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NOTA BENE:

The following Nota Bene is contributed by Sreeparna Mitra, Project Director and Editor of *High-T_c Update.* Our Science Editor, John R. Clem, is currently on travel.

YBCO

A paper by A. Schilling (Zürich) et al., reports measurements of the magnetic torque τ experienced by an untwinned $YBa_2Cu_3O_{7-\delta}$ single crystal in an external field up to $\mu_0 H$ = 7 T below T_c, as a function of Θ, the angle between H and the c axis of the crystal. The authors observe discontinuities in both τ and $(\partial\tau/\partial H)_T$ at the vortex lattice melting temperature that are related to changes in the transverse components of the magnetization vector **M** and $(\partial \mathbf{M}/\partial H)_T$ respectively. From the $(\partial\tau/\partial H)_T$ data, the authors are able to extract the differences in the reduced specific heat between the vortex-fluid and vortex-solid phases, and compare results with corresponding thermal data. The authors also examine the validity of standard angular scaling rules for anisotropic superconductors for melting fields $H_m(T,\Theta)$ and temperatures as high as $T/T_c = 0.99$.

Resistivity measurements as a function of temperature are reported for optimally and overdoped heavily twinned $YBa_2Cu_3O_{7-\delta}$ single crystals by J.-C. Grivel (Stockholm) et al. under a magnetic field **B** oriented parallel to the twin boundary planes (**B**||c). Characteristic features attributed to the flux-line lattice melting transition have been observed in the overdoped case for $\mathbf{B} \geq 5$ T. The first-order transition was not found in the optimally doped sample, even when **B** was tilted with respect to the c-axis. The authors discuss the differences between these two samples.

In two related papers, C. Vaast-Paci et al. (DRECAM-SPEC) describe a method for measuring the local fields arising from the vortex lattice in $YBa_2Cu_3O_{7-\delta}$ based on the field dependence of the electronuclear energy levels of non-perturbing $^{170}Yb^{3+}$ Mössbauer probes. In the first paper, they report results for bulk and surface penetration lengths. In the second paper, the authors examine the directional properties of the vortex lattice in grain-oriented $YBa_2Cu_3O_{7-\delta}$ as a function of the direction of the applied field relative to the c axis.

The microstructure and magnetic properties of textured $YBa_2Cu_3O_{7-\delta}$ samples are discussed in a preprint by G. Plesch (Comenius) et al. Samples prepared by a powder-melting process and those prepared by the quench-and-melt growth technique are described and compared.

Bi Cuprates

The Fermi surface of the *Bi-2212* system is systematically studied in a paper by D. L. Feng (Stanford) et al. using a variety of photon energies. The authors identify strongly nested Fermi surface segments that appear to be relevant to the charge-density-wave instability which is commensurate with a lattice at 1/8 doping.

A preprint by A. Morello (Max Planck) et al. reports on measurements of the irreversible magnetization of layered $Bi_{2+x}Sr_{2-(x+y)}Cu_{1+y}O_{6\pm\delta}$ *(Bi-2201)* single crystal by means of a capacitative torquemeter for applied fields parallel to the a axis up to B_a = 28 T and temperatures down to T = 60 mK. The authors observe no magnetization jumps, peak effects, or crossovers between different pinning mechanisms. The authors also report that the deduced irreversibility field B_{irr} cannot be described by the law $B_{irr}(T) \propto (1-T/T_c)^n$ based on flux creep, but an excellent agreement is found with the analytical form of the melting line of the flux lattice calculated from the Lindemann criterion.

Borocarbides

The reversible magnetization M of $Lu(Ni_{1-x}Co_x)_2B_2C$ with x = 0 and 0.06 was measured in a broad temperature domain by V. G. Kogan (Ames Lab-Iowa State) et al. as a function of field orientation θ in the basal crystal plane. The data are interpreted within London theory extended for nonlocality of the current-field relation in superconductors.

The authors report that the dependence M(θ) diminishes on warming, vanishes at $T^* < T_c$, and changes sign for $T > T^*$. The authors note that the low-T sign is opposite to what is expected from the known angular dependence of the upper critical field. Upon doping with *Co,* the effect disappears with decreasing mean-free path, in agreement with theory.

