

Professor Anant Vishnu NARLIKAR (PhD Cantab, ScD Cantab)

Current Positions:

- Senior Scientist and Fellow of Indian National Science Academy, New Delhi, India. UGC-DAE Consortium for Scientific Research, University Campus, Indore, India.
- Visiting Scientist, Applied Superconductivity and Cryoscience Group, Department of Materials Science and Metallurgy, University of Cambridge.

Contact Details:

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Research and Teaching Profile: Superconductors, Nanoscience, Nanotechnology

Professor Anant Vishnu Narlikar (PhD Cantab, ScD Cantab) has been working in Experimental Superconductivity and Superconducting Materials for over 50 years with specific attention to crystal defects and nanostructures. He is the author of over 400 research papers in refereed international journals, and almost 60 edited and authored research books. His Ph.D. thesis on Superconductivity in Niobium and Niobium Alloys (Cambridge University, 1965) was one of the first doctoral theses written on Type-II superconductors in UK. His main research contribution is in the field of structure-properties correlations with particular emphasis on the influence of nano-level defects on physical properties. He has conducted extensive studies of the role of crystal lattice defects at the atomic level in both low T_c and high T_c superconductors with particular emphasis on the effect of various nanoscale cationic disorders in different high T_c cuprate systems. Important new results were obtained on the competition between superconductivity and localization, the interlayer coupling effects and dimensionality crossover in doped cuprate systems.

Narlikar established the first research group dealing with Superconductivity in India in 1973 at the National Physical Laboratory. He has also been a pioneer in the field of nanoscience and nanotechnology, and was the first scientist in India to use scanning tunneling microscopy to study nanostructures from 1989 onwards. For the last over 20 years Narlikar has worked extensively with SPM (STM/STS/AFM) technique for nanostructure investigation of high T_c superconductors, magnetic materials, fullerene based compounds as well as various borocarbides and magnesium diboride. He has taught courses in Materials Science and Condensed Matter Physics at the post-graduate level and continues to supervise doctoral students. His research serves as a focal point, and over 1500 scientists from more than 40 countries have come together under his leadership to contribute to his edited books. The resulting scholarship is extensive, coherent and cutting-edge, and covers theoretical, experimental and applied aspects of the field.

Narlikar's current research focuses on structure-properties correlations in magnesium diboride, magneto-superconductors, and more recently discovered iron-based

superconductors. He continues to have active research interaction with his former colleagues and friends working in the field of superconductors at the Department of Materials Science and the Cavendish Laboratory at Cambridge. He is currently completing his single-authored book, *Superconductors*, which is under contract with Oxford University Press and due to be published in end 2013.

Academic Qualifications

1993: Sc.D. (Advanced Doctoral Degree), *Superconductivity*, University of Cambridge.

1965: Ph.D., *Superconductivity*, University of Cambridge, 1965

1960: M.Sc. Physics, Banaras Hindu University, Varanasi, India, 1960

Previous Positions:

1995-2000: Director Grade Scientist and Head, Superconductivity Division, National Physical Laboratory, New Delhi, India.

1973-1995: Scientist, Grades G, F, EII, EI at the National Physical Laboratory, New Delhi, India.

1972-1973: Reader, School of Physics, Tata Institute of Fundamental Research, Mumbai, India.

1969-1972: Professor and Head of Department, Physics Department, Shivaji University, Kolhapur, India

June-December 1968: Senior Research Associate, Institute of Physics, University of Geneva, Geneva, Switzerland

1965-68: Research Associate, Physics Department, University of Lancaster, UK

Academy Membership

Fellow of the Indian National Science Academy (**FNA**)

Fellow of the Indian Academy of Sciences (**FASc**)

Fellow of the National Academy of Sciences, India (**FNASc**)

Full Fellow of the International Academy of Electro Technical Sciences, Moscow, Russia

Member of the Asia Pacific Academy of Materials, Singapore

Founder Fellow, Indian Cryogenics Council, India

Formerly Fellow of the Institute of Physics, UK, and Fellow of the Institution of Metallurgists, UK.

INTERNATIONAL VISITING POSITIONS

March 2013 – to date: Visiting Scientist, Applied Superconductivity and Cryoscience Group, Department of Materials Science and Metallurgy, University of Cambridge.

April 2009 - June 2009: Wihuri Visiting Professor, Physics Department, University of

Turku, Finland.

November 2006 - February, 2007: Wihuri Visiting Professor, Physics Department, University of Turku, Finland.

