

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 ^3He -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
- 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-At-Large, Executive Committee of The American Physical Society Topical Group on Magnetism and its Applications, 2010–2015
- 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 Visiting Committee, Cornell Center for Materials Research, an NSF MRSEC, 1–2 May 2013, Ithaca, NY
- Member, DOE Committee of Visitors Review of the Materials Sciences and Engineering Division May 22–24, 2012, DOE Germantown Complex
- External reviewer for the Department of Physics at Kent State University
- Member, Program Committee, 2011 Magnetism and Magnetic Materials International Conference
- Member, American Physical Society (1979-present)
- Member, Penn State University MRSEC Visiting Committee
- Member, Executive Committee of the *Instrumentation and Measurement Sciences Topical Group* of the American Physical Society (2001-2005)
- Co-chair, *International Workshop on Novel Magnetic Materials*, Leibniz Institute for Solid State and Materials Research, 23–25 August 2010, Dresden, Germany
- Member, American Association for the Advancement of Science (2002-present)
- Proposal referee and panelist, National Science Foundation,
- Proposal referee, Department of Energy, The Research Foundation and the Petroleum Research Foundation
- Manuscript referee, *Physical Review Letters*, *Science*, *Nature*, *Physical Review B*, *Applied Physics Letters*, *Journal of Applied Physics* and *Physica C*
- Chairman, DOE BES Electron and Scanning Probe Microscopies Contractors Meeting, October 26–29, 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

- Co-organizer, *International Conference on Experimental Implementation of Quantum Computation*, January 16–19, 2001, Sydney, Australia
- Co-organizer of workshop on *Scanned Probe Microscopy in Biology, Chemistry and Physics*, December 9–12, 2001 Santa Fe, NM.
- 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)
- Member, Los Alamos National Laboratory Postdoctoral Committee (2000-2002)
- Leader, Complex Functional Nanomaterials Thrust of the LANL/Sandia Center for Integrated Nanomaterials (2001-2002)

Invited Talks

American Physical Society

1. “ ^{17}O NMR in $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$,” presented at the March Meeting of the American Physical Society, Anaheim, California, March 16–20, 1990.
2. “NMR Studies of $\text{La}_2\text{CuO}_{4+\delta}$,” presented at the March meeting of the American Physical Society, Seattle, Washington, March 22–26, 1993.
3. “NMR/NQR Studies of Oxygen Doped La_2CuO_4 : Inhomogeneous Structure and Hole Localization,” presented at the March meeting of the American Physical Society, St. Louis, Missouri, March 18–22, 1996.
4. “Ferromagnetic Resonance in Microscopic Magnets Using Magnetic Resonance Force Microscopy,” presented by Z. Zhang at the March meeting of the American Physical Society, Kansas City, Missouri, March 17–21, 1997.
5. “Magnetism of Charge-Stripe Ordered 2D Transition Metal Oxides,” presented at the March meeting of the American Physical Society, Atlanta, GA, March 21–26, 1999.
6. “Magnetic Resonance Readout in the Silicon-Based Nuclear Spin Quantum Computer,” presented at the March meeting of the American Physical Society, Minneapolis, MN, March 20–24, 2000.
7. “Scanning MRFM of Microscopic Ferromagnets” presented at the March meeting of the American Physical Society, Indianapolis, IN, March 18–22, 2002.
8. “Force-Detected Scanned Probe Magnetic Resonance Microscopy,” presented at the March meeting of the American Physical Society, Montreal, Canada, March 26, 2004
9. “Ferromagnetic Resonance Imaging with Magnetic Resonance Force Microscopy,” presented by Denis Pelekhov at the March Meeting of the American Physical Society, March 2009
10. “Nanoscale scanning probe ferromagnetic resonance imaging using localized modes,” presented at the March Meeting of the American Physical Society, Dallas TX, March 2011
11. “Spatially-resolved measurement of spin transport across nanoscale interfaces,” presented by Rohan Adur at the March Meeting of the American Physical Society, San Antonio TX, March 2015
12. “Spin Transport via Collective Spin Excitations,” presented at the March Meeting of the American Physical Society, Baltimore MD, March 2016

Gordon Research Conferences

1. “Anisotropic Knight Shifts and Relaxation Rates in $\text{YBa}_2\text{Cu}_3\text{O}_7$,” presented at the *Gordon Research Conference on Magnetic Resonance*, Plymouth NH, June 19–23, 1989.
2. “Phase Separation, Structure and Superconductivity in Oxygen-Annealed $\text{La}_2\text{CuO}_{4+\delta}$,” presented at the *Gordon Research Conference on Superconductivity*, Oxnard, CA, January 4–8, 1993.
3. “Localized Holes in Superconducting Lanthanum Cuprate,” presented at the *Gordon Research Conference on Superconductivity*, Ventura, CA, January 12–17, 1997.
4. “Glassy Spin Freezing in Lanthanum Cuprate” presented at the *Gordon Research Conference on Superconductivity*, Oxford, England, 9–14 September 2001.

5. "Scanned Probe Ferromagnetic Resonance Studies of Microscopic Ferromagnets," presented at the *Gordon Research Conference on Magnetic Nanostructures*, May 12–17, 2002 in Il Ciocco, Italy.
6. "Nanoscale scanning probe ferromagnetic resonance imaging using localized modes," *Gordon Research Conference on Magnetic Nanostructures*, Bates College, ME, 8–13 August 2010.
7. "Scanned Probe Ferromagnetic Resonance Imaging," *Gordon Research Conference on Magnetic Resonance*, 15 June 2011, University of New England, Biddeford, ME.

International Conferences and Workshops

1. "Incommensurate Spin Fluctuations and Oxygen Doping in Super-Oxygenated $\text{La}_2\text{CuO}_{4+\delta}$," presented at the *Distinguished Visitors Workshop on Spin Effects in High Temperature Superconductors*, University of Illinois at Urbana-Champaign April 2–4, 1992.
2. "Magnetism, Phase Separation, Local Structure and Superconductivity in Super-Oxygenated $\text{La}_2\text{CuO}_{4+\delta}$," presented at the *International School of Solid State Physics Workshop: Aspects of Phase Separation in Cuprate Superconductors*, May 6–13, 1992, Erice, Sicily.
3. "NMR Study of Local Structural Inhomogeneity in Metallic $\text{La}_2\text{CuO}_{4+\delta}$," presented at the *International Conference on Strongly Correlated Electron Systems*, August 16–19, 1993, La Jolla, California.
4. "NMR Study of Local Structural Inhomogeneity in Metallic $\text{La}_2\text{CuO}_{4+\delta}$," presented at the *Second International Workshop on Phase Separation in Cuprate Superconductors*, September 5–10, 1993 in Cottbus, Germany.
5. "Local Structure in Oxygen-Doped $\text{La}_2\text{CuO}_{4+\delta}$ " presented at the *International Workshop on Anharmonic Properties of High- T_c Cuprates*, Bled, Slovenia, September 1–6, 1994.
6. "Sub-surface Imaging with the Magnetic Resonance Force Microscope" presented at the *Symposium on Quantum Fluids & Solids-95*, Cornell University, June 12–17, 1995.
7. "NMR Studies of the Cuprates: Localization of Doped Holes in Metallic $\text{La}_2\text{CuO}_{4+\delta}$ and An Examination of the Oxygen Relaxation Rate in $\text{YBa}_2\text{Cu}_3\text{O}_7$," presented at the *Third International Workshop on Phase Separation, Electronic Inhomogeneities and Related Mechanisms for High- T_c Superconductors*, Erice, Italy, July 9–15, 1995.
8. "The Magnetic Resonance Force Microscope: Recent Experiments" presented at the *Southeast Magnetic Resonance Conference*, Tallahassee, FL, December 1, 1995.
9. "Localized Holes in Superconducting Lanthanum Cuprate," presented at the *International Conference on Stripes, Lattice Instabilities and High T_c Superconductivity*, Rome, Italy, December 8–12, 1996.
10. "Microscopic Characterization of Magnetic Materials Using Magnetic Resonance Force Microscopy," presented at the *NATO Advanced Study Institute: Frontiers in Magnetism of Reduced Dimension Systems*, Crimea, Ukraine, May 25–June 3, 1997.
11. "Charge Inhomogeneity in Lanthanum Cuprate and Lanthanum Nickelate," presented at the *Workshop on Spin-Charge-Lattice Coupling in Complex Electronic Materials*, Los Alamos, NM, August 12–14, 1997.
12. "Microscopic Characterization of Magnetic Materials Using Magnetic Resonance Force Microscopy," presented at the *4th International Conference on Magnetic Resonance Microscopy and Macroscopy*, Albuquerque, NM, September 21–25, 1997.

