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The Springer Handbook of Experimental Fluid Mechanics has been prepared for physicists and engineers in research and development in universities, industry and in governmental research institutions or national laboratories. Both experimental methodology and techniques are covered fundamentally and for a wide range of application fields. A generous use of citations directs the reader to additional material on each subject.

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Editorial Review

Review

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"Handbooks are reference works for daily use by two main groups of people: on the one hand by experienced scientists, and by engineers or physicists And, on the other hand, by students due to the breadth and depth, this book serves both groups excellently. ... In summary, the community of fluid mechanics today has in their hands a highly valuable and important new book, which is a major reference in our science and will soon become a standard reference." (Günter Brenn, International Journal of Heat and Mass Transfer, Vol. 51, 2008)

"The stated purpose of this 1500 page handbook is to provide comprehensive information to the experimental fluid mechanics community for planning, executing, and interpreting experiments. ... A DVD-ROM PDF version of the handbook accompanies the hardback book. ... The book is excellent for a user who wants to obtain some information on a given topic without reading and digesting many papers. ... production quality is excellent too. ... The high-quality drawings, photos, and figures are clearly labeled and captioned." (Roger L. Simpson, American Institute of Aeronautics and Astronautics Journal, Vol. 46 (10), 2008)

From the Back Cover

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Key Topics

- Experiments in fluid mechanics
- The boundary-value problem
- Measurement of material properties: density, surface tension, contact angle, thermal conductivity and thermal diffusivity, diffusion, electric and magnetic parameters of liquids and gases
- Fundamentals of data acquisition, processing and analysis
- Measurement systems for temperature, density, flow velocity, vorticity, Mach number, heat flux, pressure shear stress, forces and moments
- Applications: non-Newtonian flows, turbulence, turbomachinery, aerodynamics, hydraulics, microfluidmechanics, flow visualization, atmospheric and oceanographic measurements, electrohydrodynamic systems, combustion diagnostics

Features

- Contains over 900 two-color illustrations.
- Includes over 100 comprehensive tables summarizing experimental techniques and properties of materials.
- Emphasizes physical concepts over extensive mathematical derivations.
- Delivers a wealth of up-to-date references and further reading.

About the Author

C. Tropea: Professor Tropea studied and worked in Toronto, Karlsruhe and Erlangen before taking the Chair of Fluid Mechanics and Aerodynamics at the Technical University of Darmstadt in 1997. His background is in experimental fluid mechanics and he has authored numerous book sections and journal publications on this subject. He is currently Editor of Experiments in Fluids from Springer-Verlag and was previously Editor-in-Chief of Measurement Science and Technology from IOP Publishing.

J. F. Foss

Professor Foss received his BSME (1961), MSME (1962) and Ph.D. (1965) from Purdue University. He has been on the faculty at Michigan State University since 9/1964. He served as the NSF Program Director for Fluid Dynamics and Hydraulics (1998-2000). His research specialty is vorticity measurements. His research group addresses fundamental and applied problems in turbulent flows. The latter are primarily associated with automotive applications. He is a Fellow of ASME and the A.V. Humboldt Stiftung and a Chartered Physicist of the IOP. He holds 7 patents involving fluid mechanics.

A. Yarin:

Alexander Yarin is currently a Professor at the Department of Mechanical and Industrial Engineering at the University of Illinois at Chicago, USA. In 1990-2005 he was a Professor at the Faculty of Mechanical Engineering at the Technion-Israel Institute of Technology. Professor Yarin is an applied physicist working in the field of fluid mechanics. He received his PhD and Habilitation degrees from the Institute for Problems in Mechanics, USSR Academy of Sciences, Moscow. His main contributions are related to the free surface flows (jets, films, fibers, threads and droplets) of Newtonian and rheologically complex liquids. He is an author of 2 monographs, 5 chapters in books and 170 research articles.

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