Dr. William Ratcliff II

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Education

2003 Rutgers University, New Brunswick, Ph.D. Physics, Thesis Advisor: Professor Sang W. Cheong

1997 University of Michigan, Ann Arbor, BSE in Engineering Physics

Research Interests

The primary focus of my research has been multiferroic materials. Recently, I have explored geometric ferroelectricity in the $LuFeO_3$ series of compounds in both bulk and thin film samples (see 18,20, and 21) culminating in work with collaborators in the development of superlattices with near room temperature magneto-electric effects. Our neutron scattering work was key in understanding the intrinsic magnetic ordering of the $LuFeO_3$ geometric ferroelectric which templates $LuFe_2O_4$ in the $LuFeO_3$-$LuFe_2O_4$ superlattice to dramatic effect. Currently, I am working on topological materials (see 2,3,4,5,16). Of particular interest is the interplay of magnetism with topological materials. For example in the $MnBi_2Te_4$ system, our measurements of the magnetic structure under applied magnetic fields has direct implications for the band structure.

Career/Experience

2005-Present: Staff scientist at the NIST Center for Neutron Scattering

2003-2005: National Research Council Postdoc at the NIST Center for Neutron Research at NIST. Primary work concerned neutron scattering experiments on geometrically frustrated magnets and magnetoelectric systems. Also participated

in x-ray experiments at Brookhaven and APS. Developed a GUI application for visualization of the resolution ellipsoid for inclusion in the DAVE project.

1997-2003: Worked with Sang W. Cheong in materials physics research including materials synthesis and characterization of novel magnetic systems.

Workshops Organized

2018 ACNS Satellite School: 7th School on Representational Analysis and Magnetic Structure (RAMS), University of Maryland, College Park, Maryland

2018 Program Committee International Conference on Magnetism (ICM), San Francisco, CA

2017 Co-organizer of Fundamentals of Ferroelectrics Conference (FERRO), Williamsburg, WV

2015 5th School on Representational Analysis and Magnetic Structure (RAMS), University of Maryland, College Park, Maryland

2012 Workshop on Representational Analysis and Magnetic Structure Determination, BARC, Mumbai, India**

2011 The NIST/Georgetown 2nd School on Representational Analysis and Magnetic Structures Aug1-5, Georgetown, Washington, D.C.

2010 Program Committee MMM Meeting, Atlanta, GA

2007 The NIST Workshop on Representational Analysis of Complex Magnetic Structures, Gaithersburg, MD

Selected Honors and Memberships

Member of American Physical Society

Member of Organizing committee APS Topical Group on Data Science (2018)

Secretary APS Topical Group on Data Science (May 2019 - present)

Mentor NSF Ideas Lab (2019)

Reviewer: NSF, Swiss National Science Foundation, German Research Foundation (DFG), Cottrell Scholars, IUSSTF

2019-present: Elected Representative to SNS-HIFR User Group Executive Committee

2018-present: Chapter Leader DataKind DC

2017-2018: Elected Chair APS Committee on Minorities in Physics

2016-2018: Member APS Committee on Minorities in Physics

2015-2016: Elected ACA Neutron Scattering Special Interest Group Chair

2013-2016: Elected GMAG Member at Large

2012: APS-IUSSTF U.S.-India Exchange Program

2012: NIST Bronze Medal (highest honorary recognition given by the institute)

2010: Minority in Research Science Trailblazer award (24th annual BEYA STEM)

2003: NRC Postdoctoral Fellowship

Member Sigma Xi

Member Neutron Scattering Society of America

Publications

H-index

34 see https://scholar.google.com/citations?user=Xly2-LYAAAAJ&hl=en

Citations

> 5000 see https://scholar.google.com/citations?user=Xly2-LYAAAAJ&hl=en

Book Chapter

Multiferroics, William Ratcliff and Jeffrey W. Lynn, Chapter 5 in Neutron Scattering - Magnetic and Quantum Phenomena, Felix Fernandez-Alonso and David L. Price, editors (Academic Press, London, 2015).

Publications

1. "Exchange Bias in Bulk alpha-Fe / gamma-Fe70Mn30 Nanocomposites for Permanent Magnet Applications" Ian J McDonald, Michelle Jamer, Kathryn L Krycka, Elaf Anber, Daniel Foley, Andrew Charles Lang, William Ratcliff, Don Heiman, Mitra L Taheri, Julie A Borchers, Laura H Lewis ACS Appl. Nano Mater., 2, 1940 (2019) DOI: 10.1021/acsanm.8b02319

2. "Quantum oscillations from networked topological interfaces in a Weyl semimetal" I-Lin Liu, Colin Heikes, Taner Yildirim, Chris Eckberg, Tristin Metz, ShengRan, William Ratcliff II, Johnpierre Paglione, and Nicholas P. Butch arxiv.org/abs/1905.02277

