

Curriculum Vitae: Peter E. Schiffer

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Education

Ph.D. Physics	Stanford University	1993
Thesis advisor: Douglas D. Osheroff		
B.S. Physics (with distinction)	Yale University	1988

Appointments

<i>Vice Chancellor for Research</i> University of Illinois at Urbana-Champaign	8/12 - present
<i>Professor of Physics</i> University of Illinois at Urbana-Champaign	8/12 - present
<i>Associate Vice President for Research and Director of Strategic Initiatives</i> Pennsylvania State University	4/07 - 8/12
<i>Professor of Physics</i> Pennsylvania State University	7/03 - 8/12
<i>Associate Professor of Physics</i> Pennsylvania State University	8/00 - 7/03
<i>Assistant Professor of Physics</i> University of Notre Dame	8/95 - 8/00
<i>Postdoctoral Member of Technical Staff</i> AT&T Bell Laboratories, Murray Hill, NJ	8/93-8/95

Honors

<i>Howard Schultz Award for Research in Physics</i> Yale University	1988
<i>Early Career Development Award</i> National Science Foundation	1997
<i>Presidential Early Career Award for Scientists and Engineers</i> Army Research Office	1997
<i>Alfred. P. Sloan Research Fellowship</i> Alfred. P. Sloan Foundation	1998
<i>Fellow of the American Physical Society</i>	2004
<i>Faculty Scholar Medal in the Physical Sciences</i> Pennsylvania State University	2006
<i>Ruth and Joel Spira Award for Teaching Excellence</i> Eberly College of Science, Pennsylvania State University	2008

Administrative Service at the University of Illinois at Urbana-Champaign

As Vice Chancellor for Research, responsible for providing leadership for campus-wide interdisciplinary research institutes, promoting new research initiatives, and overseeing the administrative and business processes that ensure the productive, safe, and ethical conduct of research at Illinois.

Reporting units include:

- Agricultural Animal Care and Use Program
 - Beckman Institute for Advanced Science and Technology
 - Carver Biotechnology Center
 - Center for Advanced Study (2012-2016)
 - Division of Animal Resources
 - Division of Research Safety
 - Illinois Program for Research in the Humanities (2015 – present)
 - Institute for Genomic Biology
 - Institute for Sustainability Energy and Environment (2014 – present)
 - Institutional Animal Care & Use Committee Office
 - Interdisciplinary Health Sciences Initiative
 - National Center for Supercomputing Applications
 - Office for the Protection of Research Subjects
 - Office of Corporate Relations (2016 – present)
 - Office of Sponsored Programs
 - Office of Proposal Development (2015 – present)
 - Prairie Research Institute
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- Member, University of Illinois at Urbana-Champaign Chancellor’s Cabinet
 - Member of Board of Managers, University of Illinois Research Park
 - Member of Board of Managers, Illinois Ventures
 - Member of Board of Directors, Illinois at Singapore Pte. Ltd.
 - Member of the Governing Board, BP Energy Biosciences Institute (2012-2015)

Administrative Service at Penn State

University Level

- Oversight of Limited Submission Grant Proposal Selections (2007–2012)
- Director, Strategic Interdisciplinary Research Office (2010–2012)
- Chair, Task Force to Review Faculty Rate Approval Process (2011)
- Chair, Committee to Review Instructional Intellectual Property Policy (2011-2012)
- Chair, Research Administration Innovation Subcommittee of University Research Council (2010 – 2012)
- Worldwide Universities Network, Academic Advisory Group (2007–2012); Steering Committee (2007-2010); Steering Committee Chair (2011–2012)
- Co-Chair, Penn State Global Operations Policy Infrastructure Task Force (2010–2011)
- Chair, Organizing Committee for WUN Workshop on Adapting to Climate Change (2010)
- Chair, Network Science Initiative Committee (2008 –2009)
- Co-Chair, Review Committee for Center for Science in the Schools (2007–2008)
- Chair, University Park Greenhouse Task Force (2008)
- Co-Chair, Task Force on Globalization of Research and Graduate Education (2008)
- University Strategic Planning Council Task Force on Internationalization (2008)
- Penn State Councilor, Oak Ridge Associated Universities (2007–2012)
- Oversight of Animal Resource Program (2007–2009)
- Center for Nanoscale Science Executive Committee (2007–2012)
- Oversight of Office of Military and Security Programs (2007– 2010)
- Graduate Council (2001–2003 term)
 - Committee on Committees and Procedures and Committee on Graduate Research (2001–2)
 - Committee on Committees and Procedures, Committee on Programs and Courses, and Executive Committee (2002 –3)
- Intercollegiate Materials Program: ad hoc committee to reform program and merge with Materials Science Dept. graduate program (2003 –2005)
- Intercollegiate Materials Program Steering Committee (2002 –2005)
- Graduate School Committee to evaluate all graduate programs university-wide (2003–2004)
- Materials Research Institute Steering Committee (2004-present)
- Program Committee for new materials building (2005)

Physics Department

- Associate Department Head (July 2006 – April 2007)
- Director of Graduate Studies (2000–2002)
- Introductory Course Committee Chair (2002–2005)
- Elected to Faculty Peer Evaluation Committee (2001, 2002, 2004, 2005)
- Chair of Graduate Candidacy Committee (2001–2002)
- Chair of Promotion and Tenure Committee (2004-2005, 2005–2006)
- Chair of Faculty Search Committee (2005–2006)

Service to the Profession

American Physical Society

Officer, Division of Materials Physics (elected 3/09)

- Vice Chair, Chair Elect, Chair, and past Chair in subsequent years.
- Division of Materials Physics Program Chair for March 2011 American Physical Society General Meeting

Ad Hoc Committee to revise and update abstract sorting categories for American Physical Society General Meeting (2011)

Officer, Topical Group on Magnetism and its Applications (elected 3/02)
Vice Chair, Chair Elect, Chair, and past Chair in subsequent years

Co-Organizer of focus sessions on Magnetoresistive Oxides for the March 1997 and March 2002 American Physical Society General Meetings; focus sessions on Magnetic Semiconductors for the March 2006 American Physical Society General Meeting; focus sessions on Frustrated and Low-Dimensional Magnetic Materials for the March 2010 American Physical Society General Meeting.

Conference on Magnetism and Magnetic Materials

Program Committee member (1998, 2001, 2005).

Publications Editor (2001)

Program Co-Chair (2007)

Advisory Committee member (2006–2008)

Organizing Committee for Conference on Highly Frustrated Magnets (HFM 2000), Waterloo, Canada, (June, 2000); Scientific Advisory Committee for International Conference on Highly Frustrated Magnets (2003, 2008, and 2012).

Organizer, Tutorial on Physics of Granular Media, NASA Glenn Research Center (September, 2000).

Organizer, Physics of Frustration Workshop, Sante Fe, New Mexico (June, 2002).

National Advisory Committee for the 24th International Conference on Low Temperature Physics Orlando, FL (August, 2005)

Ad Hoc Review Committee Applied Physics Letters and Journal of Applied Physics (2009)

External Advisory Committee, Conference on Novel Phenomena in Frustrated Systems, Sante Fe, New Mexico (May 2011)

Editorial Board, New Journal of Physics (2011 - 2016)

Editorial Board, Physical Review B (2012-present)

Graduated Ph.D. Students

- Yee-kin Tsui (2000) *A study of a strongly geometrically frustrated magnet: gadolinium gallium garnet*
- Mallika Roy (2000) *A study of the rare earth manganites*
- Istvan Albert (2001) *Drag force in dense granular media*
- Joseph Snyder (2003) *Spin ice dynamics*
- Stephen Potashnik (2003) *Investigation into the physical properties of the diluted magnetic semiconductor gallium manganese arsenide* (co-advised with Prof. Nitin Samarth)
- Ruifang Wang (2007) *Geometrical magnetic frustration and demagnetization of artificial spin ice*
- Ben-Li Sheu (2007) *Investigation of III-V ferromagnetic semiconductors* (co-advised with Prof. Nitin Samarth)
- Benjamin Ueland (2007) *Cooperative magnetic relaxation in geometrically frustrated rare-earth pyrochlores*
- Ke Chen (2008) *Granular materials under vibration and thermal cycles*
- Daniel Costantino (2009) *A study on granular media: packing, intruding, and shocking*
- Mark Wilson (2010) *Exchange and crystalline orientation studies of the III-V Ferromagnetic semiconductor (Ga,Mn)As* (co-advised with Prof. Nitin Samarth)
- Jie Li (2011) *Study of artificial frustrated arrays of single domain ferromagnets*
- Maria Matthews (2012) *Field Dependent Spin Dynamics in $Dy_2Ti_2O_7$*
- Sheng Zhang (2013) *Tuning Geometries and Interactions of Artificial Frustrated Nanomagnets*
- Ian Gilbert (2015) *Ground States in Artificial Spin Ice*
- Brian Le (2016) *Magnetotransport of connected artificial spin ice*

