

CURRICULUM VITAE

DANIEL H. REICH

August 12, 2019

Department of Physics and Astronomy
The Johns Hopkins University
3400 N. Charles Street
Baltimore, Maryland 21218

Office: (410) 516-7899
Lab: (410) 516-6030
reich@jhu.edu

EDUCATION

1988 Ph.D. The University of Chicago, Physics.
1985 M.S. The University of Chicago, Physics.
1983 A.B. Harvard University, Physics, *Cum Laude*.

PROFESSIONAL EXPERIENCE

1998 - present Professor, Physics and Astronomy, Johns Hopkins University.
2008 - 2015 Department Chair, Physics and Astronomy, Johns Hopkins University.
2002 - 2008 Vice Chair for Research, Physics and Astronomy, Johns Hopkins University
1994 - 1998 Associate Professor, Physics and Astronomy, Johns Hopkins University.
1990 - 1994 Assistant Professor, Physics and Astronomy, Johns Hopkins University.
1989 - 1990 Postdoctoral Member of Technical Staff, AT&T Bell Laboratories, Murray Hill,
New Jersey. Research Advisor: Laurent P. Lévy.
1984 - 1988 Graduate Research Assistant, James Franck Institute, The University of Chicago,
Thesis advisor: Thomas F. Rosenbaum.
1983 - 1984 Graduate Teaching Assistant, The University of Chicago.

HONORS

2011 Fellow, American Physical Society.
2000 Johns Hopkins Alumni Association Excellence in Teaching Award.
1993 Packard Foundation Fellowship for Science and Engineering.
1993 National Science Foundation Young Investigator Award.

PROFESSIONAL SERVICE

International Conference on Magnetism

2012 - 2018 US Bid Committee, 2018 ICM conference.

Magnetism and Magnetic Materials Conference

2009 Chair, MMM Advisory Committee.

2008 Conference Chair.
2005 – 2010; 2012 – 2014: Member, MMM Advisory Committee.
2005 Program Committee Co-Chair.
2002 - 2004 Publication Editor.

American Physical Society Topical Group on Magnetism (GMAG)

2007 - 2008 Chair.
2006 - 2007 Chair-Elect.
2005 – 2006 Vice Chair.

Peer Review – Journals

ACS Nano, Applied Physics Letters, Biomacromolecules, Biomedical Microdevices, Biophysical Journal, IEEE Magnetics Letters, IEEE Transactions on Magnetics, J. American Chemical Society, J. Applied Physics, J. Physical Chemistry, Lab on a Chip, Langmuir, Nanoletters, Nature, Nature Materials, New Journal of Physics, Organic Electronics, Physical Review Letters, Physical Review B, PNAS, Trends in Biotechnology.

Peer Review – Funding Agencies

NSF, DOE, NIH, Cottrell Foundation, Petroleum Research Fund.

RESEARCH INTERESTS

Experimental condensed matter and biological physics. Magnetic and electronic properties of nanostructured materials; quantum magnetism; organic semiconductors; cell and tissue mechanics; nanoparticle probes of soft matter and biological systems.

PUBLICATIONS

Refereed Publications

1. S. B. Field, D. H. Reich, B. S. Shivaram, T. F. Rosenbaum, D. A. Nelson, and P. B. Littlewood, "Evidence for depinning of a Wigner crystal in Hg-Cd-Te," *Phys. Rev. B* **33**, 5082-5085 (1986).
2. D. H. Reich, T. F. Rosenbaum, G. Aeppli, and H. J. Guggenheim, "Ferromagnetism, glassiness, and metastability in a dilute-dipolar-coupled magnet," *Phys. Rev. B* **34**, 4956-4958 (1986).
3. D. H. Reich, T. F. Rosenbaum, and G. Aeppli, "Glassy relaxation without freezing in a random dipolar-coupled Ising magnet," *Phys. Rev. Lett.* **59**, 1969-1972 (1987).
4. S. B. Field, D. H. Reich, T. F. Rosenbaum, P. B. Littlewood, and D. A. Nelson, "Electron correlation and disorder in Hg(1-x)Cd(x)Te in a magnetic field," *Phys. Rev. B* **38**, 1856-1864 (1988).
5. D. H. Reich, B. Ellman, J. Yang, T. F. Rosenbaum, G. Aeppli, and D. P. Belanger, "Dipolar magnets and glasses - neutron-scattering, dynamic, and calorimetric studies of randomly distributed Ising spins," *Phys. Rev. B* **42**, 4631-4644 (1990).

