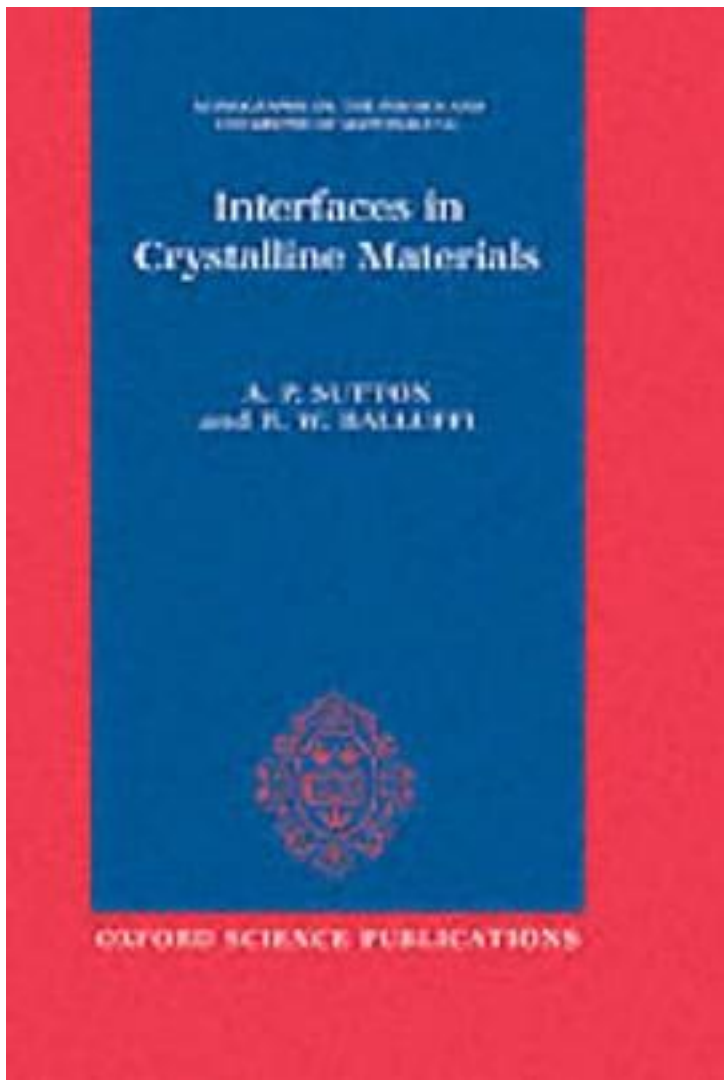


Interfaces in Crystalline Materials



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著者:Sutton, A. P./ Balluffi, R. W.

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The study of interfaces within and between materials is a central field which is relevant to almost all aspects of materials science. For example, interfaces play a role in many of the mechanical and electrical properties of materials, phase transformations, and microstructure of materials. This book is intended to serve as a graduate text consisting of four inter-related parts spanning the structure, thermodynamics, kinetics, and properties of interfaces in crystalline materials. Throughout the book emphasis is placed on the conceptual foundations of the subject through the exposition of simple models and descriptions of key experimental observations. In this way the reader is gradually taken to the forefront of the subject. The first four chapters deal with structural aspects of interfaces - interfacial geometry, dislocation models, interatomic forces, and atomic structure. There are three chapters dealing with thermodynamic aspects of interfaces; the thermodynamics of interfaces; interfacial phases and phase transitions, and segregation of solute atoms. The kinetics of interfaces are covered in three chapters concerned with diffusion, conservative motion, and non-conservative motion. Finally there are two chapters which cover the electrical and mechanical properties of interfaces. This book is a unique introduction to the field of interfaces in crystalline materials spanning the subject in a coherent and pedagogical style.

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