

Dr. Brad J. Ramshaw — Curriculum Vitae

531 Clark Hall
142 Sciences Drive
Cornell University
Ithaca, NY, 14853

Phone: 505-500-5559
Email: bradramshaw@cornell.edu
Website: http://chill.lassp.cornell.edu

EDUCATION AND APPOINTMENTS

DIRECTOR Canadian Institute for Advanced Research—Quantum Materials program.	2024 - PRESENT
VISITING PROFESSOR Institute of Science and Technology Austria.	2023
ASSOCIATE PROFESSOR Cornell University.	2023 - PRESENT
DICK AND DALE REIS JOHNSON ASSISTANT PROFESSOR Cornell University.	2019 - 2023
ASSISTANT PROFESSOR Cornell University.	2017 - 2019
STAFF SCIENTIST National High Magnetic Field Lab - Pulsed Field Facility at Los Alamos National Labs.	2015 - 2016
DIRECTOR'S POSTDOCTORAL FELLOW National High Magnetic Field Lab - Pulsed Field Facility at Los Alamos National Labs.	2012-2015
DOCTORATE IN PHYSICS University of British Columbia.	2007-2012
BACHELOR OF SCIENCE: PHYSICS AND COMPUTER SCIENCE University of British Columbia.	2002-2007

HONOURS AND AWARDS

CANADIAN INSTITUTE FOR ADVANCED RESEARCH AZRIELI GLOBAL SCHOLAR. LINK.	2020
INAUGURAL DICK AND DALE REIS JOHNSON ASSISTANT PROFESSOR. LINK.	2019
SLOAN FELLOWSHIP. LINK.	2019
DOE EARLY CAREER INVESTIGATOR. LINK.	2019
KAVLI FELLOW. LINK.	2018
NSF EARLY CAREER INVESTIGATOR LINK.	2018
LEE OSHEROFF RICHARDSON SCIENCE PRIZE. LINK.	2017
POSTDOCTORAL PUBLICATION PRIZE IN ACTINIDE SCIENCE. LINK.	2016
POSTDOCTORAL PUBLICATION PRIZE IN EXPERIMENTAL SCIENCES. LINK.	2015
DIRECTORS FELLOW: LOS ALAMOS NATIONAL LABS	2013
MARTIN AND BEATE BLOCK PHYSICS AWARD. LINK.	2011
NSERC POST-GRADUATE SCHOLARSHIP - DOCTORATE	2010

GRANTS AND FUNDING

KAVLI INSTITUTE AT CORNELL—INSTRUMENTATION PROJECT “Nanoscale Ultrasound for Unconventional Superconductors”. Funded amount: \$45,016. Principle Investigator: Brad Ramshaw.	2024-2025
CANADIAN INSTITUTE FOR ADVANCED RESEARCH SEED GRANT “Chiral phonons.” Funded amount: 50,000 CAD. Co-Principle Investigators: Brad Ramshaw and Louis Taillefer.	2023-2024
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH “Phonon Berry Curvature in Quantum Materials.” Funded amount: \$449,999. Principle Investigator: Brad Ramshaw.	2023-2026
CANADIAN INSTITUTE FOR ADVANCED RESEARCH SEED GRANT “Hydrodynamic electron flow in high-mobility metals.” Funded amount: 52,000 CAD. Co-Principle Investigators: Brad Ramshaw and Alannah Hallas.	2023-2024
A&S NEW FRONTIER GRANT “Imaging Heat Flow in Quantum Materials” Funded amount: \$200,000. Co-Principle Investigators: Katja Nowack and Brad Ramshaw.	2022-2024
DEPARTMENT OF ENERGY—ENERGY FRONTIER RESEARCH CENTER “Institute for Quantum Matter”—DE-SC0019331. Funded amount at Cornell: \$40,000. Total budget: \$1,000,000. Principle Investigator: Collin Broholm.	2022-2024
KAVLI INSTITUTE AT CORNELL—INSTRUMENTATION PROJECT “CFAB 3: The Cornell CMOS+ Foundry for Next-Gen Intelligent Nanosystems and Sensors”. Funded amount: \$52,000. Principle Investigator: Itai Cohen.	2021-2022
CANADIAN INSTITUTE FOR ADVANCED RESEARCH AZRIELI GLOBAL SCHOLAR Funded amount: 100,000 CAD. Awardee: Brad Ramshaw.	2020-2022
NATIONAL SCIENCE FOUNDATION: MID-SCALE RI-2 “A first-of-its-kind X-ray facility for new science at the high magnetic field frontier”—1946998. Funded amount: \$32,694,899. Principle Investigator: Joel Brock. My role: “Project Scientist responsible for Magnet Science.”	2021-2025
KAVLI INSTITUTE AT CORNELL—INSTRUMENTATION PROJECT “High-frequency measurements of 2D heterostructures using surface acoustic wave resonators”. Funded amount: \$35,000. Principle Investigator: Brad Ramshaw.	2019-2020

SLOAN FELLOWSHIP Funded amount: \$70,000. Awardee: Brad Ramshaw.	2019-2021
DEPARTMENT OF ENERGY—EARLY CAREER RESEARCH PROGRAM “Ultrasonic Determination of Electron Viscosity and Hydrodynamics in Metals” - DE-SC0020143. Funded amount: \$819,679. Principle Investigator: Brad Ramshaw.	2019-2024
KAVLI INSTITUTE AT CORNELL—INSTRUMENTATION PROJECT “35 Tesla Pulsed Magnet”. Funded amount: \$60,000. Principle Investigator: Brad Ramshaw.	2018-2019
DEPARTMENT OF ENERGY—ENERGY FRONTIER RESEARCH CENTER “Institute for Quantum Matter”—DE-SC0019331. Funded amount at Cornell: \$632,165. Total budget: \$10,250,000. Principle Investigator: Collin Broholm.	2018-2021
NATIONAL SCIENCE FOUNDATION: CAREER “The Extreme Quantum Limit of Weyl Semimetals”—1752784. Funded amount: \$974,062. Principle Investigator: Brad Ramshaw.	2018-2023
DEPARTMENT OF ENERGY—LABORATORY DIRECTED RESEARCH AND DEVELOPMENT: EARLY CAREER RESEARCH “New States of Matter in Weyl Semimetals”—20160616ECR. Funded amount: \$430,000. Principle Investigator: Brad Ramshaw (at Los Alamos National Labs).	2016-2018

