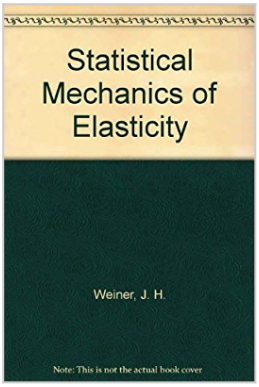

Statistical Mechanics of Elasticity

By Jerome Harris Weiner

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An advanced treatment of elasticity from the atomistic viewpoint, this volume offers students and teachers a self-contained text. Its detailed development of the general principles of statistical mechanics leads to a concentration on the principles' application to the elastic behavior of solids. The first part is based solely on classical mechanics, starting with an introductory chapter that summarizes thermoelasticity from the continuum viewpoint. The principles of classical statistical mechanics are then developed and applied to the study of the thermoelastic behavior of both crystalline and polymeric solids. The second part is based on quantum mechanics, discussing their role in interatomic force laws, the manner in which quantum statistical effects modify the low-temperature mechanical behavior of solids, and the nature of quantum effects upon the rates of thermally activated processes.
This book provides an alternative to the usual course in statistical mechanics, in which the major emphasis is on applications to gases, liquids, and electronic and magnetic phenomena. Graduate students of physics and chemistry will appreciate the treatment of the basic principles of classical statistical mechanics and quantum statistical mechanics, while polymer physicists will find the discussion of curvilinear coordinates, geometric constraints, and the distinction between rigid and flexible polymer models of particular interest.

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About the Author

Jerome H. Weiner is Professor Emeritus of Engineering and Physics at Brown University. His other Dover book, co-written with Bruno A. Boley, is *Theory of Thermal Stresses.*

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