13. "Microscopic Characterization of Layered Magnetic Materials Using Magnetic Resonance Force Microscopy," presented at the *25th Conference on the Physics and Chemistry of Semiconductor Interfaces*, Salt Lake City, Utah, 18–22 January 1998.
14. "Charge Inhomogeneity in Transition Metal Oxides," presented at the *Second International Conference on Stripes and High T_c Superconductivity*, Rome, Italy, 2-6 June 1998.
15. "Microscopic Characterization of Magnetic Materials Using Magnetic Resonance Force Microscopy," presented at the *3rd International Symposium on Metallic Multilayers*, Vancouver, British Columbia, Canada, 14–19 June 1998.
16. "Magnetism of Charge-Striped 2D Transition Metal Oxides" presented at the *Colloquium on Magnetic Resonance in High- T_c Superconductors*, Engelberg, Switzerland, 17–21 January 1999.
17. "High Resolution Scanned Probe Magnetic Resonance Microscopy," plenary talk presented at the Swiss-US workshop on *Tools and Simulations in Nanotechnology*, Zürich, Switzerland, 20–21 September 1999.
18. "Inhomogeneous Low Frequency Spin Dynamics in $\text{La}_{1.8-x}\text{Eu}_{0.2}\text{Sr}_x\text{CuO}_4$ " presented at the Symposium on *Itinerant and Localized States in HTSC* in Klosters, Switzerland, 6–10 April, 2000.
19. "Glassy Spin Freezing in Lanthanum Cuprate," presented at the *Workshop on High Temperature Superconductivity*, Institute for Theoretical Physics, University of California, Santa Barbara, CA, August 14–18, 2000.
20. "Glassy Spin Freezing and Stripe Order in Lanthanum Cuprate," presented at *Stripes 2000* in Rome, Italy, 25–30 September 2000.
21. "The Magnetic Resonance Force Microscope: Readout for a Silicon-Based Nuclear-Spin Quantum Computer," presented at the International Conference on Experimental Implementation of Quantum Computation, Sydney Australia, 16–19 January, 2001.
22. "Glassy Spin Freezing in Lanthanum Cuprate," presented at the *Aspen Winter Physics Conference*, Aspen, CO, January 21–27, 2001.
23. "Probing Materials with Magnetic Resonance," presented at the *The Future of Materials Physics* Workshop in honor of Zachary Fisk, August 13-15, 2001, Los Alamos, NM
24. "Force-Detected Scanned Probe Magnetic Resonance Microscopy," presented at the Physical Phenomena at High Magnetic Fields-IV Conference, Santa Fe, New Mexico, October 19–25, 2001
25. "Force Detected Scanned Probe Magnetic Resonance: The Magnetic Resonance Force Microscope," presented at *Physical Properties of Amyloid Diseases Workshop*, the University of California, San Francisco, CA November 29–December 1, 2001
26. "The Silicon-Based Nuclear Spin Quantum Computer," to be presented at the SPIE International Conference "Photonics West", San Jose, CA, Jan 20–25, 2002
27. "The Silicon-Based Quantum Computer," presented at the *3rd Annual Conference of the Southwest Quantum Information and Technology Network*, NIST, Boulder, CO, March 8-10, 2002.
28. "Ultrasensitive Electron Spin Resonance with the Magnetic Resonance Force Microscope," presented at *EPR 2005*, Columbus, OH, on 7 September 2005.
29. "The Magnetic Resonance Force Microscope: A New Tool for High Resolution Materials Studies," presented at the 135th Annual Meeting of *The Minerals, Metals & Materials Society (TMS)*, San Antonio, TX, March 13, 2006.

30. "The Magnetic Resonance Force Microscope: A New Tool for High Resolution Materials Studies" presented at the Summer School on Magnetic Resonance Force Microscopy, Ithaca, NY, June 23, 2006
31. "Ultrasensitive Magnetic Resonance Detection with Micromechanical Cantilevers" presented at the Symposium on Nonlinear Dynamics of Nanosystems at Chemnitz, Germany, August 29, 2007.
32. "Submicron Ferromagnetic Resonance Imaging Using Scanned Probe MRFM," presented at the 2007 Aspen Conference on Spins in Nanostructures, Aspen, CO, January 2007
33. "Scanned Probe Ferromagnetic Resonance Imaging," presented at the Third International Workshop on Nanomagnetism, Coma Ruga, Spain, 2 July 2007
34. "The Spirit of Adventure in the Search for Truth: Magnetic Resonance Studies of Condensed Matter," presented at the Conference honoring Bob Richardson, 12–13 April 2008, Ithaca, NY
35. "Mechanisms of FMR imaging," invited presentation, International Conference on Nanoscience & Technology 21–25 July, 2008
36. "Scanned Probe Magnetic Resonance Imaging and Spectroscopy of Materials," invited presentation at the DOE sponsored Workshop on *Frontiers of Atomic-Scale Functionality Imaging* 28–30 September, 2008, Annapolis, MD
37. "Scanned Probe Magnetic Resonance Imaging and Spectroscopy of Materials," invited presentation at the International Conference on *Physics and Chemistry of Surfaces and Interfaces*, January 9, 2009, Santa Barbara, CA
38. "Scanned Probe Magnetic Resonance" presented at the Conference on *Functional Materials by Design*, Los Alamos National Lab, 20 January, 2009
39. "Ferromagnetic Resonance Imaging," presented at the Workshop *Molecular Imaging 2009: Routes to Three-Dimensional Imaging of Single Molecules*, August 9–13, 2009, Ithaca NY
40. "Generation of Localized Ferromagnetic Resonance Modes for Scanned Probe Imaging," to be presented at the Workshop: *Opportunities for Magnetism in MEMS/NEMS*, Argonne National Laboratory, 16–17 April 2010
41. "Nanoscale scanned probe ferromagnetic resonance imaging using localized modes," to be presented at the *3rd nano-MRI research conference: Exploring the Frontiers of Magnetic Resonance Imaging* to be held at Le Tremblay sur Mauldre, France, 12–16 July 2010
42. "Scanned probe imaging of spin physics," presented at the *International Workshop on Novel Magnetic Materials*, Leibniz Institute for Solid State and Materials Research, 23–25 August 2010, Dresden, Germany
43. "Localized Ferromagnetic Resonance Modes for Scanned Probe Imaging," *55th Annual Conference on Magnetism & Magnetic Materials*, 14–18 November 2010, Atlanta, GA
44. "Spin Transport Driven by Magnetization Dynamics: Nanoscale studies of spin dynamics," invited talk presented at the *8th ASRC International Workshop on Spin Mechanics*, Tokai, Japan, 24–26 February 2013
45. "Spin dynamics and transport in nanoscale volumes," Keynote talk presented at the 2014 Annual Meeting of the AAAS, 13–17 February 2014, Chicago, IL
46. "Probing the Influence of Interfaces in Spin Pumping," SPIE Spintronics VII, 17–21 August 2014, San Diego, California

47. "The Role of Interfaces in Dynamic Spin Transport," 59th Annual Magnetism and Magnetic Materials Conference, 3–7 November 2014, Honolulu, Hawaii
48. "Spin Transport by Collective Magnetization Excitations," Santorini IV Workshop on Complex Oxides, Porquerolles, France, 16 June 2016

Colloquia and Seminars

1. "Magnetism in $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$: Insights from NMR" at the Physics and Theoretical Division Colloquium, Los Alamos National Lab, March 1990.
2. " ^{139}La Magnetic Resonance Studies of Single Crystal $\text{La}_2\text{CuO}_{4+\delta}$ ", Physics Department, Northwestern University, Evanston Illinois, March 18, 1991.
3. " ^{139}La Magnetic Resonance Studies of Single Crystal $\text{La}_2\text{CuO}_{4+\delta}$ ", Materials Science Division, Argonne National Laboratory, March 19, 1991.
4. "NMR Studies of the High Temperature Superconductors $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$," Joint Los Alamos National Laboratory and Sandia National Laboratories Office of Basic Energy Sciences Materials Sciences Information and Review Meeting, May 29–30, 1991.
5. "Magnetism, Phase Separation, Local Structure and Superconductivity in Super-Oxygenated $\text{La}_2\text{CuO}_{4+\delta}$," presented at the Theory Institute of the Swiss Federal Institute of Technology (ETH), Zurich, Switzerland, May 18, 1992.
6. "Magnetism, Phase Separation, Local Structure and Superconductivity in Super-Oxygenated $\text{La}_2\text{CuO}_{4+\delta}$," presented at the Solid State Physics Laboratory of the University of South Paris, Orsay, France, May 25, 1992.
7. "NMR Study of Local Structure in Metallic $\text{La}_2\text{CuO}_{4+\delta}$," presented at the University of Köln, September 16, 1993.
8. "NMR Study of Local Structure and Charge Distribution in Metallic $\text{La}_2\text{CuO}_{4+\delta}$," presented at the Condensed Matter Physics Department, California Institute of Technology, January 11, 1994.
9. "NMR Study of Local Structure and Charge Distribution in Metallic $\text{La}_2\text{CuO}_{4+\delta}$," presented at the Physics Department, University of California at Riverside, January 13, 1994.
10. "Phase Separation and Local Structure in Oxygen-Doped $\text{La}_2\text{CuO}_{4+\delta}$," presented to the Physics Department at the University of California at Los Angeles, May 18, 1994.
11. "An Examination of the Oxygen Relaxation Rate in $\text{YBa}_2\text{Cu}_3\text{O}_7$ " presented to the Physics Department, University of Florida, Gainesville, FL, November 27, 1995.
12. "The Magnetic Resonance Force Microscope: Recent Experiments" presented to the Physics Department, University of Florida, Gainesville, FL, November 28, 1995.
13. "Localized Holes in Superconducting Lanthanum Cuprate," presented at the Condensed Matter Physics Seminar, Physics Department, University of Illinois at Urbana/Champaign, February 21, 1997.
14. "Doped Holes and Stripes in 2D Cuprates and Nickelates," presented at the Condensed Matter Physics Seminar, Department of Physics, Florida State University and National High Magnetic Field Laboratory, Tallahassee, FL, April 11, 1997.

