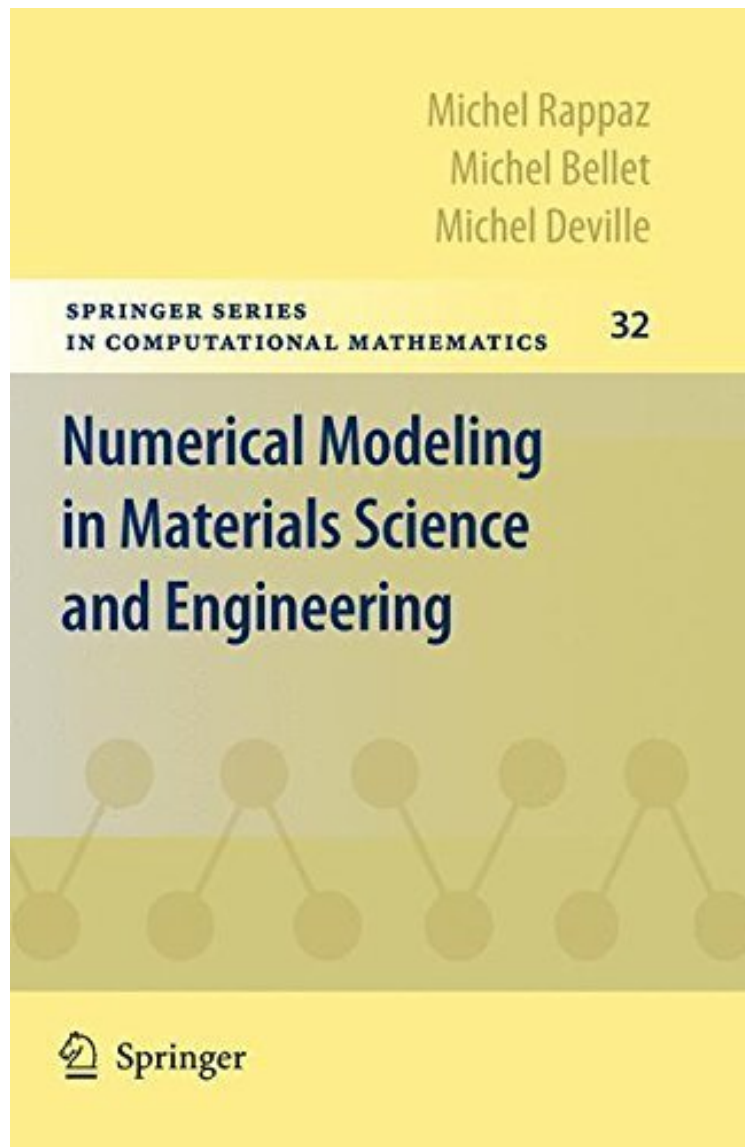


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Numerical Modeling in Materials Science and Engineering (Springer Series in Computational Mathematics)

Michel Rappaz, Michel Bellet, Michel Deville
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Michel Rappaz, Michel Bellet, Michel Deville : Numerical Modeling in Materials Science and Engineering (Springer Series in Computational Mathematics) before purchasing it in order to gauge whether or not it would be worth my time, and all praised Numerical Modeling in Materials Science and Engineering (Springer Series in Computational Mathematics):

2 of 2 people found the following review helpful. Modelling at the continuum scale
By Newton Ooi
With the increased power and availability of computers, computer aided modeling is becoming more prevalent in various fields of engineering. One important example is modelling of stress, strain, and flow (plastic solid and liquid) at the continuum level. Examples of this are finite element analysis, finite difference analysis, Monte Carlo simulations, and the random walk. This book covers all of these topics and generally serves as a good introductory textbook to learn about modelling at the continuum scale. The mathematical treatment is very brisk though, and requires prior knowledge of linear and partial differential equations, linear algebra, and basic computing.

Computing application to materials science is one of the fastest-growing research areas. This book introduces the concepts and methodologies related to the modeling of the complex phenomena occurring in materials processing. It is intended for undergraduate and graduate students in materials science and engineering, mechanical engineering and physics, and for engineering professionals or researchers.

From the reviews: "The book offers an impressive and excellent overview of a large variety of important aspects in the broad field of numerical modelling in material science and engineering. The authors included many meaningful and scientifically interesting examples. These are very valuable not only for students hellip; but also for the advanced computationally-oriented reader interested looking into new areas of research. hellip; To conclude, the book is highly recommendable to advanced students as well as scientists in the fields of engineering and material science." (Technische Mechanik, Vol. 24 (3-4), 2004) "The book under review is devoted to the numerical simulation and modeling in (especially) materials science and engineering. It aims at familiarizing the materials scientists and engineers with the numerical methods and techniques that are state-of-the-art in this subject. hellip; this is a well written and well-organized reference book that will hopefully prove to be indispensable, especially for those materials scientists and engineers whose investigations make use of the various numerical methods and techniques developed in this book." (HM Srivastava, Applied Mechanics s, Vol. 56 (6), November, 2003) "This book is essentially devoted to numerical simulation and modeling in engineering and materials science. hellip; this book is written to meet the needs of a textbook at the undergraduate and graduate levels in materials science and engineering. It may also be useful for researchers and engineering professionals who are interested in numerical methods, numerical simulation and modeling in engineering and materials science. hellip; Summarizing, this book is an important addition to the literature on material science." (L. Debnath, Zentralblatt MATH, Vol. 1024, 2003) "This book is devoted to numerical simulation and modeling in materials science and engineering. The aim of the monograph is to acquaint the materials science student or the engineer with the numerical methods which are state-of-the-art in this subject hellip; . The book is written at an introductory level and goes directly to the point. It should be recommended to students in material science and engineers who are either new in this field or want to get acquainted with numerical methods." (Jean-Luc Guermond, Mathematical s, 2003 h)ldquo;This is a carefully constructed introduction to the techniques and applications of numerical modelling in materials science and engineering. hellip; The layout of the text is clear and the order of presentation of material is logical. hellip; The advantage, of course, is that the book will survive changes in programming languages and fashions, and hold its value both as a textbook for undergraduates and graduates and as a reference.rdquo; (A. H. Harker, Contemporary Physics, February, 2012)
From the Back Cover
This book introduces the concepts and methodologies related to the modelling of the complex phenomena occurring in materials processing. After a short reminder of conservation laws and constitutive relationships, the authors introduce the main numerical methods: finite differences, finite volumes and finite elements. These techniques are developed in three main chapters of the book that tackle more specific problems: phase transformation, solid mechanics and fluid flow. The two last chapters treat inverse methods to obtain the boundary conditions or the material properties and stochastic methods for microstructural simulation. This book is intended for undergraduate and graduate students in materials science and engineering, mechanical engineering and physics and for engineering professionals or researchers who want to get acquainted with numerical simulation to model and compute materials processing.