

Dr. William J. Gannon
Curriculum Vitae

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Current Appointment	University of Kentucky Department of Physics and Astronomy ·Lexington, KY, USA ·Assistant Professor of Physics	From August 2019
Education	Northwestern University Department of Physics and Astronomy ·Evanston, IL, USA ·Doctor of Philosophy, Physics and Astronomy, December 2013 ·Advisor: Professor William P. Halperin ·Thesis Title: <i>Neutron Scattering Experiments with the Unconventional Superconductor UPt_3</i>	2006-2013
	University of Michigan College of Literature, Science, and the Arts ·Ann Arbor, MI, USA ·Bachelor of Science, Physics, April 2005	2001-2005
Professional History	Research Associate The University of British Columbia ·Stewart Blusson Quantum Matter Institute ·Vancouver, BC Canada ·Advisor: Professor and Dean of Faculty of Science Meigan C. Aronson	2018 – 2019
	Postdoctoral Research Associate Texas A&M University ·Department of Physics and Astronomy ·College Station, TX, USA ·Advisor: Professor and Dean of College of Science Meigan C. Aronson	2015-2018

	Postdoctoral Research Associate Stony Brook University ·Department of Physics and Astronomy ·Stony Brook, NY, USA ·Advisor: Professor Meigan C. Aronson	2013-2015
	Guest Researcher Appointment Brookhaven National Laboratory ·Upton, NY, USA	2013-2015
	Graduate Research Assistant Northwestern University ·Evanston, IL, USA ·Advisor: Professor William P. Halperin <ul style="list-style-type: none"> • Crystal growth and neutron scattering experiments on the magnetically mediated, unconventional superconductor $U\text{Pt}_3$. 	2006-2013
	Undergraduate Research Assistant University of Michigan ·Ann Arbor, MI, USA	2004-2005
Teaching Experience	Teaching Assistant Northwestern University <ul style="list-style-type: none"> • Teaching assistant for all subjects covered in introductory physics laboratories and introductory physics class discussion sections at Northwestern University. 	2006-2008
Other Relevant Experience	Science Specialist – Legislation Lewis-Burke Associates, LLC ·Washington DC, USA <i>·www.lewis-burke.com</i> <ul style="list-style-type: none"> • Provided research, analysis, and support activities for government relations firm that specializes in obtaining federal funding for universities and major research institutions in the United States. 	2005-2006
Personal Information	Date of Birth: January 13,1983 Place of Birth: Washington DC, USA Citizenship: USA	
Invited Talks	<ul style="list-style-type: none"> • Condensed Matter Physics Seminar, Department of Physics, University of Cincinnati, Cincinnati, OH USA. April 7, 2021. • Condensed Matter Physics Seminar, Department of Physics and Astronomy, Michigan State University, East Lansing, MI USA. March 29, 2021. • Condensed Matter Physics Seminar, Department of Physics and Astronomy, University of Kentucky, Lexington, KY USA. April 25, 2020. • Condensed Matter Physics Seminar, Department of Physics, Brown University, Providence, RI USA. April 23, 2020. 	

- Department of Physics and Astronomy Colloquium, University of Nevada-Las Vegas, Las Vegas, NV USA. March 15, 2019.
- Department of Physics and Astronomy Colloquium, University of Kentucky, Lexington, KY USA. February 18, 2019.
- International Union of Pure and Applied Physics International Conference on Magnetism, San Francisco, CA USA. July 16, 2018
- Stewart Blusson Quantum Matter Institute Seminar, University of British Columbia, Vancouver, BC Canada. May 29, 2018.
- Department of Physics and Astronomy Seminar, Hong Kong University of Science and Technology, Hong Kong SAR, China. January 22, 2018.
- Department of Physics and Astronomy Colloquium, University of Wyoming, Laramie, WY USA. November 30, 2017.
- Department of Physics Colloquium, Oklahoma State University, Stillwater, OK USA. November 6, 2017.
- Gordon Research Seminar on Neutron Scattering, Hong Kong University of Science And Technology, Hong Kong SAR, China. August 5, 2017.
- Atomic and Molecular Optics and Condensed Matter Physics Seminar, Institute for Quantum Science and Engineering, Texas A&M University, College Station, TX USA. April 18, 2017.
- Condensed Matter Physics Seminar, Northwestern University, Evanston, IL USA. April 7, 2017.
- American Physical Society March Meeting, New Orleans, LA USA. March 13, 2017.
- Condensed Matter Physics Seminar, Department of Physics, Washington University in St. Louis, St. Louis, MO USA. January 23, 2017.
- Condensed Matter Physics Seminar, Department of Physics, University of Notre Dame, Notre Dame, IN USA. October 6, 2016.