15. "The Magnetic Resonance Force Microscope: A New Probe of Magnetic Materials," presented at the Condensed Matter Seminar, Department of Physics, The Ohio State University, Columbus, OH, November 12, 1997.
16. "The Magnetic Resonance Force Microscope: A New Probe of Magnetic Materials," presented at the Physics Colloquium, Texas A&M University, College Station, TX, December 4, 1997.
17. "Consequences of Inhomogeneous Charge Structures for Magnetism in 2D Transition Metal Oxides from NMR" presented at the University of Köln, Köln, Germany, May 25, 1998.
18. "Consequences of Inhomogeneous Charge Structures for Magnetism in 2D Transition Metal Oxides from NMR" presented at the University of Augsburg, Augsburg, Germany, May 27, 1998.
19. "The Magnetic Resonance Force Microscope: A New Probe of Magnetic Materials," presented at the University of Zürich, Zürich, Switzerland, May 28, 1998.
20. "The Magnetic Resonance Force Microscope: A New Approach to Microscopic Subsurface Imaging," Physics Department Colloquium presented at the University of California, Davis, February 22, 1999.
21. "Magnetism of Charge-Striped 2D Transition Metal Oxides," presented at the University of California, Riverside, February 23, 1999.
22. "Magnetism of Charge-Stripe Ordered Transition Metal Oxides," presented at Solid State Sciences Seminar, Caltech, Pasadena, CA May 25, 1999.
23. "High Resolution Scanned Probe Magnetic Resonance Microscopy," Physics Colloquium, The Ohio State University, Columbus, OH, November 2, 1999.
24. "Inhomogeneous Low Frequency Spin Dynamics in $\text{La}_{1.8-x}\text{Eu}_{0.2}\text{Sr}_x\text{CuO}_4$," Physics Colloquium, University of California, San Diego, 8 March, 2000.
25. "The Silicon-Based Nuclear Spin Quantum Computer," presented at the Physics Colloquium, Boston College, April 26, 2000.
26. "Glassy Spin Freezing and Stripe Order in Lanthanum Cuprate," presented at the UCLA Solid State Seminar, May 10, 2000.
27. "Glassy Spin Freezing in Lanthanum Cuprate," presented at the University of Köln, Köln, Germany, October 2, 2000.
28. "Magnetic Resonance Readout in the Silicon-Based Nuclear Spin Quantum Computer," presented at the University of Stuttgart, Stuttgart, Germany October 4, 2000.
29. "Glassy Spin Freezing in Lanthanum Cuprate," presented at the Max Planck Institute, Stuttgart, Germany, October 5, 2000.
30. "The Magnetic Resonance Force Microscope: Imaging Magnetic Materials," presented at the Ohio State University, November 20, 2000.
31. "Glassy Spin Freezing in Lanthanum Cuprate," presented to the Applied Physics Department, Stanford University, November 30, 2000.
32. "Magnetic Resonance Readout in the Silicon-Based Nuclear Spin Quantum Computer," presented at the University of California, San Diego, La Jolla, CA, February 14, 2001.
33. "High Resolution Scanned Probe Magnetic Resonance," presented to the Department of Radiology, The Ohio State University, Columbus, OH, May 29, 2001.

34. "Force Detected Scanned Probe Magnetic Resonance: The Magnetic Resonance Force Microscope," presented at the University of California, Santa Barbara, May 25, 2001.
35. "Force-Detected Scanned Probe Magnetic Resonance Microscopy," presented at the University of Illinois at Urbana/Champaign on October 29, 2001, Urbana, Illinois.
36. "Force-Detected Scanned Probe Magnetic Resonance Microscopy: The Magnetic Resonance Force Microscope," presented at Cornell University on December 18, 2001, Ithaca, NY.
37. "Force-Detected Scanned Probe Magnetic Resonance Microscopy," Department of Physics Colloquium presented at the University of Akron September 4, 2003
38. "Force-Detected Scanned Probe Magnetic Resonance Microscopy," Physics Colloquium, Kenyon College, January 23, 2004
39. "Force-Detected Scanned Probe Magnetic Resonance Microscopy," Physics Colloquium, University of Wisconsin-Madison, January 30, 2004
40. "Scanned Probe Magnetic Resonance: The Magnetic Resonance Force Microscope," Condensed Matter Physics Seminar presented at Case Western Reserve University, April 18, 2005.
41. "Force-Detected Scanned Probe Magnetic Resonance Microscopy," Colloquium presented at Miami University of Ohio, October 19, 2005.
42. "Ultrasensitive Magnetic Resonance Detection with Micromechanical Cantilevers" Seminar presented at the Institute for Solid State Research of the Leibniz Institute for Solid State and Materials Research, Dresden, Germany, September 1, 2006.
43. "Submicron Ferromagnetic Resonance Imaging Using Scanned Probe MRFM," Solid state seminar presented at the Department of Physics, Cornell University, Ithaca, NY, 14 November 2006.
44. "Submicron Ferromagnetic Resonance Imaging Using Scanned Probe MRFM," presented at the Los Alamos National Lab Materials Colloquium, Los Alamos, NM, 21 February, 2007
45. "Scanned Probe Magnetic Resonance Imaging for Magnetoelectronics," Colloquium, Department of Physics, Kent State University, Kent, OH, 12 April, 2007
46. "Scanned Probe Magnetic Resonance Imaging for Magnetoelectronics," Seminar presented at the Leibniz Institute for Solid State and Materials Research, Dresden, Germany, 5 July, 2007
47. "Scanned Probe Magnetic Resonance Imaging for Magnetoelectronics," Colloquium, Department of Physics, Carnegie Mellon University, Pittsburgh, PA, 10 September, 2007
48. "Scanned Probe Magnetic Resonance Imaging for Magnetoelectronics," Colloquium, Department of Physics, Wayne State University, Detroit, MI, 6 December 2007
49. "Scanned Probe Magnetic Resonance Imaging for Magnetoelectronics," Colloquium, Department of Physics, Northwestern University, Evanston, IL, 1 February 2008
50. "Scanned Probe Ferromagnetic Resonance," Condensed Matter Seminar, Department of Physics and Astronomy, Michigan State University, East Lansing, MI, October 13, 2008
51. "Scanned Probe Magnetic Resonance", Colloquium, University of Illinois, Urbana-Champaign, IL, January 30, 2009
52. "Scanned Probe Magnetic Resonance Imaging for Magnetoelectronics," Colloquium, Department of Physics, Penn State University, 19 February 2009
53. "Scanned Probe Ferromagnetic Resonance Imaging," Condensed Matter Physics Seminar, University of California, Riverside, 20 April, 2011

54. "Scanned Probe Ferromagnetic Resonance Imaging," Physics Department Colloquium, University of California, Irvine, 21 April, 2011
55. "Scanned Probe Ferromagnetic Resonance Imaging," Center for Nonlinear Studies Colloquium, Los Alamos National Laboratory, Los Alamos, NM, 31 May 2011
56. "Spin Transport Driven by Magnetization Dynamics," Colloquium presented at Boston College Department of Physics, Chestnut Hill, MA, December 5, 2012
57. "Spin dynamics and transport in nanoscale volumes," Condensed Matter Physics Seminar, UCLA Department of Physics & Astronomy presented 17 January 2014, Los Angeles, CA
58. "Spin dynamics and transport in nanoscale volumes," Materials Colloquium, Los Alamos National Laboratory, 22 January, 2014, Los Alamos, NM
59. "Probing the Influence of Interfaces in Spin Pumping," Condensed Matter Seminar, Service de Physique de l'Etat Condensé, CEA, Saclay, France, 23 September 2015
60. "Probing the Influence of Interfaces in Spin Pumping," Seminar, SPINTEC, CEA Grenoble, France, 15 October 2015
61. "Probing the Influence of Interfaces in Spin Pumping," Seminar, Institute for Metallic Materials (IMW) Leibniz Institute for Solid State and Materials REsearch Dresden, 21 October 2015

