

Adam Aczel

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Research Interests

I study strongly correlated electron systems, with a current emphasis on frustrated magnetism, long period magnetic structures such as soliton and skyrmion lattices, and 4d/5d transition metal-based magnets with strong spin-orbit coupling. I study these materials primarily with neutron scattering, but I also perform muon spin rotation/relaxation (μ SR), synchrotron x-ray experiments, and high magnetic field bulk characterization measurements in select cases when these other techniques can provide additional insight into a particular material. Finally, I have maintained an interest in synthesizing polycrystalline samples and single crystals of new materials and characterizing them via magnetometry, heat capacity, resistivity, and X-ray diffraction measurements.

Professional Experience

Staff Scientist

2013 - present

Neutron Sciences Directorate
Oak Ridge National Laboratory, Oak Ridge, USA

Job Duties:

- Perform excellent research at ORNL and maintain a strong scientific publication record
- Act as an instrument scientist for the triple axis spectrometers at the High Flux Isotope Reactor by serving as a local contact for general user experiments and helping users analyze and publish their results
- Work to improve the performance of the triple axis spectrometers
- Attract new users and work on strengthening the triple axis spectrometer user community

Assistant Professor, Joint Faculty Program

2017 - 2020

Department of Physics and Astronomy
University of Tennessee, Knoxville, USA

Postdoctoral Research Associate

2010 - 2013

Neutron Sciences Directorate
Oak Ridge National Laboratory, Oak Ridge, USA

Collaborators: S.E. Nagler, G.E. Granroth, D. Mandrus

Research Projects: Crystal growth, bulk characterization and neutron scattering studies of the vibrational and magnetic properties of geometrically frustrated and itinerant magnets

Education

Doctor of Philosophy (Physics) 2005 - 2010

McMaster University, Hamilton, Canada

Collaborators: G.M. Luke (Ph.D. supervisor), Y.J. Uemura, M. Jaime

Research Projects: Crystal growth and high magnetic field measurements of quantum magnets, μ SR measurements of exotic magnets and unconventional superconductors

Thesis Title: Studies of Bose-Einstein condensates in magnetic insulators

Bachelor of Science (Physics Honours – Co-op) 2001 - 2005

University of Windsor, Windsor, Canada

Minor: mathematics

Funding

2022: co-PI (with Chris Redmon and Josh Pierce) – Science Productivity Proposal: Clone of the 6 T Asymmetric Vertical Field Cryomagnet for HFIR (\$560,000)

2017: PI – Mid-Scale Level Investment Proposal: 50 mm bore liquid helium cryostat at HFIR (\$104,000)

2017: co-PI (with Daniel Pajerowski and Harish Agrawal) – Science Productivity Proposal: 6 T Asymmetric Vertical Field Cryomagnet for HFIR (\$420,000)

2016: co-PI (with Wei Tian) – Science Productivity Proposal: HB-1A upgrade, including an optimized monochromator system, a new analyzer-detector assembly, and a new sample table (\$2,900,000)

Honors and Awards

2016: *UT Battelle Team Research Award* and *UT Battelle Director's Team Research Award*: “For team effort culminating in the observation of fractionalized quantum spin liquid excitations”

2005 - 2009: *Alexander Graham Bell Canada Graduate Scholarship, National Science and Engineering Research Council of Canada*. Awarded to a high caliber scholar engaged in a doctoral program in the natural sciences or engineering.

2006 - 2007: *James F. Harvey and Helen S. Harvey Travel Scholarship, McMaster University*

2005 - 2006: *Golden Key Graduate Scholar Award, Golden Key International Honour Society*. Awarded to an outstanding graduate student who excels in the areas of academics, leadership, and service.

2006: *Board of Governor's Medal, Physics, University of Windsor*. Awarded to the graduating student with the highest average in their discipline.

Memberships

- American Physical Society, including GMAG, DMP, DCMP, and SESAPS
- American Crystallographic Association
- Golden Key International Honour Society
- Neutron Scattering Society of America
- Canadian Institute for Neutron Scattering

Graduate Student Supervision

2022 – present: **A. Brassington**, University of Tennessee, co-supervision with Prof. H.D. Zhou

2019 – 2022: **K. Lu**, University of Illinois at Urbana-Champaign, co-supervision with Prof. G.J. MacDougall and Dr. L. DeBeer-Schmitt throughout the second half of his Ph.D. program.
Current position: Staff Scientist at Alibaba Quantum Laboratory

2019 – 2022: **L. Kish**, University of Illinois at Urbana-Champaign, co-supervision with Prof. G.J. MacDougall and Dr. L. DeBeer-Schmitt for one year through the DOE Office of Science Graduate Student Research (SCGSR) program and then afterwards throughout the duration of his Ph.D. program.

Current position: Postdoctoral fellow with Dr. Igor Zaliznyak at Brookhaven National Laboratory

2017 – 2020: **Q. Chen**, University of Tennessee, co-supervision with Prof. H.D. Zhou through the Joint Faculty Program.

