

**Superconductivity:
The Next Revolution?**

Gianfranco Vidali
(Cambridge University Press, 1993,
165 pages).
ISBN: 0521-37757-9

It is a rare occasion these days when one picks up a book and just can't put it down! Such was the case recently when I first lifted this sleekly bound volume. As the title intimates, it covers the area of superconductivity, a topic that has, over the past 80 years or so, captured the attention and imagination of scientists, and the purse strings of funding agencies, all to various degrees—not to mention a few Nobel Prizes into the bargain. And superconductivity, during the past six years, has also had its full share of drama.

Despite the temptation to recount the story only of the most recent events, which have been scientifically breathtaking, this book sets the plot where it rightfully should be—at the turn of the century. What unfolds thereafter is a trail of mystery and intrigue, rivalry, self-doubt, tears and laughter—and, on several occasions, triumph. Unlike in many good novels, however, there is not yet a satisfactory ending. The author's initial question, "The Next Revolution?", sadly remains unanswered. In fact, he rather cleverly (and frustratingly) leaves it to the readers to answer for themselves.

Readers, however, have lots to go on. The topic is handled, as the sleeve notes state, "in plain, nontechnical terms," the understanding of which, as the author himself says in the preface, "requires only some background in high school or introductory college physics." While this might reasonably open up the subject to most of the civilized world, some cynical educators here in the U.K. might argue otherwise!

What follows is an enjoyable and most readable scientific history of a fundamentally difficult topic, involving Onnes, London, Dewar, Schrieffer, Anderson, Meissner, and others, in essentially a complete "Who's Who" of the field. There is only a handful of equations in the 165 pages, and two of these are $V = RI$ and $P = \text{constant}/V!$ Cleverly, the necessary scientific statements are often summarized in informative diagrams that are interspersed with photographs of equipment, materials, or some of the characters of the moment.

Potential readers should not at this stage be encouraged to believe that this is by any means a "gee whiz" book. Many of the very real problems still to be satis-

factorily solved are clearly presented. The theoretical understanding, underlying materials problems, technical issues, and sociological factors affecting possible applications and other issues are reasonably addressed.

The volume is aimed at fascinating the general reader and scientist alike. The contents will certainly do that, particularly the 11 blank pages inside the back cover! It is neither an airport paperback nor a coffee-table conversation piece, and I doubt it will mimic a *Brief History of Time*. However, if you are ever tempted to pick it up and scan a few pages, you'll probably end up buying it.

Reviewer: Ian W. Boyd is in the Department of Electronic and Electrical Engineering at the University College London, England.

Books

Below is a list of recently published books and new journals, relevant to materials science, that have come to the *Bulletin's* attention. Reviews of some of the books listed here may appear in future issues of the *MRS Bulletin*.

Advanced Metallization for ULSI Applications 1992, *Proceedings of the Conference held October 20–22, 1992, Tempe, Arizona, T.S. Cale and F.S. Pintchovski, eds.* Materials Research Society, Pittsburgh, PA, 1992. 401 pp, \$55.00 MRS members, \$65.00 U.S. list, \$70.00 foreign, *hc*, ISBN 1-55899-192-1.

Better Ceramics Through Chemistry V, *Materials Research Society Symposium Proceedings*, Volume 271, M.J. Hampden-Smith, W.G. Klemperer, and C.J. Brinker, eds. Materials Research Society, Pittsburgh, PA, 1992. 967 pp, \$57.00 MRS members, \$66.00 U.S. list, \$74.00 foreign, *hc*, ISBN 1-55899-166-2.

Bond-Orientational Order in Condensed Matter Systems, *Partially Ordered Systems*, K.J. Strandburg, ed. Springer-Verlag, New York, 1992. 388 pp, \$89.00 *hc*, ISBN 0-387-97638-8.