**Contributed Talks
and Posters**

- Poster titled “Formation of a Longitudinal Mode in One Dimensional $\text{Yb}_2\text{Pt}_2\text{Pb}$ ”, Gordon Research Conference on Neutron Scattering, Courtyard Marriott Sha Tin, Hong Kong SAR, China. May 5-10 2019.
- Presentation titled “Formation of a Longitudinal Mode in One Dimensional $\text{Yb}_2\text{Pt}_2\text{Pb}$,” American Physical Society March Meeting, Boston, MA USA 2019
- Presentation titled “Spinon Confinement and a Longitudinal Mode in One Dimensional $\text{Yb}_2\text{Pt}_2\text{Pb}$ ” American Physical Society March Meeting, Los Angeles, CA USA 2018.
- Poster titled “Evolution of Spinons and the Emergence of Confinement and a Longitudinal Mode in One Dimensional $\text{Yb}_2\text{Pt}_2\text{Pb}$,” Gordon Research Conference on Neutron Scattering, Hong Kong University of Science And Technology, Hong Kong SAR, China. August 6-11, 2017.
- Poster titled “One Dimensional Quantum Excitations in the f-Electron Metal $\text{Yb}_2\text{Pt}_2\text{Pb}$,” Frontiers of Quantum Materials Workshop, Rice University Center for Quantum Materials, Rice University, Houston, TX USA 2016.
- Presentation titled “Quantum Criticality in $\text{YFe}_2\text{Al}_{10}$,” American Physical Society March Meeting, Baltimore, MD USA 2016.

- Presentation titled “Evolution of Spinons with Magnetic Field in One-Dimensional $\text{Yb}_2\text{Pt}_2\text{Pb}$,” American Physical Society March Meeting, San Antonio, TX USA 2015.
- Presentation titled “The Field-Temperature Phase Diagram of $\text{Ce}_2\text{Ge}_2\text{Mg}$,” American Physical Society March Meeting, Denver, CO USA 2014.
- Presentation titled “Temperature Dependence of the London Penetration Depth and Nodal Gap Structure of UPt_3 from Small Angle Neutron Scattering,” American Physical Society March Meeting, Denver, CO USA 2014.
- Presentation titled “Bulk Magnetization in the Superconducting State of UPt_3 ,” American Physical Society March Meeting, Baltimore, MD USA, March, 2013.
- Poster titled “Equal Spin Pairing in the Heavy Fermion Superconductor UPt_3 ,” Materials and Mechanisms of Superconductivity conference, Washington DC USA, August, 2012.
- Presentation titled “Small Angle Neutron Scattering Studies of the Vortex Lattice of UPt_3 ,” American Physical Society March Meeting, Boston, MA USA, March, 2012.
- Presentation titled “Small Angle Neutron Scattering and the Vortex Lattice of UPt_3 ,” American Physical Society March Meeting, Dallas, TX USA, March, 2011.
- Poster titled “Neutron Scattering Experiments with the Unconventional Superconductor UPt_3 ,” International Symposium on Quantum Fluids and Solids, Grenoble, France, August, 2010.
- Presentation titled “Investigations of the order parameter in UPt_3 single crystals,” American Physical Society March Meeting, Portland, OR USA, March, 2010.

Publication List Submitted Manuscripts

- “Reversible ordering and disordering of the vortex lattice in UPt_3 ,” K. E. Avers, S. J. Kuhn, A. W. D. Leishman, W. J. Gannon, L. DeBeer-Schmitt, C. D. Dewhurst, D. Honecker, R. Cubitt, W. P. Halperin, M. R. Eskildsen, *submitted to Physical Review Letters*. <https://arxiv.org/abs/2103.09843> (2021).
- “The Future of the Correlated Electron Problem,” A. Alexandradinata *et al.*, *submitted to Reviews of Modern Physics*. <https://arxiv.org/abs/2010.00584v1> (2020).