6. D. H. Reich, L. P. Levy, and T. Giamarchi, "Quantum fluctuations in CsNiF₃ - a case-study of an S = 1 planar spin chain," *Phys. Rev. Lett.* **67**, 2207-2210 (1991).
7. D. H. Reich, L. P. Levy, and D. L. Hawthorne, "Long wavelength dynamics in a 1D planar ferromagnet - magnetostatic modes and soliton-induced damping in CsNiF₃," *J. Appl. Phys.* **69**, 5950-5952 (1991).
8. T. F. Rosenbaum, W. Wu, B. Ellman, J. Yang, G. Aeppli, and D. H. Reich, "Dipolar ferromagnets and glasses," *J. Appl. Phys.* **70**, 5946-5951 (1991).
9. W. H. Wu, B. Ellman, T. F. Rosenbaum, G. Aeppli, and D. H. Reich, "From classical to quantum glass," *Phys. Rev. Lett.* **67**, 2076-2079 (1991).
10. S. L. Ma, C. Broholm, D. H. Reich, B. J. Sternlieb, and R. W. Erwin, "Dominance of long-lived excitations in the antiferromagnetic spin-1 chain NENP," *Phys. Rev. Lett.* **69**, 3571-3574 (1992).
11. L. P. Levy, D. H. Reich, L. Pfeiffer, and K. West, "Aharonov-Bohm ballistic billiards," *Physica B* **189**, 204-209 (1993).
12. J. S. Jiang, D. Davidovic, D. H. Reich, and C. L. Chien, "Oscillatory superconducting transition-temperature in Nb/Gd multilayers," *Phys. Rev. Lett.* **74**, 314-317 (1995).
13. S. Kumar, D. H. Reich, and M. O. Robbins, "Critical dynamics of contact-line motion," *Phys. Rev. E* **52**, R5776-R5779 (1995).
14. S. L. Ma, D. H. Reich, C. Broholm, B. J. Sternlieb, and R. W. Erwin, "Spin correlations at finite-temperature in an S=1 one-dimensional antiferromagnet," *Phys. Rev. B* **51**, 3289-3292 (1995).
15. D. Davidovic, S. Kumar, D. H. Reich, J. Siegel, S. B. Field, R. C. Tiberio, R. Hey, and K. Ploog, "Correlations and disorder in arrays of magnetically coupled superconducting rings," *Phys. Rev. Lett.* **76**, 815-818 (1996).
16. D. C. Dender, D. Davidovic, D. H. Reich, C. Broholm, K. Lefmann, and G. Aeppli, "Magnetic properties of a quasi-one-dimensional S=1/2 antiferromagnet: Copper benzoate," *Phys. Rev. B* **53**, 2583-2589 (1996).
17. P. R. Hammar and D. H. Reich, "Cu-2(1,4-diazacycloheptane)(2)Cl₄: A quasi-one-dimensional S=1/2 spin liquid system," *J. Appl. Phys.* **79**, 5392-5394 (1996).
18. J. S. Jiang, D. Davidovic, D. H. Reich, and C. L. Chien, "Superconducting transition in Nb/Gd/Nb trilayers," *Phys. Rev. B* **54**, 6119-6121 (1996).
19. S. Kumar, M. O. Robbins, and D. H. Reich (1996) An experimental study of the dynamics of contact lines. *Disordered Materials and Interfaces*, Materials Research Society Symposium Proceedings, eds Cummins HZ, Durian DJ, Johnson DL, & Stanley HE (Materials Research Soc, Pittsburgh), Vol 407, pp 21-25.
20. C. L. Chien, J. S. Jiang, J. Q. Xiao, D. Davidovic, and D. H. Reich, "Proximity and coupling effects in superconductor/ferromagnet multilayers," *J. Appl. Phys.* **81**, 5358-5363 (1997).
21. D. Davidovic, S. Kumar, D. H. Reich, J. Siegel, S. B. Field, R. C. Tiberio, R. Hey, and K. Ploog, "Magnetic correlations, geometrical frustration, and tunable disorder in arrays of superconducting rings," *Phys. Rev. B* **55**, 6518-6540 (1997).
22. D. C. Dender, P. R. Hammar, D. H. Reich, C. Broholm, and G. Aeppli, "Direct observation of field-induced incommensurate fluctuations in a one-dimensional S=1/2 antiferromagnet," *Phys. Rev. Lett.* **79**, 1750-1753 (1997).
23. P. R. Hammar, D. C. Dender, D. H. Reich, A. S. Albrecht, and C. P. Landee, "Magnetic studies of the two-dimensional, S=1/2 Heisenberg antiferromagnets (5CAP)(2)CuCl₄ and (5MAP)(2)CuCl₄," *J. Appl. Phys.* **81**, 4615-4617 (1997).
24. C. Broholm, D. H. Reich, G. Aeppli, S. H. Lee, D. C. Dender, P. R. Hammar, G. Y. Xu, J. F. Ditusa, and A. P. Ramirez (1998) Neutron scattering studies of non-metallic low-dimensional