PUBLICATIONS

- [1] G Grissonnanche, GA Pan, H LaBollita, D Ferenc Segedin, Q Song, H Paik, CM Brooks, AS Botana, JA Mundy, and **B. J. Ramshaw**. Seebeck coefficient in a nickelate superconductor: electronic dispersion in the strange metal phase. *To appear in **Physical Review X***, 2024
- [2] Florian Theuss, Avi Shragai, Gael Grissonnanche, Luciano Peralta, Gregorio de la Fuente Simarro, Ian M Hayes, Shanta R Saha, Yun Suk Eo, Alonso Suarez, Andrea Capa Salinas, Ganesh Pokharel, Stephen D. Wilson, Nicholas P Butch, Johnpierre Paglione, and **B. J. Ramshaw**. Absence of a bulk thermodynamic phase transition to a density wave phase in Ute_2 . *To appear in **Physical Review B***, 2024
- [3] Florian Theuss, Avi Shragai, Gael Grissonnanche, Ian M Hayes, Shanta R Saha, Yun Suk Eo, Alonso Suarez, Tatsuya Shishidou, Nicholas P Butch, Johnpierre Paglione, and **B. J. Ramshaw**. Single-component superconductivity in Ute_2 at ambient pressure. ***Nature Physics***, pages 1–7, 2024
- [4] Florian Theuss, Gregorio de la Fuente Simarro, Avi Shragai, Gael Grissonnanche, Ian M. Hayes, Shanta Saha, Tatsuya Shishidou, Taishi Chen, Satoru Nakatsuji, Sheng Ran, Michael Weinert, Nicholas P. Butch, Johnpierre Paglione, and **B. J. Ramshaw**. Resonant ultrasound spectroscopy for irregularly shaped samples and its application to uranium ditelluride. ***Physical Review Letters***, 132:066003, Feb 2024

- [5] Mark P. Zic, Matthias S. Ikeda, Pierre Massat, Patrick M. Hollister, Linda Ye, Elliott W. Rosenberg, Joshua A. W. Straquadine, Yuntian Li, **B. J. Ramshaw**, and Ian R. Fisher. Giant elastocaloric effect at low temperatures in TmVO_4 and implications for cryogenic cooling. *Proceedings of the National Academy of Sciences*, 121(25), June 2024
- [6] Fabian Jerzembeck, You-Sheng Li, Grgur Palle, Zhenhai Hu, Mehdi Biderang, Naoki Kikugawa, Dmitry A. Sokolov, Sayak Ghosh, **B. J. Ramshaw**, Thomas Scaffidi, Michael Nicklas, Jörg Schmalian, Andrew P. Mackenzie, and Clifford W. Hicks. T_c and the elastocaloric effect of Sr_2RuO_4 under $\langle 110 \rangle$ uniaxial stress: No indications of transition splitting. *Phys. Rev. B*, 110:064514, Aug 2024
- [7] A. Shekhter, R. D. McDonald, **B. J. Ramshaw**, and K. A. Modic. Magnetotropic susceptibility. *Physical Review B*, 108:035111, Jul 2023
- [8] K. Wang, L. Wang, I-L. Liu, F. Boschini, M. Zonno, M. Michiardi, E. Rotenberg, A. Bostwick, D. Graf, **B. J. Ramshaw**, A. Damascelli, and J. Paglione. Symmetry-enforced fermi degeneracy in topological semimetal Rhsb_3 . *Physical Review Materials*, 7:074205, Jul 2023
- [9] Akash Khansili, Ali Bangura, Ross David Mcdonald, **B. J. Ramshaw**, Andreas Rydh, and A Shekhter. Calorimetric measurement of nuclear spin-lattice relaxation rate in metals. *Physical Review B*, 107(19):195145, 2023
- [10] Yawen Fang, Yang Xu, Kaifei Kang, Benyamin Davaji, Kenji Watanabe, Takashi Taniguchi, Amit Lal, Kin Fai Mak, Jie Shan, and **B. J. Ramshaw**. Quantum oscillations in graphene using surface acoustic wave resonators. *Physical Review Letters*, 130:246201, Jun 2023
- [11] Avi Shragai, Florian Theuss, Gaël Grissonnanche, and **B. J. Ramshaw**. Rapid method for computing the mechanical resonances of irregular objects. *The Journal of the Acoustical Society of America*, 153(1):119–123, January 2023
- [12] Conrad L Smart, Alejandro J Cortese, **B. J. Ramshaw**, and Paul L McEuen. Nanocalorimetry using microscopic optical wireless integrated circuits. *Proceedings of the National Academy of Sciences*, 119(45):e2205322119, 2022
- [13] Sayak Ghosh, Thomas G. Kiely, Arkady Shekhter, F. Jerzembeck, N. Kikugawa, Dmitry A. Sokolov, A. P. Mackenzie, and **B. J. Ramshaw**. Strong increase in ultrasound attenuation below T_c in Sr_2RuO_4 : Possible evidence for domains. *Phys. Rev. B*, 106:024520, Jul 2022
- [14] Florian Theuss, Sayak Ghosh, Taishi Chen, Oleg Tchernyshyov, Satoru Nakatsuji, and **B. J. Ramshaw**. Strong magnetoelastic coupling in Mn_3X ($X = \text{Ge}, \text{Sn}$). *Phys. Rev. B*, 105:174430, May 2022
- [15] You-Sheng Li, Markus Garst, Jörg Schmalian, Sayak Ghosh, Naoki Kikugawa, Dmitry A. Sokolov, Clifford W. Hicks, Fabian Jerzembeck, Matthias S. Ikeda, Zhenhai Hu, **B. J. Ramshaw**, Andreas W. Rost, Michael Nicklas, and Andrew P. Mackenzie. Elastocaloric determination of the phase diagram of sr_2ruo_4 . *Nature*, 607(7918):276–280, Jul 2022
- [16] Yawen Fang, Gael Grissonnanche, Anaëlle Legros, Simon Verret, Francis Laliberte, Clement Colignon, Amirreza Ataei, Maxime Dion, Jianshi Zhou, David Graf, M. J. Lawler, Paul Goddard, Louis Taillefer, and **B. J. Ramshaw**. Fermi surface transformation at the pseudogap critical point of a cuprate superconductor. *Nature Physics*, pages 1–7, 2022
- [17] Zhengguang Lu, Patrick Hollister, Mykhaylo Ozerov, Seongphill Moon, Eric D Bauer, Filip Ronning, Dmitry Smirnov, Long Ju, and **B. J. Ramshaw**. Weyl fermion magneto-electrodynamics and ultralow field quantum limit in taas. *Science Advances*, 8(2):eabj1076, 2022