Chemical Perspectives of Microelectronic Materials III, *Materials Research Society Symposium Proceedings*, Volume 282, C.R. Abernathy, C.W. Bates, D.A. Bohling, and W.S. Hobson, eds. Materials Research Society, Pittsburgh, PA, 1993. 725 pp, \$58.00 MRS members, \$67.00 U.S. list, \$77.00 foreign, *hc*, ISBN 1-55899-177-8.

Chemical Processes in Inorganic Materials: Metal and Semiconductor Clusters and Colloids, *Materials Research Society Symposium Proceedings*, Volume 272, P.D. Persans, J.S. Bradley, R.R. Chianelli, and G. Schmid, eds. Materials Research Society, Pittsburgh, PA, 1992. 331 pp, \$54.00 MRS members, \$62.00 U.S. list, \$70.00 foreign, *hc*, ISBN 1-55899-167-0.

Chemical Vapor Deposition—Principles and Applications, M.L. Hitchman and K.F. Jensen, eds. Academic Press, San Diego, 1993. 677 pp, \$75.00 *hc*, ISBN 0-12-349670-5.

Computational Methods in Materials Science, *Materials Research Society Symposium Proceedings*, Volume 278, J.E. Mark, M.E. Glicksman, and S.P. Marsh, eds. Materials Research Society, Pittsburgh, PA, 1992. 401 pp, \$54.00 MRS members, \$62.00 U.S. list, \$70.00 foreign, *hc*, ISBN 1-55899-173-5.

Diffraction Optics of Complex-Structured Periodic Media, V.A. Belyakov, ed. Springer-Verlag, New York, 1992. 352 pp, *hc*, ISBN 0-387-97654-X.

Dynamics in Small Confining Systems, *Materials Research Society Symposium Proceedings*, Volume 290, J.M. Drake, J. Klaffer, R. Kopelman, and D.D. Awschalom, eds. Materials Research Society, Pittsburgh, PA, 1993. 375 pp, \$60.00 MRS members, \$69.00 U.S. list, \$79.00 foreign, *hc*, ISBN 1-55899-185-9.

Electronic Packaging Materials Science VI, *Materials Research Society Symposium Proceedings*, Volume 264, P.S. Ho, K.A. Jackson, C-Y. Li, and G.F. Lipscomb, eds. Materials Research Society, Pittsburgh, PA, 1992. 437 pp, \$51.00 MRS members, \$57.00 U.S. list, \$65.00 foreign, *hc*, ISBN 1-55899-159-X.

Flow and Microstructure of Dense Suspensions, *Materials Research Society Symposium Proceedings*, Volume 289, L.J. Struble, C.F. Zukoski, and G. Maitland, eds. Materials Research Society, Pittsburgh, PA, 1993. 259 pp, \$60.00 MRS members, \$69.00 U.S. list, \$79.00 foreign, *hc*, ISBN 1-55899-184-0.

High-Temperature Ordered Intermetallic Alloys V, *Materials Research Society Symposium Proceedings*, Volume 288, I. Baker, R. Darolia, J.D. Whittenberger, and M.H. Yoo, eds. Materials Research Society, Pittsburgh, PA, 1993. 1212 pp, \$60.00 MRS members, \$69.00 U.S. list, \$79.00 foreign, *hc*, ISBN 1-55899-183-2.

Intermetallic Matrix Composites II, *Materials Research Society Symposium Proceedings*, Volume 273, D.B. Miracle, D.L. Anton, and J.A. Graves, eds. Materials Research Society, Pittsburgh, PA, 1992. 450 pp, \$54.00 MRS members, \$62.00 U.S. list, \$70.00 foreign, *hc*, ISBN 1-55899-168-9.

Layered Superconductors: Fabrication, Properties and Applications, *Materials Research Society Symposium Proceedings*, Volume 275, D.T. Shaw, C.C. Tsuei, T.R. Schneider, and Y. Shiohara, eds. Materials Research Society, Pittsburgh, PA, 1992. 923 pp, \$57.00 MRS members, \$66.00 U.S. list, \$74.00 foreign, *hc*, ISBN 1-55899-170-0.

