

Book Reviews

Shock Wave – Boundary Layer Interactions

**H. Babinsky and
J. K. Harvey**

Cambridge University Press, Cambridge, UK. 2011. 461pp. Illustrated. £80. ISBN 978-0-521-84852-7.

A welcome addition to the literature on high-speed flows, this volume assembles nine technical chapters by experts in specific and generic problems of shock-wave interactions with boundary layers that continue to challenge experiment, numerical simulation and modelling. The topic is rich in flow physics, bringing together the subjects of gas dynamics, including possible real gas effects, and boundary layers, including problems of separation and turbulence, none of which is adequately treated in the usual computational fluid dynamics approaches. The subject is one of the most interesting branches of fluid mechanics, with unsolved problems of academic and practical interest, with surface friction, heat transfer and unsteady effects being particular challenges for the emerging field of flow control.

The present volume begins with an overview from Jean Délery, one of the fathers of the subject, with further review chapters on transonic and supersonic interactions in two and three dimensions. Experiments and numerical simulations are covered in two chapters by Michael Holden and Graham Candler respectively that illustrate the complexity of the flows and the challenges facing measurement and prediction. The final three chapters are on special topics, including rarefied gas effects, unsteady interactions and the method of matched asymptotic expansions (by the late George Inger), for which the application to shock-induced separation was one of the most important successes. The book

has been well planned and executed, though perhaps rather long in gestation, with only limited coverage of the literature since about 2008. The last few years have seen particularly rapid progress in numerical simulations (particularly direct and large-eddy simulation) and in the application of laser-based diagnostics in laboratory experiments, providing full-field data and revitalising this area of research.

The present volume serves as an excellent technical overview of the subject and provides extensive background material to enable readers to appreciate the current journal literature.

Professor N. D. Sandham, CEng, FRAeS

Aircraft Design – a Conceptual Approach – Fifth edition

D. P. Raymer

American Institute of Aeronautics and Astronautics, 1801 Alexander Bell Drive, Suite 500, Reston, VA 20191-4344, USA. 2012. Distributed by Transatlantic Publishers Group, 97 Greenham Road London N10 1LN, UK (Tel: 020-8815 5994; e-mail: mark.chaloner@tpgltd.co.uk). 2012. 1044pp. Illustrated. £85. [20% discount available to RAeS members on request. ISBN 978-1-60086-911-2.

The field of aircraft design textbooks is becoming crowded faster than the aircraft manufacturers are merging. Raymer's book has long been one of the most widely used, and its publication by the AIAA guarantees acceptance.

The fifth edition updates this popular work for undergraduate students and adds new material concerning 'green' means of propulsion, rockets and hypersonic vehicles. The cost analysis