Current position: Postdoctoral fellow with Profs. Bruce Gaulin and Graeme Luke at McMaster University

2020: **M. Daum**, Georgia Institute of Technology, co-supervision with Prof. M. Mourigal, Dr. B. Winn and Dr. G.E. Granroth for six months through the DOE SCGSR program.

Current position: Future Technical Leaders Program at Northrup Grumman

2016: **D. Reig-i-Plessis**, University of Illinois at Urbana-Champaign, co-supervision with Prof. G.J. MacDougall for six months through the DOE SCGSR program.

Current position: Postdoctoral fellow with Profs. Alannah Hallas and Meigan Aronson at the University of British Columbia

Workshops and Event Organization

2022: Georgia Tech Undergraduate Student Visit to ORNL, co-organizer with Alicia Manjon-Sanz and Christina Hoffman

2022: National School on Neutron and X-ray Scattering, co-organizer with Bianca Haberl, Keith Taddei, Mike Manley, Stephan Rosenkranz, Uta Ruett, and Yongseong Choi

2016 – 2019, 2022: Quantum Materials Young Investigators Meetings, co-organizer with Stuart Calder

2015, 2017: MANTA - A new cold triple axis spectrometer for HFIR, co-organizer with Jaime Fernandez-Baca

Service

2015 - Present: *Proposal Reviewer for x-ray/neutron scattering user programs*
Cornell High Energy Synchrotron Source and National Institute of Standards and Technology

2015 - Present: *Committee Member*
ORNL Neutron Sciences High Magnetic Field and Low Temperature Sample Environment Steering Committee
We discuss high magnetic field and low temperature sample environment policies and development projects. We also make recommendations to management for new equipment.

2009 - Present: *Referee*
Physical Review B, Physical Review Letters, Physical Review X, Physical Review Materials, npj Quantum Materials, Nature Communications, Nature Physics, the Journal of Physics: Condensed Matter, the Journal of Solid-State Chemistry, and Inorganic Chemistry

2020 – 2021: *Executive Committee Member, Chair (2020), Past-Chair (2021)*
American Crystallographic Association, Neutrons Scientific Interest Group

2018 – 2021: *Committee Member*
NHMFL Pulsed Field Facility Advisory Sub-Committee

2018 – 2020: *Secretary*
SNS and HFIR User Group Executive Committee (SHUG-EC)

2018 – 2020: *Committee Member*
APS March Meeting Frustrated Magnetism Focus Topic Committee

2018 – 2019: *Committee Member*
Neutron Scattering Division (NSD) Career Advancement Committee
We provide recommendations to NSD management on career advancement policies and procedures for neutron scattering scientists.

2017 – 2018: *Committee Chair*
ORNL Neutron Scattering Division Early Career Scientist (ECS) Initiative
I worked with a task force of ECS staff members to organize career development events and seminars with the overall goal of enhancing the science culture in our division.

2015 - 2017: *Committee Member*
ORNL DOE Scientific Highlights Committee
We chose ORNL neutron scattering highlights for our management to present to the Department of Energy.

2014 - 2016: *Committee Member*

Publications

Impact: H-index = 27 and 3307 total citations (Web of Science, Oct. 2022)

Symbols: * denotes corresponding author, ** denotes co-supervision of student

116. X. Yao, J. Gaudet, R. Verma, D.E. Graf, H.-Y. Yang, F. Bahrami, R. Zhang, **A.A. Aczel**, S. Subedi, D.H. Torchinsky, J. Sun, A. Bansil, S.-M. Huang, B. Singh, P. Nikolic, P. Blaha, and F. Tafti, *Observation of spiral order and A-phase in the Weyl semimetal SmAlSi*, Submitted to Phys. Rev. X (2022)

115. B.R. Ortiz, P.M. Sarte, A.H. Avidor, A. Hay, E. Kenney, A.I. Kolesnikov, **A.A. Aczel**, C. Brown, C. Wang, M.J. Graf, R. Seshadri, L. Balents, and S.D. Wilson, *Quantum disordered ground state in the Heisenberg-Kitaev candidate NaRuO₂*, submitted to Nature Physics (2022)

114. **A.A. Aczel***, Q. Chen, J.P. Clancy, C. dela Cruz, D. Reig-i-Plessis, G.J. MacDougall, C.J. Pollock, M.H. Upton, T.J. Williams, N. LaManna, J.P. Carlo, J. Beare, G.M. Luke, and H.D. Zhou, *Spin-orbit coupling controlled ground states in the double perovskite iridates A₂BIrO₆ (A = Ba, Sr; B = Lu, Sc)*, Phys. Rev. Mat. **6**, 094409 (2022)

113. Z.Y. Li, X.Y. Li, J.M. He, M.M. McGuire, **A.A. Aczel**, J.A. Alonso, M.T. Fernandez-Diaz, and J.S. Zhou, *Exotic physical properties in metallic perovskite LaRuO₃: strong evidence for Hund metal*, Phys. Rev. B **106**, L081104 (2022)

