Ryan Stadel

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EDUCATION

B.S., Professional Physics, *cum laude*, Northern Illinois University, DeKalb, IL 2014

Ph.D. Physics, Northern Illinois University, DeKalb, IL June 2021

Postdoctoral Fellowship, University of Maryland, Dept. of Chemistry & Biochemistry - Rodriguez Group, College Park, MD 2021 (current)

SPECIAL PROGRAMS

19th National School on Neutron and X-ray Scattering August 2017 Argonne National Laboratory, Lemont, IL & Oak Ridge National Laboratory, Oak Ridge, TN

7th School on Representational Analysis of Magnetic Structures June 2018 University of Maryland, College Park, MD

TEACHING EXPERIENCE

PAL Tutor, Northern Illinois University, 2012-2014
Northern Illinois University
Courses: All undergraduate general education math and science courses

Teaching Assistant, Northern Illinois University, 2014-2015
Courses: General Physics, Electricity and Magnetism

RESEARCH EXPERIENCE

- Graduate Researcher, Argonne National Laboratory, 2015-2021
- Postdoctoral Researcher, University of Maryland, 2021-present
- Solid state synthesis of various crystalline and polycrystalline materials
- Synchrotron x-ray diffraction/reactor & spallation neutron diffraction
- Rietveld refinement of nuclear and magnetic structures
- Magnetic susceptibility measurement and data analysis
- EDX (energy dispersive x-ray) measurement and analysis

- Resistivity measurement and data analysis
- Muon spin resonance measurement and data analysis
- Laboratory safety officer

PRESENTATIONS

"Mapping the Superconducting AFM C_4 Phase in Iron-Pnictides" Oral presentation at the American Physical Society March Meeting 2017.

"Structure-Based Phase Diagram of $LaFeAs_{1-x}P_xO$." Oral presentation at the American Physical Society March Meeting 2018.

"Multiple Distinct Magnetic and Superconducting Phases in $LaFeAs_{1-x}P_xO$ 1111 Characterized Via X-ray and Neutron Diffraction." Oral presentation at the American Physical Society March Meeting 2019.

"Stalking Novel Magnetic Phases Through the Iron-Pnictide Superconductors." Invited oral presentation at ISIS, Rutherford Appleton Laboratory 2019.

"Multiple Magnetic Phases Hiding in Plain (and Out-of-Plane) Sight in Coexistence with Superconductivity in $LaFeAs_{1-x}P_xO$ 1111 System." Oral presentation at the American Physical Society March Meeting 2020.

"Suppression of Long-Range Magnetic Order Accompanying Structural Transition in $TbFeAs_{1-x}P_xO$." Oral presentation at the American Physical Society March Meeting 2021.

PUBLICATIONS

R. Stadel, M. Christensen, R. Fernandes, D.D. Khalyavin, P. Manuel, S. Lapidus, D. Phelan, D.Y. Chung, R. Osborn, and S. Rosenkranz, and O. Chmaissem "Multiple magnetic orders in LaFeAs1-xPxO uncover universality of iron-pnictide superconductors." *Commun Phys* **5,** 146 (2022)

R. Stadel, K. M. Taddei, R. DeRose, M. Krogstad, I. Zahir, D. Phelan, D.Y. Chung, R. Osborn, and S. Rosenkranz, and O. Chmaissem (2021) "Synthesis and Properties of High-Quality $Ba_{1-x}Na_xFe_2As_2$ Single Crystals." *Physical Review X, submitted*

R. Stadel, D.D. Khalyavin, P. Manuel, Z. Qiang, S. Lapidus, D. Phelan, D.Y. Chung, R. Osborn, and S. Rosenkranz, and O. Chmaissem (2021) "Weak Long-Range Magnetic Order in $TbFeAs_{1-x}P_xO$." *In preparation – nearly complete*

O. Chmaissem, **R. Stadel**, K. M. Taddei, D. Bugaris, D.D. Khalyavin, P. Manuel, S. Lapidus, D.Y. Chung, M.G. Kanatzidis, H. Claus, R. Osborn, and S. Rosenkranz (2021) "Scaling and Disorder-Induced Universality of Hole-Doped Iron-Based Superconductors." *Physical Review Letters, submitted*

B. A. Frandsen, K. M. Taddei, D. E. Bugaris, **R. Stadel**, M. Yi, A. Acharya, R. Osborn, S. Rosenkranz, O. Chmaissem, and R. J. Birgeneau. (2018). "Widespread orthorhombic fluctuations in the **(Sr, Na)Fe_2As_2** family of superconductors." *Physical Review B*, volume 98, 180505.

B. A. Frandsen, K. M. Taddei, M. Yi, A. Frano, Z. Guguchia, R. Yu, Q. Si, D. E. Bugaris, **R. Stadel**, R. Osborn, S. Rosenkranz, O. Chmaissem, and R. J. Birgeneau. (2017) "Local Orthorhombicity in the Magnetic C4 Phase of the Hole-Doped Iron-Arsenide Superconductor **$Sr_{1-x}Na_xFe_2As_2$**" *Physical Review Letters,* volume 119, 187001.

K. M. Taddei, J. M. Allred, D. E. Bugaris, S. Lapidus, M. J. Krogstad, **R. Stadel**, H. Claus, D. Y. Chung, M. G. Kanatzidis, S. Rosenkranz, R. Osborn, and O. Chmaissem. (2016). "Detailed magnetic and structural analysis mapping a robust magnetic **C_4** dome in **$Sr_{1-x}Na_xFe_2As_2$**" *Physical Review B*, volume 93, 134510.

AWARDS

Dissertation Completion Fellowship, Northern Illinois University (2020-2021)

RELEVANT SKILLS

Safe material synthesis of volatile, toxic, and carcinogenic compounds
Safe mixing and handling of acids
Delicate manipulation of crystals < 10 μm^3 under microscope
Operation of x-ray diffractometer (XRD)
Operation of magnetic properties measurement system (MPMS)
Operation of transmission electron microscope (TEM)
Operation of energy-dispersive X-ray spectroscopy instrument (EDX)
Handling and refilling of cryogenic liquids
Arc-welding in inert atmosphere
Glasswork of quartz (melting point ~1650°C) under pressure differential
Polycrystal and crystal x-ray and neutron diffraction
Solving magnetic structures from powder diffraction with limited reflections
DAC (diamond anvil cell) sample mounting for high pressure diffraction (x-ray and neutron)
Muon spin resonance (μSR) experiment and data analysis
Nuclear and magnetic Rietveld refinement using GSAS, GSAS-II, and FullProf