

Abridged Book Reviews

Frank W. Schmidt, Editor-in-Chief

Atlas of Visualization

Edited by The Visualization Society of Japan

Pergamon Press, 329 pp., \$135.00

The *Atlas of Visualization* is the first in a series of publications by the Visualization Society of Japan to provide new visualization techniques, image processing, visualization of measured and computed results and computer graphics. The areas of application of these techniques are engineering, physics, medical science, agriculture, marine products, oceanography, meteorology and sports.

The book contains 20 articles. The majority of these are associated with visualization of the fluid dynamic phenomena, both compressible and incompressible. Two articles are from the medical profession. One deals with endoscope development while the other investigates the flow of blood in the heart chambers using a pulsed Doppler ultrasonic technique. The use of liquid crystals to model large-scale atmospheric motion near the ground in the polar region is reported. The application of visualization techniques in computer-aided engineering and numerical simulation are also discussed. The book concludes with a section on quantitative flow visualization and image processing followed by two articles dealing with particle image velocimetry.

In many cases, a book on flow visualization cannot discuss the complex phenomena observed without the use of colored pictures. The publishers and editor are to be complimented for

including a large number of color panels, thereby allowing the author to present all aspects of the results using fascinating color as required.

Imaging in Transport Processes

Edited by S. Sideman and K. Hijikata

Begell House Inc., 621 pp., \$135.00

Recent developments in computer technology and imaging processing systems have resulted in the development of a variety of new techniques for the simulation and analysis of complex 3-D fluid dynamics and heat transfer problems. This book is based on contributions presented by those working in these areas at an international seminar sponsored in 1992 by the International Center for Heat and Mass Transfer.

The selected presentations are grouped into the following sections: Imaging and Visualization of Dynamic Fields; Flow, Heat and Mass Transfer Visualization; Visualization by Thermography and Liquid Crystals; Image Processing and Transport Visualization at Interfaces; Image Processing by Particle Tracking; Imaging of Phase Change; Imaging and Analysis of Combustion and Analysis; Imaging and Visualization in Physiological Systems.

As with seminar proceedings, there is variation in the quality of the papers. The book does, however, present a cohesive collection of material for those interested in the visualization imaging of the complex transport phenomena. Its value as a reference book could have been

increased if each section had been preceded by an overview article that tied together the articles in the section.

Physicochemical Hydrodynamics

2nd Edition

R. F. Probstein

John Wiley & Sons, 400 pp., \$69.95

The fluid flow effects on physical, chemical and biochemical processes and, conversely, the effect of physical, chemical, biochemical processes on fluid flow are discussed in this second edition of a book dealing with physicochemical hydrodynamics. The flow fields studied are laminar and the fluids are liquids.

After a brief introductory chapter, the basic constitutive relations and the equations of change for single and multicomponent flows are presented. The transport of mass by convective diffusion in an isothermal solution containing uncharged molecular species is discussed. The solution may be reacting or nonreacting. The hydrodynamic of solutions of small uncharged macromolecules is then introduced and followed by a discussion of flows involving electrolytes, charged macromolecules and particles. The book concludes with a study of the effects of rheology, concentrated suspensions and surface tension.

This book is an excellent introduction for the fluid dynamist wishing to extend their field of interest to the flow of liquids in chemical and biochemical processes.

Books Received But Not Reviewed

Heat Pipes

P. D. Dunn and D. A. Reay

Elsevier Science Ltd., Oxford, UK,

348 pp.

Creative Troubleshooting in the Chemical Process Industries

D. Saletan

Chapman & Hall, London and

New York, 366 pp., \$54.95