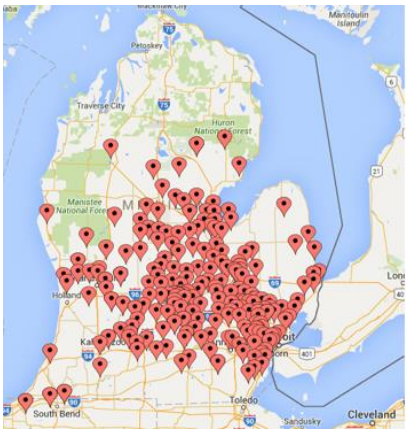
FRIB Importance for Michigan, America



The map points represent locations of employees of construction contractors who worked on the FRIB Project.

Michigan State University (MSU) operates the Facility for Rare Isotope Beams (FRIB) as a user facility for the U.S. Department of Energy Office of Science (DOE-SC), supporting the mission of the DOE-SC Office of Nuclear Physics to discover, explore, and understand all forms of nuclear matter. The establishment of FRIB was funded by DOE-SC, MSU, and the State of Michigan, and user facility operation is supported by the DOE-SC Office of Nuclear Physics.

Economic Impact in Michigan

FRIB spent and obligated $1,447 million in procurements and labor from January 2011 to January 2022, with $1,122 million, more than three-quarters, in Michigan, and more than 94 percent in the United States. FRIB uses a best-value procurement approach as required by federal regulations. Michigan has proven to be a great resource, and a strong regional skilled workforce supported civil construction.

The MSU Center for Economic Analysis attributes the following to FRIB construction activity (FY2009-FY2021) and a 20-year operational phase:

- FRIB will sustain hundreds of permanent jobs during operations.
- FRIB is expected to generate accumulated wages of $1.7 billion and add $4.4 billion to Michigan's economy during operations.
- The state's $94.5 million investment in FRIB is expected to generate $205 million in tax revenues and $830 million in higher gross state product, or the total market value of all goods and services produced in Michigan, through 2040.
- About 2,000 workers contributed to FRIB's construction.

Learn more at frib.msu.edu

Science

FRIB will transform the nuclear science landscape by providing intense beams of rare isotopes (short-lived nuclei not normally found on Earth). Hosting the most powerful heavy-ion accelerator, FRIB will enable scientists to make discoveries advancing our knowledge of the physics of atomic nuclei, nuclear astrophysics, fundamental interactions, and practical applications of rare isotopes benefiting society in fields such as medicine, materials science, national security, and industry.

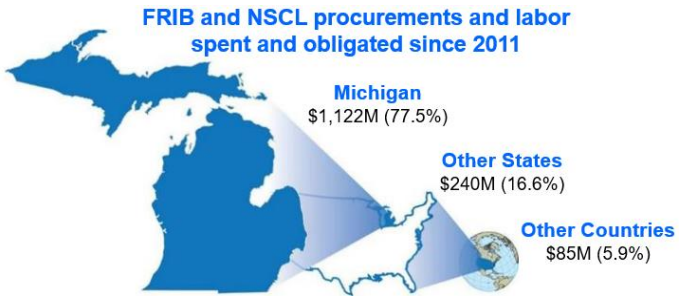
Talent Accelerator

As the only DOE-SC user facility of its kind located on a university campus, FRIB is uniquely positioned to develop the next generation of U.S. science and technical talent.

FRIB will be a magnet for top students in nuclear physics. MSU is home to the No. 1 nuclear physics graduate program (U.S. News and World Report, since 2010).

FRIB also will be a top facility for students studying accelerator science, cryogenic engineering and radiochemistry, all areas identified in federal advisory panel reports as in short supply for the nation, and critical to U.S. economic competitiveness, energy security, nuclear security, and nonproliferation efforts.

FRIB collaborates with the College of Natural Science and the College of Engineering to attract the best and brightest students into accelerator science and engineering.



Isotope Harvesting

A critical new area of opportunity for researchers and innovative businesses is isotope harvesting. During routine operation for its nuclear physics mission—without interfering with FRIB's primary users—extra, unused isotopes can be "harvested" using additional tools and infrastructure. FRIB will be the only place to in the nation to obtain these. FRIB isotope harvesting offers a fast development path for any rare isotope, leading to innovations and funding opportunities. Rare isotopes have a role in multiple fields of study, such as medicine, biochemistry, materials science, horticulture, and astrophysics. Isotope harvesting at FRIB is recommended by the Nuclear Science Advisory Committee Isotopes Subcommittee. The DOE Isotope Program has provided $13 million to build FRIB's isotope-harvesting capabilities.

Single Event Effects Test Facility

FRIB's Single Event Effects (SEE) Test Facility uses energetic and penetrating heavy-ion beams to measure the response of electronic components to such ions. This simulates in a few minutes the effect of cosmic rays on electronics over decades. SEEs are caused when a single particle deposits enough energy to cause an effect in a device. Such effects could lead to device failure or other errors in systems on Earth, in airplanes, or in spacecraft. The high ion energy allows testing to be done in air, rather than in vacuum, simplifying issues such as part cooling and access.

Innovation and Economic Engine

FRIB supports multi-disciplinary collaboration, affords opportunities to generate new intellectual property, and stimulate external investment. FRIB will enable scientists to perform research and further development in industry and in the national interest. Past discoveries in nuclear science have enabled important advances in medical technology, like MRI and PET machines; smoke detection in homes to keep families safe; and cell phone technology.

FRIB provides leadership in applying accelerator technology to the sciences and developing technology required to operate the most powerful superconducting, heavy-ion accelerator.

FRIB will also provide economic benefits as a research destination and will improve quality of life for Michigan residents through discoveries with medical and industrial applications. FRIB will attract important private-sector economic development, as has happened around other national labs. MSU works closely with local economic developers to ensure they are aware of FRIB and its potential.

Nuclear Science Leadership

Discoveries at FRIB will transform our understanding of nature. FRIB addresses science's most important questions related to the stability, composition, reactions, and applications of atomic nuclei.

FRIB will provide researchers with more than 1,000 new rare isotopes never before produced on Earth. This will enable researchers to answer key scientific questions, ranging from the origins of stars and the universe to how to diagnose and cure diseases, optimize nuclear reactors, and destroy nuclear waste.

FRIB will become the best place for rare isotope research, and it has the potential to enable major discoveries. The goal of research at FRIB is a comprehensive theory of atomic nuclei, leading to major benefits and new opportunities.

For More Information

Contact FRIB
Senior Communications Manager
Karen King
kingk@frib.msu.edu
517-908-7262

MICHIGAN STATE UNIVERSITY
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