- quantum antiferromagnets. *Dynamical Properties of Unconventional Magnetic Systems*, Nato Advanced Science Institutes Series, Series E, Applied Sciences, eds Skjeltorp AT & Sherrington D (Springer, Dordrecht), Vol 349, pp 77-105.
25. P. R. Hammar, D. H. Reich, and C. Broholm, "Spin gap in a quasi-one-dimensional $S=1/2$ antiferromagnet: $\text{Cu}_2(1,4\text{-diazacloheptane})(2)\text{Cl}_4$," *Phys. Rev. B* **57**, 7846-7853 (1998).
 26. I. A. Zaliznyak, D. C. Dender, C. Broholm, and D. H. Reich, "Tuning the spin Hamiltonian of $\text{Ni}(\text{C}_2\text{H}_8\text{N}_2)(2)\text{NO}_2\text{ClO}_4$ by external pressure: A neutron-scattering study," *Phys. Rev. B* **57**, 5200-5204 (1998).
 27. C. L. Chien and D. H. Reich, "Proximity effects in superconducting/magnetic multilayers," *Journal of Magnetism and Magnetic Materials* **200**, 83-94 (1999).
 28. P. R. Hammar, M. B. Stone, D. H. Reich, C. Broholm, P. J. Gibson, M. M. Turnbull, C. P. Landee, and M. Oshikawa, "Characterization of a quasi-one-dimensional spin- $1/2$ magnet which is gapless and paramagnetic for $g \mu H-B$ less than or similar to J and $k(B)T \ll J$," *Phys. Rev. B* **59**, 1008-1015 (1999).
 29. K. M. Hong, F. Y. Yang, K. Liu, D. H. Reich, P. C. Searson, C. L. Chien, F. F. Balakirev, and G. S. Boebinger, "Giant positive magnetoresistance of Bi nanowire arrays in high magnetic fields," *J. Appl. Phys.* **85**, 6184-6186 (1999).
 30. F. Y. Yang, K. Liu, K. M. Hong, D. H. Reich, P. C. Searson, and C. L. Chien, "Large magnetoresistance of electrodeposited single-crystal bismuth thin films," *Science* **284**, 1335-1337 (1999).
 31. C. L. Chien, F. Y. Yang, K. Liu, D. H. Reich, and P. C. Searson, "Very large magnetoresistance in electrodeposited single-crystal Bi thin films (invited)," *J. Appl. Phys.* **87**, 4659-4664 (2000).
 32. M. Enderle, L. P. Regnault, C. Broholm, D. Reich, I. Zaliznyak, M. Sieling, H. Ronnow, and D. McMorrow, "High-field spin dynamics of antiferromagnetic quantum spin chains," *Physica B* **276**, 560-561 (2000).
 33. D. H. Reich, D. M. Silevitch, C. L. Chien, D. Davidovic, and S. B. Field, "Disorder and correlations in extended superconducting nanostructures," *Journal of Alloys and Compounds* **303**, 245-251 (2000).
 34. P. M. Vereecken, L. Sun, P. C. Searson, M. Tanase, D. H. Reich, and C. L. Chien, "Magnetotransport properties of bismuth films on p-GaAs," *J. Appl. Phys.* **88**, 6529-6535 (2000).
 35. G. Y. Xu, C. Broholm, D. H. Reich, and M. A. Adams, "Triplet waves in a quantum spin liquid," *Phys. Rev. Lett.* **84**, 4465-4468 (2000).
 36. F. Y. Yang, K. Liu, K. M. Hong, D. H. Reich, P. C. Searson, C. L. Chien, Y. Leprince-Wang, Y. Z. Kui, and K. Han, "Shubnikov-de Haas oscillations in electrodeposited single-crystal bismuth films," *Phys. Rev. B* **61**, 6631-6636 (2000).
 37. C. Broholm, G. Aeppli, Y. Chen, D. C. Dender, M. Enderle, P. R. Hammar, Z. Honda, K. Kastsumata, C. P. Landee, M. Oshikawa, L. P. Regnault, D. H. Reich, S. M. Shapiro, M. Sieling, M. B. Stone, M. M. Turnbull, I. Zaliznyak, and A. Zheludev (2001) Magnetized states of quantum spin chains. *High Magnetic Fields: Applications in Condensed Matter Physics and Spectroscopy*, Lecture Notes in Physics, eds Berthier C, Levy LP, & Martinez G (Springer-Verlag Berlin, Berlin), Vol 595, pp 211-234.
 38. J. L. Manson, J. A. Schlueter, U. Geiser, M. B. Stone, and D. H. Reich, "Crystal structures and magnetic properties of $\text{Mn}[\text{N}(\text{CN})(2)](2)\text{L}$ $\{\text{L}=2,5\text{-dimethylpyrazine and aminopyrazine}\}$," *Polyhedron* **20**, 1423-1429 (2001).
 39. D. M. Silevitch, D. H. Reich, C. L. Chien, S. B. Field, and H. Shtrikman, "Imaging and magnetotransport in superconductor/magnetic dot arrays," *J. Appl. Phys.* **89**, 7478-7480 (2001).

40. M. B. Stone, I. Zaliznyak, D. H. Reich, and C. Broholm, "Frustration-induced two-dimensional quantum disordered phase in piperazinium hexachlorodocuprate," *Phys. Rev. B* **64**, 144405 (2001).
41. G. J. Strijkers, F. Y. Yang, D. H. Reich, C. L. Chien, P. C. Searson, Y. M. Strelniker, and D. J. Bergman, "Magnetoresistance anisotropy of a Bi antidot array," *IEEE Transactions on Magnetics* **37**, 2067-2069 (2001).
42. M. Tanase, L. A. Bauer, A. Hultgren, D. M. Silevitch, L. Sun, D. H. Reich, P. C. Searson, and G. J. Meyer, "Magnetic alignment of fluorescent nanowires," *Nano Lett.* **1**, 155-158 (2001).
43. F. Y. Yang, G. J. Strijkers, K. Hong, D. H. Reich, P. C. Searson, and C. L. Chien, "Large magnetoresistance and finite-size effect in electrodeposited bismuth lines," *J. Appl. Phys.* **89**, 7206-7208 (2001).
44. C. L. Chien, L. Sun, M. Tanase, L. A. Bauer, A. Hultgren, D. M. Silevitch, G. J. Meyer, P. C. Searson, and D. H. Reich, "Electrodeposited magnetic nanowires: arrays, field-induced assembly, and surface functionalization," *Journal of Magnetism and Magnetic Materials* **249**, 146-155 (2002).
45. M. B. Stone, Y. Chen, J. Rittner, H. Yardimci, D. H. Reich, C. Broholm, D. V. Ferraris, and T. Lectka, "Frustrated three-dimensional quantum spin liquid in CuHpCl," *Phys. Rev. B* **65**, 064423 (2002).
46. M. Tanase, D. M. Silevitch, A. Hultgren, L. A. Bauer, P. C. Searson, G. J. Meyer, and D. H. Reich, "Magnetic trapping and self-assembly of multicomponent nanowires," *J. Appl. Phys.* **91**, 8549-8551 (2002).
47. L. A. Bauer, D. H. Reich, and G. J. Meyer, "Selective functionalization of two-component magnetic nanowires," *Langmuir* **19**, 7043-7048 (2003).
48. N. S. Birenbaum, B. T. Lai, C. S. Chen, D. H. Reich, and G. J. Meyer, "Selective noncovalent adsorption of protein to bifunctional metallic nanowire surfaces," *Langmuir* **19**, 9580-9582 (2003).
49. M. Chen, L. Sun, J. E. Bonevich, D. H. Reich, C. L. Chien, and P. C. Searson, "Tuning the response of magnetic suspensions," *Appl. Phys. Lett.* **82**, 3310-3312 (2003).
50. J. S. Gardner, A. Keren, G. Ehlers, C. Stock, E. Segal, J. M. Roper, B. Fak, M. B. Stone, P. R. Hammar, D. H. Reich, and B. D. Gaulin, "Dynamic frustrated magnetism in Tb₂Ti₂O₇ at 50 mK," *Phys. Rev. B* **68**, 180401 (2003).
51. A. Hultgren, M. Tanase, C. S. Chen, G. J. Meyer, and D. H. Reich, "Cell manipulation using magnetic nanowires," *J. Appl. Phys.* **93**, 7554-7556 (2003).
52. D. H. Reich, M. Tanase, A. Hultgren, L. A. Bauer, C. S. Chen, and G. J. Meyer, "Biological applications of multifunctional magnetic nanowires (invited)," *J. Appl. Phys.* **93**, 7275-7280 (2003).
53. M. B. Stone, D. H. Reich, C. Broholm, K. Lefmann, C. Rischel, C. P. Landee, and M. M. Turnbull, "Extended quantum critical phase in a magnetized spin-1/2 antiferromagnetic chain," *Phys. Rev. Lett.* **91**, 037205 (2003).
54. M. Tanase, D. M. Silevitch, C. L. Chien, and D. H. Reich, "Magnetotransport properties of bent ferromagnetic nanowires," *J. Appl. Phys.* **93**, 7616-7618 (2003).
55. D. A. Tennant, C. Broholm, D. H. Reich, S. E. Nagler, G. E. Granroth, T. Barnes, K. Damle, G. Xu, Y. Chen, and B. C. Sales, "Neutron scattering study of two-magnon states in the quantum magnet copper nitrate," *Phys. Rev. B* **67**, 054414 (2003).
56. A. Anguelouch, D. H. Reich, C. L. Chien, and M. Tondra, "Detection of ferromagnetic nanowires using GMR sensors," *IEEE Transactions on Magnetics* **40**, 2997-2999 (2004).

