may be expected to approximate reasonably the master equation in different physical situations. This work, related to van Kampen's own research, yields a procedure that avoids the Itô–Stratonovich dilemma. It leads naturally to a more systematic and sophisticated discussion of such topics as diffusion in inhomogeneous media, bistability, and critical fluctuations, and to applications to a wide range of physical and chemical problems.

The book has appeared at an auspicious time: It summarizes what is becoming a mature theoretical approach to a rapidly developing field. Current emphasis in non-equilibrium dynamics tends to focus on the detailed microscopic dynamics of non-linear and/or dissipative systems. The present work decidedly does not address the determination of such microscopic dynamics. It focuses instead on use of such knowledge to work up to the macroscopic level. Thus, it omits such concepts as path integrals (in spite of close relationships), renormalization, chaotic dynamics, universality, scaling, fractals and results of computer simulations, which are playing an increasingly important role in this area.

What is not done in the area of detailed dynamics, however, in no way detracts from the fact that van Kampen has written an excellent introduction to the use (and avoidance of abuse) of master equations. It should be in every physics and chemistry library. It would also make an excellent, though very expensive, text.

WILLIAM P. REINHARDT
University of Colorado, Boulder

KLINGER SCIENTIFIC

POSITIONING 'INGEN-EERING'

Klinger...Innovator in Micro-positioner Technology... Offers Precise, Repeatable Accuracy for Motor-Driven and Manual Positioning.

Eliminate guess-work...avoid costly problems. Klinger's precise 'Ingen-eering' and craftsmanship delivers Sub-micron position repeatability ... with Linear Resolution to 0.1 micron... Angular Resolution to 0.001°.

Choose from a selection of Linear, Rotation and Elevation Stages. Stepping motor-driven units are computer compatible, utilizing programmable controllers with digital readout. They provide backlash-free "Homing" capability with position feedback provided by optical encoders. Preloaded ball bearing guides assure high precision tracking. Virtually flawless stainless steel construction accounts for the long term durability and reliability. Now, here are a few applications...

- o Integrated Circuit Manufacture and Testing
- o Fiber Optic Positioning
- o Ultra-Precision Machining
- o Tracking and Interferometry
- o Metrology and Elipsometry

Klinger...The Micropositoner 'Ingen-eering' People.

KLINGER SCIENTIFIC

110-20 Jamaica Avenue
Richmond Hill, N.Y. 11418
(212) 846-3700

In Canada:
Optikon Corporation Ltd.
410 Conestogo Road
Waterloo, Ontario N2L 4E2 (519) 885-2551

Phone 212-846-3700 or write for Catalog.

APS SHOW-BOOTH #21

Circle number 41 on Reader Service Card

Geometry, Particles and Fields

B. Felsager
643 pp. Odense U.P., Denmark, 1981.

The present volume is a welcome addition to the growing number of books that develop geometrical language and use it to describe new developments in particle physics. Although more technical treatments of differential geometry and of gauge field theories are available, Bjørn Felsager's book is a well-balanced introductory text. It provides a clear treatment that is accessible to graduate students with a knowledge of advanced calculus and of classical physics.

Felsager devotes the first half of the book to classical and quantum field theory, in particular, to electromagnetism and the changes brought about by the inclusion of magnetic monopoles. He discusses magnetic and Dirac strings and after developing Lagrangian and Hamiltonian mechanics, applies them to obtain the path-integral formulation of quantum mechanics. By starting with an infinitely long discrete string he develops the dynamics of classical fields. He also treats the Lagrangian and Hamiltonian formalism for relativistic fields, giving the standard applications—including the Cauchy problem—to the Klein–Gordon fields, the Maxwell field and the massive vector field. The book begins to develop its special character in the discussion of solitons and instantons. Felsager develops nonlinear field theory with degenerate vacua in the ϕ^4 model (topological charges and winding numbers appear here); solitary waves and the Backlund transformation; the Wick notation and the resulting Euclidian field.

The second half of the book deals with the principles of differential geometry and its applications, with a mathematical machinery of very wide range. Here clear line drawings and illustrations supplement the multitude of mathematical definitions. This section, in its clarity and pedagogy, is reminiscent of *Gravitation* by Charles

Misner, Kip Thorn and John Wheeler. It covers differential manifolds and tensor analysis, with applications to electromagnetism and the magnetic monopole; integral calculus on manifolds, and its applications to the Lagrangian formalism, electromagnetism, the Nambu string and the Nielson–Olessen vortex; the Dirac monopole (in modern geometric form); smooth maps; the winding number; and in a final chapter, symmetries and conservation laws.

Felsager gives a very clear presentation of the use of geometric methods in particle physics. It is not possible, however, even in a book of this size (643 pages), to cover all interesting geometric and topological techniques that particle physicists are using. For those who have resisted learning this new language, his book provides a very good introduction as well as physical motivation. The inclusion of numerous exercises, worked out, renders the book useful for independent study also. I hope this book will be followed by others from authors with equal flair to provide a readable excursion into the next step.

