Subhash L. Shindé • David A. Rudman
Editors

INTERFACES IN HIGH-T_c SUPERCONDUCTING SYSTEMS

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Interfaces In Hightc Superconducting Systems

Hans Kuzmany,Michael Mehring,Jörg Fink

Interfaces In Hightc Superconducting Systems:

Interfaces in High-Tc Superconducting Systems Subhash L. Shinde,David A. Rudman,2012-12-06 Because the new high temperature superconductors cannot be grown as large single crystals interfaces and junctions play an important role in their properties The chapters in this book each by leading researchers in the field examine the state of our understanding of such interfaces Chapters cover such topics as studies of YCBO films by transmission electron scanning tunneling and atomic force microscopy microstructure interfacial interactions and twin boundary structures in YCBO films grain boundary Josephson junctions and overlayer formation Interfaces in High-Tc Superconducting Systems Subhash L. Shinde,David Rudman,1993-12-17 Because the new high temperature superconductors cannot be grown as large single crystals interfaces and junctions play an important role in their properties The chapters in this book each by leading researchers in the field examine the state of our understanding of such interfaces Chapters cover such topics as studies of YCBO films by transmission electron scanning tunneling and atomic force microscopy microstructure interfacial interactions and twin boundary structures in YCBO films grain boundary Josephson junctions and overlayer formation High-Tc Superconductors and Related Materials S.-L. Drechsler,T. Mishonov,2012-12-06 A broad introduction to high Tc superconductors their parent compounds and related novel materials covering both fundamental questions of modern solid state physics such as correlation effects fluctuations unconventional symmetry of superconducting order parameter and applied problems related to short coherence length grain boundaries and thin films The information that can be derived from electron spectroscopy and optical measurements is illustrated and explained in detail Descriptions widely employ the clear relatively simple phenomenological Ginzburg Landau model of complex phenomena such as vortex physics vortex charge determination plasmons in superconductors Cooper pair mass and wetting of surfaces The first comprehensive reviews of several novel classes of materials are presented including borocarbides and chain cuprates **Electronic Properties of High-Tc Superconductors** Hans Kuzmany,Michael Mehring,Jörg Fink,2012-12-06 The International Winter School on Electronic Properties of High Temperature Superconductors held between March 7 14 1992 in Kirchberg Tyrol Austria was the sixth in a series of meetings to be held at this venue Four of the earlier meetings were dedicated to issues in the field of conducting polymers while the winter school held in 1990 was devoted to the new discipline of high T c superconductivity This year s meeting constituted a forum not only for the large number of scientists engaged in high Tc research but also for those involved in the new and exciting field of fullerenes Many of the issues raised during the earlier winter schools on conducting polymers and the last one on high T c superconductivity have taken on a new significance in the light of the discovery of superconducting C materials 60 The Kirchberg meetings are organized in the style of a school where expe rienced scientists from universities research laboratories and industry have the opportunity to discuss their most recent results and where students and young scientists can learn about the present status of research and applications from some of

