Kate A. Ross

Assistant Professor

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Research Interests

Quantum materials, quantum spin liquids, quantum phase transitions, topological spin textures, neutron scattering, crystal growth, ultrasound spectroscopy.

Current Position

2015/08 - present
Department of Physics, Colorado State University
Position: Assistant Professor

2016/07 - 2018/07
CIFAR Quantum Materials Program
Position: CIFAR Azrieli Global Scholar

Education

09/2007 - 11/2012 McMaster University, Hamilton, Ontario Canada

Ph.D., Physics; Thesis title: *Neutron Scattering Studies of the Quantum Spin Ice Material* $Yb_2Ti_2O_7$. Advisor: Bruce Gaulin

09/2002 - 09/2007 University of Waterloo, Waterloo, Ontario Canada

B.Sc., Honours Physics, Co-operative Program; Research: *Specific Heat Measurements of the Magnetic Pyrochlores* $Gd_2Sn_2O_7$ *and* $Gd_2Ti_2O_7$. Advisor: Jan Kycia

Grants and Awards

- Oxford Instruments 2018 Lee Osheroff Richardson prize (Feb. 2018)
- American Physical Society 2016 George E. Valley Jr. Prize (awarded March 2017)
- NSF DMR-1611217 "Quantum phases in spin-orbit coupled honeycomb magnets: beyond 4d and 5d transition metal ions" (Sept. 2016 - Sept. 2019)
- Canadian Institute for Advanced Research (CIFAR) Azrieli Global Scholar (June 2016)
- Royal Society of Canada's Alice Wilson Award (Nov 2014)
- NSERC Post Doctoral Fellowship (awarded Feb 2014)
- 2014 Prize for Outstanding Student Research, Neutron Scattering Society of America (February 2014)
- One of two Canadians selected by the Royal Society of Canada to attend the interdisciplinary "IAP Conference of Young Scientists" in Dalian, China in 2013.
- NSERC CGS-D: Sept. 2009 - Sept. 2011
- NSERC CGS-M: Sept. 2007 – Sept. 2009
- 1st Place Presentation at Symposium Day (September 2008), Department of Physics and Astronomy, McMaster University
- NSERC Industrial USRA: Summer 2006
- Xerox Research Centre Award (for written communication, University of Waterloo): 2004 and 2005
- I.R. Dagg Memorial Scholarship (University of Waterloo): 2005-2006
- Selected to attend the 2008 Lindau Nobel Laureate conference (June 2008), Lindau Germany

Past Positions

2014/09 - 2015/08
Department of Chemistry, Colorado State University
Position: NSERC Postdoctoral fellow
Research focus: Synthesis of new exotic magnetic materials
Advisor: James Neilson

2012/09 - 2014/09
Institute for Quantum Matter, Johns Hopkins University and the NIST Center for Neutron Research.
Position: Postdoctoral fellow
Research focus: Quantum magnets, exotic phases of magnetic materials, neutron scattering as a probe of strongly interacting electronic systems, emergent phenomena
Advisor: Collin Broholm

2010/09 - 2012/09
McMaster University, Hamilton, Ontario Canada
Position: Instrument Responsible at McMaster Nuclear Reactor (MNR)
Research focus: Commissioning the new triple-axis neutron spectrometer at the MNR, preparation for use as a teaching and research tool
Advisor: Bruce Gaulin

2007/09 - 2012/09
McMaster University, Hamilton, Ontario Canada
Position: Ph.D. Candidate
Research focus: Crystal growth, neutron and x-ray scattering, frustrated magnetic materials
Advisor: Bruce Gaulin

2006/09 – 2007/04
University of Waterloo, Waterloo, Ontario Canada
Position: Undergraduate researcher
Research focus: Ultra-low temperature specific heat measurements, frustrated magnetic materials
Advisor: Jan Kycia

2004/09 – 2004/12
PICASSO Dark Matter Search Experiment, Queen's University, Kingston, Ontario Canada
Position: Undergraduate researcher
Research focus: Design and construction of a portable neutron calibration source, machine shop, design drawings, Monte Carlo simulations in C++
Advisor: Tony Noble