57. A. Hultgren, M. Tanase, C. S. Chen, and D. H. Reich, "High-yield cell separations using magnetic nanowires," *IEEE Transactions on Magnetics* **40**, 2988-2990 (2004).
58. M. Kenzelmann, Y. Chen, C. Broholm, D. H. Reich, and Y. Qiu, "Bound spinons in an antiferromagnetic $S=1/2$ chain with a staggered field," *Phys. Rev. Lett.* **93**, 017204 (2004).
59. C. Lapointe, A. Hultgren, D. M. Silevitch, E. J. Felton, D. H. Reich, and R. L. Leheny, "Elastic torque and the levitation of metal wires by a nematic liquid crystal," *Science* **303**, 652-655 (2004).
60. A. Hultgren, M. Tanase, E. J. Felton, K. Bhadriraju, A. K. Salem, C. S. Chen, and D. H. Reich, "Optimization of yield in magnetic cell separations using nickel nanowires of different lengths," *Biotechnol. Prog.* **21**, 509-515 (2005).
61. M. Kenzelmann, C. D. Batista, Y. Chen, C. Broholm, D. H. Reich, S. Park, and Y. Qiu, " $S=1/2$ chain in a staggered field: High-energy bound-spinon state and the effects of a discrete lattice," *Phys. Rev. B* **71**, 094411 (2005).
62. C. Lapointe, N. Cappallo, D. H. Reich, and R. L. Leheny, "Static and dynamic properties of magnetic nanowires in nematic fluids (invited)," *J. Appl. Phys.* **97**, 10Q304 (2005).
63. M. Tanase, E. J. Felton, D. S. Gray, A. Hultgren, C. S. Chen, and D. H. Reich, "Assembly of multicellular constructs and microarrays of cells using magnetic nanowires," *Lab Chip* **5**, 598-605 (2005).
64. A. Anguelouch, R. L. Leheny, and D. H. Reich, "Application of ferromagnetic nanowires to interfacial microrheology," *Appl. Phys. Lett.* **89**, 111914 (2006).
65. T. Hong, M. Kenzelmann, M. M. Turnbull, C. P. Landee, B. D. Lewis, K. P. Schmidt, G. S. Uhrig, Y. Qiu, C. Broholm, and D. Reich, "Neutron scattering from a coordination polymer quantum paramagnet," *Phys. Rev. B* **74**, 094434 (2006).
66. M. B. Stone, C. Broholm, D. H. Reich, O. Tchernyshyov, P. Vorderwisch, and N. Harrison, "Quantum criticality in an organic magnet," *Phys. Rev. Lett.* **96**, 257203 (2006).
67. M. B. Stone, I. A. Zaliznyak, T. Hong, C. L. Broholm, and D. H. Reich, "Quasiparticle breakdown in a quantum spin liquid," *Nature* **440**, 187-190 (2006).
68. N. Cappallo, C. Lapointe, D. H. Reich, and R. L. Leheny, "Nonlinear microrheology of wormlike micelle solutions using ferromagnetic nanowire probes," *Phys. Rev. E* **76**, 031505 (2007).
69. Y. Chen, M. B. Stone, M. Kenzelmann, C. D. Batista, D. H. Reich, and C. Broholm, "Phase diagram and spin Hamiltonian of weakly-coupled anisotropic $S=1/2$ chains in $\text{CuCl}_2 \cdot 2((\text{CD}_3)_2\text{SO})$," *Phys. Rev. B* **75**, 214409 (2007).
70. A. M. Fond, N. S. Birenbaum, E. J. Felton, D. H. Reich, and G. J. Meyer, "Preferential noncovalent immunoglobulin G adsorption onto hydrophobic segments of multi-functional metallic nanowires," *Journal of Photochemistry and Photobiology a-Chemistry* **186**, 57-64 (2007).
71. N. J. Sniadecki, A. Anguelouch, M. T. Yang, C. M. Lamb, Z. Liu, S. B. Kirschner, Y. Liu, D. H. Reich, and C. S. Chen, "Magnetic microposts as an approach to apply forces to living cells," *Proc. Nat. Acad. Sci.* **104**, 14553-14558 (2007).
72. M. B. Stone, C. Broholm, D. H. Reich, P. Schiffer, O. Tchernyshyov, P. Vorderwisch, and N. Harrison, "Field-driven phase transitions in a quasi-two-dimensional quantum antiferromagnet," *New Journal of Physics* **9**, 31 (2007).
73. C. P. Lapointe, D. H. Reich, and R. L. Leheny, "Manipulation and organization of ferromagnetic nanowires by patterned nematic liquid crystals," *Langmuir* **24**, 11175-11181 (2008).