the most eminent workers in their field In common with the previous winter school on high Tc superconductors the of the cuprate superconductors present one focused on the electronic properties In addition consideration was given to related compounds which are relevant to the understanding of the electronic structure of the cuprates in the normal state to other oxide superconductors and to fulleride superconductors **Handbook of Superconductivity** David A. Cardwell,David C. Larbalestier,Aleksander Braginski,2022-07-05 This is the second of three volumes of the extensively revised and updated second edition of the Handbook of Superconductivity The past twenty years have seen rapid progress in superconducting materials which exhibit one of the most remarkable physical states of matter ever to be discovered Superconductivity brings quantum mechanics to the scale of the everyday world where a single coherent quantum state may extend over a distance of metres or even kilometres depending on the size of a coil or length of superconducting wire Viable applications of superconductors rely fundamentally on an understanding of this intriguing phenomena and the availability of a range of materials with bespoke properties to meet practical needs While the first volume covers the fundamentals of superconductivity and the various classes of superconducting materials Volume 2 covers processing of the desired superconducting materials into desired forms bulks films wires and junction based devices The volume closes with articles on the refrigeration methods needed to put the materials into the superconducting state Key Features Covers the depth and breadth of the field Includes contributions from leading academics and industry professionals across the world Provides hands on guidance to the manufacturing and processing technologies A comprehensive reference the handbook is suitable for both graduate students and practitioners in experimental physics materials science and multiple engineering disciplines including electronic and electrical chemical mechanical metallurgy and others **The SQUID Handbook** John Clarke,Alex I. Braginski,2006-03-06 This two volume handbook offers a comprehensive and well coordinated presentation of SQUIDs Superconducting Quantum Interference Devices including device fundamentals design technology system construction and multiple applications It is intended to bridge the gap between fundamentals and applications and will be a valuable textbook reference for graduate students and for professionals engaged in SQUID research and engineering It will also be of use to specialists in multiple fields of practical SQUID applications from human brain research and heart diagnostics to airplane and nuclear plant testing to prospecting for oil minerals and buried ordnance The first volume contains chapters presenting the theory of SQUIDs their fabrication from low and high temperature superconductors the necessary readout electronics and the design and performance of practical direct current dc and radio frequency rf SQUIDs This volume concludes with an overview of the most important SQUID system issues An appendix summarizes briefly the foundations of superconductivity that are necessary to understand SQUIDs A glossary and tables of units and constants are also included The second volume of the handbook will deal with applications of SQUIDs and SQUID systems **Applied Superconductivity** Paul Seidel,2015-01-22 This wide ranging presentation of applied superconductivity from fundamentals and materials right up to

the details of many applications is an essential reference for physicists and engineers in academic research as well as in industry Readers looking for a comprehensive overview on basic effects related to superconductivity and superconducting materials will expand their knowledge and understanding of both low and high Tc superconductors with respect to their application Technology preparation and characterization are covered for bulk single crystals thins fi lms as well as electronic devices wires and tapes The main benefit of this work lies in its broad coverage of significant applications in magnets power engineering electronics sensors and quantum metrology The reader will find information on superconducting magnets for diverse applications like particle physics fusion research medicine and biomagnetism as well as materials processing SQUIDs and their usage in medicine or geophysics are thoroughly covered as are superconducting radiation and particle detectors aspects on superconductor digital electronics leading readers to quantum computing and new devices Characterization of High Tc Materials and Devices by Electron Microscopy Nigel D. Browning,Stephen J. Pennycook,2000-07-06 This is a clear account of the application of electron based microscopies to the study of high Tc superconductors Written by leading experts this compilation provides a comprehensive review of scanning electron microscopy transmission electron microscopy and scanning transmission electron microscopy together with details of each technique and its applications Introductory chapters cover the basics of high resolution transmission electron microscopy including a chapter devoted to specimen preparation techniques and microanalysis by scanning transmission electron microscopy Ensuing chapters examine identification of superconducting compounds imaging of superconducting properties by low temperature scanning electron microscopy imaging of vortices by electron holography and electronic structure determination by electron energy loss spectroscopy The use of scanning tunnelling microscopy for exploring surface morphology growth processes and the mapping of superconducting carrier distributions is discussed Final chapters consider applications of electron microscopy to the analysis of grain boundaries thin films and device structures Detailed references are included Diverse Superconducting Systems and Some Miscellaneous Aspects Anant Narlikar,2001 Studies of High Temperature Superconductors Volume 37 Diverse Superconducting Systems Some Miscellaneous Applications **Advances in Superconductivity VI** Toshizo Fujita,Yuh Shiohara,2012-12-06 More than seven years have passed since the dramatic breakthrough in the critical temperature for superconductors During this period a host of new materials have been discovered and efforts have been stepped up in a variety of domains including device and systems applications commercialization and basic research on the properties of superconductive materials Recent progress in areas such as bulk single crystal production long scale wire and tape produc tion flywheel and bearing applications and electronic device applications for thin films indicate that science and technology have been working hand in hand in this field as has been the case in the research and development of semi conductors This interdisciplinary resonance will be certain to lead to further outstanding advances in the years to come It goes without saying that worldwide information exchange is the key to accelerating progress in superconductivity science and technology As in

previous years the ISS 93 served as a venue where visions of future develop ments were shared in addition to presentations and extensive discussions on the most up to date research results I hope that the Proceedings contained in this volume will be consulted not only as a summary of the current state of the art in high Tc superconductivity but also as a stimulating source of ideas regarding future applications of superconductivity research **Energy Research Abstracts** ,1992