Publications

Average citation rate for ten most-cited papers: > 200 citations/paper

> 4330 citations, ISI *h*-index: 33

ORCID-ID: orcid.org/0000-0002-4138-4798

1. "Spin aligned hydrogen: Some considerations for ESR vs. NMR experiments and preliminary observation of $H\uparrow$ at low temperature," B. Yurke, D. Ignier, E. Smith, B. Johnson, J. Denker, C. Hammel, D. Lee and J. Freed, *Journal de Physique (Paris) Colloque* **41**, C7-177 (1980).
2. "Fabrication of 0.25 μm metal particles," P. Chris Hammel and Robert C. Richardson, *Physica* **107B**, 611 (1981).
3. "Magnetic coupling between ^3He and ^{19}F at low temperatures," P.C. Hammel, M.L. Roukes, Y. Hu, T.J. Gramila, T. Mamiya and R.C. Richardson, *Phys. Rev. Lett.* **51**, 2124 (1983).
4. "Relaxation as an interface probe in ^3He -substrate systems," P.C. Hammel, T.J. Gramila, Y. Hu and R.C. Richardson, Proc. of the 17th International Conference on Low Temperature Physics (North-Holland, Amsterdam, 1984), p. 753.
5. "Surface relaxation of ^3He on CaF_2 ," T.J. Gramila, Y. Hu, P.C. Hammel, and R.C. Richardson, *ibid*, p. 755.
6. "Relaxation of nuclear magnetization of liquid ^3He -substrate systems," P.C. Hammel and R.C. Richardson, *Phys. Rev. Lett.* **52**, 1441 (1984).
7. " ^{19}F nuclear relaxation at the interface between liquid ^3He and a solid substrate at high field and low temperature," P.C. Hammel, P.L. Kuhns, O. Gonen and J.S. Waugh, *Phys. Rev. B* **34**, 6453 (1986).
8. "Unexpectedly rapid ^{19}F spin-lattice relaxation in CaF_2 below 1K," P.L. Kuhns, P.C. Hammel, O. Gonen, and J.S. Waugh, *Phys. Rev. B* **35**, 4591 (1987).
9. "Nuclear spin lattice relaxation in ^3He - ^4He mixtures," Mary Lowe, P.C. Hammel, R.E. Ecke, K. Bedell and M. Takigawa, *Phys. Rev. B* **37**, 2281 (1988).
10. "Copper nuclear quadrupole resonance in $\text{GdBa}_2\text{Cu}_3\text{O}_7$: Determination of Site Assignment," P.C. Hammel, M. Takigawa, R.H. Heffner and Z. Fisk, *Phys. Rev. B* **38**, 2832 (1989).
11. "Anisotropic Cu Knight shift and magnetic susceptibility in the normal state of $\text{YBa}_2\text{Cu}_3\text{O}_7$," M. Takigawa, P.C. Hammel, R.H. Heffner, Z. Fisk, J.L. Smith, and R.B. Schwarz, *Phys. Rev. B* **39**, 300 (1989).
12. "Spin susceptibility in superconducting $\text{YBa}_2\text{Cu}_3\text{O}_7$ from ^{63}Cu Knight shift," by M. Takigawa, P.C. Hammel, R.H. Heffner and Z. Fisk, *Phys. Rev. B* **39**, 7371 (1989).
13. "Anomalous temperature dependence of Cu NMR line width and magnetization in $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$," M. Takigawa, P.C. Hammel, R.H. Heffner, Z. Fisk, J.D. Thompson and M. Maley, *Physica C* **162-164**, 175 (1989).
14. "NMR relaxation rates at copper and oxygen sites in $\text{YBa}_2\text{Cu}_3\text{O}_7$," P.C. Hammel, M. Takigawa, R.H. Heffner, Z. Fisk and K.C. Ott, *Physica C* **162-164**, 177 (1989).
15. "NMR study of $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$," M. Takigawa, P.C. Hammel, R.H. Heffner, Z. Fisk, K.C. Ott, and J.D. Thompson, *Physica C* **162-164**, 853 (1989).
16. " ^{17}O NMR study of local spin susceptibility in aligned $\text{YBa}_2\text{Cu}_3\text{O}_7$ powder," M. Takigawa, P.C. Hammel, R.H. Heffner, Z. Fisk, K.C. Ott and J.D. Thompson, *Phys. Rev. Lett.* **63**, 1865 (1989).

17. "Spin dynamics at oxygen sites in $\text{YBa}_2\text{Cu}_3\text{O}_7$," P.C. Hammel, M. Takigawa, R.H. Heffner, Z. Fisk and K.C. Ott, *Phys. Rev. Lett.* **63**, 1992 (1989).
18. "Observation of Cu NMR in Antiferromagnetic $\text{PrBa}_2\text{Cu}_3\text{O}_7$: Evidence for Hole-Band Filling," A.P. Reyes, D.E. MacLaughlin, M. Takigawa, P.C. Hammel, R.H. Heffner, J.D. Thompson, J.E. Crow, A. Kebede, T. Mihalisin, J. Schwegler, *Phys. Rev. B* **42**, 2688 (1990).
19. "Normal state ^{63}Cu Knight Shift and Hole-band Modification in $\text{Y}_{1-x}\text{Pr}_x\text{Ba}_2\text{Cu}_3\text{O}_7$," A.P. Reyes, D.E. MacLaughlin, M. Takigawa, P.C. Hammel, R.H. Heffner, J.D. Thompson, J.E. Crow, A. Kebede, T. Mihalisin, and J. Schwegler, *J. Appl. Phys.* **67**, 5032 (1990).
20. " ^{139}La NMR study of Phase Separation in Single Crystal $\text{La}_2\text{CuO}_{4.032}$," P.C. Hammel, A.P. Reyes, Z. Fisk, M. Takigawa, J.D. Thompson, R.H. Heffner, S-W. Cheong and J.E. Schirber, *Phys. Rev. B* **42**, 6781 (1990).
21. "A Low Temperature NMR Probe for Use in a Dilution Refrigerator," P.L. Kuhns, S-H Lee, C. Coretsopoulos, P.C. Hammel, O. Gonen, and J.S. Waugh, *Rev. Sci. Instr.* **62**, 2159 (1991).
22. " ^{63}Cu NMR and Hole Depletion in the Normal State of Yttrium Rich $\text{PrBa}_2\text{Cu}_3\text{O}_7$," A.P. Reyes, D.E. MacLaughlin, M. Takigawa, P.C. Hammel, R.H. Heffner, J.D. Thompson and J.E. Crow, *Phys. Rev. B* **43**, 2989 (1991).
23. "Cu and O NMR Studies of the Magnetic Properties of $\text{YBa}_2\text{Cu}_3\text{O}_{6.63}$," 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).
24. " ^{139}La NMR and NQR Study of the Temperature Dependent Structure of $\text{La}_2\text{CuO}_{4+\delta}$," P.C. Hammel, E.T. Ahrens, A.P. Reyes, R.H. Heffner, P.C. Canfield, S-W. Cheong and Z. Fisk, and J.E. Schirber, *Physica C* **185–189**, 1095 (1991).
25. Comment on "Order-Disorder Structural Phase Transition in $\text{La}_{2-x}\text{Sr}_x\text{CuO}_{4+\delta}$ at 150 K," by D.E. MacLaughlin, P.C. Hammel, J.P. Vithayathil, P.C. Canfield, Z. Fisk, R.H. Heffner, A.P. Reyes, J.D. Thompson, and S-W. Cheong, *Phys. Rev. Lett.* **67**, 525, (1991).
26. "Phase Separation, Structure and Superconductivity in Oxygen-Annealed $\text{La}_2\text{CuO}_{4+\delta}$," P.C. Hammel, E.T. Ahrens, A.P. Reyes, J.D. Thompson, D.E. MacLaughlin, Z. Fisk, P.C. Canfield, and J.E. Schirber, in *Phase Separation in Cuprate Superconductors*, edited by K. Alex Müller and G. Benedek, p. 139 (World Scientific Publishing, Singapore, 1993).
27. "Pressure Effects on NQR Parameters in Oxygen-deficient $\text{YBa}_2\text{Cu}_3\text{O}_{6.62}$," A.P. Reyes, E.T. Ahrens, P.C. Hammel, R.H. Heffner and M. Takigawa, in *Lattice Effects in High- T_c Superconductors*, edited by Y. Bar-Yamm, T. Egami, J. Mustre-de Leon and A.R. Bishop, p. 143 (World Scientific Publishing, Singapore, 1993).
28. "NQR Study of Local Structure and Cooling Rate Dependent Superconductivity in $\text{La}_2\text{CuO}_{4+\delta}$," A.P. Reyes, E.T. Ahrens, P.C. Hammel, J.D. Thompson, P.C. Canfield, Z. Fisk, and J.E. Schirber, *J. Appl. Phys.* **73**, 6323 (1993).
29. "Thermal History Dependent Superconductivity and Local Structure in $\text{La}_2\text{CuO}_{4+\delta}$," E.T. Ahrens, A.P. Reyes, P.C. Hammel, J.D. Thompson, P.C. Canfield, Z. Fisk, J.E. Schirber, *Physica C* **212**, 317 (1993).
30. "NMR Determination of the B substitutional site in $\text{U}(\text{Be}_{1-x}\text{B}_x)_{13}$," E.T. Ahrens, P.C. Hammel, R.H. Heffner, A.P. Reyes, J.L. Smith and W.G. Clark, *Phys. Rev. B* **48**, 6691 (1993).
31. "NMR Study of Local Structure in Metallic $\text{La}_2\text{CuO}_{4+\delta}$," P.C. Hammel, A.P. Reyes, S-W. Cheong, Z. Fisk and J.E. Schirber, *Phys. Rev. Lett.* **71**, 440 (1993).

