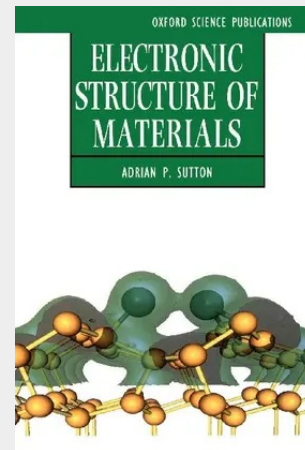


Electronic Structure of Materials

This textbook provides an up-to-date account of modern thinking about the electronic structure and properties of crystalline and non-crystalline materials in a form that is readily accessible to undergraduates in materials science, physics, and chemistry. In recent years the dominant role of the local atomic environment in controlling electronic structure and properties of materials has been recognized. The 'real-space' approach to electronic structure that this recognition has spawned runs through this book, and provides a coherent framework in which to study perfect and defective crystals and non-crystalline materials. This is the approach that those who have been worried by the conventional preoccupation with perfect crystals and band theory have been waiting for. The reciprocal space approach, exemplified in band theory, is also developed and powerful links between the two approaches are shown. Modern, first principles calculations, based on density functional theory, are now predictive tools in materials science and they are introduced and illustrated with relevant examples. Throughout this book the mathematical complexity is kept to a minimum. This therefore, is a textbook which provides a unique introduction to current understanding and predictive modelling of electronic structure and properties in today's materials.

This book describes the modern real-space approach to electronic structures and properties of crystalline and non-crystalline materials in a form readily accessible to undergraduates in materials science, physics, and chemistry.



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