112. B.C. Sales, W.R. Meier, D.S. Parker, L. Yin, J.Q. Yan, A.F. May, S. Calder, **A.A. Aczel**, Q. Zhang, H. Li, T. Yilmaz, E. Vescovo, H. Miao, D.H. Moseley, R.P. Hermann, and M.A. McGuire, *Chemical control of magnetism in the Kagome metal CoSn_{1-x}In_x: magnetic order from non-magnetic substitutions*, Chemistry of Materials **34**, 7069 (2022)

111. J.M. Moya, A.M. Hallas, V. Loganathan, C.-L. Huang, L. Kish**, **A.A. Aczel**, J. Beare, Y. Cai, G.M. Luke, F. Weickert, A.H. Nevidomskyy, C.D. Malliakas, M. Kanatzidis, S.M. Lei, K. Bayliff, and E. Morosan, *Field-induced quantum critical point in the new itinerant antiferromagnet Ti₃Cu₄*, Communications Physics **5**, 136 (2022)

111. Q. Chen**, R. Sinclair, A. Akbari-Sharbat, Q. Huang, E.S. Choi, M. Mourigal, A. Verrier, R. Rouane, X. Bazier-Matte, J.A. Quilliam, **A.A. Aczel***, and H.D. Zhou, *Magnetic order and spin liquid behavior in Mo₃¹¹⁺ molecular magnets*, Phys. Rev. Mat. **6**, 044414 (2022)

110. S. Lee, E.W. Huang, T.A. Johnson, X. Guo, A.A. Husain, M. Mitrano, K. Lu, A.V. Zakrzewski, G.A. de la Pena, Y. Peng, H. Huang, S.-J. Lee, H. Jang, J.-S. Lee, Y.I. Joe, W.B. Dorisese, P. Szypryt, D.S. Swetz, **A.A. Aczel**, G.J. MacDougall, S.A. Kivelson, E. Fradkin, and P. Abbamonte, *Generic character of charge and spin density waves in superconducting cuprates*, PNAS **119**, e2119429119 (2022)

109. S. Wu, Z. Xu, S.C. Haley, S.F. Weber, A. Acharya, E. Maniv, Y. Qiu, **A.A. Aczel**, J.B. Neaton, J.G. Analytis, and R.J. Birgeneau, *Highly tunable magnetic phases in transition metal dichalcogenide $Fe_{1/3+\delta}NbS_2$* , Phys. Rev. X **12**, 021003 (2022)
108. L.L. Kish**, A. Thaler, M. Lee, A.V. Zakrzewski, D. Reig-i-Plessis, B. Wolin, X. Wang, K.C. Littrell, R. Budakian, H.D. Zhou, Z. Gai, M.D. Frontzek, V.S. Zapf, **A.A. Aczel**, L. DeBeer-Schmitt, and G.J. MacDougall, *Domain wall patterning and giant response functions in ferrimagnetic spinels*, Advanced Science **8**, 2101402 (2021)
107. M.D. LeBlanc, **A.A. Aczel**, G.E. Granroth, B.W. Southern, J.-Q. Yan, S.E. Nagler, J.P. Whitehead, and M.L. Plumer, *Impact of further-range exchange and cubic anisotropy on magnetic excitations in the fcc kagome antiferromagnet $IrMn_3$* , Phys. Rev. B **104**, 014427 (2021)
106. S.J. Gomez, P.M. Sarte, M. Zelensky, A.M. Hallas, B.A. Gonzalez, K.H. Hong, E.J. Pace, S. Calder, M.B. Stone, Y. Su, E. Feng, M.D. Le, C. Stock, J.P. Attfield, S.D. Wilson, C.R. Wiebe, and **A.A. Aczel***, Absence of moment fragmentation in the mixed B-site pyrochlore Nd_2GaSbO_7 , Phys. Rev. B **103**, 214419 (2021), *Editor's Suggestion*
105. P.M. Sarte, K. Cruz-Kan, B.R. Ortiz, K.H. Kong, M.B. Bordelon, D. Reig-i-Plessis, M. Lee, E.S. Choi, M.B. Stone, S. Calder, D.M. Pajerowski, L. Mangin-Thro, Y. Qiu, J.P. Attfield, S.D. Wilson, C. Stock, H.D. Zhou, A.M. Hallas, J.A.M. Paddison, **A.A. Aczel***, and C.R. Wiebe, *Dynamical ground state in the XY pyrochlore Yb_2GaSbO_7* , npj Quantum Materials **6**, 42 (2021)
104. S.K. Karna, D. Tristant, J.K. Hebert, G. Cao, R. Chapai, W.A. Phelan, Q. Zhang, Y. Wu, C. Dhital, Y. Li, H.B. Cao, W. Tian, C.R. dela Cruz, **A.A. Aczel**, O. Zaharko, A. Khasanov, M.A. McGuire, A. Roy, W. Xie, D.A. Browne, I. Vekhter, V. Meunier, W.A. Shelton, P.W. Adams, P.T. Sprunger, D.P. Young, R. Jin, and J.F. DiTusa, *Helical magnetic order and Fermi surface nesting in non-centrosymmetric $ScFeGe$* , Phys. Rev. B **103**, 014443 (2021)
103. D. Reig-i-Plessis**, T.A. Johnson, K. Lu, Q. Chen**, J.P.C. Ruff, M.H. Upton, T.J. Williams, S. Calder, H.D. Zhou, J.P. Clancy, **A.A. Aczel***, and G.J. MacDougall, *Structural, electronic, and magnetic properties of nearly-ideal $J_{eff} = 1/2$ iridium halides*, Phys. Rev. Mat. **4**, 124407 (2020)
102. M. Dragomir, **A.A. Aczel**, C.R. Wiebe, J.A. Lussier, P. Dube, and J.E. Greedan, *The magnetic ground state of La_2LiMoO_6 : A comparison with other Mo^{5+} ($S = 1/2$) double perovskites*, Phys. Rev. Mat. **4**, 104406 (2020)
101. M. Lee, Q. Chen**, E.S. Choi, Q. Huang, Z. Wang, L. Ling, Z. Qu, G.H. Wang, J. Ma, **A.A. Aczel***, and H.D. Zhou, *Magnetocaloric effect arising from a field-induced pseudo Jahn-Teller distortion in a rare earth magnet*, Phys. Rev. Mat. **4**, 094411 (2020)
100. Y. Tao, J.A. Schneeloch, **A.A. Aczel**, and D. Louca, *T_d to IT' structural phase transition in WTe_2 Weyl semimetal*, Phys. Rev. B **102**, 060103(R) (2020)