32. "Phase Separation and Superconductivity in $\text{La}_2\text{CuO}_{4+\delta}$: Effects of Oxygen Diffusion," A.P. Reyes, P.C. Hammel, E.T. Ahrens, J.D. Thompson, P.C. Canfield, Z. Fisk, and J.E. Schirber, *J. Phys. Chem. Solids* **54**, 1393 (1993).
33. "NMR Study of Oxygen-Doped $\text{La}_2\text{CuO}_{4+\delta}$," P.C. Hammel, A.P. Reyes, E.T. Ahrens, D.E. MacLaughlin, J.D. Thompson, Z. Fisk, P.C. Canfield, S-W. Cheong, J.E. Schirber, *Physica B* **199** & **200**, 235 (1994).
34. "Abrupt but Continuous Antiferromagnetic Transition in Nearly Stoichiometric $\text{La}_2\text{CuO}_{4+\delta}$," D.E. MacLaughlin, J.P. Vithayathil, H.B. Brom and J.C.J.M. de Rooy, P.C. Hammel, P.C. Canfield, A.P. Reyes, J.D. Thompson, and S-W. Cheong, *Phys. Rev. Lett.* **72**, 760-763 (1994).
35. "Microscopic Study of Local Structure and Charge Distribution in Metallic $\text{La}_2\text{CuO}_{4+\delta}$," P.C. Hammel, A.P. Reyes, E.T. Ahrens, Z. Fisk, P.C. Canfield, and J.D. Thompson, in *Phase Separation in Cuprate Superconductors*, edited by E. Sigmund and K. Alex Müller, (Springer-Verlag, Berlin, Heidelberg 1994).
36. "Observation of Vortex-Lattice Melting by NMR Spin-Lattice Relaxation in the Mixed-State," L.N. Bulaevskii, P.C. Hammel, and V.M. Vinokur, *Phys. Rev. B* **51**, 15355 (1995).
37. "Spin Susceptibility and Low-Lying Excitations in the Haldane-Gap Compound YBaNi_2O_5 ," T. Shimizu, D.E. MacLaughlin, P.C. Hammel, J.D. Thompson, and S-W. Cheong, *Phys. Rev. B* **52**, R9835 (1995).
38. "Oxygen Ordering and Phase Separation in $\text{La}_2\text{CuO}_{4+\delta}$," B.W. Statt, P.C. Hammel, Z. Fisk, S-W. Cheong, F.C. Chou, and D.C. Johnston, and J.E. Schirber, *Phys. Rev. B* **52**, 15575 (1995).
39. "Sub-surface imaging with the Magnetic Resonance Force Microscope," P.C. Hammel, Z. Zhang, G.J. Moore and M.L. Roukes, *Jour. of Low Temp. Phys.* **101**, 59 (1995).
40. " ^9Be and ^{11}B NMR Study of Superconductivity in Boron Doped UBe_{13} ," E.T. Ahrens, R.H. Heffner, P.C. Hammel, A.P. Reyes, J.L. Smith, and W.G. Clark, *Physica B* **206** & **207**, 589 (1995).
41. "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).
42. "Sensitivity and Spatial Resolution in Magnetic Resonance Force Microscopy," Z. Zhang, M.L. Roukes and P.C. Hammel, *J. Appl. Phys.* **80**, 6931 (1996).
43. "Application of a Novel rf Coil Design to the Magnetic Resonance Force Microscope," Z. Zhang, P.C. Hammel and G.J. Moore, *Rev. Sci. Instr.* **67**, 3307 (1996).
44. "Local microstructure and the cuprate spin gap puzzle," P.C. Hammel and D.J. Scalapino, *Phil. Mag. B* **74**, 523 (1996).
45. "Oxygen nuclear magnetic resonance on the 90 K plateau of $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$," J. A. Martindale and P.C. Hammel, *Phil. Mag. B* **74**, 573 (1996).
46. "Magnetic Excitations of the Doped-Hole State in Diamagnetic $\text{La}_2\text{Cu}_{0.5}\text{Li}_{0.5}\text{O}_4$," Y. Yoshinari, P.C. Hammel, J.A. Martindale, E. Moshopoulou, J.D. Thompson, J.L. Sarrao and Z. Fisk, *Phys. Rev. Lett.* **77**, 2069 (1996).
47. "Properties of Li-doped La_2CuO_4 ," J.L. Sarrao, D.P. Young, Z. Fisk, P.C. Hammel, Y. Yoshinari, and J.D. Thompson, *Proceedings of the 10th Anniversary HTS Workshop on Physics, Materials, and Applications*, ed. C.W. Chu and K.A. Müller (World Scientific, Singapore, 1997) p. 107.

48. "Vortex Melting in Polycrystalline $\text{YBa}_2\text{Cu}_3\text{O}_7$ from ^{17}O NMR," A.P. Reyes, X.P. Tang, H.N. Bachman, W.P. Halperin, J.A. Martindale, P.C. Hammel, *Phys. Rev. B* **55**, 14737 (1997).
49. "Magnetic Resonance Force Microscopy with a Permanent Magnet on the Cantilever," Z. Zhang and P.C. Hammel, *IEEE Trans. Magn.* **33**, 4047 (1997).
50. "Localized Holes in Superconducting Lanthanum Cuprate," P.C. Hammel, B.W. Statt, R.L. Martin, S-W. Cheong, F.C. Chou, and D.C. Johnston, *Phys. Rev. B* **57**, R712 (1998).
51. "Temperature Dependence of the Anisotropic Planar Oxygen Nuclear Spin-Lattice Relaxation Rate in $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$," J.A. Martindale, P.C. Hammel, W.L. Hults and J.L. Smith, *Phys. Rev. B* **57**, 11769 (1998).
52. "Towards a Magnetic Resonance Force Microscope Employing a Ferromagnetic Probe Mounted on the Force Detector," Z. Zhang and P.C. Hammel, *Solid State Nuclear Magnetic Resonance* **11**, 65 (1998).
53. "The Magnetic Resonance Force Microscope: A New Microscopic Probe of Magnetic Materials," P. C. Hammel, Z. Zhang, M. Midzor, M. L. Roukes, P. E. Wigen and J. R. Childress, *Frontiers in Reduced Dimensional Magnetism*, edited by V. G. Bar'yakhtar, P. E. Wigen and N. A. Lesnik, Kluwer Academic Publishers (Dordrecht), p. 441 (1998).
54. "Suppression of Antiferromagnetic Order by Light Hole Doping in $\text{La}_2\text{Cu}_{1-x}\text{Li}_x\text{O}_4$: A ^{139}La NQR Study," B.J. Suh, P.C. Hammel, Y. Yoshinari, J.D. Thompson, J.L. Sarrao, and Z. Fisk, *Phys. Rev. Lett.* **81**, 2791 (1998).
55. "Ferromagnetic Resonance Imaging of Co Films Using Magnetic Resonance Force Microscopy," B. J. Suh, P. C. Hammel, Z. Zhang, M. M. Midzor, M. L. Roukes, and J. R. Childress, *J. Vac. Sci. Tech. B* **16**, 2275 (1998).
56. "Ferromagnetic Resonance Force Microscopy on Microscopic Co Single Layer Films," Z. Zhang, P. C. Hammel, M. Midzor, M. L. Roukes, and J. R. Childress, *Appl. Phys. Lett.* **73**, 2036 (1998).
57. "Magnetic field independence of the spin gap in $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$," K. Gorny, O. M. Vyaselev, J. A. Martindale, C. H. Pennington, P. C. Hammel, W. L. Hults, J. L. Smith, P. L. Kuhns, A. P. Reyes, and W. G. Moulton, *Phys. Rev. Lett.* **82**, 177 (1999).
58. "Nuclear Magnetic Resonance Study of $\text{U}(\text{Be}, \text{B})_{13}$ in the Normal and Superconducting States," E. T. Ahrens, R. H. Heffner, P. C. Hammel, A. P. Reyes, J. D. Thompson, J. L. Smith, and W. G. Clark, *Phys. Rev. B* **59**, 1432 (1999).
59. "Local Magnetic and Structural Properties of the LTO $\rightarrow$ LTT Transition: A ^{139}La NQR Study in Lightly Hole-Doped $\text{La}_{1.8-x}\text{Eu}_{0.2}\text{Sr}_x\text{CuO}_4$," B. J. Suh, P. C. Hammel, M. Hückler and B. Büchner, *Phys. Rev. B* **59**, R3952 (1999).
60. "Magnetism of Stripe-Ordered $\text{La}_{5/3}\text{Sr}_{1/3}\text{NiO}_4$," Y. Yoshinari, P. C. Hammel and S-W. Cheong, *Phys. Rev. Lett.* **82**, 3536 (1999).
61. "Spin freezing and recovery of sublattice magnetization in lightly doped lanthanum cuprate," B. J. Suh, P. C. Hammel, J. L. Sarrao, J. D. Thompson, Z. Fisk, M. Hückler and B. Büchner, in *Physical Phenomena at High Magnetic Fields*, Z. Fisk, L. Gor'kov, J.R. Schrieffer, eds., World Scientific Publishing Co. Pte. Ltd., (Singapore) p. 336 (1999).
62. " ^{139}La NMR evidence for sensitivity of local structure to magnetic field in $\text{La}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$ " Y. Yoshinari, P.C. Hammel, J.D. Thompson and S-W. Cheong, *Phys. Rev. B* **60**, 9275 (1999).
63. "Mobile Anti-phase Domains in Lightly Doped Lanthanum Cuprate," P. C. Hammel, B. J. Suh and J. L. Sarrao, and Z. Fisk, *Stripes and Related Phenomena*, , edited by A. Bianconi and N. Saini (Kluwer Academic/Plenum Publishers, New York, 2000) p. 295.

