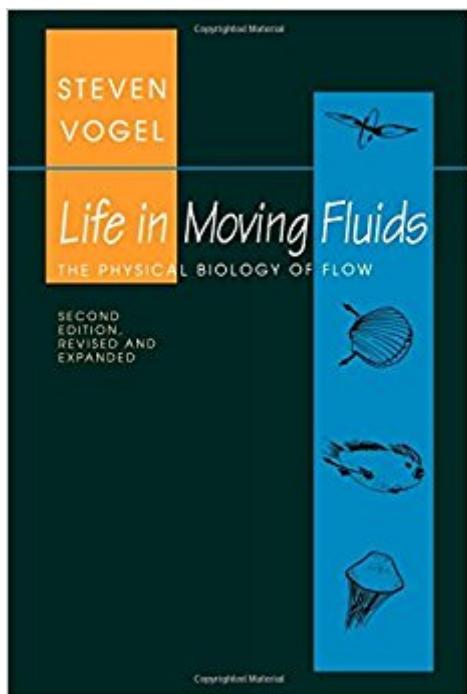


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# Life In Moving Fluids: The Physical Biology Of Flow (Princeton Paperbacks)



## Synopsis

Both a landmark text and reference book, Steven Vogel's *Life in Moving Fluids* has also played a catalytic role in research involving the applications of fluid mechanics to biology. In this revised edition, Vogel continues to combine humor and clear explanations as he addresses biologists and general readers interested in biological fluid mechanics, offering updates on the field over the last dozen years and expanding the coverage of the biological literature. His discussion of the relationship between fluid flow and biological design now includes sections on jet propulsion, biological pumps, swimming, blood flow, and surface waves, and on acceleration reaction and Murray's law. This edition contains an extensive bibliography for readers interested in designing their own experiments.

## Book Information

Series: Princeton Paperbacks

Paperback: 484 pages

Publisher: Princeton University Press; 2nd Revised edition (April 1, 1996)

Language: English

ISBN-10: 0691026165

ISBN-13: 978-0691026169

Product Dimensions: 6 x 1.2 x 9 inches

Shipping Weight: 1.5 pounds (View shipping rates and policies)

Average Customer Review: 4.4 out of 5 stars 13 customer reviews

Best Sellers Rank: #453,613 in Books (See Top 100 in Books) #93 in Books > Science & Math > Biological Sciences > Biophysics #410 in Books > Science & Math > Biological Sciences > Biology > Molecular Biology #1813 in Books > Textbooks > Science & Mathematics > Biology & Life Sciences > Biology

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Vogel ... has a deep knowledge of hydrodynamics and knows how to teach the subject. Many phenomena are explained more clearly in his book than in common fluid dynamic texts.... Beautifully produced.--Jerry Gollub "Physics Today" This edition includes more of everything: more physical concepts, more biological examples, more sources for additional information.... Vogel finds a way to make sense of even the least intuitive concepts.--Mike May "American Scientist" For biologists who want to come to the beginning of a quantitative understanding of a wide variety of adaptations, for general readers who want to see how fluid mechanics works in a varied and often surprising context

... this book, full of data, rich in up-to-date and well-appraised references, is a first-class opportunity.--Philip Morrison "Scientific American "Vogel ... has a deep knowledge of hydrodynamics and knows how to teach the subject. Many phenomena are explained more clearly in his book than in common fluid dynamic texts.... Beautifully produced.--Jerry Gollub "Physics Today "This edition includes more of everything: more physical concepts, more biological examples, more sources for additional information.... Vogel finds a way to make sense of even the least intuitive concepts.--Mike May "American Scientist "Praise for the previous edition: "Required reading for students of biology at all levels of career development.--Paul W. Webb "Science "For biologists who want to come to the beginning of a quantitative understanding of a wide variety of adaptations, for general readers who want to see how fluid mechanics works in a varied and often surprising context... this book, full of data, rich in up-to-date and well-appraised references, is a first-class opportunity.--Philip Morrison "Scientific American ""Vogel ... has a deep knowledge of hydrodynamics and knows how to teach the subject. Many phenomena are explained more clearly in his book than in common fluid dynamic texts.... Beautifully produced."--Jerry Gollub, "Physics Today""This edition includes more of everything: more physical concepts, more biological examples, more sources for additional information.... Vogel finds a way to make sense of even the least intuitive concepts."--Mike May, "American Scientist" Praise for the previous edition: "Required reading for students of biology at all levels of career development."--Paul W. Webb, "Science""For biologists who want to come to the beginning of a quantitative understanding of a wide variety of adaptations, for general readers who want to see how fluid mechanics works in a varied and often surprising context ... this book, full of data, rich in up-to-date and well-appraised references, is a first-class opportunity."--Philip Morrison, "Scientific American"