2004/01 – 2004/04
TRIUMF Weak Interaction Symmetry Test (TWIST), Vancouver, British Columbia Canada
Position: Undergraduate researcher
Research focus: Monte Carlo simulations in C++
Advisor: Art Olin

Professional Activities

- Communications Secretary, Neutron Scattering Society of America (Feb 2017 - Feb 2021)
- Member of Oak Ridge National Laboratory's SNS/HFIR User Group Executive Committee (SHUG-EC) (*Vice-Chair* Jan 2016 - Dec 2016, *Chair* Jan 2017 - Dec 2018)
- Member of the Program Committee for the 2016 Highly Frustrated Magnetism conference held in Taipei, Sept. 2016
- Member of the Scientific Review Committee (SRC) for Oak Ridge National Laboratory's neutron scattering user program. (2015 - present)
- Focus Topic Organizer for the APS March Meeting (GMAG unit) (Fall 2015 & Fall 2017)
- Member of the TRIUMF MMS-EEC (scientific review committee for the muSR user program) (Jan. 2016 - present)
- Co-organizer for the Front Range Magnetics Symposium (FRAMS) at Colorado State University (Sept. 2015)
- Referee for peer-reviewed journals: Science, Nature, PRL, PRB

Publications (updated December 31, 2017)

1) H.S. Nair, J.M. Brown, E. Coldren, G. Hester, M.P. Gelfand, A. Podlesnyak, Q. Huang, **K.A. Ross**. *Short range order in the quantum XXZ honeycomb lattice material $BaCo_2(PO_4)_2$*. arXiv:1712.06208 [cond-mat.str-el] (2017)

2) M.J. Tarne, M.M. Bordelon, S. Calder, J.R. Neilson, **K.A. Ross**. *Tuning the antiferromagnetic helical pitch length and nanoscale domain size in $Fe_3PO_4O_3$ by magnetic dilution*. Phys. Rev. B **96**, 214431 (2017)

3) B. A. Frandsen, **K. A. Ross**, J. W. Krizan, G. J. Nilsen, A. R. Wildes, R. J. Cava, R. J. Birgeneau, S. J. L. Billinge. *Real-space investigation of short-range magnetic correlations in fluoride pyrochlores $NaCaCo_2F_7$ and $NaSrCo_2F_7$ with magnetic pair distribution function analysis*. Phys. Rev. Materials **1**, 074412 **[Editor's suggestion]** (2017)

4) A. J. Neer, J. Milam-Guerrero, J. E. So, B. C. Melot, **K. A. Ross**, Z. Hulvey, C. M. Brown, A. A. Sokol, and D. O. Scanlon. *Ising-like antiferromagnetism on the octahedral sublattice of a cobalt-containing garnet and the potential for quantum criticality.* Phys. Rev. B **95**, 144419 (2017)

5) **K.A. Ross,** J.M. Brown, R.J. Cava, J.W. Krizan, S. E. Nagler, J.A. Rodriguez-Rivera, and M. B. Stone. *Single-ion properties of the S = 1/2 XY antiferromagnetic pyrochlores, $NaA'Co_2F_7$ ($A' = Ca^{2+}, Sr^{2+}$)*. Phys. Rev. B **95**, 144414 **[Editor's suggestion]** (2017)

6) J.-J. Wen, S. M. Koohpayeh, **K. A. Ross**, B. A. Trump, T. M. McQueen, K. Kimura, S. Nakatsuji, Y. Qiu, D. M. Pajerowski, J. R. D. Copley, and C. L. Broholm. *Disordered Route to the Coulomb Quantum Spin Liquid: Random Transverse Fields on Spin Ice in $Pr_2Zr_2O_7$*. Phys. Rev. Lett. **118**, 107206 (2017)

7) Edwin Kermarrec, Jonathan Gaudet, Katharina Fritsch, Rustem Khasanov, Zurab Guguchia, Clemens Ritter, **Kate Ross**, Hanna Dabkowska, and Bruce Gaulin. *Ground state selection under pressure in the quantum pyrochlore magnet $Yb_2Ti_2O_7$.* Nature Communications 8, 14810 (2017)