- [18] M. Ikhlas, S. Dasgupta, F. Theuss, T. Higo, Shunichiro Kittaka, **B. J. Ramshaw**, O. Tchernyshyov, C. W. Hicks, and S. Nakatsuji. Piezomagnetic switching of the anomalous hall effect in an antiferromagnet at room temperature. *Nature Physics*, Aug 2022
- [19] Yawen Fang, Hari P. Nair, Ludi Miao, Berit Goodge, Nathaniel J. Schreiber, Jacob P. Ruf, Lena F. Kourkoutis, Kyle M. Shen, Darrell G. Schlom, and **B. J. Ramshaw**. Quantum oscillations and quasiparticle properties of thin film Sr_2RuO_4 . *Phys. Rev. B*, 104:045152, Jul 2021
- [20] Gaël Grissonnanche, Yawen Fang, Anaëlle Legros, Simon Verret, Francis Laliberté, Clément Colignon, Jianshi Zhou, David Graf, Paul A Goddard, Louis Taillefer, and **B. J. Ramshaw**. Linear-in temperature resistivity from an isotropic Planckian scattering rate. *Nature*, 595(7869):667–672, 2021
- [21] Chen Li, Hao Ma, Tianyang Li, Jinghang Dai, Md. Abu Jafar Rasel, Alessandro Mattoni, Ahmet Alatas, Malcolm G. Thomas, Zachary W. Rouse, Avi Shragai, Shefford P. Baker, **B. J. Ramshaw**, Joseph P. Feser, David B. Mitzi, and Zhiting Tian. Remarkably weak anisotropy in thermal conductivity of two-dimensional hybrid perovskite butylammonium lead iodide crystals. *Nano Letters*, 2021
- [22] S. A. Crooker, M. Lee, R. D. McDonald, J. L. Doorn, I. Zimmermann, Y. Lai, L. E. Winter, Y. Ren, Y.-J. Cho, **B. J. Ramshaw**, H. G. Xing, and D. Jena. GdAlO_3 in the quantum regime: Magneto-transport and photoluminescence to 60 tesla. *Applied Physics Letters*, 117(26):262105, 2020
- [23] Sayak Ghosh, Arkady Shekhter, F Jerzembeck, N Kikugawa, Dmitry A Sokolov, Manuel Brandt, AP Mackenzie, Clifford W Hicks, and **B. J. Ramshaw**. Thermodynamic Evidence for a Two-Component Superconducting Order Parameter in Sr_2RuO_4 . *Nature Physics*, 17(2):199–204, 2021
- [24] K. A. Modic, Ross D. McDonald, J. P. C. Ruff, Maja D. Bachmann, You Lai, Johanna C. Palmstrom, David Graf, Mun Chan, F. F. Balakirev, J. B. Betts, G. S. Boebinger, Marcus Schmidt, D. A. Sokolov, Philip J. W. Moll, **B. J. Ramshaw**, and Arkady Shekhter. Scale-invariant magnetic anisotropy in RuCl_3 at high magnetic fields. *Nature Physics*, 2020
- [25] Ian M. Hayes, Nikola Maksimovic, Gilbert N. Lopez, Mun K. Chan, **B. J. Ramshaw**, Ross D. McDonald, and James G. Analytis. Superconductivity and quantum criticality linked by the Hall effect in a strange metal. *Nature Physics*, 2020
- [26] Jaron Kent-Dobias, Michael Matty, and **B. J. Ramshaw**. Elastic properties of hidden order in URu_2Si_2 are reproduced by a staggered nematic. *Phys. Rev. B*, 102:075129, Aug 2020
- [27] Steven Allan Kivelson, Andrew Chang Yuan, **B. J. Ramshaw**, and Ronny Thomale. A proposal for reconciling diverse experiments on the superconducting state in Sr_2RuO_4 . *npj Quantum Materials*, 5(1):43, June 2020
- [28] Sayak Ghosh, Michael Matty, Ryan Baumbach, Eric D Bauer, KA Modic, Arkady Shekhter, JA Mydosh, Eun-Ah Kim, and **B. J. Ramshaw**. One-component order parameter in URu_2Si_2 uncovered by resonant ultrasound spectroscopy and machine learning. *Science Advances*, 6(10):eaaz4074, 2020
- [29] Mun K. Chan, Ross D. McDonald, **B. J. Ramshaw**, Jon B. Betts, Arkady Shekhter, Eric D. Bauer, and Neil Harrison. Extent of Fermi-surface reconstruction in the high-temperature superconductor $\text{HgBa}_2\text{CuO}_{4+\delta}$. *Proceedings of the National Academy of Sciences*, 2020
- [30] Mark E. Barber, Frank Lechermann, Sergey V. Streltsov, Sergey L. Skornyakov, Sayak Ghosh, **B. J. Ramshaw**, Naoki Kikugawa, Dmitry A. Sokolov, Andrew P. Mackenzie, Clifford W. Hicks, and I. I. Mazin. Role of correlations in determining the van hove strain in Sr_2RuO_4 . *Phys. Rev. B*, 100:245139, Dec 2019

