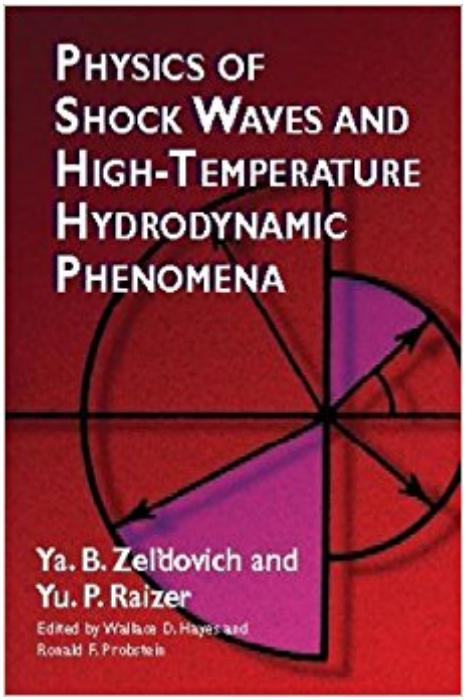
Physics Of Shock Waves And High-Temperature Hydrodynamic Phenomena (Dover Books On Physics)



Synopsis

High temperatures elicit a variety of reactions in gases, including increased molecular vibrations, dissociation, chemical reactions, ionization, and radiation of light. In addition to affecting the motion of the gas, these processes can lead to changes of composition and electrical properties, as well as optical phenomena.These and other processes of extreme conditions â ” such as occur in explosions, in supersonic flight, in very strong electrical discharges, and in other cases â ” are the focus of this outstanding text by two leading physicists of the former Soviet Union. The authors deal thoroughly with all the essential physical influences on the dynamics and thermodynamics of continuous media, weaving together material from such disciplines as gas dynamics, shock-wave theory, thermodynamics and statistical physics, molecular physics, spectroscopy, radiation theory, astrophysics, solid-state physics, and other fields.This volume, uniquely comprehensive in the field of high-temperature gas physics and gas dynamics, was edited and annotated by Wallace D. Hayes and Ronald F. Probstein, leading authorities on the flow of gases at very high speeds. It is exceptionally well suited to the needs of graduate students in physics, as well as professors, engineers, and researchers.

Book Information

Series: Dover Books on Physics

Paperback: 944 pages

Publisher: Dover Publications; Annotated edition edition (March 31, 2002)

Language: English

ISBN-10: 0486420027

ISBN-13: 978-0486420028

Product Dimensions: 6.3 x 1.8 x 9.2 inches

Shipping Weight: 2.7 pounds (View shipping rates and policies)

Average Customer Review: 4.6 out of 5 stars 12 customer reviews

Best Sellers Rank: #256,060 in Books (See Top 100 in Books) #7 inÂ Books > Engineering & Transportation > Engineering > Aerospace > Gas Dynamics #53 inÂ Books > Science & Math > Physics > Waves & Wave Mechanics #889 inÂ Books > Textbooks > Science & Mathematics > Physics

Customer Reviews

Text: English (translation) Original Language: Russian

Son of a Gambling ManRonald F. Probstein, Ford Professor of Engineering, Emeritus, at the Massachusetts Institute of Technology has had a long career in engineering research and has made significant contributions in many areas from ballistic missile design, to hypersonic flight theory, to the field of synthetic fuels, a subject of obvious importance to everyone. His 1959 book, Hypersonic Flow Theory, co-authored with Wallace D. Hayes, and reprinted by Dover in 2004 as Hypersonic Inviscid Flow, is still the basic book on this subject. Synthetic Fuels, written with R. Edwin Hicks, is certainly one of the most important and timely engineering texts ever reprinted by Dover. In addition to their own writings, Probstein and Hayes edited the English translation of a major text by two distinguished Russian physicists, Ya. B. Zel'dovich and Yu. P. Raizer, Physics of Shock Waves and High-Temperature Hydrodynamic Phenomena. ã However, Dr. Probstein's literary legacy isn't all about hard science. In 2009 he published an evocatively entertaining memoir of his father and their life in Depression-era New York, Honest Sid: Memoir of a Gambling Man. Even though not a Dover book, it is certainly highly recommended. Critical Acclaim for Physics of Shock Waves and High-Temperature Hydrodynamic Phenomena:"The republication by Dover Publications of this masterwork by Ya. B. Zel'dovich and Yu. P. Raizer will be welcomed by all workers dealing with high-temperature (radiating) flows. This book is a virtual 'bible' for studies of shocks and radiation fronts in high speed aeronautics, astronautics (re-entry), astrophysics, fireballs, shock tubes, and very intense explosions. Zel'dovich was a physicist of extraordinary breadth of interests. The style of this book is to give heuristic explanations followed by rigorous analysis. It is insightful for both beginning students and researchers in the field. This book is an ABSOLUTE MUST for anyone working on the subjects listed above." "I URGE anyone working in astrophysics and high-temperature flow physics to buy, read, enjoy, and be enlightened by this masterpiece." â ” Dimitri Mihalas, co-author of Foundations of Radiation Hydrodynamics

The fields of shock waves and high temperature hydrodynamics have been exhaustively examined in the literature and, while more recent treatments exist, there is still no better introduction than this enduring classic. The mathematically correct presentation of most of the relevant physics quickly enables applied mathematicians and engineers working in these disciplines to achieve the level of understanding necessary to start producing useful results. It can be read in its entirety as a solid introduction to more specialised topics or simply serve as an excellent reference. And the price of this beautifully reprinted volume from Dover is irresistible.

