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L. Herbert Ballou University Professor of Physics  
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### 2. EDUCATION:

2001 Ph. D. Physics, Northwestern University, Evanston, IL  
 1996 M. S. Physics, Northwestern University, Evanston, IL  
 1995 B. S. Physics, Illinois Institute of Technology (IIT), Chicago, IL

### 3. PROFESSIONAL APPOINTMENTS:

2024 - present Chair, Department of Physics, Brown University  
 2022 - present L. Herbert Ballou University Professor of Physics, Brown University  
 2020 - present Professor of Engineering, Brown University, Providence, RI  
 2018 - 2022 Professor of Physics, Brown University, Providence, RI  
 2017 - 2022 Director of Physics Master's Program, Brown University  
 2010 - 2018 Associate Professor of Physics, Brown University, Providence, RI  
 2007 - 2010 Manning Assistant Professor of Physics, Brown University, Providence, RI  
 2004 - 2009 Assistant Professor of Physics, Brown University, Providence, RI  
 2002 - 2004 Post Doctoral Fellow, Grenoble High Magnetic Field Laboratory, Grenoble, France

### 4. ACADEMIC AWARDS and HONORS:

2024-2026 Member of the Gordon and Betty Moore Foundation National Advisory Committee for 2025/26 Experimental Physics Investigators Initiative  
 2023-2024 DCMP- APS Fellowship Selection Committee  
 2022 M.S. Honorary Degree, Brown University  
 2022-pres. Member of the Editorial Board of the New Journal of Physics  
 2022 Executive Committee Vice-Chair of the Group on Instrument and Measurement Science (GIMS) of the American Physical Society (APS)  
 2022-2025 Member at Large on the Executive Committee of the APS Division of Condensed Matter Physics (DCMP)  
 2021 APS - 2022 Joseph F. Keithley Award For Advances in Measurement Science Selection Committee Member  
 2020-pres. Member of the Editorial Board of the Journal of the Low Temperature Physics  
 2019 Visiting Professor, Université Grenoble Alpes, Grenoble, France  
 2019 Finalist of Moore Investigators in Quantum Materials Program  
 2019 Member the APS "Richard L. Greene Dissertation Award in Experimental Condensed Matter or Materials Physics" award selection committee  
 2016 Visiting Professor, Université Grenoble Alpes, Grenoble, France  
 2015 Fellow of the American Physical Society  
*(for "pioneering contributions to NMR study of low energy excitations in emergent quantum phases".)*  
 2015 Visiting Scientist, GNHMFL-CNRS, Grenoble, France

2014	Visiting Professor, Université Joseph Fourier, Grenoble, France
2011	Visiting Professor, Université Joseph Fourier, Grenoble, France
2010	Visiting Professor, IQC, Waterloo, Canada
2008	France-US Kavli Frontiers of Science Alumni
2007	Alfred P. Sloan Fellowship
2007	Manning Assistant Professorship, Brown University
2006	National Science Foundation CAREER Award
2005	Richard B. Salomon, Faculty Research Award, Brown University
2005	Visiting Scientist Program, NHMFL, Tallahassee, FL

## 5. PUBLICATIONS:

### a. Refereed Journal Articles:

1. Michael Warnock, David A. Hague, and Vesna F. Mitrović, “Multi-Directional Periodic Driving of a Two-Level System beyond Floquet Formalism”, **arXiv:2511.03977 [quant-ph]** (*pre-print*) (2025).  
<https://doi.org/10.48550/arXiv.2511.03977>
2. Ilija K. Nikolov, Giuseppe Allodi, Adrien Rosuel, Ginevra Corsale, Pietro Bonfà, Roberto De Renzi, Andrea Capa Salinas, Stephen D. Wilson, Marc-Henri Julien, Samuele Sanna, and Vesna F. Mitrović, “Observation of ubiquitous charge correlations and hidden quantum critical point in hole-doped kagome superconductors”, (*under review in npj Quantum Materials*) **arXiv:2512.09256 [cond-mat.str-el]** (*pre-print*) (2025).  
<https://doi.org/10.48550/arXiv.2512.09256>
3. V. da Cruz Pinha Barbosa, D. Maharaj, Z. Cronkwright, Y. Wang, Rong Cong, E. Garcia, A. Reyes, J.q. Yan, C. Ritter, V. F. Mitrović, B. Gaulin, J. Greedan, P. Woodward, “Exploring the links between structural distortions, orbital ordering, and multipolar magnetic ordering in double perovskites containing Re(VI) and Os(VII)”, **Chemistry of Materials**, **36** (23), 11478-11489 (2024).  
<https://doi.org/10.1021/acs.chemmater.4c02135>
4. Ilija K. Nikolov, Rong Cong, Stephen Carr, Ian R. Fisher, Dmitri E. Feldman, Adrian G. Del Maestro, Chandrasekhar Ramanathan, and V. F. Mitrović, “Unveiling the nature of hidden order in a relativistic Mott insulator”, (*under review in Science*) (2024).
5. Charles Snider, Stephen Carr, D. E. Feldman, Chandrasekhar Ramanathan and V. F. Mitrović, “Dynamic Simulations of Strongly Coupled Spin Ensembles”, (*submitted to Computer Physics Communications*) (2024).
6. Ifeanyi John Onuorah, Jonathan Frassinetti, Qiaochu Wang, Muhammad Maikudi Isah, Pietro Bonfà, Jeffrey G. Rau, J. A. Rodriguez-Rivera, A. I. Kolesnikov, Vesna F. Mitrović, Samuele Sanna, and Kemp W. Plumb, “Unraveling the magnetic ground state in the alkali-metal lanthanide oxide Na<sub>2</sub>PrO<sub>3</sub>”, **Phys. Rev. B** **110**, 064425 (2024). (Editors’ Suggestion)  
<https://doi.org/10.1103/PhysRevB.110.064425>
7. S. Agrestini, F. Borgatti, P. Florio, J. Frassinetti, D. Fiore Mosca, Q. Faure, B. Detlefs, C.J. Sahle, S. Francoual, J. Choi, M. Garcia-Fernandez, K.-J. Zhou, V.F. Mitrović, P.M. Woodward, G. Ghiringhelli, C. Franchini, F. Boscherini, S. Sanna, and M. Moretti Sala, “Origin of Magnetism in a Supposedly Nonmagnetic Osmium Oxide”, **Phys. Rev.**

- Lett.** **133**, 066501 (2024). (Editors' Suggestion)  
<https://doi.org/10.1103/PhysRevLett.133.066501>
8. Lorenzo Celiberti, Dario Fiore Mosca, Giuseppe Allodi, Leonid V. Pourovskii, Anna Tassetti, Paola Caterina Forino, Rong Cong, Erick Garcia, Phuong M. Tran, Roberto De Renzi, Patrick M. Woodward, Vesna F. Mitrović, Samuele Sanna, and Cesare Franchini, “Spin-orbital Jahn-Teller bipolarons”, **Nature Communications** **15**, 2429 (2024).  
<https://doi.org/10.1038/s41467-024-46621-0>
  9. Anantha Rao, Stephen Carr, Charles Snider, D. E. Feldman, Chandrasekhar Ramanathan and V. F. Mitrović, “Machine learning assisted determination of electronic correlations from magnetic resonance”, **Phys. Rev. Research** **5**, 043098 (2023).  
<https://doi.org/10.1103/PhysRevResearch.5.043098>
  10. Andrea N. Capa Salinas, Brenden R. Ortiz, Calvin Bales, Jonathan Frassineti, Vesna F. Mitrović, Stephen D. Wilson, “Electron-hole asymmetry in the phase diagram of carrier-tuned  $\text{CsV}_3\text{Sb}_5$ ”, **Frontiers in Electronic Materials**, **3**, 1257490 (2023).  
<https://doi.org/10.3389/femat.2023.1257490>
  11. R. Cong, E. Garcia, P. C. Forino, A. Tassetti, G. Allodi, P. Tran, P. M. Woodward, C. Franchini, S. Sanna, V. F. Mitrović, “Effects of charge doping on Mott insulator with strong spin-orbit coupling,  $\text{Ba}_2\text{NaOsO}_6$ ”, **Physical Review Materials** **7**, 084409 (2023).  
<https://link.aps.org/doi/10.1103/PhysRevMaterials.7.084409>
  12. Stephen Carr, Ilija K. Nikolov, Rong Cong, Adrian G. Del Maestro, Chandrasekhar Ramanathan and V. F. Mitrović, “Multi-modal spectroscopy of phase transitions”, **Physical Review B** **108**, 054421 (2023).  
<https://link.aps.org/doi/10.1103/PhysRevB.108.054421>
  13. Davide Candoli, Ilija K. Nikolov, Lucas Z. Brito, Stephen Carr, Samuele Sanna, and V. F. Mitrović, “PULSE: A software for the quantum simulation of an extensive set of magnetic resonance observables”, **Computer Physics Communications**, **284**, 108598 (2023).  
<https://doi.org/10.1016/j.cpc.2022.108598>
  14. Jonathan Frassineti, Pietro Bonfà, Giuseppe Allodi, Erick Garcia, Rong Cong, Brenden R. Ortiz, Stephen D. Wilson, Roberto De Renzi, Vesna F. Mitrović, and Samuele Sanna, “Microscopic nature of the charge-density wave in kagome superconductor  $\text{RbV}_3\text{Sb}_5$ ”, **Phys. Rev. Research** **5** L012017 (2023).  
<https://doi.org/10.1103/PhysRevResearch.5.L012017>
  15. Zezhu Wei, Navketan Batra, V. F. Mitrović, and D. E. Feldman, “Thermal interferometry of anyons”, **Phys. Revs B**, **107** 104406 (2023).  
<https://doi.org/10.1103/PhysRevB.107.104406>
  16. Ilija K. Nikolov, Stephen Carr, Adrian G. Del Maestro, Chandrasekhar Ramanathan and V. F. Mitrović, “Spin squeezing as a probe of emergent quantum orders”, **J. of Phys. Soc. Jap.**, *Proceedings of the 29th International Conference on Low Temperature Physics (LT29)* **38**, 011149 (2023).  
<https://doi.org/10.7566/JPSCP.38.011149>
  17. E. Garcia, C. Bales, W. Patterson, A. Zaslavsky, and V. F. Mitrović, “Cryogenic probe