74. N. J. Sniadecki, C. M. Lamb, Y. Liu, C. S. Chen, and D. H. Reich, "Magnetic microposts for mechanical stimulation of biological cells: Fabrication, characterization, and analysis," *Rev. Sci. Instrum.* **79**, 044302 (2008).
75. M. H. Lee, C. P. Lapointe, D. H. Reich, K. J. Stebe, and R. L. Leheny, "Interfacial hydrodynamic drag on nanowires embedded in thin oil films and protein layers," *Langmuir* **25**, 7976-7982 (2009).
76. Y. Liu, S. M. Watson, T. Lee, J. M. Gorham, H. E. Katz, J. A. Borchers, H. D. Fairbrother, and D. H. Reich, "Correlation between microstructure and magnetotransport in organic semiconductor spin-valve structures," *Phys. Rev. B* **79**, 075312 (2009).
77. Y. H. Liu, T. Lee, H. E. Katz, and D. H. Reich, "Effects of carrier mobility and morphology in organic semiconductor spin valves," *J. Appl. Phys.* **105**, 07C708 (2009).
78. J. Sun, B. J. Jung, T. Lee, L. Berger, J. Huang, Y. Liu, D. H. Reich, and H. E. Katz, "Tunability of Mobility and Conductivity over Large Ranges in Poly(3,3"-didodecylquaterthiophene)/Insulating Polymer Composites," *ACS Appl. Mater. Interfaces* **1**, 412-419 (2009).
79. M. H. Lee, C. P. Lapointe, D. H. Reich, K. J. Stebe, and R. L. Leheny, "Combined passive and active microrheology study of protein-layer formation at an air-water interface," *Langmuir* **26**, 2650-2658 (2010).
80. J. B. Rovner, C. P. Lapointe, D. H. Reich, and R. L. Leheny, "Anisotropic Stokes drag and dynamic lift on cylindrical colloids in a nematic liquid crystal," *Phys. Rev. Lett.* **105**, 228301 (2010).
81. M. H. Lee, S. P. Cardinali, D. H. Reich, K. J. Stebe, and R. L. Leheny, "Brownian dynamics of colloidal probes during protein-layer formation at an oil-water interface," *Soft Matter* **7**, 7635-7642 (2011).
82. S. A. Thompson, C. R. Copeland, D. H. Reich, and L. Tung, "Mechanical coupling between myofibroblasts and cardiomyocytes slows electric conduction in fibrotic cell monolayers," *Circulation* **123**, 2083-2093 (2011).
83. M. T. Yang, D. H. Reich, and C. S. Chen, "Measurement and analysis of traction force dynamics in response to vasoactive agonists," *Integrative Biology* **3**, 663-674 (2011).
84. S. B. Kirschner, N. P. Smith, K. A. Wepasnick, H. E. Katz, B. J. Kirby, J. A. Borchers, and D. H. Reich, "X-ray and neutron reflectivity and electronic properties of PCBM-poly(bromo)styrene blends and bilayers with poly(3-hexylthiophene)," *J. Mater. Chem.* **22**, 4364-4370 (2012).
85. S. Kola, N. J. Tremblay, M. L. Yeh, H. E. Katz, S. B. Kirschner, and D. H. Reich, "Synthesis and Characterization of a Pyromellitic Diimide-Based Polymer with C- and N-Main Chain Links: Matrix for Solution-Processable n-Channel Field-Effect Transistors," *ACS Macro Letters* **1**, 136-140 (2012).
86. R. Lecover, N. Williams, N. Markovic, D. H. Reich, D. Q. Naiman, and H. E. Katz, "Next-Generation Polymer Solar Cell Materials: Designed Control of Interfacial Variables," *ACS Nano* **6**, 2865-2870 (2012).
87. Y. C. Lin, C. M. Kramer, C. S. Chen, and D. H. Reich, "Probing cellular traction forces with magnetic nanowires and microfabricated force sensor arrays," *Nanotechnology* **23**, 075101 (2012).
88. E. J. Felton, C. R. Copeland, C. S. Chen, and D. H. Reich, "Heterotypic cell pair co-culturing on patterned microarrays," *Lab Chip* **12**, 3117-3126 (2012).
89. J. B. Rovner, D. S. Borgnia, D. H. Reich, and R. L. Leheny, "Elastic and hydrodynamic torques on a colloidal disk within a nematic liquid crystal," *Phys. Rev. E* **86**, 041702 (2012).