- [31] JR Chamorro, A Topp, Y Fang, MJ Winiarski, CR Ast, M Krivenkov, A Varykhalov, **B. J. Ramshaw**, LM Schoop, and TM McQueen. Dirac fermions and possible weak antilocalization in lacusb2. *APL Materials*, 7(12):121108, 2019
- [32] Maja D Bachmann, GM Ferguson, Florian Theuss, Tobias Meng, Carsten Putzke, Toni Helm, KR Shirer, You-Sheng Li, KA Modic, Michael Nicklas, Marcus Konig, D. Low, Sayak Ghosh, Andrew P. Mackenzie, Frank Arnold, Elena Hassinger, Ross D. McDonald, Laurel E. Winter, Eric D. Bauer, Filip Ronning, **B. J. Ramshaw**, Katja C. Nowack, and Philip J.W. Moll. Spatial control of heavy-fermion superconductivity in CeIrIn5. *Science*, 366(6462):221–226, 2019
- [33] Yuval Gannot, **B. J. Ramshaw**, and Steven A. Kivelson. Fermi surface reconstruction by a charge density wave with finite correlation length. *Phys. Rev. B*, 100:045128, Jul 2019
- [34] M. J. Veit, M. K. Chan, **B. J. Ramshaw**, R. Arras, R. Pentcheva, and Y. Suzuki. Three-dimensional character of the Fermi surface in ultrathin LaTiO₃/SrTiO₃ heterostructures. *Physical Review B*, 99(11), Mar 18 2019
- [35] KA Modic, Tobias Meng, Filip Ronning, Eric D Bauer, Philip JW Moll, and **B. J. Ramshaw**. Thermodynamic Signatures of Weyl Fermions in NbP. *Scientific Reports*, 9(1):2095, 2019
- [36] Ian M. Hayes, Zeyu Hao, Nikola Maksimovic, Sylvia K. Lewin, Mun K. Chan, Ross D. McDonald, **B. J. Ramshaw**, Joel E. Moore, and James G. Analytis. Magnetoresistance Scaling Reveals Symmetries of the Strongly Correlated Dynamics in BaFe₂(As_{1-x}P_x)₂. *Phys. Rev. Lett.*, 121:197002, Nov 2018
- [37] K. A. Modic, Maja D. Bachmann, **B. J. Ramshaw**, F. Arnold, K. R. Shirer, Amelia Estry, J. B. Betts, Nirmal J. Ghimire, E. D. Bauer, Marcus Schmidt, Michael Baenitz, E. Svanidze, Ross D. McDonald, Arkady Shekhter, and Philip J. W. Moll. Resonant torsion magnetometry in anisotropic quantum materials. *Nature Communications*, 9, 2018
- [38] K. A. Modic, **B. J. Ramshaw**, A. Shekhter, and C. M. Varma. Chiral spin order in some purported kitaev spin-liquid compounds. *Phys. Rev. B*, 98:205110, Nov 2018
- [39] P. Giraldo-Gallo, J. A. Galvis, Z. Stegen, K. A. Modic, F. F. Balakirev, J. B. Betts, X. Lian, C. Moir, S. C. Riggs, J. Wu, A. T. Bollinger, X. He, I. Božović, **B. J. Ramshaw**, R. D. McDonald, G. S. Boebinger, and A. Shekhter. Scale-invariant magnetoresistance in a cuprate superconductor. *Science*, 361(6401):479–481, 2018
- [40] **B. J. Ramshaw**, K. A. Modic, Arkady Shekhter, Yi Zhang, Eun-Ah Kim, Philip J. W. Moll, M. K. Chan, J. B. Betts, F. Balakirev, A. Migliori, N. J. Ghimire, E. D. Bauer, F. Ronning, and R. D. McDonald. Quantum limit transport and destruction of the Weyl nodes in TaAs. *Nature Communications*, 9, June 2018
- [41] M.J. Veit, R. Arras, **B. J. Ramshaw**, R. Pentcheva, and Y. Suzuki. Nonzero Berry phase in quantum oscillations from giant Rashba-type spin splitting in LaTiO₃/SrTiO₃ heterostructures. *Nature Communications*, 9, 2018
- [42] O. Cyr-Choinière, R. Daou, F. Laliberté, C. Collignon, S. Badoux, D. LeBoeuf, J. Chang, **B. J. Ramshaw**, D. A. Bonn, W. N. Hardy, R. Liang, J.-Q. Yan, J.-G. Cheng, J.-S. Zhou, J. B. Goodenough, S. Pyon, T. Takayama, H. Takagi, N. Doiron-Leyraud, and Louis Taillefer. Pseudogap temperature T^* of cuprate superconductors from the nernst effect. *Phys. Rev. B*, 97:064502, Feb 2018
- [43] **B. J. Ramshaw**, N. Harrison, S. E. Sebastian, S. Ghannadzadeh, K. A. Modic, D. A. Bonn, W. N. Hardy, Ruixing Liang, and P. A. Goddard. Broken rotational symmetry on the fermi surface of a high- T_c superconductor. *NPJ Quantum Materials*, 2(1):8, 2 2017

