

# Dr. William Ratcliff II, Physicist

NIST  
100 Bureau Drive  
Mailstop 6102, Bldg 235, Room E151  
Gaithersburg, MD 20899:  
Phone: 301-975-4316  
Fax: 301-921-9847

## Education

**2003 (October):** Rutgers University, New Brunswick, Ph.D. Physics, Thesis Advisor: Professor Sang W. Cheong  
**1997 (May):** University of Michigan, Ann Arbor, BSE in Engineering Physics

## Technical skills

- Operating Systems: Unix/Linux, Windows, MacOS
- Computer Languages&Frameworks: C, IDL, Matlab, Maple, Python, html, javascript, django
- Familiarity: C++, Fortran, Mathematica
- Project Management: Svn, Git

## Neutron Scattering

- Expertise: Single crystal and powder diffraction for solution of magnetic and crystallographic structures, inelastic neutron scattering (Triple-axis)
- Familiarity: Small Angle Neutron Scattering and Reflectivity

## Professional Employment

- Fall 05-Present: Staff scientist at the NIST Center for Neutron Scattering at NIST.
- Fall03-2005: 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. Also developed a GUI application for visualization of the resolution ellipsoid for inclusion in the DAVE project at NIST.
- Sum97-Fall 03: Worked with Sang W. Cheong in materials physics research including materials synthesis and characterization of novel magnetic systems.

## Workshops Organized

- Program Committee International Conference on Magnetism (ICM) (2018), San Francisco, CA
- Co-organizer of Fundamentals of Ferroelectrics Conference (FERRO) Jan. (2017), Williamsburg, WV
- **5th School on Representational Analysis and Magnetic Structure (RAMS) Aug. (2015), University of Maryland, College Park, Maryland**
- **Workshop on Representational Analysis and Magnetic Structure Determination Dec. (2012), BARC, Mumbai, India**
- **The NIST/Georgetown 2nd School on Representational Analysis and Magnetic Structures Aug1-5 (2011), Georgetown, Washington, D.C.**
- Program Committee MMM Meeting (2010), Atlanta, GA
- **The NIST Workshop on Representational Analysis of Complex Magnetic Structures July 23-26 (2007), Gaithersburg, MD**

## Honors and Memberships

- Neutron Scattering Society of America
- Chair APS Committee on Minorities in Physics (2017)
- Member APS Committee on Minorities in Physics (2016-2018)
- ACA Neutron Scattering Special Interest Group Chair (2015-2016)
- GMAG Member at Large (2013-2016)
- APS-IUSSTF U.S.-India Exchange Program
- NIST Bronze Medal (highest honorary recognition given by the institute, 2012)

- Minority in Research Science Trailblazer award (24th annual BEYA STEM, 2010)
- NRC Postdoctoral Fellowship
- NSF GK-12 Fellowship
- GAANN Fellowship
- Grants in Aid of Research Award (Sigma Xi)
- Sigma Pi Sigma (Physics Honor Society)
- Eta Kappa Nu (Electrical Engineering and Computer Engineering Honor Soc.)
- Golden Key National Honor Society
- Sigma Xi
- American Physical Society

## Publications

### H-index

30 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).

### Refereed Publications

#### 2017

"Electric-field Induced Reversible Switching of the Magnetic Easy-axis in Co/BiFeO<sub>3</sub> on SrTiO<sub>3</sub>" 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

"Successive field-induced transitions in BiFeO<sub>3</sub> 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).

"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).

#### 2016

"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).

"Atomically engineered ferroic layers yield a roomtemperature 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.

"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, Qining 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

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

#### 2015

"Magnetic Structure and Ordering of Multiferroic Hexagonal  $\text{LuFeO}_3$ " 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).

"Multiferroicity in doped hexagonal  $\text{LuFeO}_3$ " 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).

"One Dimensional(1D)-to-2D Crossover of Spin Correlations in the 3D Magnet  $\text{ZnMn}_2\text{O}_4$ " 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)

## 2014

"Complex structures of different  $\text{CaFe}_2\text{As}_2$  samples" B Saparov, C Cantoni, MH Pan, TC Hogan, W. Ratcliff, SD Wilson, K Fritsch, BD Gaulin, AS Sefat, AS, Scientific Reports, 4120 (2014).

