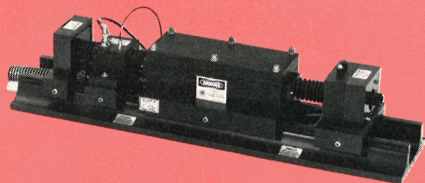


"User Friendly" Nd:YAG Laser



CW and Q-Switched

■ TEM₀₀-Mode Lasers

- 5 models 3-18 Watts
- Active Stabilization
- Q-Switch Option
- Applications
 - Resistor Trimming
 - Scribing/Cutting
 - Spectroscopy
 - Mode-Locking

■ Multimode Lasers

- Models 25W-1.8 kW
- Q-Switching up to 200 W
- Applications
 - Marking / Engraving
 - Soldering / TAB
 - Welding

■ Features

- Computer Interface
- OEM Configurations
- Optical Accessories
 - Fiber Optics
 - Beam Expanders
 - Focusing Optics

LEE LASER

3718 VINELAND RD., ORLANDO, FLORIDA 32811 U.S.A.
TEL: 407-422-2476 FAX: 407-839-0294
Circle number 23 on Reader Service Card

(Prentice Hall, 1991); in addition, *The Ideas of Particle Physics* by Guy D. Coughlan and James E. Dodd (Cambridge U. P., 1991) provides a thorough qualitative discussion of contemporary topics in particle physics. None is perfect for a one-semester course for seniors, but this text by Das and Ferbel would not be my first choice among them.

CHARLES GLASHAUSSER
Rutgers University
New Brunswick, New Jersey

Bénard Cells and Taylor Vortices

E. L. Koschmieder
Cambridge U. P., New York,
1993. 337 pp. \$64.95 hc
ISBN 0-521-40204-2

Recently, there has been a remarkable revival of interest in fluid dynamics within the physics community. Interest is particularly strong in the formation of sometimes-intricate ordered and disordered patterns. Of course, it is always possible to find complicated patterns in complicated systems; the physicist's goal is to find interesting and complex behavior in systems that are simple enough to understand. Consequently, much of the work on pattern formation has centered on the two systems discussed in Lothar Koschmieder's volume: Rayleigh-Bénard convection, in which a layer of fluid is subjected to a vertical temperature gradient, and Taylor-Couette flow, in which a fluid fills the gap between two rotating cylinders. It has been the hope that insights gained in one system will illuminate problems in the other and increase our understanding of more general flows.

Koschmieder has been an important contributor to experimental research on both Taylor-Couette and Rayleigh-Bénard flows for many years. He entered the field long before the current interest arose within the physics community, and his perspectives are welcome. His book is a good review of these problems, giving us a thorough and accessible account of linear and nonlinear stability problems and of turbulent flows. The author consistently discusses what he feels are the open questions and controversial issues. He also provides historical insights not often found in current research papers. The book does succeed in many respects. It is not, however, immune to criticism. For one, Koschmieder clearly expresses a dislike for letters journals, leading him to overlook some impor-

tant contributions. For example, the seminal paper on chaos in Taylor-Couette flow by Jerry P. Gollub and Harry L. Swinney in *Physical Review Letters* **35**, 927 (1975) is not mentioned. He also claims there has been no attempt to understand spiral turbulence since initial studies in the 1960s, but this neglects new results reported by John J. Hegseth and coauthors in *Physical Review Letters* **62**, 257 (1989).

Other omissions occur by deliberate choice: Koschmieder does not cover binary fluid convection, in spite of the many novel patterns found over the last several years in water-alcohol mixtures; he argues that it does not meet his criteria for verified results. However, there are instances in the study of this problem in which theory and experiment have converged and comparable experiments have been performed in several different laboratories; this work should be included in a second edition. Some omissions occur because the book includes results only through 1991. Thus Koschmieder does not cover recent work on spiral defect chaos, rotating convection or the phase dynamics of Taylor-Couette structures.

Bénard Cells and Taylor Vortices, in spite of its shortcomings, should be read and considered by those interested in pattern formation in fluids. Koschmieder's critical views of both experiment and theory, such as the use of model equations, are not widely held among workers in the field; thus they may challenge our thinking. However, for a balanced perspective, this book must be supplemented by those with other viewpoints, such as Tom Mullin's *The Nature of Chaos* (Oxford U. P., New York, 1993), and by the overview of pattern formation by Michael C. Cross and Pierre C. Hohenberg in *Reviews of Modern Physics* **65**, 851 (1993).

C. DAVID ANDERECK
Ohio State University
Columbus, Ohio

NEW BOOKS

Society and Government

Science Advice to the President. Second edition. W. T. Golden, ed. AAAS, Washington, D. C., 1993. 329 pp. \$29.95 pb ISBN 0-87168-509-4

Science and Technology Advice to the President, Congress, and Judiciary. W. T. Golden, ed. AAAS, Washington, D. C., 1993. 529 pp. \$29.95 pb ISBN 0-87168-510-8

Science Education Partnerships: Manual for Scientists and K-12 Teachers. A. Sussman, ed. U. California P.,

San Francisco, 1993. 244 pp. \$14.95 *pb*
ISBN 0-9635683-1-0

The Space Telescope: A Study of NASA, Science, Technology, and Politics. R. W. Smith. Cambridge U. P., New York, 1993. 508 pp. \$24.95 *pb* ISBN 0-521-45769-6

Space Physics

Venus: The Geological Story. P. Cattermole. John Hopkins U. P., Baltimore, 1994. 250 pp. \$49.95 *hc* ISBN 0-8018-4787-7