3. "Large exchange splitting in monolayer graphene magnetized by an antiferromagnet" Yingying Wu, Gen Yin, Lei Pan, Alexander J. Grutter, Quanjun Pan, Albert Lee, Eun Sang Choi,Mingliang Tian, Peng Deng, Qiming Shao, Shin-Hung Tsai,Qinglin He, Dustin A. Gilbert, Julie A. Borchers, William Ratclliff II, Ang Li, Xiao-dong Han, and Kang L. Wang (submitted)

4. “Spin Scattering and Noncollinear Spin Structure-Induced Intrinsic Anomalous Hall effect in Antiferromagnetic Topological Insulator MnBi2Te4” Seng Huat Lee, Yanglin Zhu, Yu Wang, Leixin Miao, Hemian Yi, Timothy Pillsbury, Susan Kempinger, Jin Hu, Colin A. Heikes, Patrick A. Quarterman, William D. Ratcliff, Julie A. Borchers, H. Zhang, Xianglin Ke, David Graf, Nasim Alem, Cui-Zu Chang, Nitin Samarth, and Zhiqiang Mao (submitted)

5. “Mechanical control of crystal symmetry and superconductivity in Weyl semimetal MoTe2” Colin Heikes, I-Lin Liu, Tristin Metz, Chris Eckberg, Paul Neves, Yan Wu, Linda Hung, Phil Piccoli, Huibo Cao, Juscelino Leao, Johnpierre Paglione, Taner Yildirim, Nicholas P. Butch, 1, William Ratcliff II Phys. Rev. Materials 2, 074202 (2018)

6. “reductus: a stateless Python data-reduction service with a browser frontend” Brian Maranville, William Ratcliff II, Paul Kienzle Journal of Applied Crystallography 51, 1500 (2018)

7. “Fe2MnGe: A Hexagonal Heusler Analogue” S. Keshavarz, N. Naghibolashra, M.E. Jamer, K. Vinson, D. Mazumdar, C.L. Dennis, W. Ratcliff II, J.A. Borchers, A. Gupta, P. LeClair Journal of Alloys and Compounds, 771, 793 (2019)

8. “Ordered Magnetism in the Decorated 3D Ising jeff = 1/2 alpha-CoV3O8” P. M. Sarte, A. M. Arevalo-Lopez, M. Songvilay,D. Le, T. Guidi, V. Garcia-Sakai, S. Mukhopadhyay, S. C. Capelli, W. D. Ratcliff, K. H. Hong, G. M. McNally , E. Pachoud , J. P. Attfield, and C. Stock Phys. Rev. B. 98, 224410 (2018)

9. “Lifetime-shortened acoustic phonons and static order at the Brillouin zone boundary in the organic-inorganic perovskite CH3NH3PbCl3” M. Songvilay, C. Stock, Z.-G. Ye, Guangyong Xu, P. M. Gehring, W. D. Ratcliff, K. Schmalzl, F. Bourdarot, and B. Roessli Phys. Rev. Materials 2, 123601 (2018)

10. “A high-energy density antiferroelectric made by interfacial electrostatic engineering” Julia A Mundy, Colin A Heikes, Bastien F Grosso, Dan Ferenc Segedin, Zhe Wang, Berit H Goodge, Quintin N Meier, Christopher T Nelson, Bhagwati Prasad, Lena F Kourkoutis, William D Ratcliff, Nicola A Spaldin, Ramamoorthy Ramesh, Darrell G Schlom arXiv:1812.09615

11. “Probing Superexchange Interactions in Spin Ice Ho2Ti2O7 Thin Films” Kevin Barry, Naween Anand, Biwen Zhang, Yan Xin, Arturas Vailionis, Colin Heikes, Haidong Zhou, Y. Qiu, William Ratcliff, Christianne Beekman arXiv:1805.06565

12. “Electric-field Induced Reversible Switching of the Magnetic Easy-axis in Co/BiFeO3 on SrTiO3” Tieren Gao, Xiaohang Zhang, William Ratcliff, Shingo Maruyama, Makoto Murakami, Anbusathaiah Varatharajan, Zahra Yamani, Peijie Chen, Ke Wang, Huairuo Zhang, Robert D Shull, Leonid A Bendersky, John Unguris, Ramamoorthy Ramesh, Ichiro Takeuchi, Nano Letters 17, 2825 (2017). doi: 10.1021/acs.nanolett.6b05152

13. “Successive field-induced transitions in BiFeO3 around room temperature”

Shiro Kawachi, Atsushi Miyake, Toshimitsu Ito, Sachith E Dissanayake, Masaaki Matsuda, II Ratcliff, Zhijun Xu, Yang Zhao, Shin Miyahara, Nobuo Furukawa, Masashi Tokunaga Phys. Rev. Materials 1, 024408 (2017)

14. "Structural and Magnetic Phase Transitions in Chromium Nitride Thin Films Grown by RF Nitrogen Plasma Molecular Beam Epitaxy" Khan Alam, Steven M Disseler, William D Ratcliff, Julie A Borchers, Rodrigo Ponce-Perez, Gregorio H Cocoletzi, Noboru Takeuchi, Andrew Foley, Andrea Richard, David C Ingram, Arthur R Smith Phys. Rev. B 96, 104433 (2017)