64. "Spin Dynamics in the LTT Phase of $\cong 1/8$ Doped Single Crystal $\text{La}_{1.67}\text{Eu}_{0.2}\text{Sr}_{0.13}\text{CuO}_4$," B. J. Suh, P. C. Hammel, M. Hücker, B. Büchner, U. Ammerahl, and A. Revcolevschi, *Phys. Rev. B* **61**, R9265 (2000).
65. "Imaging Mechanism of Force Detected FMR Microscopy," M.M. Midzor, P.E. Wigen, D. Pelekhov, W. Chen, P.C. Hammel and M.L. Roukes, *J. Appl. Phys.* **87**, 6493 (2000)
66. "The Cu NMR echo decay in stripe ordered $\text{La}_{1.65}\text{Eu}_{0.2}\text{Sr}_{0.15}\text{CuO}_4$," N.J. Curro and P.C. Hammel, *Physica C* **341**, 1797 (2000).
67. "La-139 NQR and NMR studies of the structural phase transitions in $\text{La}_{1.8-x}\text{Eu}_{0.2}\text{Sr}_x\text{CuO}_4$," B.J. Suh and P.C. Hammel, *Physica C* **341**, 2127 (2000).
68. "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)
69. "Inhomogeneous Low Frequency Spin Dynamics in $\text{La}_{1.65}\text{Eu}_{0.2}\text{Sr}_{0.15}\text{CuO}_4$," N.J. Curro, P.C. Hammel, B.J. Suh, M. Hücker, B. Büchner, U. Ammerahl, and A. Revcolevschi, *Phys. Rev. Lett.* **85**, 642 (2000).
70. "Evidence for Spiral Magnetic Order in the Heavy Fermion Material CeRhIn_5 ," N. J. Curro, P. C. Hammel, P. G. Pagliuso, J. L. Sarrao, J. D. Thompson and Z. Fisk, *Phys. Rev. B* **62**, R6100 (2000).
71. "Magnetic field independence of Cu(2) NMR spin-lattice relaxation rate in the normal state of optimally doped $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$," K.R. Gorny, O.M. Vyaselev, C.H. Pennington, P.C. Hammel, W.L. Hults, J.L. Smith, J. Baumgartner, T.R. Lemberger, P. Klamut, B. Dabrowski, *Phys. Rev. B* **63**, 4513 (2001), article no. 064513.
72. "Magnetic resonance force microscopy quantum computer with tellurium," G.P. Berman, G.D. Doolen, P.C. Hammel, V.I. Tsifrinovich, *Phys. Rev. Lett.* **86**, 2894 (2001).
73. "Anomalous Magnetic NMR Shifts in CeCoIn_5 ," N.J. Curro, B. Simovic, P.C. Hammel, P.G. Pagliuso, J.L. Sarrao, J.D. Thompson, *Phys. Rev. B Rapid Communications* **64**, 0514 (2001).
74. "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).
75. "Static Stern-Gerlach effect in magnetic force microscopy" G.P. Berman, G.D. Doolen, P.C. Hammel and V.I. Tsifrinovich, *Phys. Rev. A* **65**, 2311 (2002)
76. "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).
77. "Future probes in materials science" James W. Allen, Meigan Aronson, Gregory S. Boebinger, Collin L. Broholm, S. Lance Cooper, J.E. Crowe, P. Chris Hammel, Gerry Lander, *Physica B* **318**, 12–23 (2002).
78. "Magnetic resonance force microscopy and the solid state quantum computer," D.V. Pelekhov, I. Martin, A. Suter, D.W. Reagor, and P.C. Hammel, *Proc. SPIE* **4656** p. 1-9, *Quantum Dot Devices and Computing*, James A. Lott, Nikolai N. Ledentsov, Kevin J. Malloy, Bruce E. Kane, Thomas W. Sigmon, Eds. (2002).
79. "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).

80. "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).
81. "Application of magnetic resonance force microscopy cyclic adiabatic inversion for a single-spin measurement," G.P. Berman, F. Borgonovi, G. Chapline, S.A. Gurvitz, P.C. Hammel, D.V. Pelekhov, A. Suter and V.I. Tsifrinovich, *J. Phys. A: Mathematical and General* **36**, 4417 (2003).
82. "Local structure of $\text{La}_{1.65}\text{Eu}_{0.2}\text{Sr}_{0.15}\text{CuO}_4$ determined by ^{63}Cu NMR spectroscopy and Van Vleck paramagnetism of Eu^{3+} ions, B. Simovič, M. Hücker, P.C. Hammel, B. Büchner, U. Ammerahl and A. Revcolevschi, *Phys. Rev. B* **67**, 224508 (2003).
83. "Experimental evidence for a glass forming stripe liquid in the magnetic ground state of $\text{La}_{1.65}\text{Eu}_{0.2}\text{Sr}_{0.15}\text{CuO}_4$," B Simovič, P.C. Hammel, M. Hücker, B. Büchner and A. Revcolevschi, *Phys. Rev. B* **68**, 012145 (2003).
84. "The Magnetic-Resonance Force Microscope: A New Tool for High-Resolution, 3-D, Subsurface Scanned Probe Imaging," P. Chris Hammel, Denis V. Pelekhov, Philip E. Wigen, Timothy R. Gosnell, Melissa M. Midzor, and Michael L. Roukes, *Proceedings of the IEEE*, **91**, 789 (2003).
85. "Interplay between freezing and superconductivity in the optimally doped $\text{La}_{1.65}\text{Eu}_{0.2}\text{Sr}_{0.15}\text{CuO}_4$ under hydrostatic pressure," B. Simovič, M. Nicklas, P. C. Hammel, M. Hücker, B. Büchner and J. D. Thompson, *Europhys. Lett.*, **66** 722728 (2004).
86. "Seeing Single Spins," P.C. Hammel, *Nature* **430**, 300 (2004).
87. "Light-free magnetic resonance force microscopy for studies of electron spin polarized systems," Denis V. Pelekhov, Camelia Selcu, Palash Banerjee, Kin Chung Fong, P. Chris Hammel, Harish Bhaskaran and Keith Schwab, *J. Magn. Magn. Mat.*, **286** 324 (2005).
88. "Perturbation of magnetostatic modes observed by ferromagnetic resonance force microscopy," R. Urban, A. Putilin, P.E. Wigen, S.-H. Liou, M.C. Cross, P.C. Hammel, and M.L. Roukes, *Phys. Rev. B* **73**, 212410 (2006).
89. "Origin of fourfold anisotropy in square lattices of circular ferromagnetic dots," G.N. Kakazei, Yu. G. Pogorelov, M.D. Costa, T. Mewes, P.E. Wigen, P.C. Hammel, V.O. Golub, T. Okuno and V. Novosad, *Physical Review B* **74**, 60406-1-4 (2006)
90. "Ferromagnetic resonance force microscopy studies of arrays of micron size permalloy dots," T. Mewes J. Kim, D. V. Pelekhov, G. N. Kakazei, P. E. Wigen, S. Batra, and P. C. Hammel, *Phys. Rev. B* **74**, 144424 (2006)
91. "Ferromagnetic Resonance Force Microscopy," Philip E. Wigen, Michael L. Roukes and Peter C. Hammel, **Book chapter** in *Spin Dynamics in Confined Magnetic Structures III*, B. Hillebrands and A. Thiaville, eds., Springer-Verlag Berlin Heidelberg 2006
92. "Low Temperature Magnetic Resonance Force Microscope: Design and Performance" E. Nazaretski, T. Mewes, D. V. Pelekhov, P. C. Hammel, and R. Movshovich, *AIP Conf. Proc.* **850**, 1641 (2006)
93. "Magnetic resonance force microscopy studies in a thin permalloy film," E. Nazaretski, J.D. Thompson, D.V. Pelekhov, T. Mewes, P.E. Wigen, J. Kim, M. Zalalutdinov, J.W. Baldwin, B. Houston, P.C. Hammel and R. Movshovich, *J. Magn. Magn. Mat.*, **310** e941 (2007)
94. "Real time cantilever signal frequency determination using digital signal processing," Yu. Obukhov, K.C. Fong, D. Daughton, and P.C. Hammel, *J. Appl. Phys.*, **101** 034315 (2007)