Statistical Physics

Statistical Mechanics: An Introduction. *Ellis Horwood Series in Physics and Its Applications.* D. H. Trevena. Ellis Horwood (Simon and Schuster), New York, 1993. 148 pp. \$27.00 *hc* ISBN 0-13-845512-0

Theory and

Mathematical Methods

Combinatorial Dynamics and Entropy in Dimension One. *Advanced Series in Nonlinear Dynamics, Vol. 5.* L. Alsedà, J. Llibre, M. Misiurewicz. World Scientific, River Edge, N. J., 1993. 329 pp. \$58.00 *hc* ISBN 981-02-1344-1

Computational Complexity. C. H. Papadimitriou. Addison-Wesley, Menlo Park, Calif., 1994. 523 pp. \$45.25 *hc* ISBN 0-201-53082-1

Deterministic Chaos in Infinite Quantum Systems. *Trieste Notes in Physics.* F. Benatti. Springer-Verlag, New York, 1993. 225 pp. \$49.00 *pb* ISBN 0-387-57017-9

Dynamical Systems VII. *Encyclopaedia of Mathematical Sciences 16.* V. I. Arnold, S. P. Novikov, eds. (Translated from the Russian by A. G. Reyman, M. A. Semenov). Springer-Verlag, New York, 1994. 341 pp. \$98.00 *hc* ISBN 0-387-18176-8

Euclidean Quantum Gravity. G. W. Gibbons, S. W. Hawking, eds. World Scientific, River Edge, N. J., 1993. 586 pp. \$84.00 *hc* ISBN 981-02-0515-5

Path-Integral Methods and their Applications. D. C. Khandekar, S. V. Lawande, K. V. Bhagwat. World Scientific, River Edge, N. J., 1993. 343 pp. \$38.00 *hc* ISBN 981-02-0563-5

A Quantum Measurement Approach to Tunneling. D. K. Roy. World Scientific, River Edge, N. J., 1993. 116 pp. \$38.00 *hc* ISBN 981-02-1223-2

Quantum Mechanics. Second edition. V. K. Thankappan. Wiley (Eastern Limited), New Delhi, India, 1993 (1985). 539 pp. \$Price not stated *pb* ISBN 81-224-0526-6

Randomness & Undecidability in Physics. K. Svozil. World Scientific, River Edge, N. J., 1993. 292 pp. \$38.00 *hc* ISBN 981-02-0809-X

Renormalisation in Area-Preserving Maps. *Advanced Series in Nonlinear Dynamics, Vol. 6.* R. S. MacKay. World Scientific, River Edge, N. J., 1993. 304 pp. \$48.00 *hc* ISBN 981-02-1371-9

Some Elementary Gauge Theory Concepts. *World Scientific Lecture Notes in Physics, Vol. 47.* C. Hong-Mo, T. S. Tsun.

World Scientific, River Edge, N. J., 1993. 156 pp. \$32.00 *hc* ISBN 981-02-1080-9

Symmetries, Gauge Fields, Strings and Fundamental Interactions, Vol. 1: Mathematical Techniques in Gauge and String Theories. T. Dass., Wiley (Eastern Limited), New Delhi, India, 1993. 506 pp. \$Price not stated *hc* ISBN 81-224-0470-7

Topics in Ergodic Theory. *Princeton Mathematical Series 44.* Y. G. Sinai. Princeton U. P., Princeton, 1994. 218 pp. \$39.50 *hc* ISBN 0-691-03277-7

Texts and Popularizations

Connecting Time and Space. H. E. Bates, ed. AAPT, College Park, MD., 1992. 136 pp. \$18.00 *pb* ISBN 0-917853-47-4

Laser Spectroscopy. R. Gupta, ed. AAPT, College Park, MD., 1993. 149 pp. \$18.00 *pb* ISBN 0-917853-49-0

The Quark and the Jaguar: Adventures in the Simple and the Complex. M. Gell-Mann. Freeman, New York, 1994. 380 pp. \$23.95 *hc* ISBN 0-7167-2581-9

PRECISION

AUTOTUNING

LTC

CRYOGENIC

TEMPERATURE

CONTROLLERS

TEN TIMES BETTER STABILITY.

Less than a milliKelvin.

- 20-bit resolution and six-digit display Auto-tuned, pre-programmed, and manual PID control
- Two to eight input channels
- 50W heater and analog outputs
- Preprogrammed calibration tables for most sensors
- RS-232 and GPIB standard
- Ten user-programmable sensor excitation and calibration tables
- Standard configuration accepts most common sensors



THREE MODELS TO CHOOSE FROM!

LTC-20	LTC-10	LTC-10C
■ Germanium, carbon & carbon glass resistors; all types of diodes; platinum, rhodium/iron, ruthenium oxide sensors ■ AC/DC sensor excitation	■ All diodes and platinum sensors ■ Many resistive sensors ■ DC sensor excitation	All the features of LTC-10, plus: ■ 3 to 8 input channels ■ Auto cryocooler warm-up

Convenient menu-driven operation of all important features.

Conductus Inc.
Instrument and Systems Division
10623 Roselle Street,
San Diego, CA 92121
Tel: 619.550.2700
Fax: 619.550.2799



In Japan: Niki Glass Co. LTD.
P.O. Box 33, Takanawa, Tokyo
108 Japan
Tel: 03 3456 4700
Fax: 03 3456 3423

Conductus and the Conductus logo are registered trademarks of Conductus, Inc.

Circle number 24 on Reader Service Card