Highlighted Publications

- “Broken time-reversal symmetry in the topological superconductor UPt_3 ,” K. E. Avers, **W. J. Gannon**, S. J. Kuhn, W. P. Halperin, J. A. Sauls, L. DeBeer-Schmitt, C. D. Dewhurst, J. Gavilano, G. Nagy, U. Gasser, M. R. Eskildsen, *Nature Physics* **16**, 531 (2020).
- “Spinon Confinement and a Sharp Longitudinal Mode in $\text{Yb}_2\text{Pt}_2\text{Pb}$,” **W. J. Gannon**, L. S. Wu, I. A. Zaliznyak, A. E. Feiguin, A. M. Tsvelik, F. Demmel, Y. Qiu, J. R. D. Copley, M. S. Kim, and M. C. Aronson, *Nature Communications* **10**, 1123 (2019).
- “Local quantum phase transition in $\text{YFe}_2\text{Al}_{10}$,” **W. J. Gannon**, L. S. Wu, I. A. Zaliznyak, W. H. Xu, A. M. Tsvelik, Y. Qiu, J. A. Rodriguez-Rivera, and M. C. Aronson. *Proceedings of the National Academy of Sciences of the United States of America* **115**, 6995 (2018).
- “Intermediate valence in single crystalline $\text{Yb}_2\text{Si}_2\text{Al}$,” **W. J. Gannon**, K. Chen, M. Sundermann, F. Strigari, Y. Utsumi, K.-D. Tsuei, J.-P. Rueff, P. Bencok, A. Tanaka, A. Severing, and M. C. Aronson. *Physical Review B* **98**, 075101 (2018).

- “Quantum critical singularities in two-dimensional metallic XY ferromagnets,” C. M. Varma, **W. J. Gannon**, M. C. Aronson, J. A. Rodriguez-Rivera, and Y. Qiu, *Physical Review B* **97**, 085134 (2018).
- “Spin susceptibility of the topological superconductor UPt₃ from polarized neutron diffraction,” **W. J. Gannon**, W. P. Halperin, M. R. Eskildsen, U. B. Hansen, K. Lefmann, and A. Stunault, *Physical Review B* **96**, 041111(R) (2017).
- “Orbital-exchange and fractional quantum number excitations in an f-electron metal, Yb₂Pt₂Pb,” L. S. Wu, **W. J. Gannon**, I. A. Zaliznyak, A. M. Tsvetik, M. Brockmann, J.-S. Caux, M. S. Kim, Y. Qiu, J. R. D. Copley, G. Ehlers, A. Podlesnyak, and M. C. Aronson, *Science* **352**, 1206 (2016).
- “Nodal gap structure and order parameter symmetry of the unconventional superconductor UPt₃,” **W. J. Gannon**, W. P. Halperin, C. Rastovski, K. J. Schlesinger, J. Hlevyack, M. R. Eskildsen, A. B. Vorontsov, J. Gavilano, U. Gasser, and G. Nagy, *New Journal of Physics* **17**, 023041 (2015).
- “Observation of broken time-reversal symmetry in the heavy-fermion superconductor UPt₃,” E. R. Schemm, **W. J. Gannon**, C. M. Wishne, W. P. Halperin, and A. Kapitulnik, *Science* **345**, 190 (2014).
- “The superfluid glass phase of He-3-A,” J. I. A. Li, J. Pollanen, A. M. Zimmerman, C. A. Collett, **W. J. Gannon**, and W. P. Halperin, *Nature Physics* **9**, 775 (2013).
- “New chiral phases of superfluid ³He stabilized by anisotropic silica aerogel,” J. Pollanen, J.I.A. Li, C.A. Collett, **W.J. Gannon**, W.P. Halperin and J.A. Sauls, *Nature Physics* **8**, 317 (2012).
- “Magnetization in the superconducting state of UPt₃ from polarized neutron diffraction,” **W. J. Gannon**, W. P. Halperin, C. Rastovski, M. R. Eskildsen, P. Dai, and A. Stunault, *Physical Review B* **86**, 104510 (2012).
- “The Transition Between Real and Complex Superconducting Order Parameter Phases in UPt₃,” J.D. Strand, D.J. Bahr, D.J. Van Harlingen, J.P. Davis, **W.J. Gannon**, W.P. Halperin, *Science* **328**, 1368 (2010).

Other Publications

- “Field and temperature dependence of the superconducting anisotropy and transverse field modulation of Sr₂RuO₄ determined by small-angle neutron scattering studies of the vortex lattice,” S. J. Kuhn, W. Morgenlander, E. R. Loudon, C. Rastovski, **W. J. Gannon**, H. Takatsu, Y. Maeno, C. D. Dewhurst, J. Gavilano, and M. R. Eskildsen, *Physical Review B* **96**, 174507 (2017).
- “A Generalizable Multigram Synthesis and Mechanistic Investigation of YMnO₃ Nanoplates,” C. L. McBean, C. S. Lewis, A. L. Tian, J. W. Simonson, M-G. Han, **W. J. Gannon**, S. Yue, J. M. Patete, A. A. Corrao, A. C. Santulli, L. Wu, M. C. Aronson, Y. Zhu, and S. S. Wong, *Industrial Engineering and Chemistry Research* **56**, 5573 (2017).
- “Orientation of the Angular Momentum in Superfluid He-3-A in a Stretched Aerogel,” J. I. A. Li, A. M. Zimmerman, J. Pollanen, C. A. Collett, **W. J. Gannon**, and W. P. Halperin, *Journal of Low Temperature Physics* **175**, 31 (2014).
- “Stability of Superfluid He-3-B In a Compressed Aerogel,” J. I. A. Li, A. M. Zimmerman, J. Pollanen, C. A. Collett, **W. J. Gannon**, and W. P. Halperin, *Physical Review Letters* **112**, 115303 (2014).