- for low-noise, high-frequency electronic measurements”, **Review of Scientific Instruments**, **93**, 103902 (2022).  
<https://doi.org/10.1063/5.0106239>
18. Pietro Bonfà, Jonathan Frassineti, John M. Wilkinson, Giacomo Prando, Muhammad M. Isah, Chennan Wang, Tiziana Spina, Bobby Joseph, Vesna F. Mitrović, Roberto De Renzi, Stephen J. Blundell, and Samuele Sanna, “Entanglement between a muon spin and  $I > 1/2$  nuclear spins”, **Phys. Rev. Lett.**, **129**, 097205 (2022). (Editor’s Suggestion)  
<https://doi.org/10.1103/PhysRevLett.129.097205>
  19. Yuzki M. Oey, Brenden R. Ortiz, Farnaz Kaboudvand, Jonathan Frassineti, Erick Garcia, Samuele Sanna, Vesna F. Mitrović, Ram Seshadri, and Stephen D. Wilson, “Fermi level tuning and double-dome superconductivity in the kagome metals  $\text{CsV}_3\text{Sb}_{5-x}\text{Sn}$ ”, **Phys. Rev. Materials**, **6**, L041801 (2022). (Editor’s Suggestion)  
<https://link.aps.org/doi/10.1103/PhysRevMaterials.6.L041801>
  20. S. Carr, C. Snider, D. E. Feldman, C. Ramanathan, J. B. Marston and V. F. Mitrović, “Signatures of electronic correlations and spin-susceptibility anisotropy in nuclear magnetic resonance”, **Phys. Rev. B**, **106**, L041119 (2022).  
<https://doi.org/10.1103/PhysRevB.106.L041119>
  21. Zezhu Wei, V. F. Mitrović, and D. E. Feldman, “Thermal interferometry of anyons in spin liquids”, **Phys. Rev. Lett.**, **127**, 167204 (6 pp) (2021).  
<https://link.aps.org/doi/10.1103/PhysRevLett.127.167204>
  22. Z. Zhuang, V. F. Mitrović, and J. B. Marston, “Resistively detected NMR as a probe of topological nature of conducting edge/surface states”, **Phys. Rev. B**, **104**, 045144 (2021).  
<https://link.aps.org/doi/10.1103/PhysRevB.104.045144>
  23. J. K. Kesavan, D. F. Mosca, S. Sanna, F. Borgatti, G. Schuck, P. M. Tran, P. M. Woodward, V. F. Mitrović, C. Franchini, and F. Boscherini, “Doping evolution of the local electronic and structural properties of the double perovskite  $\text{Ba}_2\text{Na}_{1-x}\text{Ca}_x\text{OsO}_6$ ”, **Journal of Physical Chemistry**, **124**, 16577 (13 pp) (2020).  
<https://doi.org/10.1021/acs.jpcc.0c04807>
  24. R. Cong, R. Nanguneri, B. M. Rubenstein, and V. F. Mitrović, “First principles calculations of the electrical field gradient tensors of  $\text{Ba}_2\text{NaOsO}_6$ , a Mott Insulator with strong spin orbit coupling”, **J. Phys.: Condens. Matter**, **32**, 405802 (24 pp) (2020).  
<https://doi.org/10.1088/1361-648X/ab9056>
  25. R. Cong, R. Nanguneri, B. M. Rubenstein, and V. F. Mitrović, “Evidence from first-principles calculations for orbital ordering in  $\text{Ba}_2\text{NaOsO}_6$ : A Mott insulator with strong spin-orbit coupling”, **Phys. Rev. B**, **100**, 245141 (6 pp) (2019).  
<https://doi.org/10.1103/PhysRevB.100.245141>
  26. W. Liu, R. Cong, A. P. Reyes, I. R. Fisher, and V. F. Mitrović, “Nature of Lattice Distortions in Double-Perovskite  $\text{Ba}_2\text{NaOsO}_6$ ”, **Phys. Rev. B**, **97**, 224103 (14 pp) (2018).
  27. “Quantum Sensing for High Energy Physics”, (38 pp) **arXiv:1803.11306** (2018).

28. W. Liu, R. Cong, E. Garcia, A. P. Reyes, H.O. Lee, I. R. Fisher, and V. F. Mitrović, “Phase Diagram of  $\text{Ba}_2\text{NaOsO}_6$ , a Mott insulator with strong spin orbit interactions”, **Physica B: Condensed Matter**, **536**, 863-866 (2018).
29. W. Liu, L. Lu, and V. F. Mitrović, “Application of surface coil in nuclear magnetic resonance studies of physical properties of quasi-2D materials”, **Review of Scientific Instruments**, **88**, 113902 (2017).  
<https://doi.org/10.1063/1.4986047>
30. L. Lu, M. Song, W. Liu, A. P. Reyes, P. Kuhns, H. O. Lee, I. R. Fisher, and V. F. Mitrović, “Novel Magnetism and Local Symmetry Breaking in a Mott Insulator with Strong Spin-Orbit Interactions”, **Nature Communications**, **8**, 14407 (26 pp) (2017).  
<https://doi.org/10.1038/ncomms14407>.
31. H. Mayaffre, S. Krämer, M. Horvatić, C. Berthier, K. Miyagawa, K. Kanoda and V. F. Mitrović, “Evidence of Andreev bound states as a hallmark of the FFLO phase in  $\kappa\text{-(BEDT-TTF)}_2\text{Cu(NCS)}_2$ ”, **Nature Physics**, **10**, 928 (21 pp) (2014).
32. M.-A. Vachon, G. Koutroulakis, V. F. Mitrović, Ookie Ma, J. B. Marston, A. P. Reyes, P. Kuhns, R. Coldea, and Z. Tylczynski, “Nature of the low energy excitations in the short range ordered phase of  $\text{Cs}_2\text{CuCl}_4$  as revealed by  $^{133}\text{Cs}$  NMR”, **New J. Phys.** **13**, 093029 (13 pp) (2011). (IOP-Select Article)
33. Arnaud Comment, Hadrien Mayaffre, Vesna Mitrović, Mladen Horvatić, and Claude Berthier, Béatrice Grenier, Patrice Millet, “NMR and NQR study of the tetrahedral frustrated quantum spin system  $\text{Cu}_2\text{Te}_2\text{O}_5\text{Br}_2$  in its paramagnetic phase”, **Phys. Rev. B** **82**, 214416 (7 pp) (2010).
34. G. Koutroulakis, M. D. Stewart, V. F. Mitrović, M. Horvatić, C. Berthier, G. Lapertot, J. Flouquet, “Field Evolution of Coexisting Superconducting and Magnetic Orders in  $\text{CeCoIn}_5$ ”, **Phys. Rev. Lett.** **104**, 087001 (4 pp) (2010).
35. M.D. Stewart Jr., G. Koutroulakis, N. Kalechofsky, V. F. Mitrović, “A reusable, low-profile, cryogenic wire seal”, **Cryogenics** **50**, 50 (2 pp) (2010).
36. Rongwei Hu, V. F. Mitrović, and C. Petrovic, “Magnetism and metal-insulator transition in  $\text{Fe}(\text{Sb}_{1-x}\text{Te}_x)_2$ ”, **Phys. Rev. B** **79**, 064510 (5 pp) (2009).
37. G. Koutroulakis, V. F. Mitrović, M. Horvatić, C. Berthier, G. Lapertot, J. Flouquet, “Field Dependence of the Ground State in the Exotic Superconductor  $\text{CeCoIn}_5$ : a Nuclear Magnetic Resonance Investigation”, **Phys. Rev. Lett.** **101**, 047004 (2008).
38. M.-A. Vachon, G. Koutroulakis, V. F. Mitrović, R. Coldea, and Z. Tylczynski, “Anisotropic Transferred Hyperfine Interactions in  $\text{Cs}_2\text{CuCl}_4$ ”, **J. Phys.: Condens. Matter**, **20**, 295225 (2008).
39. V. F. Mitrović, G. Koutroulakis, M. Klanjšek, M. Horvatić, C. Berthier, G. Knebel, G. Lapertot, J. Flouquet, Comment on “Texture in the Superconducting Order Parameter of  $\text{CeCoIn}_5$  Revealed by Nuclear Magnetic Resonance”, **Phys. Rev. Lett.** **101**, 039701 (2008).
40. V. F. Mitrović, C. de Vaulx, M. Horvatić, C. Berthier, T. Suzuki, K. Yamada, M.-H Julien, “Similar glassy features in the  $^{139}\text{La}$  NMR response of pure and disordered  $\text{La}_{1.88}\text{Sr}_{0.12}\text{CuO}_4$ ”, **Phys. Rev. B** **78**, 014504 (2008).

41. Rongwei Hu, V. F. Mitrović, and C. Petrovic, “Giant Carrier Mobility in Single Crystals of FeSb<sub>2</sub>”, **Appl. Phys. Lett.** **92**, 182108 (2008).
42. Rongwei Hu, Y. Lee, J. Hudis, V. F. Mitrović, and C. Petrovic, “Composition and field-tuned magnetism and superconductivity in Nd<sub>1-x</sub>Ce<sub>x</sub>CoIn<sub>5</sub>”, **Phys. Rev. B** **77**, 165129 (2008).
43. Rongwei Hu, K. J. Thomas, Y. Lee, T. Vogt, E. S. Choi, V. F. Mitrović, R. P. Hermann, F. Grandjean, P. C. Canfield, J. W. Kim, A. I. Goldman, and C. Petrovic, “Colossal Positive Magnetoresistance in a Doped Nearly Magnetic Semiconductor”, **Phys. Rev. B** **77**, 085212 (2008).
44. V. F. Mitrović, G. Koutroulakis, M. -A. Vachon, M. Horvatić, C. Berthier, G. Knebel, G. Lapertot, J. Flouquet, “Phase Diagram of CeCoIn<sub>5</sub> in the Vicinity of  $H_{c2}$  as Determined by NMR”, **Physica B**, **403**, 986 (2008).
45. Rongwei Hu, R. P. Hermann, F. Grandjean, Y. Lee, J. B. Warren, V. F. Mitrović, and C. Petrovic, “Weak ferromagnetism in Fe<sub>1-x</sub>Co<sub>x</sub>Sb<sub>2</sub>”, **Phys. Rev. B** **76**, 224422 (2007).
46. V. F. Mitrović, M. Horvatić, C. Berthier, M. Shayegan, “NMR Study of Large Skyrmions in Al<sub>0.13</sub>Ga<sub>0.87</sub>As Quantum Wells”, **Phys. Rev. B** **76**, 115335 (2007).
47. Rongwei Hu, V. F. Mitrović, and C. Petrović, “Anisotropy in magnetic and transport properties of Fe<sub>1-x</sub>Cr<sub>x</sub>Sb<sub>2</sub>”, **Phys. Rev. B** **76**, 115105 (2007).  
<https://doi.org/10.1103/PhysRevB.76.115105>
48. N. D. Daniilidis, I. K. Dimitrov, V. F. Mitrović, C. Elbaum, and X. S. Ling, “Magnetocaloric studies of the peak effect in Nb”, **Phys. Rev. B** **75**, 174519 (2007).
49. Rongwei Hu, K. Lauritch-Kullas, J. O’Brian, V. F. Mitrović, and C. Petrovic, “Anisotropy of Electrical Transport and Superconductivity in Metal Chains of Nb<sub>2</sub>Se<sub>3</sub>”, **Phys. Rev. B** **75**, 064517 (2007).
50. Bo Chen, W. P. Halperin, Prasenjit Guptasarma, D. G. Hinks, V. F. Mitrović, A. P. Reyes, P. Kuhns, “Two-dimensional Vortices in Superconductors”, **Nature Physics** **3**, 239 (2007).
51. A. Perucchi, L. Digiorgi, R. Hu, C. Petrović, V. F. Mitrović, “Optical investigation of the metal-insulator transition in FeSb<sub>2</sub>”, **Euro. Phys. J. B** **54**, 175 (2006).
52. V. F. Mitrović, M. Horvatić, C. Berthier, G. Knebel, G. Lapertot, J. Flouquet, “Observation of Spin Susceptibility Enhancement in the Possible Fulde-Ferrell-Larkin-Ovchinnikov State of CeCoIn<sub>5</sub>”, **Phys. Rev. Lett.** **97**, 117002 (2006).
53. Rongwei Hu, V. F. Mitrović, and C. Petrović, “Anisotropy in magnetic and transport properties of Fe<sub>1-x</sub>Co<sub>x</sub>Sb<sub>2</sub>”, **Phys. Rev. B** **74**, 195130 (2006).
54. Bo Chen, Pratim Sengupta, W. P. Halperin, E. E. Sigmund, V. F. Mitrović, M. H. Lee, K. H. Lee, C. Y. Kwak, J. S. Rhee, C. A. Kim, B. K. Cho, “Anisotropy and Penetration Depth of MgB<sub>2</sub> from <sup>11</sup>B NMR”, **New J. Phys.** **8** 274 (2006).
55. M.-A. Vachon, W. Kundhikanjana, A. Straub, and V. F. Mitrović; A.P. Reyes, P. Kuhns, R.Coldea, Z. Tylczynski, “<sup>133</sup>Cs NMR investigation of 2D frustrated Heisenberg antiferromagnet, Cs<sub>2</sub>CuCl<sub>4</sub>”, **New J. Phys.** **8**, 222 (2006).