95. "Temperature-dependent magnetic resonance force microscopy of a thin Permalloy film," E. Nazaretski, J.D. Thompson, R. Movshovich, M. Zalalutdinov, J.W. Baldwin, B. Houston, T. Mewes, D.V. Pelekhov, P. Wigen, and P.C. Hammel, *J. App. Phys.* **101** 074905 (2007)
96. "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
97. "Ferromagnetic resonance force microscopy on a thin permalloy film," E. Nazaretski, I. Martin, R. Movshovich, D.V. Pelekhov, P.C. Hammel, M. Zalalutdinov, J.W. Baldwin, B. Houston and T. Mewes, *Appl. Phys. Lett.* **90**, 234105 (2007)
98. "Detection of higher order modulation harmonics in magnetic resonance force microscopy," T. Mewes, C.K.A. Mewes, E. Nazaretski, J. Kim, K.C. Fong, Y. Obukhov, D.V. Pelekhov, P.E. Wigen and P.C. Hammel, *J. App. Phys.* **102** 033911 (2007)
99. "Magnetic resonance force microscopy studies in a thin permalloy film," E. Nazaretski, J.D. Thompson, D.V. Pelekhov, T. Mewes, P.E. Wigen, J. Kim, M. Zalalutdinov, J.W. Baldwin, B. Houston, P.C. Hammel and R. Movshovich, *J. Magn. Magn. Mat.*, **310**, E941-E943 (2007)
100. "Magnetic Force Microscopy of Superparamagnetic Nanoparticles," S. Schreiber, M. Savla, D.V. Pelekhov, C. Selcu, P.C. Hammel, G. Agarwal, *Small* **4** 270-278 (2008)
101. "Ferromagnetic resonance force microscopy studies of a continuous permalloycobalt film," E. Nazaretski, E.A. Akhadov, K.C. Cha, D.V. Pelekhov, I. Martin, K.S. Graham, P.C. Hammel and R. Movshovich, *Phys. Stat. Sol. A*, **1-4** (2008) / DOI 10.1002/pssa.200723465
102. "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)
103. "Spatial characterization of the magnetic field profile of a probe tip used in magnetic resonance force microscopy," E. Nazaretski, E.A. Akhadov, I. Martin, D.V. Pelekhov, P.C. Hammel and R. Movshovich, *Applied Physics Letters* **92** 214104 (2008)
104. "Manipulating spins by cantilever synchronized frequency modulation: A variable resolution magnetic resonance force microscope," K.C. Fong, P. Banerjee, Yu. Obukhov, D.V. Pelekhov, and P.C. Hammel, *Applied Physics Letters* **93** 012506 (2008)
105. "Probing arrays of circular magnetic microdots by ferromagnetic resonance," G.N. Kakazei, T. Mewes, P.E. Wigen, P.C. Hammel, A.N. Slavin, Yu. G. Pogorelov, M.D. Costa, V.O. Golub, K. Yu. Guslienko, and V. Novosad, *Journal Of Nanoscience And Nanotechnology* **8** 2811-2826 (2008)
106. "Molecular packing and magnetic properties of lithium naphthalocyanine crystal: Hollow channels enabling permeability and paramagnetic sensitivity to molecular oxygen," Ramasamy P. Pandian, Michelle Dolgos, Camelia Marginean, Patrick M. Woodward, P. Chris Hammel, Periakaruppan T. Manoharan, and Periannan Kuppusamy, *J. Mater. Chem.*, **19**, 41384147 (2009) DOI: 10.1039/B800602D
107. "Nanoscale MRI," P.C. Hammel, *Nature* **458** 844 (2009)
108. "Effect of localized magnetic field on the uniform ferromagnetic resonance mode in a thin film," Yu. Obukhov, D. V. Pelekhov, E. Nazaretski, R. Movshovich, and P.C. Hammel, *Applied Physics Letters* **94** 172508 (2009)

109. "Design of a variable temperature scanning force microscope," E. Nazaretski, K. S. Graham, J. D. Thompson, J. A. Wright, D. V. Pelekhov, P. C. Hammel and R. Movshovich, *Review of Scientific Instruments* **80** 083704 (2009)
110. "Localized ferromagnetic resonance force microscopy in Permalloy-cobalt films," E. Nazaretski, Yu. Obukhov, I. Martin, D. V. Pelekhov, K. C. Cha, E. A. Akhadov, P. C. Hammel and R. Movshovich
Journal of Applied Physics **106** 046103 (2009)
111. "Detection of localized ferromagnetic resonance in a continuous thin film via magnetic resonance force microscopy," E. Nazaretski, D. V. Pelekhov, I. Martin, M. Zalalutdinov, D. Ponarin, A. Smirnov, P. C. Hammel and R. Movshovich
Physical Review B **79** 132401 (2009)
112. "Magnetization reversal in an individual 25 nm iron-filled carbon nanotube," Palash Banerjee, F. Wolny, D. V. Pelekhov, M. R. Herman, K. C. Fong, U. Weissker, T. Mühl, Yu. Obukhov, A. Leonhardt, B. Büchner, and P. Chris Hammel
Applied Physics Letters **96** 252505 (2010) DOI: 10.1063/1.3440951
<http://link.aip.org/link/?APL/96/252505>,
113. "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
<http://www.nature.com/nature/journal/v466/n7308/full/nature09279.html>
114. "A strong ferroelectric ferromagnet created by means of spinlattice coupling," June Hyuk Lee, Lei Fang, Eftihia Vlahos, Xianglin Ke, Young Woo Jung, Lena Fitting Kourkoutis, Jong-Woo Kim, Philip J. Ryan, Tassilo Heeg, Martin Roeckerath, Veronica Goian, Margitta Bernhagen, Reinhard Uecker, P. Chris Hammel, Karin M. Rabe, Stanislav Kamba, Jürgen Schubert, John W. Freeland, David A. Muller, Craig J. Fennie, Peter Schiffer, Venkataraman Gopalan, Ezekiel Johnston-Halperin & Darrell G. Schlom,
Nature **466** 954-958 (19 August 2010) doi:10.1038/nature09331
<http://www.nature.com/nature/journal/v466/n7309/full/nature09331.html>
115. "Quantitative magnetic force microscopy on permalloy dots using an iron filled carbon nanotube probe," F. Wolny, Y. Obukhov, T. Mühl, U. Weissker, S. Philippi, A. Leonhardt, P. Banerjee, A. Reed, G. Xiang, R. Adur, I. Lee, A.J. Hauser, F.Y. Yang, D.V. Pelekhov, B. Büchner and P.C. Hammel, *Ultramicroscopy* **111** 1360–1365 (2011)
<http://dx.doi.org/10.1016/j.ultramic.2011.05.002>
116. "Magnetic force microscopy in the presence of a strong probe field," Inhee Lee, Jongjoo Kim, Yuri Obukhov, Palash Banerjee, Gang Xiang, Denis V. Pelekhov, Adam Hauser, Fengyuan Yang and P. Chris Hammel, *Applied Physics Letters* **99** 162514 (2011), selected for publication in the *Virtual Journal of Nanoscale Science & Technology* (<http://www.vjnano.org/>)
117. "Spin Lifetime in Small Electron Spin Ensembles Measured by Magnetic Resonance Force Microscopy," K.C. Fong, M.R. Herman, P. Banerjee, D.V. Pelekhov and P.C. Hammel, *Physical Review B, Rapid Communications*, **84** 220405(R) (2011) selected as an Editor's Suggestion and highlighted in *Physics*: <http://physics.aps.org/synopsis-for/10.1103/PhysRevB.84.220405>
118. "Nanoscale confined mode ferromagnetic resonance imaging of an individual Ni₈₁Fe₁₉ disk using magnetic resonance force microscopy," Inhee Lee, Yuri Obukhov, A.J. Hauser, F.Y. Yang, D.V. Pelekhov and P.C. Hammel *Journal Of Applied Physics* **109** 07D313 (2011) DOI: 10.1063/1.3536821