99. J.A. Schneeloch, Y. Tao, C. Duan, M. Matsuda, **A.A. Aczel**, J.A. Fernandez-Baca, G. Xu, J.C. Neuefeind, J. Yang, and D. Louca, *Evolution of the structural transition in $Mo_{1-x}W_xTe_2$* , Phys. Rev. B **102**, 054105 (2020)
98. Q. Chen**, A. Verrier, D. Ziat, A.J. Clune, R. Rouane, X. Bazier-Matte, G. Wang, S. Calder, K.M. Taddei, C.R. dela Cruz, A.I. Kolesnikov, J. Ma, J.-G. Cheng, Z. Liu, J.A. Quilliam, J.L. Musfeldt, H.D. Zhou, and **A.A. Aczel***, *Realization of the orbital selective state at the molecular level in $Ba_3LaRu_2O_9$* , Phys. Rev. Mat. **4**, 064409 (2020)
97. K. Lu, D. Sapkota, L. DeBeer-Schmitt, Y. Wu, H.B. Cao, N. Mannella, D. Mandrus, **A.A. Aczel***, and G.J. MacDougall, *Canted antiferromagnetic order in the monoaxial chiral magnets $V_{1/3}TaS_2$ and $V_{1/3}NbS_2$* , Phys. Rev. Mat. **4**, 054416 (2020)
96. M. Vogl, R. Morrow, **A.A. Aczel**, R.B. Rodriguez, A.U.B. Wolter, S. Wurmehl, S. Aswartham, and B. Buchner, *Complex magnetic properties in the mixed 4f-5d double perovskite iridates Ln_2ZnIrO_6 ($Ln = Nd, Sm, Eu, Gd$)*, Phys. Rev. Mat. **4**, 054413 (2020)
95. J.-Q. Yan, Y. Liu, D. Parker, W. Yu, **A.A. Aczel**, M. Matsuda, M.A. McGuire, and B.C. Sales, *A-type antiferromagnetic order in $MnBi_4Te_7$ and $MnBi_6Te_{10}$ single crystals*, Phys. Rev. Mat. **4**, 054202 (2020)
94. R.W. Smaha, W. He, J.M. Jiang, C.J. Titus, J.-J. Wen, Y.-F. Jiang, J.P. Sheckelton, S.G. Wang, Y.-S. Chen, S.J. Teat, **A.A. Aczel**, Y. Zhao, G. Xu, J.W. Lynn, H.-C. Jiang, and Y.S. Lee, *Team of rivals in a Kagome material: quantum spin liquid, spin order, and valence bond crystal*, npj Quantum Materials **5**, 054202 (2020)
93. N. Metoki, **A.A. Aczel**, D. Aoki, S. Chi, J.A. Fernandez-Baca, J.-C. Griveau, M. Hagihala, T. Hong, Y. Haga, K. Ikeuchi, Y. Inamura, K. Kamazawa, R. Kajimoto, H. Kitazawa, T. Masuda, M. Matsuda, M. Nakamura, J. Ohtsuki, D.P. Pajerowski, H.S. Suzuki, E. Yamamoto, and H. Yamauchi, *The f-electron state of the heavy fermion superconductor $NpPd_5Al_2$ and the isostructural family*, JPS Conference Proceedings **30**, 011123 (2020)
92. Y. Cai, M.N. Wilson, J. Beare, C. Lygouras, G. Thomas, D.R. Yahne, K.A. Ross, K.M. Taddei, G. Sala, H.A. Dabkowska, **A.A. Aczel***, and G.M. Luke, *Crystal fields and magnetic structure of the Ising antiferromagnet $Er_3Ga_5O_{12}$* , Phys. Rev. B **100**, 184415 (2019), **Editor's Suggestion**
91. D. Reig-i-Plessis**, A. Cote, S. van Geldern, R.D. Mayrhofer, **A.A. Aczel**, and G.J. MacDougall, *Neutron scattering measurement of crystalline electric fields in magnesium rare earth selenide spinels*, Phys. Rev. Mater. **3**, 114408 (2019)
90. F. Weickert, **A.A. Aczel***, M.B. Stone, V.O. Garlea, C. Dong, Y. Kohama, R. Movshovich, A. Demuer, N. Harrison, M.B. Gamza, A. Steppke, M. Brando, H. Rosner, and A.A. Tsirlin, *Field-induced double dome and Bose-Einstein condensation in the crossing quantum spin chain system $AgVOAsO_4$* , Phys. Rev. B **100**, 104422 (2019)

