

ANDREI T. SAVICI

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EXPERTISE

Neutron scattering - direct geometry spectroscopy, triple axis spectroscopy, single crystal diffraction, event based data processing

Scientific computing - C++, Python, IDL

Muon spin relaxation

EXPERIENCE

2013–present Neutron Scatting Software Scientist

*NScD, Oak Ridge
National
Laboratory*

Develop capabilities for direct geometry spectroscopy, in particular for polarized neutron scattering. Developed the mathematics and implemented algorithms that allow data processing and visualization for large regions in reciprocal space, with application to direct geometry spectroscopy and single crystal diffuse scattering. Implemented autoreduction at many instruments.

2010–2013 Postdoctoral Researcher - software

*NScD, Oak Ridge
National
Laboratory/ORAU*

Worked on software for direct geometry neutron spectroscopy. Developed the NXSPe file format, and increased speed and usability for the DAVE software when using data from SNS instruments. Started developing data reduction routines in MANTID.

2007–2009 Postdoctoral Researcher - neutron scattering

*Johns Hopkins
University*

Worked on the design of a high magnetic field instrument (ZEEMANS). Research related to low dimensional magnetic systems (1D), using inelastic neutron scattering.

2004–2007 Postdoctoral Researcher - neutron scattering

*Brookhaven
National
Laboratory*

Learned neutron scattering, with focus on Triple Axis Spectroscopy. Research related to low dimensional magnetic systems (2D), using inelastic neutron scattering.

1999–2004 Graduate Research Assistant

*Columbia
University*

Research related to superconductors and low dimensional magnetic systems, using muon spin relaxation.

1998–2004 Teaching Assistant

*Columbia
University*

Taught introductory and advanced laboratories, held recitation sections for lectures ranging from introductory undergraduate physics to graduate condensed matter.

EDUCATION

| | | |
|------------------------|-----------|--|
| | 2000-2004 | Columbia University |
| <i>Ph.D. Physics</i> | | Dissertation: <i>Muon Spin Relaxation Study of Coexisting Superconductivity and Magnetic Ordering in La₂CuO₄ Based Systems</i> Advisor: Prof. Y.J.UEMURA |
| | 1998-2000 | Columbia University |
| <i>M.Phil. Physics</i> | | Graduate School of Arts and Science |
| | 1997-1998 | Babes-Bolyai University |
| <i>M.S. Physics</i> | | Department of Physics |
| | 1993-1997 | Babes-Bolyai University |
| <i>B.S. Physics</i> | | Department of Physics |

ADDITIONAL INFORMATION

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| <i>Invited talks</i> | 2007 | · Oak Ridge National Laboratory User Week - Spin structure and excitations emerging in hole-doped layered perovskite La _{1.5} Sr _{0.5} CoO ₄ |
| | 2009 | · American Crystallographic Association Conference, Toronto, Canada - Searching for stripes in short range charge and spin superstructures |
| | 2016 | · Johns Hopkins Condensed Matter Seminar - Data treatment and measurement statistics for time-of-flight neutron scattering experiments |
| | 2018 | · Superstripes / Quantum Complex Matter Conference, Rome, Italy - Neutron scattering data challenges and opportunities for quantum condensed matter |

PUBLICATIONS

- [1] X. Hu, A. Sapkota, Z. Hu, A. T. Savici, A. I. Kolesnikov, J. M. Tranquada, C. Petrovic, and I. A. Zaliznyak. "Coupling of magnetism and Dirac fermions in YbMnSb₂". In: *Phys. Rev. B* 107 (2023), p. L201117. DOI: [10.1103/PhysRevB.107.L201117](https://doi.org/10.1103/PhysRevB.107.L201117).
- [2] A. McDannald, M. Frontzek, A. T. Savici, M. Doucet, E. E. Rodriguez, K. Meuse, J. Opsahl-Ong, D. Samarov, I. Takeuchi, W. Ratcliff, and A. G. Kusne. "ANDiE the Autonomous Neutron Diffraction Explorer". In: *Neutron News* 34 (2023), pp. 6–7. DOI: [10.1080/10448632.2023.2190714](https://doi.org/10.1080/10448632.2023.2190714). eprint: <https://doi.org/10.1080/10448632.2023.2190714>.
- [3] Y. Cheng, G. Wu, D. M. Pajerowski, M. B. Stone, A. T. Savici, M. Li, and A. J. Ramirez-Cuesta. "Direct prediction of inelastic neutron scattering spectra from the crystal structure*". In: *Machine Learning: Science and Technology* 4 (2023), p. 015010. DOI: [10.1088/2632-2153/acb315](https://doi.org/10.1088/2632-2153/acb315).
- [4] A. T. Savici, M. A. Gigg, O. Arnold, R. Tolchenov, R. E. Whitfield, S. E. Hahn, W. Zhou, and I. A. Zaliznyak. "Efficient data reduction for time-of-flight neutron scattering experiments on single crystals". In: *Journal of Applied*

Crystallography 55 (2022), pp. 1514–1527. DOI:
[10.1107/S1600576722009645](https://doi.org/10.1107/S1600576722009645).