56. J. Hudis, R. Hu, C. L. Broholm, V. F. Mitrović, C. Petrovic, “Magnetic and transport properties of  $\text{RCoIn}_5$  ( $\text{R} = \text{Pr}, \text{Nd}$ ) and  $\text{RCoGa}_5$  ( $\text{T} = \text{Tb-Tm}$ )”, **J. Mag. & Mag. Mat.** **307**, 301-307 (2006).
57. V. F. Mitrović, E. E. Sigmund, W. P. Halperin, “NMR Lineshape in the Vortex Lattice State of Near-Optimally Doped  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ ”, Proceedings of LT23, **Physica C** **388-389**, 629 (2003).
58. V. F. Mitrović, E. E. Sigmund, W. P. Halperin, A. P. Reyes, P. Kuhns, W. G. Moulton, “Antiferromagnetism in the Vortex Cores of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ ”, **Phys. Rev. B** **67**, 220503(R) (2003).
59. E. E. Sigmund, V. F. Mitrović, E. S. Calder, G. W. Thomas, H. N. Bachman, W. P. Halperin, P. Kuhns, A. P. Reyes, “Inductive Shielding of NMR Phase Noise”, **J. Mag. Res.** **159**, 190 (2002).
60. G. W. Thomas, H. N. Bachman, E. E. Sigmund, V. F. Mitrović, E. S. Calder, W. P. Halperin, “Polar Signal Averaging”, **Conc. Magn. Reson.** **14**, 359 (2002).
61. V. F. Mitrović, H. N. Bachman, W. P. Halperin, A. P. Reyes, P. Kuhns, W. G. Moulton, “The Pseudogap in  $\text{YBa}_2\text{Cu}_3\text{O}_7$  Tested by NMR in High Magnetic Fields”, **Phys. Rev. B** **66**, 014511 (2002).
62. V. F. Mitrović, E. E. Sigmund, M. Eschrig, H. N. Bachman, W. P. Halperin, A. P. Reyes, P. Kuhns, W. G. Moulton, “Spatially resolved electronic structure inside and outside the vortex cores of a high-temperature superconductor”, **Nature** **413**, 501 (2001).
63. V. F. Mitrović, E. E. Sigmund, W. P. Halperin, “Progressive Saturation NMR Relaxation”, **Phys. Rev. B** **64**, 024520-1 (2001).
64. E. E. Sigmund, E. S. Calder, G. W. Thomas, V. F. Mitrović, H. N. Bachman, W. P. Halperin, A. P. Reyes, P. Kuhns, “NMR Phase Noise in Bitter Magnets”, **J. Mag. Res.** **148(2)**, 309 (2001).
65. V. F. Mitrović, H. N. Bachman, A. P. Reyes, W. P. Halperin, M. Eschrig, J. A. Sauls, P. Kuhns, W. G. Moulton, “Superconducting Fluctuation Effects on the Spin Lattice Relaxation Rate in  $\text{YBa}_2\text{Cu}_3\text{O}_7$ ”, **Phys. Rev. Lett.** **82**, 2784 (1999).
66. H. N. Bachman, V. F. Mitrović, A. P. Reyes, W. P. Halperin, M. Eschrig, J. A. Sauls, A. Kleinhammes, P. Kuhns, W. G. Moulton, “Superconducting Fluctuation Effects on the Electron Spin Susceptibility in  $\text{YBa}_2\text{Cu}_3\text{O}_7$ ”, **Phys. Rev. B** **60**, 7591 (1999).
67. H. N. Bachman, A. P. Reyes, V. F. Mitrović, W. P. Halperin, A. Kleinhammes, P. Kuhns, W. G. Moulton, “High Field Vortex Dynamics from  $^{17}\text{O}$  nuclear magnetic resonance”, **Phys. Rev. Lett.** **80**, 1726 (1998).
68. P. Bandyopadhyay, B. Boyanov, V. Mitrović, G. Bunker, “Numerical Simulation of Flux Density Spectra for Tapered Undulators”, **Rev. Sci. Inst.** **66** (2), 1854 (1995).

**b. Patent Disclosures:**

Tech ID: 3507 – Title: *A novel design to perform topological quantum computations* – PIs: Dmitri Feldman & Vesna Mitrović, April, 2025

Tech ID: 3473 – Title: *A novel methodology to decouple quantum systems from the thermal noise at ambient conditions enabling quantum information processing (QIP) in biological matter at room temperature* –

PI: Vesna Mitrović, November, 2024

Tech ID: 3472 – Title: *A novel methodology to unveil quantum entanglement in biological matter at ambient conditions* –

PI: Vesna Mitrović, November, 2024

Tech ID: 3413 – Title: *A novel fundamental quantum probe of spin state* –

PI: Vesna Mitrović, April, 2024

Tech ID: 3415 – Title: *A novel protocol to reveal quantum entanglement in biomolecules at physiological conditions* –

PI: Vesna Mitrović, April, 2024

### c. Selected Press Releases:

“Researchers find unexpected roadblock to conductivity in Mott insulators” - Physics Org. May. 2024

“Researchers detail never-before-seen properties in a family of superconducting Kagome metals” - Physics Org. Feb. 2023

“A new strategy for detecting non-conformist particles called anyons” - Physics Org. Oct. 2021

“New strategy for detecting non-conformist particles called anyons” - ScienceDaily Oct. 2021

“New Method to Probe Anyons Property Could be Useful in Future Quantum Computers” - AZO Quantum, 2021

“NMR confirms strong spin orbit interactions drive magnetic quantum phase transition” - <https://www.cambridge.org/core/journals/mrs-bulletin/news/nmr-confirms-strong-spin-orbit-interactions-drive-magnetic-quantum-phase-transition>  
MRS Bulletin (Quantum Materials), March 17, 2017

“Research reveals novel quantum state in strange insulating materials” - Nanotechnology Now

“Research reveals novel quantum state in strange insulating materials” - Phys.org

“New study explains magnetic attraction of Mott insulators” - Materials Today

“Superconductor finally goes with the FFLO” - IOP Physics World 2015

“Un nuovo stato per la superconduzione” - Le Scienze

“Kompromissbereite Superleitung” - Physik Journal 14 Nr 3, 31 (2015)

“Brown team observes Andreev bound states in FFLO phase” -Superconductor Week, November 30, Vol. 28, No. 11, pg. 11 (2014)

<https://news.brown.edu/articles/2014/10/superconductivity>

NSF News: [http://www.nsf.gov/news/news\\_summ.jsp?cntn\\_id=116548](http://www.nsf.gov/news/news_summ.jsp?cntn_id=116548)

“Physics Synopsis: Unlikely partners” -

<http://physics.aps.org/synopsis-for/10.1103/PhysRevLett.104.087001>

## 6. PRESENTATIONS:

### a. Invited Lectures:

“What electronic configurations are possible in materials?”, AI Winter Workshop, Brown University, Providence, RI. (January, 2024).

“Probing quantum materials to obtain unprecedented views of matter”, distinguished lecture at the MANO second semester SPRING Workshop, University of Bologna, Bologna, Italy (May, 2023).

“Sensing at the Quantum Limit using spin squeezing and multi-modal microwave techniques”, Invited lecture at the 4<sup>th</sup> annual International Summer School on **QUANTUM SENSING, INFORMATION PROCESSING AND COMPUTING: shaping the future with the second quantum revolution**, University of Bologna, Bologna, Italy (July, 2022).

“Magnetic Resonance Techniques”, Invited lecture at 5<sup>th</sup> annual **Fundamentals of Quantum Materials Summer School** co-sponsored by the Gordon and Betty Moore Foundation’s EPiQS Program, the Institute of Complex and Advanced Matter and the NSF, University of Maryland, College Park, MD (Jun 2022).

“Exotic Magnetic Field Measurements & Effects”, guest lecture at University of New Hampshire - Solid State Physics Class, virtual (May 2021).

“Lecture on Qubits, quantum measurements, & gates”, 2020 Quantum Winter School: An Introduction to Quantum Computing and Materials, virtual. (December 2020).

“Lecture on Quantum Sensing”, International Summer School on Physical Sensing, Processing and Computation, Bologna, Italy (July, 2019).

“NMR in Superconductors”, Aspen Summer Workshop on Quantum Vortices and Fluctuations in Superconductors and Superfluids, Aspen, CO (July, 2009).

Series of two advanced graduate level lectures on “Spin Resonance Spectroscopies Applied to Condensed Matter Physics” were given at The Boulder Summer School for Condensed Matter and Materials Physics - “*Strongly Correlated Materials*”, Boulder, CO (June 2008).

“NMR in Unconventional Superconductors” - Northwestern University, Evanston, IL (May 2008).

### b. Invited Conference Talks:

1. “Novel glimpse into ground states of spin-orbit entangled quantum matter”, International Workshop on Spin-Orbit Driven Phenomena in Quantum Matter, University of Bologna, Bologna, Italy (January 2026).

