

wife Priscilla). Luminous matter in the universe is found concentrated in vast assemblages called galaxies. The *Milky Way* is the descriptive, historical name of the galaxy in which our Sun and its planets are contained. We have learned that the Milky Way contains some 100 billion stars, distributed over dimensions of about 100 000 light years. We know that the Milky Way also contains gas and dust, that it is rotating about a nucleus located some 30 000 light years distant from the Sun.

and that some stars, especially the younger and more luminous ones, are distributed in a flat, spiral pattern. These and other discoveries and further questions are all described in this splendid book. The fifth edition is not a reorganization of the material but rather an updated version of the fourth edition, which was published in 1974. Bok says that the book is aimed at "beginning college students and at bright boys and girls of high-school age." I feel it is more appropriate for

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advanced college students and educated people without much astronomical background. The book presupposes no background and introduces the necessary basic astronomical concepts in the first few chapters. Subsequent chapters deal with stellar populations, clusters, galactic rotation, the galactic nucleus, interstellar gas and dust, spiral structure and, finally, a bit of galactic evolution.

The writing style is clear, fresh and personal; indeed, at times one can almost hear Bart speaking. Those (many!) conjectures that are not yet definitely established are always qualified with phrases such as "most likely," "in all probability," and "we think that." I like this because I feel it is important to distinguish between what we know and what we don't know. Too often astronomers present as facts what are really only currently accepted (fashionable) theories.

The only negative comment I have about this latest edition is that I find the format (type face, double columns, larger-scale illustrations) of the fourth edition more attractive. If you don't have a copy of the fourth, and are interested in learning about our galaxy and current galactic research, the fifth edition of Bok's *The Milky Way* is the finest introduction available.

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new books

Atomic, Molecular and Chemical Physics

Atomic Many-Body Theory. I. Lindgren, J. Morrison. 469 pp. Springer, New York, 1982. \$55.00. *graduate text*

Aerosol Microphysics II: Chemical Physics of Microparticles. W. Marlow, ed. 189 pp. Springer, New York, 1982. \$29.00. *compendium*

Particles, Nuclei and High-Energy Physics

Pointlike Structures Inside and Outside Hadrons. Proceedings of the Seventeenth International School of Subnuclear Physics, Erice, 1979. A Zichichi, ed. 739 pp. Plenum, New York, 1982. \$85.00

The Atomic Nucleus. R. Evans. 972 pp. Krieger, Malabar, Fla., 1982. \$55.00. *reprint*

Progress in Particle and Nuclear Physics. Vol. 8. Quarks and the Nucleus. Proceedings of the International School of Nuclear Physics, Erice, 1981. D. Wilkinson, ed. 446 pp. Pergamon, New York, 1982. \$84.00

High-Energy Ion-Atom Collisions. Proceedings of the International Seminar. Debrecen, 1981. D. Berenyi, G. Hock, eds. 274 pp. Elsevier, New York, 1982. \$69.75

Nuclear Magnetism: Order and Disorder. A. Abragam, M. Goldman. 626 pp. Oxford, New York, 1982. \$69.00

Dynamics of Nuclear Fission and Related Collective Phenomena. Proceedings of the International Symposium, Bad Monnef, 1981. P. David, T. Mayer-Kuckuk, A. van der Woude, eds. 462 pp. Springer, New York, 1982. \$23.50

Optics and Acoustics

Applications of Optical Fourier Transforms. H. Stark, ed. 545 pp. Academic, New York, 1982. \$67.50. *compendium*

Optical Fibers. T. Okoshi, 299 pp. Academic, New York, 1982. \$39.00. *reference*

Fundamentals of Ocean Acoustics. L. Brekhovskikh, Y. Lysanov. 250 pp. Springer, New York, 1982. \$49.00. *text and reference*

Fundamentals of Optical Fiber Communications. Second Edition. M. Barnoski, ed. 351 pp. Academic, New York, 1981. \$29.50. *compendium*

Quantum Optics. Proceedings of the South African Summer School in Theoretical Physics, South Africa, 1981. C. Engelbrecht, ed. 329 pp. Springer, New York, 1982. \$20.00

Electricity, Magnetism and Fields

The Dissipation of Electromagnetic Waves in Plasmas. Proceedings (Trudy) of the P. N. Lebedev Physics Institute. Vol. 92. N. Basov, ed. 101 pp. Consultants Bureau, New York, 1982. \$49.50

Student Texts and Popularizations

Planets of Rock and Ice: From Mercury to the Moons of Saturn. C. Chapman. 222 pp. Scribner's, New York, 1982. \$13.95

The Logic of Machines and Structures. P. Sandori. 180 pp. Wiley, New York, 1982. \$29.95

Materials Science and Condensed Matter

Los Alamos Shock Profile Data. C. Morris, ed. 488 pp. U. of California P., Berkeley, 1982. \$35.00

Metal Vapours in Flames. C. Alkemade, T. Hollander, W. Snelleman, P. Zeegers, 1033 pp. Pergamon, New York, 1982. \$95.00. *reference*

Elastic Models of Crystal Defects. C. Teodosiu. 336 pp. Springer, New York, 1982. \$25.80. *text*

Nonmetallic Materials and Composites at Low Temperatures. Proceedings of the Second ICMC Symposium, Geneva, 1980. G. Hartwig, D. Evans, eds. 399 pp. Plenum, New York, 1982. \$49.50