In-plane resistance for $TmNi_2B_2C$ has been measured by D. G. Naugle (Texas A&M) et al. as a function of magnitude and direction of the magnetic field and temperature, from above the superconducting transition temperature at 10.7 K to below the magnetic transition temperature T_N = 1.5 K. The superconducting upper critical field $H_{c2}(T)$ exhibits a large anisotropy and structure in the vicinity of T_N, and the magnetoresistance above T_c is large and changes sign as the direction of the magnetic field is rotated from in-plane to parallel with the c axis.

$YbNi_2B_2C$ is a heavy fermion metal with neither superconductivity nor magnetic order, in contrast to other members of the borocarbide group, and $LuNi_2B_2C$ is a superconductor with T_c ~ 16.3 K and no magnetic order. A paper by K.D.D. Rathnayaka (Texas A & M) et al. reports transport studies on a single-crystal $Yb_xLu_{(1-x)}Ni_2B_2C$ that show systematic change from a heavy-fermion system to a moderately high-temperature superconductor. The authors observe a "giant" thermopower for small x to x = 1, i.e., in the transition region from a Kondo alloy to a heavy-fermion metal. The authors also report measurements of $H_{c2}(T,x)$ for x < 0.15.

Other Materials

Tunneling experiments were performed by A. I. D'yachenko (Warsaw) et al. on single crystals of hole-doped two-leg ladders $(SrCa)_{10}Cu_{17}O_{29}$ with $T_c \approx 75$ K, and on textured bulk samples of $Bi_2Sr_2CaCu_2O_8$ *(Bi-2212)* as reference. Experimental results are consistent with the formation of zero-energy Andreev bound states at the surface of the superconductors and $d_{x^2-y^2}$-wave symmetry of the order parameter Δ in both compounds.

A paper by A. K. Pradhan et al. (ISTEC) studies the flux pinning behavior of ternary melt-processed $(Nd\text{-}Eu\text{-}Gd)Ba_2Cu_3O_y$ superconductors, with varying Gd_2BaCuO_5 second phase *(Gd-211)* defect concentrations, using magneto-transport and magnetization measurements. The critical current density J_c is observed to increase with the addition of *Gd-211* particles, displaying a maximum value of J_c for 30% at zero and intermediate field range and decrease on further addition of *Gd-211* particles. The authors note that the addition of the second phase and its subsequent refinement by *Pt* addition enhances pinning strength significantly.

The effect of *Sr* substitution on the *Ba* site for $Hg_{0.7}Pb_{0.3}Ba_2Ca_2Cu_3O_y$ is studied in a paper by Y. Zhuo (Pohang) et al. From analysis of reversible magnetization, the authors find that the fluctuation magnetization is much suppressed in the *Sr*-substituted compound. The authors explain this feature in terms of the enhanced interlayer coupling strength associated with the *Sr* substitution and obtain various thermodynamic parameters from the theoretical analysis. The study notes that the $H_{c2}(0)$ of the *Sr*-substituted sample is about two times that of the non-substituted sample.

To explain observed intrinsic steps in the flux-flow resistance of c-axis-oriented films of $Nd_{2-x}Ce_xCuO_y$ *(NCCO),* O. M. Stoll (Tübingen) et al. propose an electronic structure in the mixed state consisting of subbands between the Fermi energy and the superconducting energy gap. Two papers by the authors detail studies of electric-field dependence of the flux-flow resistance and the electronic vortex structure in *NCCO,* as well as magnetic-field and temperature dependence of the intrinsic resistance steps.

The physical behavior of the oxygen- and hydrogen-charged $Eu_{1.5}Ce_{0.5}RuSr_2Cu_2O_{10-\delta}$ are studied in a preprint by I. Felner et al. (Hebrew University) by microscopic magnetization and resistivity measurements combined with microscopic scanning-tunneling-spectroscopy studies. In another paper, the authors use these techniques to study the superconductor-to-insulator transition in ceramic $Eu_{1.5}Ce_{0.5}NbSr_2Cu_2O_{10}$.

Tapes

Extended voltage-current characteristics of thirteen optimized *(Bi,Pb)2223/Ag* multifilamentary tapes from four different manufacturers were extensively evaluated by L. A. Schwartzkopf et al. (ASC-Madison) to extract the field dependent $J_c(H)$, the characteristic field H_p obtained from the relation $J_c = \exp(-H/H_p)$, and the irreversibility field H*. The data show that connectivity and flux pinning make independent contributions to the magnitude of J_c. The authors assert that $J_c(0T,77K)$ is a flawed characterization parameter because of its heavy dependence on self-field, and a better descriptor is $J_c(0.1T,77K)$, because it lies outside the self-field and weak-link destruction regimes, and clearly within the flux-pinning-controlled domain where the connectivity-determined active cross-section-carrying current is constant.