- [44] KA Modic, **B. J. Ramshaw**, JB Betts, Nicholas P Breznay, James G Analytis, Ross D McDonald, and Arkady Shekhter. Robust spin correlations at high magnetic fields in the harmonic honeycomb iridates. *Nature Communications*, 8, 2017
- [45] F Ronning, T Helm, K Shirer, M Bachmann, L Balicas, M Chan, **B. J. Ramshaw**, RD McDonald, FF Balakirev, M Jaime, , ED Bauer, and PJW Moll. Electronic in-plane symmetry breaking at field-tuned quantum criticality in CeRhIn₅. *Nature*, 548:313–317, Aug 17 2017
- [46] Akash V Maharaj, Ilya Esterlis, Yi Zhang, **B. J. Ramshaw**, and SA Kivelson. Hall number across a van Hove singularity. *Physical Review B*, 96(4):045132, 2017
- [47] Jiecheng Zhang, Eli M. Levenson-Falk, **B. J. Ramshaw**, D. A. Bonn, Ruixing Liang, W. N. Hardy, Sean A. Hartnoll, and Aharon Kapitulnik. Anomalous thermal diffusivity in underdoped YBa₂Cu₃O_{6+x}. *Proceedings of the National Academy of Sciences*, 114(21):5378–5383, May 23 2017
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- [49] Philip JW Moll, Toni Helm, Shang-Shun Zhang, Cristian D Batista, Neil Harrison, Ross D McDonald, Laurel E Winter, **B. J. Ramshaw**, Mun K Chan, Fedor F Balakirev, B Batlogg, ED Bauer, and F. Ronning. Emergent magnetic anisotropy in the cubic heavy-fermion metal CeIn₃. *NPJ Quantum Materials*, 2(1):46, 2017
- [50] Arkady Shekhter, K. A. Modic, R. D. McDonald, and **B. J. Ramshaw**. Thermodynamic constraints on the amplitude of quantum oscillations. *Phys. Rev. B*, 95:121106, Mar 2017
- [51] Albert Migliori, Per Söderlind, Alexander Landa, Franz J Freibert, Boris Maiorov, **B. J. Ramshaw**, and Jon B Betts. Origin of the multiple configurations that drive the response of δ -plutonium's elastic moduli to temperature. *Proceedings of the National Academy of Sciences*, page 201609215, 2016
- [52] Nicholas P. Breznay, Ian M. Hayes, **B. J. Ramshaw**, Ross D. McDonald, Yoshiharu Krockenberger, Ai Ikeda, Hiroshi Irie, Hideki Yamamoto, and James G. Analytis. Shubnikov-de Haas quantum oscillations reveal a reconstructed Fermi surface near optimal doping in a thin film of the cuprate superconductor Pr_{1.86}Ce_{0.14}CuO_{4± δ} . *Phys. Rev. B*, 94:104514, Sep 2016
- [53] Philip JW Moll, Andrew C Potter, Nityan L Nair, **B. J. Ramshaw**, KA Modic, Scott Riggs, Bin Zeng, Nirmal J Ghimire, Eric D Bauer, Robert Kealhofer, Filip Ronning, and James G. Analytis. Magnetic torque anomaly in the quantum limit of Weyl semimetals. *Nature Communications*, 7, 2016
- [54] M. K. Chan, N. Harrison, R. D. McDonald, **B. J. Ramshaw**, K. A. Modic, N. Barisic, and M. Greven. Single reconstructed Fermi surface pocket in an underdoped single-layer cuprate superconductor. *Nature Communications*, 7, Jul 2016
- [55] Akash V. Maharaj, Yi Zhang, **B. J. Ramshaw**, and S. A. Kivelson. Quantum oscillations in a bilayer with broken mirror symmetry: A minimal model for YBa₂Cu₃O_{6+ δ} . *Phys. Rev. B*, 93:094503, Mar 2016
- [56] G. Grissonnanche, F. Laliberté, S. Dufour-Beauséjour, M. Matusiak, S. Badoux, F. F. Tafti, B. Michon, A. Riopel, O. Cyr-Choinière, J. C. Baglo, **B. J. Ramshaw**, R. Liang, D. A. Bonn, W. N. Hardy, S. Krämer, D. LeBoeuf, D. Graf, N. Doiron-Leyraud, and Louis Taillefer. Wiedemann-Franz law in the underdoped cuprate superconductor YBa₂Cu₃O_{6+ δ} . *Phys. Rev. B*, 93:064513, Feb 2016
- [57] Jing Fei Yu, **B. J. Ramshaw**, I. Kokanović, K. A. Modic, N. Harrison, James Day, Ruixing Liang, W. N. Hardy, D. A. Bonn, A. McCollam, S. R. Julian, and J. R. Cooper. Magnetization of underdoped YBa₂Cu₃O_y above the irreversibility field. *Phys. Rev. B*, 92:180509, Nov 2015

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- [60] B. S. Tan, N. Harrison, Z. Zhu, F. Balakirev, **B. J. Ramshaw**, B. J., A. Srivastava, S. A. Sabok, B. Dabrowski, G. G. Lonzarich, and Suchitra E. Sebastian. Fragile charge order in the nonsuperconducting ground state of the underdoped high-temperature superconductors. *Proceedings of the National Academy of Sciences*, 2015
- [61] N Doiron-Leyraud, S Badoux, S René de Cotret, S Lepault, D LeBoeuf, F Laliberté, E Hassinger, **B. J. Ramshaw**, DA Bonn, WN Hardy, et al. Evidence for a small hole pocket in the fermi surface of underdoped $\text{YBa}_2\text{Cu}_3\text{O}_y$. *Nature Communications*, 6, 2015
- [62] N. Shapira, Y. Lamhot, O. Shpielberg, Y. Kafri, **B. J. Ramshaw**, D. A. Bonn, Ruixing Liang, W. N. Hardy, and O. M. Auslaender. Disorder-induced power-law response of a superconducting vortex on a plane. *Phys. Rev. B*, 92:100501, Sep 2015
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MANUSCRIPTS UNDER REVIEW