Macromolecular Host-Guest Complexes: Optical, Optoelectronic, and Photorefractive Properties and Applications, *Materials Research Society Symposium Proceedings*, Volume 277, S.A. Jenekhe, ed. Materials

Research Society, Pittsburgh, PA, 1992. 239 pp, \$54.00 MRS members, \$62.00 U.S. list, \$70.00 foreign, *hc*, ISBN 1-55899-172-7.

Materials Thermochemistry, 6th edition revised of Kubaschewski and Alcock's *Metallurgical Thermochemistry*, O. Kubaschewski, C.B. Alcock, and P.J. Spencer, eds. Pergamon Press, Tarrytown, NY, 1993. 363 pp, \$47.00 *pb*, ISBN 0-08-041-8880.

Materials Issues in Art and Archaeology III, *Materials Research Society Symposium Proceedings*, Volume 267, P.B. Vandiver, J.R. Druzik, G.S. Wheeler, and I.C. Freestone, eds. Materials Research Society, Pittsburgh, PA, 1992. \$54.00 MRS members, \$62.00 U.S. list, \$70.00 foreign, *hc*, ISBN 1-55899-162-X.

Materials Theory and Modelling, *Materials Research Society Symposium Proceedings*, Volume 291, J. Broughton, P. Bristowe, and J. Newsam, eds. Materials Research Society, Pittsburgh, PA, 1993. 663 pp, \$60.00 MRS members, \$69.00 U.S. list, \$79.00 foreign, *hc*, ISBN 1-55899-186-7.

Materials Reliability in Microelectronics II, *Materials Research Society Symposium*

Proceedings, Volume 265, C.V. Thompson and J.R. Lloyd, eds. Materials Research Society, Pittsburgh, PA, 1992. 327 pp, \$54.00 MRS members, \$62.00 U.S. list, \$70.00 foreign, *hc*, ISBN 1-55899-160-3.

Materials Modification by Energetic Atoms and Ions, *Materials Research Society Symposium Proceedings*, Volume 268, K.S. Grabowski, S.A. Barnett, S.M. Rossnagel, and K. Wasa, eds. Materials Research Society, Pittsburgh, PA, 1992. 403 pp, \$57.00 MRS members, \$66.00 U.S. list, \$74.00 foreign, *hc*, ISBN 1-55899-163-8.

Materials Interactions Relevant to Recycling of Wood-Based Materials, *Materials Research Society Symposium Proceedings*, Volume 266, R.M. Rowell, T.L. Laufenberg, and J.K. Rowell, eds. Materials Research Society, Pittsburgh, PA, 1992. 305 pp, \$57.00 MRS members, \$66.00 U.S. list, \$74.00 foreign, *hc*, ISBN 1-55899-161-1.

Mechanics of Composite Structures, V.V. Vasiliev, ed.; R.M. Jones, English edition ed.; translated by L.I. Man. Taylor & Francis, Washington, DC, 1993. 506 pp, \$99.00 *hc*, ISBN 1-56032-034-6.

Microcrystalline Semiconductors: Materials Science & Devices, *Materials Research Society Symposium Proceedings*, Volume 283, P.M. Fauchet, C.C. Tsai, L.T. Canham, I. Shimizu, and Y. Aoyagi, eds. Materials Research Society, Pittsburgh, PA, 1993. 951 pp, \$60.00 MRS members, \$69.00 U.S. list, \$79.00 foreign, *hc*, ISBN 1-55899-178-6.

Microwave Processing of Materials III, *Materials Research Society Symposium Proceedings*, Volume 269, R.L. Beatty, W.H. Sutton, and M.F. Iskander, eds. Materials Research Society, Pittsburgh, PA, 1992. 623 pp, \$54.00 MRS members, \$62.00 U.S. list, \$70.00 foreign, *hc*, ISBN 1-55899-164-6.

