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Philosophy of Science for Biologists

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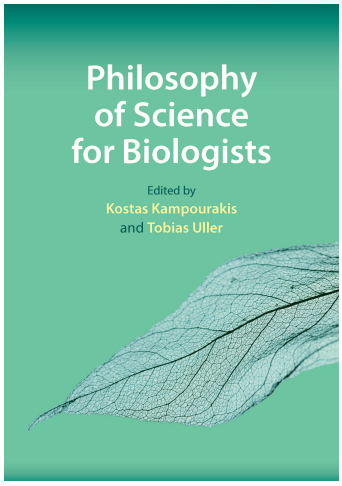

Biologists rely on theories, apply models and construct explanations, but rarely reflect on their nature and structure. This book introduces key topics in philosophy of science to provide the required philosophical background for this kind of reflection, which is an important part of all aspects of research and communication in biology. It concisely and accessibly addresses fundamental questions such as: Why should biologists care about philosophy of science? How do concepts contribute to scientific advancement? What is the nature of scientific controversies in the biological sciences? Chapters draw on contemporary examples and case studies from across biology, making the discussion relevant and insightful. Written for researchers and advanced undergraduate and graduate students across the life sciences, its aim is to encourage readers to become more philosophically minded and informed to enable better scientific practice. It is also an interesting and pertinent read for philosophers of science.

1. Why should biologists care about philosophy of science?; 2. What constitutes an explanation in biology?; 3. What is biological knowledge?; 4. What is the nature of theories and models in biology?; 5. How are biology concepts used and transformed?; 6. Why does it matter that many biology concepts are metaphors?; 7. How do concepts contribute to scientific advancement? Evolutionary biology as a case study; 8. How can conceptual analysis contribute to scientific practice? The case of cultural evolution; 9. What methods do life scientists use? A brief history with philosophical implications; 10. Is it possible to scientifically reconstruct the history of life on earth? The biological sciences and deep time; 11. What is the basis of biological classification? The search for natural systems; 12. What is the nature of scientific controversies in the biological sciences?; 13. What is the relation between facts and values in biological science? Biology in society; 14. A philosopher in the age of creationism: What have I learned after fifty years doing philosophy of biology that I want to pass on to biologists; 15. How can we teach philosophy of science to biologists?

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'As a philosopher and a biologist I have been waiting for a long time for a book like this to come out. My students will learn a lot from it.'
Massimo Pigliucci,
K.D. Irani Professor of Philosophy, City College of New York

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