Undergraduate Researchers Supervised (those who coauthored peer-reviewed publications)

- Rachel Barry
- Jason Bartell
- David Bernstein
- Isaac Carrasquillo
- Julia Cole
- Casey Conger
- Sebastian Diaz
- John Draskovic
- Bryce Fore
- David Garand
- Chris Grigas
- Andrew Harris
- Daniel Hornbaker
- Kit Klein
- Matthew Lohr
- William McConville
- Zachary Modig
- Andrew Morss
- Michael Paskvan
- Matthew Pelc
- Mark Pfeifer
- Shivakumar Rajagopalan
- John Sample

Publications

Total citations of more than 10,000 with Hirsch index of 50 (Web of Science)

1. “Magnon Thermal Conductivity of Solid ^3He in the U2D2 Antiferromagnetic Phase,” Y.P. Feng, P. Schiffer, D.D. Osheroff, Physical Review Letters **65**, 1450-1453 (1990).
2. “Heat Transport in a Nuclear Antiferromagnet,” D.D. Osheroff, Y.P. Feng, and P. Schiffer, Physica B **169**, 204-208 (1991).
3. “Anomalous NMR Frequency Shift in the Low-Field Phase of Solid ^3He ,” Y.P. Feng, P. Schiffer, D.D. Osheroff, Physical Review Letters **67**, 691-694 (1991).
4. “Strong Supercooling and Stimulation of the A-B Transition in Superfluid ^3He ,” P. Schiffer, M.T. O’Keefe, H. Fukuyama, and D.D. Osheroff, Physical Review Letters **69**, 120-123 (1992).
5. “Low Temperature Studies of the NMR Frequency Shift in Superfluid ^3He -A,” P. Schiffer, M.T. O’Keefe, H. Fukuyama, and D.D. Osheroff, Physical Review Letters **69**, 3096-3099 (1992).
6. “Thermal Boundary Conductance Between the U2D2 Solid and the B Superfluid Phases of ^3He ,” Y.P. Feng, P. Schiffer, D.D. Osheroff, and M.C. Cross, Journal of Low Temperature Physics **90**, 475-513 (1993).
7. “Magnetization of ^3He on Grafoil in the Low-Temperature Limit,” P. Schiffer, M.T. O’Keefe, D.D. Osheroff, and H. Fukuyama, Physical Review Letters **71**, 1402-1405 (1993).
8. “Low Temperature Magnetization of ^3He Films,” P. Schiffer, M.T. O’Keefe, D.D. Osheroff, and H. Fukuyama, Journal of Low Temperature Physics **94**, 489-513 (1994).
9. “Anisotropic Thermal Conduction in the Antiferromagnetic Spin-Ordered Phase of Solid ^3He ,” Y.P. Feng, P. Schiffer, and D.D. Osheroff, Physical Review B **49**, 8790-8796 (1994).
10. “Low Temperature Magnetization of Pure ^3He Films on Grafoil,” H. Fukuyama, P. Schiffer, M.T. O’Keefe, and D.D. Osheroff, Physica B **194-196**, 683-684 (1994).
11. “Radiation Induced Nucleation of the AB Transition in Superfluid ^3He ,” P. Schiffer, M.T. O’Keefe, M.D. Hildreth, H. Fukuyama, and D.D. Osheroff, Physica B **194-196**, 807-808 (1994).
12. “Investigation of the Field Induced Antiferromagnetic Phase Transition in the Frustrated Magnet: Gadolinium Gallium Garnet,” P. Schiffer, A.P. Ramirez, D.A. Huse and A.J. Valentino, Physical Review Letters **73**, 2500-2503 (1994).
13. “The AB Transition in Superfluid ^3He : Baked Alaska and Surface Effects,” P. Schiffer and D.D. Osheroff, Reviews of Modern Physics **67**, 491-501 (1995).

14. "Origin and Control of the 'Colossal' Magnetoresistance in Doped LaMnO_3 ," S-W. Cheong, H.Y. Hwang, P.G. Radaelli, D.E. Cox, M. Marezio, B. Batlogg, *P. Schiffer* and A.P. Ramirez, *Proceedings of Physical Phenomena at High Fields II*, World Scientific (1995).
15. "Nucleation of the AB Transition in Superfluid ^3He : Experimental and Theoretical Considerations," *P. Schiffer*, D.D. Osheroff, and A.J. Leggett, *Progress in Low Temperature Physics* **14**, Elsevier Science B.V., Amsterdam, Netherlands, W.P. Halperin, ed., (1995).
16. "Frustration Induced Spin Freezing in a Site-Ordered Magnet: Gadolinium Gallium Garnet," *P. Schiffer*, A.P. Ramirez, D.A. Huse, P.L. Gammel, U. Yaron, D.J. Bishop, and A.J. Valentino, *Physical Review Letters* **74**, 2379-2382 (1995).
17. "Low Temperature Magnetoresistance and the Magnetic Phase Diagram of $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$," *P. Schiffer*, A.P. Ramirez, W. Bao, and S-W. Cheong, *Physical Review Letters* **75**, 3336-3339 (1995).
18. "Simultaneous Structural, Magnetic, and Electronic Transitions in $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ with $x = 0.25$ and 0.50 ," P.G. Radaelli, D.E. Cox, M. Marezio, S-W. Cheong, *P.E. Schiffer*, and A.P. Ramirez, *Physical Review Letters* **75**, 4488-4491 (1995).
19. "Thermodynamic and Electron Diffraction Signatures of Charge and Spin Ordering in $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$," A. P. Ramirez, *P. Schiffer*, S-W. Cheong, C. H. Chen, W. Bao, T. T. M. Palstra, P.L. Gammel, D. J. Bishop, and B. Zegarski, *Physical Review Letters* **76**, 17, 3188-3191 (1996).
20. "Recent Experimental Progress in the Study of Geometrical Magnetic Frustration," *P. Schiffer* and A. P. Ramirez, *Comments on Condensed Matter Physics* **18**, 21-50 (1996).
21. "Interaction-Induced Spin Coplanarity in a Kagomé Compound: $\text{SrCr}_9\text{pGa}_{12-9\text{p}}\text{O}_{19}$," *P. Schiffer*, A.P. Ramirez, K.N. Franklin, and S.W. Cheong, *Physical Review Letters* **77**, 2085-2088 (1996).
22. "Colossal Magnetoresistance and Charge Ordering in $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$," A. P. Ramirez, S.-W. Cheong, and *P. Schiffer*, *Journal of Applied Physics* **81**, 5337-5342 (1997).
23. "Small Angle Neutron Scattering Studies of the Vortex Lattice in the UPT_3 Mixed State: Direct Structural Evidence for the $B \rightarrow C$ Transition," U. Yaron, P. L. Gammel, G. S. Boebinger, E. Bucher, D. J. Bishop, G. Aeppli, *P. Schiffer*, C. Broholm, K. Mortensen, *Physical Review Letters* **78**, 3185-3188 (1997).
24. "Controlled Temperature Broadening of Colossal Magnetoresistance in a Manganite Heterostructure," N. Kalechofsky, Y-K. Tsui, H. Reichenbach, P. McGinn, and *P. Schiffer*, *Journal of Applied Physics* **81**, 8115-8117 (1997).
25. "What Keeps Sandcastles Standing," D. J. Hornbaker, R. Albert, I. Albert, A.-L. Barabási, and *P. Schiffer*, *Nature* **387**, 765 (1997).
26. "A Two-Population Model for Anomalous Low Temperature Magnetism in Geometrically Frustrated Magnets," *P. Schiffer* and I. Daruka, *Physical Review B* **56**, 13712-13715 (1997).

