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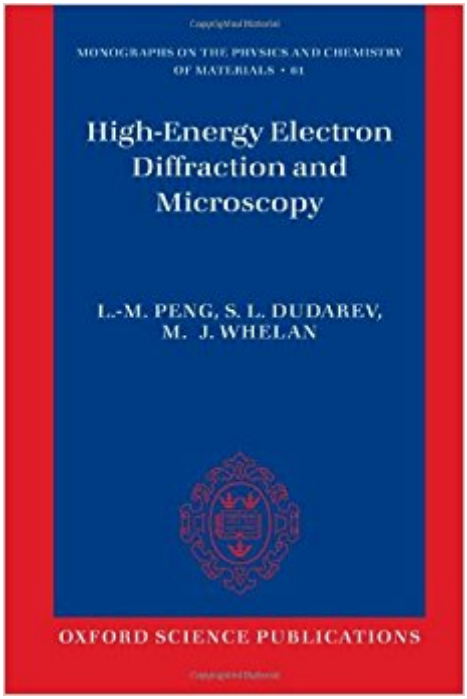
High Energy Electron Diffraction And Microscopy (Monographs On The Physics And Chemistry Of Materials)



Synopsis

High Energy Electron Diffraction and Microscopy provides a comprehensive introduction to high energy electron diffraction and elastic and inelastic scattering of high energy electrons, with particular emphasis on applications to modern electron microscopy. Starting from a survey of fundamental phenomena, the authors introduce the most important concepts underlying modern understanding of high energy electron diffraction. Dynamical diffraction in transmission (THEED) and reflection (RHEED) geometries is treated using a general matrix theory, where computer programs and worked examples are provided to illustrate the concepts and to familiarize the reader with practical applications. Diffuse and inelastic scattering and coherence effects are treated comprehensively both as a perturbation of elastic scattering and within the general multiple scattering quantum mechanical framework of the density matrix method. Among the highlights are the treatment of resonance diffraction of electrons, HOLZ diffraction, the formation of Kikuchi bands and lines and ring patterns, and application of diffraction to monitoring of growing surfaces. Useful practical data are summarised in tables including those of electron scattering factors for all the neutral atoms and many ions, and the temperature dependent Debye-Waller factors given for over 100 elemental crystals and compounds.

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Customer Reviews

... has the potential to become one of the classic reference books in electron microscopy. * Bulletin

of the Microscopical Society of Canada * Although the book is mathematically based, the authors take care to provide a physical interpretation whenever possible, for example by the use of diagrams... The serious electron microscopist will find it a sound investment. * Micron * This is a superb book. It is certainly the most thorough, unified and comprehensive treatment of high-energy electron diffraction (HEED) theory to appear for many years...In summary this is a book that all laboratories working in electron microscopy and surface science must have. It is also a highly readable textbook, which is unusually clearly written and complete. * Acta Crystallographica *

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