

# BOOK REVIEWS

Selection of books for review is based on the editor's opinions regarding possible reader interest and on the availability of the book to the editor. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.



## **Theory of Magnetically Confined Plasmas** (Proceedings of the Course held in Varenna, Italy)

*Editors* B. Coppi, T. Stringer, R. Pozzoli, E. Sindoni, J. P. Carnihan, and G. G. Leotta

*Publisher* Pergamon Press, Elmsford, New York (1979)

*Pages* 513

*Price* \$55.00

*Reviewer* N. V. V. J. Swamy

This 513-page paperback contains the proceedings of the course on "Theory of Magnetically Confined Plasmas" held in Varenna, Italy in September 1977 by the International School of Plasma Physics. The topics covered in the course include magnetohydrodynamic theory, transport phenomena and codes, modes and instabilities, heating, alpha particles, and new concepts, and the book is well organized into appropriately titled chapters. The school had participants and invited lecturers and the book is essentially a transcript of the talks given by the latter. The invited speakers being experienced researchers in their fields, there can be no question about the quality of the contributions. There is an understandable variation in the presentation of the material, some starting at an introductory level and some tending to be more research reports than lectures to the less informed. As the editors put it in their Foreword, the lectures were followed by illuminating discussions that really enhance the value of the lecture itself, all the more because the discussions were objective and candid even to the point of disbelieving the results of calculations presented. Although it is supposed to be a course on "The *Theory* of Magnetically Confined Plasmas," there is not only a good deal of incidental experimental material, but even a review of tokamak experiments. There is a section on a possible future objective of alpha-particle heating in a deuterium-tritium (D-T) plasma. While it is a course, it certainly is not at a level where, for instance, the instructor expatiates on the beauty of Maxwell's equations or the cleverness of Vlasov's approach, but is more in the nature of an advanced course with prerequisites. The people who can get most out of this book are those who have a background in tokamak plasmas and a research interest in confinement, transport, instabilities, methods of heating, and so on. It is somehow typical of papers in plasma physics that many references cited related to conference proceedings or reports of national laboratories, some of which are not

readily available in many universities. The paper on "Ignitor Experiments" is a typical example. The recent work on second harmonic electron cyclotron resonance heating of a plasma and numerical simulation of disruption in tokamaks makes one wish that this book had come out soon after the course, but this probably is a circumstance that cannot be helped.

*N. V. V. J. Swamy is a professor of physics at Oklahoma State University in Stillwater, Oklahoma. He is the author of a book and several publications relating to nuclear structure, nuclear fission, relativistic quantum mechanics, symmetry and group theory, astrophysics, and plasma wave dispersion relations. In 1975, he spent his sabbatical at the Plasma Physics Institute of Kernforschungsanlage in the Federal Republic of Germany, where the dominant theoretical activity was the study of radiofrequency heating of tokamak plasmas, and at Cambridge University in England. Because of the levitation experiments that seem to establish the existence of fractionally charged particles (quarks) and the contention of particle physicists that the existence of quantized charges implies the existence of magnetic charges, Dr. Swamy's current research interests include the investigation of consequences in plasma physics (other than nuclear fusion) of the existence of such charges.*

## **Fundamentals of Pipe Flow**

*Author* Robert P. Benedict

*Publisher* John Wiley & Sons, Inc., Somerset, New Jersey (1980)

*Pages* 531

*Price* \$39.95

*Reviewer* K. Almenas

When American National Standards Institute standards for the review of comprehensive texts are written, one can be certain that the job of the reviewer will become a great deal harder. It is certainly hard enough at present; however, in the absence of a standard (which is certain to include detailed instructions regarding completeness), the reviewer can at least avail himself of the privilege of talking about aspects of the text that fit his knowledge and prejudices and gloss over the remainder. I hope the