27. "Maximum Angle of Stability in Wet and Dry Spherical Granular Media," R. Albert, I. Albert, D. J. Hornbaker, *P. Schiffer*, and A.-L. Barabási, Physical Review E **56**, R6271-6274 (1997).
28. "Transport Mechanisms in Doped LaMnO₃: Evidence for Polaron Formation," T.T.M. Palstra, A.P. Ramirez, S-W. Cheong, B.R. Zegarski, *P. Schiffer*, J. Zaanen, Physical Review B **56**, 5104-5107 (1997).
29. "From Double Exchange to Superexchange in Charge-Ordering Perovskite Manganites," W. Bao, J.D. Axe, C.H. Chen, S.-W. Cheong, *P. Schiffer*, and M. Roy, Physica B **241-243**, 418-420 (1998).
30. "Doping-Induced Transition from Double Exchange to Charge Order in La_{1-x}Ca_xMnO₃ Near x = 0.50," M. Roy, J. F. Mitchell, A. P. Ramirez, and *P. Schiffer* Physical Review B **58**, 5185-5188 (1998).
31. "Slow Drag in a Granular Medium," R. Albert, M. A. Pfeifer, A.-L. Barabási, and *P. Schiffer*, Physical Review Letters **82**, 205-208 (1999).
32. "A Study of the Low Temperature Thermal Properties of the Geometrically Frustrated Magnet: Gadolinium Gallium Garnet," Y. K. Tsui, N. Kalechofsky, C. A. Burns, and *P. Schiffer*, Journal of Applied Physics **85**, 4512-4514 (1999).
33. "The Physics of Sandcastles: Maximum Angle of Stability in Wet and Dry Granular Media," A.-L. Barabási, R. Albert, and *P. Schiffer*, Physica A **266**, 366-371 (1999).
34. "The Physical Basis for A-B Nucleation" *P. Schiffer*, D. D. Osheroff, and A. J. Leggett, Physical Review Letters **82**, 3925 (1999).
35. "Magnetic Field-Induced Transitions from Spin Glass to Liquid to Long Range Order in a 3D Geometrically Frustrated Magnet," Y. K. Tsui, C. A. Burns, J. Snyder, and *P. Schiffer*, Physical Review Letters **82**, 3532-3535 (1999).
36. "A Study of the Magnetic and Electrical Crossover Region of La_{0.5±δ}Ca_{0.5±δ}MnO₃," M. Roy, J. F. Mitchell, A. P. Ramirez, and *P. Schiffer*, Journal of Physics: Condensed Matter **11**, 4843-4859 (1999).
37. "Liquid-Induced Transitions in Granular Media," P. Tegzes, R. Albert, M. Paskvan, A.-L. Barabási, T. Vicsek, and *P. Schiffer*, Physical Review E **60**, 5823-5826 (1999).
38. "Thermal Studies of the Spin Liquid State and Analog to the Helium-4 Melting Curve in a Geometrically Frustrated Magnet," Y. K. Tsui, C. A. Burns, J. Snyder, and *P. Schiffer*, Physica B **280**, 296-300 (2000).
39. "Ferromagnetic Semiconductors and Their Nanostructures: New Opportunities and Challenges," J. K. Furdyna, *P. Schiffer*, Y. Sasaki, S. J. Potashnik, and X. Y. Liu, Proceedings of the NATO Workshop on Optoelectronic Materials: NATO Science Series, Vol. 81, edited by M. L. Sadowski, M. Potemski, and M. Grynberg (Kluwer, Dordrecht, 2000), 211-224.

40. “An Experimental Study of the Fluctuations in Granular Drag,” István Albert, Pál Tegzes, Réka Albert, John Sample, Albert-László Barabási, Tamás Vicsek, B. Kahng and *Peter Schiffer* in Proc. Materials Research Society Symposium Series, **627**, ed. S. Sen, M. Hunt (2000).
41. “Jamming and Fluctuations in Granular Drag,” I. Albert, P. Tegzes, B. Kahng, R. Albert, J. Sample, M. Pfiefer, A.-L. Barabási, T. Vicsek, and *P. Schiffer*, Physical Review Letters **84**, 5122-5125 (2000).
42. “Field Dependent Specific-Heat of Rare Earth Manganites,” M. Roy, J. F. Mitchell, S. J. Potashnik, and *P. Schiffer*, Journal of Magnetism and Magnetic Materials **218**, 191-197 (2000).
43. “Magnetoresistance,” *P. Schiffer* and R. B. van Dover, McGraw-Hill 2000 Yearbook of Science and Technology.
44. “Soft Spin Waves in the Low-Temperature Thermodynamics of $\text{Pr}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$,” M. Roy, J. F. Mitchell, A. P. Ramirez, and *P. Schiffer*, Physical Review B **62**, 13876-13879 (2000).
45. “Time Dependent Effects and Transport Evidence for Phase Separation in $\text{La}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$,” M. Roy, J. F. Mitchell, and *P. Schiffer*, Journal of Applied Physics **87**, 5831-5833 (2000).
46. “Low Temperature Magneto-thermodynamics of $\text{Pr}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$,” M. Roy, J. F. Mitchell, A. P. Ramirez, and *P. Schiffer*, Philosophical Magazine B, **81**, 415-429 (2001).
47. “Phase Separation and the Low-Field Bulk Magnetic Properties of $\text{Pr}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$,” I. G. Deac, J. F. Mitchell, and *P. Schiffer*, Physical Review B **63**, 172408 – 1-4 (2001).
48. “Intrinsic Exchange Biasing in MnAs Epilayers Grown on (001) GaAs,” S. H. Chun, S. J. Potashnik, K. C. Ku, J. J. Berry, *P. Schiffer*, and N. Samarth, Applied Physics Letters **78**, 2530-2532 (2001).
49. “Thermodynamic Study of Excitations in a 3D Spin Liquid,” Y.K. Tsui, J. Snyder, and *P. Schiffer*, Physical Review B **64**, 012412 – 1-4 (2001).
50. “How Spin Ice Freezes,” J. Snyder, J. S. Slusky, R. J. Cava, and *P. Schiffer*, Nature **413**, 48 - 51 (2001).
51. “Two-Carrier Transport in Epitaxially Grown MnAs,” J. J. Berry, S. J. Potashnik, S. H. Chun, K. C. Ku, *P. Schiffer*, and N. Samarth Physical Review B **64**, 052408 – 1-4 (2001).
52. “Stick-Slip Fluctuations in Granular Drag,” I. Albert, P. Tegzes, R. Albert, J. G. Sample, A.-L. Barabási, T. Vicsek, and *P. Schiffer*, Physical Review E **64**, 031307 – 1-9 (2001).
53. “Repose Angle Studies of Wet Granular Media,” *P. Schiffer*, P. Tegzes, T. Vicsek, R. Albert A.-L. Barabási, in Powders and Grains 2001: Proceedings of Fourth International Conference on Micromechanics of Granular Media, ed. Y. Kishino, (A. A. Balkema, Lisse, 2001).

54. “The Drag Force in Granular Media,” *P. Schiffer*, I. Albert, J. G. Sample, and A.-L. Barabási, in Powders and Grains 2001: Proceedings of Fourth International Conference on Micromechanics of Granular Media, ed. Y. Kishino, (A. A. Balkema, Lisse, 2001).
55. “Effects of Annealing Time on Defect-Controlled Ferromagnetism in $\text{Ga}_{1-x}\text{Mn}_x\text{As}$,” S. J. Potashnik, K. C. Ku, S. H. Chun, J. J. Berry, N. Samarth, and *P. Schiffer*, Applied Physics Letters **79**, 1495-1497 (2001).
56. “Re-Entrant Behavior of a 3D Spin Liquid Phase and Analog to the ^4He Melting Curve in a Geometrically Frustrated Magnet,” Y.K. Tsui, J. Snyder, and *P. Schiffer* Canadian Journal of Physics **79**, 1439–1446 (2001).
57. “Granular Drag on a Discrete Object: Shape Effects on Jamming,” I. Albert, J. G. Sample, A. J. Morss, S. Rajagopalan, A.-L. Barabási, and *P. Schiffer*, Physical Review E **64**, 061303 – 1-4 (2001).
58. “Modeling Relaxation and Jamming in Granular Media,” B. Kahng, I. Albert, *P. Schiffer*, and A.-L. Barabási, Physical Review E **64**, 051303 – 1-4 (2001).
59. “Ferromagnetic III-Mn-V Semiconductor Multilayers: Manipulation of Magnetic Properties by Proximity Effects and Interface Design,” J. K. Furdyna, X. Liu, Y. Sasaki, S. J. Potashnik and *P. Schiffer* Journal of Applied Physics **91**, 7490-7495 (2002).
60. “Saturated Ferromagnetism and Magnetization Deficit in Optimally Annealed $\text{Ga}_{1-x}\text{Mn}_x\text{As}$ Epilayers” S. J. Potashnik, K. C. Ku, R. Mahendiran, S. H. Chun, R. F. Wang, N. Samarth, and *P. Schiffer* Physical Review B **66**, 012408 – 1-4 (2002).
61. “Magnetic Relaxation in $\text{La}_{0.250}\text{Pr}_{0.375}\text{Ca}_{0.375}\text{MnO}_3$ with Varying Phase Separation”, I. G. Deac, S. V. Diaz, B. G. Kim, S.-W. Cheong, and *P. Schiffer* Physical Review B **65**, 174426 – 1-6 (2002).
62. “Above-Room-Temperature Ferromagnetism in GaSb/Mn Digital Alloys” X. Chen, M. Na, M. Cheon, S. Wang, H. Luo, B.D. McCombe, X. Liu, Y. Sasaki, T. Wojtowicz, J. K. Furdyna, S. J. Potashnik, and *P. Schiffer* Applied Physics Letters **81**, 511-513 (2002).
63. “Growth and Characterization of Ferromagnetic $\text{Ga}_{1-x}\text{Mn}_x\text{As}$ Epilayers on (001) ZnSe” S. H. Chun, K. C. Ku, S. J. Potashnik, *P. Schiffer*, and N. Samarth Journal of Vacuum Science and Technology B **20**, 1266-1269 (2002).
64. “Avalanche Dynamics in Wet Granular Materials” P. Tegzes, T. Vicsek, and *P. Schiffer* Physical Review Letters **89**, 094301 – 1-4 (2002).
65. “Intrinsic Chemical and Structural Inhomogeneity in Lightly Doped $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$,” Tomohiro Shibata, Bruce Bunker, John Mitchell, and *Peter Schiffer* Physical Review Letters **88**, 207205 – 1-4 (2002).
66. “Dirty Spin Ice: The Effect of Dilution on Spin Freezing in $\text{Dy}_2\text{Ti}_2\text{O}_7$ ” J. Snyder, J. S. Slusky, R. J. Cava, and *P. Schiffer* Physical Review B **66**, 064432 – 1-5 (2002).

