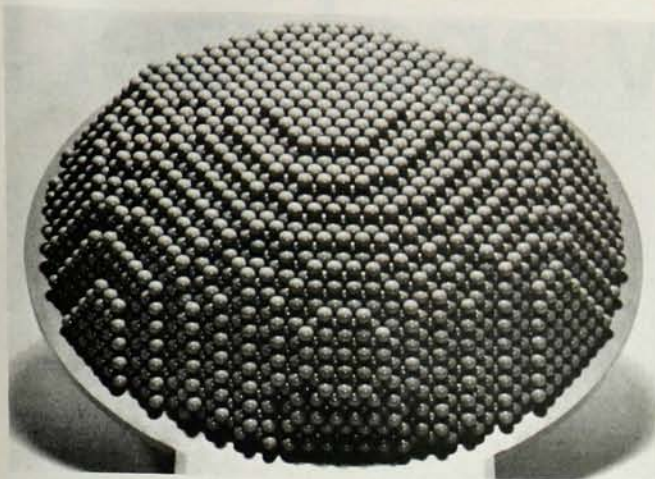




IDEALIZED MODEL of bcc field-emission tip, in which electrons tunnel through the energy barrier. Each plastic ball represents an atom. (From *Experimental Methods in Materials Research*.)

review of recent advances. Shull describes some typical applications that make use of three characteristics (also discussed) unique to neutron radiation; he thus covers the interpretation of crystal structures, of phonon distributions and of electronic structures in materials. Techniques associated with electron transmission microscopy form the main theme of Phillips's review. Melmed, in his article, covers both field-electron and field-ion (emission) microscopy. Heinrich's short paper on the probe gives a very brief survey of the instrument, the techniques and the applications. Flinn's article presents ways in which the Mossbauer effect has been used to study magnetic solids, lattice dynamics, crystal defects and diffusion. The complexities involved in the interpretation of internal friction peaks in iron are considered in some detail by Beshers. A distinction is made by Arsenault between those low-temperature deformation techniques used to obtain engineering data and those used to obtain information about dislocation mechanisms; his presentation is accordingly divided into two parts. The problems of stored-energy measurements are defined by Williams, who then goes on to discuss and compare the methods that have been used and the results obtained with them. Finally, Tomizuka covers briefly selected topics of diffusion in metals. All the papers are very readable and well referenced; they can be used as introductory articles to the field.

According to the editor, it is planned to produce a volume annually, with future volumes containing

most frequently review articles on diverse areas. The first volume reviewed here is well produced and contains a subject index as well as an author index, both fairly extensive. However a few disturbing printer's errors were noticed. The caption to figure 9 made reference to figures 9 and 10 instead of to 8 and 9. The diagram on page 54 was upside down. On page 199 figure 2(c) was not properly aligned with figures 2(a) and 2(b). Errors in the type-setting were also found. However, these are all minor defects in a book that, although already dated by two years, still presents a timely survey of numerous recent experimental techniques both in materials and solid-state research.

* * *

The reviewer is manager of the materials research laboratory at Martin Marietta Corp., Orlando, Florida.

Applied abstract spaces

BOUNDARY VALUE PROBLEMS OF MATHEMATICAL PHYSICS, Vol. 1. By Ivan Stakgold. 340 pp. Macmillan, New York, 1967. \$12.95

by George H. Weiss

More and more the subject matter of mathematical physics is phrased in the terminology of abstract spaces. It is therefore a matter of good education to have some acquaintance with this terminology, particularly for theoretical physicists. However, a course that deals only in the formulation of boundary-value problems in the abstract can hardly be adequate prepara-