8) J.H. Roudebush, **K.A. Ross**, and R.J. Cava. *Iridium containing honeycomb Delafossites by topotactic cation exchange*. Dalton Trans., **45**, 8783-8789 (2016)

9) J. Gaudet, **K. A. Ross**, E. Kermarrec, N. P. Butch, G. Ehlers, H. A. Dabkowska, and B. D. Gaulin. *Gapless quantum excitations from an ice-like splayed ferromagnetic ground state in stoichiometric $Yb_2Ti_2O_7$.* Phys. Rev. B **93**, 064406 **[Editor's suggestion]** (2016)

10) **K. A. Ross**, J. W. Krizan, J. A. Rodriguez-Rivera, R. J. Cava, and C. L. Broholm. *Static and dynamic XY-like short-range order in a frustrated magnet with exchange disorder.* Phys. Rev. B **93**, 014433 (2016)

11) L. Pan, N. J. Laurita, **K. A. Ross**, B. D. Gaulin & N. P. Armitage. *A measure of monopole inertia in the quantum spin ice $Yb_2Ti_2O_7$.* Nature Physics (2015)

12) J. Gaudet, D. D. Maharaj, G. Sala, E. Kermarrec, **K. A. Ross**, H. A. Dabkowska, A. I. Kolesnikov, G. E. Granroth, and B. D. Gaulin. *Neutron spectroscopic study of crystalline electric field excitations in stoichiometric and lightly stuffed $Yb_2Ti_2O_7$.* Phys. Rev. B **92**, 134420 (2015)

13) **K. A. Ross,** M.M. Bordelon, G. Terho, J. R. Neilson. *Nanosized helical magnetic domains in strongly frustrated $Fe_3PO_4O_3$.* Phys. Rev. B **92**, 134419 **[Editor's suggestion]** (2015)

14) L. Pan, S.K. Kim, A. Ghosh, C.M. Morris, **K.A. Ross**, E. Kermarrec, B. D. Gaulin, and S.M. Koohpayeh, O. Tchernyshyov, N. P. Armitage. *Low-energy electrodynamics of novel spin excitations in the quantum spin ice $Yb_2Ti_2O_7$.* Nature Communications **5**, 4970 (2014)

15) E.M. Seibel, J.H. Roudebush, M.N. Ali, **K.A. Ross**, R.J. Cava. *Structure and Magnetic Properties of the Spin-1/2-Based Honeycomb $NaNi_2BiO_{6-\delta}$ and Its Hydrate $NaNi_2BiO_{6-\delta}\cdot 1.7H_2O$.* Inorganic Chemistry **53** (20), 10989-10995 (2014**)**

16) **K.A. Ross**, L. Harriger, Z. Yamani, W. J. L. Buyers, J. D. Garrett, A. A. Menovsky, J. A. Mydosh, C. L. Broholm. *Strict limit on in-plane ordered magnetic dipole moment in URu_2Si_2.* Phys. Rev. B, **89**, 155122 (2014)

17) **K. A. Ross**, Y. Qiu, J. R. D. Copley, H. A. Dabkowska, B. D. Gaulin. *Order by Disorder Spin Wave Gap in the XY Pyrochlore Magnet $Er_2Ti_2O_7$.* Phys. Rev. Lett. **112**, 057201 (2014)

18) H. J. Silverstein, K. Fritsch, F. Flicker, A.M. Hallas, J.S. Gardner, Y. Qiu, G. Ehlers, A.T. Savici, Z. Yamani, **K.A. Ross**, B.D. Gaulin, M.J.P. Gingras, J.A.M. Paddison, K. Foyevtsova, R. Valenti, F. Hawthorne, C.R. Wiebe, H.D. Zhou. *Liquid-like correlations in single crystalline $Y_2Mo_2O_7$: an unconventional spin glass*. Phys. Rev. B **89**, 054433 (2014)