15. "Pressure tuning of collapse of helimagnetic structure in Au2Mn" I-Lin Liu, Maria J. Pascale, Juscelino B. Leao, Craig M. Brown, William D. Ratcliff, Qingzhen Huang, and Nicholas P. Butch Phys. Rev. B 96, 184429 (2017)

16. "Tailoring Exchange Couplings in Magnetic Topological Insulator/Antiferromagnet Heterostructures" Qing Lin He, Xufeng Kou, Alexander J. Grutter, Gen Yin, Lei Pan, Xiaoyu Che, Yuxiang Liu, Tianxiao Nie, Bin Zhang, Steven M. Disseler, Brian J. Kirby, William Ratcliff II, Qiming Shao, Koichi Murata, Xiaodan Zhu, Guoqiang Yu, Yabin Fan, Mohammad Montazeri, Xiaodong Han, Julie A. Borchers & Kang L. Wang , Nature Materials 16, 94(2017). doi:10.1038/nmat4783

17. "Magnetic Structures and Dynamics of Multiferroic Systems Obtained with Neutron Scattering" W. D. Ratcliff, II, Jeffrey W. Lynn, Valery Kiryukhin, Prashant Jain, and Michael R. Fitzsimmons, Nature Partner Journals: Quantum Materials 1, 16003 (2016)

18. "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. Rbola, 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, & Darrell G. Schlom , Nature 537, 523 (2016). doi: 10.1038/nature19343

19. "Bayesian method for the analysis of diffraction patterns using BLAND" JE Lesniewski, SM Disseler, DJ Quintana, PA Kienzle, WD Ratcliff, Journal of Applied Crystallography 49, 2201-2209 (2016)

20. "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, William D Ratcliff Physical Review Letters, 114, 217602 (2015)

21. "Multiferroicity in doped hexagonal LuFeO3" Steven M. Disseler, Xuan Luo, Bin Gao, Yoon Seok Oh, Rongwei Hu, Yazhong Wang, Dylan Quintana,

Alexander Zhang, Qingzhen Huang, June Lau, Rick Paul, Jeffrey W. Lynn, Sang-Wook Cheong, and William Ratcliff, II, Phys. Rev. B 92, 054435 (2015)

22. "One Dimensional(1D)-to-2D Crossover of Spin Correlations in the 3D Magnet ZnMn2O4" S. M. Disseler, Y. Chen, S. Yeo, G. Gasparovic, P. M. B. Piccoli, A. J. Schultz, Y. Qiu, Q. Huang, S-W. Cheong, and W. Ratcliff II, Scientific Reports, 5, 17771. http://doi.org/10.1038/srep17771 (2015)

23. "Complex structures of different CaFe2As2 samples" B Saparov, C Cantoni, MH Pan, TC Hogan, W. Ratcliff, SD Wilson, K Fritsch, BD Gaulin, AS Sefat, AS, Scientific Reports, 4120 (2014)

24. "Reflections on the magnetic pair distribution function" W. Ratcliff, Acta Crystallographica A 70, 1 (2014)

25. "Change in the magnetic structure of (Bi,Sm)FeO3 thin films at the morphotropic phase boundary probed by neutron diffraction" Shingo Maruyama, Varatharajan Anbusathaiah, Amy Fennell, Mechthild Enderle, Ichiro Takeuchi, William D. Ratcliff, APL Materials, 2, doi10.1063/1.4901294 (2014)

26. "Electric-field-controlled antiferromagnetic domains in epitaxial BiFeO3 thin films probed by neutron diffraction" W. Ratcliff II, Zahra Yamani, V. Anbusathaiah, T.R. Gao, P.A. Kienzle, H. Cao, I. Takeuchi, Phys. Rev. B. 87, 140405 (2013)

27. "Double Focusing Thermal Triple-Axis Spectrometer at the NCNR" Lynn, J.W., Chen, Y., Chang, S., Zhao, Y., Chi, S., W. Ratcliff, II, Ueland, B.G., Erwin, R.W., Journal of Research of the National Institute of Standards and Technology 117, 61 (2012)

28. "Local Weak ferromagnetism in single-crystalline ferroelectric BiFeO3", M. Ramazanoglu, M. Laver, W. Ratcliff II, S.M. Watson, W.C. Chen, A. Jackson, K. Kothapalli, Seongsu Lee, S.-W. Cheong, V. Kiryukhin Phys. Rev. Lett. 107, 207206 (2011)

29. "Antiferromagnetic order and superlattice structure in nonsuperconducting and superconducting Rb(y)Fe(1.6+x)Se2 Phys. Rev. B 84, 094504 (2011)