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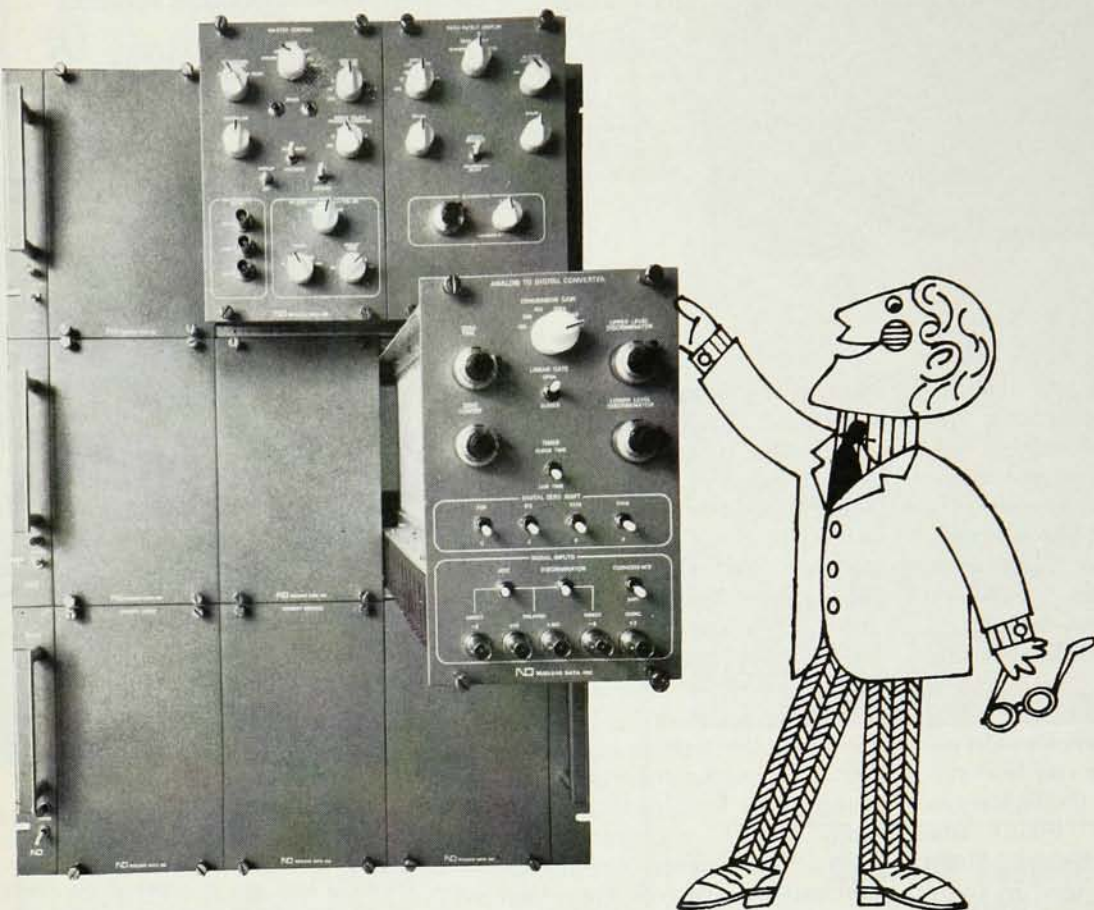
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3.5"	9531R	200	1300	25
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tion for work in theoretical physics. Viewed in light of these remarks, Stakgold's book is an excellent introduction to the methodology of abstract spaces applied to boundary value problems but does not give sufficient attention to the manipulative aspects of the subject to be the sole text for a course in mathematical physics.

The subject matter in this first volume consists of the theory of Green's functions, an introduction to linear spaces, and applications to linear integral equations and the spectral theory of second-order differential operators. Throughout, the writing is lucid and the account of elementary aspects of the theory is agreeably complete. Parenthetically, one might wish for a more

complete development of matrix theory, but there is some account of the theory as a specialization of some of the more abstract theory. A distinct deficiency is a lack of motivation for the abstract theory. Nevertheless, I would definitely recommend this book as a supplementary text for a course in mathematical physics or applied mathematics if it were accompanied by suitable material on solution techniques.

