P. Chris Hammel

Department of Physics
The Ohio State University

191 West Woodruff Avenue
Columbus, Ohio 43210-1117

Phone: 614 247-6928
Fax: 292-7557

e-mail: hammel@mps.ohio-state.edu

Education

- B.A. in Physics, University of California, San Diego, Magna Cum Laude 1977.
- Ph.D. in Physics, Cornell University 1984,
  Thesis topic: "Magnetic Coupling Across the Liquid ^{3}He–Substrate Interface,"
  Advisor: Prof. R.C. Richardson.

Employment and Appointments

- **Professor** of Physics and **Ohio Eminent Scholar**, The Ohio State University, July 2002 to present
- **Professor** of Electrical and Computer Engineering
- **Director**, Center for Emergent Materials (CEM), a National Science Foundation funded Materials Research Science and Engineering Center (MRSEC)
- **Director**, Center for Electronic and Magnetic Nanoscale Complex Multifunctional Materials (ENCOMM) 2005–2011
- **Fellow**, Los Alamos National Laboratory, July 2000 to August 2004
- **Staff Member**, Condensed Matter and Thermal Physics Group, Los Alamos National Laboratory, October 1989 to June 2002
- **Visiting Associate in Physics**, California Institute of Technology, 1996–2000
- **Oppenheimer Fellow**, Los Alamos National Laboratory, October 1986 to October 1989.
- **Postdoctoral Fellow**, MIT with Prof. John S. Waugh, January 1984 to October 1986.
- **Research Assistant**, Cornell University, Ithaca, NY, June 1979-January 1984.

Research Interests

- Magnetic resonance force microscopy
- Spin Electronics and Quantum Information with Spins
- Ferromagnetic Resonance Imaging
- NMR studies of highly correlated electronic materials
- Ultra-low temperature magnetic resonance

Invited Talks (over 100)

- 6 at Gordon Research Conferences
- 10 at meetings of the American Physical Society
- 27 at International Conferences and Workshops.

Awards and Honors

- Oppenheimer Fellow, Los Alamos National Laboratory, October 1986
- Los Alamos National Laboratory Fellows Prize, February 1995.
- Fellow, The American Physical Society, 1998.
- Fellow, Los Alamos National Laboratory, July 2000
- Fellow, The American Association for the Advancement of Science, elected 2005

Professional Activities

- Director, Center for Electronic and Magnetic Nanoscale Composite Multifunctional Materials (ENCOMM)
- Co-leader, IRG-1 of our NSF funded Materials Research Science and Engineering Center (MRSEC) *Towards Heterogeneous Spin-Preserving Networks* 2008-2011
- Co-chair, *International Workshop on Novel Magnetic Materials,* Leibniz Institute for Solid State and Materials Research, 23–25 August 2010, Dresden, Germany
- Co-organizer, *International Conference on Experimental Implementation of Quantum Computation*, January 16–19, 2001, Sydney, Australia
- Co-organizer, *Workshop: Scanned Probe Microscopy in Biology, Chemistry and Physics,* December 9–12, 2001 Santa Fe, NM.
- Meeting Chair, DOE BES Electron and Scanning Probe Microscopies Contractors Meeting, October 26–29, 2008
- Member, External Review Committee, Materials Chemistry Division, Lawrence Berkeley National Laboratory, Berkeley CA, 15–18 January 2008
- Member, External Review Committee, Materials Division, Argonne National Laboratory, Argonne, IL, 14–16 May 2008
- Invited panelist, Scientific Review of Stanford's *Center for Probing the Nanoscale,* 16–19 September, 2009
- Member, American Physical Society (1979-present)
- Member, Penn State University MRSEC Advisory Board
- Member, Executive Committee of the *Instrumentation and Measurement Sciences Topical Group* of the American Physical Society (2001-2005)
- Member, American Association for the Advancement of Science (2002-present)

Selected Publications

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Four publications with more than 100 citations, one with more than 500

- "Nanoscale scanning probe ferromagnetic resonance imaging using localized modes," Inhee Lee, Yuri Obukhov, Gang Xiang, Adam Hauser, Fengyuan Yang, Palash Banerjee, Denis V. Pelekhov & P. Chris Hammel, *Nature* **466** 845-848 (12 August 2010) doi:10.1038/nature09279
- "A strong ferroelectric ferromagnet created by means of spinlattice coupling," June Hyuk Lee, et al, *Nature* **466** 954-958 (19 August 2010) doi:10.1038/nature09331
- "Nanoscale MRI," P. Chris Hammel, *Nature* **458**, 844 (2009).
- "Local Ferromagnetic Resonance Imaging with Magnetic Resonance Force Microscopy," Yu. Obukhov, D.V. Pelekhov, J. Kim, P. Banerjee, I. Martin, E. Nazaretski, R. Movshovich, S. An, T.J. Gramila, S. Batra and P.C. Hammel, *Phys. Rev. Lett.,* **100** 197601 (2008)
- "The Magnetic Resonance Force Microscope," P.C. Hammel and D.V. Pelekhov, **Book Chapter,** *Handbook of Magnetism and Advanced Magnetic Materials*, Helmut Kronmüller and Stuart Parkin, eds., Volume 5: Spintronics and Magnetoelectronics, John Wiley & Sons, Ltd. ISBN: 978-0-470-02217-7
- "Seeing Single Spins," P.C. Hammel, *Nature* **430**, 300 (2004).
- "Theory of spin relaxation in magnetic resonance force microscopy," D. Mozyrsky, I. Martin, D. Pelekhov and P. C. Hammel, *Appl. Phys. Lett.* **82**, 1278 (2003).
- "Probe-Sample Coupling in the Magnetic Resonance Force Microscope," A. Suter, D.V. Pelekhov, M.L. Roukes and P.C. Hammel, *Journal of Magnetic Resonance* **154**, 210 (2002).
- "Inhomogeneous Low Frequency Spin Dynamics in $La_{1.65}Eu_{0.2}Sr_{0.15}CuO_4$," N.J. Curro, P.C. Hammel, B.J. Suh, M. Hücker, B. Büchner, U. Ammerahl, and A. Revcolevschi, *Phys. Rev. Lett.* **85**, 642 (2000).
- "Observation of Ferromagnetic Resonance in a Microscopic Sample Using Magnetic Resonance Force Microscopy," Z. Zhang, P.E. Wigen and P.C. Hammel, *Appl. Phys. Lett.* **68**, 2005 (1996).