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Autore	Maldovan Martin
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Altri autori (Persone)	ThomasEdwin L
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Periodic Materials and Interference Lithography; Contents; Preface; Introduction; Theory; 1 Structural Periodicity; 1.1 Nonperiodic versus Periodic Structures; 1.2 Two-dimensional Point Lattices; 1.3 Three-dimensional Point Lattices; 1.3.1 Primitive and Nonprimitive Unit Cells; 1.4 Mathematical Description of Periodic Structures; 1.5 Fourier Series; 1.5.1 Fourier Series for Two-dimensional Periodic Functions; 1.5.2 Fourier Series for Three-dimensional Periodic Functions; 1.5.3 Arbitrary Unit Cells; Further Reading; Problems; 2 Periodic Functions and Structures; 2.1 Introduction 2.2 Creating Simple Periodic Functions in Two Dimensions2.2.1 The Square Lattice; 2.2.2 The Triangular Lattice; 2.3 Creating Simple Periodic Functions in Three Dimensions; 2.3.1 The Simple Cubic Lattice; 2.3.2 The Face-centered-cubic Lattice; 2.3.3 The Body-centered-cubic Lattice; 2.4 Combination of Simple Periodic Functions; Problems; 3 Interference of Waves and Interference Lithography; 3.1 Electromagnetic Waves; 3.2 The Wave Equation; 3.3 Electromagnetic

Plane Waves; 3.4 The Transverse Character of Electromagnetic Plane Waves; 3.5 Polarization
 3.5.1 Linearly Polarized Electromagnetic Plane Waves 3.5.2 Circularly Polarized Electromagnetic Plane Waves; 3.5.3 Elliptically Polarized Electromagnetic Plane Waves; 3.6 Electromagnetic Energy; 3.6.1 Energy Density and Energy Flux for Electromagnetic Plane Waves; 3.6.2 Time-averaged Values; 3.6.3 Intensity; 3.7 Interference of Electromagnetic Plane Waves; 3.7.1 Three-dimensional Interference Patterns; 3.8 Interference Lithography; 3.8.1 Photoresist Materials; 3.8.2 The Interference Lithography Technique; 3.8.3 Designing Periodic Structures; Further Reading; Problems
 4 Periodic Structures and Interference Lithography 4.1 The Connection between the Interference of Plane Waves and Fourier Series; 4.2 Simple Periodic Structures in Two Dimensions Via Interference Lithography; 4.3 Simple Periodic Structures in Three Dimensions Via Interference Lithography; Further Reading; Problems; Experimental; 5 Fabrication of Periodic Structures; 5.1 Introduction; 5.2 Light Beams; 5.3 Multiple Gratings and the Registration Challenge; 5.4 Beam Configuration; 5.4.1 Using Four Beams; 5.4.2 Using a Single Beam (Phase Mask Lithography) 5.5 Pattern Transfer: Material Platforms and Photoresists 5.5.1 Negative Photoresists; 5.5.2 Positive Photoresists; 5.5.3 Organic-Inorganic Hybrids Resists; 5.6 Practical Considerations for Interference Lithography; 5.6.1 Preserving Polarizations and Directions; 5.6.2 Contrast; 5.6.3 Drying; 5.6.4 Shrinkage; 5.6.5 Backfilling - Creating Inverse Periodic Structures; 5.6.6 Volume Fraction Control; 5.7 Closing Remarks; Further Reading; Applications; 6 Photonic Crystals; 6.1 Introduction; 6.2 One-dimensional Photonic Crystals; 6.2.1 Finite Periodic Structures; 6.2.2 Infinite Periodic Structures 6.2.3 Finite versus Infinite Periodic Structures

Sommario/riassunto

Written by the department head of materials science and engineering at MIT, this concise and stringent introduction takes readers from the fundamental theory to in-depth knowledge. It sets out with a theoretical scheme for the design of desirable periodic structures, then presents the experimental techniques that allow for fabrication of the periodic structure and exemplary experimental data. Subsequently, theory and numerical data are used to demonstrate how these periodic structures control the photonic, acoustic, and mechanical properties of materials, concluding with examples from these

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Soggetti	Chemical engineering Genie chimique Genie biochimique chemical engineering Chemische Verfahrenstechnik Zeitschrift Online-Ressource Biotechnologie Periodicals. Zeitschrift
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Periodico
Note generali	Refereed/Peer-reviewed Title from general information screen for v. 65-present (ScienceDirect, viewed Oct. 20, 2005). "An international journal of research and development." Some issues also have distinctive theme titles.
Sommario/riassunto	"The Chemical engineering journal provides an international forum for the presentation of original research, interpretative reviews and discussion of new development in chemical engineering. Papers which describe novel theory and its application to practice are welcome, as are those which illustrate the transfer of techniques from other disciplines."