* * *

The reviewer is presently head of the Physical Sciences Laboratory, Division of Computer Research and Technology of the National Institutes of Health. He is also on the board of editors of the Journal of Mathematical Physics.

NEW BOOKS

ELEMENTARY PARTICLES & FIELDS

High Energy Physics, Vol. 2. E. H. S. Burhop, ed. 483 pp. Academic Press, New York, 1967. \$24.00

Précis de Mécanique Quantique Relativiste. By O. Costa de Beauregard. 202 pp. Dunod, Paris, 1967. 24 F.

ATOMS & MOLECULES

Methods of Experimental Physics, Vol. 4: Atomic and Electron Physics, Part A: Atomic Sources and Detectors. Vernon W. Hughes, Howard L. Schultz, eds. 515 pp. Academic Press, New York, 1967. \$21.50

Laser Systems and Applications. By Herbert A. Elion. 624 pp. Pergamon Press, Oxford, 1967. \$22.50

FLUIDS, PLASMAS

Electromagnetic Fluctuations in Plasma. By A. G. Sitenko. Trans. from Russian by Morris D. Friedman. 256 pp. Academic Press, New York, 1967. \$12.50

Stability of Parallel Flows. By Robert Betchov, William O. Criminale Jr. 330 pp. Academic Press, New York, 1967. \$16.00

Introduction to the Dynamics of Rarefied Gases. By V. P. Shidlovskiy. Trans. by Scripta Technica. 168 pp. American Elsevier, New York, 1967. \$12.50

SOLIDS

Magnetism and Magnetic Materials 1967 Digest: A Survey of the Technical Literature of the Preceding Year. W. D. Doyle, A. B. Harris, eds. 280 pp. Academic Press, New York, 1967. \$11.00

The Physics of Electroluminescent Devices. By P. R. Thornton. 382 pp.

Barnes & Noble, New York, 1967. \$14.50
La Surface de Fermi des Métaux. By Wladimir Mercouloff. 230 pp. Masson, Paris, 1967. 80 F.

Theory of Magnetism in Transition Metals. (Enrico Fermi School, Varenna, Italy, June 1966). W. Marshall, ed. 454 pp. Academic Press, New York, 1967. \$18.50

Progress in Low Temperature Physics, Vol. 5. C. J. Gorter, ed. 332 pp. North-Holland, Amsterdam (Interscience, New York), 1967. \$15.50

Phonons et Hypersons. Conf. proc. (Grenoble, March-April 1966). 176 pp. Presses Universitaires de France, Paris, 1967. Paper 35 F.

CLASSICAL PHYSICS

Theory and Applications of Holography. By John B. DeVelis, George O. Reynolds. 196 pp. Addison-Wesley, Reading, Mass., 1967. \$12.95

The Logic of Special Relativity. By S. J. Prokhovnik. 128 pp. Cambridge U. Press, London, 1967. \$5.95

Electromagnetic Wave Theory. Conf. proc. (Delft, The Netherlands, Sept. 1965). J. Brown, ed. 1099 pp. in two volumes. Pergamon Press, Oxford, 1967. \$43.00

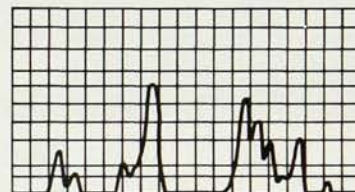
MATHEMATICS & MATHEMATICAL PHYSICS

Generalized Functions, Vol. 3: Theory of Differential Equations. By I. M. Gel'fand, G. E. Shilov. Trans. from Russian by M. E. Mayer. 222 pp. Academic Press, New York, 1967. \$11.00

Joint Statistical Papers of J. Neyman and E. S. Pearson. 299 pp. U. of California Press, Berkeley, Calif., 1967. \$7.00

Approximate Methods for Solution of Differential and Integral Equations. By S. G. Mikhlin, K. L. Smolitskiy. Trans.

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