Nanophase and Nanocomposite Materials, *Materials Research Society Symposium Proceedings*, Volume 286, S. Komarneni, J.C. Parker, and G.J. Thomas, eds. Materials Research Society, Pittsburgh, PA, 1993. 457 pp, \$55.00 MRS members, \$63.00 U.S. list, \$72.00 foreign, *hc*, ISBN 1-55899-181-6.

Novel Forms of Carbon, *Materials Research Society Symposium Proceedings*, Volume 270, C.L. Renschler, J.J. Pouch, and D.M. Cox, eds.

NEW JOURNAL ANNOUNCEMENT

SUPRAMOLECULAR SCIENCE

Editor-in-Chief: Wolfgang Knoll
*Max-Planck-Institut für Polymerforschung
and Frontier Research Program (RIKEN)*

Editors:

Toshihiro Akaike, *Tokyo Institute of Technology*
Neal R Armstrong, *University of Arizona*
Mike C Petty, *University of Durham*
Michael F Rubner, *Massachusetts Institute of Technology*

Supramolecular Science will provide an inter-disciplinary forum for publishing original peer-reviewed articles in the field of supramolecular aggregates, assemblies and nanoscopic materials.

AIMS & SCOPE

- **CHEMICAL ASPECTS** of molecularly designed, tailor-made novel functionalized materials
- **PHYSICAL PRINCIPLES** of interaction schemes leading to self-assembled or artificially engineered molecular aggregates, architectures and machines
- **BIOLOGICAL/BIOMIMETIC APPROACHES** to design, assembly and functionalization of new intelligent materials, devices and systems
- **MOLECULAR ENGINEERING ASPECTS** including novel fabrication and processing routines
- **NEW CHARACTERIZATION TECHNIQUES** for investigating the interrelation - at the molecular level - between the structure, the order and the dynamical features of these materials and systems with their physical properties and functions
- **COMPUTER SIMULATIONS**

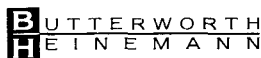
TOPICS INCLUDE:

- supramolecular chemistry • self-assembly systems
- self-organizing systems • OBME • OMCVD • Langmuir-Blodgett multilayers • STM/AFM as nano-tools • High resolution electron microscopies

FIRST ISSUE - MID 1994

FREE SAMPLE COPIES, FURTHER DETAILS & NOTES FOR AUTHORS

are available on request. Please contact Catriona Burns at



Linacre House, Jordan Hill, Oxford, OX2 8DP, UK Tel: +44 (0)865 310366 Fax: +44 (0)865 310898

Please visit Booth No. 208 at the Equipment Exhibit/Table Top Display in Boston, Nov. 30-Dec. 2, 1993.
Circle No. 19 on Reader Service Card.

BOOK REVIEWS

Materials Research Society, Pittsburgh, PA, 1992. 521 pp, \$54.00 MRS members, \$62.00 U.S. list, \$70.00 foreign, *hc*, ISBN 1-55899-165-4.

P/M in Aerospace, Defense and Demanding Applications—1993, *Proceedings of the Third International Conference on Powder Metallurgy in Aerospace, Defense, and Demanding Applications*, sponsored by the Metal Powder Industries Federation, February 7–10, 1993, San Diego, California; F.H. Froes, ed. Metal Powder Industries Federation, Princeton, NJ, 1993. 402 pp, \$125.00 *pb*, ISBN 1-878954-31-8.

Scientific Basis for Nuclear Waste Management XVI, *Materials Research Society Symposium Proceedings, Volume 294*, C.G. Interrante and R.T. Pabalan, eds. Materials Research Society, Pittsburgh, PA, 1993. 951 pp, \$55.00 MRS members, \$63.00 U.S. list, \$72.00 foreign, *hc*, ISBN 1-55899-189-1.

Silicon Nitride Ceramics Scientific and Technological Advances, *Materials Research Society Symposium Proceedings, Volume 287*, I-

W. Chen, P.F. Becher, M. Mitomo, G. Petzow, and T-S. Yen, eds. Materials Research Society, Pittsburgh, PA, 1993. 549 pp, \$55.00 MRS members, \$63.00 U.S. list, \$72.00 foreign, *hc*, ISBN 1-55899-182-4.

