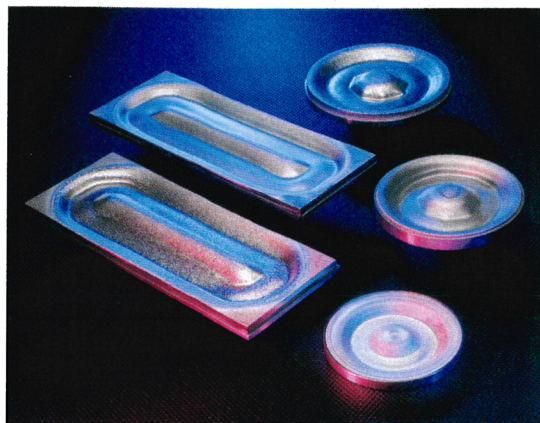


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maintain a selective collection in nonlinear dynamics and its applications. Looking carefully at chaotic data is an excellent way to deepen one's understanding of chaos.

JERRY P. GOLLUB

Haverford College
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Cataclysmic Variable Stars

Brian Warner

Cambridge U. P., New York, 1995.

572 pp. \$100.00 hc

ISBN 0-521-41231-5

Disk accretion powers many astronomical objects, including the youngest known stars and the most distant quasars. The nearest and best-studied examples of accretion disks are the cataclysmic variable stars (CVs), in which a tidally distorted red dwarf star loses material into a disk surrounding a white dwarf star. Modern analyses of CV brightness variations—on time scales from seconds to centuries—led directly to a physical model for every other accreting system. The CVs still provide the best tests of the model, but this success has been tempered by extreme disappointments. In 1897, the irregular outbursts of the CV U Geminorum led John Parkhurst of Yerkes Observatory to lament, "Predictions with regard to it can better be made after the fact." This frustration continues today with T Pyxidis, a recurrent nova long overdue for its next eruption.

In *Cataclysmic Variable Stars*, Brian Warner sets out to review our current understanding of these complex binary systems. After a brief summary of early history, Warner explains the basic physical picture of a cataclysmic binary and introduces observations across the electromagnetic spectrum. The middle chapters of the book systematically describe the many CV subclasses, including dwarf novae, nova-like variables, classical novae and magnetic systems. The main text concludes with a comprehensive discussion of the long-term evolution of cataclysmic variables. The volume includes an extensive list of references and a fine index.

Warner has studied CVs for over a quarter-century, and his expertise shines throughout each chapter. His descriptions of individual CV subclasses are thorough. Each section includes a variety of new and published results to illustrate the many facets of CV behavior. The 70-odd light curves—including nearly 100 years of data from SS Cygni—are a marvelous resource. Warner also develops the es-

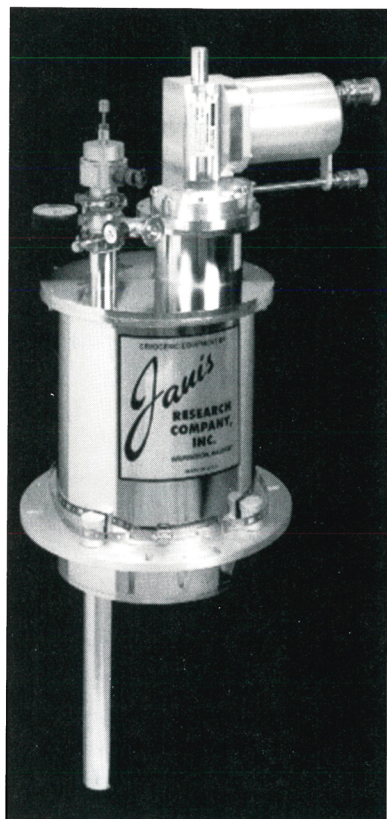
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sential physical concepts in each chapter and explains the successes and failures of theoretical models. His discussions of accretion physics—the basis of nearly all CV models—are comprehensive and one of the book's highlights.