89. Y. Tao, J.A. Schneeloch, C. Duan, M. Matsuda, S.E. Dissanayake, **A.A. Aczel**, J.A. Fernandez-Baca, and D. Louca, *Appearance of a new phase across the T_d - IT' phase boundary in Weyl semimetal $Mo_{1-x}W_xTe_2$* , Phys. Rev. B **100**, 100101 (2019)
88. G. Hester, H.S. Nair, T. Reeder, D.R. Yahne, T.N. DeLazzer, L. Berges, D. Ziat, J.A. Quilliam, J.R. Neilson, **A.A. Aczel**, G. Sala, and K.A. Ross, *A novel strongly spin-orbit coupled quantum dimer magnet: $Yb_2Si_2O_7$* , Phys. Rev. Lett. **123**, 027201 (2019)
87. Q. Chen**, S. Fan, K.M. Taddei, M.B. Stone, A.I. Kolesnikov, J. Cheng, J.L. Musfeldt, H.D. Zhou, and **A.A. Aczel***, *Large positive zero field splitting in the cluster magnet $Ba_3CeRu_2O_9$* , J. Am. Chem. Soc. **141**, 9928 (2019)
86. D. Reig-i-Plessis**, S.V. Geldern, **A.A. Aczel**, D. Kochkov, B.K. Clark, G.J. MacDougall, *Deviation from the dipole-ice model in a new spinel spin-ice candidate*, Phys. Rev. B **99**, 134438 (2019)
85. **A.A. Aczel***, J.P. Clancy, Q. Chen, H.D. Zhou, D. Reig-i-Plessis, G.J. MacDougall, J.P. Ruff, M.H. Upton, Z. Islam, T.J. Williams, S. Calder, and J.-Q. Yan, *Revisiting the Kitaev material candidacy of Ir^{4+} double perovskite iridates*, Phys. Rev. B **99**, 134417 (2019),
Editor's Suggestion
84. B.K. Rai, S. Chikara, X. Ding, I.W.H. Oswald, R. Schonemann, V. Loganathan, A.M. Hallas, H.B. Cao, M. Stavinoha, H. Man, S. Carr, J. Singleton, V.S. Zapf, K. Benavides, J.Y. Chan, Q.R. Zhang, D. Rhodes, Y.C. Chiu, L. Balicas, **A.A. Aczel**, Q. Huang, J.W. Lynn, J. Gaudet, P. Dai, A.H. Nevidomskyy, C.-L. Huang, and E. Morosan, *Anomalous metamagnetism in the low carrier density Kondo lattice $YbRh_3Si_7$* , Phys. Rev. X **8**, 041047 (2018)
83. Hiroyuki Takeya, **A.A. Aczel**, Tao Hong, Masaaki Matsuda, Hazuki Kawano-Furukawa, *Weak ferromagnetic superconductor $Tb_{0.47}Y_{0.53}Ni_2^{11}B_2C$* , Physica B **551**, 108 (2018)
82. C. Thompson, D. Reig-i-Plessis, L. Kish, **A.A. Aczel**, B. Zhang, E. Karapetrova, G.J. MacDougall, and C. Beekman, *Spin canting and orbital order in spinel vanadate thin films*, Phys. Rev. Mat. **2**, 104411 (2018)
81. C. Mauws, A.M. Hallas, G. Sala, **A.A. Aczel**, P.M. Sarte, J. Gaudet, D. Ziat, J.A. Quilliam, J.A. Lussier, M. Bieringer, H.D. Zhou, A. Wildes, M.B. Stone, D.L. Abernathy, G.M. Luke, B.D. Gaulin and C.R. Wiebe, *Dipolar-octupolar Ising antiferromagnetic in $Sm_2Ti_2O_7$: a moment fragmentation candidate*, Phys. Rev. B **98**, 100401(R) (2018)
80. N. Metoki, H. Yamauchi, H.S. Suzuki, H. Kitazawa, M. Hagihara, T. Masuda, **A.A. Aczel**, S. Chi, T. Hong, M. Matsuda, D.P. Pajerowski, and J.A. Fernandez-Baca, *The f -electron states in $PrPd_5Al_2$* , J. Phys. Soc. Jpn. **87**, 094704 (2018)
79. H.-Y. Yang, J. Gaudet, **A.A. Aczel**, D.E. Graf, P. Blaha, B.D. Gaulin, and F.F. Tafti, *Interplay of magnetism and transport in $HoBi$* , Phys. Rev. B **98**, 045136 (2018)