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

"Change in the magnetic structure of  $(\text{Bi,Sm})\text{FeO}_3$  thin films at the morphotropic phase boundary probed by neutron diffraction" Shingo Maruyama, Varatharajan Anbusathaiah, Any Fennell, Mechthild Enderle, Ichiro Takeuchi, William D. Ratcliff, APL Materials, 2, doi10.1063/1.4901294 (2014).

## 2013

"Electric-field-controlled antiferromagnetic domains in epitaxial  $\text{BiFeO}_3$  thin films probed by neutron diffraction" W. Ratcliff II, Zahra Yamani, V. Anbusathaiah, T.R. Gao, P.A. Kienzie, H. Cao, I. Takeuchi, Phys. Rev. B. 87, 140405 (2013).

## 2012

"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).

## 2011

"Local Weak ferromagnetism in single-crystalline ferroelectric  $\text{BiFeO}_3$ ", 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)

"Antiferromagnetic order and superlattice structure in nonsuperconducting and superconducting  $\text{Rb}(\text{y})\text{Fe}(\text{1.6+x})\text{Se}_2$ , Phys. Rev. B 84, 094504 (2011).

"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).

"Temperature-dependent properties of the magnetic order in single-crystal  $\text{BiFeO}_3$ " M. Ramazanoglu, W. Ratcliff II, Y.J. Choi, Seongsu Lee, S-W. Cheong, V. Kiryukhin, Phys. Rev. B. 83, 174434 (2011)

"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).

"Mechanism of exchange-striction of ferroelectricity in multiferroic orthorhombic  $\text{HoMnO}_3$  single crystals" N. Lee, Y.J. Choi, M. Ramazanoglu, W. Ratcliff II, V. Kiryukhin, and S-W. Cheong, Phys. Rev. B 84, 020101 (2011)

"Neutron Diffraction Investigations of Magnetism in  $\text{BiFeO}_3$  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)

"Antiferromagnetic Order and Superlattice Structure in Nonsuperconducting and Superconducting  $\text{RbFe}_{1.6+x}\text{Se}_2$ " 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).

"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)

"Incommensurate Magnetism in  $\text{FeAs}$  Strips: Neutron Scattering from  $\text{CaFe}_4\text{As}_3$ " Yusuke Nambu, Liang L. hao, Emilia Morosan, Kyoo Kim, Gabriel Kotliar, Pawel Zajdel, Mark A. Green, William Ratcliff, Jose A. Rodriguez-Ruera, Collin Broholm, Phys. Rev. Lett 106, 037201 (2011).

## 2010

"Interplay of Fe and Nd magnetism in NdFeAsO single crystals" W. Tian, W. Ratcliff II, M. G. Kim, J.-Q. Yan, P.A. Kienle, 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).

"Cd Doping Effects in the heavy-fermion compounds Ce<sub>2</sub>Min<sub>8</sub> (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).

"Magnetic form factor of SrFe<sub>2</sub>As<sub>2</sub>: Neutron diffraction measurements" W. Ratcliff II, P.A. Kienle, Jeffrey W. Lynn, Shiliang Li, Pengcheng Dai, G.F. Chen, N.L. Wang, Phys. Rev. B 81, 140502 (2010).

## 2009

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

"Crossover from incommensurate to commensurate magnetic orderings in CoCr<sub>2</sub>O<sub>4</sub>" LJ Chang, DJ Huang, WH Li, SW Cheong, W. Ratcliff, JW Lynn J. Phys. Cond. Matt. 21, 456008 (2009).

"Short Range Incommensurate magnetic order near the superconducting phase boundary in Fe(1+delta)Te(1-x)Se<sub>x</sub>" J.S. Wen, GY Xu, ZJ Xu, ZW Lin, Q. Li, W. Ratcliff, G. Gu, JM Tranquada Phys. Rev. B 80, 104506 (2009).