67. “Spin-Polarized Tunneling in Hybrid Metal-Semiconductor Magnetic Tunnel Junctions” S. H. Chun, S. J. Potashnik, K. C. Ku, *P. Schiffer*, and N. Samarth *Physical Review B* **66**, 100408 – 1-5 (2002).
68. “Magnetization and Resistivity Steps in the Phase Separated $\text{Pr}_{0.5}\text{Ca}_{0.5}\text{Mn}_{1-x}\text{Ni}_x\text{O}_3$ manganites” S. Hebert, A. Maignan, V. Hardy, C. Martin, M. Hervieu, B. Raveau, R. Mahendiran, and *P. Schiffer*, *European Physical Journal B* **29**, 419-424 (2002).
69. “Ultra-Sharp Magnetization Steps in Perovskite Manganites” R. Mahendiran, A. Maignan, S. Hébert, C. Martin, M. Hervieu, B. Raveau, J. F. Mitchell, and *P. Schiffer*, *Physical Review Letters* **89**, 286602 – 1-4 (2002).
70. “Magnetic Frustration Squeezed Out” *P. Schiffer* *Nature* **420**, 35-38 (2002).
71. “Phase Separation, Time Dependent Effects, and Glassy Behavior in the CMR Manganites” *P. Schiffer*, in *Nanoscale Phase Separation and Colossal Magnetoresistance* edited by E. Dagotto (Springer-Verlag, Heidelberg, 2003).
72. “Novel Ferromagnetism in Digital GaAs/Mn and GaSb/Mn Alloys” B. D. McCombe, M. Na, X. Chen, M. Cheon, S. Wang, H. Luo, X. Liu, Y. Sasaki, T. Wojtowicz, J. K. Furdyna, S. J. Potashnik, *P. Schiffer*, *Physica E* **16**, 90-98 (2003).
73. “Development of Correlations in the Dynamics of Wet Granular Avalanches” P. Tegzes, T. Vicsek, and *P. Schiffer* *Physical Review E* **67**, 051303 – 1-17 (2003).
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164. “Magnetothermal study of the hybrid frustrated magnet $\text{Dy}_{2-x}\text{Tb}_x\text{Ti}_2\text{O}_7$ ”, X. Ke, D. V. West, R. J. Cava, and *P. Schiffer* Physical Review B **80**, 144426 – 1-4 (2009).
165. “Comparing artificial frustrated magnets by tuning the symmetry of nanoscale permalloy arrays” J. Li, X. Ke, S. Zhang, D. Garand, C. Nisoli, P. Lammert, V. H. Crespi, and *P. Schiffer* Physical Review B **81**, 092406 – 1-4 (2010).
166. “Magnetic properties of $\text{Ba}_2\text{HoSbO}_6$ with a frustrated lattice geometry” S. Calder, X. Ke, F. Bert, A. Amato, C. Baines, C. Carboni, R. J. Cava, A. Daoud-Aladine, P. Deen, T. Fennell, A. D. Hillier, H. Karunadasa, J. W. Taylor, P. Mendels, *P. Schiffer*, and S. T. Bramwell Physical Review B **81**, 064425 – 1-9 (2010).

167. “Coexisting magnetic order and cooperative paramagnetism in the stuffed pyrochlore $Tb_{2+x}Ti_{2-2x}Nb_xO_7$ ” B. G. Ueland, J. S. Gardner, A. J. Williams, M. L. Dahlberg, J. G. Kim, Y. Qiu, J. R. D. Copley, *P. Schiffer*, and R. J. Cava *Physical Review B* **81**, 060408 – 1-4 (2010).
168. “Interlayer and interfacial exchange coupling in ferromagnetic metal/semiconductor heterostructures” M. J. Wilson, M. Zhu, R. C. Myers, D. D. Awschalom, *P. Schiffer*, and N. Samarth, *Physical Review B* **81**, 045319 – 1-4 (2010).
169. “Optimized Synthesis and Magnetic Properties of Intermetallic Au_3Fe_{1-x} , Au_3Co_{1-x} , and Au_3Ni_{1-x} Nanoparticles” James F. Bondi, Rajiv Misra, Xianglin Ke, Ian T. Sines, *Peter Schiffer*, Raymond E. Schaak, *Chemistry of Materials* **22**, 3988-3994 (2010).
170. “Colloidal Synthesis of Non-Equilibrium Wurtzite-Type MnSe” Ian T. Sines, Rajiv Misra, *Peter Schiffer*, and Raymond E. Schaak, *Angewandte Chemie* **49**, 4638-4640 (2010).
171. “Adsorption-controlled growth of $BiMnO_3$ films by molecular-beam epitaxy”, J. H. Lee, X. Ke, R. Misra, J. F. Ihlefeld, X. S. Xu, Z. G. Mei, T. Heeg, M. Roeckerath, J. Schubert, Z. K. Liu, J. L. Musfeldt, *P. Schiffer*, and D. G. Schlom, *Applied Physics Letters* **96**, 262905 – 1-3 (2010).
172. “A strong ferroelectric ferromagnet created by means of spin–lattice 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*, Venkatraman Gopalan, Ezekiel Johnston-Halperin, Darrell G. Schlom, *Nature* **466**, 954-958 (2010).
173. “Effective Temperature in an Interacting Vertex System: Theory and Experiment on Artificial Spin Ice”, Cristiano Nisoli, Jie Li, Xianglin Ke, D. Garand, *Peter Schiffer*, and Vincent H. Crespi, *Physical Review Letters* **105**, 047205 – 1-4 (2010).
174. “Comparing frustrated and unfrustrated clusters of single-domain ferromagnetic islands” J. Li, S. Zhang, J. Bartell, C. Nisoli, X. Ke, Paul E. Lammert, Vincent H. Crespi, and *P. Schiffer*, *Physical Review B* **82**, 134407 – 1-5 (2010).
175. “Direct entropy determination and application to artificial spin ice” Paul E. Lammert, Xianglin Ke, Jie Li, Cristiano Nisoli, David M. Garand, Vincent H. Crespi, and *Peter Schiffer*, *Nature Physics* **6**, 786-789 (2010).
176. “Experimental Determination of Quantum and Centroid Capacitance in Arsenide–Antimonide Quantum-Well MOSFETs Incorporating Nonparabolicity Effect” Ashkar Ali, Himanshu Madan, Rajiv Misra, Ashish Agrawal, *Peter Schiffer*, J. Brad Boos, Brian R. Bennett, and Suman Datta *IEEE Transactions on Electron Devices* **58**, 1397-1403 (2011).
177. “Bridging hcp-Ni and Ni_3C via a Ni_3C_{1-x} Solid Solution: Tunable Composition and Magnetism in Colloidal Nickel Carbide Nanoparticles” Zachary L. Schaefer, Kaitlyn M. Weeber, Rajiv Misra, *Peter Schiffer*, and Raymond E. Schaak *Chemistry of Materials* **23**, 2475-2480 (2011).

