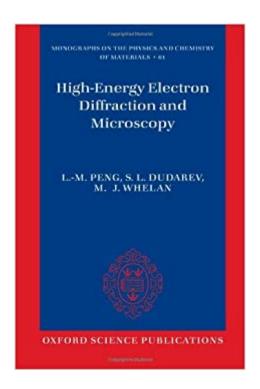


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# High Energy Electron Diffraction And Microscopy (Monographs On The Physics And Chemistry Of Materials)





# **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.

## **Book Information**

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

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L.-M. Peng, Yangtze Professor of Nanoscale Science and Technology at Peking University; elected Fellow of Institute of Physics in 2000 and awarded the Qiu Shi Prize for Outstanding Young Scientist in Physics in 1998. Currently serves as an Associate Editor of the "International Journal of Nanoscience", a member of the Advisory Editorial Board of Ultramicroscopy and a member of the Editorial Board, MICRON. S.L.Dudarev, Principal Scientist at EURATOM/UKAEA Fusion Association and Senior Research Fellow of Linacre College, Oxford. Received DSc in Theoretical and Mathematical Physics from Moscow Engineering Physics Institute in 1994. Held visiting positions at Melbourne University, Max-Planck Institute for Solid State Research in Stuttgart and Hong-Kong Polytechnic University. Currently involved in the development of a comprehensive programme on mathematical modelling of fusion materials. M.J.Whelan, FRS, Emeritus Professor of Microscopy of Materials in the Department of Materials, Oxford University. Emeritus Fellow of Linacre College, Oxford. --This text refers to the Hardcover edition.

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