Although not easy reading, *Cataclysmic Variable Stars* provides a complete introduction for graduate students. For more experienced researchers, the text also serves as a valuable review of the physics of accretion disks and interacting binary stars. I have already applied the results of several sections to my own research and expect many more such consultations in the years to come. At \$100, the hardcover version is expensive; a softcover book would allow a wider audience to learn about the wonderful complexities of cataclysmic variable stars.

SCOTT KENYON

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Incompressible Flow

Ronald L. Panton

Wiley, New York, 1996.

2nd edition. 837 pp. \$79.95 hc

ISBN 0-471-59358-3

Fluid mechanics is a very important field in engineering and applied sciences. It describes the motion of gases and liquids inside enclosures or over bodies and their mutual interference with those enclosures or bodies. The significance of the field, which in the past 60 years has progressed enormously, was established 2500 years ago when the Greek philosopher Heraclitus postulated "*Ta panta rhei*"—which could be translated as "everything flows." Heraclitus was not the father of fluid mechanics, but he can be credited with being among the first to be so fascinated by the motion of fluids that he included them as the cornerstone of his philosophic beliefs and cosmological explanation of the universe. Practical applications of fluid mechanics are many and diverse, from airplanes, cars and rivers to atmosphere, plasma and biological fluids.

Undergraduate textbooks in fluid mechanics are many. However, very few texts exist for graduate course instruction. This second edition of Ronald Pantan's *Incompressible Flow* (1984) is a streamlined version of the very successful first, with some noticeable additions. The intended audience remains the same: serious students in mechanical, aerospace, chemical or civil engineering, as well as in physics and mathematics, and researchers entering the field of fluid dynamics. The

strength of the book is in its very well-crafted, balanced presentation of the concepts, a presentation that is not overwhelmed by mathematics or formula derivations. It is very rich in discussion of physical insights and effective in its presentation of a range of several applications.

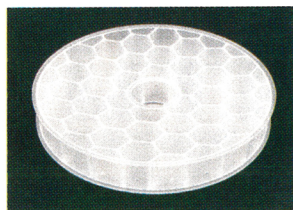
It is exactly this balance that makes the book's substance easier for the instructor to deliver, and for the students to receive. In that respect, Pantan's

work is more suitable than the classical text by George K. Batchelor, *An Introduction to Fluid Mechanics* (Cambridge U. P., 1970), which uses more and higher-level mathematics to describe very similar topics.

Among the concepts treated lucidly and extensively in *Incompressible Flow* are those of vorticity and circulation, quantities associated with the generation of lifting forces in airfoils and other streamlined bodies. The production of

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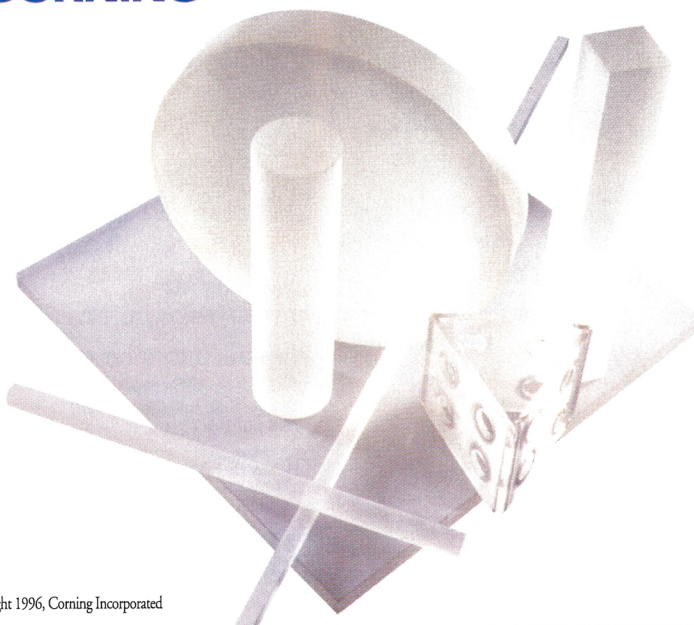


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