You only have to read a couple of chapters from this book if you are a beginner in shock wave

science to gain a basic undestanding. This is an excellent book together with Courant’s bookÂ Supersonic Flow and Shock Waves (Applied Mathematical Sciences) (v. 21)

GREAT

The author is the "father" of high temperature, high pressure physics. While not discussed directly, clearly this book is a data dump of the knowledge in the USSR developed during their nuclear weapons programs..... many of the physicist that developed the Soviet nuclear capabilities were Jewish and this book should be a tribute to their contribution (in particular in light of Stalin’s purge of the Jews from all high positions).

This book is a true classic, written by the great Zel’dovicha long time ago. Dover’s two-volumes-in-one book new editionprovides an excellent opportunity to enrich every physicslibrary, private or institutional.

Happy with purchase.

I’ve wasted many credit hours taking physics courses all the way up through grad school and never learned a damned thing! This book reignited my interest in physics. It explains how to think about the physics and what things mean as opposed to the typical nonsense of here’s the equation and the solution (solution obtained by some absurd change of variable or transformation that you will never be able to guess if you lived a 1.0E12 years!) Gives great insight on physical modeling. This is one of few physics books I cannot live without. This is one of 3 books that allowed me to get a Ph.D!However, it is not for beginers. You must have some experience in fluid mechanics and quantum mechanics in order to appreciate the material. The book is not going to tell you how to solve problems, but focus on the meaning of results.

The republication by Dover Publications of this masterwork by Ya. B. Zel’dovich and Yu. P. Raizer will be welcomed by all workers dealing with high-temperature (radiating) flows. This book is a virtual "Bible" for studies of shocks and radiation fronts in high speed aeronautics, astronautics (re-entry), astrophysics, fireballs, shock tubes, and very intense explosions.Zel’dovich was a physicist of extraordinary breadth of interests. The style of this book is to give heuristic explanations followed by rigorous analysis. It is insightful for both beginning students and researchers in the field.

This book is an ABSOLUTE MUST for anyone working on the subjects listed above.The Dover edition binds both original volumes as one, and is based on the very scarce second printing, in which most of the typographical errors in the first printing were corrected. All other errors noted over the years since the original edition went out of print have been collected and corrected in this version, which should be virtually error free.I URGE anyone working in astrophysics and high-temperature flow physics to buy, read, enjoy, and be enlightened by this masterpiece.

Physics of Shock Waves and High-Temperature Hydrodynamic Phenomena (Dover Books on Physics) Mitigation of Hydrodynamic Resistance: Methods to Reduce Hydrodynamic Drag High-Energy-Density Physics: Fundamentals, Inertial Fusion, and Experimental Astrophysics (Shock Wave and High Pressure Phenomena) High Fiber Recipes: 101 Quick and Easy High Fiber Recipes for Breakfast, Snacks, Side Dishes, Dinner and Dessert (high fiber cookbook, high fiber diet, high fiber recipes, high fiber cooking) Explosive Effects and Applications (Shock Wave and High Pressure Phenomena) Physics of Waves (Dover Books on Physics) Hydrodynamic and Hydromagnetic Stability (International Series of Monographs on Physics) Culture Shock! Jakarta: A Survival Guide to Customs and Etiquette (Culture Shock! at Your Door) (Cultureshock Jakarta: A Survival Guide to Customs & Etiquette) Culture Shock! Tokyo: A Survival Guide to Customs and Etiquette (Culture Shock! At Your Door: A Survival Guide to Customs & Etiquette) Culture Shock! Mauritius: A Survival Guide to Customs and Etiquette (Culture Shock! Guides) Culture Shock! Taiwan: A Survival Guide to Customs and Etiquette (Culture Shock! A Survival Guide to Customs & Etiquette) Culture Shock! Hungary: A Survival Guide to Customs and Etiquette (Culture Shock! Guides) (Cultureshock Hungary: A Survival Guide to Customs & Etiquette) Culture Shock! Saudi Arabia: A Survival Guide to Customs and Etiquette (Culture Shock! Guides) Culture Shock! Syria: A Survivial Guide to Customs and Etiquette (Culture Shock! Guides) Culture Shock! Venezuela (Culture Shock! A Survival Guide to Customs & Etiquette) Culture Shock! Borneo (Culture Shock! A Survival Guide to Customs & Etiquette) Culture Shock! Mauritius (Culture Shock! A Survival Guide to Customs & Etiquette) Culture Shock! Morocco (Culture Shock! A Survival Guide to Customs & Etiquette) Culture Shock! Taiwan (Culture Shock! A Survival Guide to Customs & Etiquette) Culture Shock!: Taiwan (Culture Shock!)

Privacy

FAQ & Help