30. "Giant Effect of Uniaxial Pressure on Magnetic Domain Populations in Multiferroic Bismuth Ferrite" M. Ramazanoglu, W. Ratcliff, H.T. Yi, A.A. Sirenko, SW Cheong, V. Kiryukhin, Phys. Rev. Lett. 107, 067203 (2011)

31. "Temperature-dependent properties of the magnetic order in single-crystal BiFeO3" M. Ramazanoglu, W. Ratcliff II, Y.J. Choi, Seongsu Lee, S-W. Cheong, V. Kiryukhin, Phys. Rev. B. 83, 174434 (2011)

32. "Giant Effect of Uniaxial Pressure on Magnetic Domain Populations in Multiferroic Bismuth Ferrite," Ramazanoglu, M., Ratcliff, II, W., Yi, H.T., Sirenko, A.A., Cheong, S.W., Kiryukhin, V., Physical Review Letters 107(6), 067203-1 (2011)

33. "Mechanism of exchange-striction of ferroelectricity in multiferroic orthorhombic HoMnO3 single crystals" N. Lee, Y.J. Choi, M. Ramazanoglu, W. Ratcliff II, V. Kiryukhkin, and S-W. Cheong, Phys. Rev. B 84, 020101 (2011)

34. "Neutron Diffraction Investigations of Magnetism in BiFeO3 Epitaxial Films" William Ratcliff II, Daisuke Kan, Wangchun Chen, Shannon Watson, Songxue Chi, Ross Erwin, Garry J. McIntyre, Sylvia C. Capelli, Ichiro Takeuchi, Advanced Functional Materials 21, 1567 (2011)

35. "Antiferromagnetic Order and Superlattice Structure in Nonsuperconducting and Superconducting RbyFe1.6+xSe2" Wang, M., Wang, M., Li, G.N., Huang, Q., Li, C.H., Tan, G.T., Zhang, C.L., Cao, H., Tian, W., Zhao, Y., Chen, Y.C., Lu, X.Y., Sheng, B., Luo, H.Q., Li, S.L., Fang, M.H., Zarestky, J.L., Ratcliff, W.D., Lumsden, M.D., Lynn, J.W., Dai, P., Physical Review B 84, 094504-1 (2011)

36. "Nitrogen contamination in elastic neutron scattering" Songxue Chi, Jeffrey W. Lynn, Ying Chen, William Ratcliff II, Benjamin G. Ueland, Nicholas P. Butch, Shanta R. Saha, Kevin Kirshenbaum, Johnpierre Paglione, Measurement Science and Technology 22, 047001 (2011)

37. "Incommensurate Magnetism in FeAs Strips: Neutron Scattering from CaFe4As3" Yusuke Nambu, Liang L. hao, Emilia Morosan, Kyoo Kim, Gabriel Kotliar, Pawel Zajdel, Mark A. Green, William Ratcliff, Jose A. Rodrigueze-Ruvera, Collin Broholm, Phys. Rev. Lett 106, 037201 (2011)

38. "Interplay of Fe and Nd magnetism in NdFeAsO single crystals" W. Tian, W. Ratcliff II, M. G. Kim, J.-Q. Yan, P.A. Kienzle, Q. Huang, B. Jensen, K.W. Dennis, R.W. McCallum, T.A. Lograsso, R.J. McQueeney, A.I. Goldman, J.W. Lynn, A. Kreyssig, Phys. Rev. B 82, 060514 (2010)

39. "Cd Doping Effects in the heavy-fermion compounds Ce2Min8 (M=Rh and Ir)" C. Adriano, C. Giles, E.M. Bittar, L.N. Coelho, F. De Bergevin, C. Mazzoli, L. Paolasini, W. Ratcliff, R. Bindel, J.W. Lynn, Z. Fisk, P.G. Pagliuso, Phys. Rev. B 81, 245115 (2010)

40. "Magnetic from factor of SrFe2As2: Neutron diffraction measurements" W. Ratcliff II, P.A. Kienzle, Jeffrey W. Lynn, Shiliang Li, Pengcheng Dai, G.F. Chen, N.L. Wang, Phys. Rev B. 81, 140502 (2010)

41. "Evolution of the bulk properties, structure, magnetic order, and superconductivity with Ni doping in CaFe(2-x)NixAs2" N. Kumar, SX Chi, Y. Chen, KG Rana, AK Nigam, A. Thamizhavel, W. Ratcliff, SK Dar, JW Lynn Phys. Rev. B 80, 144524 (2009)

42. "Crossover from incommensurate to commensurate magnetic orderings in CoCr2O4" LJ Chang, DJ Huang, WH Li, SW Cheong, W. Ratcliff, JW Lynn J. Phys. Cond. Matt. 21, 456008 (2009)

43. "Short Range Incommensurate magnetic order near the superconducting phase boundary in Fe(1+delta)Te(1-x)Sex" J.S. Wen, GY Xu, ZJ Xu, ZW Lin,