"Spin-Lattice Order in Frustrated ZnCr<sub>2</sub>O<sub>4</sub>" S. Ji, SH Lee, C. Broholm, TY Koo, W. Ratcliff, SW Cheong, P. Zschack Phys. Rev. Lett 103, 037201 (2009).

"The Magnetic ground state of CaMn<sub>2</sub>Sb<sub>2</sub>" W. Ratcliff II, ALL Sharma, AM Gomes, JL Gonzalez, Q. Huang, J Singleton J Mag. Mag. Materials 321, 2612 (2009).

"Order by Static Disorder in the Ising Chain Magnet Ca<sub>3</sub>Co<sub>2</sub>-xMn<sub>x</sub>O<sub>6</sub>" V. Kiryukhin, S. Lee, W. Ratcliff II, Q. Huang, HT Yi, YJ Choi, SW Cheong Phys Rev. Lett. 102, 187202 (2009).

"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).

## 2008

"Low energy spin waves and magnetic interactions in SrFe<sub>2</sub>As<sub>2</sub>" Jun Zhao, Dao Xin Yao, Shiliang Li, Tao Hong, Y. Chen, S. Chang, W. Ratcliff 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).

"Spin and Lattice Structure of Single Crystal SrFe<sub>2</sub>As<sub>2</sub>" 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).

"Magnetic order close to superconductivity in the iron-based layered LaO<sub>1-x</sub>Fe<sub>x</sub>As systems" C. dela Cruz, Q. Huang, JW Lynn, JY Li, W. Ratcliff, JL Zarestsky, HA Mook, GF Chen, JL Luo, NL Wang, PC Dai Nature 453, 899 (2008).

"Neel to Spin-Glass-Like Transition Versus Dilution in Geometrically Frustrated ZnCr<sub>2</sub>-2xGa<sub>2x</sub>O<sub>4</sub>" S-H. Lee, W. Ratcliff, Q. Huang, T.H. Kim, S-W. Cheong PRB 77, 014405 (2008)

"Formation of pancakelike ising domains and giant magnetic coercivity in ferrimagnetic LuFe<sub>2</sub>O<sub>4</sub>" 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)

"Electric field control of the magnetic state in BiFeO<sub>3</sub> single crystals" Seoungsu Lee, W. Ratcliff, SW Cheong, V. Kiryukhin APL 92, 192906 (2008)

"Single Ferroelectric and chiral magnetic domain of single-crystalline BiFeO<sub>3</sub> in an electric field" Seoungsu Lee, Taekjib Choi, W. Ratcliff II, R. Erwin, S-W. Cheong, and V. Kiryukhin PRB RC 78, 100101 (2008)

"The pressure effect on the magnetic commensurability and ferroelectricity in multiferroic HoMn<sub>2</sub>O<sub>5</sub>" CR dela Cruz, B. Lorenz, W. Ratcliff, J. Lynn, MM Gospodinov, C.W. Chu Physica B 403, 1359 (2008)

"Observation of a continuous phase transition in a shape-memory alloy" J.C. Lahsley, 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)

## 2007

"Crystal distortions in geometrically frustrated  $\text{ACr}_2\text{O}_4$  ( $\text{A}=\text{Zn}, \text{Cd}$ )", 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).

"Evidence for strong spin-lattice coupling in multiferroic  $\text{RMn}_2\text{O}_5$  ( $\text{R}=\text{Tb}, \text{Dy}, \text{Ho}$ ) 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.

"Structural Anomalies at the magnetic and ferroelectric transitions in  $\text{RMn}_2\text{O}_5$  ( $\text{R}=\text{Tb}, \text{Dy}, \text{Ho}$ )", 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.

"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.

## 2006

"Structural anomalies at the magnetic and ferroelastic transitions in  $\text{RMn}_2\text{O}_5$  ( $\text{R}=\text{Tb}, \text{Dy}, \text{Ho}$ )" 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).

## 2005

"Pressure-dependent magnetic properties of geometrically frustrated  $\text{ZnCr}_2\text{O}_4$ " Y. Jo, JG Park, HC Kim, W. Ratcliff, S-W. Cheong, *Phys. Rev. B* 72, 184421 (2005).