- “Persistence of Metastable Vortex Lattice Domains in MgB_2 in the Presence of Vortex Motion,” C. Rastovski, K. J. Schlesinger, **W. J. Gannon**, C. D. Dewhurst, L. DeBeer-Schmitt, N. D. Zhigadlo, J. Karpinski, and M. R. Eskildsen, *Physical Review Letters* **111** 107002, (2013).
- “Anisotropy of the Superconducting State in Sr_2RuO_4 ,” C. Rastovski, C. D. Dewhurst, **W. J. Gannon**, D. C. Peets, H. Takatsu, Y. Maeno, M. Ichioka, K. Machida, and M. R. Eskildsen, *Physical Review Letters* **111**, 087003 (2013).
- “Anisotropy of Silica Aerogels Induced by Small Strain,” A. M. Zimmerman, M. G. Specht, D. Ginzburg, J. Pollanen, J. I. A. Li, C. A. Collett, **W. J. Gannon**, and W. P. Halperin, *Journal of Low Temperature Physics* **171**, 745 (2013)
- “Zeeman Splitting and Nonlinear Field-Dependence in Superfluid ^3He ,” C. A. Collett, J. Pollanen, J. I. A. Li, **W. J. Gannon**, W. P. Halperin, *Journal of Low Temperature Physics* **17**, 214 (2013).
- “Nonlinear field dependence and f -wave interactions in superfluid ^3He ,” C. A. Collett, J. Pollanen, J. I. A. Li, **W. J. Gannon**, and W. P. Halperin, *Physical Review B* **87**, 024502 (2013).
- “Nonlinear field-dependence of the Imaginary Squashing Mode of superfluid He-3 at moderate magnetic fields,” C. A. Collett, J. Pollanen, J. I. A. Li, **W. J. Gannon**, J. P. Davis, and W. P. Halperin, *26th International Conference on Low Temperature Physics: Journal of Physics Conference Series* **400**, 012006 (2012)
- “Pressure Dependence of the Longitudinal Resonance Frequency of ^3He Superfluid Phases in Aerogel,” J. I. A. Li, J. Pollanen, C. A. Collett, **W. J. Gannon**, W. P. Halperin, *26th International Conference on Low Temperature Physics: Journal of Physics Conference Series* **400**, 012039 (2012).
- “Identification of Superfluid Phases of ^3He in Uniformly Isotropic 98.2% Aerogel,” J. Pollanen, J.I.A. Li, C.A. Collett, **W.J. Gannon** and W.P. Halperin, *Physical Review Letters* **107**, 195301 (2011).
- “Magnetoresistance of UPt_3 ,” T. M. Lippman, H. Choi, J. P. Davis, J. Pollanen, **W. J. Gannon**, and W. P. Halperin, *New Journal of Physics* **10**, 043006 (2008).
- “A new unconventional antiferromagnet, Yb_3Pt_4 ,” M. C. Bennett, P. Khalifah, D. A. Sokolov, **W. J. Gannon**, Y. Yiu, M. S. Kim, C. Henderson, and M. C. Aronson, *Journal of Magnetism and Magnetic Materials* **321**, 2021 (2009).
- “Magnetic excitations and heat capacity of fayalite, Fe_2SiO_4 ,” M. C. Aronson, L. Stixrude, M. K. Davis, **W. Gannon**, and K. Ahilan, *American Mineralogist* **92** 481 (2007).
- “Critical Phenomena and the Quantum Critical Point of Ferromagnetic $\text{Zr}_{1-x}\text{Nb}_x\text{Zn}_2$,” D. A. Sokolov, M. C. Aronson, **W. Gannon**, and Z. Fisk, *Physical Review Letters* **96**, 116404 (2006).
- “On the existence of Einstein oscillators and thermal conductivity in bulk metallic glass,” Zhenhua Zhou, Ctirad Uher, Donghua Xu, W. L. Johnson, **W. Gannon**, and M. C. Aronson, *Applied Physics Letters* **89** 031924 (2006).

References

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