78. **A.A. Aczel***, L.M. DeBeer-Schmitt, T.J. Williams, M.A. McGuire, N.J. Ghimire, L. Li, and D. Mandrus, *Extended exchange interactions stabilize long-period magnetic structures in $Cr_{1/3}NbS_2$* , Appl. Phys. Lett. **113**, 032404 (2018)
77. A.V. Zakrzewski, S. Gangopadhyay, G.J. MacDougall, **A.A. Aczel**, S. Calder, and T.J. Williams, *Evolution of magnetic and orbital properties in the magnetically-diluted A-site spinel $Cu_{1-x}Zn_xRh_2O_4$* , Phys. Rev. B **97**, 214411 (2018)
76. N. Blanc, J. Trinh, L. Dong, X. Bai, **A.A. Aczel**, M. Mourigal, L. Balents, T. Siegrist, and A.P. Ramirez, *Quantum criticality among entangled spin chains*, Nature Physics **14**, 273 (2018)
75. A. Banerjee, P. Lampen-Kelley, J. Knolle, C. Balz, **A.A. Aczel**, B. Winn, Y. Liu, D. Pajerowski, J.-Q. Yan, C.A. Bridges, A.T. Savici, B.C. Chakoumakos, M.D. Lumsden, D.A. Tennant, R. Moessner, D.G. Mandrus, and S.E. Nagler, *Excitations in the field-induced quantum spin liquid state of α - $RuCl_3$* , npj Quantum Materials **3**, 8 (2018)
74. J. Xiong, J.-Q. Yan, **A.A. Aczel**, and P.M. Woodward, *Type I antiferromagnetic order in Ba_2LuReO_6 : Exploring the role of structural distortions in double perovskites containing $5d^2$ ions*, Journal of Solid State Chemistry **258**, 762 (2018)
73. P. Lampen-Kelley, A. Banerjee, **A.A. Aczel**, H.B. Cao, J.-Q. Yan, S.E. Nagler, and D. Mandrus, *Destabilization of magnetic order in a dilute Kitaev spin liquid candidate*, Phys. Rev. Lett. **119**, 237203 (2017)
72. T.J.S. Munsie, M.N. Wilson, A. Millington, C.M. Thompson, R. Flacau, C. Ding, Z. Gong, S. Guo, **A.A. Aczel**, H.B. Cao, T.J. Williams, H.A. Dabkowska, F. Ning, J.E. Greedan, and G.M. Luke, *Neutron diffraction and μ SR studies of two polymorphs of nickel niobate ($NiNb_2O_6$)*, Phys. Rev. B **96**, 144417 (2017)
71. P.M. Sarte, **A.A. Aczel**, G. Ehlers, C. Stock, B.D. Gaulin, C. Mauws, M.B. Stone, S. Calder, S.E. Nagler, J.W. Hollett, J.S. Gardner, J.P. Attfield, and C.R. Wiebe, *Quantum confinement of monopole quasiparticles in a quantum spin ice*, Journal of Physics: Condensed Matter **29**, 45LT01 (2017), **Annual Journal Highlight**
70. D. Ziat, **A.A. Aczel***, R. Sinclair, Q. Chen, H.D. Zhou, T.J. Williams, M.B. Stone, A. Verrier, and J.A. Quilliam, *Frustrated spin-1/2 molecular magnetism in the mixed-valence antiferromagnets $Ba_3MRu_2O_9$ ($M = In, Y, Lu$)*, Phys. Rev. B **95**, 184424 (2017)
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4. **A.A. Aczel***, H.A. Dabkowska, P. R. Provencher, and G. M. Luke, *Crystal growth and characterization of the new spin dimer compound $\text{Ba}_3\text{Cr}_2\text{O}_8$* ; Journal of Crystal Growth **310**, 870 (2008)
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2. **A.A. Aczel***, H.A. Dabkowska, J.F. Britten, L.E. Harrington, and G.M. Luke, *Barium chromium oxide, $\text{Ba}_3\text{Cr}_2\text{O}_8$, as grown by the traveling solvent floating zone technique*, Acta Crystallographica E **63**, i196 (2007)
1. Y. J. Uemura, T. Goko, I. M. Gat-Malureanu, J. P. Carlo, P. L. Russo, A. T. Savici, **A. Aczel**, G. J. MacDougall, J. A. Rodriguez, G. M. Luke, S. R. Dunsiger, A. McCollam, J. Arai, Ch. Pfleiderer, P. Boni, K. Yoshimura, E. Baggio-Saitovitch, M. B. Fontes, J. Larrea, Y. V. Sushko, and J. Sereni, *Phase separation and suppression of critical dynamics at quantum transitions of itinerant magnets: MnSi and $(\text{Sr}_{1-x}\text{Ca}_x)\text{RuO}_3$* ; Nature Physics **3**, 29 (2007)