90. R. Zhao, T. Boudou, W. G. Wang, C. S. Chen, and D. H. Reich, "Decoupling cell and matrix mechanics in engineered microtissues using magnetically actuated microcantilevers," *Adv. Mater.* **25**, 1699-1705 (2013).
91. H. Kong, J. Sinha, D. Hoefft, S. B. Kirschner, D. H. Reich, and H. E. Katz, "Solution processable organic p-n junction bilayer vertical photodiodes," *Org. Electron.* **14**, 703-710 (2013).
92. J. B. Rovner, D. H. Reich, and R. L. Leheny, "Anisotropic Stokes drag and dynamic lift on spheres sedimenting in a nematic liquid crystal," *Langmuir* **29**, 2104-2107 (2013).
93. R. Zhao, T. Boudou, W. G. Wang, C. S. Chen, and D. H. Reich, "Magnetic approaches to study collective 3D cell mechanics in long-term cultures (invited)," *J. Appl. Phys.* **115**, 172616 (2014).
94. S. A. Thompson, A. Blazeski, C. R. Copeland, D. Cohen, C. S. Chen, D. H. Reich, and L. Tung, "Acute slowing of cardiac conduction in response to myofibroblast coupling to cardiomyocytes through N-cadherin " *J. Mol. Cell. Cardiol.* **68**, 29-37 (2014).
95. R. Zhao, C. S. Chen, and D. H. Reich, "Force-driven evolution of mesoscale structure in engineered 3D microtissues and the modulation of tissue stiffening," *Biomaterials* **35**, 5056-5064 (2014).
96. D. B. Allan, D. M. Firester, V. P. Allard, D. H. Reich, K. J. Stebe, and R. L. Leheny, "Linear and nonlinear microrheology of lysozyme layers forming at the air-water interface," *Soft Matter* **10**, 7051-7060 (2014).
97. M. B. Stone, Y. Chen, D. H. Reich, C. Broholm, G. Xu, J. R. D. Copley, and J. C. Cook, "Magnons and continua in a magnetized and dimerized spin-1/2 chain," *Phys. Rev. B* **90**, 094419 (2014).
98. M. Cieplak, D. B. Allan, R. L. Leheny, and D. H. Reich, "Proteins at air-water interfaces: a coarse-grained model," *Langmuir* **30**, 12888-12896 (2014).
99. K. Chen, L. P. Metcalf, D. P. Rivas, D. H. Reich, and R. L. Leheny, "Anisotropic colloidal transport and periodic stick-slip motion in cholesteric finger textures," *Soft Matter* **11**, 4189-4196 (2015).
100. F. Xu, R. Zhao, A. S. Liu, T. Metz, Y. Shi, P. Bose, and D. H. Reich, "A microfabricated magnetic actuation device for mechanical conditioning of arrays of 3D microtissues," *Lab Chip* **15**, 2496-2503 (2015).
101. O. J. Alley, E. Plunkett, T. S. Kale, X. Guo, G. McClintock, M. Bhuparthiraju, B. J. Kirby, D. H. Reich, and H. E. Katz, "Synthesis, fabrication, and heterostructure of charged, substituted polystyrene multilayer dielectrics and their effects in pentacene transistors," *Macromolecules* **49**, 3478-3489 (2016).
102. A. S. Liu, H. Wang, C. R. Copeland, C. S. Chen, V. B. Shenoy, and D. H. Reich, "Matrix viscoplasticity and its shielding by active mechanics in a microtissue model: in situ experiments and mathematical modeling.," *Scientific Reports* **6**, 33919 (2016).
103. K. Chen, O. J. Gebhardt, R. Devendra, G. Drazer, R. D. Kamien, D. H. Reich, and R. L. Leheny, "Colloidal transport within nematic liquid crystals with arrays of obstacles," *Soft Matter* **14**, 83-91 (2018).
104. Q. Zhang, T. S. Kale, E. Plunkett, W. Shi, B. J. Kirby, D. H. Reich, and H. E. Katz, "Highly contrasting static charging and bias stress effects in pentacene transistors with polystyrene heterostructures incorporating oxidizable N,N'-bis(4-methoxyphenyl)aniline side chains as gate dielectrics," *Macromolecules* **51**, 6011-6020 (2018).
105. E. Plunkett, T. S. Kale, Q. Zhang, H. E. Katz, and D. H. Reich, "Effects of trifluoromethyl substituents on interfacial and bulk polarization of polystyrene gate dielectrics," *Appl. Phys. Lett.* **114**, 023301 (2019).

106. H. Li, E. Plunkett, S. Thon, D. H. Reich, and H. E. Katz, "Dopant-dependent increase in Seebeck coefficient and electrical conductivity in blended polymers with offset carrier energies," *Advanced Electronic Materials*, 201800618 (2019).
107. R. Mhanna, J. Lee, S. Narayanan, D. H. Reich, and R. L. Leheny, "Phase-dependent shear-induced order of nanorods in isotropic and nematic wormlike micelle solutions," *Nanoscale* **11**, 7875-7884 (2019).
108. Y. Shi, C. L. Porter, J. C. Crocker, and D. H. Reich, "Dissecting fat-tailed fluctuations in the cytoskeleton with active micropost arrays," *Proc. Nat. Acad. Sci.*, 201900963 (2019).
109. P. Bose, J. Eyckmans, T. D. Nguyen, C. S. Chen, and D. H. Reich, "Effects of geometry on the mechanics and alignment of three-dimensional engineered microtissues," *ACS Biomaterials Science & Engineering* **5**, 3843-3855 (2019).

Book Chapters

Edward J. Felton and Daniel H. Reich, "Biological Applications of Multifunctional Magnetic Nanowires," in *Biomedical Applications of Nanotechnology*, John Wiley and Sons, (2007).

Prasenjit Bose, Chen Yu Huang, Jeroen Ecykmans, Christopher S. Chen, and Daniel H. Reich, "Fabrication and Mechanical Properties Measurements of 3D Microtissues for the Study of Cell-Matrix Interactions," in *The Surfaceome: Methods and Protocols*, Humana Press, pp. 303-328 (2018).

ISSUED PATENT

D. H. Reich, C. S. Chen, C. L. Chien, G. J. Meyer, and P. C. Searson, "Multifunctional Magnetic Nanowires," U. S. Patent No. 7,132,275, 2006.

INVITED PRESENTATIONS AT CONFERENCES

1. "Novel Phenomena and Glassiness in a Dilute Dipolar Magnet," APS March Meeting, Anaheim, CA, March 1990.
2. "The Complete Magnetic Response Function of an S=1 Chain," APS March Meeting, Seattle, WA, March 1993.
3. "Two-dimensional magnetism in arrays of superconducting rings," APS March Meeting, St. Louis, MO, March 1996.
4. "Two-dimensional magnetism in arrays of superconducting rings," Gordon Conference on Strongly Correlated Electron Systems, Plymouth, NH, July 1996.
5. "Spin-gap in a double chain antiferromagnet," APS March Meeting, Los Angeles, CA, March 1998.
6. "Recent Developments in Quantum Magnetism," APS New England Section Meeting, April 1998.
7. "Magnetic field effects in Quantum Spin Chains," Aspen Winter Meeting, Aspen, CO, January 1999.
8. "Disorder and correlations in extended superconducting nanstructures," Rare Earth Research Conference, Argonne National Laboratory, July 1999.