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This is not for the layman. But it's great if you want to understand effects of motion on things, living things included. I would think one would need to have a degree in a physical science to read this book.

This is really an excellent book for understanding basic fluid mechanics and physics. Profesor Vogel is a gifted writer and provides a real understanding of the various parameters and equations in fluid flow such as viscosity and turbulence. He writes in a very readable and fun style that makes it much more interesting to read then any standard textbook. And of course his insights into how animals and insects have evolved to take advantage of various fluid environment is the strength of the book. I think if this this book was used in more introductory physics classes that more kids would be turned on to physics because they see the application in the natural world. I highly recommended.

A good mix of scientific knowledge to understand the moving of life in turbulent and laminar environments. An excellent example of "biologist"!

A great read about fluid dynamics

Good book for math to life applications.

I needed this book for a class. This book is rich in biology and fluid mechanics that it was way over my head. My professor explained things that we needed to know much simpler than this book did.

"Life in Moving Fluids" is a well-written and entertaining, as well as technically accurate, introduction to the behavior of fluids. It explains many of the concepts of fluid dynamics in terms of biological examples, and is my first choice of book to recommend to biologists who want to understand the design and behavior of a wide range of plants and animals that live, as most do, in moving air or water -- our two most common fluids. That would be quite enough distinction for a book, but the utility of Vogel's book goes farther: it is one of the best introductions to the subject of fluid dynamics for those interested in physics, such as the nature of lift and drag, or the design of buildings or wind tunnels (sometimes the same thing). It also is helpful in physical chemistry where diffusion and convection must be understood -- to say nothing of how fluids move through the pipes and junctures of our equipment. I was inspired to write this review because I had just recommended the book to a colleague who was designing a wind tunnel to work at Reynolds numbers in the 10,000 range and whose previous sources were from aerodynamicists, whose designs are generally not appropriate at this scale. If you don't know what a Reynolds number is or why it is interesting, this book has the best explanation I've seen. It does not assume that you remember much, it teaches what you need as it goes along. Many are the times I've recommended "Life in Moving Fluids" to students and

co-workers, and in each case, I have been warmly thanked. This review allows me to thank Dr. Vogel in a practical manner for his outstanding book. He also has a penchant for the occasional pun and keeps a light tone throughout, which makes the book suitable as pleasure reading for those who enjoy the popular science magazines, but don't mind a bit more depth. If you work in fields where fluid dynamics counts (see the section on prairie squirrels), or just fly model planes, the book is also a handy refresher/reference work. It'll blow you away.

A good introduction to aspects of fluid dynamics among living creatures such as plants and animals. Generally the book covers the material well with good explanations although I found that at times the concepts demonstrated were very well explained and at others not so well. Some of these fluid dynamical ideas are quite non-intuitive and I feel that a course covering this material really requires experiments to give the student a feel for the movements inherent in fluids and the various forces which act to produce the types of drag or filter feeding etc. Naturally such a course could use this book as a theoretical introduction along with maybe some sort of lab manual accompanying it. I did feel that it would have been good to have this together in one text rather than spread over two or more. Having said this I must note that this book is probably not intended in this way and possibly fits into the niche left open by the gap between a serious student text and an introduction which can be read purely for interest's sake as I did. It accomplished this second task quite well maintaining interest even though it dealt in mechanical laws and left out much of the biology, which would, if not directly, have added to the explanation offered yet, provide a link both as a source of the physics and as a means to connect the now separate streams of physics and biology, which is unfortunately nowadays always considered as completely disconnected. Darcy Thomson would have been dismayed at this process. Nonetheless some very beautiful drawings accompany the book and provide much needed sense of the plant and animal world. Altogether a fine introduction.

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