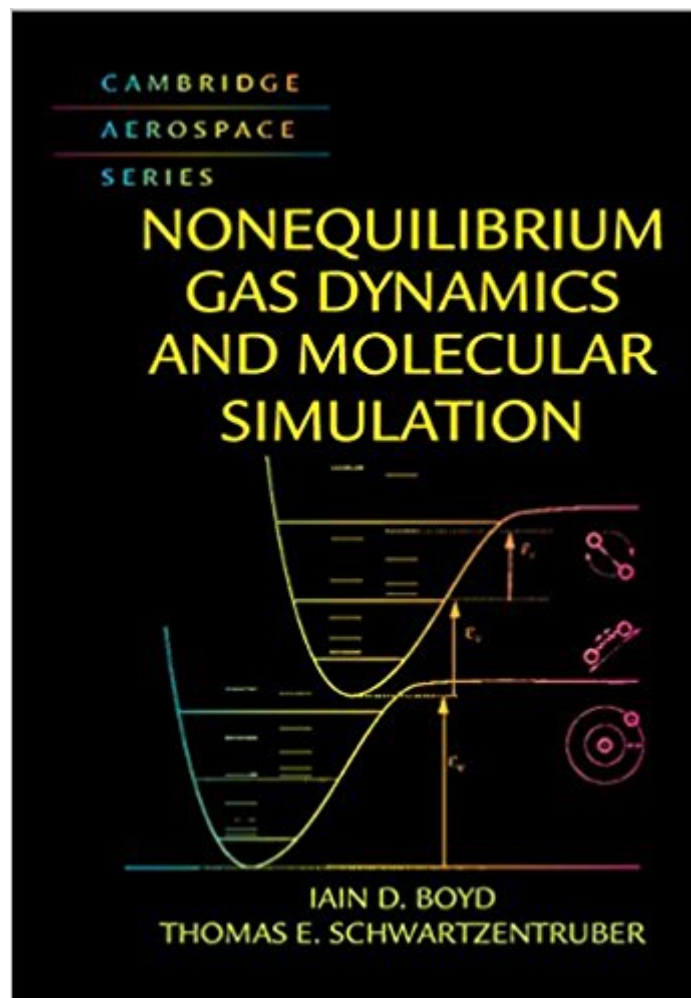




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Nonequilibrium Gas Dynamics And Molecular Simulation (Cambridge Aerospace Series)



Synopsis

This current and comprehensive book provides an updated treatment of molecular gas dynamics topics for aerospace engineers, or anyone researching high-temperature gas flows for hypersonic vehicles and propulsion systems. It demonstrates how the areas of quantum mechanics, kinetic theory, and statistical mechanics can combine in order to facilitate the study of nonequilibrium processes of internal energy relaxation and chemistry. All of these theoretical ideas are used to explain the direct simulation Monte Carlo (DSMC) method, a numerical technique based on molecular simulation. Because this text provides comprehensive coverage of the physical models available for use in the DSMC method, in addition to the equations and algorithms required to implement the DSMC numerical method, readers will learn to solve nonequilibrium flow problems and perform computer simulations, and obtain a more complete understanding of various physical modeling options for DSMC than is available in other texts.

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Customer Reviews

This is an excellent textbook and reference book on modern gas dynamics. The authors are experts

in this field and the book will be valuable to both students entering the field and those of us already working in it for many years. The book assembles many current topics in theoretical and numerical gas dynamics that, until now, were only accessible from the original journal articles. It also has a clear, detailed description of Direct Simulation Monte Carlo (DSMC), which is the dominant numerical method for the simulation of rarefied gas flows. Along with G. Bird's classic book, Boyd and Schwartzentruber is a must-have reference for scientists and engineers using DSMC.

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