explains superconducting phenomena in terms of a condensed state in which electrons are paired.

In the subsequent dozen years exciting new advances have followed in a steady stream. For example, A. A. Abrikosov created the field of type II superconductivity, which has brought much theoretical insight as well as practical application in high-field superconducting solenoids. Brian Josephson's prediction of tunneling by superconducting pairs has led to a deeper undertaking of the significance of the phase of the macroscopic quantum wavefunction introduced rather phenomenologically by V. L. Ginzburg and L. D. Landau. It has also led to the development of ultrasensitive magnetometers and voltmeters and to a more precise value of the fundamental constant ratio h/e. In the past few years, attention has turned to the effects of thermodynamic fluctuations, both in causing finite (but usually extremely small) resistance below T_c and in causing weak superconducting effects above T_c.

Given this explosive expansion of our understanding of the subject, this book is a very timely effort at gathering together an authoritative account of where we stand (or more precisely, where we stood in 1968). Although enumeration of all the topics covered would obviously be impractical, some idea of the scope of coverage is given by a partial list: BCS theory, Green's function methods, Ginzburg–Landau theory (including the microscopic derivation and extensions to wider applicability), collective modes, weakly coupled superconductors and macroscopic quantum phenomena, strong-coupling superconductivity, superconducting semiconductors, transition-metal superconductivity, type II superconductivity, boundary and proximity effects, gapless superconductivity, flux flow, the intermediate state and superconducting devices. Comparison of theory with experiment is maintained throughout.

By drawing on 33 authors to write the 23 chapters, the editor was able to divide up the labor to a sufficient degree so that he could attract top-notch experts such as P. Anderson, de Gennes, Josephson, and Maki to contribute to the project. Despite the diverse authorship, Parks was able to maintain a satisfactory degree of uniformity in notation and overall coherence in organization. Thus, the resulting treatise is considerably more useful than would be a compendium of completely independent contributions.

As Parks wryly remarks in his preface, this treatise might be thought to be "the last nail in the coffin (of superconductivity)." Although that is certainly unlikely, in view of the continuing vigorous activity, it is clear that the presented material forms a large body of knowledge that is highly developed and should not soon become obsolete. About the only major topic that developed too late to be included is fluctuation effects; a somewhat more extensive and up-dated discussion of time-dependent Ginzburg–Landau theory also would be desirable in view of developments since the treatise went to press. None the less, this treatise should remain the definitive one on the overall subject of superconductivity for some time.

The potential audience for these books appears limited by the high price to libraries and to those individuals and groups with a well developed commitment to the subject. However, the level of presentation makes it suitable as a reference for graduate students as well as professional research workers. Thus, it is heartening that the editor has persuaded the publisher to try offering a very substantial price reduction to $40.00 for class orders by instructors in an effort to broaden the usage of this treatise as a textbook. In any case, the treatise is a "must" for the library of any organization dealing in any significant way with solid-state and low-temperature physics. We should all be grateful to the editor and his many authors for their labors to bring this treatise to fruition.

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Special Relativity

By A. Shadowitz
203 pp. Saunders, Philadelphia, 1969. $3.50

Beginning students of special relativity fall into two well defined categories: those who prefer to do everything graphically, and those who do not. A. Shadowitz's book is lovingly written to indulge the former to the maximal degree.

In the old days, doing a problem

graphically meant plotting it onto a Minkowski diagram—a Cartesian (x,ct) plane in which a (Lorentz) transformation of coordinates corresponds not to a rigid rotation but to a scissoring of the axes. Playing with Minkowski diagrams (in two and three dimensions) fortifies the important idea that space and time are welded together and that different choices of axes in absolute spacetime correspond to observers with different motions.

Shadowitz, however, uses the diagrams more recently invented by Loedel and Brehme, which apply to those situations in which precisely two observers play a role. Their motions jointly determine the coordinates, and the diagrams cannot accommodate further observers. Though they make the solution of certain problems easy, they are somewhat artificial and fail in developing that feeling for spacetime that is so useful in special relativity and vital in general relativity. I know that some educators will disagree with me. The important thing is that there should be textbooks for every taste, and Shadowitz's pleasantly written book will appeal to many.

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Plasma Technology

By B. Gross, B. Gryca, K. Miklossy
(Trans. by R. C. G. Leckey) 487 pp. American Elsevier, New York, 1969. $17.00

During the last few years we have seen a constantly increasing stream of books on plasma physics, but few of them have concentrated on the engineering aspects of this state of matter. This volume does just this and does it in a way that is quite different from books published particularly in the US.