News articles based on this work:

- (1) D. Belitz and T.R. Kirkpatrick, Nature Physics **3**, 15 (2007)

Presentations

- (a) The following is a list of the invited talks that I have given:

15. *Muon spin rotation/relaxation studies of quantum materials*, ORNL workshop: Neutrons and Complementary Techniques for Quantum Materials, virtual (2022)
14. *MANTA: A Multi-analyzer Triple Axis Spectrometer at HFIR*, ORNL's Neutron Advisory Board Meeting, virtual (2021)
13. *Iridium on the fcc lattice: new design principles for realizing $J_{\text{eff}} = 1/2$ moments and significant Kitaev interactions*, March Meeting of the American Physical Society, virtual (2021)
12. *Neutron scattering as a probe of heavy transition metal magnetism*, Brockhouse Materials Institute Colloquium, McMaster University, Hamilton ON, Canada (2019)
11. *Foreign partnership opportunities for neutron scattering at ORNL*, Canadian Institute of Neutron Scattering Annual Meeting, Hamilton ON, Canada (2019)
10. *Neutron scattering as a probe of heavy transition metal magnetism*, Physics Colloquium, University of Manitoba, Winnipeg MB, Canada (2019)
9. *Evidence for dominant Kitaev interactions on the fcc lattice in La_2BIrO_6 ($\text{B} = \text{Mg}, \text{Zn}$)*, Meeting of the American Crystallographic Association, Toronto ON, Canada (2018)
8. *Exotic magnetism in double perovskites based on heavy transition metals*, Condensed Matter Science Colloquium, Los Alamos National Laboratory, Los Alamos NM, USA (2017)
7. *Neutrons and muons as probes of magnetism in heavy transition metal compounds*, Physics Colloquium, University of Notre Dame, Notre Dame IN, USA (2017)
6. *Exotic magnetism on the quasi-FCC lattices of the d^3 double perovskites La_2NaTO_6 ($T = \text{Ru}, \text{Os}$)*, March Meeting of the American Physical Society, San Antonio TX, USA (2015)
5. *Quantum oscillations of nitrogen atoms in uranium nitride*, International Conference on Neutron Scattering, Edinburgh, UK (2013)
4. *Quantum oscillations of nitrogen atoms in uranium nitride*, Physics Colloquium, Rice University, Houston TX, USA (2013)
3. *Quantum oscillations of nitrogen atoms in uranium nitride*, DOE-BES triennial review of the ORNL Neutron Sciences Directorate, Oak Ridge TN, USA (2012)
2. *BEC of magnons in Cr-based quantum magnets*, Research seminar at Oak Ridge National Laboratory, Oak Ridge TN, USA (2010)
1. *Cr^{+5} compounds: a new area of magnetic oxide research*, Solid state chemistry seminar at McMaster University, Hamilton ON, Canada (2008)

(b) The following is a list of contributed talks I have given:

29. *Triple axis spectroscopy instrumentation at ORNL*, 2022 Quantum Materials Young Investigators Workshop, Oak Ridge TN, USA (2022)
28. *Multi-analyzer neutron triple axis spectrometer: MANTA*, American Conference on Neutron Scattering, Denver CO, USA (2022)
27. *Dynamical ground state in the XY pyrochlore magnet Yb_2GaSbO_7* , American Conference on Neutron Scattering, Denver CO, USA (2022)
26. *Realization of the orbital selective state at the molecular level in $Ba_3LaRu_2O_9$* , March Meeting of the American Physical Society, virtual (2021).
25. *Realization of the orbital selective state at the molecular level in $Ba_3LaRu_2O_9$* , American Conference on Neutron Scattering, virtual (2020).
24. *Double perovskite iridates as new candidate Kitaev materials*, Magnetic North VI Conference, Gimli MB, Canada (2019)
23. *MANTA: A multiple analyzer triple axis spectrometer at HFIR*, 2019 Quantum Materials Young Investigators Workshop, Oak Ridge TN, USA (2019)
22. *Double perovskite iridates as new candidate Kitaev materials*, March Meeting of the American Physical Society, Boston MA, USA (2019)
21. *Magnetic order and spin dynamics of $J_{eff} = 1/2 Ir^{4+}$ moments on the fcc lattice in La_2BIrO_6 ($B = Mg, Zn$)*, American Conference on Neutron Scattering, College Park MD, USA (2018)
20. *Magnetic order and spin dynamics of $J_{eff} = 1/2 Ir^{4+}$ moments on the fcc lattice in La_2BIrO_6 ($B = Mg, Zn$)*, March Meeting of the American Physical Society, Los Angeles CA, USA (2018)
19. *New neutron scattering instrumentation at the HFIR: MANTA*, 2017 Quantum Materials Young Investigators Workshop, Oak Ridge TN, USA (2017)
18. *2017 MANTA workshop at ORNL*, MANTA workshop, Oak Ridge TN, USA (2017)
17. *Structural and magnetic properties of the $5d^2$ double perovskites Sr_2BReO_6 ($B = In, Y$)*, March Meeting of the American Physical Society, New Orleans LA, USA (2017)
16. *Spin liquid ground state in the frustrated J_1 - J_2 zigzag chain system $BaTb_2O_4$* , March Meeting of the American Physical Society, Baltimore MD, USA (2016)
15. *New cold neutron multi-analyzer triple-axis (MANTA) spectrometer at HFIR*, MANTA workshop, Oak Ridge TN, USA (2015)