2. “Probing Ground State Wavefunction Evolution through Magnetic Phase Transition in Layered van der Waals Material”, Advances in Quantum Magnetism and Superconductivity, University of Parma, Parma Italy (January 2026).  
(Plenary Speaker with Roberto De Renzi-University of Parma; Stephen J. Blundell-University of Oxford; Bernd Büchner-IFW Dresden and Dresden University of Technology; & Pietro Carretta-University of Pavia)
3. Workshop on the Physics in Kagome Lattice Materials, the Kavli Institute for Theoretical Sciences (KITS), Chinese Academy of Sciences in Beijing, China (October 25).  
(*invitation declined*)
4. Global Summit on Graphene Technology, 2D & 3D Materials, *Graphene & Beyond: Unlocking the Future of 2D & 3D Materials*, Bangkok, Thailand (March 26). (*invitation declined*)
5. “How orbital glass conceals missing magnetic entropy in a relativistic Mott insulator”, **30<sup>th</sup> International Conference on LOW TEMPERATURE PHYSICS - LT30**, Bilbao, Spain (August 2025).
6. “How orbital glass conceals missing magnetic entropy in a relativistic Mott insulator”, *Spin-Orbit Entangled Quantum Matter* workshop, **FisMat2025** - Annual Meeting of the Italian Physical Society, Ca’Foscari University - Campus San Giobbe, Venice, Italy (July 2025).
7. “Novel probes of ground states of complex quantum materials”, **5<sup>th</sup> Solid-State Science & Research (SCIRES)** - Department of Chemistry of the Faculty of Science, Zagreb, Croatia (July 2025).
8. “Microscopic nature of the charge density wave in kagome metals”, **WE-Heraeus-Seminar - Electronic Order in Kagome Metals**, Hamburg, Germany (December 2024).
9. “What drives emergent magnetic order in a correlated insulator”, **International Conference on Magnetism - Frustrated, disordered and quantum magnetic phases**, Bologna, Italy (July 2024).
10. “NMR Studies of Multipolar Osmates”, **APS March Meeting 2024 - Ordering Phenomena in Spin-Orbit Coupled Systems - Focus Session Invited Talk**, Minneapolis (March 2024).
11. “New methods for probing electronic correlations and spin-susceptibility anisotropy in nuclear magnetic resonance”, **Magnetic Resonance of Correlated Electron Materials 2023**, Institute for Solid State Research, IFW, Dresden Germany (September 2023).
12. “Probing and Utilizing Topological Materials”, **The Center for Integrated Nanotechnologies (CINT) Sandia Labs Annual User Meeting** (September 2022).
13. “Multi-modal NMR spectroscopy of phase transitions in quantum materials”, **29<sup>th</sup> International Conference on LOW TEMPERATURE PHYSICS - LT29**, Sapporo, Japan (August 2022).
14. “Probing quantum orders in relativistic-quantum materials”, **Gordon Research Con-**

- ference on Correlated Electrons, Mount Holyoke College, MA (June 2022).
15. 2nd Global Summit on Condensed Matter Physics (CONMAT2022), Dubai, UAE (October 2022) - participation declined.
  16. “Materials with spin orbit coupling”, “**Global Summit and Expo on Magnetism and Magnetic Materials (GSEMMM2022)**”, Copenhagen, Denmark. (June 2022) - participation declined.
  17. “Materials with spin orbit coupling”, “**Global Experts conference on Materials Science and Engineering**”, Rome, Italy. (June 2022) - participation declined.
  18. “Harnessing the data revolution for the quantum leap: From quantum control to quantum materials”, RII Track-2 Symposium: Best Practices, Lessons Learned, and Tips for Success, the **2021 Annual EPSCoR PI Meeting, NSF** - virtual (May 2021).
  19. “Materials with spin orbit coupling”, “**Global Virtual Summit on Materials Science & Engineering - Materials Summit 2020 - Materials Science for better future**”, England (August 2020) - participation declined.
  20. “Phase diagram of  $\text{Ba}_2\text{NaOsO}_6$ , a Mott insulator with strong spin orbit interactions”, “**9th International Conference on Advanced Materials and Engineering Materials (ICAMEM2020)**”, Bangkok, Thailand (July 2020) - participation declined.
  21. “Spin-orbit coupled systems”, “**Theoretical developments and experimental progresses in quantum matter - emergent phenomena**”, Tsung-Dao Lee Institute on the campus of Shanghai Jiao Tong University, Shanghai, China (August 2020) - participation declined.
  22. “Magnetism in Dirac-Mott Insulators”, “**Electronic, Magnetic & Optical Materials**” - **European Advanced Materials Congress**, Stockholm Sweden (August 2020) - participation declined.
  23. **World Nanotech Summit 2020**, Houston, Texas, USA (April 2020) - participation declined.
  24. “Novel magnetism and local symmetry breaking in a Mott insulator with strong spin orbit interactions”, **International Conference on Crystallography and Structural Chemistry - Crystallography 2020**, Barcelona, Spain (April 2020) - participation declined.
  25. “Magnetism in Dirac-Mott Insulators”, **SPICE (“Novel Electronic and Magnetic Phases in Correlated Spin-Orbit Coupled Oxides”)** Workshop, Johannes Gutenberg University of Mainz, Mainz, Germany (November 2019).
  26. “Quantum Sensing”, **5th EMN Meeting on Quantum**, Barcelona, Spain (August 2019) - participation declined.
  27. “Probing complex magnetic and orbital phases”, **The 60th Experimental NMR Conference (ENC) - Emerging Science Session**, Asilomar, CA (April 2019).
  28. “Probing complex magnetic and orbital orders”, **International Conference on Materials Science: Revolutionizing the New Horizon in Materials Science and**

- Graphene Research**, Dubai, UAE (April 2018) - participation declined.
29. “Novel magnetism and local symmetry breaking in a Mott insulator with strong spin orbit interactions”, **2<sup>nd</sup> International Conference on Applied Crystallography**, Chicago, IL (October 2017).
  30. “Novel magnetism and orbital ordering in materials with strong spin orbit interaction”, **International Conference on Material Science**, Rome, Italy (October 2017) - participation declined.
  31. “Quantum Magnetism”, **Quantum Physics 2017**, Berlin, Germany, (September 2017) - participation declined.
  32. “Evidence of Andreev bound states as a hallmark of the FFLO state”, **Multicomponent and Strongly Correlated Superconductivity**, Nordita, Stockholm, Sweden, (August 2017) - participation declined.
  33. “Novel magnetism and local symmetry breaking in a Mott insulator with strong spin orbit interactions”, **International Conference on Strongly Correlated Electron Systems, SCES’17**, Prague, Czech Republic, (July 2017).
  34. “Andreev bound states - a hallmark of the FFLO phase in a superconductor”, **11<sup>th</sup> International Conference on New Theories, Discoveries, Applications of Superconductors and Related Materials**, Bled, Slovenia (September 2016) - participation declined.
  35. “High field phases in Pauli-limited superconductors”, **Workshop “Interference of Magnetism and Superconductivity”**, the International Institute of Physics - UFRN, Natal, Brazil (August/September 2016) - participation declined.
  36. “Andreev bound states - a hallmark of the FFLO phase in a superconductor”, **Conductivity and Magnetism in Molecular Materials Gordon Research Conference**, Mount Holyoke College, Massachusetts (August 2016) - participation declined.
  37. “Andreev bound states - a hallmark of the FFLO phase in a superconductor”, **FFLO-Phase in Quantum Liquids, Quantum Gases, and Nuclear Matter**, Dresden, Germany, (June 2016).
  38. “High Field Phases in a Pauli-limited Organic Superconductor”, **Spectroscopies in Novel Superconductors**, Stuttgart (Ludwigsburg), Germany, (June 2016).
  39. “Using magnetic fields to decipher novel quantum states and manipulate spin in presence of strong spin-orbit coupling”, **The 7<sup>th</sup> International Workshop on Materials Analysis and Processing in Magnetic Fields**, MAP7, Providence, RI, (June 2016).
  40. “Quantum magnetism and superconductivity”, **Quantum Science Symposium**, Cambridge, MA, (September 2015).
  41. “Andreev bound states in an organic superconductor”, **QFS2015: International Symposium on Quantum Fluids and Solids**, Niagara Falls, NY, (August 2015).
  42. “Evidence of Andreev bound states as a hallmark of the FFLO phase in an organic superconductor”, **11<sup>th</sup> International Conference on Research in High Magnetic**

- Fields, Grenoble, France, (July 2015).
43. “NMR as a probe of competing orders in frustrated systems”, **Emerging Frontiers in Experimental Condensed Matter Physics of Strongly Correlated Electron Systems**, NSF, Arlington, VA, (May 2015).  
“Resonance techniques for probing element-specific material properties, diffusion, and low frequency dynamics with in-situ variation of extrinsic parameter”, **NUWC-visit Workshop**, Providence, RI (May 2015).
  44. “NMR techniques for study of physical properties of reduced dimensionality and nano-scale materials”, **4<sup>th</sup> International Conference on Nanotechnology**, San Francisco, CA, (December 2014).
  45. “Evidence of spin-polarized Andreev bound states as a hallmark of the modulated superconducting phase”, **The International Conference on Strongly Correlated Electron Systems (SCES’14)**, Grenoble, France, (July 2014).
  46. “Prospectives on Probing Low Energy Excitations in 2D Short Range Ordered (Spin-Liquid) Phases”, **Taishan Forum** (special Chinese government award), Shandong University, Jinan, China (December 2013).
  47. “Probing Unconventional Superconductivity with Magnetic Fields”, **9<sup>th</sup> International Conference on New Theories, Discoveries and Applications of Superconductors and Related Materials**, Frascati-Rome, Italy, (September 2012).
  48. “Field Induced Exotic Superconductivity and Spin Density Waves”, **“GREEN” Heavy Fermion Focus Day**, Grenoble, France, (January 2012).
  49. “Probing Unconventional Superconductivity with Magnetic Fields” - **18<sup>th</sup> Symposium on Condensed Matter Physics - SFKM 2011**, Belgrade, Serbia, (April 2011) - participation declined.
  50. “Nature of low energy excitations and spin texture in a frustrated magnet”, **The New Frontiers in High Field Condensed Matter NMR**, Tallahassee, FL, (October 2011).
  51. “Probing Magnetic Field Induced Exotic Superconducting States”, **Physical Phenomena at High Magnetic Fields - VII**, Tallahassee, FL, (December 2010).
  52. “NMR in exotic superconducting phases”, **SENSE (Superconductivity Explored by Neutron Scattering Experiments) 2010**, Grenoble, France, (October 2010).
  53. “Exotic Magnetic Field Induced Superconducting States”, **Recent Advances in Broad-Band Solid-State NMR of Correlated Electronic Systems**, Trogir, Croatia, (September 2010).
  54. “Exotic superconducting phases”, **International Workshop “On the Heavy Fermion Road”**, Paris, France, (August 2010).
  55. “Exotic Field Induced Superconducting States”, **Third Annual Greater Boston Area Quantum Matter Meeting**, Boston, MA, (April 2010).

56. “NMR in Superconductors”, **Aspen Summer Workshop on Quantum Vortices and Fluctuations in Superconductors and Superfluids**, Aspen, CO, U.S.A., (July 2009).
57. “Spin Susceptibility in the FFLO Phase in CeCoIn<sub>5</sub>”, **International Conference on Strongly Correlated Electron Systems (SCES’07)**, Houston, TX, U.S.A., (May 2007).
58. “Magnetism and Superconductivity in LSCO - Inhomogeneous Spin Dynamics”, **NMR/EPR of Correlated Electron Superconductors**, Dresden, Germany, (October 2005).
59. “High Magnetic Field NMR Microscopy of Vortices in High-T<sub>c</sub> Superconductors”, **Physical Phenomena at High Magnetic Fields - V**, Tallahassee, FL, U.S.A., (August 2005).
60. “Coexistence of Antiferromagnetic Fluctuations and Superconductivity in the Vortex State of HTS”, **Physics of Oxydes - GDR reunion**, Paris, France, (November 2002).  
“The Pseudogap in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-δ</sub> from NMR in High Magnetic Fields”,
61. “**6<sup>th</sup> Franco-American workshop on functional oxides**”, Caen, France, (September 2002).
62. “High Magnetic Field NMR Microscopy of Vortices in High-T<sub>c</sub> Superconductors”, **LT23**, Hiroshima, Japan, (August 2002).
63. “High Magnetic Field NMR Microscopy of Vortices in High-T<sub>c</sub> Superconductors”, **JMC8**, Marseille, France, (August 2002).
64. “High Magnetic Field NMR Microscopy of Vortices in High-T<sub>c</sub> Superconductors”, “**5<sup>th</sup> Franco-American workshop on functional oxides**”, Evanston, IL, U.S.A., (June 2001).