April 2005 - June 2005: Visiting Professor, Physics Department, University of Turku, Finland.

September 2003 - December 2003: Lady Davis Visiting Professor of Physics, Racah Institute of Physics, Hebrew University, Jerusalem, Israel.

May 2002 - July 2002: Visiting Professor, Department of Physics, Peking University, Beijing, People's Republic of China.

September 2001 - January 2002: Senior Visiting Fellow, Peterhouse, University of Cambridge; Science and Engineering Research Council (UK) Senior Visiting Fellow at the Interdisciplinary Research Centre in Superconductivity, University of Cambridge, UK.

August 2000 - August 2001: FAPESP Senior Visiting Fellow, Departamento de Fisica, Universidade Federal de Sao Carlos, 13565-905 Sao Carlos, BRAZIL

May 1998 - August 1998: Max Planck Society Fellow, Max Planck Institute for Solid State Research, Stuttgart, Germany.

July 1997 (3 weeks): Indian National Science Academy-French Academy of Sciences Exchange Fellow, Institute of Low Temperature Physics, Grenoble, France.

July 1992 - August 1992: Indian National Science Academy-Royal Society Exchange Fellow; visited University of Cambridge, University of Oxford, Royal Holloway, University of Lancaster, UK

July 1991 (3 weeks): Exchange Program between NPL and Standards' Institute Braunschweig, Max Planck Institute, University of Stuttgart; Standards' Institute, Braunschweig; Standards' Institute, Berlin.

August 1986 (3 weeks): Indian National Science Academy-Soviet Academy of Sciences Exchange Fellow, Institute of Physical Problems, Moscow.

October 1983 - March 1984: Science and Engineering Research Council (SERC) Senior Visiting Fellow, University of Cambridge, UK.

October 1982 (3 weeks): Chinese Academy of Sciences Visiting Fellow, Institute of Physics, Beijing; Institute of Cryogenics, Beijing, People's Republic of China.

June 1981 - August 1981: Visiting Scientist, University of Karlsruhe, Germany.

June 1980 - August 1980: Visiting Scientist, Nuclear Science Centre, Karlsruhe, Germany.

June 1979 - July 1979: Senior Visiting Fellow, ETH Zurich, Switzerland

June 1978 - August 1978: INSA-Royal Society Visiting Fellow, University of Cambridge

PUBLICATIONS:

See list of select publications on website.

- Over 400 research papers in refereed international journals
- Two single-authored books
- Almost 60 specialized edited volumes on Superconductivity published in the UK, USA and Germany

Awards / Honours Held:

- FIE Foundation Award for Science & Technology, 2000
- Homi Jehangir Bhabha Medal 1996 (Indian National Science Academy)
- A.N. Khosla Gold Medal and National Award, University of Rorkee, 1994
- MRSI (India) Superconductivity Award, 1990
- Chatterjee Gold Medal, 1977 of Indian Cryogenics Council
- Tait Memorial Prize for Physics, 1963, Peterhouse, Cambridge University, UK
- Peterhouse Research Studentship (1961-64) and Central Electricity Generating Board, UK maintenance grant (1964-65)
- Holkar Research Fellowship (BHU) 1961-1963

Miscellaneous:

Have served on the selection panels and other committees of several important organizations including Indian National Science Academy, Council of Scientific and Industrial Research, University Grants Commission, Department of Science and Technology, Inter-University Consortium-Department of Atomic Energy, All India Council for Technical Education, Ministry of Human Resource Development, Nehru Trust for Cambridge University, Nuclear Science Centre-New Delhi, and several leading universities and institutes.

Journal Referee: Physical Rev B; Superconductor Science and Technology; Bulletin of Materials Science; Journal of Materials Science; Solid State Communications; Materials Research Bulletin; Cryogenics; Journal of Low Temperature Physics; Modern Physics Letters; Physica B; Physica C; Materials Letters; Indian Journal of Pure and Applied Physics; Indian Journal of Cryogenics; Pramana; Philosophical Magazine etc.

Referee for Academic Promotions Exercises in International Institutions: University of Cambridge (UK), University of Hong Kong (Hong Kong), University of Witwatersand (Johannesberg), National Physical Laboratory (Delhi); Tata Institute of Fundamental Research (Mumbai), Indian Institute of Technology (Kharagpur, Chennai, and Delhi), Central Electronic and Engineering Research Institute (Pilani), Publications and Information Directorate (Delhi); University of Rajasthan (Jaipur); and formerly Chancellor's Nominee for academic promotions at Shivaji University (India).