Q. Li, W. Ratcliff, G. Gu, JM Tranquada Phys. Rev. B 80, 104506 (2009)

44. "Spin-Lattice Order in Frustrated ZnCr2O4" S. Ji, SH Lee, C. Broholm, TY Koo, W. Ratcliff, SW Cheong, P. Zschack Phys. Rev. Lett 103, 037201 (2009)

45. "The Magnetic ground state of CaMn2Sb2" W. Ratcliff II, ALL Sharma, AM Gomes, JL Gonzalez, Q. Huang, J Singleton J Mag. Mag. Materials 321, 2612 (2009)

46. "Order by Static Disorder in the Ising Chain Magnet Ca3Co2-xMnxO6" V. Kiryukhin, S. Lee, W. Ratcliff II, Q. Huang, HT Yi, YJ Choi, SW Cheong Phys Rev. Lett. 102, 187202 (2009)

47. "3:1 magnetization plateau and suppression of ferroelectric polarization in an Ising chain multiferroic" YJ Jo, S. Lee, ES Choi, HT Yi, W. Ratcliff II, YJ Choi, V. Kiryukhin, SW Cheong, L. Balicas Phys. Rev. B 79, 012407 (2009)

48. "Low energy spin waves and magnetic interactions in SrFe2As2" Jun Zhao, Dao Xin Yao, Shiliang Li, Tao Hong, Y. Chen, S. Chang, W. Ratcliff I I, J. W. Lynn, H. A. Mook, G. F. Chen, J. L. Luo, N. L. Wang, E. W. Carlson, Jiangping Hu, and Pengcheng Dai Phys. Rev. Lett 101, 167203 (2008)

49. "Spin and Lattice Structure of Single Crystal SrFe2As2" Jun Zhao, W. Ratcliff II, J-W. Lynn, G.F. Chen, J.L. Luo, N.L. Wang, Jiangping Hu, Pengcheng Dai Phys. Rev. B 78, 140504 (2008)

50. "Magnetic order close to superconductivity in the iron-based layered LaO1-xFxFeAs systems" C. dela Cruz, Q. Huang, JW Lynn, JY Li, W. Ratcliff, JL Zaretsky, HA Mook, GF Chen, JL Luo, NL Wang, PC Dai Nature 453, 899 (2008)

51. "Neel to Spin-Glass-Like Transition Versus Dilution in Geometrically Frustrated ZnCr2-2xGa2xO4" S-H. Lee, W. Ratcliff, Q. Huang, T.H. Kim, S-W. Cheong PRB 77, 014405 (2008)

52. "Formation of pancakelike ising domains and giant magnetic coercivity in ferrimagnetic LuFe2O4" W. Wu, V. Kiryukhin, H.-J. Noh, K.-T. Ko, J.-H. Park, W. Ratcliff II, P. A. Sharma, N. Harrison, Y.J. Choi, Y. Horime, S. Lee, S. Park, H.T. Yi, C.L. Zhang, S-W. Cheong PRL 101, 137203 (2008)

53. "Electric field control of the magnetic state in BiFeO3 single crystals" Seoungsu Lee, W. Ratcliff, SW Cheong, V. Kiryukhin APL 92, 192906 (2008)

54. "Single Ferroelectric and chiral magnetic domain of single-crystalline BiFeO3 in an electric field" Seongsu Lee, Taekjib Choi, W. Ratcliff II, R. Erwin, S-W. Cheong, and V. Kiryukhin PRB RC 78, 100101 (2008)

55. "The pressure effect on the magnetic commensurability and ferroelectricity in multiferroic HoMn2O5" CR dela Cruz, B. Lorenz, W. Ratcliff, J. Lynn, MM Gospodinov, C.W. Chu Physica B 403, 1359 (2008)

56. “Observation of a continuous phase transition in a shape-memory alloy” J.C. Lahshley, S.M. Shapiro, B.L. Winn, C.P. Opeil, M.E. Manley, A. Alatas, W. Ratcliff, T. Park, R.A. Fisher, B. Mihaila, P. Riseborough, E. K. H. Salje, J.L. Smith Phys. Rev. Lett 101, 135703 (2008)

57. “Crystal distortions in geometrically frustrated ACr2O4 (A=Zn,Cd)”, S.-H. Lee, G. Gasparovic, C. Broholm, M. Matsuda, J-H Chung, YJ Kim, H. Ueda, G. Xu, P Zschack, K. Kakurai, H. Takagi, W. Ratcliff, T-H. Kim, S-W Cheong Journal of Physics Condensed Matter 19, 145259 (2007)

58. “Evidence for strong spin-lattice coupling in multiferroic RMn2O5 (R=Tb, Dy, Ho) via thermal expansion anomalies”, CR dela Cruz, F. Yen, B. Lorenz, S. Park, SW Cheong, MM Gospodinov, W. Ratcliff, JW Lynn, CW Chu Journal of Applied Physics 99 08R2103 (2006)

59. “Structural Anomalies at the magnetic and ferroelectric transitions in RMn2O5 (R=Tb, Dy, Ho)”, CR dela Cruz, F. Yen, B. Lorenz, MM Gospodinov, CW Chu, W. Ratcliff, JUW Lynn, S. Park, S-W Cheong Phys. Rev. B 73, 100406 (2006)