### c. Invited Seminars and Colloquia:

1. “Sensing changes in quantum mechanical wave-function through a magnetic phase transition”, SPICE - INSPIRE Seminar, Institut für Physik Johannes Gutenberg Universität, Mainz, Germany (November 2025).
2. “Novel glimpse into ground states of quantum matter”, Physics Department, Syracuse University, Syracuse, N.Y. (October 2025). (Department Colloquium)
3. “Creating & Manipulating Entanglement in Bio Molecules at Ambient Conditions”, Brown Interdisciplinary Quantum Seminar, Brown University, Providence, RI (April 2025).
4. “Novel view of magnetism and topological matter”, Purdue University, West Lafayette, IN (November 2024).
5. “NMR as an effective probe of *hidden order*”, the Leipzig Spin Resonance Colloquium, Institute for Theoretical Physics, University of Leipzig, Germany (June 2024). (Department Colloquium)

6. “Unveiling Quantum Entanglement: Neurotransmitter in Physiological Conditions”, The Big Quantum Bio Meetings - online colloquium (May 2024).
7. “Novel view of quantum matter”, Brown University, Providence, RI (October 2023). (Department Colloquium)
8. “Novel probes of emergent quantum orders”, Laboratoire National des Champs Magnétiques Intenses, LNCMI /CNRS, Grenoble, France (July 2023).
9. “Detecting Emergent Quantum Orders with Symmetry Tailored Resonance Spectroscopy”, University of Bologna, Bologna Italy (May 2023).
10. “Multi-modal NMR spectroscopy of phase transitions in quantum materials”, University of Connecticut, Storrs, CT (November 2022).
11. “Probing Emergent Quantum Orders”, Amherst College, Amherst, MA (October 2021). (Department Colloquium)
12. “Relativistic-Quantum Magnets”, University of Tennessee, Knoxville, TN (November 2020). (Department Colloquium)
13. “Lecture on Quantum Sensing”, International summer school - University of Bologna, Brown, Columbia - on **Physical sensing, processing and computation**, Bologna, Italy (June 2019).
14. “Quantum Magnetism in Relativistic Osmates”, University of Delaware, Newark, DE (May 2019).
15. “Magnetism in relativistic-quantum materials”, Washington University, St. Louis, MO (April 2018). (Chemistry Department Colloquium)
16. “Magnetism in relativistic-quantum materials”, Argonne National Laboratory, Argonne, IL (March 2018). (High Energy Physics Special Seminar)
17. “NMR techniques for study of physical properties of reduced dimensionality and nano-scale materials”, Department of Electrical and Computer Engineering, McGill University, Montreal, QC, Canada (March 2018). (seminar for - IEEE Women in Engineering (WIE) Montreal Section with Women in Engineering (WIE) McGill Branch)
18. “Magnetism in relativistic-quantum materials”, Brown University, Providence, RI (September 2017). (Department Colloquium)
19. “Novel magnetism and local symmetry breaking in a Mott insulator with strong spin orbit interactions”, Northwestern University, Evanston, IL (May 2017).
20. “Novel Quantum States and Spin-Manipulation in Presence of Strong Spin-Orbit Coupling” Dartmouth College, Hanover, NH (April 2016).
21. “Superconductivity and Magnetic Fields”, Smith College, Northampton, MA (September 2015). (Department Colloquium)

22. “Modulated Superconductivity”, Massachusetts Institute of Technology (MIT), Cambridge, MA (March 2015).
23. “Modulated Superconductivity”, Rutgers University, Piscataway, NJ (February 2015).
24. “Modulated Superconductivity”, Ohio State University, Columbus, OH (January 2015).
25. “Coexistence of Superconductivity and Ferromagnetism - Plausible?”, University of Massachusetts, Amherst, MA (November 2014).
26. “Evidence of Andreev Bound States as a Hallmark of the Inhomogeneous Superconducting Phase”, ETH, Zürich, Switzerland (July 2013).
27. “Probing Unconventional Superconductivity and Magnetic Field Induced Magnetism by NMR”, Paul Scherrer Institute (PSI), Villigen, Switzerland (July 2013).
28. “Exotic Superconductivity”, Northwestern University, Evanston, IL (October 2011).
29. “Exotic Superconductivity”, Dartmouth College, Hanover, NH (April 2011). (Department Colloquium)
30. “Exotic Superconductivity”, University of Houston, Houston, TX (April 2011). (Department Colloquium)
31. “Exotic Superconductivity”, University of Waterloo, Waterloo, ON, Canada (March 2011). (Department Colloquium)
32. “Exotic Magnetic Field Induced Superconducting Phases”, University of Vermont, Burlington, VT (February 2010). (Department Colloquium)
33. “Exotic Superconducting Phases”, Iowa State University, Ames, IA (March 2009). (Department Colloquium)
34. “Response of Unconventional Superconductivity to a Magnetic Field”, Università di Salerno, Baronissi (SA), Italy, (November 2008).
35. “Response of Unconventional Superconductivity to a Magnetic Field”, Boston College, Chestnut Hill, MA, (April 2008). (Department Colloquium)
36. “Response of Unconventional Superconductivity to a Magnetic Field”, LANL, Los Alamos, NM, (February 2008).
37. “Inhomogeneous Superconductivity”, MIT, Boston, MA, (December 2007).
38. “Inhomogeneous Superconductivity”, Johns Hopkins University, Baltimore, MD, (September 2007).
39. “Inhomogeneous Superconductivity”, Brown University, Providence, RI, (April 2007).
40. “Spatially Inhomogeneous Properties of Unconventional Superconductors as Probed by NMR”, Boston College, Chestnut Hill, MA, (February 2007).

41. “Frustrated Quantum Magnets”, Clark University, Worcester, MA, (November 2005). (Department Colloquium)
42. “Field Induced Spin Density Wave in Quasi-1D Organic Conductors”, University of Florida, Gainesville, FL, (April 2005).
43. “NMR Studies of the Quasi-1D Conductors”, NHMFL, Tallahassee, FL, (November 2004).
44. “Vortices in High Temperature Superconductors - An NMR Point of View”, University of Notre Dame, Notre Dame, IN, (April 2004). (Department Colloquium)
45. “Coexistence of Antiferromagnetic Fluctuations and Superconductivity in the Vortex State of High Temperature Superconductors”, Brookhaven National Laboratory, Upton, NY, (February 2004).
46. “Probing the Interactions between Composite Fermions by NMR”, Università degli studi di Pavia, Dipartimento di Fisica “A. Volta”, Pavia, Italy, (February 2003).
47. “Probing Antiferromagnetic Fluctuations and Low Energy Quasiparticle Excitations in the Vortex Lattice State of HTS by NMR”, Université Paris XI, Orsay, France, (October 2002).
48. “Antiferromagnetic Fluctuations in the Vortex Core Probed by NMR”, ESPCI, Paris, France, (March 2002).
49. “Probing Low Energy Quasiparticle Excitations in the Vortex Lattice State of HTS by NMR”, NHMFL, Tallahassee, FL, (October 2001).

## 7. RESEARCH GRANTS:

### a. Current Grants:

DOE - Traineeship in High Energy Physics Instrumentation:  
“A Consortium for Training Students in High Energy Physics Instrumentation”  
(PIs: U. Heintz, V. F. Mitrović, & M. Narain) (Total Amount: \$2,000,000)  
(01/2022-12/2026).

### b. Completed Grants:

NSF - EPSCoR RII Track-2 FEC:  
“Harnessing the data revolution for the quantum leap: From quantum control to quantum materials”  
(PI) (Total Amount: \$4,588,854) (08/19-12/24).

NSF - DMR-CMP:  
“Magnetic Resonance Study of Novel Phases and Dynamics in Strongly Correlated Spin-Orbit Coupled Materials”  
(PI) (Total Amount: \$600,000) (08/19-06/24).

NSF - QII-TAQS:

“Spatially and temporally resolved ultrasensitive magnetic sensing of quantum spin liquids and topological insulators”

(coPI: V. F. Mitrović, PI: G. Xiao (Brown)) (Total Amount: \$ 2,000,000) (01/20-12/23).

Brown - Seed Funds:

“Reverse engineering the synaptic cleft - the search for quantum information processing in the brain”

(PI) (Total Amount: ~ \$ 90,000) (05/21-06/22).

DOE - Quantum Information Science Enabled Discovery (QuantISED) for High Energy Physics - with ORNL:

“Search for Bosonic Dark Matter Using Magnetic Tunnel Junction Arrays”

(PI) (Total Amount: \$ 342,000) (11/19-12/23).

NSF - Quantum Leap Challenge Institutes (QLCI):

“QLCI-CG: Identification and Control of Fundamental Properties of Quantum Systems”

(PI) (Total Amount: \$ 148,365) (01/20-01/21).

NSF - DMR-CMP:

“Nuclear Magnetic Resonance Study of Emergent Orders”

(PI) (Total Amount: \$ 450,000) (07/16-06/20).

Brown - Seed Funds:

“Development of on-site helium liquefaction for study of physical property of advanced materials and enabling novel applications”

(PI) (Total Amount: ~ \$ 50,000) (07/16-06/18).

Millikelvin Technologies Inc. (& BRUKER):

“Studies of Spin Relaxation Processes for Enhancement of MRI Sensitivity”

(PI) (Total Amount: ~ \$ 160,000)

NSF NHMFL - User Collaboration Grants Program

“Nuclear Magnetic Resonance Probe for *in-situ* Stress and Strain Variation”

(Co-PI with A. P. Reyas and P. L. Khuns),

(Total Amount: \$ 193,234.86), (01/15 - 12/17).

BROWN - IMNI (Institute for Molecular and Nanoscale Innovation) - Seed Funds:

“Giant Spin-orbit Coupling and Quantum Confinement in Functional and Enabling Nanoscale Structures”,

(PI), (Total Amount: \$ 40,000), (09/14 - 05/15).

NSF - MRI:

“Acquisition of a High Magnetic Field and Cryogen-Free Physical Property Measurement System”,

(Co-PI with Gang Xiao), (Total Amount: \$ 279,790), (09/12 - 02/14).

NSF ADVANCE Award,

“Development of an Electrochemical-solid state NMR (EC-ssNMR) Probe”,  
(PI), (Total Amount: \$ 50,000), (01/13 - 09/13).

NSF - CAREER:

“NMR Studies of Quantum Fluctuations in Strongly Correlated Systems in High  
Magnetic Fields and at Low Temperatures”,  
(PI), (Total Amount: \$ 500,000), (07/06 - 06/12).

NSF - Materials World Network:

“Microscopic Study of the Inhomogeneous Superconductivity”,  
(PI), (Total Amount: \$ 288,000), (07/07 - 06/11).

BROWN - NSF ADVANCE Award,

(PI), (Total Amount: \$ 15,000), (09/10 - 09/11).

NIH - SBIR phase I with Millikelvin Technologies -

“Manufacture and Supply of Hyperpolarized Chloroform for Use as an NMR Sol-  
vent”,  
(Collaborator/Subaward to Brown), (Total Amount: ~\$ 30,319), (09/09 - 08/10).

NIH - SBIR phase I with Millikelvin Technologies -

“Enabling Metabolic Imaging Using Hyperpolarized  $^{13}\text{C}$  Magnetic Resonance”,  
(Collaborator/Subaward to Brown), (Total Amount: ~\$ 33,819), (04/09 - 03/10).

