



Comparative Biomechanics: Life's Physical World, Second Edition

By Steven Vogel

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Comparative Biomechanics: Life's Physical World, Second Edition By Steven Vogel

Why do you switch from walking to running at a specific speed? Why do tall trees rarely blow over in high winds? And why does a spore ejected into air at seventy miles per hour travel only a fraction of an inch? *Comparative Biomechanics* is the first and only textbook that takes a comprehensive look at the mechanical aspects of life--covering animals and plants, structure and movement, and solids and fluids. An ideal entry point into the ways living creatures interact with their immediate physical world, this revised and updated edition examines how the forms and activities of animals and plants reflect the materials available to nature, considers rules for fluid flow and structural design, and explores how organisms contend with environmental forces.

Drawing on physics and mechanical engineering, Steven Vogel looks at how animals swim and fly, modes of terrestrial locomotion, organism responses to winds and water currents, circulatory and suspension-feeding systems, and the relationship between size and mechanical design. He also investigates links between the properties of biological materials--such as spider silk, jellyfish jelly, and muscle--and their structural and functional roles. Early chapters and appendices introduce relevant physical variables for quantification, and problem sets are provided at the end of each chapter. *Comparative Biomechanics* is useful for physical scientists and engineers seeking a guide to state-of-the-art biomechanics. For a wider audience, the textbook establishes the basic biological context for applied areas--including ergonomics, orthopedics, mechanical prosthetics, kinesiology, sports medicine, and biomimetics--and provides materials for exhibit designers at science museums.

- Problem sets at the ends of chapters
- Appendices cover basic background information
- Updated and expanded documentation and materials
- Revised figures and text
- Increased coverage of friction, viscoelastic materials, surface tension, diverse modes of locomotion, and biomimetics

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Editorial Review

Review

"[T]his is a fantastic book! . . . [T]here can be no doubt, this is a science book of the highest and finest quality. Students in biology and physics, including (mechanical) engineers, will find in this book a sound guideline for an alternative view of their respective disciplines. It is a source of inspiration, also for the interested layman, for further reflection on the realm of physics in the biological world."--**Harold Heatwole, *Integrative and Comparative Biology***

About the Author

Steven Vogel is James B. Duke Professor Emeritus of Biology at Duke University. His numerous books include "Glimpses of Creatures in Their Physical Worlds" (Princeton) and "Cats' Paws and Catapults" (Norton).

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