19) R. M. D'Ortenzio, H. A. Dabkowska, S. R. Dunsiger, B. D. Gaulin, M. J. P. Gingras, T. Goko, J. B. Kycia, L. Liu, T. Medina, T. J. Munsie, D. Pomaranski, **K. A. Ross**, Y. J. Uemura, T. J. Williams, and G. M. Luke. *Unconventional magnetic ground state in $Yb_2Ti_2O_7$*. Phys. Rev. B **88**, 134428 (2013)

20) J. J. Wagman, G. Van Gastel, **K. A. Ross**, Z. Yamani, Y. Zhao, Y. Qiu, J. R. D. Copley, A. B. Kallin, E. Mazurek, J. P. Carlo, H. A. Dabkowska, and B. D. Gaulin. *Two-dimensional incommensurate and three-dimensional commensurate magnetic order and fluctuations in La2-xBaxCuO4*. Phys. Rev. B, **88** 014412 (2013)

21) D. Pomaranski, L.R. Yaraskavitch, S. Meng, **K.A. Ross**, H.M.L. Noad, H.A. Dabkowska, B.D. Gaulin, J.B. Kycia. *Absence of Pauling's residual entropy in thermally equilibrated $Dy_2Ti_2O_7$*. Nature Physics, **9**, 353-356 (2013)

22) K. Fritsch, **K.A. Ross,** Y. Qiu, J.R.D. Copley, T. Guidi, R.I. Bewley, H.A. Dabkowska, B.D. Gaulin. *Antiferromagnetic spin ice correlations at (1/2, 1/2, 1/2) in the ground state of the pyrochlore magnet Tb2Ti2O7*. Phys. Rev. B **87** (9), 094410 (2013)

23) W. H. Toews, S.S. Zhange, **K.A. Ross**, H.A. Dabkowska, B.D. Gaulin and R.W. Hill. *Thermal conductivity of $Ho_2Ti_2O_7$ along the [111] direction.* Phys. Rev. Lett., **110**, 217209, (2013)

24) N.R. Hayre, **K.A. Ross**, R. Applegate, T. Lin, R.R.P. Singh, B.D. Gaulin and M.J.P. Gingras. *Thermodynamic properties of $Yb_2Ti_2O_7$ pyrochlore as a function of temperature and magnetic field: Validation of a quantum spin ice exchange Hamiltonian*, Phys. Rev. B, **87**, 184453, (2013)

25) **K.A. Ross**, T Proffen, H.A. Dabkowska, J.A. Quilliam, L.R. Yaraskavitch, J.B. Kycia, B.D. Gaulin. *Lightly stuffed pyrochlore structure of single-crystalline $Yb_2Ti_2O_7$ grown by the optical floating zone technique.* Phys. Rev. B **86** (17), 174424 (2012)

26) H.M Revell, L.R. Yaraskavitch, J.D. Mason, **K.A. Ross**, H.M.L. Noad, H.A. Dabkowska, B.D. Gaulin, P. Henelius, J.B. Kycia. *Evidence of impurity and boundary effects on magnetic monopole dynamics in spin ice*. Nature Physics **9** (1), 34-37 (2012)

27) L. Savary, **K.A. Ross**, B.D. Gaulin, J.P.C. Ruff, L. Balents. *Order by Quantum Disorder in Er2Ti2O7*. Phys. Rev. Lett. **109** (16), 167201 (2012)

28) L.R. Yaraskavitch, H.M. Revell, S. Meng, **K.A. Ross**, H.M.L. Noad, H.A. Dabkowska, B.D. Gaulin, and J.B. Kycia. *Spin dynamics in the frozen state of the dipolar spin ice material* $Dy_2Ti_2O_7$. Phys. Rev. B **85**, 020410(R) (2012)

29) Z. Islam, J.P.C. Ruff, **K.A. Ross**, H. Nojiri, and B.D. Gaulin. *Time-resolved one-dimensional detection of x-ray scattering in pulsed magnetic fields.* Rev. Sci. Instrum. **83**, 013113 (2012)

30) **K.A. Ross**, L. Savary, B. D. Gaulin, and L. Balents. *Quantum Excitations in Quantum Spin Ice*. Phys. Rev. X **1**, 021002 (2011).