9. "Gapped states of quantum spin chains," ITP Conference on quantum magnetism, Santa Barbara, CA, August 1999.
10. "The Physics of Nanotechnology," National Science Teachers Association Regional Meeting, Baltimore, MD, November 2000.
11. "Quantum disordered states in $D > 1$ Spin-1/2 systems," APS March Meeting, Indianapolis, IN, March 2002.
12. "Multifunctional magnetic nanowires for biotechnology applications," International Conference on Fine Particle Magnetism, Pittsburgh, PA, August 2002.
13. "Biological applications of multifunctional magnetic nanowires," Magnetism and Magnetic Materials Conference, Tampa, FL, November 2002.
14. "Magnetic Nanoparticles for Biotechnology and Biomagnetics: Current Uses and New Approaches," Advanced Materials Research Institute Symposium, New Orleans, LA, February 2003.
15. "Multifunctional magnetic nanowires for biotechnology applications," International Symposium on Clusters and Nano-Assemblies: Physical and Biological Systems, Richmond, VA, November 2003.
16. "Multifunctional magnetic nanowires for biotechnology applications," PhotonicsWest (SPIE International Conference), San Jose, CA, January 2004.
17. "Magnetic nanoparticles and spintronics in biology and biotechnology: current uses and new approaches," Spintronics Tutorial, American Physical Society March Meeting, Montreal, Canada, March 2004.
18. "Biological Applications of Multifunctional Magnetic Nanowires," 2nd Annual Research, Technologies, and Applications in Biodefense Conference, Washington, DC, August 2004.
19. "Multifunctional Magnetic Nanowires for Biotechnology and Biomagnetics Applications," 2005 Spring Materials Research Society Meeting, San Francisco, CA, March 2005.
20. "Cell Manipulation and Sub-Cellular Force Measurements Using Magnetic Nanowires," JHU Symposium on Mining the Biology-Physics Interface, Johns Hopkins University, January 2006.
21. "Cell Manipulation and Sub-Cellular Force Measurements Using Magnetic Nanowires," 2006 International Conference on Magnetism (Intermag), San Diego, CA, May 2006.
22. "Probing Cell Mechanics and Cell-Cell Interactions with Tailored Magnetic Nanoparticles," National Cancer Institute workshop: "Bridging the Gap from Molecules to Cell Behavior in Cancer," Seattle, WA, July 2008.
23. "Magnetically Patterned co-Cultures for Cancer Studies," National Cancer Institute meeting on Innovative Molecular Analysis Technologies, Cambridge, MA, October 2008.
24. "Resolving sub-cellular force dynamics using arrays of magnetic microposts," APS March Meeting, Portland OR, March 2010.
25. "Probing subcellular forces with arrays of magnetic microposts," Workshop on Biomolecules and Nanostructures, Bedlewo, Poland, September 2011.
26. "Decoupling cell and matrix mechanics in engineered microtissues using magnetically actuated microcantilevers," Mid-Atlantic Soft Matter Workshop, Washington, DC, January 2013.
27. "Formation of mesoscale structure and the role of cell mechanics in tissue stiffening in engineered 3D microtissues," 7th World Congress of Biomechanics, Boston, MA, July 2014.

SEMINARS AND COLLOQUIA

1. "Dynamics of Haldane Gap Antiferromagnets," University of Illinois, February 1992.
2. "Dynamics of Haldane Gap Antiferromagnets," University of Delaware, March 1992.
3. "The Complete Magnetic Response Function of an S=1 Chain," Michigan State University, February, 1993.
4. "Excitations in Quantum Antiferromagnets," Naval Research Laboratory, April 1993.
5. "Excitations in Quantum Antiferromagnets," Pennsylvania State University, September 1993.
6. "The Magnetic Properties of Copper Benzoate," Clark University, November 1993.
7. "Superconducting T_c Oscillations in Nb/Gd Multilayers," Indiana University, October 1994.
8. "Superconducting T_c Oscillations in Nb/Gd Multilayers," University of Michigan, January 1995.
9. "Magnetism in Arrays of Superconducting Rings," NIST, September 1995.
10. "Magnetism in Arrays of Superconducting Rings," Johns Hopkins University, October 1995.
11. "Magnetism in Arrays of Superconducting Rings," Stanford University, November 1995.
12. "Magnetic Properties of Superconducting Microstructures," National Nanofabrication Users Network Meeting, Stanford, CA, November 1995.
13. "Magnetic Correlations in Arrays of Superconducting Rings," Univ. of British Columbia, January 1996.
14. "Magnetic Correlations in Arrays of Superconducting Rings" Simon Fraser University, January 1996.
15. "Two-dimensional Magnetism in Arrays of Superconducting Rings" NEC Research Inst., Princeton, NJ, February 1996.
16. "Field-induced Incommensurability in a Quasi-1D Magnet," Princeton University, December 1996.
17. "Magnetic Properties of Arrays of Superconducting Rings," Johns Hopkins Applied Physics Laboratory, March 1997.
18. "Magnetic Properties of Arrays of Superconducting Rings," Rice University, March 1997.
19. "Magnetic Field Effects in Quantum Spin Chains," MIT, November 1997.
20. "Magnetic Field Effects in Quantum Spin Chains," University of Colorado, November 1997.
21. "Magnetic Field Effects in Quantum Spin Chains," Colorado State University, November 1997.
22. "Low-dimensional Spin Systems in High Magnetic Fields," University of Rhode Island, April 1998.
23. "Low-dimensional Magnetism," Williams College, October 1999.
24. "Gapped states of quantum spin chains," University of Pennsylvania, April 2000.
25. "Spin-gaps, Dimerization, and Frustration in Quantum Antiferromagnets," Pennsylvania State University, May 2001.
26. "Multifunctional magnetic nanowires: new approaches for biomagnetics," University of Nebraska, October 2002.
27. "Magnetic nanoparticles for biotechnology: current uses and new approaches," Georgia Institute of Technology, February 2003