178. “The Zintl ion $[\text{As}_7]^{2-}$: an example of an electron-deficient As_x radical anion” Sukhendu Mandal, Ran Liu, Arthur C. Reber, Meichun Qian, Héctor M. Saavedra, Xianglin Ke, *Peter Schiffer*, Saikat Sen, Paul S. Weiss, Shiv N. Khanna and Ayusman Sen *Chemical Communications* **47**, 3126-3128 (2011).
179. “Low-velocity granular drag in reduced gravity” D. J. Costantino, J. Bartell, K. Scheidler, and *P. Schiffer* *Physical Review E* **83**, 011305 – 1-4 (2011).
180. “Low-temperature dynamic freezing and the fragility of ordering in $\text{Tb}_2\text{Sn}_2\text{O}_7$ ” M. L. Dahlberg, M. J. Matthews, P. Jiramongkolchai, R. J. Cava, and *P. Schiffer* *Physical Review B* **83**, 140410(R) – 1-4 (2011).
181. “Measurements of Nanoscale Domain Wall Flexing in a Ferromagnetic Thin Film” A. L. Balk, M. E. Nowakowski, M. J. Wilson, D. W. Rench, *P. Schiffer*, D. D. Awschalom, and N. Samarth *Physical Review Letters* **107**, 077205 – 1-4 (2011).
182. “Ignoring Your Neighbors: Moment Correlations Dominated by Indirect or Distant Interactions in an Ordered Nanomagnet Array,” Sheng Zhang, Jie Li, Jason Bartell, Xianglin Ke, Cristiano Nisoli, Paul E. Lammert, Vincent H. Crespi, and *Peter Schiffer* *Physical Review Letters* **107**, 117204 – 1-4 (2011).
183. “Structural and magnetic characteristics of MnAs nanoclusters embedded in Be-doped GaAs,” D. Rench, *P. Schiffer*, and N. Samarth *Physical Review B* **84**, 094434 – 1-8 (2011).
184. “Purification and Magnetic Interrogation of Hybrid Au- Fe_3O_4 and FePt- Fe_3O_4 Nanoparticles”, Jacob S. Beveridge, Matthew R. Buck, James F. Bondi, Rajiv Misra, *Peter Schiffer*, Raymond E. Schaak, Mary Elizabeth Williams *Angewandte Chemie* **123**, 10049-10053 (2011).
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186. “Magnetization states and switching in narrow-gapped ferromagnetic nanorings,” Jie Li, Sheng Zhang, Chris Grigas, Rajiv Misra, Jason Bartell, Vincent H. Crespi, and *Peter Schiffer* *AIP Advances* **2**, 012136 – 1-6 (2012).
187. “Interplay between ferromagnetism, surface states, and quantum corrections in a magnetically doped topological insulator,” Duming Zhang, Anthony Richardella, David W. Rench, Su-Yang Xu, Abhinav Kandala, Thomas C. Flanagan, Haim Beidenkopf, Andrew L. Yeats, Bob B. Buckley, Paul V. Klimov, David D. Awschalom, Ali Yazdani, *Peter Schiffer*, M. Zahid Hasan, and Nitin Samarth, *Physical Review B* **86**, 205127 – 1- 9 (2012).
188. The adsorption-controlled growth of LuFe_2O_4 by molecular-beam epitaxy,” Charles M. Brooks, Rajiv Misra, Julia A. Mundy, Lei A. Zhang, Brian S. Holinsworth, Kenneth R. O’Neal,

Tassilo Heeg, Willi Zander, J. Schubert, Janice L. Musfeldt, Zi-Kui Liu, David A. Muller, *Peter Schiffer*, and Darrell G. Schlom, *Applied Physics Letters* **101**, 132907- 1-4 (2012).

189. “Unusual field dependence of spin fluctuations on different timescales in $Tb_2Ti_2O_7$,” P. J. Baker, M. J. Matthews, S. R. Giblin, *P. Schiffer*, C. Baines, and D. Prabhakaran, *Physical Review B* **86**, 094424 -1- 6 (2012).

190. “Perpendicular Magnetization and Generic Realization of the Ising Model in Artificial Spin Ice,” Sheng Zhang, Jie Li, Ian Gilbert, Jason Bartell, Michael J. Erickson, Yu Pan, Paul E. Lammert, Cristiano Nisoli, K. K. Kohli, Rajiv Misra, Vincent H. Crespi, Nitin Samarth, C. Leighton, and *Peter Schiffer*, *Physical Review Letters* **109**, 087201 – 1-4 (2012).

191. “High-temperature onset of field-induced transitions in the spin-ice compound $Dy_2Ti_2O_7$,” M. J. Matthews, C. Castelnovo, R. Moessner, S. A. Grigera, D. Prabhakaran, and *P. Schiffer*, *Physical Review B* **86**, 214419 – 1-6 (2012).

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195. “Artificial Spin Ice: Controlling Geometry, Engineering Frustration,” Cristiano Nisoli, Roderich Moessner, and *Peter Schiffer*, *Reviews of Modern Physics* **85**, 1473-1490 (2013).

196. “Solution-Phase Synthesis and Magnetic Properties of Single-Crystal Iron Germanide Nanostructures,” D.D. Vaughn, D. Sun, J. A. Moyer, A.J. Biacchi, R. Misra, *P. Schiffer*, and R. E. Schaak, *Chemistry of Materials* **25**, 4396-44-1 (2013).

197. “Intrinsic magnetic properties of hexagonal $LuFeO_3$ and the effects of nonstoichiometry,” J. A. Moyer, R. Misra, J. A. Mundy, C. M. Brooks, J. T. Heron, D. A. Muller, D. G. Schlom, and *P. Schiffer*, *APL Materials* **2**, 012106-1-4 (2014).

198. “Epitaxial growth of VO_2 by periodic annealing,” J. W. Tashman, J. H. Lee, H. Paik, J. A. Moyer, R. Misra, J. A. Mundy, T. Spila, T. A. Merz, J. Schubert, D. A. Muller, *P. Schiffer*, D. G. Schlom, *Applied Physics Letters* **104**, 063104-1-3 (2014).

199. “Emergent ice rule and magnetic charge screening from vertex frustration in artificial spin ice,” Ian Gilbert, Gia-Wei Chern, Sheng Zhang, Liam O’Brien, Bryce Fore, Cristiano Nisoli, and *Peter Schiffer*, *Nature Physics* **10**, 670–675 (2014).

200. “Nonmonotonic residual entropy in diluted spin ice: A comparison between Monte Carlo simulations of diluted dipolar spin ice models and experimental results”, T. Lin, X. Ke, M. Thesberg, *P. Schiffer*, R. G. Melko, and M. J. P. Gingras, *Physical Review B* **90**, 214433-1-11 (2014).
201. “Effects of exchange bias on magnetotransport in permalloy kagome artificial spin ice,” B. L. Le, D. W. Rench, R. Misra, L. O’Brien, C. Leighton, N. Samarth and P. Schiffer, *New Journal of Physics* **17**, 023047-1-7 (2015).
202. “A Novel, Layered Phase in Ti-Rich SrTiO₃ Epitaxial Thin Films”, Sungki Lee, Anoop R. Damodaran, Prashun Gorai, Nuri Oh, Jarrett A. Moyer, Ji-Hwan Kwon, Naheed Ferdous, Amish Shah, Zuhuang, Chen, Eric Breckenfeld, R. V. K. Mangalam, Paul V. Braun, *Peter Schiffer*, Moonsub Shim, Jian-Min Zuo, Elif Ertekin, and Lane W. Martin *Advanced Materials* **27**, 861–868 (2015).
203. “Magnetically disordered phase in epitaxial iron-deficient Fe₃O₄ thin films” J. A. Moyer, S. Lee, *P. Schiffer*, and L. W. Martin, *Physical Review B* **91**, 064413-1-10 (2015).
204. “Enhanced electrical and magnetic properties in La_{0.7}Sr_{0.3}MnO₃ thin films deposited on CaTiO₃-buffered silicon substrates”, C. Adamo, L. Méchin, T. Heeg, M. Katz, S. Mercone, B. Guillet, S. Wu, J.-M. Routoure, J. Schubert, W. Zander, R. Misra, *P. Schiffer*, X. Q. Pan, and D. G. Schlom *APL Materials* **3**, 062504 -1-10 (2015).
205. “Magnetic Structure and Ordering of Multiferroic Hexagonal LuFeO₃,” Steven M. Disseler, Julie A. Borchers, Charles M. Brooks, Julia A. Mundy, Jarrett A. Moyer, Daniel A. Hillsberry, Eric L. Thies, Dmitri A. Tenne, John Heron, Megan E. Holtz, James D. Clarkson, Gregory M. Stiehl, *Peter Schiffer*, David A. Muller, Darrell G. Schlom, and William D. Ratcliff, *Physical Review Letters* **114**, 217602-1-5 (2015).
206. “Epitaxial growth of highly-crystalline spinel ferrite thin films on perovskite substrates for all-oxide devices,” Jarrett A. Moyer, Ran Gao, *Peter Schiffer*, and Lane W. Martin, *Scientific Reports* **5**, 10363-1-11 (2015).
207. “Quenched crystal-field disorder and magnetic liquid ground states in Tb₂Sn_{2-x}Ti_xO₇,” B. D. Gaulin, E. Kermarrec, M. L. Dahlberg, M. J. Matthews, F. Bert, J. Zhang, P. Mendels, K. Fritsch, G. E. Granroth, P. Jiramongkolchai, A. Amato, C. Baines, R. J. Cava, and *P. Schiffer*, *Physical Review B* **91**, 245141-1-6 (2015).
208. “Direct visualization of memory effects in artificial spin ice”, I. Gilbert, G.W. Chern, B. Fore, Y. Y. Lao, S. Zhang, C. Nisoli, and *P. Schiffer* *Physical Review B* **92**, 104417 -1- 4 (2015).
209. “Transport properties of ultra-thin VO₂ films on (001) TiO₂ grown by reactive molecular-beam epitaxy”, Hanjong Paik, Jarrett A. Moyer, Timothy Spila, Joshua W. Tashman, Julia A. Mundy, Eugene Freeman, Nikhil Shukla, Jason M. Lapano, Roman Engel-Herbert, Willi Zander,

Jürgen Schubert, David A. Muller, Suman Datta, *Peter Schiffer* and Darrell G. Schlom Applied Physics Letters **107**, 163101-1-3 (2015).