60. “Conformation of the HIV-1 Gag protein in solution”, SAK Datta, JE Curtis, W.Ratcliff, PK Clark, RM Crist, J Lebowitz, S. Krueger, A. Rein Journal of Molecular Biology 365, 812 (2007)

61. “Structural anomalies at the magnetic and ferroelastic transitions in RMn2O5 (R=Tb, Dy, Ho)” C.R. dela Cruz, F. Yen, B. Lorenz, M.M. Gospodinov, C.W. Chu, W. Ratcliff, J.W. Lynn, S. Park, and S-W.Cheong. Phys. Rev. B 73, 100406 (2006)

62. “Pressure-dependent magnetic properties of geometrically frustrated ZnCr2O4” Y. Jo, JG Park, HC Kim, W. Ratcliff, S-W. Cheong, Phys. Rev. B. 72, 184421 (2005)

63. “Magnetic Phase Diagram of the Colossal Magneoelectric, DyMn2O5” W. Ratcliff II, V. Kiryukhin, M.A. Kenzelmann, S-H. Lee, J. Schefer, R. Erwin, N. Hur, S. Park,and S-W. Cheong. Phys Rev. B. (R) 72, 060407 (2005)

64. “Effects of spin-phonon coupling in the magnetic transition in strongly frustrated ZnCr2O4” A. B. Sushkov, H. D. Drew, O. Tchernyshyov, W. Ratcliff, S.W. Cheong, Phys. Rev. Lett. 94, 137202 (2005)

65. “Spin Singlet formation in MgTi2O4: evidence of a chiral dimerization pattern” M. Schmidt, W. Ratcliff II, P.G. Radaelli, K. Refson, N.M. Harrison, S.W. Cheong, Phys. Rev. Lett. 92, 056402 (2004)

66. “First-Order nature of the ferromagnetic phase transition in (La-Ca)MnO3 near optimal doping.” C.P. Adams, J.W. Lynn, V.N. Smolyaninova, A. Biswas, R.L. Green, W. Ratcliff II, S.-W. Cheong, Y.M. Mukovskii, D.A. Shulyatev, Phys. Rev. B. 70, 134414 (2004)

67. “Emergent excitations in a geometrically frustrated magnet” S.-H. Lee, C.

Broholm, W. Ratcliff, G. Gasparovic, Q. Huang, T.H. Kim and S-W. Cheong. Nature 418, 856-858 (2002)

68. "Fluctuations and Freezing of Spin-Correlated Nanoclusters in a Geometrically Frustrated Magnet" W. Ratcliff II, S.-H. Lee, C. Broholm, S-W. Cheong, Q. Huang Physical Review B: Rapid Communications 65, 220406/1-220406/4 (2002)

69. "Magnetic properties of the frustrated antiferromagnetic spinel ZnCr2O4 and the spin glass Zn1-xCdxCr2O4 (x=0.05,0.10)" H Martinho, NO Moreno,JA Sanjurjo,C Rettori, AJ Garcia-Adeva, DL Huber,SB Oseroff,W Ratcliff,SW Cheong,PG Pagliuso,JL Sarrao,GB Martins Phys. Rev. B. 64, 024408/1-024408/6 (2001).

70. "Studies of the three-dimensional frustrated antiferromagnetic ZnCr2O4" H Martinho, NO Moreno, JA Sanjurjo,C Rettori,AJ Garcia-Adeva, DL Huber,SB Oseroff,W Ratcliff,SW Cheong,PG Pagliuso,JL Sarrao,GB Martins Journal of Applied Physics 89, 7050-7052 (2001)

71. "Muon spin relaxation study of La1-xCaxMnO3" RH Heffner, JE Sonier, DE MacLaughlin, GJ Nieuwenhuys, GM Luke, YJ Uemura, W Ratcliff, SW Cheong, G Balakrishnan Phys. Rev. B. 63, 094408/1-094408/14 (2001)

72. "Local spin resonance and spin-Peierls-like phase transition in a geometrically frustrated antiferromagnet" SH Lee, C Broholm, TH Kim, W Ratcliff, SW Cheong Phys. Rev. Lett. 84, 3718-3721 (2000)

73. "Intergrain magnetoresistance via second-order tunneling in perovskite manganites" S Lee, HY Hwang, BI Shraiman, WD Ratcliff, SW Cheong Phys. Rev. Lett. 82, 4508-4511 (1999)

Selected Conference Talks/Posters

"Neutron Investingations of the Multiferroic Skyrmion GaV4S8" March Meeting of the American Physical Society, Boston, MA (2019)

"Neutron Investigations of Thin Film Ho2Ti2O7" March Meeting of the American Physical Society, Los Angeles, CA (2018)

"Mechanical control of the band structure of MoTe2" Telluride , Telluride, Colorado (2018)