14. *Exotic magnetism on the quasi-FCC lattices of the d^3 double perovskites La_2NaTO_6 ($T = Ru, Os$), American Conference on Neutron Scattering, Knoxville TN, USA (2014)*
13. *Low temperature magnetic ordering in the frustrated zigzag ladder system $BaNd_2O_4$, March Meeting of the American Physical Society, Denver CO, USA (2014)*
12. *Quantum oscillations of nitrogen atoms in uranium nitride, March Meeting of the American Physical Society, Baltimore MD, USA (2013)*
11. *Frustration by competing interactions in the highly-distorted double perovskites La_2NaTO_6 ($T = Ru, Os$), March Meeting of the American Physical Society, Baltimore MD, USA (2013)*
10. *Quantum oscillations of nitrogen atoms in uranium nitride, American Conference on Neutron Scattering, Washington DC, USA (2012)*
9. *Coexisting short and long-range magnetic order in $SrYb_2O_4$, Conference on Highly-Frustrated Magnetism, Hamilton ON, Canada (2012)*
8. *Quantum oscillations of nitrogen atoms in uranium nitride, Neutron Sciences Directorate Seminar Series, Oak Ridge National Laboratory, Oak Ridge TN, USA (2012)*
7. *Magnetic structure and dynamics of the ferromagnetic chalcogenides Cr_2Te_3 and $tr-Cr_5Te_8$, March Meeting of the American Physical Society, Boston MA, USA (2012)*
6. *Magnetic excitations in the rare earth magnet Gd , March Meeting of the American Physical Society, Boston MA, USA (2012)*
5. *Coexistence of ferromagnetism and superconductivity in single crystalline $EuFe_2(As_{0.7}P_{0.3})_2$, March Meeting of the American Physical Society, Dallas TX, USA (2011)*
4. *Field-induced Bose-Einstein condensation of triplons up to ~ 8 K in $Sr_3Cr_2O_8$, March Meeting of the American Physical Society, Portland OR, USA (2010)*
3. *Bose-Einstein Condensation of Triplons in $Ba_3Cr_2O_8$, March Meeting of the American Physical Society, Pittsburgh PA, USA (2009)*
2. *Crystal growth and high field magnetization of the spin dimer compound $Ba_3Cr_2O_8$, March Meeting of the American Physical Society, New Orleans LA, USA (2008)*
1. *Muon perturbation effects in pure and doped $SrCu_2(BO_3)_2$, March Meeting of the American Physical Society, Denver CO, USA (2007)*

(c) The following is a list of posters that I have presented:

9. *Neutron Scattering as a Probe of Heavy Transition Metal Magnetism, ORNL Neutron Advisory Board Meeting, Oak Ridge, TN (2019)*

8. *Neutron Diffraction Studies of Frustrated Magnets*, DOE-BES triennial review of the ORNL Neutron Sciences Directorate, Oak Ridge TN, USA (2018)
7. *Magnetic Properties of the $S = \frac{1}{2}$ Quantum Molecular Magnets $Ba_3BRu_2O_9$ ($B = In, Y, Lu$)*, American Conference on Neutron Scattering, Long Beach CA, USA (2016)
6. *Magnetic Properties of the Frustrated J_1 - J_2 chain systems BaR_2O_4 ($R = Nd, Tb$)*, Big Ideas in Quantum Materials Workshop, San Diego CA, USA (2015)
5. *MANTA: A New Multi-Analyzer Triple Axis Spectrometer at the HFIR*, JCNS Workshop, Tutzling, Germany (2014)
4. *Field-Induced Magnetic Ordering in the Spin Dimer System $Sr_3Cr_2O_8$* , Meeting of the Canadian Institute for Advanced Research, Vancouver BC, Canada (2009)
3. *The spin dimer system $Ba_3Cr_2O_8$: A new BEC of magnons compound*, Meeting of the Canadian Institute for Advanced Research, Toronto ON, Canada (2008)
2. *Muon perturbation effects in pure and doped $SrCu_2(BO_3)_2$* , I2CAM/FAPERJ spring school entitled “New Phenomena in Highly Correlated Quantum Matter”, Rio de Janeiro, Brazil (2007)
1. *μ SR study of the spin singlet state in the two-dimensional system $SrCu_2(BO_3)_2$* , Meeting of the Canadian Institute for Advanced Research, Montreal, Canada (2006)

References

Available upon request