Smart Materials Fabrication and Materials for Micro-Electro-Mechanical Systems, *Materials Research Society Symposium Proceedings, Volume 276*, A.P. Jardine, G.C. Johnson, A. Crowson, and M. Allen, eds. Materials Research Society, Pittsburgh, PA, 1992. 317 pp, \$51.00 MRS members, \$57.00 U.S. list, \$65.00 foreign, *hc*, ISBN 1-55899-171-9.

Solid State Ionics III, *Materials Research Society Symposium Proceedings, Volume 293*, G-A. Nazri, J-M. Tarascon, and M. Armand, eds. Materials Research Society, Pittsburgh, PA, 1993. 471 pp, \$60.00 MRS members, \$69.00 U.S. list, \$79.00 foreign, *hc*, ISBN 1-55899-188-3.

Solitons in Liquid Crystals, L. Lam and J. Prost, eds. Springer-Verlag, New York, 1992. 338 pp, \$69.00 *hc*, ISBN 0-387-96878-4.

Structure and Properties of Energetic Materials, *Materials Research Society Symposium Proceedings, Volume 296*, D.H. Liebenberg, R.W. Armstrong, and J.J. Gilman, eds. Materials Research Society, Pittsburgh, PA, 1993. 387 pp, \$60.00 MRS members, \$69.00 U.S. list, \$79.00 foreign, *hc*, ISBN 1-55899-191-3.

Submicron Multiphase Materials, *Materials Research Society Symposium Proceedings, Volume 274*, R.H. Baney, L.R. Gilliom, S-I. Hirano, and H.K. Schmidt, eds. Materials Research Society, Pittsburgh, PA, 1992. 185 pp, \$57.00 MRS members, \$66.00 U.S. list, \$74.00 foreign, *hc*, ISBN 1-55899-169-7.

New Journals

Aerospace Materials, The Shephard Press Ltd., 111 High St., Burnham, Buckinghamshire SL1 7JZ, United Kingdom; 44-628-604311; fax 44-628-664334. Quarterly; first issue: May 1993. Subscription rate: \$40.00.

MATERIALS RESEARCH SOCIETY

1994 Institutional Subscription Rates

MRS Bulletin

(ISSN: 0883-7694)

Volume 19

One year subscription (12 issues)

U.S.A. \$112

Foreign (air freight) \$165

Journal of Materials Research

(ISSN: 0884-2914)

Volume 9

One year subscription (12 issues)

U.S.A. \$440

Foreign (surface) \$470

Foreign (air freight) \$520

JMR Abstracts

(ISSN: 1066-2375)

Volume 9

One year subscription (12 issues)

U.S.A. \$60

Foreign (air freight) \$70

With a 1994 subscription

to *Journal of Materials*

Research \$35

Bonus! Order a 1994 subscription to both *Journal of Materials Research* and *JMR Abstracts* and receive a FREE custom binder to store your *JMR Abstracts* in.

Order from: Materials Research Society, 9800 McKnight Road, Pittsburgh, PA 15127; Phone (412) 367-3012; FAX (412) 367-4373. Or your subscription agency.

Advertisers in This Issue

	Page No.
Butterworth Heinemann	85
Crane & Company, Inc.	15
Elsevier Science Publishers	12, 83
High Voltage Engineering/ Europa BV	inside front cover
Huntington Laboratories	back cover
Inspec	17
Intevac	4
The Mellen Company, Inc.	8
MKS Instruments, Inc.	3
Philips Analytical X-Ray B.V.	22
Plasma Sciences, Inc.	6
Royal Microscopical Society	5
Semiconductor Processing Company	7
TopoMetrix	inside back cover
VCH	15
Virginia Semiconductor, Inc.	14
Voltaix, Inc.	13

For free information about the products and services offered in this issue, fill out and mail the Reader Service Card, or FAX it to (312) 922-3165.