

Research Associate – Fixed Term

Position Summary

The [National Superconducting Cyclotron Laboratory \(NSCL\)](#) invites applications from outstanding candidates for a fixed-term research associate (Postdoctoral Researcher) position in the area of experimental nuclear science, who will work in the research group of Prof. Ringle.

The successful candidate will primarily work on hardware developments and experiments related to the [LEBIT](#) facility, which is used to perform high-precision mass spectrometry on rare isotopes produced at the NSCL now, and FRIB in the future. The LEBIT group is very active, typically performing multiple rare isotope measurements per year, as well as mass measurements of naturally occurring isotopes of scientific interest. The range of science topics addressed by these measurements is broad, including nuclear structure, nuclear astrophysics, fundamental interactions, highly-forbidden decays, etc. The new Single-Ion Penning Trap (SIPT) project will enable mass measurements with a single ion using the Fourier Transform Ion Cyclotron Resonance (FT-ICR) technique. SIPT is in the final stages of commissioning and will be available for first rare-isotope measurements in the near future. An additional technical development currently underway is the implementation of the Phase Imaging Ion Cyclotron Resonance (PI-ICR) technique, which will offer improved resolution in shorter times. A collision-induced-dissociation gas cell (CID GC) demonstrator is currently being developed to improve the purity of beams delivered to LEBIT and other experiments sensitive to molecular contaminants. There is no shortage of opportunities to perform cutting-edge science with LEBIT that can't be done anywhere else in the world.

NSCL is one of the world's flagship nuclear science research facilities. The Laboratory's research program is broad: fast, stopped, and reaccelerated beams of rare-isotopes are available to address key scientific questions concerning the creation of the elements in the cosmos, the limits of nuclear stability, the properties of nuclei with extreme neutron-to-proton ratios, and the equation of state of neutron-rich nuclear matter as it may exist inside neutron stars. Postdoctoral researchers play an important role in expanding, improving and utilizing the world-class experimental capabilities at the Laboratory. Experimentalists often work closely with theorists in the Laboratory and beyond and projects can involve high-performance computing.

NSCL is part of the [Facility for Rare Isotope Beam \(FRIB\)](#) Laboratory, which aspires to become the world's leading laboratory for education and research in rare isotope science, in accelerator science, and in applications of rare isotopes to meet societal needs. To realize this vision, the FRIB Laboratory builds on the expertise and the achievements of NSCL as it establishes FRIB, which will extend the frontier of nuclear science through unprecedented discovery potential.

This Research Associate position is initially offered through 09/31/22, depending on the availability of funds. An extension of up to a total of three years is possible, subject to funding and satisfactory performance evaluations.

Besides the excellent research environment, the FRIB Laboratory offers a strong program for mentoring postdoctoral researchers in preparation for the next steps in their careers. You can read more in the [postdoc mentoring plan](#). Postdoctoral researchers play a role in running the Laboratory, from leading

forefront research to serving on important committees. They help supervise students and, for those interested, there are opportunities to engage with teaching and outreach.

NSCL is funded by the National Science Foundation through the Nuclear Physics program of the NSF Physics Division to be a national user facility with a mission to provide beams of rare isotopes for researchers from around the world. Hundreds of users come to Michigan State University each year to take advantage of our facilities and explore the inner workings of atoms and their role in the universe.

The FRIB Laboratory is a major administrative unit within Michigan State University, comprised of NSCL and the FRIB Project. MSU is establishing FRIB as a scientific user facility with financial assistance from the Office of Nuclear Physics in the U.S. Department of Energy Office of Science (DOE-SC).

MSU is one of the largest university campuses in the United States with a beautiful campus of 5,000 tree-filled acres. It has 17 degree-granting colleges and is a center for academic and research activities as well as the arts and athletics.

The campus sits between Lansing (Michigan's capital city) and East Lansing. The Lansing area has a population of 460,000 and offers lovely suburban areas, loft condos and other urban living opportunities as well as easy-to-get-to rural areas. A symphony orchestra, excellent health care, many community and professional theatres, rivers, lakes, outdoor festivals, close access to large cities and Lake Michigan make for a near-perfect living environment.

MSU is an affirmative action, equal opportunity employer and is committed to achieving excellence through cultural diversity. The University actively encourages applications and/or nominations of people belonging to under-represented groups. Job applicants are considered for employment opportunities and employees are treated without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, disability, or veteran status. The University actively encourages applications of women, persons of color, veterans, and persons with disabilities.

Required Qualifications

- Ph.D. in Nuclear Physics, Nuclear & Radiochemistry, Nuclear Astrophysics, or related fields
- High potential for excellence in research, as demonstrated through completed research projects and publications in peer-review journals
- Excellent communication skills to present approaches, plans, and findings as evidenced by presentations at conferences, workshops, or other professional meetings
- Solid knowledge of principles and techniques pertaining to nuclear and/or atomic science and experimental research, demonstrated by the preparation, execution, and analysis of experiments
- Demonstrable experience with the development of computer programs for the purpose of acquiring and analyzing data, ion optics simulations, and control systems for unique experimental equipment
- Demonstrable experience with the successful development of experimental instruments
- Strong interest in mass measurement experiments with rare isotope beams with applications in nuclear structure, nuclear astrophysics, and/or fundamental interactions, as described in the application for the position

Desired Qualifications

- Demonstrated experience with ion trap techniques used in nuclear science experiments
- Demonstrated experience with ion trap techniques used for high-precision mass spectrometry
- Demonstrated experience designing, building, and commissioning ion-trap-based experiments for any field

Required Application Materials

In the cover letter of their application applicants must highlight their interest in, and experience/expertise related to, the open position in the research group of Prof. Ringle. Applicants must provide a Curriculum Vita including a complete list of publications and presentations. Applicants must also provide contact information for three letters of recommendation.

To apply: please visit <http://careers.msu.edu>, search for posting number xxxxxx and follow the application process.

Special Instructions

Review of applications will begin immediately, and the search will continue until the position is filled. General questions regarding the position may be sent to the Associate Director for Experimental Research, Sean Liddick (liddick@nscl.msu.edu); specific research questions about this opportunity should also be sent to Prof. Ringle (ringle@nscl.msu.edu).

Further information

LEBIT: <https://groups.nscl.msu.edu/lebit/>

NSCL: <https://www.nscl.msu.edu/>

FRIB: <https://frib.msu.edu/>