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## Curriculum Vitae

### Professional Experience:

Postdoctoral Research Associate, Seaborg Fellow,  
Center for Integrated Nanotechnologies, Los Alamos National Laboratory  
Advisors: Dr. Rohit Prasankumar and Dr. Dmitry Yarotski 2017-2019

Technical Staff Member  
Center for Integrated Nanotechnologies, Los Alamos National Laboratory 2019-Present

### Technical Expertise:

Electron spectroscopy, X-ray spectroscopy, X-ray diffraction, Ultrafast optical and terahertz spectroscopy, nonlinear optics

### Education:

B. S. in Physics and Chemistry, Bridgewater College (2010)  
Advisors: Dr. Richard Bowman and Dr. Eric Brumbaugh

Ph.D in Physics, The University of Tennessee (2017)

**Thesis Title:** Local Moments and Itinerant Electrons: Gaining New Insights through Investigating Electronic and Dynamical Properties.

[http://trace.tennessee.edu/utk\\_graddiss/4652/](http://trace.tennessee.edu/utk_graddiss/4652/)

### Awards:

2013: Paul H. Stelson Fellowship for Beginning Research-University of Tennessee

2016: Chancellor's Citation for Extraordinary Professional Promise-University of Tennessee

2020: Laboratory Directed Research and Development, Exploratory Research (co-PI) – Shedding Light on Quantum Phenomena in Topological Chiral Crystals – Los Alamos National Laboratory

2021: Institute for Material Science Rapid Response R & D-Resolving the Spinon Continuum – Los Alamos National Laboratory

2021: Large Team Distinguished Performance Award – Black Bear – Los Alamos National Laboratory

**Journal Referee:** *Physical Review X* (1), *Physical Review Letters* (3), *Nature Communications* (2), *NPJ Quantum Materials* (1), *Physical Review Research* (1), *Physical Review B* (8), *Review of Scientific Instruments* (1)

**Review Committees:** NSF CAREER – Electronic and Photonic Materials Program (2020)

**Invited Talks:**

“Probing the Ultrafast Nonlinear Response in the Transition Metal Monopnictide Family of Weyl Semimetals”

[APS March Meeting Focus Session on Dirac and Weyl Semimetals \(2020\)](#)

“Tracking Ultrafast Photocurrents in the Weyl Semimetal TaAs”

[SPIE Defense and Commercial Sensing \(2019\)](#)

[SPIE Optics and Photonics \(2019\)](#)

**Publications:**

Photocurrent-driven transient symmetry breaking in the Weyl Semimetal TaAs

**N. Sirica**, P. P. Orth, M.S. Sheurer, Y.M. Dai, M.-C. Lee, P. Padmanabhan, L. T. Mix, S.W. Teitelbaum, M. Trigo, L.X. Zhao, G.F. Chen, B. Xu, R. Yang, C. Hu, B. Shen, C.-C. Lee, H. Lin, T.A. Cochran, S.A. Trugman, J.-X. Zhu, M.Z. Hasan, N. Ni, X.G. Qiu, A.J. Taylor, D.A. Yarotski, and R.P. Prasankumar

[arXiv:2005.10308 \(2021\) – Accepted \*Nature Materials\*](#)

Direct Observation of Coherent Longitudinal and Shear Acoustic Phonons in the Weyl Semimetal TaAs Using Ultrafast X-ray Diffraction

M.-C. Lee, **N. Sirica**, S. W. Teitelbaum, A. Maznev, T. Pezeril, R. Tutchton V. Krapivin, G. A. de la Pena, Y. Huang, L. X. Zhao, G. F. Chen, B. Xu, R. Yang, J. Shi, J.-X. Zhu, D. A. Yarotski, X.G. Qiu, K. A. Nelson, M. Trigo, D. A. Reis, and R. P. Prasankumar

[arXiv:2011.07196 \(2021\) – In review \*Physical Review Letters\*](#)

Disentangling Electronic Lattice and Spin Dynamics in the Chiral Helimagnet  $\text{Cr}_{1/3}\text{NbS}_2$

**N. Sirica**, H. Hedayat, D. Bugini, M. R. Koehler, L. Li, D. S. Parker, D. G. Mandrus, C. Dallera, E. Carpena, and N. Mannella

[In review \*Physical Review B\* \(2021\)](#)

Shaking up topology with light

**N.S. Sirica** and R.P. Prasankumar

[Nature Materials \*\*20\*\*, 283 \(2021\)](#)

The Nature of Ferromagnetism in the Chiral Helimagnet  $\text{Cr}_{1/3}\text{NbS}_2$

**N. Sirica**, P. Vilmercati, F. Bondino, I. Pis, S. Nappini, S.-K. Mo, A. V. Fedorov, P. K. Das, I. Vobornik, J. Fujii, L. Li, D. Sapkota, D. S. Parker, D. G. Mandrus and N. Mannella

[Communications Physics \*\*3\*\*, 65 \(2020\)](#)

Strain dependence of Auger recombination in  $3\ \mu\text{m}$  GaInAsSb/GaSb type-I active regions

K. J. Underwood, A. F. Briggs, S. D. Sifferman, V. Verma, **N. Sirica**, R. Prasankumar, S. W.

Nam, K. L. Silverman, S. Bank, and J. T. Gopinath

*Applied Physics Letters* **116**, 262103 (2020)

Hot Carrier Cooling and Recombination Dynamics of Chlorine Doped Hybrid Perovskite Single Crystals

L. T. Mix, D. Ghosh, J. Tisdale, M. C-. Lee, K. O'Neal, **N. Sirica**, A. Neukirch, W. Nie, A. J. Taylor, R. P. Prasankumar, S. Tretiak, D. A. Yarotski

*Journal of Physical Chemistry Letters* **11**, 8340 (2020)

Multi-beam X-ray ptychography for high-throughput coherent diffraction imaging

Y. Yao, Y. Jiang, J. A. Klug, M. Wojcik, E. R. Maxey, **N. Sirica**, C. Roehrig, Z. Cai, S. Vogt, B. Lai, and J. Deng

*Scientific Reports* **10**, 19550 (2020)

Tracking Ultrafast Photocurrents in the Weyl semimetal TaAs using THz Emission Spectroscopy

**N. Sirica**, R.I. Tobey, L.X. Zhao, G.F. Chen, B. Xu, R. Yang, B. Shen, D.A. Yarotski, P. Bownan, S.A. Trugman, J.X. Zhu, Y.M. Dai, A. K. Azad, N. Ni, X.G. Qiu, A.J. Taylor, and R.P. Prasankumar

*Physical Review Letters* **122**, 197401 (2019)

Electronic structure of the chiral helimagnet and 3d intercalated transition metal dichalcogenide  $\text{Cr}_{1/3}\text{NbS}_2$

**N. Sirica**, S. -K. Mo, F. Bondino, I. Pis, S. Nappini, P. Vilmercati, J. Yi, Z. Gai, P.C. Snijders, P. Das, I. Vobornik, N. Ghimire, M. R. Koehler, L. Li, D. Sapkota, D. Parker, D. G. Mandrus and N. Mannella

*Physical Review B* **94**, 075141 (2016)

Spectroscopic Evidence for Strong Quantum Spin Fluctuations with Itinerant Character in  $\text{YFe}_2\text{Ge}_2$

**N. Sirica**, F. Bondino, S. Nappini, I. Piš, L. Poudel, A. D. Christianson, D. G. Mandrus, D. J. Singh and N. Mannella

*Physical Review B* **91**, 121102(R) (2015)