EMIL KAZES
The Pennsylvania State University

new books

Fluids and Plasmas

Finite Elasticity. Proceedings of the IUTAM Symposium, Lehigh University, August 1980. D. E. Carlson, R. T. Shield, eds. 460 pp. Nijhoff, The Hague, Netherlands, 1982. $79.00

Equilibrium Properties of Fluid Mixtures. 2. A Bibliography of Experimental Data on Selected Fluids. M. J. Hiza, A. J. Kidnay, R. C. Miller. 246 pp. Plenum, New York, 1982. $115.00

Unconventional Approaches to Fusion. Proceedings, Fifth Course of the International School of Fusion Reactor Technology, March 1981, Erice. B. Brunelli, G. G. Leotta, eds. 526 pp. Plenum, New York, 1982. $65.00

Particles, Nuclei and High-Energy Physics

Elementary Hadronic Processes and Heavy Ion Interactions. Proceedings of the Seventeenth Moriond Workshop, Les Arcs, Savoie, France, March 1982. J. Tran Thanh Van, ed. 696 pp. Editions Frontières, Gif sur Yvette, France, 1982. *price not stated*

Basics of Electron Positron Collisions. F. M. Renard. 238 pp. Editions Frontières, Gif sur Yvette, France, 1982. *price not stated. graduate text*

New Flavours. Proceedings of the Second Moriond Workshop, Les Arcs, Savoie, France, January 1982. J. Tran Thanh Van, L. Montanet, eds. 622 pp. Editions Frontières, Gif sur Yvette, France, 1982. *price not stated*

Quarks, Leptons and Supersymmetry. Proceedings of the Seventeenth Moriond Workshop, Les Arcs, Savoie, France, March 1982, J. Tran Thanh Van, ed. 644 pp. Editions Frontières, Gif sur Yvette, France, 1982. *price not stated*

Fundamental Interactions. Cargese 1981. M. Levy, J. L. Basdevant, D. Speiser, J. Weyers, M. Jacob, R. Gastmans, eds. 696 pp. Plenum, New York, 1982. $89.50

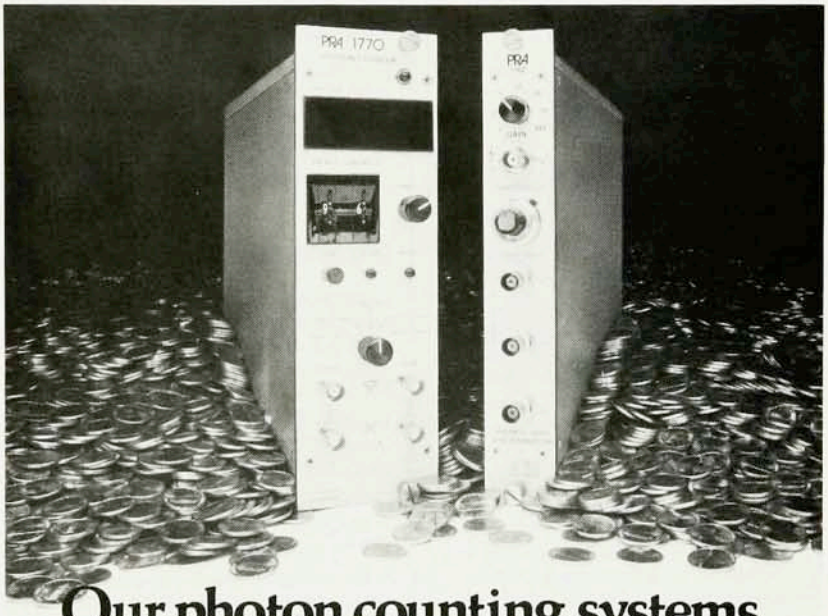
Electroweak Interactions. Proceedings of the XXI International Conference, Graz, February 1982. H. M. Graz, ed. 474 pp. Springer, New York, 1982.

Solid-State Physics and Electronics

Handbook on Semiconductors. Vol. 1. Band Theory and Transport Properties. W. Paul, eds. 879 pp. North-Holland, New York, 1982. $165.00. *compendium*

Physics of Semiconductor Devices. Proceedings of the International Workshop, November 1981, New Delhi. S. C. Jain, S. Radhakrishna, eds. 803 pp. Wiley, New York, 1982 $54.95

Chemistry and Physics of Solid Surfaces. Vol. 4. R. Vanselow, R. Howe, eds. 496



Our photon counting systems even help you count pennies.

PRA photon counting systems are the least expensive on the market—$500 to $2,000 less than other systems.

But don't let the low price fool you. Our systems offer everything the others do. And more.

Look at what you get. A preamplifier with a gain of x10 or x100 and a system gain of 10–10,000.

A leading edge discriminator with a frequency response of 100 MHz and continuously adjustable threshold from −10mV to −300mV.

A dual channel counter which counts rates up to 100 MHz and has a variety of useful output formats.

And here's something extra—computer interface capabilities.

Our system has a data coupler module with IEEE 488, RS232, 20mA current loop and standard parallel interfaces.

Send for literature. PRA, 100 Tulsa Road, Oak Ridge, Tennessee 37830, or call (615) 483-3433.

PRA

BBT INSTRUMENTER, Ballerup, Denmark, 02/66 02 08; INSTRUMAT S.A.R.L., Orsay, France (6)928 27 34; AMKO GmbH, Tornesch, Germany, 041 22-51061; THE G.G. FORUM, Thessaloniki, Greece, 031 527.039; ISRAMEX, Tel Aviv, 248213-4-5; ELCHEM, Den Haag, Netherlands, (070)837675; ROFIN, Egham, UK, (07843)7541/4.

Circle number 42 on Reader Service Card