31) **K.A. Ross**, L.R. Yaraskavitch, M. Laver, J.S. Gardner, J. A. Quilliam, S. Meng, J.B. Kycia, D. K. Singh, H.A. Dabkowska, and B.D. Gaulin. *Dimensional Evolution of Spin Correlations in the Magnetic Pyrochlore* $Yb_2Ti_2O_7$. Phys. Rev. B., **84**, 174442 (2011).

32) H. Nojiri, S. Yoshii, M. Yasui, K. Okada, M. Matsuda, J. -S. Jung, T. Kimura, L. Santodonato, G. E. Granroth, **K. A. Ross**, J. P. Carlo, and B. D. Gaulin. *Neutron Laue Diffraction Study on the Magnetic Phase Diagram of Multiferroic* $MnWO_4$ *under Pulsed High Magnetic Fields*. Phys. Rev. Lett., **106**, 237202 (2011).

33) J.P. C. Ruff, Z. Islam, J. P. Clancy, **K. A. Ross**, H. Nojiri, Y. H. Matsuda, H. A. Dabkowska, A. D. Dabkowski, and B. D. Gaulin. *Magnetoelastics of a Spin Liquid: X-Ray Diffraction Studies of* $Tb_2Ti_2O_7$ *in Pulsed Magnetic Fields*. Phys. Rev. Lett., **105**, 077203 (2010).

34) Granroth G. E., Kolesnikov A. I., Sherline T. E., Clancy J. P., **Ross K. A.**, Ruff J. P. C., Gaulin B. D., Nagler S. E. *SEQUOIA: a newly operating chopper spectrometer at the SNS*. Journal of Physics: Conference Series **251**, 12058 (2010).

35) **K.A. Ross**, J.P.C. Ruff, C.P. Adams, J.S. Gardner, H.A. Dabkowska, Y. Qiu, J.R.D. Copley, and B.D. Gaulin. *Two dimensional kagome correlations and field induced long range order in the ferromagnetic XY pyrochlore* $Yb_2Ti_2O_7$. Phys. Rev. Lett., **103**, 227202 (2009).

36) Z.Islam, J.P.C. Ruff, H. Nojiri, Y.H. Matsuda, **K.A. Ross**, B.D. Gaulin, Z. Qu, J.C. Lang. *A portable high field pulsed magnet system for single crystal x-ray scattering studies*. Rev. Sci. Instrum., **80**, 113902 (2009).

37) J.A. Quilliam, **K. A. Ross**, A. G. Del Maestro, M. J. P. Gingras, L. R. Corruccini, and J.B. Kycia. Phys. *Evidence for Gapped Spin-Wave Excitations in the Frustrated $Gd_2Sn_2O_7$ Pyrochlore Antiferromagnet from Low-Temperature Specific Heat Measurements*. Rev. Lett. **99**, 097201 (2007).

Plenary talks

- "*Spin Orbit Coupled Quantum Magnetism"*: American Physical Society's Four Corners Section Meeting (Oct. 2017)
- *"Towards Emergent Electrodynamics in a Geometrically Frustrated Magnet"*: American Conference on Neutron Scattering (June 2014) (Outstanding Student Research Prize talk)

Invited talks

- *"Spin Orbit Coupled Quantum Magnetism"*, Northwestern University, Evanston, IL (Feb 2018)
- *"Spin Orbit Coupled Quantum Magnetism"*, Seaborg Institute Lecture, Los Alamos, NM (November 2017)
- *"Spin Orbit Coupled Quantum Magnetism"*, University of Colorado, Boulder, Boulder, CO (October 2017)
- **"***New Manifestations of Classical Ground State Degeneracy"*, Ohio State University, Columbus, OH (October 2017)
- *"Quantum phenomena in Seff = 1/2 pyrochlores revealed by neutron scattering",* NCNR summer school, Gaithersburg, MD (June 2017)
- *"Frustration, Quantum Magnetism, Spin Liquids"*, CIFAR Summer School, Vancouver, Canada (April 2017)
- George E. Valley, Jr. Prize Talk: *"Quantum Frustrated Magnetism and its Expression in the Ground State Selection of Pyrochlore Magnets",* APS March Meeting, New Orleans, LA (March 2017)
- *"Quantum Phenomena in XY Pyrochlores"*, National High Magnetic Field Laboratory, Tallahassee, FL (Dec. 2016)

