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Titolo	Getting Acquainted with Homogenization and Multiscale // by Leonid Berlyand, Volodymyr Rybalko
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Descrizione fisica	1 online resource (XVIII, 178 p. 42 illus., 14 illus. in color.)
Collana	Compact Textbooks in Mathematics, , 2296-4568
Disciplina	515.353 515.35
Soggetti	Computer mathematics Applied mathematics Engineering mathematics Partial differential equations Computational Science and Engineering Mathematical and Computational Engineering Partial Differential Equations
Lingua di pubblicazione	Inglese
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Chapter 1- Preliminaries -- Chapter 2- What is Homogenization and Multiscale? First Examples -- Chapter 3- Brief History and Surprising Examples in Homogenization -- Chapter 4- Formal Two-scale Asymptotic Expansions and the Corrector Problem -- Chapter 5- Compensated Compactness and Oscillating Test-functions -- Chapter 6- Two-scale Convergence -- Chapter 7- Examples of Explicit Effective Coefficients: Laminated Structures and 2D Checkerboards -- Chapter 8- Introduction to Stochastic Homogenization -- Chapter 9- G-Convergence in Nonlinear Homogenization Problems -- Chapter 10- An Example of a Nonlinear Problem: Homogenization of Plasticity and Limit Loads -- Chapter 11- Continuum Limits for Discrete Problems with Fine Scales -- References -- Appendix: Regular and Singular Perturbations and Boundary Layers -- Index.
Sommario/riassunto	The objective of this book is to navigate beginning graduate students in mathematics and engineering through a mature field of multiscale

problems in homogenization theory and to provide an idea of its broad scope. An overview of a wide spectrum of homogenization techniques ranging from classical two-scale asymptotic expansions to Gamma convergence and the rapidly developing field of stochastic homogenization is presented. The mathematical proofs and definitions are supplemented with intuitive explanations and figures to make them easier to follow. A blend of mathematics and examples from materials science and engineering is designed to teach a mixed audience of mathematical and non-mathematical students.
