Quantitative Understanding of Biosystems: An Introduction to Biophysics

Thomas M. Nordlund

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Quantitative Understanding of Biosystems: An Introduction to Biophysics focuses on the behavior and properties of microscopic structures that underlie living systems. It clearly describes the biological physics of macromolecules, subcellular structures, and whole cells, including interactions with light.

Providing broad coverage of physics, chemistry, biology, and mathematics, this color text features:

1. Mathematical and computational tools?graphing, calculus, simple differential equations, diagrammatic analysis, and visualization tools
2. Randomness, variation, statistical mechanics, distributions, and spectra
3. The biological micro- and nanoworld?structures, processes, and the physical laws
4. Quantum effects?photosynthesis, UV damage, electron and energy transfer, and spectroscopic characterization of biological structures

Through its active learning approach, the text encourages practical comprehension of the behavior of biosystems, rather than knowledge of the latest research. The author includes graph- and diagram-centered physics and mathematics, simple software, frequent checks of understanding, and a repetition of important ideas at higher levels or from different points of view. After completing this book, students will gain significant computational and project experience and become competent at quantitatively characterizing biosystems.

CD-ROM Resource

The accompanying CD contains multimedia learning tools, such as video clips and animations, that illustrate intrinsically dynamic processes. For students inexperienced in the application of mathematics and physical principles to naturally occurring phenomena, this multimedia component emphasizes what is most obvious about biological systems: *living things move*. Students can also manipulate and re-program the included Excel graphs.

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