Matthew J. Frost

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Education

The University of Tennessee, Knoxville — **Knoxville, TN, USA**
Doctor of Philosophy in Physics and Astronomy — *December 2019*
Advisor: *Yuri Kamyshkov*
Dissertation Title: *Searching for Baryon Number Violation at Cold Neutron Sources.*

The University of Wisconsin-Madison — **Madison, WI, USA**
Master of Science in Nuclear Engineering and Engineering Physics — *May 2007*
Advisor: *Raymond J. Fonck*

Kent State University — **Kent, OH, USA**
Bachelor of Science in Physics — *May 2005*
Advisor: *D. Mark Manley*

Scientific Experience

US Department of Energy, Office of Basic Energy Sciences — **Oak Ridge, TN, USA**
Program Manager Detailee, Scientific User Facilities Division — *2023-Present*

- **Administered reviews for Small Business Innovation Research (SBIR) proposals during FY23-25.**
- **Developed content and language for SBIR proposal calls specifically dedicated to advancing neutron instrument technologies for scattering applications.**
- **Advised lead Program Managers in neutron instrumentation technologies, applications and scientific results at large-scale neutron scattering user facilities.**

Oak Ridge National Laboratory — **Oak Ridge, TN, USA**
Research Scientist, Neutron Technologies Division — *2020-Present*

- **Involved in the troubleshooting of thermal neutron scattering instrumentation at the SNS and HFIR, specifically towards the improvement of background and beam intensity performance.**
- **Supported novel experimental applications of existing neutron scattering instruments in support of advanced materials and nuclear physics research programs supported by the US Department of Energy.**
- **Mentored undergraduate students through the RSI and SULI student internship programs.**
- **Developed methods to characterize incident beams on scattering instruments at both the High Flux Isotope Reactor and the Spallation Neutron Source.**
- **Refined beam guide designs for proposed neutron scattering instrumentation at the High Flux Isotope Reactor and the Spallation Neutron Source.**
- **Performed scattering experiments towards the development of novel neutron instrumentation techniques and technologies.**
- **Utilized a virtualized, scalable computing cluster to perform complex Monte Carlo neutron ray-tracing simulations.**

Scientific Associate, Neutron Sciences Directorate — *2007-2020*

- **Lead science support activities at the VULCAN Engineering Materials Diffractometer**
- **Developed and implemented thermal-neutron scattering instrument improvements**
- **Supported concept development and assisted with calculations and testing of proposed optical designs for the VULCAN-X instrument upgrade.**
- **Developed and installed novel instrumentation for beam characterization**
- **Contributed to the design and development of two world-class neutron scattering instruments**

The University of Tennessee-Knoxville **Knoxville, TN, USA**
Graduate Research Assistant, Department of Physics and Astronomy *2013-2018*

- **Developed neutron transport simulations towards the design of a large-scale particle physics experiment**
- **Analyzed simulation results to guide future development and optimization of neutron sources, neutron optics, and annihilation targets for fundamental neutron physics experiments**
- **Collaborated in the development, simulation, and feasibility of new experiment concepts at neutron sources that can provide insight into Beyond Standard Model theoretical physics concepts of mirror-matter**
- **Developed computer simulations describing the multiple small-angle scattering of neutrons off of surfaces made of a nanoparticle composite**

The University of Wisconsin-Madison **Madison, WI, USA**
Graduate Research Assistant, Department of Engineering Physics *2005-2007*

- **Analyzed spectroscopy and emissivity data pertinent to plasma stability and control**
- **Assisted in daily operations of a university-level experiment while gaining valuable experience in instrumentation circuit design and repair and data analysis**

A detailed publication history can be found at http://orcid.org/0000-0001-6821-170X.