- [5] A. McDannald, M. Frontzek, A. T. Savici, M. Doucet, E. E. Rodriguez, K. Meuse, J. Opsahl-Ong, D. Samarov, I. Takeuchi, W. Ratcliff, and A. G. Kusne. “On-the-fly autonomous control of neutron diffraction via physics-informed Bayesian active learning”. In: *Applied Physics Reviews* 9 (2022). DOI: [10.1063/5.0082956](https://doi.org/10.1063/5.0082956). eprint: https://pubs.aip.org/aip/apr/article-pdf/doi/10.1063/5.0082956/16496841/021408_1_online.pdf.
- [6] Y. Li, N. Zaki, V. O. Garlea, A. T. Savici, D. Fobes, Z. Xu, F. Camino, C. Petrovic, G. Gu, P. D. Johnson, J. M. Tranquada, and I. A. Zaliznyak. “Electronic properties of the bulk and surface states of $\text{Fe}_{1+y}\text{Te}_{1-x}\text{S}_x$ ”. In: *Nature Materials* (2021). DOI: [10.1038/s41563-021-00984-7](https://doi.org/10.1038/s41563-021-00984-7).
- [7] J. P. Mahalik, W. Li, A. T. Savici, S. Hahn, H. Lauter, H. Ambaye, B. G. Sumpter, V. Lauter, and R. Kumar. “Dispersivity-Driven Stabilization of Coexisting Morphologies in Asymmetric Diblock Copolymer Thin Films”. In: *Macromolecules* 54 (2021), pp. 450–459. DOI: [10.1021/acs.macromol.0c01722](https://doi.org/10.1021/acs.macromol.0c01722).
- [8] A. Sapkota, L. Classen, M. B. Stone, A. T. Savici, V. O. Garlea, A. Wang, J. M. Tranquada, C. Petrovic, and I. A. Zaliznyak. “Signatures of coupling between spin waves and Dirac fermions in YbMnBi_2 ”. In: *PHYSICAL REVIEW B* 101 (2020), p. 041111. DOI: [10.1103/PhysRevB.101.041111](https://doi.org/10.1103/PhysRevB.101.041111).
- [9] D. M. Pajerowski, K. M. Taddei, L. D. Sanjeewa, A. T. Savici, M. B. Stone, and J. W. Kolis. “Quantification of local Ising magnetism in rare-earth pyrogermanates $\text{Er}_2\text{Ge}_2\text{O}_7$ and $\text{Yb}_2\text{Ge}_2\text{O}_7$ ”. In: *PHYSICAL REVIEW B* 101 (2020), p. 014420. DOI: [10.1103/PhysRevB.101.014420](https://doi.org/10.1103/PhysRevB.101.014420).
- [10] M. G. Kim, B. Winn, S. Chi, A. T. Savici, J. A. Rodriguez-Rivera, W. C. Chen, X. Xu, Y. Li, J. W. Kim, S.-W. Cheong, and V. Kiryukhin. “Spin-liquid-like state in pure and Mn-doped TbInO_3 with a nearly triangular lattice”. In: *PHYSICAL REVIEW B* 100 (2019), p. 024405. DOI: [10.1103/PhysRevB.100.024405](https://doi.org/10.1103/PhysRevB.100.024405).
- [11] L. S. Wu, S. E. Nikitin, M. Brando, L. Vasylechko, G. Ehlers, M. Frontzek, A. T. Savici, G. Sala, A. D. Christianson, M. D. Lumsden, and A. Podlesnyak. “Antiferromagnetic ordering and dipolar interactions of YbAlO_3 ”. In: *PHYSICAL REVIEW B* 99 (2019), p. 195117. DOI: [10.1103/PhysRevB.99.195117](https://doi.org/10.1103/PhysRevB.99.195117).
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- [13] J. C. Leiner, H. O. Jeschke, R. Valentí, S. Zhang, A. T. Savici, J. Y. Y. Lin, M. B. Stone, M. D. Lumsden, J. Hong, O. Delaire, W. Bao, and C. L. Broholm. "Frustrated Magnetism in Mott Insulating $(V_{1-x}Cr_x)_2O_3$ ". In: *PHYSICAL REVIEW X* 9 (2019), p. 011035. DOI: [10.1103/PhysRevX.9.011035](https://doi.org/10.1103/PhysRevX.9.011035).
- [14] L. S. Wu, S. E. Nikitin, Z. Wang, W. Zhu, C. D. Batista, A. M. Tsvetik, A. M. Samarakoon, D. A. Tennant, M. Brando, L. Vasylichko, M. Frontzek, A. T. Savici, G. Sala, G. Ehlers, A. D. Christianson, M. D. Lumsden, and A. Podlesnyak. "Tomonaga-Luttinger liquid behavior and spinon confinement in $YbAlO_3$ ". In: *NATURE COMMUNICATIONS* 10 (2019). DOI: [10.1038/s41467-019-08485-7](https://doi.org/10.1038/s41467-019-08485-7).