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- [3] Sayak Ghosh, Matthias S. Ikeda, Anzumaan R. Chakraborty, Thanapat Worasaran, Florian Theuss, Luciano B. Peralta, P. M. Lozano, Jong-Woo Kim, Philip J. Ryan, Linda Ye, Aharon Kapitulnik, Steven A. Kivelson, **B. J. Ramshaw**, Rafael M. Fernandes, and Ian R. Fisher. Elastocaloric evidence for a multi-component superconductor stabilized within the nematic state in $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$. *arXiv:2402.17945*, 2024
- [4] Toshihiro Sato, **B. J. Ramshaw**, K. A. Modic, and Fakhre F. Assaad. Scale-invariant magnetic anisotropy in $\alpha\text{-RuCl}_3$: A quantum monte carlo study. *arXiv:2312.03080*, 2023
- [5] A. Khansili, A. Bangura, R. D. McDonald, **B. J. Ramshaw**, A. Rydh, and A. Shekhter. Multi-flavor quantum criticality. *arXiv:2311.11914*, 2023

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[7] Michael J. Lawler, Kimberly A. Modic, and **B. J. Ramshaw**. Strong correlation effects observed by an ANN-MFT encoder trained on α -RuCl₃ high magnetic field data. *arXiv:2301.01301*, 2023

[8] A. Shekhter, K. A. Modic, L. E. Winter, Y. Lai, M. K. Chan, F. F. Balakirev, J. B. Betts, S. Komiyama, S. Ono, G. S. Boebinger, **B. J. Ramshaw**, and R. D. McDonald. Energy-scale competition in the hall resistivity of a strange metal. *arXiv:2207.10244*, 2022

RESEARCH HIGHLIGHTS IN THE MEDIA

- ELASTIC RESPONSE REVEALS THE PAIRING SYMMETRY MAY 2024
Bohm-Jung Yang, Nature Physics News & Views. [Link](#).
- SUPERCONDUCTIVITY PAPER SPURS DISPUTE AS FIELD REELS FROM EARLIER SCANDAL AUGUST 2024
Dan Garisto, Nature News. [Link](#).
- INVESTIGATION INTO CLAIMS OF ROOM-TEMPERATURE SUPERCONDUCTIVITY 2023
I (and James Hamlin at the University of Florida) investigated the claims of room-temperature superconductivity made in a pair of [2020](#) and [2023](#) articles. The papers ended up being retracted. These events were written up, and I am quoted, in [Science](#), the [New York Times twice](#), [The Wall Street Journal](#), and [Nature](#).
- ULTRASOUND EXPERIMENT IDENTIFIES NEW SUPERCONDUCTOR MAY 2024
Kate Blackwood, Cornell Chronicle. [Link](#).
- MAGNETISM HELPS ELECTRONS VANISH IN HIGH-TEMP SUPERCONDUCTORS MARCH 2022
Kate Blackwood, Cornell Chronicle. [Link](#).
- NEW TRANSPORT EXPERIMENTS IN STRANGE METALS DECEMBER 2021
Senthil Todadri, Journal Club for Condensed Matter Physics. [Link](#).
- CHAOTIC ELECTRONS HEED 'LIMIT' IN STRANGE METALS JULY 2021
David Nutt, Cornell Chronicle. [Link](#).
- LINEAR-IN TEMPERATURE RESISTIVITY FROM ISOTROPIC PLANCKIAN SCATTERING RATE SEPTEMBER 2021
National High Magnetic Field Lab September Science Highlight. [Link](#).
- HMF - A FIRST-OF-ITS-KIND X-RAY FACILITY OCTOBER 2020
CHESS press release. [Link](#).
- THE SYMMETRY OF SUPERCONDUCTING SR₂RUO₄ SEPTEMBER 2020
Daniel F. Agterberg, Nature Physics News and Views. [Link](#).
- RESEARCHERS IDENTIFY NEW TYPE OF SUPERCONDUCTOR SEPTEMBER 2020
David Nutt. [Link](#).
- MACHINE LEARNING ILLUMINATES MATERIAL'S HIDDEN ORDER MARCH 2020
David Nutt. [Link](#).

