

Building up from microscopic basics to observed complex functions, this insightful monograph explains and describes how the unique molecular properties of water give rise to its structural and dynamical behavior, which in turn translates into its role in biological and chemical processes.

The discussion of the biological functions of water details not only the stabilizing effect of water in proteins and DNA, but also the direct role that water molecules themselves play in biochemical processes, such as enzyme kinetics, protein synthesis, and drug-DNA interaction. The overview of the behavior of water in chemical systems discusses hydrophilic, hydrophobic, and amphiphilic effects, as well as the interactions of water with micelles, reverse micelles, microemulsions, and carbon nanotubes.

Supported by extensive experimental and computer simulation data, highlighting many of the recent advances in the study of water in complex systems, this is an ideal resource for anyone studying water at the molecular level.

"This book provides a valuable resource in relating microscopic properties to complex phenomenology, connecting diverse topics of contemporary interest."

David J. Wales, University of Cambridge

"This book... covers an extremely broad range of topics on water, written with an eye to relating theory and experiment, and by someone who has insight into both... there is... much useful material on interesting applications."

Rudy A. Marcus, California Institute of Technology

"In this unique book Biman Bagchi has brought together an extraordinary range of experimental data and the results of both theory and simulation studies ... provides both insight and the springboard for new investigations of this endlessly fascinating liquid."

Graham R. Fleming, University of California, Berkeley

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