A preprint by J. W. Anderson (ASC-Madison) et al. studies the influence of intermediate rolling deformation on the residual crack network and critical current density in multifilamentary $(Bi,Pb)_2Sr_2Ca_2Cu_3O_x$ tapes. The study concludes that the intermediate deformation is positive in so far as it decreases the filament porosity, but it cannot reduce this too much without introducing more cracking

than is healed in subsequent heat treatment. The critical current density thus maximizes at an intermediate deformation that counterbalances these two oppositely directed influences on filament connectivity.

The feasibility of producing biaxially textured *YBCO* tapes by a dynamic magnetic technique is studied in a paper by J.-Y. Genoud (DPMC) et al. A biaxially aligned dispersion of orthorhombic $Y_2Ba_4Cu_7O_{15}$ *(Y-247)* powder was settled on untextured silver substrates, and the tapes were then melt-processed to achieve high-J_c $YBa_2Cu_3O_7$ tapes with *CuO* as a secondary phase. Critical current densities of up to 5,000 A/cm^2 at 77 K in self field and 1,500 A/cm^2 in 0.5 T at 65 K were obtained in films from 20 to 40 μm thick. The authors note that, provided significant improvements in J_c can be obtained, this method offers an alternative to coated tape processes based on epitaxial growth that does not require textured substrates.

Films

A detailed investigation of atomic and electronic structure of superconducting *YBCO* films is presented in a paper by V. D. Okunev (Ukraine) et al. analyzing structural, optical, and transport data. The authors show the effect of ordering on the transition temperature T_c.

Shapiro voltage steps at voltages $V_n = nV_0$ (n=integer) have been observed by L. Van Look et al. (Leuven) in the voltage-current characteristics of a superconducting film with a square lattice of perforating microholes (antidots) in the presence of radio frequency radiation. The authors assert that the observation reveals the presence of mobile interstitial vortices in the superconducting films with regular pinning arrays, and that these interstitial vortices, moved by the driving current, coexist with immobile vortices strongly pinned at the antidots.

Detailed transport measurements were made by N. F. Heinig et al. (Madison) on $YBa_2Cu_3O_{7-x}$ thin-film [001] tilt bicrystals with misorientation angles of 3°, 5°, 7°, 10°, and 20°, encompassing the angular regime where the transition from strong to weak coupling occurs. The results show that the weak-to-strong coupling transition is progressive at 77 K, occurring at misorientation angles between 7° and 10° in zero field, and between 10° and 15° in higher magnetic fields. The authors find the shapes of the voltage-current characteristics of the 7° [001] bicrystals and the ratio of the inter- and intragranular critical current densities to be particularly sensitive to individual sample-preparation conditions. The authors also do not observe linear decline of the intergranular critical current density with misorientation angle predicted from present dislocation core overlap models.

Applications

A review of the development of a three-axis SQUID magnetometer for mineral-prospecting applications is presented in a paper by C. P. Foley (CSIRO) et al. The authors note that SQUID systems as B field sensors have advantages over coils which are dB/dt type sensors, and discuss the importance of these advantages for mineral prospecting in regions with a conducting soil cover or overburden that is typical of the Australian landscape.

A paper by M. Däumling (NKT Research) theoretically describes a superconducting cable consisting of several layers. The model allows quantitative calculations of current distributions and ac losses in superconducting multilayer power cables. The author identifies two regimes as being important: a low-current regime in which the current distribution is determined by the inductance matrix of the cable, and a high-current regime in which one or more layers have reached their critical current. The author identifies a new loss mechanism due to saturation of current, and makes comparisons between measured data and the model.

The prospects of operating rapid single flux quantum (RSFQ) circuits with high-T_c superconductive materials have been studied quantitatively with numerical inductance computations. H. Töpfer and H. F. Uhlmann (Technical University of Ilmenau) have, in this paper, provided inductance calculations for typical layout arrangements that can provide insight in regard to upper limits for the feasible operating temperature ranges.

A balanced comparator has been fabricated and tested in a three HTS layer technology by A. H. Sonnenberg et al. (Twente) for use as an element of RSFQ circuits. The junctions and inductances are located on a buried ground plane in order to reduce the inductance values, and the authors have chosen for a buried ground plane in order to avoid heating the ramp-edge junction to deposition temperatures. Correct operation has been verified by dc measurements of the switching properties.