Metastable Materials Formation by Ion Implantation. Proceedings of the Materials Research Society Annual Meeting, Boston, 1981. S. Picraux, W. Choyke, eds. 446 pp. Oxford, New York, 1982. \$70.00

Geometrical and Structural Crystallography. J. Smith. 450 pp. Wiley, New York, 1982. \$27.95. *elementary text*

Solid-State Physics and Electronics

Nonlinear Phenomena at Phase Transitions and Instabilities. Proceedings of NATO Advanced Study Institute, Geilo, Norway, 1981. T. Riste, ed. Plenum, New York, 1982. \$59.50

Excitations in Disordered Systems. Proceedings of a NATO Advanced Study Institute, 1981, Michigan. M. F. Thorpe, ed. 704 pp. Plenum, New York, 1982. \$85.00

Quantum Processes in Semiconductors. B. Ridley. 286 pp. Oxford, New York, 1982. \$55.00. *advanced text*

Semiconductors and Semimetals. Vol. 18. Mercury Cadmium Telluride. R. Willardson, A. Beer, eds. 388 pp. Academic, New York, 1982. \$59.50. *compendium*

Physics and Applications of the Josephson Effect. A. Barone, G. Paterno. Wiley, New York, 1982. \$49.50. *advanced text*

Astronomy, Cosmology and Space Physics

Galactic X-ray Sources. Proceedings of the NATO Advanced Study Institute, Greece. P. Sanford, P. Laskarides, J. Salton, eds. 450 pp. Wiley, New York, 1982. \$45.00

A Bibliography of Astronomy 1970-1979. R. Seal, S. Martin. 407 pp. Libraries Unlimited, Littleton, Colo., 1982. \$30.00

Webb Society Deep-Sky Observer's Handbook. Vol. 5. Clusters of Galaxies. G. Whiston. 241 pp. Enslow, Hillside, N. J., 1982. \$16.95

Haute Resolution Spectrale en Astrophysique: Applications au Telescope Spatial. Deuxieme Colloque National du Comité Francais du Telescope Spatial, Orsay, 1981. 214 pp. Observatoire de Paris, 1982. *no price stated*

Photometrie Bidimensionnelle. Premier Colloque National du Comité Francais du Telescope Spatial, Toulouse, 1980. P. Charvin. 272 pp. *no price stated*

Geophysics and Planetary Science

Voyages to Saturn. D. Morrison. 227 pp. NASA, Washington, D.C., 1982. \$9.50

Theory and Mathematical Physics

An Introduction to Error Analysis: The Study of Uncertainties in Physical Measurements. J. Taylor. 270 pp. University Science Books, Mill Valley, Cal., 1982. \$15.00 cloth, \$9.50 paper. *introductory text*

Spacetime and Geometry. R. Matzner, L. Shepley, eds., 189 pp. U. of Texas P., Austin, 1982. \$37.50. *essays*

Spatial Kinematic Chains: Analysis-Synthesis-Optimization. J. Angeles. 369 pp. Springer, New York, 1982. \$36.00

Integral Equation Method in Transonic Flow. P. Niyogi. 189 pp. Springer, New York, 1982. \$11.80. *monograph*

Scattering Theory of Waves and Particles. Second Edition. R. Newton. 743 pp. Springer, New York, 1982. \$48.00. *second-level text*

Instrumentation and Techniques

Infrared and Millimeter Waves. Vol. 5. Coherent Sources and Applications. Part 1. K. Button, ed. 343 pp. Academic, New York, 1982. \$52.00. *compendium*

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VLSI Electronics. Microstructure Science. Vol. 4. N. Einspruch, ed. 377 pp. Academic, New York, 1982. \$49.00. *compendium*

Electronic Music Circuits. B. Klein. 302 pp. Group Technology, Check, Va., 1982. \$16.95

Design Methodologies for VLSI Circuits. Proceedings of the NATO Advanced Study Institute, Belgium, 1980. P. Jespers, C. Sequin, F. van de Wiele, eds. 456 pp. Sijthoff & Noordhoff, Rockville, Md., 1982. \$52.50

Fourier, Hadamard, and Hilbert Transforms in Chemistry. A. Marshall, ed. 561 pp. Plenum, New York, 1982. \$65.00. *compendium*

Advances in X-Ray Analysis. Vol. 25. Proceedings of the Thirtieth Annual Conference on Applications of X-Ray Analysis, Denver, 1981. J. Russ, C. Barrett, P. Predecki, D. Leyden, eds. Plenum, New York, 1982. \$49.50

Evaluation of Diagnostic Systems: Methods from Signal Detection Theory. J. Swets, R. Pickett. 253 pp. Academic, New York, 1982. \$29.00. *reference*

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Energy and Environment

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Nuclear Waste Management Abstracts. R. Heckman, C. Minichino. 104 pp. Plenum, New York, 1982. \$45.00

Miscellaneous

Bridges to Fantasy. G. Slusser, E. Rabkin, R. Scholes, ed. 231 pp. Southern Illinois U.P., Carbondale, 1982. \$18.95. *essays on science fiction*

A Biographical Dictionary of Scientists. Third Edition. T. Williams, ed. 674 pp. Wiley, New York, 1982. \$42.95