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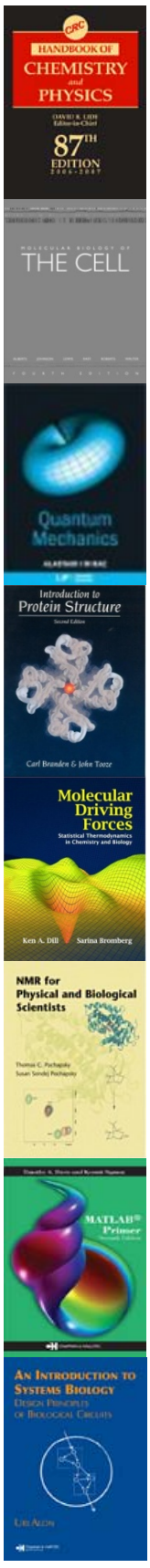

SERIES IN COMPUTATIONAL PHYSICS

ADVANCED TEXTBOOKS AT THE INTERFACE OF PHYSICAL AND COMPUTATIONAL SCIENCES

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Titles in this series aim to provide a core curriculum for this rapidly emerging field through presentation of state-of-the-art numerical methods and computational tools. They offer essential foundational materials for advanced undergraduate and graduate students in the physical sciences as well as academic and industry professionals in physics, engineering, computer science, applied math, and biology.

NEW TITLE PROPOSAL

I. Basic information

- Title
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- Name and affiliation of co-author / editor *if any*
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II. Written description (1-2 pages)

- ***Scope*** Your definition of the subject area
- ***Rationale*** An explanation of the basis for need
- ***Audience*** Details on target market and technical level
- ***Competition*** Strengths and weaknesses of similar works
- ***Organization*** Description of how the contents are organized

III. Preliminary outline

- Please include short chapter description or list of subtopics
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Series Editors
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DESCRIPTION

Computational physics is the application of numerical algorithms and simulations to physics problems for which numerical solutions exist. Whereas a traditional division highlights two components of physics (theory and experimentation), recently computation has been incorporated to reflect its growing importance in physics.

The interdisciplinary field of computational physics merges theoretical and methodological approaches from physics, computer science, and applied mathematics to problems as diverse as materials design, medical imaging, environmental modeling, and energy management.

The purpose of this new series is to present the core principles and modern methodologies for the fast-paced growth field of computational physics, thereby serving to define its foundations, current scope, and key challenges ahead. It will address underlying concepts, numerical methods, and software tools used in computational physics.

TARGET AUDIENCE

This series intends to provide appropriate instructional and background materials for advanced undergraduate and graduate students across physical sciences, as well as those with related interests in computer science, applied mathematics, engineering, and biology departments.

FEATURES

- Emphasis on qualitative understanding
- No assumption of advanced computing background
- Clear explanation of technical terms
- Chapter summaries and suggestions for further reading
- Computational exercises
- Integration of real modeling approaches
- Coverage of analytic component in addition to computational methods
- Worked examples use standard computing languages (Mathematica, MatLab, Maple, Java, etc.)
- Inclusion of experimental data and references

PROVISIONAL LIST OF TITLE TOPICS

- Computational Condensed Matter Physics
- Computational Materials Science
- Computational Fluid Dynamics
- Computational Biophysics
- Mathematical Methods for Computational Physics
- Computational Quantum Mechanics
- Computational Statistical Physics