A preprint by L. Hao (National Physical Laboratory) et al. reports on the design and operation of HTS resistive SQUIDs for potential application in Josephson noise thermometry above helium temperatures.

Vortices

Equations describing a single vortex in a charged Bose liquid at zero temperature are derived in a paper by A. S. Alexandrov (Loughborough). The zero-temperature coherence length, magnetic field penetration depth, vortex structure and energy, and lower critical field are calculated.

The author reports that the vortex differs from that in type-II BCS superconductors or in neutral superfluids in that this system has a charged core with electric field inside the core. The author asserts that while the magnetic field profile is the same as in the BCS case, the electric field associated with the vortex could provide evidence for charged bosons in the high-temperature superconductors.

A paper by Y. Cao and Z. Jiao (Zhejiang) numerically investigates the influence of pinning and thermal fluctuation effects on the motion of the 2D vortex lattice under the action of an external driving force.

Theory

A microscopic theory is developed in a paper by W. M. Zhang (Taiwan) to describe the close proximity between the insulating antiferromagnetic (AF) order and the d-wave superconducting order in the cuprates. The author shows that the cuprate ground states form a configuration of coherent pairing states consisting of extended singlet Cooper pairs and triplet π pairs, which can simultaneously describe AF and d-wave orders.

For the case of s+id symmetry of the superconducting gap, D. Quesada et al. (La Habana) calculate the temperature dependence of the specific heat C_{es} and the thermodynamic critical magnetic field H_c. The authors observe a double peak transition on $C_{es}(T)$ in the mixed regime while single-peak behavior is recovered for the purely symmetric (s or d) state. C_{es} exhibits a quadratic-law behavior at low temperatures for a d-wave gap and typical exponential attenuation for the s wave. The temperature dependence of H_c shows a clear phase transition of second order at temperatures where the d-wave component becomes negligible. These results are compared to other work.

The temperature dependence of specific heat, susceptibility, penetration depth, and thermal conductivity of a coupled ($d_{x^2-y^2}$+is)-wave BCS superconductor is studied numerically in a paper by A. Ghosh and S. K. Adhikari (Brazil) in the presence of a weak s-wave component (a) on square lattice and (b) on a lattice with orthorhombic distortion. The authors observe a less-ordered superconducting phase created in $d_{x^2-y^2}$ wave as the temperature is lowered past T_c, which changes to a more ordered phase in ($d_{x^2-y^2}$+is) wave at T_{c1}, which manifests as two second-order phase transitions.

The phase diagram of order parameters for pairing and phase coherence in hole-doped cuprates is discussed in a preprint by A. Mourachkine (Brussels). By examining recent neutron-scattering data on hole-doped cuprates and heavy fermions, the author concludes that the coherent gap in hole-doped cuprates most likely has magnetic origin and scales with T_c as $2\Delta_c/k_BT_c = 5.4$. The author discusses a model of hole-doped cuprates and the symmetries of the two order parameters.

Reviews

A brief review of the first thirteen years of high-T_c superconductivity research is summarized in a paper by D. Pavuna (Lausanne). The author addresses some of the most relevant recent results and open questions in the field, by discussing the observed phenomena in the rather complex electronic phase diagram of high-T_c oxides. (21 refs.).

A paper by C. R. Hu (TCSUH) provides an update of the many effects and novel consequences of the midgap states predicted to exist in d-wave superconductors. (29 refs.).

Reviewing the experimental work of the normal state of HTS materials, L. Zhang and Q. Han (Beijing) have put forward nine points to be considered in any theory of the normal state. The authors argue that the two-dimensional two-subsystem model is qualitatively consistent with all these points. (23 refs.).

An exhaustive review of problems where topological ideas may play a role is presented by E. Akkermans (Orsay) and K. Mallick (Haifa). In two sections of this review, the authors discuss the problem of superconducting billiards within the Ginzburg-Landau approximation. (49 refs.).

Contributed by Sreeparna Mitra

Contents: Preprints begin on page 5; Coming Events begin on page 10; Resources are on page 11; and FYI is on page 11.

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National Institute for Research in Inorganic Materials, 1-1 Namiki, Tsukuba, Ibaraki 305-0044, JAPAN; phone +81 0298 52 7449; fax +81 0298 52 7449; e-mail ono@nirim.go.jp. Key words: $BaSrYCu_3O_z$, $BaSrTmCu_3O_z$, overdoping, oxygenation, hole distribution.