- *"Quantum Phenomena in XY Pyrochlores"*, University of California Irvine, Orange County CA (Nov. 2016)
- *"Quantum Phenomena in XY Pyrochlores"*, Sherbrooke University, Sherbrooke QC (Nov. 2016)
- *"Quantum Phenomena in XY Pyrochlores"*, Stanford University, Palo Alto CA (Nov. 2016)
- "*Ferromagnetism with continuum excitations in the geometrically frustrated pyrochlore, $Yb_2Ti_2O_7$*", APS Four Corners meeting, Las Cruces, NM (Oct. 2016)
- "*Quantum Phenomena in XY Pyrochlores*", CIFAR Quantum Materials meeting. Paris, France (Oct. 2016)
- *"Quantum Spin Ice and Other Phenomena in XY Pyrochlores",* Gordon Research Conference on Correlated Electron Systems (June 2016)
- *"Ice-like Ferromagnetism with Continuum Excitations in Stoichiometric $Yb_2Ti_2O_7$",* Topological Matter Conference, MPI, Dresden Germany (Feb. 2016)
- *"Frustrated Magnetism and Quantum Phases of Matter":* Colloquium, Colorado School of Mines, Golden (Dec. 2015)
- *"Order-by-Disorder versus Spin Freezing in XY Pyrochlore Antiferromagnets"*: Condensed Matter Seminar, University of Utah, Salt Lake City (Nov. 2015)
- *"Quantum Spin Ice"*: Front Range Magnetic Symposium (FRAMS), Colorado State University (Sept. 2015)
- *"Spin Excitations in Stoichiometric $Yb_2Ti_2O_7$"*: KITP, Santa Barbara (July 2015)
- *"The effect of exchange disorder on a pyrochlore antiferromagnet: XY fluctuations and freezing in $NaCaCo_2F_7$":* Gordon Research Conference (GRC), Hong Kong (June 2015)
- *"From Order by Disorder to Emergent Electrodynamics in Geometrically Frustrated Pyrochlore Magnets"*: LASSP Seminar, Cornell University, Ithaca NY (May 2015)
- *"Towards Emergent Electrodynamics in a geometrically frustrated magnet"*: Center for Science at Extreme Conditions (CSEC), University of Edinburgh, UK (April 2015)
- *"Order-by-Disorder versus Spin Freezing in XY Pyrochlore Antiferromagnets":* Seminar, IFW, Dresden, Germany (April 2015)

- *"From Order by Disorder to Emergent Electrodynamics in Geometrically Frustrated Pyrochlore Magnets":* Colloquium, TU Dresden, Dresden, Germany (April 2015)
- *"Low energy XY spin clusters in a pyrochlore antiferromagnet with weak disorder":* APS March Meeting, San Antonio, TX (March 2015)
- *"Experimental Pyrochlore Systems":* Theory Winter School, National High Magnetic Field Lab, Tallahassee, FL (January 2015)
- *"Magnetic Correlations in a Frustrated Ni^{3+}-based Honeycomb Lattice":* Strongly Correlated Electron Systems (SCES), Grenoble, France (July 2014)
- *"Magnetic Correlations in a Frustrated Ni^{3+}-based Spin 1/2 Honeycomb Lattice: $Na_{(1-x)}Ni_2SbO_6$ * 1.5 D_2O":* Workshop on Novel Quantum Materials and Phases, Okinawa Institute of Science and Technology, Okinawa, Japan (May 2014)
- **"***From "Order By Disorder" to Emergent Electrodynamics in Geometrically Frustrated Pyrochlore Magnets*": "Chez Pierre" seminar, MIT, Cambridge MA (April 2014)
- *"Towards Emergent Electrodynamics in a Geometrically Frustrated Magnet"*: Lehigh University, Bethlehem PA (March 2014)
- **"***From "Order By Disorder" to Emergent Electrodynamics in Geometrically Frustrated Pyrochlore Magnets*": Condensed Matter Seminar, Caltech, Pasadena CA (February 2014)
- *"Ground states of the effective spin-1/2 XY pyrochlores: "Quantum Spin Ice" and "Order By Disorder"*: Condensed Matter Seminar, University of Kentucky, Lexington KY (November 2013)
- *"Ground states of the effective spin-1/2 XY pyrochlores: "Quantum Spin Ice" and "Order By Disorder"*: Condensed Matter Seminar, George Mason University, Arlington VA (November 2013)
- *"Pulsed magnet neutron scattering applied to multiferroic $MnWO_4$"*: SNS and HFIR User Group Meeting, Oak Ridge TN (August 2013)
- *"Spin Hamiltonians determined for Er2Ti2O7 and $Yb_2Ti_2O_7$ through high-field inelastic neutron scattering"*: Workshop on Synchrotron and Neutron Applications of High Magnetic Fields, ESRF, Grenoble France (October 2012)
- *""Quantum Spin Ice" Physics Determined from High Field Spin Wave Excitations in $Yb_2Ti_2O_7$"*: Exotic Phases of Frustrated Magnets, Kavli Institute for Theoretical Physics (KITP), Santa Barbara CA (October 2012)