- [15] J. Liu, A. T. Savici, G. E. Granroth, K. Habicht, Y. Qiu, J. Hu, Z. Q. Mao, and W. Bao. "A Triplet Resonance in Superconducting $Fe_{1.03}Se_{0.4}Te_{0.6}$ ". In: *CHINESE PHYSICS LETTERS* 35 (2018). DOI: [10.1088/0256-307X/35/12/127401](https://doi.org/10.1088/0256-307X/35/12/127401).
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- [19] L. S. Wu, S. E. Nikitin, M. Frontzek, A. I. Kolesnikov, G. Ehlers, M. D. Lumsden, K. A. Shaykhtudinov, E.-J. Guo, A. T. Savici, Z. Gai, A. S. Sefat, and A. Podlesnyak. "Magnetic ground state of the Ising-like antiferromagnet $DyScO_3$ ". In: *PHYSICAL REVIEW B* 96 (2017). DOI: [10.1103/PhysRevB.96.144407](https://doi.org/10.1103/PhysRevB.96.144407).
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- [21] A. T. Savici, I. A. Zaliznyak, V. O. Garlea, and B. Winn. "Data processing workflow for time of flight polarized neutrons inelastic measurements". In: *INTERNATIONAL CONFERENCE ON POLARISED NEUTRONS FOR CONDENSED MATTER INVESTIGATIONS (PNCMI 2016)*. Vol. 862. Journal of Physics Conference Series. 2017. DOI: [10.1088/1742-6596/862/1/012023](https://doi.org/10.1088/1742-6596/862/1/012023).
- [22] I. A. Zaliznyak, A. T. Savici, V. O. Garlea, B. Winn, U. Filges, J. Schneeloch, J. M. Tranquada, G. Gu, A. Wang, and C. Petrovic. "Polarized neutron scattering on HYSPEC: the HYbrid SPECtrometer at SNS". In: *INTERNATIONAL CONFERENCE ON POLARISED NEUTRONS FOR CONDENSED MATTER INVESTIGATIONS (PNCMI 2016)*. Vol. 862. Journal of Physics Conference Series. 2017. DOI: [10.1088/1742-6596/862/1/012030](https://doi.org/10.1088/1742-6596/862/1/012030).
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- [27] I. Zaliznyak, A. T. Savici, M. Lumsden, A. Tselik, R. Hu, and C. Petrovic. "Spin-liquid polymorphism in a correlated electron system on the threshold of superconductivity". In: *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA* 112 (2015), 10316–10320. DOI: [10.1073/pnas.1503559112](https://doi.org/10.1073/pnas.1503559112).
- [28] J. J. Wagman, D. Parshall, M. B. Stone, A. T. Savici, Y. Zhao, H. A. Dabkowska, and B. D. Gaulin. "Quasi-two-dimensional spin and phonon excitations in $\text{La}_{1.965}\text{Ba}_{0.035}\text{CuO}_4$ ". In: *PHYSICAL REVIEW B* 91 (2015). DOI: [10.1103/PhysRevB.91.224404](https://doi.org/10.1103/PhysRevB.91.224404).

- [29] O. Arnold, J. C. Bilheux, J. M. Borreguero, A. Buts, S. I. Campbell, L. Chapon, M. Doucet, N. Draper, R. F. Leal, M. A. Gigg, V. E. Lynch, A. Markvardsen, D. J. Mikkelsen, R. L. Mikkelsen, R. Miller, K. Palmen, P. Parker, G. Passos, T. G. Perring, P. F. Peterson, S. Ren, M. A. Reuter, A. T. Savici, J. W. Taylor, R. J. Taylor, R. Tolchenoy, W. Zhou, and J. Zikoysky. "Mantid-Data analysis and visualization package for neutron scattering and μ SR experiments". In: *NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT* 764 (2014), 156–166. DOI: [10.1016/j.nima.2014.07.029](https://doi.org/10.1016/j.nima.2014.07.029).
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June 5, 2023