

Book Reviews

Advances in Fluid Mechanics Measurements

M. Gad-el-Hak (ed.), Springer-Verlag, New York, 1989, 606 pp., \$84.50.

Technological advances, principally in computers but also in data acquisition, lasers, optics, and micro-fabrication, have led to the development of many new and powerful techniques for the experimental study of fluid flow. This book is a collection of 12 independent review articles, some covering very specific techniques, and others covering a broad range of techniques as applied to a specific class of flows. All of the articles are written by authorities who are at the leading edge of their topics. Five of the chapters deal with new methods of measuring velocity fields: titanium tetrachloride flow visualization by P. Freymuth, three-dimensional flow marking by R. Miles and D. Nosenchuck, particle tracing by M. Gharib and C. Willert, particle image velocimetry by L. Lourenco, A. Krothapalli, and C. Smith, and scanning laser Doppler velocimetry by R. Simpson. The state of the art in vorticity measurement is reviewed by J. Foss and J. Wallace, who present many results from recent studies. Techniques for measuring unsteady fluid flow properties on surfaces are described by P. Leehey (dynamic wall pressure), J. Haritonidis (wall shear stress), and T. Diller and D. Telonis (unsteady heat

transfer and skin friction). P. Weidman describes exhaustively the numerous methods used in studies of laboratory scale rotating flows, and E. Hendricks et al. review some of the fundamental types of experiments performed with drag-reducing polymers. (The first two pages of this article were missing from the specimen copy of the book.) Lastly, P. Dunn, V. Novick, and B. Schlenger discuss the measurement of aerosol properties, principally in the context of nuclear reactor test facilities.

Each of the articles is well written. The level of detail and thoroughness varies, but generally the chapters give good perspectives, sometimes contain new ideas that are not published elsewhere, and certainly include adequate references to lead the reader to more detailed treatments. In short, they are excellent starting places for investigators who are new to a field, and they also contain enough new information to make good reading for the well initiated.

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Heat Transfer Reviews 1976-1986

E. R. G. Eckert, R. J. Goldstein, T. F. Irvine Jr., and J. P. Hartnett (eds.), Wiley, New York, 1990, 681 pp., \$125.00.

The faculty associated with the Heat Transfer Laboratory at the University of Minnesota has prepared annual reviews of the heat transfer literature since 1954, and these reviews have appeared in the *International Journal of Heat and Mass Transfer* for many years. Eleven of these annual reviews, from 1976 through 1986, have been collected and published as a single volume. *Heat Transfer Reviews 1976-1986* provides a very useful reference and an excellent summary of the literature over that period of time. The annual reviews for the period 1953 through 1975 have been collected and published by Pergamon Press as two volumes in the series *Progress in Heat and Mass Transfer*.

Two useful features of the reference are the comprehensive author and subject indices, which are consolidated for the 11-year period. The subject index permits the reader to trace the development of a particular heat transfer topic area. The author index is useful in following the work of individual researchers. It is interesting to note that over the period, the number of publications included

in the review has increased from 639 in 1976 to 1485 in 1986, more than doubling.

Each of the 11 annual reviews is extremely well organized, summarizing the major heat transfer conferences held during the year as well as other conferences that may have included some papers pertaining to heat transfer or related areas. Recipients of the Max Jakob and Donald Q. Kern Awards are identified, including the titles of their associated lectures. The titles of other invited lectures at these conferences are also noted. International workshops, research reviews, and seminars are discussed, and areas of specific emphasis are identified. In addition, heat transfer books published during the year are noted.

Trends and developments in heat transfer research occurring during the year are highlighted, with emphasis on growth areas in which there have been an increased number of publications. In each of the trend areas, there is a brief discussion of the theoretical, numerical, or experimental developments. The reference provides a