"Using neutron scattering to understand solid state materials" Corning Research, Sunnyvale, CA (2018) (invited)

"Neutron Investigations of the Multiferroic Skyrmion GaV4S8" International Conference on Magnetism, San Francisco, CA (2018)

"Multiferroic LuFeO3: Adventures in Neutron Scattering" Howard University, Department of Chemistry (2018) (invited)

"Effects of Electric Field on the magnetic structure of multiferroic (Sm,Bi)FeO3 films" March Meeting of the American Physical Society, New Orleans, LA (2017)

"Magnetic structures and dynamics of multiferoic systems obtained with neutron scattering", Mid-Atlantic Sectional Meeeting, Newark, NJ (2017) (invited)

"Multiferroic h-LuFeO3–adventures in Neutron Scattering", Pittsburgh Diffraction Society, Indiana, PA (2017), (invited)

"Neutron Investigations of thin film Ho2Ti2O7", Quantum Materials Symosium 2017, Berlin, Germany (2017)

"Bayesian Library for the Analysis of Neutron Diffraction Data" March Meeting of the American Physical Society, Baltimore, MD (2016)

"Bayesian Library for the Analysis of Neutron Diffraction Data(BLAND)" American Conference on Neutron Scattering (2016)

"Bayesian Library for the Analysis of Neutron Diffraction Data" American Crystallography Association, Denver (2016)

"Atomically engineered ferroic layers yield a room temperature magnetoelectric multiferroic" Gordon Conference on Multiferroics, Lewiston, Maine (2016)

"Atomically engineered ferroic layers yield a roomtemperature magnetoelectric multiferroic" Quantum Materials Synthesis Conference, New York Academies of Science, New York, New York (2016)

Invited Lecturer Magnetic Structure Determination from Neutron Data, Florida State University, Tallahassee, FL(2016)

"Neutron scattering investigations of bulk and thin film multiferroic LuFeO3" International Conference on Magnetism, Barcelona, Spain (2015)

"Neutron investigations of multiferroic LuFeO3" American Crystallography Association, Philadelphia (2015)

"The intrinsic magnetic structure and ordering of multiferoic h-LuFeO3 Films" March Meeting of the American Physical Society, San Antonio, TX (2015)

"Neutron Investigations of Multiferroic LuFeO3" Gordon Research Conference, Biddeford, ME (2014)

"Neutron diffraction investgations of BiFeO3" Polarized Neutrons for Condensed Matter Investigations, U. Sydney, Sydney, Australia (2014) (invited)

Invited Lecturer Magnetic Structure Determination from Neutron Data Oak Ridge National Lab, Knoxville, TN (2014)

"Neutron Investigations of Multiferroic LuFeO3 Thin Films" American Conference on Neutron Scattering, Knoxville, TN (2014)

"Neutron Investigations of Multiferroic LuFe1-xMnxO3" March Meeting of the American Physical Society 2014 (Denver)

"Neutron Investigations of Multiferroic LuFe1-xMnxO3" Magnetic North IV, Victoria, British Columbia, Canada (2014)

"Evolution of the magnetic structure in (Sm,Bi)FeO3 Thin Films" March Meeting of the American Physical Society 2013 (Baltimore)

"Neutron Investigations of Multiferroic LuFeO3" Magnetism and Magnetic Materials, Denver, Co (2013)

"Neutron Diffraction Investigations of Electric-Field Control of Antiferromagnetic Domains in Epitaxial BiFeO3 Thin Films" Fundamental Physics of Ferroelectrics and Related Materials, Ames, IA (2013)

Invited Lecturer Magnetic Structure Determination from Neutron Data Oak Ridge National Lab, Oakridge, TN (2012)

"Neutron Diffraction Investigations of Magnetism in BiFeO3 Epitaxial Films" American Conference on Neutron Scattering 2012 (invited)

"Investigation of Electric Field Control Antiferromagnetic Domains in Epitaxial BiFeO3 Thin Films Using Neutron Diffraction" March Meeting of the American Physical Society 2012

"Neutron Diffraction Investigations of Magnetism in BiFeO3 Epitaxial Films" DAE Solid State Physics Symposium (2012) (invited), IIT Bombay

"Neutron Diffraction Investigations of Magnetism in BiFeO3 Epitaxial Films"" MMM 2011, Desert Ridge, Arizona (invited)

"Neutron diffraction investigations of the BiFeO3 thin films" European Spallation Source, Lundt, Sweden 2011 (invited)

"The Renaissance of Multiferroics" Missouri University Science Technology, Sep. 2011 (invited).

"The Renaissance of Multiferroics" Howard University, April 2011 (invited).