STRESSING METALLIC MATERIAL CONTROLS SUPERCONDUCTIVITY David Nutt. Link.	OCTOBER 2019
TWO ON A&S FACULTY AWARDED DOE EARLY CAREER GRANTS Melanie Lefkowitz. Link.	AUGUST 2019
RAMSHAW, LIN AND BASKIN WIN SLOAN FELLOWSHIPS Melanie Lefkowitz. Link.	MARCH 2019
"STRANGE METALS" JUST GOT STRANGER Kristen Coyne. Link.	JUNE 2018
TAKE 2 FOR SCIENCE: BRAD RAMSHAW NHMFL promotional video. Link.	JUNE 2018
MPA MATERIALS MATTER — RAMSHAW RECEIVES 2017 LEE OSCHEROFF RICHARDSON SCIENCE PRIZE Newsletter of the Materials Physics and Applications Division, Los Alamos National Laboratory. Link.	JUNE 2017
NHMFL AROUND THE LAB — NEW TECHNIQUE FOR PULSED MAGNETS Kristen Coyne. Link.	JANUARY 2016
ALUMNILINK — USING MAGNETIC FIELDS TO UNDERSTAND HIGH-TEMPERATURE SUPERCONDUCTIVITY Linda Anderman. Picked up by <i>phys.org</i> , <i>sciencedaily.com</i> , and other science websites. Link.	MAY 2015
MAGLAB REPORTS — QUANTUM OSCILLATIONS IN THE HIGH-Tc SUPERCONDUCTOR $\text{YBa}_2\text{Cu}_3\text{O}_{6+\delta}$ NEAR OPTIMAL DOPING Kristin Roberts	SUMMER 2014
LOS ALAMOS SCIENCE AND TECHNOLOGY MAGAZINE (1663) — PHASE FIVE, A NEW STATE OF MATTER Jay Schecker. Link.	NOVEMBER 2013
NATURE NEWS AND VIEWS—HIGH-TEMPERATURE SUPERCONDUCTIVITY: THE SOUND OF A HIDDEN ORDER Jan Zaanen. Link.	JUNE 2013
THE GLOBE AND MAIL—DO LARGE ICE CUBES YIELD A LESS-WATERY COCKTAIL? Beppi Crosariol. Link.	APRIL 2011
NATURE PHYSICS NEWS AND VIEWS—SUPERCONDUCTIVITY: GENETICS AND G-FACTORS Stephen R. Julian and Michael R. Norman. Link.	MARCH 2011

INVITED TALKS

CORNELL UNIVERSITY	2024
CALIFORNIA INSTITUTE OF TECHNOLOGY	2024
INSTITUTE OF SCIENCE AND TECHNOLOGY AUSTRIA	2023
COLUMBIA UNIVERSITY SCHOOL	2023
UNIVERSITY OF WATERLOO	2023
MARCH MEETING	2023
2 nd INTERNATIONAL SYMPOSIUM ON TRANSCALE QUANTUM SCIENCE, TOKYO	2022
RICE CENTER FOR QUANTUM MATERIALS STRANGE METALS CONFERENCE, HOUSTON	2022
29 th INTERNATIONAL CONFERENCE ON LOW TEMPERATURE PHYSICS, SAPPORO	2022
UNIVERSITY OF TEXAS AT AUSTIN	2022
UNIVERSITY OF MINNESOTA	2022
FLORIDA STATE UNIVERSITY	2022
MATERIALS AND MECHANISMS OF SUPERCONDUCTIVITY (M ² S), VANCOUVER	2022
CHIRALITY, TOPOLOGY AND UNCONVENTIONAL SUPERCONDUCTIVITY IN Sr ₂ RuO ₄ AND UTe ₂	2021
MASSACHUSETTS INSTITUTE OF TECHNOLOGY	2021
DOE EXPERIMENTAL CONDENSED MATTER PHYSICS PRINCIPAL INVESTIGATORS' MEETING	2021
INSTITUTE OF SCIENCE AND TECHNOLOGY, AUSTRIA	2021
STRANGE METAL WORKSHOP, UIUC	2021
UNIVERSITY OF CALIFORNIA, LOS ANGELES	2021
QUANTUM MATERIALS IN CANADA	2021
CANADIAN INSTITUTE FOR ADVANCED RESEARCH SUMMER SCHOOL	2021
MAX PLANCK INSTITUTE FOR THE PHYSICS OF COMPLEX SYSTEMS	2021
KARLSRUHE INSTITUTE OF TECHNOLOGY	2021
MARCH MEETING	2021
UNIVERSITY OF BRISTOL	2021
CANADIAN INSTITUTE FOR ADVANCED RESEARCH: FALL MEETING	2020
LOS ALAMOS NATIONAL LABS QUANTUM MATTER WORKING GROUP	2020
UNIVERSITY OF BRITISH COLUMBIA QUANTUM MATTER INSTITUTE	2020
MAX PLANCK INSTITUTE FOR THE STRUCTURE AND DYNAMICS OF MATTER (CANCELED DUE TO COVID-19)	2020
COLORADO STATE UNIVERSITY (CANCELED DUE TO COVID-19)	2020
TEXAS A&M	2020
CORNELL UNIVERSITY	2020
UNIVERSITY OF MARYLAND, COLLEGE PARK	2019
COLLEGE DE FRANCE	2019
JOHNS HOPKINS UNIVERSITY	2019

