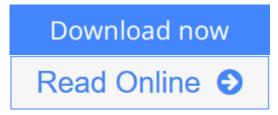# Computational Physics

By Jos Thijssen

Computational Physics By Jos Thijssen

First published in 2007, this second edition describes the computational methods used in theoretical physics. New sections were added to cover finite element methods and lattice Boltzmann simulation, density functional theory, quantum molecular dynamics, Monte Carlo simulation, and diagonalisation of one-dimensional quantum systems. It covers many different areas of physics research and different computational methodologies, including computational methods such as Monte Carlo and molecular dynamics, various electronic structure methodologies, methods for solving partial differential equations, and lattice gauge theory. Throughout the book the relations between the methods used in different fields of physics are emphasised. Several new programs are described and can be downloaded from www.cambridge.org/9781107677135. The book requires a background in elementary programming, numerical analysis, and field theory, as well as undergraduate knowledge of condensed matter theory and statistical physics. It will be of interest to graduate students and researchers in theoretical, computational and experimental physics.

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Review
"... I find this book very useful since it provides a thorough discussion of the computational methods used in physics combined with an extensive presentation of the underlying physics ... On the one hand an experienced researcher can easily transfer the obtained knowledge from this book to a particular research topic, while on the other hand a newcomer in the field will benefit from the presentation of the subject from first principles."
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Jos Thijssen is a lecturer at the Kavli Institute of Nanoscience at Delft University of Technology.

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