119. "Imaging spin properties using spatially varying magnetic fields," V. P. Bhallamudi, A. J. Berger, D. E. Labanowski, D. Stroud and P. C. Hammel, *Journal Of Applied Physics* **111** 013902 (2012)
120. "Local magnetic characterization of (Ga,Mn)As continuous thin film using scanning probe force microscopy," Inhee Lee, Yuri Obukhov, Jongjoo Kim, Xia Li, Nitin Samarth, Denis V. Pelekhov, and P. Chris Hammel, *Phys. Rev. B* **85** 184402 (2012) DOI: 10.1103/PhysRevB.85.184402 URL: <http://link.aps.org/doi/10.1103/PhysRevB.85.184402>
121. "The role of diffusion in ferritin-induced relaxation enhancement of protons," Michael A. Boss and P. Chris Hammel, *Journal Of Magnetic Resonance* **217** 36–40, DOI: 10.1016/j.jmr.2012.02.005 (2012)
122. "Dynamics of Histone Tails within Chromatin," Bernier, MW; Bravo, J; Branson, C; Jaroniec, CP; Hammel, PC; Poirier, MG, *Biophysical Journal*, **104** 343A, Supplement: 1 (2013)
123. "Correlation of electrical spin injection and non-linear charge-transport in Fe/MgO/Si," Yong Pu, J. Beardsley, P. M. Odenthal, A. G. Swartz, R. K. Kawakami, P. C. Hammel, E. Johnston-Halperin, Jairo Sinova and J. P. Pelz, *Applied Physics Letters* **103** 012402 (2013)
124. "Anisotropy and Field-Sensing Bandwidth in Self-Biased Bismuth-Substituted Rare-Earth Iron Garnet Films: Measurement by Ferromagnetic Resonance Spectroscopy," Adur, R.; Lauback, S.; Banerjee, P.; Lee, I; Fratello, VJ; Hammel, PC, *IEEE Transactions On Magnetism* **49** 2899–2902 (June 2013)
125. "Structural transitions in a doped lanthanum cuprate," S.-H. Baek, P. C. Hammel, M. Hücker, B. Büchner, U. Ammerahl, A. Revcolevschi, and B. J. Suh, *Phys. Rev. B* **87**, 174505 (2013)
126. "Experimental Demonstration of Scanned Spin-Precession Microscopy," V. P. Bhallamudi, C. S. Wolfe, V. P. Amin, D. E. Labanowski, A. J. Berger, D. Stroud, J. Sinova, and P. C. Hammel, *Physical Review Letters* **111**, 117201 (2013) (Editor's Suggestion)
127. "Control of Magnetocrystalline Anisotropy by Epitaxial Strain in Double Perovskite $\text{Sr}_2\text{FeMoO}_6$ Films," Chunhui Du, Rohan Adur, Hailong Wang, Adam J. Hauser, Fengyuan Yang, and P. Chris Hammel, *Physical Review Letters* **110** 147204 (2013) DOI: 10.1103/PhysRevLett.110.147204
128. "Large Spin Pumping from Epitaxial $\text{Y}_3\text{Fe}_5\text{O}_{12}$ Thin Films to Pt and W Layers," H. L. Wang, C. H. Du, Y. Pu, R. Adur, P. C. Hammel, and F. Y. Yang, *Physical Review B Rapid Communications* **88** 100406(R) (2013) DOI: 10.1103/PhysRevB.88.100406 URL: <http://link.aps.org/doi/10.1103/PhysRevB.88.100406>
129. "Histone H3 and H4 N-Terminal Tails in Nucleosome Arrays at Cellular Concentrations Probed by Magic Angle Spinning NMR Spectroscopy," Min Gao, Philippe S. Nadaud, Morgan W. Bernier, Justin A. North, P. Chris Hammel, Michael G. Poirier, and Christopher P. Jaroniec, *J. Am. Chem. Soc.* **135** 1527815281, DOI: 10.1021/ja407526s (2013)
130. "Probing the Spin Pumping Mechanism: Exchange Coupling with Exponential Decay in $\text{Y}_3\text{Fe}_5\text{O}_{12}$ /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
131. "The effect of spin transport on spin lifetime in nanoscale systems," Jeremy Cardellino, Nicolas Scozzaro, Michael Herman, Andrew J. Berger, Chi Zhang, Kin Chung Fong, Ciriya Jayaprakash, Denis V. Pelekhov and P. Chris Hammel, *Nature Nanotechnology* **9** 343 (2014) DOI: 10.1038/NNANO.2014.39
132. "Strain-tunable magnetocrystalline anisotropy in epitaxial $\text{Y}_3\text{Fe}_5\text{O}_{12}$ thin films," Hailong Wang, Chunhui Du, P. Chris Hammel, and Fengyuan Yang, *Phys. Rev. B* **89** 134404 (2014)

133. "Scaling of spin Hall angle in 3d, 4d and 5d metals from $\text{Y}_3\text{Fe}_5\text{O}_{12}$ /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)
134. "Enhancement of Pure Spin Currents in Spin Pumping $\text{Y}_3\text{Fe}_5\text{O}_{12}$ /Cu/metal Trilayers through Spin Conductance Matching," Chunhui Du, Hailong Wang, Fengyuan Yang, and P. Chris Hammel, *Physical Review Applied* **1** 044004 (2014)
135. "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
136. "Spin current and inverse spin Hall effect in ferromagnetic metals probed by $\text{Y}_3\text{Fe}_5\text{O}_{12}$ -based spin pumping," Hailong Wang, Chunhui Du, P. Chris Hammel and Fengyuan Yang, *Applied Physics Letters* **104** 202405 (2014) <http://dx.doi.org/10.1063/1.4878540>
137. "Ultra-narrow ferromagnetic resonance in organic-based thin films grown via low temperature chemical vapor deposition," H. Yu, M. Harberts, R. Adur, Y. Lu, P.C. Hammel, E. Johnston-Halperin and A.J. Epstein, *Applied Physics Letters* **105** 012407 (2014) DOI: 10.1063/1.4887924
138. "Magnetization dynamics of cobalt grown on graphene, A.J. Berger, W. Amamou, S.P. White, R. Adur, Y. Pu, R.K. Kawakami and P.C. Hammel, *Journal Of Applied Physics* **115** 17C510 (2014)
139. "Dual-frequency ferromagnetic resonance to measure spin current coupling in multilayers," Rohan Adur, Chunhui Du, Hailong Wang, Sergei A. Manuilov, Fengyuan Yang and P. Chris Hammel, *Proc. SPIE* **9167** *Spintronics VII*, 91672J (2014)
140. "Antiferromagnonic Spin Transport from $\text{Y}_3\text{Fe}_5\text{O}_{12}$ into NiO," Hailong Wang, Chunhui Du, P. Chris Hammel and Fengyuan Yang, *Physical Review Letters* **113** 097202 (2014)
141. "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)
142. "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)
143. "A versatile LabVIEW and field-programmable gate array-based scanning probe microscope for in operando electronic device characterization," Andrew J. Berger, Michael R. Page, Jan Jacob, Justin R. Young, Jim Lewis, Lothar Wenzel, Vidya P. Bhallamudi, Ezekiel Johnston-Halperin, Denis V. Pelekhov, P. Chris Hammel, *Review of Scientific Instruments*, **85** 123702 (2014)
144. "Experimental and numerical understanding of localized spin wave mode behavior in broadly tunable spatially complex magnetic configurations," Chunhui Du, Rohan Adur, Hailong Wang, Sergei A. Manuilov, Fengyuan Yang, Denis V. Pelekhov, and P. Chris Hammel, *Physical Review B* **90** 214428 (2014)
145. "Electron Paramagnetic Resonance from a Single Biomolecule," R.M. Teeling-Smith, Y.W. Jung, N.J. Scozzaro, J. Cardellino, I. Rampersaud, J.A. North, M. Šimon, V.P. Bhallamudi, A. Rampersaud, E. Johnston-Halperin, M.G. Poirier and P.C. Hammel, *Biophysical Journal* **108** (2), Supplement: 1, 337A (2015)

146. "Nitrogen Vacancy Centres Nanoscale MRI," Vidya Praveen Bhallamudi and P. Chris Hammel, *Nature Nanotechnology* **10** 104 (2015)
147. "The Magnetic Particle In A Box: Analytic And Micromagnetic Analysis Of Probe-Localized Spin Wave Modes." Rohan Adur, Chunhui Du, Sergei A. Manuilov, Hailong Wang, Fengyuan Yang, Denis V. Pelekhov and P. Chris Hammel, *Journal of Applied Physics* **117** 17E108 (2015) <http://dx.doi.org/10.1063/1.4908156>
148. "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)
149. "Microscopic studies of nonlocal spin dynamics and spin transport" R. Adur, C.H. Du, J. Cardellino, N Scozzaro, C.S. Wolfe, H.L. Wang, M. Herman, V.P. Bhallamudi, D.V. Pelekhov, F.Y. Yang and P.C. Hammel," *Journal Of Applied Physics* **117** 172604 (2015)
150. "Y₃Fe₅O₁₂ spin pumping for quantitative understanding of pure spin transport and spin Hall effect in a broad range of materials," Chunhui Du, Hailong Wang, P. Chris Hammel and Fengyuan Yang, *Journal Of Applied Physics* **117** 172603 (2015), doi: 10.1063/1.4913813
151. "Imaging interfaces defined by abruptly varying internal magnetic fields by means of scanned nanoscale spin wave modes," CH Du, I Lee, R Adur, Y Obukhov, C Hamann, B Buchner, J McCord, DV Pelekhov, and PC Hammel, *Physical Review B* **92** (21) 214413 (2015)
152. "Spin pumping from spinwaves in thin film YIG," S. A. Manuilov, C. H. Du, R. Adur, H. L. Wang, V. P. Bhallamudi, F. Y. Yang and P. C. Hammel, *Applied Physics Letters* **107** 042405 (2015)
153. "Correlating spin transport and electrode magnetization in a graphene spin valve: Simultaneous magnetic microscopy and non-local measurements," A.J. Berger, M.R. Page, H. Wen, K.M. McCreary, V.P. Bhallamudi, R.K. Kawakami and P.C. Hammel, *Applied Physics Letters* **107** 142406 (2015)
154. "Ferromagnetic resonance spin pumping and electrical spin injection in silicon-based metal-oxide-semiconductor heterostructures," Y. Pu, P. M. Odenthal, R. Adur, J. Beardsley, A. G. Swartz, D. V. Pelekhov, M. E. Flatté, R. K. Kawakami, J. Pelz, P. C. Hammel, and E. Johnston-Halperin, *Physical Review Letters* **115** 246602 (2015)
155. "Nanofiber-based paramagnetic probes for rapid, real-time biomedical oximetry," V.P. Bhallamudi, R. Xue, C.M. Purser, K.F. Presley, Y.K. Banasavadi-Siddegowda, J. Hwang, B. Kaur, P.C. Hammel, M.G. Poirier, J.J. Lannutti, and R.P. Pandian, *Biomedical Microdevices* **18** 38 (2016)
156. "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)
157. "Spatially resolved detection of complex ferromagnetic dynamics using optically detected nitrogen-vacancy spins," C.S. Wolfe, S.A. Manuilov, C.M. Purser, R. Teeling-Smith, C. Dubs, P.C. Hammel and V.P. Bhallamudi, *Applied Physics Letters* **108** 232409 (2016)