GORDON RESEARCH CONFERENCE IN SUPERCONDUCTIVITY, LES DIABLERETS, SWITZERLAND	2019
SRO21+4, 25 YEARS OF A PUZZLING SUPERCONDUCTOR, ETH ZURICH	2019
SUDIPFEST, UNIVERSITY OF CALIFORNIA, LOS ANGELES	2019
AMERICAN PHYSICAL SOCIETY MARCH MEETING, BOSTON	2019
8TH MANEP WINTER SCHOOL, SAAS-FEE, SWITZERLAND	2019
WEIZMANN INSTITUTE, ISRAEL	2018
NEW YORK STATE SECTION OF THE APS 118 th TOPICAL SYMPOSIUM, BINGHAMTON UNIVERSITY	2018
UNIVERSITÉ DE MONTRÉAL	2018
UNIVERSITÉ DE SHERBROOKE	2018
UNIVERSITY OF WATERLOO	2018
UNIVERSITY OF UTAH	2017
MAGLAB USER COMMITTEE MEETING, UNIVERSITY OF FLORIDA	2017
UNIVERSITY OF ROCHESTER	2017
CORNELL UNIVERSITY	2017
SOCIETY OF PHYSICS STUDENTS, CORNELL UNIVERSITY	2017
TOPOLOGICAL SEMIMETALS AND BEYOND, WEIZMANN INSTITUTE, ISRAEL	2017
POSTDOCTORAL ACTINIDE PUBLICATION AWARD, LOS ALAMOS NATIONAL LABS	2017
CANADIAN INSTITUTE FOR ADVANCED RESEARCH, VANCOUVER	2017
AMERICAN PHYSICAL SOCIETY MARCH MEETING, LOUISIANA	2017
QUANTUM CRITICALITY AND TOPOLOGY IN ITINERANT ELECTRON SYSTEMS, ALBUQUERQUE	2016
LOS ALAMOS NATIONAL LABS	2016
CORNELL UNIVERSITY	2016
COLORADO SCHOOL OF MINES	2016
JOHNS HOPKINS	2016
UNIVERSITY OF CALIFORNIA, RIVERSIDE	2016
CALTECH	2016
UNIVERSITY OF TORONTO	2016
CORNELL UNIVERSITY	2016
PHYSICAL PHENOMENA AT HIGH MAGNETIC FIELDS VIII, TALLAHASSEE	2016
POSTDOC PUBLICATION AWARD, LOS ALAMOS NATIONAL LABS	2015
INTERNATIONAL CONFERENCE ON RESEARCH IN HIGH MAGNETIC FIELDS, GRENOBLE, FRANCE	2015
UNIVERSITY OF CHICAGO	2015
STANFORD UNIVERSITY	2015
UNIVERSITY OF WASHINGTON	2014
UNIVERSITY OF CALIFORNIA, BERKELEY	2014
SUPERSTRIPES 2014, ERICE, SICILY	2014
STANFORD UNIVERSITY	2014
UNIVERSITY OF CALIFORNIA, LOS ANGELES	2014

MATERIALS RESEARCH SOCIETY SPRING MEETING 2014, SAN FRANCISCO.	2014
UNIVERSITY OF MARYLAND, COLLEGE PARK	2014
UNIVERSITY OF BRITISH COLUMBIA, VANCOUVER	2014
ASPEN WINTER PHYSICS CONFERENCE	2014
CORNELL UNIVERSITY, ITHACA	2013
CANADIAN INSTITUTE FOR ADVANCED RESEARCH, VANCOUVER	2013
UNIVERSITY OF CALIFORNIA, LOS ANGELES	2012
UNIVERSITY OF BRITISH COLUMBIA, VANCOUVER	2011
ASPEN WINTER PHYSICS CONFERENCE	2011
PHYSICAL PHENOMENA AT HIGH MAGNETIC FIELDS VII, TALLAHASSEE	2010
UNIVERSITY OF BRITISH COLUMBIA, VANCOUVER	2009

CONTRIBUTED PRESENTATIONS AND POSTERS

INTERNATIONAL CONFERENCE ON MAGNETISM, SAN FRANCISCO, CALIFORNIA	2018
NSF SITE VISIT: NATIONAL HIGH MAGNETIC FIELD LAB, TALLAHASSEE, FLORIDA	2016
AMERICAN PHYSICAL SOCIETY MARCH MEETING, SAN ANTONIO, TEXAS	2015
LOS ALAMOS POST-DOC RESEARCH DAY, LOS ALAMOS, NEW MEXICO	2013
AMERICAN PHYSICAL SOCIETY MARCH MEETING, BALTIMORE, MARYLAND	2013
GORDON RESEARCH CONFERENCE ON CORRELATED ELECTRON SYSTEMS, MOUNT HOLYOKE COLLEGE, MASSACHUSETTS	2010
AMERICAN PHYSICAL SOCIETY MARCH MEETING, PORTLAND, OREGON	2010
AMERICAN PHYSICAL SOCIETY MARCH MEETING, PITTSBURGH, PENNSYLVANIA	2009

SYNERGISTIC ACTIVITIES

VICE-CHAIR OF THE NATIONAL HIGH MAGNETIC FIELD LAB USER COMMITTEE	JAN 2020 - FALL 2023
Vice chair of the independent body representing the approximately 1,500 annual users to the National High Magnetic Field Lab (NHMFL)—the National Science Foundation’s largest user facility. Link to profile.	
ASPEN WINTER CONFERENCE - FUTURE DIRECTIONS IN TOPOLOGICAL STATES OF MATTER	JANUARY 2020
Co-organizer of a 5 day conference at the Aspen Institute for Physics, bringing together experts in both topology and strongly correlated electron systems.	
KAVLI FRONTIERS OF SCIENCE SYMPOSIUM	FEBRUARY 2018
National Academy of Sciences symposium bringing together outstanding young scientists to discuss exciting advances and opportunities in a broad range of disciplines.	
NSF WORKSHOP ON ULTRAHIGH MAGNETIC FIELDS	SEPTEMBER 2017
Workshop convening worldwide experts on high magnetic field research to determine future directions for NSF funding.	
KITP CONFERENCE ON INTERTWINED ORDER: SCIENTIFIC ADVISER	JUNE 2017
Conference on complex and intertwined orders in cuprates, pnictides, iridates, and ruthenates.	

WORKSHOP: CRACKING THE ENIGMA OF CUPRATE SUPERCONDUCTORS	MAY 2017
Attendee of a three day focus session on the outstanding problems in high- T_c superconductivity.	
NATIONAL HIGH MAGNETIC FIELD LAB: SITE REVIEW	AUGUST 2016
Two day external review of the NHMFL for the National Science Foundation—presenter.	
PHYSICS IN THE FIELD SEMINAR SERIES: CO-FOUNDER AND ORGANIZER	2013-2015
Seminar series at Los Alamos National Labs—Pulsed Field Facility.	
LET'S TALK SCIENCE: VOLUNTEER	2011-2012
Demonstrations and organizing group activities for grades 1 and 2 students.	
CANADIAN INSTITUTE FOR ADVANCED RESEARCH SUMMER SCHOOL: ORGANIZER	2009
Three-day summer school at the University of British Columbia.	