"The Magnetic Form factor of SrFe2As2" March Meeting of the American Physical Society 2011 (Dallas, Texas) (talk was presented by Pengcheng Dai due to budgetary constraints)

"The Magnetic Form Factor in SrFe2As2" MMM 2010 (Atlanta, Georgia)

"Neutron investigations of BiFeO3 Films" March Meeeting of the American Physical Society 2010 (Portland, Oregon)

"Introduction to SPINAL (Spinwave Analyzer), A program for Calculating and Analyzing Spinwaves" American Conference on Neutron Scattering 2010 (Ottawa, Canada)

"BiFeO3" Flipper, International Workshop on Single Crystal Diffraction with Polarized Neutrons, 2010 (Grenoble, France)

"BiFeO3" Aspen Winter Conference on Fundamental Physics of Ferroelectrics, 2010 (Aspen, Colorado)

"Neutron Scattering Studies of the Fe-Based Superconductors" National Conference of Black Physicists, 2009 (Nahville) W. Ratcliff II, Jun Zhao, J.W. Lynn, G.F. Chen, J.L. Luo, N.L. Wang, Jiangping Hu, Pengcheng Dai (Invited Talk)

"Dimensional Crossover in ZnMn2O4" William Ratcliff , Ying Chen , Goran Gasparovic , Yiming Qiu , Qing Huang , Jeffrey Lynn , Sunmog Yeo , Sang Cheong , Paula Piccoli , Arthur Schultz. March Meeting of the American Physical Society 2008 (New Orleans, Louisiana).

Dimensional Crossover in ZnMn2O4 William Davis Ratcliff, Ying Chen, Yiming Qiu, S. Yeo, G. Gasparovic, Q. Huang, J. Lynn, Sang Cheong, Paula Piccoli, and Arthur Schultz ACNS 2008 (Santa Fe, New Mexico)

"BiFeO3" PNCMI, 2008 (Mito, Japan). W. Ratcliff, Y.Chen, S. Yeo, G. Gasparovic, A. Schultz, P. Piccoli, Q. Huang, Y. Qiu, S-W. Cheong (Invited Talk)

"Elucidation on the effects of hydrostatic pressure on multiferroic, HoMn2O5", William Ratcliff, C.R. dela Cruz, B. Lorenz, Q. Huang, S. Park, S-W. Cheong. March Meeting of the American Physical Society 2007 (Denver).

"A New Magnet, ZnMn2O4" National Conference of Black Physicists, 2007 (Boston). (Invited Talk)

"The low dimensional magnet, ZnMn2O4" Contributed talk, March Meeting 2006 of the American Physical Society (APS), Baltimore, Maryland

"The Giant Magnetoelectric, DyMn2O5" Contributed talk, March Meeting 2005 of the American Physical Society (APS), Los Angeles, California

"The Giant Magnetoelectric, DyMn2O5" Contributed talk, American Conference on Neutron Scattering (ACNS), June 2004 College Park, Maryland

"The Magnetic Structure of ZnCr2O4" Contributed talk, March Meeting 2004 of the American Physical Society (APS), Montreal, Canada

"Frustration in Flatland Revisited" Poster, Boulder Summer School for Condensed Matter Physics, July 2003, Boulder Colorado

"Magnetism of Sr(Ti,Co)O3" Poster, Gordon Research Conference on Strongly Correlated Electrons, June 2002, Maine.

"Magnetism of Sr(Ti,Co)O3" Contributed talk, March Meeting 2002 of the American Physical Society (APS), Indianapolis, Indiana

"Site-vs-Bond disorder in the geometrically frustrated magnet, ZnCr2O4" Poster, SCES2001, August 2001, University of Michigan, Ann Arbor

"Site-vs-Bond disorder in the geometrically frustrated magnet, ZnCr2O4" Contributed talk, March Meeting 2001 of the APS, March 12-16, Seattle, Washington

"The geometrically frustrated magnet, ZnCr2O4" Poster, Gordon Research Conference Strongly Correlated Electrons, June 2000. New Hampshire.

Instruction Experience

- Conducted numerous summer schools at the NCNR
- Summer High School Intern Program (SHIP) mentor for high school students
- Summer Undergraduate Research Fellowship (SURF) mentor for undergraduate students
- Outreach through Adventures in Science
- Part time lecturer Physics 205 Employer Rutgers Inclusive Dates 6/1/2003-7/1/2003
- Curriculum development and teaching of 6th and 9th graders in 6th grade math and earth science at South Brunswick Upper Elementary School and 9th grade physical science at East Brunswick Churchill Middle School through the NSF GK-12 fellowship Inclusive dates 8/99-6/01
- Part time lecturer Physics 203 Employer Rutgers Inclusive Dates 6/1/99 - 7/1/99
- Part time lecturer Physics of Sound Employer Rutgers Inclusive Dates 1/1/99 - 6/1/99
- Part time lecturer, Physics 204 Employer Rutgers Inclusive Dates 1/1/99 - 6/1/99
- Part time lecturer Honors Modern Physics Employer Rutgers Inclusive Dates 9/1/98 - 1/1/99
- Part time lecturer Physics 204 Employer Rutgers Inclusive Dates 6/1/98-7/1/98
- Part time lecturer Physics 203 Employer Rutgers Inclusive Dates 7/1/98-8/1/98