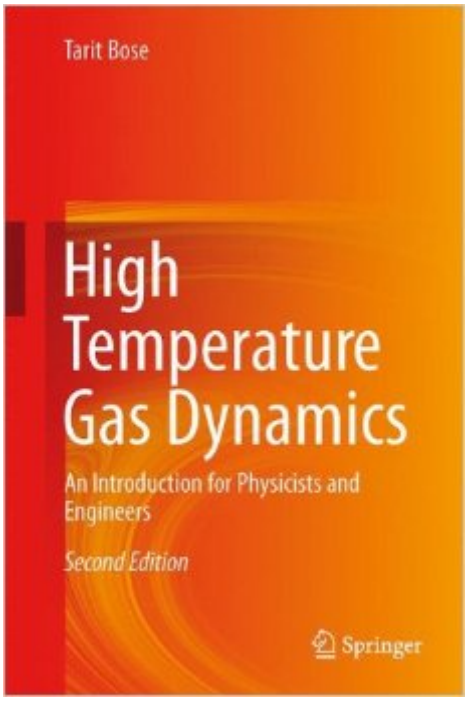
High Temperature Gas Dynamics: An Introduction For Physicists And Engineers



Synopsis

High Temperature Gas Dynamics is a primer for scientists, engineers, and students who would like to have a basic understanding of the physics and the behavior of high-temperature gases. It is a valuable tool for astrophysicists as well. The first chapters treat the basic principles of quantum and statistical mechanics and how to derive thermophysical properties from them. Special topics are included that are rarely found in other textbooks, such as the thermophysical and transport properties of multi-temperature gases and a novel method to compute radiative transfer. Furthermore, collision processes between different particles are discussed. Separate chapters deal with the production of high-temperature gases and with electrical emission in plasmas, as well as related diagnostic techniques. This new edition adds over 100 pages and includes the following updates: several sections on radiative properties of high temperature gases and various radiation models, a section on shocks in magneto-gas-dynamics, a section on stability of 2D ionized gas flow, and additional practical examples, such as MGD generators, Hall and ion thrusters, and Faraday generators.

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