Some earlier and recent topical problems in the physics of superconductors

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Earlier and Recent Aspects of Superconductivity, **(Eds.) J. G. Bednorz and K. A. Müller,** Springer-Verlag, Berlin and Heidelberg, 1990, 529 pp. (Springer Series in Solid-State Sciences V. 90).

This collection consists of papers presented to the 18th International School of Materials Science and Technology, which was held at the Ettore Majorana Center for Scientific Culture in Erice (Sicily, Italy) on July 4–16, 1989. There are 25 review papers on different aspects of superconductivity, which are presented at a level that will be largely accessible to students and younger physicists who are beginning to grapple with the physics of superconductors.

The collection begins with a paper on the history of superconductivity by H. Thomas. The other contributions are mostly concerned with specific problems in the physics of high-T_c superconductors, and also with the properties of superconducting compounds of transition metals, organic superconductors, Chevrel phases, superconductors with heavy fermions, and certain other materials. For example, A. Kitazawa discusses the development of concepts on the electronic structure of high-T_c superconductors whereas J. Fink *et al.* review the results of studies of the electronic structure of compounds of transition metals and high-T_c superconductors by photoemission and electron energy-loss spectroscopies. The electronic structure and properties of 3d transition metal compounds are discussed by G. A. Sawatzky. Theoretical models of high-T_c superconductors are surveyed in three short reviews by A. R. Bishop ("Phonons and charge-transfer excitations in high-temperature superconductors"), T. Schneider and M. Frick ('Experimental constraints and theory of layered high-temperature superconductors'), and J. Wagner *et al.* ("Generalized Hubbard models for Cu-O-based superconductors: field-theoretical and Monte Carlo results"). F. Steglich discusses current problems in the theory of superconductors with heavy fermions. The properties of organic superconductors are reviewed by D. Jerome, and Chevrel phases are discussed by O. Fischer. Some generalizations of the theory of pair breaking by magnetic impurities in superconductors are examined by P. Fulde and G. Zwicknagl. Applications of the theory of spin glasses to high-T_c superconductors are considered by I. Morgenstern.

The book covers a wide range of topics and will be of undoubted interest to physicists specializing in superconductivity.

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