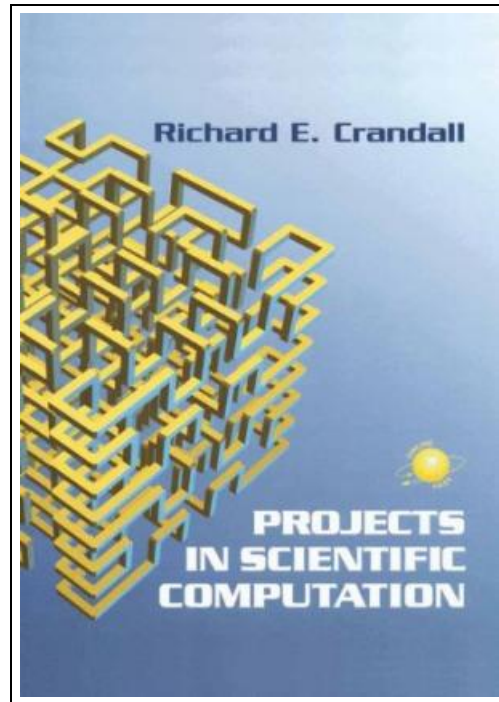# Projects in Scientific Computation

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## Reviews

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*(Desmond Becker)*

# PROJECTS IN SCIENTIFIC COMPUTATION



Book Condition: New. Publisher/Verlag: Springer, Berlin | This interdisciplinary book provides a compendium of projects, plus numerous example programs for readers to study and explore. Designed for advanced undergraduates or graduates of science, mathematics and engineering who will deal with scientific computation in their future studies and research, it also contains new and useful reference materials for researchers. The problem sets range from the tutorial to exploratory and, at times, to "the impossible". The projects were collected from research results and computational dilemmas during the author&apos;s tenure as Chief Scientist at NeXT Computer, and from his lectures at Reed College. The content assumes familiarity with such college topics as calculus, differential equations, and at least elementary programming. Each project focuses on computation, theory, graphics, or a combination of these, an d is designed with an estimated level of difficulty. The support code for each takes the form of either C or Mathematica, and is included in the appendix and on the bundled diskette. The algorithms are clearly laid out within the projects, such that the book may be used with other symbolic numerical and algebraic manipulation products.System requirements:Any NEXTSTEP computer running Mathematica 2.0 or higher is recommended to fully utilize disk contents. The diskette is also compatible with DOS, Windows, Macintosh and most UNIX computer systems (especially C language and Mathematica). | 1 Numbers everywhere Selected topics in numerical analysis.- 1.1 Numerical evaluation.- 1.1.1 Evaluation of famous constants.- 1.1.2 Evaluation of elementary functions.- 1.1.3 Special functions.- 1.2 Equation solving.- 1.2.1 Matrix algebra.- 1.2.2 Non-linear equation systems.- 1.2.3 Differential equations.- 1.3 Random numbers and Monte Carlo.- 1.3.1 Generating Random Numbers.- 1.3.2 Numerical integration and Monte Carlo.- 2 Exploratory computation Collected intra- and interdisciplinary projects.- 2.1 Mathematical problems.- 2.1.1 Planar geometry problems.- 2.1.2 Symbolic manipulation.- 2.1.3 Real and complex analysis.- 2.2 Nature-motivated...

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