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Wei-Min Zhang, "Underlying Pairing States in Cuprate Superconductors." Department of Physics, National Cheng Kung University, Tainan, Taiwan 701, REPUBLIC OF CHINA; e-mail wzhang@mail.ncku.edu.tw; preprint also available at http://xxx.lanl.gov/abs/cond-mat/9907287. 74.20.-z; 74.20.Mn; 74.25.Ha; 71.10.-w.

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COMING EVENTS

*(An * indicates a previously listed event. Also see complete listing of upcoming conferences and workshops at our Web site http://www.iitap.iastate.edu/htcu/comevents.html.)*

*Oct. 17 - 19, 1999:

12th International Symposium on Superconductivity (ISS'99), Hotel Metropolitan Morioka, Morioka, Japan. Forum for free exchange of information, to contribute to the advancement of superconductivity and strengthen international cooperation. Symposium will consist of oral and poster sessions, highlighted by a few dozen invited talks on the latest topics related to superconductivity. Will cover the latest findings and related themes in the following research fields of superconductivity: physics and chemistry, bulks, wires and tapes, system applications , films and junctions, and electronics. Official language is English. For information, contact ISTEC, Eishin Kaihatsu Bldg. 6F, 34-3 Shimbashi 5-chome, Minato-ku, Tokyo 105-0004, Japan; telephone +81 3 3431 4002; telefax +81 3 3431 4044.

*Nov. 1 - 5, 1999:

9th Workshop on rf Superconductivity, La Fonda Hotel, Downtown Santa Fe, New Mexico. Brings together over 200 contributors from dozens of laboratories and industries around the world. Workshop will cover the status of, and advances in, rf superconductivity; field emission in niobium cavities; fabrication, cleaning, and surface preparation; rf power delivery; topical reviews related to materials used in superconducting cavity fabrication; and future applications of superconducting technology. **Abstract deadline, September 15, 1999.** For more information, contact Lorraine Stanford, Los Alamos National Laboratory, P.O. Box 1663, MS H845, Los Alamos, NM 87545; telephone (505) 667-5051; telefax (505) 667-9409; e-mail rfsc99@lanl.gov; Web site http://mesa53.lanl.gov/rfsc99/.

*Nov. 29 - Dec. 3, 1999:

Materials Research Society Fall 1999 Meeting: Symposium Q – Advances in Materials Problem Solving with the Electron Microscope, Boston, Mass. Topics: structural metallic alloys (e.g., alloy development, phase transformations); structural and electronic ceramics, composites, and minerals; polymers, zeolites, catalysts, and fullerenes; microelectronic materials and electroluminescent materials; epitaxial and polycrystalline thin films and multilayers; and magnetic materials for permanent magnets and data storage. Contact Charles Allen, Argonne National Laboratory, Electron Microscopy Ctr.-HVEM-Tandem Facility, MSD 212/E211, 9700 South Cass Ave., Argonne, IL 60439; telephone (630) 252-4157; telefax (630) 252-4798 or -4298; e-mail allen@aaem.amc.anl.gov; conference Web site http://www.mrs.org/meetings/fall99/.

March 20 - 24, 2000:

2000 March Meeting, Minneapolis Convention Center, Minneapolis, Minn. Sessions on superconductivity will include the following topics: synthesis, growth, and processing (bulk and films); thermodynamic and transport properties; mechanical and structural properties; electronic structure and spectroscopic properties; flux pinning and flux dynamics; spin properties (NMR,NQR, etc.); tunnel junctions, devices, and Josephson arrays; quantum computing; and other focused sessions. **Abstract deadline, December 3, 1999.** (Complete abstract submission instructions can be found at http://www.aps.org/meet/meet-abstract.html.) For further general information, contact Donna Baudrau, Manager, APS Meetings Department, telephone (301) 209-3285, e-mail baudrau@aps.org; more information on the March meeting is available at the Web site http://www.aps.org/meet/MAR00/.

*May 28 - June 2, 2000:

International Conference on Transport Processes in Inorganic Materials: Fundamentals to Devices, Venice (Jesolo Beach), Italy. Objective is to discuss recent developments in microscopic mechanisms of transport in different inorganic materials; assess the role of transport in materials reactivity, synthesis, and processing; explore the transport mechanisms which affect materials properties and behavior under operating conditions; and exploit the role of transport processes in a number of advanced technologies of current or emerging interest. Papers are solicited in several areas, including diffusion and transport in media of lower dimensionality, single-crystal growth, materials processing for HTS materials, and superconducting devices for high- and low-field applications. For information, contact CIMTEC-Transport Phenomena Conference, P.O. Box 174, I-48018 Faenza, Italy; telefax +39 0546 664138.