210. “Emergent reduced dimensionality by vertex frustration in artificial spin ice” Ian Gilbert, Yuyang Lao, Isaac Carrasquillo, Liam O’Brien, Justin D. Watts, Michael Manno, Chris Leighton, Andreas Scholl, Cristiano Nisoli, and *Peter Schiffer*, Nature Physics **12**, 162–165 (2016).

211. “Frustration by design”, Ian Gilbert, Cristiano Nisoli and *Peter Schiffer* Physics Today **69**, 54-59 (2016).

212. “Atomically engineered ferroic layers yield a room - temperature magnetoelectric multiferroic”, Julia A. Mundy, Charles M. Brooks, Megan E. Holtz, Jarrett A. Moyer, Hena Das, Alejandro F. Rébola, John T. Heron, James D. Clarkson, Steven M. Disseler, Zhiqi Liu, Alan Farhan, Rainer Held, Robert Hovden, Elliot Padgett, Qingyun Mao, Hanjong Paik, Rajiv Misra, Lena F. Kourkoutis, Elke Arenholz, Andreas Scholl, Julie A. Borchers, William D. Ratcliff, Ramamoorthy Ramesh, Craig J. Fennie, *Peter Schiffer*, David A. Muller, and Darrell G. Schlom Nature **537**, 523–527 (2016).

Invited Talks and Seminars

1. “Strong Supercooling and Stimulation of the AB transition in Superfluid ^3He ” **American Physical Society April Meeting, Washington, DC** April 21, 1992.
2. “Two Dimensional Magnetism in the Second Layer of ^3He Adsorbed on Graphite” **American Physical Society March Meeting, Pittsburgh, PA**, March 25, 1994.
3. “A Case of Extreme Frustration: The Low Temperature Properties of Gadolinium Gallium Garnet” **Solid State Seminar, Stanford University**, Department of Applied Physics, June 1, 1995.
4. “A Case of Extreme Frustration: The Low Temperature Properties of Gadolinium Gallium Garnet” **Physics Colloquium, Western Michigan University**, Department of Physics, Kalamazoo, Michigan, November 14, 1995.
5. “Spin Freezing and Metamagnetism Induced by Geometrical Frustration in Gadolinium Gallium Garnet (GGG)” **Condensed Matter Seminar, Physics Department, University of Tsukuba**, Tsukuba, Japan, May 27, 1996.
6. “Thermodynamic, Transport, and Structural Characterizations of the Compositional Phase Diagram of $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ ” at the **1996 Joint Research Council for Atomic Technology Workshop on Spin-Charge-Lattice Coupled Phenomena in Perovskites**, Tsukuba, Japan, May 29, 1996.
7. “Spin Freezing and Metamagnetism Induced by Geometrical Magnetic Frustration in Gadolinium Gallium Garnet (GGG),” **Department of Physics Seminar, Brookhaven National Laboratory**, Upton, New York, June 26, 1996.
8. “Geometrically Frustrated Magnetic Systems” **Army Research Office Workshop on Nanoscale Design of Magnetic Materials**, Research Triangle Park, NC, September 17, 1996.
9. “Recent Experimental Results in Geometrically Frustrated Magnets” **Condensed Matter Seminar, University of Michigan**, Ann Arbor, November 12, 1996.
10. “The Compositional Phase Diagram of $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$: Colossal Magnetoresistance and More” **Condensed Matter Seminar, Michigan State University**, December 2, 1996.
11. “New Frustration in an Old System: Low Temperature Magnetism in Gadolinium Gallium Garnet (GGG)” **Institute of Physics, Condensed Matter and Materials Physics Conference**, York, England, December 19, 1996.
12. “Recent Experimental Results in Geometrically Frustrated Magnet” **Physics Department Colloquium, University of Illinois, Chicago**, January 29, 1997.
13. “The Compositional Phase Diagram of $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ ” **Condensed Matter Seminar, University of Wisconsin**, Madison, Wisconsin, February 6, 1997.

14. “The Compositional Phase Diagram of $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ ” **Condensed Matter Seminar, University of Chicago**, Chicago, Illinois, February 17, 1997.
15. “Common Features in Geometrically Frustrated Magnets and Interaction-Induced Spin Coplanarity in $\text{SrCr}_9\text{pGa}_{12-9\text{p}}\text{O}_{19}$ ” **March 1997 American Physical Society Meeting**.
16. “Geometrical Frustration in Magnets: Common Behavior and Unique Ground States” **Condensed Matter Seminar, Northwestern University Physics Department**, Evanston, Illinois, October 23, 1997.
17. “Geometrical Frustrated Antiferromagnets: Common Behavior and Unique Ground States” **Condensed Matter Seminar, Purdue University**, West Lafayette, Indiana, May 1, 1998.
18. “Beach Physics: Studies of Wetting and Drag Force on Granular Media” **Physics Division Colloquium, Argonne National Laboratory**, Argonne, Illinois, May 29, 1998.
19. “Geometrical Frustrated Antiferromagnets: Common Behavior and Unique Ground States,” **Seminar, Bell Laboratories**, Murray Hill, New Jersey, June 5, 1998.
20. “Beach Physics: Studies of Wetting and Drag Force on Granular Media” **Physics Department Colloquium, University of Toronto** Toronto, Canada, October 22, 1998.
21. “Geometrical Frustrated Antiferromagnets: Common Behavior and Unique Ground States,” **Condensed Matter Seminar, University of Toronto**, Toronto, Canada, October 23, 1998.
22. “Field-Induced Spin Glass to Liquid to Solid Transition in a Three-Dimensional Geometrically Frustrated Magnet,” **Condensed Matter Seminar, Princeton University**, Princeton, NJ, December 4, 1998.
23. “The Physics of Wet Granular Media” **Argonne Sanday: Workshop on the Physics of Granular Media**, Argonne, IL, February 6, 1999.
24. “Physics of Wetting and Drag Force in Granular Media” **Centennial Meeting of the American Physical Society**, Atlanta, GA March 24, 1999.
25. “Beach Physics: Studies of Wetting and Drag Force in Granular Media” **Seminar, Center for Nonlinear and Complex Systems, Duke University**, Durham, NC April 6, 1999.
26. “Geometrical Frustration in Magnets: Common Behavior and Unique Ground States” **Condensed Matter Seminar, University of Missouri**, Columbia, MO April 21, 1999.
27. “Geometrical Frustration in Magnets: Common Behavior and Unique Ground States” **Condensed Matter Seminar, University of Cincinnati**, Cincinnati, OH June 2, 1999.
28. “Spin Liquid and Analog to the Helium-4 Melting Curve in a Geometrically Frustrated Magnet” **22nd International Conference on Low Temperature Physics**, Helsinki, Finland, August 7, 1999.

29. “Physics of Wetting and Drag Force in Granular Media” **Seminar, Laboratory of Physics, Helsinki University of Technology**, Helsinki, Finland, August 10, 1999.
30. “Beach Physics: Studies of Wetting and Drag Force on Granular Media” **Physics Department Colloquium, Emory University** Atlanta, GA, September 24, 1999.
31. “Studies of Wetting and Drag Force on Granular Media” **Departmental Seminar, Department of Mechanical and Aerospace Engineering, University of Notre Dame** Notre Dame, IN, September 28, 1999.
32. “Geometrical Frustration in Magnets: Common Behavior and Unique Ground States” **Condensed Matter Seminar, Pennsylvania State University**, University Park, PA November 8, 1999.
33. “Studies of Wetting and Drag Force on Granular Media” **Condensed Matter Seminar, Pennsylvania State University**, University Park, PA November 9, 1999.
34. “Beach Physics: Studies of Wetting and Drag Force on Granular Media” **Physical Chemistry Seminar, University of Notre Dame** Notre Dame, IN, February 17, 2000.
35. “Wetting-Induced Effects in Granular Media” **Materials Research Society Spring Meeting** San Francisco, CA, April 27, 2000.
36. “Beach Physics: Studies of Wetting and Drag Force on Granular Media” **Condensed Matter Physics Seminar, Stanford University** Stanford, CA, April 27, 2000.
37. “Spin Liquid Thermodynamics in Gadolinium Gallium Garnet (GGG)” **Highly Frustrated Magnetism 2000** Waterloo, CA, June 13, 2000.
38. “Wet Granular Media and Slow Motion in Granular Media” **Lecture in Tutorial on Physics of Granular Media, NASA Glenn Research Center**, Cleveland, OH September 21, 2000.
39. “Beach Physics: Studies of Wetting and Drag Force on Granular Media” **Materials Research Lab Seminar, Pennsylvania State University**, University Park, PA September 27, 2000.
40. “Beach Physics: Studies of Wetting and Drag Force on Granular Media” **Brockhouse Institute Seminar, McMaster University** Hamilton, ON December 4, 2000.
41. “Studies of Wetting and Drag Force on Granular Media” **Center for Collective Phenomena in Restricted Geometries Seminar, Pennsylvania State University**, University Park, PA January 29, 2001.
42. “Spin Glass, Spin Liquid, and Spin Solid Phases in a Model Geometrically Frustrated Magnet” **Condensed Matter Seminar, University of Wisconsin**, Madison, WI February 15, 2001.