28. "Spinons, solitons, and triplons: dynamics of low-dimensional antiferromagnets in strong magnetic fields," Brown University, September 2003.
29. "Spinons, solitons, and triplons: dynamics of low-dimensional antiferromagnets in strong magnetic fields," University of Rhode Island, September 2003.
30. "Biological Applications of Multifunctional Magnetic Nanowires," Michigan State University, April 2005.
31. "Probing Soft Matter with Magnetic Nanowires," UCLA, May 2006.
32. "Magnetic Nanoparticles for Biology and Biotechnology: Current Uses and New Approaches," Howard University, September 2006.
33. "New Probes of Soft Matter and Sub-Cellular Forces using Magnetic Nanostructures," Colorado State University, February 2007.
34. "New Probes of Soft Matter and Sub-Cellular Force Transduction using Magnetic Nanowires," Northern Illinois University, March 2007.
35. "New Probes of Soft Matter and Sub-Cellular Forces using Magnetic Nanostructures," Laboratory of Physical Sciences, University of Maryland, April 2007.
36. "Probing Cell Mechanics and Soft Matter with Tailored Magnetic Nanoparticles," Conference on Frontiers in the Characterization and Control of Magnetic Carriers, Clemson University, April 2009.
37. "Probing Cell Mechanics and Cell-Cell Interactions with Tailored Magnetic Nanoparticles," University of Maryland, Sept. 2009.
38. "Probing Sub-Cellular Force Transduction and Soft Matter using Magnetic Nanowires," Colloquium at Georgetown University, February 2011.
39. "Applications of Magnetic Nanoparticles in biological systems," University of Virginia, May 2011.
40. "Probing sub-cellular force dynamics and soft matter using magnetic nanowires," Williams College, November 2011.
41. "Probing sub-cellular force dynamics and engineered microtissues using magnetically actuated microcantilevers," Johns Hopkins Applied Physics Laboratory, April 2013.
42. "Probing cell and matrix mechanics in engineered microtissues using magnetically actuated microcantilevers," Carnegie Institution of Washington, Department of Embryology, Sept. 2014.

TEACHING AND EDUCATION

Courses Taught at Johns Hopkins University

Spring 1991	171.622	Graduate Condensed Matter Physics
Spring 1992	171.764	Experimental Condensed Matter Physics
Fall 1992	171.405	Intro. Condensed Matter Physics
Spring 1993	171.406	Advanced Undergraduate Condensed Matter Physics
Spring 1993	171.622	Graduate Condensed Matter Physics
Fall 1993	171.405	Intro. Condensed Matter Physics

Spring 1994	171.764	Experimental Condensed Matter Physics
Fall 1994	171.405	Intro. Condensed Matter Physics
Spring 1995	173.412/712	Laboratory of Advanced Instrumentation
Fall 1995	171.405	Intro. Condensed Matter Physics
Spring 1996	173.412/712	Laboratory of Advanced Instrumentation
Fall 1996	171.105	Intro. Classical Physics - Mechanics
Spring 1997	171.106	Intro. Classical Physics - Electricity and Magnetism
Fall 1997	171.105	Intro. Classical Physics - Mechanics
Spring 1998	171.106	Intro. Classical Physics - Electricity and Magnetism
Fall 1998	171.105	Intro. Classical Physics - Mechanics
Spring 1999	171.106	Intro. Classical Physics - Electricity and Magnetism
Fall 1999	171.201	Special Relativity and Waves
Spring 2000	171.202	Modern Physics
Fall 2000	171.201	Special Relativity and Waves
Spring 2001	171.202	Modern Physics
Fall 2001	171.201	Special Relativity and Waves
Spring 2002		<i>Sabbatical Leave</i>
Fall 2002	171.319	Intermediate Physics for the Biosciences I
Spring 2003	171.320	Intermediate Physics for the Biosciences II
Fall 2003	171.319	Intermediate Physics for the Biosciences I
Spring 2004	171.320	Intermediate Physics for the Biosciences II
Fall 2004	171.319	Intermediate Physics for the Biosciences I
Spring 2005	171.320	Intermediate Physics for the Biosciences II
Fall 2005	171.209	Wave Phenomena with Biophysical Applications
Spring 2006	171.210	Biological Physics
Fall 2006	171.209	Wave Phenomena with Biophysical Applications
Spring 2007	171.210	Biological Physics
Fall 2007	171.103	General Physics I for the Biosciences
Spring 2008	171.106	Electricity and Magnetism I
Fall 2008 – Spring 2015		<i>Department Chair – relieved from teaching</i>
Fall 2015	171.105	Classical Mechanics I
Fall 2015	670.619	Fundamental Physics and Chemistry of Nanomaterials (20% of lectures)
Spring 2016	171.309	Wave Phenomena with Biophysical Applications
Fall 2016	171.105	Classical Mechanics I
Fall 2016	670.619	Fundamental Physics and Chemistry of Nanomaterials (20% of lectures)
Spring 2017	171.108	General Physics II (Active Learning)
Fall 2017	171.105	Classical Mechanics I
Fall 2017	670.619	Fundamental Physics and Chemistry of Nanomaterials (20% of lectures)
Spring 2018	171.108	General Physics II (Active Learning)
Fall 2018	171.201	Special Relativity and Waves
Spring 2019	171.108	General Physics II (Active Learning)

Education and Outreach

2015 – present	Coordinator: Johns Hopkins Annual Physics Fair
1997 - present	Supervised 18 high school student research interns.

2006 - 2011 JHU Lead: Partnership for Research and Education in Materials with Howard University and Prince George's Community College.
2005 - 2012 Education Outreach Coordinator, JHU Materials Research Science and Engineering Center (MRSEC).
2004 and 2008 co-Organizer, JHU Materials Science Outreach Workshop on Explorations in Nanoscale Science and Engineering.
1997 - 2011 Conducted annual workshops on materials research for high school teachers.

Publication related to teaching

“A Graduate Course in Experimental Physics,” D. H. Reich, American Physical Society Forum on Education, Summer, 1994.