

Hypersonic and High-Temperature Gas Dynamics

Third Edition

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Hypersonic And High Temperature Gas Dynamics Second Edition Aiaa Education

Xinguo Zhang



Hypersonic And High Temperature Gas Dynamics Second Edition Aiaa Education:

Hypersonic and High-temperature Gas Dynamics John David Anderson, 2006 This book is the second edition of a successful self contained text for those students and readers interested in learning hypersonic flow and high temperature gas dynamics Like the first edition it assumes no prior familiarity with either subject on the part of the reader If you have never studied hypersonic and or high temperature gas dynamics before and if you have never worked extensively in the area then this book is for you On the other hand if you have worked and or are working in these areas and you want a cohesive presentation of the fundamentals a development of important theory and techniques a discussion of the salient results with emphasis on the physical aspects and a presentation of modern thinking in these areas then this book is also for you In other words this book is designed for two roles 1 as an effective classroom text that can be used with ease by the instructor and understood with ease by the student and 2 as a viable professional working tool for engineers scientists and managers who have any contact in their jobs with hypersonic and or high temperature flow Because of its success most of the first edition has been carried over to the second edition with the addition of much new material This second edition has updated figures and data to complement the presentation and discussion of the fundamentals New to this edition are some educational tools that the author has found successful in previous books 1 previews of each chapter written in plain language to inform the reader why it is important to read and understand the material in the chapter to highlight the important aspects and to whip up the readers interest 2 design examples scattered throughout the book to illustrate the applic

Hypersonic and High-temperature Gas Dynamics ,2006 *High Enthalpy Gas Dynamics* Ethirajan Rathakrishnan, 2015-06-29 This is an introductory level textbook which explains the elements of high temperature and high speed gas dynamics written in a clear and easy to follow style the author covers all the latest developments in the field including basic thermodynamic principles compressible flow regimes and waves propagation in one volume covers theoretical modeling of High Enthalpy Flows with particular focus on problems in internal and external gas dynamic flows of interest in the fields of rockets propulsion and hypersonic aerodynamics High enthalpy gas dynamics is a compulsory course for aerospace engineering students and this book is a result of over 25 years teaching by the author accompanying website includes a Solutions Manual for exercises listed at the end of each chapter plus lecture slides

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engineers scientists and managers who have any contact in their jobs with hypersonic and or high temperature flow This third edition has been updated throughout and features new figures and examples along with a user friendly interior design

High Temperature Materials and Mechanisms Yoseph Bar-Cohen, 2014-03-03 The use of high temperature materials in current and future applications including silicone materials for handling hot foods and metal alloys for developing high speed aircraft and spacecraft systems has generated a growing interest in high temperature technologies High Temperature Materials and Mechanisms explores a broad range of issues related to high temperature materials and mechanisms that operate in harsh conditions While some applications involve the use of materials at high temperatures others require materials processed at high temperatures for use at room temperature High temperature materials must also be resistant to related causes of damage such as oxidation and corrosion which are accelerated with increased temperatures This book examines high temperature materials and mechanisms from many angles It covers the topics of processes materials characterization methods and the nondestructive evaluation and health monitoring of high temperature materials and structures It describes the application of high temperature materials to actuators and sensors sensor design challenges as well as various high temperature materials and mechanisms applications and challenges Utilizing the knowledge of experts in the field the book considers the multidisciplinary nature of high temperature materials and mechanisms and covers technology related to several areas including energy space aerospace electronics and metallurgy Supplies extensive references at the end of each chapter to enhance further study Addresses related science and engineering disciplines Includes information on drills actuators sensors and more A comprehensive resource of information consolidated in one book this text greatly benefits students in materials science aerospace and mechanical engineering and physics It is also an ideal resource for professionals in the industry

Turbulence and Transition in Supersonic and Hypersonic Flows Johan Larsson, Xiaolin Zhong, 2025-09-01 Turbulence and Transition in Supersonic and Hypersonic Flows explains how to understand and mathematically model these phenomena with an emphasis on the unique challenges and features that the compressibility of the fluid introduces This timely book responds to an increase in research interest in this topic explaining how to use the latest numerical methods as well as providing important background theory It covers both the problem of how a laminar boundary layer transitions to turbulence in the supersonic and hypersonic regime and the problem of how compressibility of a fluid affects turbulence Compressible flows are important in many areas of engineering including external aerodynamics internal flows in propulsion and power generation applications flows in supercritical fluids and many others Provides an interdisciplinary approach to this topic drawing on physics applied math and fluid mechanics Explains theory and modeling of high speed turbulent shear layers Addresses astrophysical applications such as star formation

Hypersonic Vehicles Giuseppe Pezzella, Antonio Viviani, 2022-05-04 Some sixty years after the experimental flights of the North American X 15 hypersonic rocket powered aircraft sustained hypervelocity travel is still the next frontier in high

speed transportation Today there is much excitement and interest regarding hypersonic vehicles In fact many aerospace agencies large industries and several start ups are involved in design activities and experimental campaigns both in wind tunnels and in flight with full scale experimental flying test beds and prototypes to make hypersonic travel almost as easy and convenient as airliner travel Achieving this goal will radically revolutionize the future of civil transportation This book contains valuable contributions that focus on various design issues related to hypersonic aircraft *Journal of Guidance, Control, and Dynamics* ,2008

The Proceedings of the 2018 Asia-Pacific International Symposium on Aerospace Technology (APISAT 2018) Xinguo Zhang,2019-06-08 This book is a compilation of peer reviewed papers from the 2018 Asia Pacific International Symposium on Aerospace Technology APISAT 2018 The symposium is a common endeavour between the four national aerospace societies in China Australia Korea and Japan namely the Chinese Society of Aeronautics and Astronautics CSAA Royal Aeronautical Society Australian Division RAeS Australian Division the Korean Society for Aeronautical and Space Sciences KSAS and the Japan Society for Aeronautical and Space Sciences JSASS APISAT is an annual event initiated in 2009 to provide an opportunity for researchers and engineers from Asia Pacific countries to discuss current and future advanced topics in aeronautical and space engineering *Introduction to Aerospace Engineering with a Flight Test Perspective* Stephen Corda,2017-01-03 Comprehensive textbook which introduces the fundamentals of aerospace engineering with a flight test perspective Introduction to Aerospace Engineering with a Flight Test Perspective is an introductory level text in aerospace engineering with a unique flight test perspective Flight test where dreams of aircraft and space vehicles actually take to the sky is the bottom line in the application of aerospace engineering theories and principles Designing and flying the real machines are often the reasons that these theories and principles were developed This book provides a solid foundation in many of the fundamentals of aerospace engineering while illuminating many aspects of real world flight Fundamental aerospace engineering subjects that are covered include aerodynamics propulsion performance and stability and control Key features Covers aerodynamics propulsion performance and stability and control Includes self contained sections on ground and flight test techniques Includes worked example problems and homework problems Suitable for introductory courses on Aerospace Engineering Excellent resource for courses on flight testing Introduction to Aerospace Engineering with a Flight Test Perspective is essential reading for undergraduate and graduate students in aerospace engineering as well as practitioners in industry It is an exciting and illuminating read for the aviation enthusiast seeking deeper understanding of flying machines and flight test

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