43. “Novel Ground States in Geometrically Frustrated Magnets: A Liquid and an Ice.” **Condensed Matter Seminar, Los Alamos National Lab**, Los Alamos, NM May 23, 2001.
44. “Drag Force and Jamming in Granular Media” **Applied Dynamics Seminar, University of Maryland**, College Park, MD March 7, 2002.
45. “Beach Physics: Studies of Wetting and Drag Force on Granular Media” **Physics Dept. Colloquium, Indiana University of Pennsylvania**, Indiana, PA, March 29, 2002.
46. “Novel Ground States in Geometrically Frustrated Magnets: A Liquid, a Glass and an Ice” **Material Science Division Colloquium, Argonne National Laboratory**, Argonne, IL May 8, 2002.
47. “Beach Physics: Studies of Wetting and Drag Force on Granular Media” **Condensed Matter Seminar, Northwestern University**, Evanston, IL, May 9, 2002.
48. “Non- Magnetic Vacancies and Correlated Spin Freezing in Spin Ice” **Workshop on the Physics of Frustration**, Sante Fe, NM, June 21, 2002.
49. “Stability and Avalanche Dynamics in Wet Granular Materials” **Gordon Conference on Granular and Granular-Fluid Flow**, Holderness, NH July 2, 2002.
50. “Glassiness, Local Inhomogeneity, and Metamagnetism in some Manganites” **Workshop on CMR Manganites and Related Transition Metal Oxides**, Telluride, CO July 16, 2002.
51. “Dynamic Spin Freezing in the Spin Ice Compound $Dy_2Ti_2O_7$ ” **23rd International Conference on Low Temperature Physics**, Hiroshima, Japan August 26, 2002.
52. “Beach Physics: Studies of Wetting and Drag Force on Granular Media” **Physics Dept. Colloquium, SUNY Buffalo**, Buffalo, NY, November 7, 2002.
53. “Beach Physics: Studies of Wetting and Drag Force on Granular Media” **Material Science Dept. Seminar, University of Pennsylvania**, Philadelphia, PA, February 6, 2003.
54. “Defect-Controlled Material Properties in the Ferromagnetic Semiconductor (Ga,Mn)As” **American Physical Society March Meeting**, Austin, TX, March 4, 2003.
55. “Sharp Metamagnetism in Perovskite Manganites and Something (almost) Completely Different: Ferromagnetism in $Ga_{1-x}Mn_xAs$ ”, **Workshop on “Phase Competition in Transition-Metal Oxides and Other Compounds”**, Berkeley, CA, May 14, 2003.
56. “Defect-Controlled Magnetism in the Ferromagnetic Semiconductor (Ga,Mn)As”. **International Workshop on Diluted Magnetic Semiconductors**, Lyon, France, June 12, 2003.
57. “Glassiness and Sharp Metamagnetism in Phase-Separated Manganites” **Summer College and Conference on the Physics and Chemistry of Rare-Earth Manganites**, Trieste, Italy June 16, 2003.

58. “Beach Physics” **Colloquium, Physics Dept., Lehigh University**, Bethlehem, PA, September 18, 2003.
59. “Low Temperature Spin States in Geometrically Frustrated Magnets: a Liquid, a Solid, and an Ice” **Condensed Matter Seminar, Physics Dept., University of Illinois**, Urbana, IL, October 3, 2003.
60. “Defect Controlled Ferromagnetism in (Ga,Mn)As” **Aspen Winter Conference: Spins in Nanostructures, Aspen Center for Physics**, Aspen, CO, January 6, 2004.
61. “Drag and Penetration Through the Sand” **Colloquium, Physics Dept., Emory University**, Atlanta, GA, January 30, 2004.
62. “Novel Phases in Geometrically Frustrated Magnets: a Liquid, a Glass, and an Ice” **Condensed Matter Seminar, Physics Dept., University of Florida**, Gainesville, FL, February 23, 2004.
63. “Freezing of Spin Ice” **Gordon Conference on Correlated Electron Systems**, Mt. Holyoke, MA, June 23, 2004.
64. “Drag and Penetration and Local Jamming in Granular Media” **Gordon Conference on Granular and Granular Fluid Flows (invited short talk)**, Colby College, ME, July 1, 2004.
65. “Defect-Controlled Ferromagnetism in the Canonical Ferromagnetic Semiconductor (Ga,Mn)As”, **Workshop on Nanomagnetism Using X-ray Techniques**, Lake Geneva, WI, August 30, 2004.
66. “Local Jamming: Drag and Penetration Through Granular Media” **Center for Nonlinear Systems Seminar, Physics Dept., University of Texas**, Austin, TX, November 10, 2004.
67. “Local Jamming: Drag and Penetration Through Granular Media” **Condensed Matter Physics Seminar, Physics Dept., Johns Hopkins University**, Baltimore, MD, December 1, 2004.
68. “Beach Physics” **Condensed Matter Physics Seminar**, Physics Dept., University College London, United Kingdom, January 24, 2005.
69. “Novel Phases in Geometrically Frustrated Magnets: a Liquid, a Glass, and an Ice”, **Condensed Matter Physics Seminar, Université Pierre et Marie Curie, Paris, France** January 26, 2005.
70. “Novel Phases and Freezing in Geometrically Frustrated Magnets” **Princeton Workshop on Strongly Correlated Electronic Materials**, Princeton, NJ, January 28, 2005.
71. “Local Jamming: Drag and Penetration Through Granular Media” **Meeting of the New York Section of the American Physical Society**, Rochester, NY, April 16, 2005.
72. “Defect Controlled Ferromagnetism in (Ga,Mn)As” **Workshop on Novel Electronic Materials**, Lexington, KY, April 25, 2005.

73. “Drag and Penetration through Granular Materials” **Conference on Granular Physics**, Kavli Institute for Theoretical Physics, Santa Barbara, CA, June 23, 2005.
74. “Beach Physics” **Departmental Colloquium, Physics Dept., Colgate University**, Hamilton, NY, September 20, 2005.
75. “Beach Physics” **Departmental Colloquium, Physics Dept., University of Waterloo**, Waterloo, Ontario, October 20, 2005.
76. “Freezing and Frozen States in Natural and Artificial Spin Ice” **Condensed Matter Seminar, McMaster University**, Hamilton, Ontario, October 21, 2005.
77. “Artificial and Natural Spin Ice” **American Physical Society March Meeting, Baltimore, MD**, March 13, 2006.
78. “Artificial Spin Ice: Frustration by Design” **Spintronics Conference**, Kavli Institute for Theoretical Physics, Santa Barbara, CA, March 22, 2006.
79. “Artificial Spin Ice: Frustration in a Patterned Array of Nanoscale Ferromagnetic Islands” **Center for Nanoscale Materials Users Meeting**, Argonne National Laboratory, Argonne, IL, May 2, 2006.
80. “Artificial Spin Ice: Frustration by Design” **Seminar, NIST National Center for Neutron Research**, Gaithersburg, MD, June 9, 2006.
81. “Spin Ice: Natural, Artificial, and Stuffed” **Correlated Electron Systems Gordon Research Conference**, South Hadley, MA, June 21, 2006.
82. “Fun in the Sand: Some Experiments in Granular Physics” **Condensed Matter Seminar**, University of Tennessee, Knoxville, TN, August 29 2006.
83. “Freezing and Frozen States in Natural and Artificial Spin Ice” **Materials Science and Technology Division Seminar**, Oak Ridge National Laboratory, Oak Ridge, TN, August 30 2006.
84. “Beach Physics: Experimental Studies of the Physics of Granular Materials” **Physical Chemistry Seminar**, Pennsylvania State University, University Park, PA, March 23 2007.
85. “Freezing in Diluted, Stuffed, and Artificial Spin Ice” **Condensed Matter Seminar**, Princeton University, Princeton, NJ, April 16, 2007.
86. “Freezing in Diluted, Stuffed, and Artificial Spin Ice” **Workshop on Highly Frustrated Magnets and Strongly Correlated Systems: From Non-Perturbative Approaches to Experiments**, International Center for Theoretical Physics, Trieste, Italy, August 9, 2007.
87. “Fun in the Sand: Some Experiments in Granular Physics” **Physics Department Colloquium**, SUNY Stony Brook October 2, 2007.