- *"Spin Hamiltonian and Ground State Clues from Neutron Scattering in the Pyrochlore Spin Liquid Candidate, Yb2Ti2O7"*: NIST Center for Neutron Research Seminar, NIST, Gaithersburg MD (October 2012)
- *"Experimental Clues to the Ground State of a "Quantum Spin Ice" Pyrochlore Magnet*": Canadian Association of Physicists (CAP) Congress, Calgary AB (June 2012)
- *"Experimental clues to the ground state of the quantum spin ice Yb2Ti2O7"*: Highly Frustrated Magnetism (HFM), McMaster University, Hamilton ON (June 2012)
- *"Effective Spin-1/2 Hamiltonians Determined for Er2Ti2O7 & Yb2Ti2O7 Through Inelastic Neutron Scattering"*: 4-Corner Condensed Matter Symposium, Perimeter Institute, Waterloo ON (May 2012)
- *"Experimental clues to the ground state of the magnetic pyrochlore, Yb2Ti2O7"*: Condensed Matter Seminar, Johns Hopkins University, Baltimore MD (January 2012)
- *"Experimental clues to the ground state of the magnetic pyrochlore, Yb2Ti2O7"*: Condensed Matter Seminar, MIT, Cambridge MA (January 2012)
- "*Dimensional Evolution of Spin Correlations in $Yb_2Ti_2O_7$*": Geometrically Frustrated Magnets (International Institute of Physics) conference, Natal Brazil (December 2011).
- "*Experimental Clues to the Ground State of the Magnetic Pyrochlore $Yb_2Ti_2O_7$*": Condensed Matter Seminar, University of Waterloo, Waterloo ON (October 2011).
- "*You can take it with you: tailoring your undergraduate degree to prepare for graduate school*": Undergraduate seminar, University of Waterloo, Waterloo ON (October 2011).
- "*From Two Dimensional Correlations to a Disordered Ground State in the XY Pyrochlore, $Yb_2Ti_2O_7$*" APS March Meeting 2011, abstract #A18.00001, Dallas TX (March 2011).
- *"Time of Flight Neutron Diffraction at 30T",* American Conference on Neutron Scattering, Ottawa ON (June 2010).
- *"Unexpected Frustration, 2D Spin Correlations, and Field-Induced Order in $Yb_2Ti_2O_7$"*, Seminars at Kyoto University and Japan Atomic Energy Agency, Japan (Feb 2010).
- *"Unexpected Frustration, 2D Spin Correlations, and Field-Induced Order in $Yb_2Ti_2O_7$"*, Advanced Photon Source User Talk, Argonne IL (October 2009).