"Magnetic Phase Diagram of the Colossal Magnetoelectric,  $\text{DyMn}_2\text{O}_5$ " 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).

"Effects of spin-phonon coupling in the magnetic transition in strongly frustrated  $\text{ZnCr}_2\text{O}_4$ " A. B. Sushkov, H. D. Drew, O. Tchernyshyov, W. Ratcliff, S.W. Cheong, *Phys. Rev. Lett.* 94, 137202 (2005).

## 2004

"Spin Singlet formation in  $\text{MgTi}_2\text{O}_4$ : 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).

"First-Order nature of the ferromagnetic phase transition in  $(\text{La-Ca})\text{MnO}_3$  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).

## 2002

"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).

"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).

## 2001

"Magnetic properties of the frustrated antiferromagnetic spinel  $\text{ZnCr}_2\text{O}_4$  and the spin glass  $\text{Zn}_{1-x}\text{Cd}_x\text{Cr}_2\text{O}_4$  ( $x=0.05, 0.10$ )" 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).

"Studies of the three-dimensional frustrated antiferromagnetic  $\text{ZnCr}_2\text{O}_4$ " 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).

"Muon spin relaxation study of  $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ " 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).

## 2000

"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).

## 1999

"Intergrain magnetoresistance via second-order tunneling in perovskite manganites" S Lee, HY Hwang, BI Shraiman, WD Ratcliff, SW Cheong

## Selected Conference Talks/Posters

### 2017

"Effects of Electric Field on the magnetic structure of multiferroic (Sm,Bi)FeO<sub>3</sub> films" March Meeting of the American Physical Society, New Orleans, LA (2017)

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

"Multiferroic h-LuFeO<sub>3</sub>--adventures in Neutron Scattering", Pittsburgh Diffraction Society, Indiana, PA (2017), (invited)

"Neutron Investigations of thin film Ho<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub>", Quantum Materials Symposium 2017, Berlin, Germany (2017)

### 2016

"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 room temperature 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)

### 2015

"Neutron scattering investigations of bulk and thin film multiferroic LuFeO<sub>3</sub>" International Conference on Magnetism, Barcelona, Spain (2015)

"Neutron investigations of multiferroic LuFeO<sub>3</sub>" American Crystallography Association, Philadelphia (2015)

"The intrinsic magnetic structure and ordering of multiferroic h-LuFeO<sub>3</sub> Films" March Meeting of the American Physical Society, San Antonio, TX (2015)

### 2014

"Neutron Investigations of Multiferroic LuFeO<sub>3</sub>" Gordon Research Conference, Biddeford, ME (2014)

"Neutron diffraction investigations of BiFeO<sub>3</sub>" 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 LuFeO<sub>3</sub> Thin Films" American Conference on Neutron Scattering, Knoxville, TN (2014)

"Neutron Investigations of Multiferroic LuFe<sub>1-x</sub>MnxO<sub>3</sub>" March Meeting of the American Physical Society 2014 (Denver)

"Neutron Investigations of Multiferroic LuFe<sub>1-x</sub>MnxO<sub>3</sub>" Magnetic North IV, Victoria, British Columbia, Canada (2014)

### 2013

"Evolution of the magnetic structure in (Sm,Bi)FeO<sub>3</sub> Thin Films" March Meeting of the American Physical Society 2013 (Baltimore)

"Neutron Investigations of Multiferroic LuFeO<sub>3</sub>" Magnetism and Magnetic Materials, Denver, Co (2013)

"Neutron Diffraction Investigations of Electric-Field Control of Antiferromagnetic Domains in Epitaxial BiFeO<sub>3</sub> Thin Films" Fundamental Physics of Ferroelectrics and Related Materials, Ames, IA (2013)

### 2012

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

"Neutron Diffraction Investigations of Magnetism in BiFeO<sub>3</sub> Epitaxial Films" American Conference on Neutron Scattering 2012 (invited)

"Investigation of Electric Field Control Antiferromagnetic Domains in Epitaxial BiFeO<sub>3</sub> Thin Films Using Neutron Diffraction" March Meeting of the American Physical Society 2012

