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Nota di contenuto	Continuum Scale Simulation of Engineering Materials; Contents; Preface; List of Contributors; I Fundamentals and Basic Methods; 1 Computer Simulation of Diffusion Controlled Phase Transformations; 1.1 Introduction; 1.2 Numerical Treatment of Diffusion Controlled Transformations; 1.2.1 Diffusion; 1.2.2 Boundary Conditions; 1.2.3 Cell Size; 1.3 Typical Applications; 1.3.1 LE, LENP and PE in Fe-Mn-C; 1.3.2 LE, LENP and PE in Fe-Si-C; 1.3.3 PE in Fe-Ni-C; 1.3.4 Effect of Traces on the Growth of Grain Boundary Cementite; 1.3.5 Continuous Cooling 1.3.6 Competitive Growth of Phases: Multi-Cell Calculations1.3.7 Gas-Metal-Reactions: Carburization; 1.4 Outlook; References; 2 Introduction to the Phase-Field Method of Microstructure Evolution; 2.1 Introduction; 2.2 Origin of the Model; 2.3 Theoretical Fundamentals of the Method; 2.3.1 Representation of a Microstructure; 2.3.2 Thermodynamics of Microstructures; 2.3.3 The Evolution Equations; 2.4 Advantages and Disadvantages of the Method; 2.5 Typical Fields of Applications and Examples; 2.6 Summary and Opportunities;

References; 3 Cellular, Lattice Gas, and Boltzmann Automata
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Science; 3.1.4 Recrystallization Simulations with Cellular Automata; 3.2
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5.3.3 Yield Surfaces Defined by Hyperplanes

Sommario/riassunto

This book fills a gap by presenting our current knowledge and understanding of continuum-based concepts behind computational methods used for microstructure and process simulation of engineering materials above the atomic scale. The volume provides an excellent overview on the different methods, comparing the different methods in terms of their respective particular weaknesses and advantages. This trains readers to identify appropriate approaches to the new challenges that emerge every day in this exciting domain. Divided into three main parts, the first is a basic overview covering fu

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