BNL - DOE:

“Exploratory Material Synthesis Using High Temperature Fluxes”,  
(Co-PI with PI Cedomir Petrovic, funds support 1 graduate student from Brown  
University), (Total Amount: ~ \$120,000), (02/05 - 06/09).

BROWN - NSF ADVANCE Career Development Award,

(PI), (Total Amount: \$ 8,800), (09/08 - 09/07).

NSF - IMR:

“Acquisition of a High Magnetic Field Dilution Refrigerator System for Materials  
Research and Education”,  
(PI), (Total Amount: \$ 289,000), (07/05 - 12/07).

**c. Proposals Submitted (in last 3 years):**

MOORE Foundation - Small-scale experiments in fundamental physics - “Quan-  
tum Noise Interferometry for Axion and Gauge Field Detection” - (PI: V. F.  
Mitrović) - (January 2026).

DOE - Quantum Information Science in Chemical Science, GeoSciences, and  
Biosciences- “Probing Quantum Entanglement in Biological Systems under Phys-  
iological Conditions” - (PI: V. F. Mitrović) - (December 2025) (pre-proposal).

DOE - Quantum Information Science in Materials Science and Engineering - “Tar-  
geted Noise Control and Error Mitigation in Multi-Qubit Systems” - (PI: V. F.  
Mitrović) - (November 2025) (pre-proposal).

DOE - Experimental Condensed Matter Physics - “Optimal Quantum Control and Exploration of Topological Materials and Devices” - (PI: V. F. Mitrović) - (November 2025) (pre-proposal).

DOE - High Energy Physics (HEP): Quantum Information Science - “Quantum Noise Interferometry for Axion and Gauge Field Detection” - (PI: V. F. Mitrović) (Total Amount: \$ 800,000) - (November 2025) (pre-proposal).

W. M. Keck Foundation - “Probing Quantum Entanglement in Living Systems: Direct Measurements under Physiological Conditions” - (PI: V. F. Mitrović) (Total Amount: \$ 1,000,000) - (November 2025).

Brown-Seed - “New probe for topological devices” - (PI: A. Rosuel, co-PI: V. F. Mitrović) (Total Amount: \$ 75,000) - (November 2025).

Brown - Research Innovation Award - Phase II (Pre-proposal) - “Quantum gates in biological molecules in physiological conditions” - (PI: V. F. Mitrović) (Total Amount: \$ 200,000) - (November 2025).

NSF - OSI QL - “QLCI Preliminary Proposal: Institute for Complex Quantum Systems” - (PI: V. F. Mitrović) (Total Amount: \$ 38,394,390) - (March 2025).

W. M. Keck Foundation - “A phase-sensitive, symmetry-tailored probe of emergent quantum phases of matter” - (PI: V. F. Mitrović) (Total Amount: \$ 2,467,794) - (October 2024).

DOE - High Energy Physics (HEP): Quantum Information Science Enabled Discovery (QUANTISED 2.0) for HEP - “Quest for Dark Matter using Coherently Controlled Spin Dynamics in Quantum Matter” - (PI: V. F. Mitrović) (Total Amount: \$ 5,000,000) - (July 2024).

DOE - EFRC - “Non-Linear and Non-Reciprocal Quantum Transport for Energy Efficient Computing Material Platform” - (PI: V. F. Mitrović) (Total Amount: \$ 16,000,000) - Pre-Proposal (February 2024).

NSF - MRI - “Track 1 Acquisition of a highly sensitive SQUID magnetometer for Functional and Quantum Materials Research” - (coPI: V. F. Mitrović, PI: K. Plumb) (Total Amount: \$ 928,300) (October 2023).

DoD - Vannevar Bush Faculty Fellowship Program - “Development of microscopic probes and optimal control of topological quantum matter” - (PI: V. F. Mitrović) (Total Amount: \$ 2,000,000) - Pre-Proposal (September 2023).

The Gordon and Betty Moore Foundation’s Emergent Phenomena in Quantum Systems Initiative (EPiQS) Ideas for Flexible Funding - “Novel Probes of the Quantum Ground States” (PI: V. F. Mitrović) (Total Amount: \$ 1,500,000) (April 2023).

NSF - DMRCMP - “Detecting Emergent Quantum Orders with Symmetry Tailored Resonance Spectroscopy” - (PI: V. F. Mitrović) (Total Amount: \$ 1,273,243) (February 2023).

ONR - Vannevar Bush Faculty Fellowship Program - “Quantum probes and optimal control of fundamental properties in correlated materials” - (PI: V. F. Mitrović) (Total Amount: \$ 2,875,000) - White Paper (October 2022).

The Simons, the Sloan, Moore and Templeton Foundations “Tabletop” Experiments - “Search for Axions and Time Reversal Symmetry Breaking” - (PI: V. F. Mitrović) (Total Amount: \$ 3,976,000) - pre-proposal (October 2022).

The Simons, the Sloan, Moore and Templeton Foundations “Tabletop” Experiments - “Thermal probes of anyons” - (co-PI with PI Jia Leo Li) (Total Amount: \$ 3,900,000) - pre-proposal (October 2022).

NSF - “QuSeC-TAQS: Multi-parametric radio frequency techniques and optimal control for enabling next generation of quantum sensing of complex materials and devices” - (PI: V. F. Mitrović) (Total Amount: \$ 2,499,000) - pre-proposal to Brown Internal competition (October 2022).

NSF - “NRT-QISE: Identification and Control of Fundamental Properties of Quantum Matter and Devices for Enabling Quantum Leap and Workforce Development” - (PI: V. F. Mitrović) (Total Amount: \$ 1,999,000) (09/2023-09/2029) (September 2022).

DOE - BES - Energy Research Frontier Centers (EFRC): “Fractional Anyons Technology for Energy Dependability (FATED)” (PI: V. F. Mitrović) (Total Amount: ~ \$ 16,000,000) (11/22-11/26) (May 2022).

The Gordon and Betty Moore Foundation Emergent Phenomena in Quantum Systems Initiative (EPiQS) Ideas for Flexible Funding - “Multi-modal quantum spectroscopy of phase transitions with inversion symmetry” (PI: V. F. Mitrović) (Total Amount: \$ 2,000,000) (April 2022).

DOE - BES - Energy Research Frontier Centers (EFRC): Pre-Proposal for “Fractional Anyons Technology for Energy Dependability (FATED)” (PI: V. F. Mitrović) (Total Amount: ~ \$ 16,000,000) (11/22-11/26) (February 2022).

## 8. SERVICE:

### i to the Profession:

Member of the Program Committee of the international workshop “Magnetic Resonance of Correlated Electron Materials” (MagRes-2026), Huairou, Beijing, China, (September 2026).

Organizer of the “**Spin-Orbit Entangled Quantum Magnetism**”, Erwin Schrödinger Institute, Vienna, Austria (September, 2024).

Member of the Gordon and Betty Moore Foundation National Advisory Committee for 2026 Experimental Physics Investigators Initiative

Member of the evaluation committee of REGROUPEMENT QUÉBÉCOIS SUR LES MATÉRIAUX DE POINTE - Fonds de recherche du Québec - secteur Nature

et technologies (FRQNT), Quebec, Canada (July 2025).

Member of the Gordon and Betty Moore Foundation National Advisory Committee for 2025 Experimental Physics Investigators Initiative

Member of the selection committee for the APS DCMP (the Division of Condensed Matter Physics) APS Fellows (July 2024).

Member of the Editorial Board of the **New Journal of Physics** (2023-2026).

Organizer of the “**Spin-Orbit Entangled Quantum Magnetism**”, Erwin Schrödinger Institute, Vienna, Austria (September, 2024).

Chair of the selection committee for the APS DCMP (the Division of Condensed Matter Physics) APS Fellows (July 2023).

Chair of the selection committee for the APS GIMS (Group on Instrument and Measurement Science) topical group APS Fellowships (July 2022).

A member at large (APS DCMP) to the executive committee for the Division of Condensed Matter Physics (DCMP), the largest division of the American Physical Society (APS) (2022-2025).

The vice chair of the APS executive committee GIMS (Group on Instrument and Measurement Science) (2022-2025).

Selection Committee Member for the APS - 2022 Joseph F. Keithley Award For Advances in Measurement Science (July 2021).

Organizer of the 2022 APS Conference for Undergraduate Women in Physics at Brown University (2021-2022).

Member of the Advisory Board of the **Journal of Low Temperature Physics** (2020-2023).

Organizer and Chair of the “**Planning Workshop for NSF Quantum Leap Challenge Institute on the Identification and Control of Fundamental Properties of Quantum Systems**”, Brown University, Providence, RI, USA (January, 2020).

Nominated for the APS GMAG (Topical Group on Magnetism and its Applications) executive committee for the vice chair position (2019).

Member of the award selection committee for the APS “Richard L. Greene Dissertation Award in Experimental Condensed Matter or Materials Physics”, (2019).

Organizer of Focus Topic 10.1.2 on Emergent Properties of Bulk Complex Oxides (GMAG/DMP/DCOMP) for the APS March Meeting 2019.

Guest Editor for a special issue of Symmetry (ISSN 2073-8994) - “Symmetry in Spectroscopy and NMR” - MDPI (2018-2019).

Co-chair and organizer of the session on “Tuning the physical properties by external strain” with Prof. S. Sanna, University of Bologna, for ICSM2018, 6<sup>th</sup>

International Conference on Superconductivity and Magnetism, Fethiye, Turkey (April/May 2018).

Editorial Board Member for the International Journal of Magnetism & Nuclear Science (IJMN).

Scientific Committee Member for Material Science 2017, International Conference on Material Science, Rome, Italy (Oct. 2017).

The Committee for Advancement of the Broader Impact of the NSF Condensed Matter Physics Program Member (2015-2017).

National High Magnetic Field Laboratory, Tallahassee, FL, Users' Committee Member (2009-2012).

National High Magnetic Field Laboratory, Tallahassee, FL, Users' Committee Member (2006-2008).

Referee for papers submitted to APS and European journals.

Reviewer of research proposals submitted to:

NSF (CAREER, DMR, Quantum Information Science, and DMREF Condensed Matter/Emergent Phenomena programs);

DOE - BES;

Fonds de Recherche sur la Nature et les Technologies Québec;

Deutsche Forschungsgemeinschaft (German Research Foundation);

Global Nuclear Energy Partnership,

NSERC Canada,

U.S. Civilian Research Development Foundation.

Proposal Review Panelist for NSF/DMR and Fonds de Recherche sur la Nature et les Technologies Québec.

Physics text books reviewer.