June 21 - 23, 2000:

4th European Workshop on Low Temperature Electronics (WOLTE-4), European Space Research and Technology Centre (ESTEC), Noordwijk, The Netherlands. Organized by the European Space Agency (ESA) and co-sponsored by IEEE/EDS. Objective of the workshop is to provide an international forum for discussing recent research and development in the area of low-temperature electronics including semiconductors, low- and high-temperature superconductors, devices, circuits, and systems. Emphasis on the application of these for space instrumentation. Both oral and poster presentations. Intent

to exhibit or to organize a short course should be indicated to the Conference Secretariat with a preliminary description of requirements by October 15, 1999. Topics: device physics and fundamental aspects, fabrication technologies, device and circuit design, packaging and interconnections, front-end systems for cryogenic sensors, device simulation and modeling, cryogenic measurements and instrumentation, new materials and novel technologies, space-related applications, refrigeration, and interfacing for electronics. **Abstract deadline, December 15, 1999.** Contact ESTEC Conference Bureau, P.O. Box 299, 2200 AG Noordwijk, The Netherlands; telephone +31 71 5655005; telefax +31 71 5655658; e-mail confburo@estec.esa.nl; Web site http://www.estec.esa.nl/CONFANNOUN/wolte4/.

RESOURCES

Information

Proceedings: *Physics and Materials Science of Vortex States, Flux Pinning and Dynamics* – Proceedings of the NATO Advanced Study Institute, Kusadasi, Turkey, July 26-August 8, 1998, edited by Ram Kossowsky, Shyamalendu Bose, Vladimir Pan, and Zafer Durusoy. NATO Science Series: Applied Sciences, Volume 356. Discussion by an assembly of expert physicists and materials scientists embracing the specific features of vortex-pin interactions, modes of different kinds of vortex motion under the action of Lorenz force, and mechanisms of dissipation. Implications for the development of new devices and components in electrical engineering, modern electronics, computer technology, and microwave communication. Publ. 1999; 788 pp.; price $357 (HB) or $117 (PB); ISBN 0-7923-5663-2 (HB) or ISBN 0-7923-5664-0 (PB).

Crystal Engineering: The Design and Application of Functional Solids – Proceedings of the NATO Advanced Study Institute, held in Digby, Nova Scotia, Canada, September 9-20, 1996, edited by Kenneth Richard Seddon and Michael Zaworotko. NATO Science Series C: Mathematical and Physical Sciences, Volume 539. Crystal engineering is a rapidly emerging, cross-disciplinary field that seeks to develop protocols for predicting and controlling the structure and thus the functional properties of solids. The emergence of the field can be attributed to a corresponding rise in the importance of supramolecular chemistry and its relevance to areas as diverse as polymorphism in pharmaceuticals, nonlinear optics and high-T_c superconductors. Book consists of chapters discussing bonding theory, computational chemistry, applied spectroscopy, structural methods, synthesis strategies, and applications of custom-designed solids. Readership: synthetic chemists, solid-state chemists, physicists, pharmaceutical researchers interested in polymorphism and the bulk properties of solids; and theoreticians interested in the prediction of bulk properties. The book can serve both as an introduction to the field and an advanced research reference. Publ. 1999; 512 pp.; price $227 (HB); ISBN 0-7923-5905-4.

High-Temperature Superconductors and Novel Inorganic Materials: Proceedings of the NATO Advanced Research Workshop on High-Temperature Superconductors and Novel Inorganic Materials Engineering MSU-HTSC V, Moscow, Russia, March 24-29, 1998, edited by G. Van Tendeloo, E. V. Antipov, and S. N. Putilin. NATO Science Partnership Series: High Technology, Volume 62. Research into high-T_c materials demands the co-operation of physicists, chemists and materials scientists to discover the best solutions to the most important challenges presented by the field. In this fifth annual Workshop, the topic is extended beyond high-T_c superconductivity to include other advanced oxide materials, mainly colossal magnetoresistance materials, which are closely related to the ceramic superconductors. This book covers the synthesis, characterization (both structural and physical) and engineering of this class of materials. Publ. 1998; 318 pp.; price $147 (HB), $72 (PB); ISBN 0-7923-5345-5 (HB), ISBN 0-7923-5346-3 (PB).

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