

# MOHIT RANDERIA

## Education

1987 Ph.D., Physics, Cornell University  
1982 M.S., Physics, California Institute of Technology  
1980 B.Tech., Electrical Engineering, IIT, Delhi, India

## Employment

2004 - Professor, Department of Physics, The Ohio State University  
2002-2003 George A. Miller Visiting Professor, Physics and MRL,  
University of Illinois at Urbana-Champaign  
1995-2004 Reader, Associate Professor & Professor, Theoretical Physics,  
Tata Institute of Fundamental Research, Bombay, India  
1991-1995 Assistant Scientist and Scientist, Materials Science Division,  
Argonne National Laboratory  
1989-1991 Assistant Professor of Physics, SUNY at Stony Brook  
1987-1989 Post-Doctoral Fellow, Univ. of Illinois at Urbana-Champaign  
1987 Post-Doctoral Fellow, Cornell University

## Honors

2008 Fellow of the American Physics Society  
2007 Distinguished Alumni Award, Indian Institute of Technology, New Delhi  
2002 ICTP Prize, International Center for Theoretical Physics, Trieste  
2002 S. S. Bhatnagar Award in Physical Sciences, India  
1998-2003 Swarnajayanti Fellowship, India

## Areas of Active Research: Theoretical Condensed Matter Physics

- Strong Correlations in Solids and Cold Atoms
- High Temperature Superconductivity
- Ultracold atomic gases: BCS-BEC Crossover; Optical Lattices
- Angle-Resolved Photoelectron Spectroscopy
- Magnetism, Disorder and Nanoscale Inhomogeneity in Oxides

## Ten Significant Publications

- 1) “*Competition between Antiferromagnetic and Superconducting States, Electron Hole Doping Asymmetry, and Fermi Surface Topology in High Temperature Superconductors*”, S. Pathak, V. B. Shenoy, M. Randeria, and N. Trivedi, *Phys. Rev. Lett.* **102**, 027002 (2009).
- 2) “*Strong correlations lead to protected low energy excitations in disordered d wave superconductors*”, A. Garg, M. Randeria, and N. Trivedi, *Nature Phys.* **4**, 762 (2008).
- 3) “*Quantum Fluctuations in the Superfluid State of the BCS-BEC Crossover*”, R. B. Diener, R. Sensarma, and M. Randeria; *Phys Rev A* **77**, 023626 (2008).
- 4) “*Quantum critical behavior in the superfluid density of strongly underdoped ultrathin cuprate films*”, I. Hetel, T. R. Lemberger, and M. Randeria, *Nature Phys.* **3**, 700 (2007).

- 5) “From Fermi Arcs to the Nodal Metal: Scaling of the Pseudogap with Doping and Temperature”, A. Kanigel, M. R. Norman, M. Randeria, *et al.*, *Nature Phys.* **2**, 447 (2006).
- 6) “Can Correlations Drive a Band Insulator Metallic?”, A. Garg, H. R. Krishnamurthy, and M. Randeria, *Phys. Rev. Lett.* **97**, 046403 (2006).
- 7) “Vortices in Superfluid Fermi Gases through the BEC to BCS Crossover”, R. Sensarma, M. Randeria, and T.-L. Ho, *Phys. Rev. Lett.* **96**, 090403 (2006).
- 8) “Particle-Hole Asymmetry in Doped Mott Insulators: Implications for Tunneling and Photoemission Spectroscopies”, M. Randeria, R. Sensarma, N. Trivedi, and F.C. Zhang, *Phys. Rev. Lett.* **95**, 137001 (2005).
- 9) “The Physics Behind High-Temperature Superconducting Cuprates: The ‘Plain Vanilla’ Version Of RVB”, P. W. Anderson, P. A. Lee, M. Randeria, T. M. Rice, N. Trivedi, and F. C. Zhang; *J. Phys. Cond. Mat.* **16** R755R769 (2004).
- 10) “Photoemission in the High  $T_c$  Superconductors”, J. C. Campuzano, M. R. Norman and M. Randeria; in *Physics of Superconductors*, Vol. II, ed. K. H. Bennemann and J. B. Ketterson (Springer, Berlin, 2004), p. 167-273; [cond-mat/0209476].

### **Synergistic Activities:**

- Co-organizer, International Conference on “Recent Progress in Many-Body Theories” (2009); Co-organizer, Aspen Workshop on “Correlated Quantum Matter” (Summer 2005); Member, Theory panel, “Basic Research Needs for Superconductivity”, DOE, (2006).
- Member of Program/Advisory Committees for International Conf. on Low Temp. Physics LT 24 (2005), Materials and Mechanisms of Superconductivity M2S, Dresden (2006); Spectroscopies of Novel Superconductors SNS 2007, Sendai, Materials and Mechanisms of Superconductivity M2S, Tokyo (2009).
- Invited talks at International Conferences in 2004 - 2009: KITP, Santa Barbara (2004,2009); Gordon Conference, Oxford (2004); Princeton Materials Institute (2004); ITS, Notre Dame (2005); Max Plank Institute, Dresden (2005); LT 24, Orlando (2005); ICTP, Trieste (2005,2008); MaNEP Conference, Switzerland (2005); Nordita, Copenhagen (2006); IISc. Bangalore (2006); Brasilia Winter School (2006); Rutgers Mathematical Physics Conference (2006); IHP, Paris (2007); Ambegaokar Symposium, Cornell (2007); Landau Institute, Moscow (2007); SNS2007, Sendai (2007); TIFR Goa Winter School (2007); ICAM Conference on “Conductor-Insulator Transitions” (2008); APS March Meeting (2008); TIFR Mahabaleshwar Winter School (2008); Recent Prog. Many-Body Theories (2009).

### **Ph.D. and Postdoctoral Advisors:**

Ph.D. Advisor: James P. Sethna, Cornell (1984-1986)

Post-doc Advisor: Anthony J. Leggett, Urbana-Champaign (1987-1989)

**Recent Ph.D. Students and Post-docs:** Arun Paramekanti (Asst. Professor, Toronto); Arti Garg (Post-doc, Technion & UC Santa Cruz); Rajdeep Sensarma (Post-doc, Harvard & Maryland); Roberto Diener (Booz Allen Hamilton).

**Current Graduate Students:** William Schneider, Onur Erten and Onam Ngamba Meetei (jointly with N. Trivedi)

**Current Post-doctoral Fellow:** Edward Taylor (jointly with T. L. Ho)