## ii to the University:

Chair, Department of Physics (2023 - )

Director of the Master's Program of the Physics Department (2017-2022)

Member of the Search Committee for Faculty Position in Experimental Soft Matter and Biological Physics (2021-2022)

Member of the Physics Department DDIAP Committee (2020-2021)

Worked on advising the Graduate Women in Physics group (2021)

Member of the Search Committee for Faculty Position in Physical Chemistry (2019-2020)

Chair of the Search Committee for Faculty Position in Experimental Condensed Matter Physics (2017-2018)

Member of the Search Committee for Faculty Position in Theoretical Condensed Matter Physics (2017-2018)

Member of the Search Committee for Faculty Position in Photonics - School of Engineering (2017-2018)

Chair of the Search Committee for Faculty Position in Experimental Condensed Matter Physics (2016-2017)

Physics Concentration and International Studies Advisor (2015-2016)

Member of Brown University Community Council (BUCC) (2013 - 2015)

Member of the UTRA Award Committee (2011, 2012, 2013, 2014, 2016)

Chair of the PhD qualifying exam committee (Fall 2012)

Serving on Physics and Solid Mechanics Search Committee (Fall 2012 - Spring 2013)

Member of the University Committee on Faculty Recruitment, Development and Compensation (Fall 2012/Spring 2013)

Serving on numerous PhD prelim exams for both Physics and Engineering students

Member of the Barus-Holley Building Renovation Planning Committee

Member of the IMNI Materials Characterization Facility Committee

Member of the Science Building Planning Committee

Colloquium committee member and in charge of the organization of condensed matter seminar series

Prepared and graded problems for the PhD qualifying exam

Machine Shop Coordinator for Physics Department

Member of the Physics Laboratory Instruction committee

In charge of re-activating BROWN-CNRS (French national research organization) exchange and collaboration program

Lectured on Principles of Magnetic Resonance to students outside physics department

### iii to the Community:

Scientific advisor for Summer school for Innovation/Physics for elementary and middle school students - *More-Znanja - Sea of Knowledge*, Petrovac na Moru, Montenegro (August 2024).

*“Magnetism and other fascinating quantum phenomena”* - *More-Znanja*, Summer school for Innovation/Physics for elementary and middle school students,

Petrovac na Moru, Montenegro (August 2023).

Science Underground Public Lecture - *“Fascinating quantum world & how it has changed our lives, forever!”* (December 2015).

Organized visits to my laboratory for students from the French-American School of Rhode Island (Summer 2006, 2007).

Conducting “Science Club” at the French-American School of Rhode Island, Providence, RI (Fall 2004).

Judge at the Rhode Island Science and Engineering Fair, Warwick, RI, (March 2004).

## 9. TEACHING:

“What electronic configurations are possible in materials?”, AI Winter Workshop, Brown University, Providence, RI. (January, 2024).

“Probing quantum materials to obtain unprecedented views of matter”, distinguished lecture at the MANO second semester SPRING Workshop, University of Bologna, Bologna, Italy (May, 2023).

“Sensing at the Quantum Limit using spin squeezing and multi-modal microwave techniques”, Invited lectures at the **4th annual International Summer School on QUANTUM SENSING, INFORMATION PROCESSING AND COMPUTING: shaping the future with the second quantum revolution**, University of Bologna, Bologna, Italy (July, 2022).

“Magnetic Resonance Techniques”, Invited lecture at **5th annual Fundamentals of Quantum Materials Summer School**, University of Maryland, College Park, MD (Jun 2022).

Delivered a guest lecture on “Exotic Magnetic Field Measurements & Effects” at University of New Hampshire - Solid State Physics Class, virtual (May 2021).

Organized **“2020 Quantum Winter School: An Introduction to Quantum Computing and Materials”** in collaboration with our colleagues at Dartmouth. Delivered lecture on “Qubits, quantum measurements, & gates” (December 2020).

Participated at **“The Machine Learning for Science Hackathon Competition (ML4Sci)”** by designing and overseeing “Nuclear Magnetic Resonance Spin Challenge” (October 2020).

Invited 4 hours lecture on “Quantum Sensing and Interaction of Radiation with Matter”, **International Summer School on Physical Sensing, Processing and Computation**, - organized by Physics departments of University of Bologna, Brown, & Columbia

University, Bologna, Italy (July 2019).

Delivered 12 hours of lectures on *Low Dimensional Quantum Transport and Modern Microscopic Techniques* at the Faculty of Physics, Hanoi University of Science, Hanoi, Vietnam (December 2012).

### Courses:

Phys 0560 - Experiments in Modern Physics - (Spring 2022 [35 students]).

Phys 2711 - Seminar in Research Topics on Quantum Sensing for Advanced Detectors in High Energy Physics - (Spring 2022 [11 students], Spring 2024 [5 students]).

Phys 2050 - Graduate Quantum Mechanics I - (Fall 2020 [36 students enrolled] & Fall 2021 [56 students enrolled] Fall 2022 [60 students enrolled]).

Phys 2010 & 1560 - Techniques in Experimental Physics (graduate course) - (Spring 2020 [14 students enrolled], Spring 2021 [12 students enrolled]).

Phys 1530 - Thermodynamics and Statistical Mechanics - (Fall 2017 [25 students enrolled], Fall 2018 [20 students enrolled], Fall 2019 [29 students enrolled]).

Phys 2010 - Techniques in Experimental Physics - (Spring 2017 [8 students enrolled], Spring 2018 [10 students enrolled], Spring 2019 [10 students enrolled]).

Phys 1560 - Modern Physics Laboratory - (Spring 2014 [5 students], Spring 2015 [10 students]).

Phys 1410 - Quantum Mechanics A - (Fall 2011 [40 students enrolled], Fall 2012 [35 students enrolled], Fall 2013 [26 students enrolled]), & Fall 2014 [33 students enrolled], Fall 2015 [41 students enrolled]).

Phys 0040 - Introduction to Physics II (Electricity and Magnetism) - (Spring 2012 [240 students enrolled] & Spring 2013 [245 students enrolled]).

Phys 2420 - Solid State Physics II (graduate course) - (Spring 2009 [5 students enrolled], Spring 2010 [5 students enrolled], Spring 2011 [2 students enrolled]).

Phys 0790 - Physics of Matter - (Fall 2007 [24 students enrolled], Fall 2008 [11 students enrolled], & Fall 2009 [26 students enrolled]).

Phys 0560 - Experiments in Modern Physics - (Spring 2006 [20 students], Spring 2007 [26 students enrolled], & Spring 2008 [16 students enrolled]).

Phys 0153 - Thermodynamics and Statistical Mechanics - (Fall 2004 [22 students enrolled], Fall 2005 [7 students enrolled], & Fall 2006 [24 students enrolled]).

### Graduate Students Supervised in 2025:

Genevra Corsale, Calvin Bales, Ilija Nikolov, Donovan Davino, Jiwoo Seo, Lindsey Tensen, Aaron Baumgart, Michael Warnock, Albert Young, Shawn Khanna.

### Independent Study Courses:

Shawn Khanna - Quantum Information Processing with Bio-molecules - (Fall 2024 & Spring 2025)

Taichi Murakami - Physics of Cluster Mott Insulators - (Fall 2022)

Yi Ren - Quantum Processing in the Brain - (Fall 2022)

David (Xiaozhou) Ye - Piezo resonance as probe of nano-particle magnetization - (Fall 2022)

Musqan Nighojkar - NMR observables for study of the quantum information processing in the brain - (Fall 2021)

Zhengxiang Gao - Powder pattern simulations of the NMR spectra - (Fall 2020)

Benjamin Davis - Physics of parametric amplifiers - (Spring 2020)

Michael Warnock - Study of thermoelectric properties in piezo materials - (Fall 2018, Spring 2019)

Louis Hamaide - Novel ideas in axion detection - (Spring 2019)

Boyuan Xu - Piezo-electrical resonance of simple dipole in the electric field gradient - (Fall 2018)

Li Zheng - NMR quantum computing - (Fall 2018, Spring 2019)

Tianyi Zhou - Novel measurements of magnetic anisotropy by piezo-resonance - (Fall 2017)

Timo Yannick Simnacher - Emergent phenomena in entangled multi-particle quantum states - (Spring 2017)

Tsung-Han Yang - Conduction mechanisms in small gap semiconductors - (Spring 2017)

Tsung-Han Yang - Simulation of the probability distribution of spin on triangular lattice - (Fall 2016)

Dominic Adams - Calculation of powder pattern NMR spectra for high nuclear spin,  $I = 9/2$  case- (Spring 2015)

Wencong Liu - Calculation of the electric field gradient in  $\text{Ba}_2\text{NaOsO}_6$  using point charge approximation formalism - (Spring 2013)

Brad Barry - Calculation of the probability distribution of the local spin operators using lattice sum formalism - (Spring 2013)

Wencong Liu - Spatial dependence of the RF field profile of the NMR surface coils - (Fall 2012)

William Lockhart - Quantum control - (Spring 2012)

Altan Allawala - NMR relaxation Rate in Luttinger liquid formalism - (Fall 2011)

Peter Nagler - Ultralow temperature NMR - (Fall 2011)

Kyle Cackett - Elementary quantum computing in  $\text{NaClO}_3$  - (Spring 2011)

Ryan Lester - Theory of quantum computing - (Spring 2011)

John Golden - Simulation of the NMR spectra on triangular lattices - (Fall 2010)

Rongwei Hu - Magnetic properties of material - (Spring 2006)

**Ph.D., ScM, and Undergraduate Senior Thesis Supervised:**

Aaron Baumgart - “A Light Pulse Atom Interferometric Gravimeter in Dynamic Environments” - (Defended the PhD thesis on 05/21/2025, currently scientist at DRAPER Labs.)

Shawn Khanna - “Quantum Algorithms with Biological Qubits” - (ScM thesis 2025, currently PhD student at Brown)

Calvin Bales - “Application of Multi-Modal Spectroscopic Techniques for the Study of Magnetism in Strongly Correlated Materials” - (Defended the PhD thesis on 03/31/2025, cryogenics scientist at BlueForce)

Donovan Davino - “Quantum Information Processing in Biological Molecules” - (Defended the PhD thesis on 03/21/2025)

Jonathan Frassinetti - “Study of charge, spin, and structural orderings in quantum materials using nuclei and muons as local probes” - (Defended the PhD thesis on 10/25/2023 at Università di Bologna, Italy, HPC specialist at CINECA, Casalecchio di Reno/Bologna, Italy)

Charles Snider - “Dynamic Simulations of Strongly Coupled Spin Ensembles” - (Defended the PhD thesis on 04/27/2022, Principal Scientific Consultant Boulder BioConsulting)

Rong Cong - “Magnetic and structural properties of 5d osmate double perovskites probed by nuclear magnetic resonance” - (Defended the PhD thesis on 04/25/2022, Scientists at NHMFL)

Erick Garcia - “Studies of the Charge Doped Mott Insulator With Strong Spin-Orbit Coupling  $\text{Ba}_2\text{Na}_x\text{Ca}_{1-x}\text{OsO}_6$ ” (Defended the PhD thesis on 04/20/2022, Senior Manager - Superconducting Systems at VEIR)

Max Melendez - “Tensions Between Proposed  $\text{Sr}_2\text{RuO}_4$  Superconducting Order Parameters: Using Lattice Deformations to Differentiate Symmetry-Protected and Accidental Degenerate Solutions” (Sc.B 2022)

Benjamin Wolcott - “Simulation of Powder NMR Spectra Patterns” (Sc.B 2020)

Musqan Nighojkar - “Reverse Engineering the Synaptic Cleft: The Search for Quantum Information Processing in The Brain” - (ScM thesis 2022)

Anna Tessatti - “NMR Investigation of Spin and Charge Dynamics in the Electron Doped Dirac-Mott Insulator  $\text{Ba}_2\text{Na}_{1-x}\text{Ca}_x\text{OsO}_6$  Double Perovskite”. (ScM thesis 2021 - Università di Bologna, Italy - currently PhD student at Università di Trento, Italy)

Zhenxiang Gao - “A study on the anisotropic Knight shift in  $\text{Ba}_2\text{Na}_{1-x}\text{Ca}_x\text{OsO}_6$ ”

through NMR spectra simulations”.