Although there is the usual introduction to transport equations, the Boltzmann theory and statistical mechanics, the authors do not really use these tools. Rather they discuss concepts in terms of thermodynamic balance, entropy and enthalpy and what one might call a chemical-engineering approach to plasmas, which I found both interesting and informative.

The title of the book is quite properly *Plasma Technology* and the real interest of the authors is clearly in the plasma torch and in the use of this device for industrial processes, such as welding, melting, high-temperature chemical reactions, and the possible technological application of magnetohydrodynamics. One long chapter describes in great detail the construction of plasma torches in Czechoslovakia and compares these with those manufactured in the US, the USSR, in West Germany and in Poland. This is clearly a reflection of the authors' own interests. Boleslav Gross is a research physicist at the Institute of Electronics of the Czechoslovak Academy of Sciences; Bronislav Grycz works at the Czechoslovak Research Institute for Electrical Engineering at Bechovice, and Konstantin Miklóssy's research is carried on at the State Research Institute for Heavy-Current Engineering.

The book leans heavily on detailed enginering drawings of devices and pictures of actual welding equipment and other plasma-engineering machines, but the authors are careful to document their description from the world's literature and explain in simple and direct terms the physical bases of the devices they are detailing.

I found the book stimulating because its approach is very different from the usual plasma book that is finding its way onto physicists' shelves, and the translation by R. C. G. Leckey of La Trobe University, Victoria, Australia, is a smooth flowing and undoubtedly edited version of the original Czech.

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NEW BOOKS

CONFERENCE PROCEEDINGS

Topics in Theoretical Physics. (Proceedings of the Liperi Summer School in Theoretical Physics, Liperi, Finland, 1967.) C. Cronstrom, ed. 302 pp. Gordon and Breach, New York, 1969. $25.50 reference, $12.50 professional

Topics in Theoretical Physics. (Proceedings of the Liperi Summer School in Theoretical Physics, Liperi, Finland, 1968.) Dan Olof Riska, ed. 410 pp. Gordon and Breach, New York, 1969. $25.00 reference, $15.00 professional

Lectures in Theoretical Physics, Vol. XI-D. (Proceedings of the 11th Boulder Summer Institute for Theoretical Physics, Boulder, Colo., 17 June–23 Aug., 1968.) K. T. Mahanthappa, W. E. Brittin, eds. 648 pp. Gordon and Breach, New York, 1969. $29.50 hard, $17.00 paper

Quasars and High-Energy Astronomy. (Including the Proceedings of the 2nd Texas Symposium of Relativistic Astrophysics, 15–19 December 1964.) K. N. Douglas, I. Robinson, A. Schild, E. L. Schucking, J. A. Wheeler, N. J. Woolf, eds. 485 pp. Gordon and Breach, New York, 1969. $30.00 cloth, $11.00 paper

High Energy Collisions. (3rd International Conference, State University of New York, Stony Brook, 5,6 Sept. 1969.) C. N. Yang, J. A. Cole, M. Good, R. Hwa, J. Lee-Franzini organizers. 525 pp. Gordon and Breach, New York, 1969. $27.50 reference, $15.00 professional

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Electron Paramagnetic Resonance with Applications to Selected Problems in Biology. (*Les Houches Lectures*, 1969). By G. Feher. 139 pp. Gordon and Breach, New York, 1970. $12.00

Plasma Waves in Space and Laboratory, Vol. 2. (Proceedings of NATO Advanced Study Institute, Roros, Norway, 17–26 April 1968.) J. O. Thomas, B. J. Landmark, eds. 562 pp. American Elsevier, New York, 1970. $21.00

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Semiconductor Effects in Amorphous Solids. (Conf. proc. of Symposium on Semiconductor Effects in Amorphous Solids, New York, 14–17 May 1969.) W. Doremus, ed. 604 pp. North-Holland, (American Elsevier) New York, 1970. $30.00

Clean Surfaces: Their Preparation and Characterization for Interfacial Studies. (Based on Symposium, North Carolina State University, Raleigh, 8–10 April 1968.) George Goldfinger, ed. 385 pp. Marcel Dekker, New York, 1970. $18.75

NUCLEI

Excitation Mechanisms of the Nucleus, Nuclear Theory Series, Vol. 2. By J. M. Eisenberg, W. Greiner. 370 pp. American Elsevier, New York, 1970. $19.25

ATOMS, MOLECULES, CHEMICAL PHYSICS

Sigma Molecular Orbital Theory. By Oktay Sinanoglu, Kenneth B. Wiberg. 455 pp. Yale U. P., New Haven, Conn., 1970. $17.50