Contributed talks

- K.A. Ross, J. Roudebush, D. Pajerowski, C. Brown, J. Rodriguez, C.L. Broholm, R.J. Cava, *"Magnetic Correlations in a Frustrated Ni^{3+}-based Spin 1/2 Honeycomb Lattice",* APS March Meeting 2014, abstract #L4.00009, Denver CO (March 2014)
- K.A. Ross, Th. Proffen, H.A. Dabkowska, J.A. Quilliam, L.R. Yaraskavitch, J.B. Kycia, B.D. Gaulin, *"Single crystals of $Yb_2Ti_2O_7$ grown by the Optical Floating Zone technique: naturally ``stuffed'' pyrochlores?"*, APS March Meeting 2013, abstract #U14.00005, Baltimore MD (March 2013)
- K.A. Ross, K. Fritsch, R.Bewley, T. Guidi, Y. Qiu, C. Wiebe, H. Zhou, H. Dabkowska, B.D. Gaulin, *"Investigating the nature of magnetic correlations in the anti-ferromagnetic hyper-kagome material, $Yb_3Ga_5O_{12}$"*, APS March Meeting 2012, abstract #V8.00005, Boston MA (February 2012)
- K.A. Ross, J.P.C. Ruff, B.D. Gaulin, C.P. Adams, J.S. Gardner, H.A. Dabkowska, Y. Qiu, J.R.D. Copley, *"Unexpected Frustration, 2D Spin Correlations, and Field-Induced Order in $Yb_2Ti_2O_7$"*, Canadian Association of Physicists (CAP) Congress, Toronto ON (June 2010).
- K.A. Ross, J.P.C. Ruff, B.D. Gaulin, C.P. Adams, J.S. Gardner, H.A. Dabkowska, Y. Qiu, J.R.D. Copley, *"Planar Correlations and Field Induced Order in $Yb_2Ti_2O_7$"*, International Conference on Neutron Scattering, Knoxville TN (April 2009).
- K.A. Ross, J.P.C. Ruff, B.D. Gaulin, C.P. Adams, J.S. Gardner, H.A. Dabkowska, Y. Qiu, J.R.D. Copley, *"Planar Correlations and Field Induced Order in $Yb_2Ti_2O_7$"*, Seminar at the University of Waterloo, Waterloo ON (February 2009).
- K.A. Ross, J.P.C. Ruff, B.D. Gaulin, C.P. Adams, J.S. Gardner, H.A. Dabkowska, Y. Qiu, J.R.D. Copley, *"Two Dimensional Correlations and Field Induced Order in the Pyrochlore Ferromagnet $Yb_2Ti_2O_7$"*, APS March Meeting 2009, abstract #Y31.00002, Pittsburgh PA (March 2009)
- K.A. Ross, J.A.Quilliam, L.Corruccini, J.B. Kycia *"Low temperature specific heat of geometrically frustrated $Gd_2Sn_2O_7$"*. APS March Meeting, March 5-9, 2007, abstract #A15.003, Denver CO (March 2007)

Teaching

2015 - present
Lecturer, Colorado State University (Math Methods, Physical Thermodynamics)

2018/01
Lecturer, Magnetics PRSE Workshop

2017/04
Instructor, CIFAR Summer School

2013/07 & 2017/06
Instructor, NCNR Neutron Scattering Summer School

2007/09 - 2012/09
Teaching Assistant, McMaster University

Undergraduate level: Physics 1B03 (kinematics and dynamics), Physics 2B03 (electronics), Arts and Science 2D06 (physics for an interdisciplinary program), Solid State Physics 4K03

Outreach

04/2017: STEM Middle School Girls workshop leader (Expand Your Horizons)

06/2015: Interview for "The Innovators with Laurelle Turner", KCSU radio station.

06/2014: Participated in a live television interview about neutron scattering on Knoxville's WBIR news station

2012 - 2014: Tour guide for school group tours of the NIST Center for Neutron Research.

2011/09 - 2012/09: Member of the Organizing committee for the Condensed Matter Journal Club, McMaster University

2011/09 - 2012/09: Mentor for incoming graduate students, McMaster University

2010/09 and 2011/09: Volunteer for the Engineering and Science Olympics, McMaster University

2007/09 - 2012/09**:** Liquid Nitrogen and Superconductivity Demonstrator for the High School Outreach program, McMaster University

2010/10**:** Graduate student representative for McMaster University, Canadian Undergraduate Physics Conference (CUPC), Halifax NS, Canada