



Numerical and Analytical Methods for Scientists and Engineers, Using Mathematica

By Daniel Dubin

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Editorial Review

Review

"...a very valuable addition to the literature of the field..." (*Zentralblatt Math*, Vol. 1029, 2004)

"...offers a comprehensive *Mathematica*-based guide to the analytical and numerical methods used every day...includes many exercises and worked examples..." (*The Mathematica Journal*, Vol. 9 No. 1)

From the Back Cover

Utilizing state-of-the-art software to facilitate solutions to real-world problems

Practitioners in the field of physical science are continually faced with a variety of complex, real-world problems, the solution of which requires a working knowledge of both analytical and numerical techniques. An Introduction to Mathematical and Computational Physics Using Mathematica® is designed to help prospective scientists develop a practical, working knowledge of these techniques using the latest, most efficient electronic methodologies.

Written from the perspective of a physicist rather than a mathematician, the text focuses on modern practical applications in the physical and engineering sciences, attacking these problems with a range of numerical and analytical methods, both elementary and advanced. Incorporating the widely used and highly praised Mathematica® software package, the author offers solution techniques for the partial differential equations of mathematical physics such as Poisson's equation, the wave equation, and Schrödinger's equation, including Fourier series and transforms, Green's functions, the method of characteristics, grids, Galerkin and simulation methods, elementary probability theory, and statistical methods.

The incorporation of Mathematica® offers students a wealth of practical benefits in that it

- Requires little or no previous computer experience
- Offers maximum flexibility and sophistication
- Delivers easy access to the important ideas behind the various numerical methods
- Facilitates important but often tedious analytic calculations
- Is easily adapted to the application of other related software packages

Designed for both advanced undergraduate and graduate students in the physical and engineering sciences, as well as professionals who want to learn these methods, An Introduction to Mathematical and Computational Physics Using Mathematica® is also provided electronically on an accompanying CD. The electronic version contains the full text of the book, along with animations, user-modifiable source code, and links to related Web material.

About the Author

DANIEL DUBIN holds a Ph.D. in Astrophysics from Princeton University and is a Fellow of the American Physical Society. He is currently a Professor of Physics at the University of California at San Diego.

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