88. “Natural, Artificial, and Stuffed Spin Ice” **Condensed Matter Seminar**, Brookhaven National Laboratory, Brookhaven, NY October 3, 2007.
89. “Frustration in a Patterned Array of Nanoscale Ferromagnetic Islands: Artificial Spin Ice” **American Physical Society March Meeting**, New Orleans, LA, March 12, 2008.
90. “Artificial Frustrated Magnets” **Highly Frustrated Magnetism 2008, Braunschweig, Germany**, September 9, 2008.
91. “Fun in the Sand: Some Experiments in Granular Physics” **Physics Department Colloquium**, Purdue University September 10, 2009.
92. “Magnetic Frustration of Interacting Nanomagnet Arrays” **Topics In the Frustration of Pyrochlore Magnets Workshop**, Abingdon, United Kingdom, September 17, 2009.
93. “Artificial Frustrated Magnets: Frustration by Design” **Condensed Matter Seminar**, Rice University, April 25, 2010.
94. “Artificial Spin Ice” **2nd Bragg-Stoner Symposium: Understanding frustrated interactions using nanotechnology**, Leeds, United Kingdom, July 13, 2010.
95. “Artificial Frustrated Magnets: Frustration by Design” **Physics Department Colloquium**, University of West Virginia, December 10, 2010.
96. “Artificial spin ice: experimental studies of correlations and disorder” **Emergent Magnetic Monopoles in Frustrated Magnetic Systems: Theo Murphy International Scientific Meeting**, The Kavli Royal Society International Centre, Buckinghamshire, United Kingdom, October 17, 2011.
97. “Frustration by Design: Artificial Frustrated Magnets” **56th Annual Conference on Magnetism and Magnetic Materials**, Scottsdale, AZ, November 3, 2011.
98. “Correlations and Geometrical Effects in Artificial Spin Ice” **Frustrated Magnets: From Spin Ice to Kagome Planes**, Natal, Brazil, December 12, 2011.
99. “Nanomagnetism and Artificial Spin Ice” **Seventh International School and Conference on Spintronics and Quantum information Technology**, Chicago, IL, July 29, 2013.
100. “Frustration by Design: Artificial Spin Ice” **Physics Department Colloquium**, Cornell University, Ithaca, NY, February 24, 2014.
101. “Thermalizing Artificial Spin Ice” **Mesoscale Science Frontiers**, Sante Fe, NM, May 13, 2014.
102. “Frustration by design: Artificial Spin Ice” **Seminar**, Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan November 4, 2014.

103. “Thermalization, Charge Ordering, and other Recent Developments in Artificial Spin Ice” **American Physical Society March Meeting**, San Antonio, TX, March 3, 2015.
104. “Frustration by Design: Artificial Spin Ice” **Material Science Division Colloquium**, Argonne National Laboratory, Argonne, IL, April 6, 2015.
105. “Thermalization and exotic frustration in artificial spin ice” **International Conference on Magnetism**, Barcelona, Spain, July 7, 2015.
106. “Thermalization, Charge Ordering, and other Recent Developments in Artificial Spin Ice” **Seminar**, Applied Physics Department, Yale University February 9, 2016.
107. “Artificial Spin Ice: New Developments in Vertex Frustrated Lattices and in Magnetotransport” **61st Annual Conference on Magnetism and Magnetic Materials**, New Orleans, LA, November 2, 2016.

Research Grants and Contracts

Investigations of Novel Low Temperature Behavior in Materials

National Science Foundation 6/1/97 - 5/31/01
\$230,000 total

Acquisition of a SQUID Magnetometer

(PI: Peter Schiffer, co-PI: Jacek Furdyna, Slavi Sevov, Paul McGinn, and Lisa Paulius)
National Science Foundation 6/1/97 - 5/31/98
\$87,995 total

Geometrically Frustrated Magnets: Model Systems for Frustration-Induced Phenomena

Army Research Office 1/15/98 - 7/31/04
\$500,000 total

Experimental Studies of Wet Granular Media

Petroleum Research Fund 3/01/98 - 2/29/00
\$20,000 total

Alfred P. Sloan Research Fellowship

Alfred P. Sloan Foundation 9/16/98 - 9/15/00
\$35,000 total

Instrumentation for the Study of Geometrically Frustrated Magnets

Army Research Office 3/1/99 - 2/29/00
\$142,710 total

Acquisition of a Traveling Solvent Floating Zone Furnace

(PI: Howard Blackstead, co-PI: Jacek Furdyna, Paul McGinn, Peter Burns, Peter Schiffer)
National Science Foundation 8/1/99 - 7/31/00
\$131,500 total

Experimental and Theoretical Studies of Wet Granular Materials

NASA 4/1/00 – 1/31/04
\$350,000 total (PI: Peter Schiffer, co-PI: A.-L. Barabási)

Acquisition of an Experimental Platform for Studies of Geometrically Frustrated Magnets

Army Research Office 4/4/00 - 4/3/01
\$102,200 total

Spintronics and Spin-Photonics in Ferromagnetic InAs/GaSb-Based Heterostructures

DARPA (Subcontract through Notre Dame and SUNY Buffalo)
10/01/00 - 3/31/05
\$291,990 total for Peter Schiffer

Spins in Confined Geometries

Seed Grant from Penn State Materials Research Science and Education Center (National Science Foundation supported)

\$57,000 total 2/1/01- 1/31/04 (co-PI with Nitin Samarth)

Physics Department Research Experience for Undergraduates at Pennsylvania State University

National Science Foundation 5/01 to 4/04

\$367,000 total (PI: Qi Li, co-PI Peter Schiffer and Ron Redwing)

Studies of Unusual Ferromagnetic Materials

National Science Foundation 6/01/01 - 5/31/05

\$292,744 total

Acquisition of a Variable Temperature and Magnetic Field Magnetic Force Microscope for Studies of Geometrically Frustrated Magnetic Nanostructures

Army Research Office 3/15/02 – 3/14/03

\$186,628 total

Geometrical Effects in Interacting Magnetic Arrays

Army Research Office 8/15/03 - 8/14/07

\$380,000 total (PI: Peter Schiffer, co-PI: Vincent Crespi and Nitin Samarth)

Correlation Effects in Dense Granular Media

NASA 2/1/04 - 9/30/07

\$330,000 total

Spin Control In Hybrid Magnetic Semiconductor Structures

Subcontract with UC-Santa Barbara (prime: DARPA) 4/15/04 - 10/14/06

\$225,000 total (PI: Nitin Samarth, co-PI: Peter Schiffer)

Low Temperature Studies of Novel Magnetic Materials

National Science Foundation 6/1/04 - 5/31/08

\$246,414 total

NSF Europe: Collaborative Study of Geometrically Frustrated Magnetic Materials

National Science Foundation 6/1/04 - 5/31/08

\$458,055 total (co-PI: Robert Cava)

Acquisition of a Vibrating Sample Magnetometer for Studies of Geometrically Frustrated Magnetic Nanostructures

Army Research Office 4/1/05 - 3/31/07

\$135,005 total

A Single Multifunctional Chip for Reconfigurable Information Processing

Subcontract Univ. California - Santa Barbara (ONR) 5/1/06 - 4/30/11

\$905,208 total (PI: Nitin Samarth, co-PI: Peter Schiffer)

Epitaxial Engineering of Curie Temperature in III-Mn-V Ferromagnetic Semiconductors
DARPA 5/1/06 - 4/30/08
\$300,000 total (PI: Nitin Samarth, co-PI: Peter Schiffer)

Development and Investigation of Artificial Frustrated Magnets
Army Research Office 4/1/07 - 3/31/11
\$375,000 total (PI: Peter Schiffer, co-PI: Nitin Samarth and Vincent Crespi)

Experimental Studies of Geometrically Frustrated Magnets
National Science Foundation 7/1/07 - 6/30/11
\$513,500 total

SISGR: Using Interfaces to Create Strongly-Coupled Magnetic-Ferroelectrics
Subcontract Cornell University (DOE) 9/15/09-9/15/12
\$378,000 total for Peter Schiffer

Exploration of Artificial Frustrated Magnets
DOE 9/1/10 - 5/31/13
\$475,000 total (PI: Peter Schiffer, co-PI: Vincent Crespi and Nitin Samarth)

Rare Earth Geometrically Frustrated Magnets
National Science Foundation 8/15/11 - 7/31/15
\$520,000 total

SSIGR: Using interfaces to create strongly-coupled magnetic-ferroelectrics
Subcontract Cornell University (DOE) 9/15/2012 - 8/14/2015
\$284,000 total for Peter Schiffer

Thermalization of artificial spin ice and related frustrated magnetic arrays
DOE 8/15/2013 - 5/31/2016
\$537,193 total (PI: Peter Schiffer, co-PI: Vincent Crespi and Nitin Samarth)

Emergent Collective Phenomena in Artificial Spin Ice
DOE 8/1/2016 - 7/31/2019
\$538,000 total (PI: Peter Schiffer, co-PI: Nitin Samarth)