Scientific and Technical Aerospace Reports ,1995 Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database High-temperature Superconductivity (Bhtsc '92) - Proceedings Of The Beijing International Conference Z X Zhao,Z Z Gan,S S Xie,1993-10-13 This volume will contain both invited and contributed papers which focus on the search for new high Tc materials characterization of their physical properties and microstructures basic applications and the application of high Tc superconductors *Oxide Spintronics* Tamalika Banerjee,2019-05-28 Oxide materials have been used in mainstream semiconductor technology for several decades and have served as important components such as gate insulators or capacitors in integrated circuits However in recent decades this material class has emerged in its own right as a potential contender for alternative technologies generally designated as beyond Moore The 2004 discovery by Ohtomo and Hwang was a global trendsetter in this context It involved observing a two dimensional high mobility electron gas at the heterointerface between two insulating oxides LaAlO3 and SrTiO3 supported by the rise of nascent deposition and growth monitoring techniques which was an important direction in materials science research The quest to understand the origin of this unparalleled physical property and to find other emergent properties has been an active field of research in condensed matter that has united researchers with expertise in diverse fields such as thin film growth defect control advanced microscopy semiconductor technology computation magnetism and electricity spintronics nanoscience and nanotechnology **High Tc Superconductors** J. Dumas,H.W. Neumüller,H.F. Braun,V.P. Seminozhenko,Yu.D. Tretyakov,1993-05-05 A wide range of progress in materials development single crystals ceramics thin films wire and tapes is reported in the 169 papers in this volume The main focus of the papers is in attaining a better understanding of the relationship between microstructure and electrical properties Invited papers cover topics such as the effects of substitution and doping multilayers nanostructure characterisation electric field effects in High Tc Superconductors HTS surface stability critical currents flux pinning and magnetooptic imaging of flux patterns effects of irradiation induced defects properties and preparation of materials microwave properties and electronic devices A clearly broadened basis for understanding processes and mechanisms in HTS is portrayed Appreciable progress has been achieved in the reproducible manufacturing of high quality materials supported by very efficient methods in microstructural analysis This essential improvement is reflected in the increased number of practical devices encouraging the use of HTS in applications for electronics and power engineering all of which are reviewed in depth in this work *Physics Briefs* ,1993

Beijing International Conference on High Temperature Superconductivity Z. X. Zhao,G. J. Cui,R. S. Han,1990 http www worldscientific com worldscibooks 10 1142 0957 Superconductivity A. Bisarsh,1999 This book consists of over 600 selected descriptions and abstracts of books book chapters patents and journal articles from throughout the world dealing with this high profile topic Each citation contains complete bibliographic data plus key words The entries are grouped under the headings of Theory of Superconductivity Superconducting Devices Superconducting Properties of Materials Applications of Superconductors Author Index Subject Index **Transdex Index** ,1990 An index to translations issued by the United States Joint Publications Research Service JPRS **Realizing Controllable Quantum States - Proceedings Of The International Symposium On Mesoscopic Superconductivity And Spintronics - In The Light Of Quantum Computation** Junsaku Nitta,Hideaki Takayanagi,2005-08-02 This volume is a collection of papers from the third meeting of the international symposium on mesoscopic superconductivity and spintronics Research on quantum information technology has advanced a great deal since the previous meeting Mesoscopic physics such as spins in nano scale semiconductor structures micro fabricated superconducting junctions and extraordinary metal contacts have now been not only theoretically but also experimentally established as important solid state elements of quantum information devices The book also contains some papers on information theory from the viewpoint of quantum algorithms indicating that further collaboration between physics and computer science promises to produce fruitful results in quantum information technology

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