology and a broad set of examples of how to apply the physics concepts to biological systems. This textbook does all of this in a well-balanced mix. It will be an excellent choice both as course material and for self-study.”

Prof. Ulrich Gerland
University of Munich (LMU), Germany

Biophysics is a new way of looking at living matter. It uses quantitative experimental, theoretical, and computational methods, thereby opening a new window for studying and understanding life processes. This textbook provides a brief introduction to the basics of the field, followed by in-depth discussions of more advanced biophysics subjects, going all the way to state-of-the-art experiments and their theoretical interpretations. The second edition presents some of the newest developments in the field (e.g., biomolecular condensates, loop extrusion), a new chapter on computational methods, and many computer exercises specially designed for this textbook.



Helmut Schiessel studied physics at the Albert-Ludwigs University, Freiburg, Germany. There he did his PhD with Prof. A. Blumen in the Group for Theoretical Polymer Physics. After graduating in 1997, he worked as a postdoc with Prof. P. A. Pincus at the University of California, Santa Barbara. Then, he was a joint postdoc with Profs. W. M. Gelbart and R. Bruinsma at the University of California, Los Angeles. In 2000, he joined the Theory Group of the Max Planck Institute for Polymer Research, Mainz, Germany, where he was in charge of a biophysics research project. From 2005 to 2020, Prof. Schiessel headed the chair of Theoretical Physics of Life Processes in the Instituut-Lorentz at Leiden University, the Netherlands. In 2021, he joined the Cluster of Excellence Physics of Life at the Technical University in Dresden, Germany, where he heads the Theoretical Physics of Living Matter Group.

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