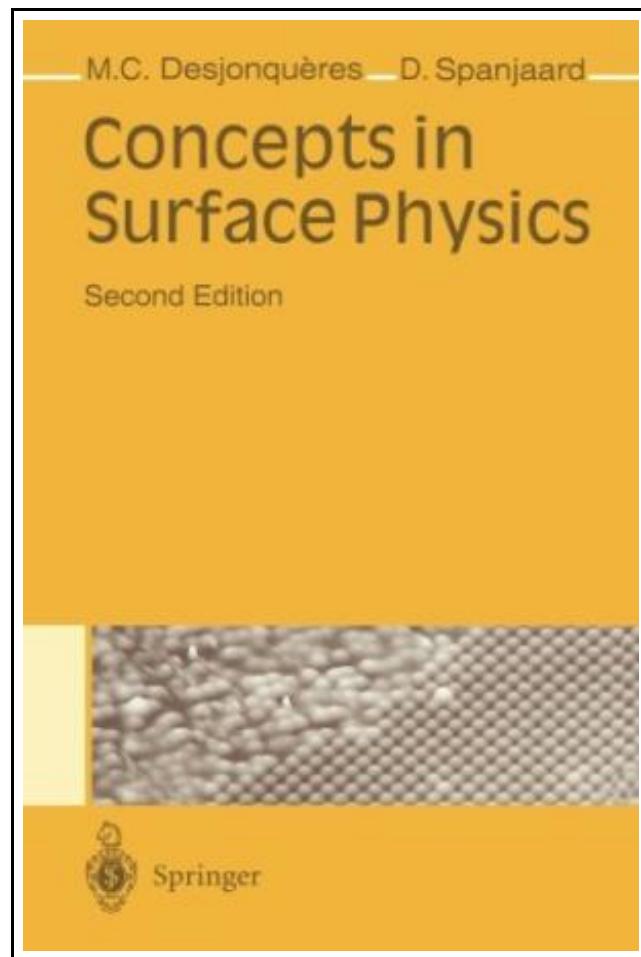


Concepts in Surface Physics



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Book Condition: New. Publisher/Verlag: Springer, Berlin | Concepts in Surface Physics presents a tutorial treatment of the main concepts and phenomena of the physics of crystal surfaces. Emphasis is placed on simplified calculations - and the corresponding detailed analytical derivations - that are able to throw light on the most important physical mechanisms. More rigorous techniques, which often require a large amount of computer time, are also explained. The topics treated include thermodynamic and statistical properties of clean and adsorbate-covered surfaces, atomic structure, vibrational properties, electronic structure, and the theory of physisorption and chemisorption. As well as including some improvements on the original book, this second edition has been supplemented with problems to encourage students to investigate the subject more thoroughly. | 1. Introduction.- 2. Thermodynamical and Statistical Properties of Clean Surfaces.- 2.1 Thermodynamics of a Surface at Equilibrium.- 2.2 Equilibrium Shape of a Crystal.- 2.3 Facetting.- 2.4 The Roughening Transition.- 2.4.1 Generalities.- 2.4.2 Macroscopic Approach: The Continuum Limit.- a) One Dimensional Case: Statistics of a Step.- b) The Two Dimensional Case: Statistics of a Surface.- 2.4.3 Microscopic Approach.- a) Equilibrium Shape of a Step Edge.- b) Equilibrium Shape of a Surface: The Roughening Transition.- 2.4.4 Consequences of the Roughening Transition for the Equilibrium Shape of Crystals and for Crystal Growth.- 2.4.5 Experimental Evidences of the Roughening Transition.- 2.4.6 Special Cases of Vicinal Surfaces.- Problems.- 3. Atomic Structure of Surfaces.- 3.1 Surface Crystallography.- 3.1.1 Two-Dimensional Lattices.- 3.1.2 Semi-Infinite Crystals. Relaxation. Reconstruction.- 3.1.3 Notations for Surface Structures.- 3.1.4 Vicinal Surfaces.- 3.1.5 Reciprocal Lattice and Brillouin Zones.- 3.2 Experimental Techniques.- 3.2.1 Observation of the Real Lattice.- a) Field-ion Microscopy (FIM).- b) Scanning Tunneling Microscopy (STM).- 3.2.2 Observation of the Reciprocal Lattice.- a) Principles of Diffraction.- b) Low Energy Electron Diffraction (LEED).- c) Atom Scattering.- d) X-ray Scattering at Grazing Incidence.- 3.2.3 Indirect Methods.

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