P. Chris Hammel

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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** and **Ohio Eminent Scholar**, The Ohio State University, June 2002 to present
- **Director**, Center for Emergent Materials (CEM), a National Science Foundation funded Materials Research Science and Engineering Center (MRSEC)
- **Fellow**, Los Alamos National Laboratory, July 2000 to present
- **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, Pasadena, CA, 1996–2000
- **J. Robert 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**, Laboratory of Atomic and Solid State Physics, Cornell University, Ithaca, NY, June 1979–January 1984

Research Interests

- Nanoscale spin dynamics and microwave magnetics
- Magnetic resonance force microscopy
- Optically detected magnetic resonance
- Biomagnetism

Awards and Honors

- Oppenheimer Fellow, Los Alamos National Laboratory, October 1986
- Fellow, Los Alamos National Laboratory, July 2000
- Los Alamos National Laboratory Fellows Prize, February 1995
- Fellow, The American Physical Society, 1998
- Fellow, The American Association for the Advancement of Science, 2006
- Recipient, College of Engineering *Building Bridges* Award, 2016

Professional Activities

- Founding Director, Center for Exploration of Novel Complex Materials (ENCOMM) 2005–2011
- Member, Electorate Nominating Committee of the Physics Section of the American Association for the Advancement of Science, 2016-2019
- Member-At-Large, Executive Committee of The American Physical Society Topical Group on Magnetism and its Applications, 2010–2015
- Member, Executive Committee of the *Instrumentation and Measurement Sciences Topical Group* of the American Physical Society (2001-2005)
- Invited Panelist, Review Panel for DOE Energy Frontier Research Centers (EFRC), 19-20 January 2016, Bethesda, MD
- Invited Panelist, DOE BES workshop on Basic Research Needs (BRN) for Quantum Materials for Energy Relevant Technology, 8-10 February 2016, Gaithersburg MD
- Member, External Review Committee for E3S Science and Technology Center, 12–14 January 2015 and 8–10 January 2013, Berkeley, CA
- Member, External Review Committee for US DOE, Office of Basic Energy Sciences (BES) Materials Chemistry Research Program at the Lawrence Berkeley National Laboratory (LBNL) 13–16 January 2014 and 15–18 January 2008, Berkeley, CA
- Member, American Physical Society (1979-present)
- Member, American Association for the Advancement of Science (2002-present)
- 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
- Member, Quantum Information Science and Technology Expert Panel, tasked with developing a national quantum information roadmap (2000-2002)
- Member, International Advisory Committee, Australian Research Council Special Research Centre for Quantum Computer Technology (2000-2002)

Selected Publications

Average citation rate for ten most-cited papers: $>$ 242 citations/paper
$>$ 5400 citations, ISI h-index: 37 (Google Scholar: 43)
ORCID-ID: orcid.org/0000-0002-4138-4798

1. "Spin dynamics at oxygen sites in $YBa_2Cu_3O_7$," P.C. Hammel, M. Takigawa, R.H. Heffner, Z. Fisk and K.C. Ott, *Phys. Rev. Lett.* **63**, 1992 (1989).

2. "Cu and O NMR Studies of the Magnetic Properties of $YBa_2Cu_3O_{6.63}$ (T_c = 62 K)," M. Takigawa, A.P. Reyes, P.C. Hammel, J.D. Thompson, R.H. Heffner, Z. Fisk, K.C. Ott, *Phys. Rev.* B **43**, 247 (1991).

3. "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).

4. "Superconductivity and magnetism in a new class of heavy-fermion materials," J.D. Thompson, R. Movshovich, Z. Fisk, F. Bouquet, N.J. Curro, R.A. Fisher, P.C. Hammel, H. Hegger, M.F. Hundley, M. Jaime, P.G. Pagliuso, C. Petrovic, N.E. Phillips and J.L. Sarrao, *J. Magn. Magn. Mat.* **226**, 5 (2001).

5. "Solid-state nuclear-spin quantum computer based on magnetic resonance force microscopy," G.P. Berman, G.D. Doolen, P.C. Hammel, and V.I. Tsifrinovich, *Phys. Rev. B* **61**, 14694 (2000)

6. "Magnetic-resonance force microscopy measurement of entangled spin states," G. P. Berman, F. Borgonovi, G. Chapline, P. C. Hammel, and V. I. Tsifrinovich, *Physical Review A* **66**, 32106 (2002).

7. "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).

8. "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

9. "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)

10. "Probing the Spin Pumping Mechanism: Exchange Coupling with Exponential Decay in $Y_3Fe_5O_{12}$/Barrier/Pt Heterostructures," C. H. Du, H. L. Wang, Y. Pu, T. L. Meyer, P. M. Woodward, F.Y. Yang, and P. C. Hammel, *Physical Review Letters* **111** 247202 (2013)
DOI: 10.1103/PhysRevLett.111.247202

11. "Scaling of spin Hall angle in 3d, 4d and 5d metals from $Y_3Fe_5O_{12}$/metal spin pumping," H. L. Wang, C. H. Du, Y. Pu, R. Adur, P. C. Hammel and F. Y. Yang *Physical Review Letters* **112** 197201 (2014)

12. "Off-resonant manipulation of spins in diamond via precessing magnetization of a proximal ferromagnet," C. S. Wolfe, V. P. Bhallamudi, H. L. Wang, C. H. Du, S. Manuilov, R. M. Teeling-Smith, A. J. Berger, R. Adur, F. Y. Yang and P. C. Hammel, *Physical Review B Rapid Communication* **89** 180406 (2014) (Editor's Suggestion and Physics Highlight) DOI: 10.1103/PhysRevB.89.180406

13. "Antiferromagnonic Spin Transport from $Y_3Fe_5O_{12}$ into NiO," Hailong Wang, Chunhui Du, P. Chris Hammel and Fengyuan Yang, *Physical Review Letters* **113** 097202 (2014)

14. "Damping of Confined Modes in a Ferromagnetic Thin Insulating Film: Angular Momentum Transfer Across a Nanoscale Field-defined Interface," Rohan Adur, Chunhui Du, Hailong Wang, Sergei A. Manuilov, Vidya P. Bhallamudi, Chi Zhang, Denis V. Pelekhov, Fengyuan Yang and P. Chris Hammel, *Physical Review Letters*, **113** 176601 (2014)

15. "Systematic variation of spin-orbit coupling with d-orbital filling: Large inverse spin Hall effect in 3d transition metals," Chunhui Du, Hailong Wang, Fengyuan Yang, and P. Chris Hammel, *Physical Review B,* **90**, 140407R (2014)

16. "Spin transport in antiferromagnetic insulators mediated by magnetic correlations," Hailong Wang, Chunhui Du, P. Chris Hammel and Fengyuan Yang, *Physical Review B* **91** 220410 (2015)

17. "Electron Paramagnetic Resonance of a Single NV Nanodiamond Attached to an Individual Biomolecule," Richelle M. Teeling-Smith, Young Woo Jung, Nicolas Scozzaro, Jeremy Cardellino, Isaac Rampersaud, Justin A. North, Marek Šimon, Vidya P. Bhallamudi, Arfaan Rampersaud, Ezekiel Johnston-Halperin, Michael G. Poirier and P. Chris Hammel, *Biophysical Journal* **110** 2044–2052, (2016)

18. "FMR-driven spin pumping in $Y_3Fe_5O_{12}$-based structures," Fengyuan Yang and P. Chris Hammel, *Journal Of Physics D-Applied Physics,* **51** 253001 (2018)