"Neutron Diffraction Investigations of Magnetism in BiFeO<sub>3</sub> Epitaxial Films" DAE Solid State Physics Symposium (2012) (invited), IIT Bombay

## 2011

"Neutron Diffraction Investigations of Magnetism in BiFeO<sub>3</sub> Epitaxial Films" MMM 2011, Desert Ridge, Arizona (invited)

"Neutron diffraction investigations of the BiFeO<sub>3</sub> thin films" European Spallation Source, Lund, 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 SrFe<sub>2</sub>As<sub>2</sub>" March Meeting of the American Physical Society 2011 (Dallas, Texas) (talk was presented by Pengcheng Dai due to budgetary constraints)

## 2010

"The Magnetic Form Factor in SrFe<sub>2</sub>As<sub>2</sub>" MMM 2010 (Atlanta, Georgia)

"Neutron investigations of BiFeO<sub>3</sub> Films" March Meeting 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)

"BiFeO<sub>3</sub>" Flipper, International Workshop on Single Crystal Diffraction with Polarized Neutrons, 2010 (Grenoble, France)

"BiFeO<sub>3</sub>" Aspen Winter Conference on Fundamental Physics of Ferroelectrics, 2010 (Aspen, Colorado)

## 2009

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

## 2008

"Dimensional Crossover in ZnMn<sub>2</sub>O<sub>4</sub>" William Ratcliff, Ying Chen, Goran Gasparovic, Yiming Qiu, Qing Huang, Jeffrey Lynn, Sunmug Yeo, Sang Cheong, Paula Piccoli, Arthur Schultz March Meeting of the American Physical Society 2008 (New Orleans, Louisiana).

Dimensional Crossover in ZnMn<sub>2</sub>O<sub>4</sub> 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)

"BiFeO<sub>3</sub>" 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)

## 2007

"Elucidation on the effects of hydrostatic pressure on multiferroic, HoMn<sub>2</sub>O<sub>5</sub>", 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, ZnMn<sub>2</sub>O<sub>4</sub>" National Conference of Black Physicists, 2007 (Boston). (Invited Talk)

## 2006

"The low dimensional magnet, ZnMn<sub>2</sub>O<sub>4</sub>" Contributed talk, March Meeting 2006 of the American Physical Society (APS), Baltimore, Maryland

## 2005

"The Giant Magnetoelectric, DyMn<sub>2</sub>O<sub>5</sub>" Contributed talk, March Meeting 2005 of the American Physical Society (APS), Los Angeles, California

## 2004

"The Giant Magnetoelectric,  $\text{DyMn}_2\text{O}_5$ " Contributed talk, American Conference on Neutron Scattering (ACNS), June 2004 College Park, Maryland

"The Magnetic Structure of  $\text{ZnCr}_2\text{O}_4$ " Contributed talk, March Meeting 2004 of the American Physical Society (APS), Montreal, Canada

## 2003

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

## 2002

"Magnetism of  $\text{Sr}(\text{Ti},\text{Co})\text{O}_3$ " Poster, Gordon Research Conference on Strongly Correlated Electrons, June 2002, Maine.

"Magnetism of  $\text{Sr}(\text{Ti},\text{Co})\text{O}_3$ " Contributed talk, March Meeting 2002 of the American Physical Society (APS), Indianapolis, Indiana

## 2001

"Site-vs-Bond disorder in the geometrically frustrated magnet,  $\text{ZnCr}_2\text{O}_4$ " Poster, SCES2001, August 2001, University of Michigan, Ann Arbor

"Site-vs-Bond disorder in the geometrically frustrated magnet,  $\text{ZnCr}_2\text{O}_4$ " Contributed talk, March Meeting 2001 of the APS, March 12-16, Seattle, Washington

## 2000

"The geometrically frustrated magnet,  $\text{ZnCr}_2\text{O}_4$ " Poster, Gordon Research Conference Strongly Correlated Electrons, June 2000. New Hampshire.

## Instruction Experience

- Conducted numerous summer schools at the NCNR
- SHIP mentor for high school students
- 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