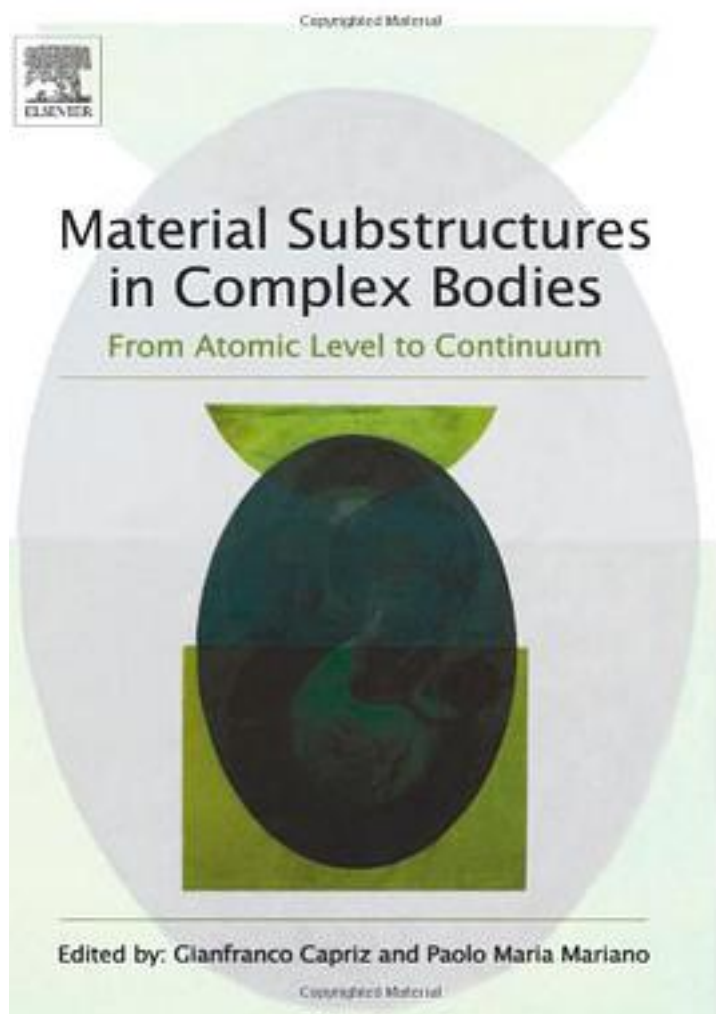


Material Substructures in Complex Bodies



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Stringent industrial requirements for sophisticated performance and circumstantial

control of microdevices or nanotechnology manufacturing, and other types of machinery at multiple scales, require complex materials. The adjective complex indicates that the substructure influences gross mechanical behaviour in a prominent way and interactions due to substructural changes are represented directly. Examples are liquid crystals, quasi-periodic alloys, polymeric bodies, spin glasses, magnetostrictive materials and ferroelectrics, suspensions, in particular liquids with gas bubbles, polarizable fluids, etc. The mechanical behaviour of complex bodies described in this book gives rise to a wide variety of challenging problems from the macroscopic- to the nano-world. The chapters composing this book explore various aspects of these problems, giving rise to new areas of discussion together with specific solutions. The contributors to this book include: Carlo Cercignani; Gianfranco Capriz; Pierre Degond; Antonio Fasano; Harley T. Johnson; Sukky Jun; Krishna Kannan; Wing Kam Liu; Alberto Mancini; Paolo Maria Mariano; Ingo Muller; Kumbakonam R. Rajagopal; and, Jan Jerzy Slawianowski. This book will be a useful tool for researchers and students working on the basic mathematical and physical problems accruing from the mechanics of materials. It features the leading scientific competence of contributors. It contains a clear writing style linking solutions and open problems. It includes suggestions for direct technological applications and new research work. It offers mathematical models for nanotechnology devices.

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