(ScM thesis 2021, ScM Research Excellence/Thesis Award, currently PhD student at the University of British Columbia, Vancouver, Canada)

Aaron Baumgart - “Raman Population Transfer in a Quantum Gravimeter”.

(ScM thesis 2021 - @ Draper labs)

Davide Candoli - “Simulation of NMR/NQR observables spin control for application in quantum science”.

(ScM thesis 2020 - Università di Bologna, Italy - currently PhD student at the University of Innsbruck, Innsbruck, Austria)

Benjamin Davis - “The Physics of Josephson Parametric Amplifiers”.

(ScM thesis 2020 - currently PhD student at the University of Washington Seattle)

Paola Caterina Forino - “Nuclear Magnetic Resonance Study of the Electron Doped Dirac-Mott Insulator Double Perovskite  $\text{Ba}_2\text{Na}_{1-x}\text{Ca}_x\text{OsO}_6$ .”

(ScM thesis 2020 - Università di Bologna, Italy - currently PhD student at the EPFL, Lausanne, Switzerland)

Louis Hamaide - “Novel ideas in axion detection & Group Structure of ( $N = 4$ ,  $d = 1$ ) SUSY”.

(ScM thesis 2019 - currently PhD student at King’s College. London, U.K.)

Li Zheng - “NMR technique for single qubit control”.

(ScM thesis 2019 - currently PhD student at Michigan State University)

Michael Warnock - “Investigation of Mechanical Boundary Condition Induced Property Losses in Piezoelectric Materials by the Symplectic Method”.

(ScM thesis 2019 - currently PhD student at Brown)

Timo Yannick Simnacher - “One-Way Quantum Computing Using Nuclear Magnetic Resonance Spectroscopy”.

(ScM 2017 - ScM Research Excellence/Thesis Award, afterwards PhD student at the University of Siegen, Germany)

Wencong Liu - “NMR study of materials with significant spin-orbit coupling and transparent oxide films”.

(Defended the PhD thesis on 09/29/2017, Capital One Bank, New York)

Lu Lu - “Nuclear Magnetic Resonance Study of Ferromagnetism and Local Symmetry Breaking in Double Perovskite Mott Insulator  $\text{Ba}_2\text{NaOsO}_6$ ”.

(Defended the PhD thesis on 09/24/2015, Global Head of Rates/Macro Risk at Jain Global, New York)

Georgios Koutroulakis - “Unravelling the mysteries of unconventional superconductivity with NMR: The curious case of  $\text{CeCoIn}_5$ ”

(Defended the PhD thesis on 10/08/2010, Lecturer & y Research Associate at UCSB)

Rongwei Hu - “Investigation of a *d*-electron Kondo insulator FeSb<sub>2</sub>”.  
(Defended the PhD thesis on 06/30/2009, currently Research Associate at Rutgers University)

Marc-André Vachon - “Nuclear Magnetic Resonance Study of the Magnetism in the 2D Frustrated Quantum Heisenberg Antiferromagnet Cs<sub>2</sub>CuCl<sub>4</sub>”.  
(Defended the PhD thesis on 12/11/2008, Equisoft Inc., Montreal, Canada)

Dominic T. Adams - “Computational Simulation of Powder NMR Spectra”.  
(Sc. B 2016 - Best Thesis Award)

Brad Barry - “Simulating Local Spin Texture Induced by Spin-Orbit interaction and Exotic Orbital Orders in the Mott Insulator Ba<sub>2</sub>NaOsO<sub>6</sub> - Exploring Utility as a Qubit”.  
(Sc. B 2014 - Best Thesis Award)

James Bensson - “Quantum Computing with Nuclear Magnetic Resonance”.  
(Sc. B 2012 - Best Thesis Award, afterwards graduate student at Stanford)

Ryan Lester - “Bulk Quantum Computing with NMR”.  
(Sc. B 2012)

Kyle Cackett - “Elementary Quantum Computing in NaClO<sub>3</sub>”.  
(Sc. B 2011 - Best Thesis Award)

Jonathan Schwartz - “NMR applications of Microcoils”.  
(Sc. B 2007, afterwards Ph. D. student at Berkeley)

Worasom Kundhikanjana - “NMR Study of FeSb<sub>2</sub>”.  
(Sc. B 2006, afterwards Ph. D. student at Stanford)

Adam Straub - “Low Temperature NMR Probe Design”.  
(Sc. B 2006, afterwards Ph. D. student at Cornell)

#### **Postgraduate Scholars Supervised:**

Adrien Rosuel (Postdoc, 2023 - );

Rong Cong (Postdoc, 2022 - 2023);

Stephen Carr (Postdoc, 2020 - 2022);

Michael D. Stewart, Jr. (NIST-Staff Scientist, Postdoc, 2008 - 2009);

Myeonghun Song (LG - Korea, Postdoc, 2010 - 2011).

#### **Undergraduate Research Projects Supervised:**

Lucas Brito - (Fall 2021).

Benjamin Walcott - (Fall 2019).

Fernando Gomez Ortiz - Exchange student from University of Cantabria, Spain (Summer 2017).

London Cooper-Troendle - UTRA ResearchProject (Summer 2015).  
Dominic Adams - (Summer/Fall 2014) & UTRA Project (Summer 2015).  
Brad Barry - (Summer/Fall 2013).  
Adam Frees - (Spring 2012).  
Zack Winoker - UTRA Project (Fall 2011) & (Summer 2012).  
James Bensson - UTRA project (Summer 2011).  
Ryan Kaplan - UTRA project (Summer 2009) & Summer Research (2010).  
Octavia Crompton - REU project (2008-2009).  
Jacob Matlick - UTRA project (Summer 2008).  
Worasom Kundhikanjana - Royce Fellowship Research project (2005-2006).  
Adam Straub - UTRA project (2005).

**Academic Advising:**

Master Students advisor (2017-2021). In 2021 primary advisor of the entire incoming class of 35 students.  
Sophomore Advisor for a student (2017-2018).  
Physics Concentration and International Studies Advisor (2015-2016).  
Freshmen Advisor for 5 students (2014).  
First & Second Year Graduate Student Advisor (2010-2012).  
Sophomore Advisor for 4 students (2009-2010).  
Sophomore Advisor for 2 students (2008-2009).  
Freshmen Advisor for 6 students (2008-2009).  
Freshmen Advisor for 5 students (2007-2008).  
Freshmen Advisor for ~ 6 students (2006-2007).

**Member of Ph.D Thesis Defense Committees:**

Dr. Jakob Nachtigal, “NMR Study of Electronic Properties of Topological Insulators  $\text{Bi}_2\text{Te}_3$  and  $\text{Bi}_2\text{Se}_3$ ”, Fakultät für Physik und Erdsystemwissenschaften, Felix-Bloch-Institut für Festkörperphysik, Universität Leipzig, Leipzig, Germany (November 2025).  
Dr. Angela Pizzuto, “Linear and Nonlinear Terahertz Near-Field Microscopy for Characterizing Electronic Systems”, Brown University, Providence, RI, (November 2022).

Dr. Zekun Zhuang, “Transport theory and its application in detecting quantum matters”, Brown University, Providence, RI, (July 2021).

Dr. Lijuan Qian, “Electron Magneto-transport in Nanostructures with Enhanced Spin-dependent Properties”, Brown University, Providence, RI, (March 2021).

Dr. Yang Song, “Characteristics and Stability of High Performance Indium Zinc Oxide Thin Film Transistors”, Brown University, Providence, RI, (December 2017).

Dr. Matteo Moroni, “NMR study of iron-based superconductors”, Università degli studi di Pavia, Dipartimento di Fisica “A. Volta”, Pavia, Italy, (September 2017).

Dr. Declan Oller, “Anodic alumina as a scalable platform for structural coloration and optical rectification”, Brown University, Providence, RI, (September 2017).

Dr. Philip Zucker, “Novel Probes of Topological Order in the Quantum Hall Effect”, Brown University, Providence, RI, (January 2017).

Dr. Xu Luo, “Thermodynamic Studies of Phase Transitions and Emerging Orders in Unconventional Superconductors”, Brown University, Providence, RI, (April 2015).

Dr. Shawna Hollen, “Cooper Pair Localization in Thin Films Near the Superconductor - Insulator Transition”, Brown University, Providence, RI, (June 2012).

Dr. Chenjie Wang, “Transport in Quantum Hall Systems: Probing Anyons and Edge Physics”, Brown University, Providence, RI, (April 2012).

Dr. Wenzhe Zhang, “Noise and Spin-Dependent Transport in MgO-Based Magnetic Tunnel Junctions”, Brown University, Providence, RI, (April 2012).

Dr. Xi Wang, “3D Neutron Diffraction Studies on the Vortex Lattice”, Brown University, Providence, RI, (May 2011).

Dr. Helen Hanson, “The Crystallography of Vortex Matter in a Niobium Crystal”, Brown University, Providence, RI, (May 2011).

Dr. Francesco Aimò, “Nouveaux états quantiques induits sous champ : étude microscopique par Résonance Magnétique Nucléaire de l’azurite”, Université de Grenoble, Grenoble, France, (December 2010).

Dr. Hung Nguyen, “Experiments on a Cooper Pair Insulator”, Brown University, Providence, RI, (March 2010).

Dr. Xiaojing Zou, “The Physical Properties of Half-Metallic CrO<sub>2</sub> Nanostructures”, Brown University, Providence, RI, (October 2009).

Dr. Seungwook Ma, “Non-Perturbative Approaches to Problems in Strongly-

Correlated Many-Body Physics”, Brown University, Providence, RI, (September 2008).

Dr. Kam Tuen Law, “Probing Abelian and Non-Abelian Statistics in Fractional Quantum Hall States”, Brown University, Providence, RI, (June 2008).

Dr. Dipanjan Mazumdar, “Coherent Magnetotunneling based on (001) Magnesium Oxide Barrier”, Brown University, Providence, RI, (September 2007).

Dr. Nikolaos Daniilidis, “Experimental Studies of the Bragg Glass Transition in Niobium”, Brown University, Providence, RI, (June 2007).

Dr. Ivo K. Dimitrov, “Ultrasonic Attenuation, AC Magnetic Susceptibility and Small- Angle Neutron Scattering Studies of Vortex States in Bulk Low- $T_c$  Type II Superconductors”, Brown University, Providence, RI, (September 2006).

Dr. Cagri Aydin, “Silicon Based Tunneling Devices Combined with Silicon-on-insulator for Ultra-large-scale Integration”, Brown University, Providence, RI, (August 2004).

Dr. Sang Ryul Park, “Neutron Scattering and AC Magnetic Susceptibility Studies of Vortex Matter in Type II Superconductors”, Brown University, Providence, RI, (June 2004).

Dr. Patrizia Tedesco, “Fluctuating diamagnetism and  $^{89}\text{Y}$  NMR quantities from the underdoped to the overdoped regime in YBCO”, Università degli studi di Pavia, Dipartimento di Fisica “A. Volta”, Pavia, Italy, (February 2003).

## 10. LANGUAGES:

Fluent in English, French, Italian, and Serbo-Croatian. Basic knowledge of German.