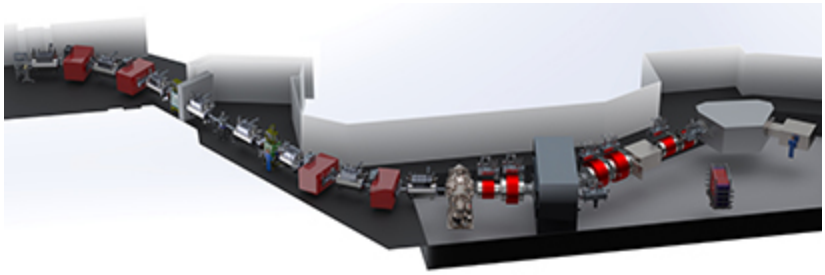
LABORATORY
UPDATE for ALUMNI
FRIB
October
2024

High Rigidity Spectrometer HTBL subproject advances to next review stage



The U.S. Department of Energy Office of Science (DOE-SC) Office of Project Assessment (OPA) held a review to assess the High Rigidity Spectrometer High Transmission Beam Line (HRS-HTBL) readiness for Critical Decision (CD) 2/3. The review committee recommended proceeding to the CD-2/3 review for the HRS-HTBL subproject of the HRS project.

The other subproject of the HRS project – the Spectrometer Section (HRS-SPS) – is scheduled for a CD-2/3A readiness review in October 2025.

CD-2/3 is part of the DOE's four-step staged project-approval process. CD-2 marks the approval of the subproject's performance baseline scope, cost and schedule, while CD-3 indicates that the subproject is approved to start execution.

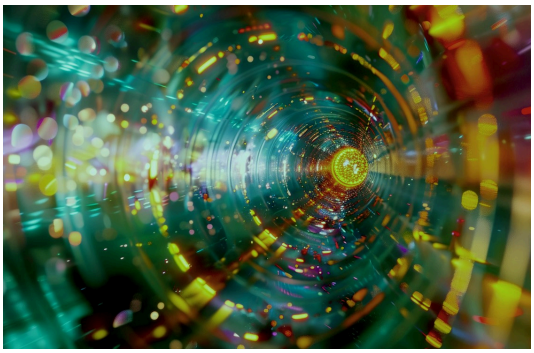
The review committee was organized into six subcommittees, and FRIB staff gave 17 presentations. The committee answered all seven charge questions affirmatively.

HRS will extend FRIB's scientific reach to neutron-rich isotopes by up to a factor of about 100. HRS will enable scientists to characterize the properties of

isotopes that are created in rare-isotope reactions produced at about 50 percent of the speed of light. With the ability to measure properties such as the mass, charge, and velocity of rare isotopes produced in those conditions, HRS will be a centerpiece experimental instrument of FRIB's fast-beam program that will substantially increase FRIB's scientific reach and productivity. A user community of over 500 scientists is expected for HRS.

Read more about HRS

FRIB achieves milestones on path to increasing beam intensity



FRIB achieved a pair of milestones recently, delivering the world's highest heavy-ion beam power and simultaneously accelerating five charge states of particle beams. These milestones further advance FRIB's commitment to meeting the needs of the scientific community.

Read more

U.S. Department of Energy Office of Science presents the Facility for Rare Isotope Beams with Secretary of Energy's Achievement Award

Dr. Linda L. Horton, U.S. Department of Energy Office of Science (DOE-SC) Associate Deputy Director for Science Programs and acting Associate Director of the DOE-SC Office of Nuclear Physics (DOE-SC NP), presented a DOE Secretary of Energy Achievement Award—DOE's highest recognition for team achievements—to the FRIB Project team on 8 October. The project team designed and established FRIB—on budget and ahead of schedule. Michigan State University now operates FRIB as a user facility for DOE-SC, with financial support from and furthering the mission of DOE-SC NP.

Read more

French ambassador visit to FRIB highlights global efforts to advance forefront science, foster international relations

Laurent Bili, the Ambassador of France to the United States, visited FRIB on 22 July. In addition to marking the activities of the International Research Laboratory on Nuclear Physics and Astrophysics (IRL NPA) at MSU after one year, Bili's visit centered on highlighting the ongoing France and U.S. efforts that advance forefront science and foster positive international relations and global impact, including many MSU/France initiatives, collaborations, and programming. IRL NPA is permanently staffed with French scientists dedicated to answering fundamental nuclear physics and astrophysics research questions. CNRS, an interdisciplinary public research organization under the administrative supervision of the French Ministry of Higher Education and Research, has nearly 80 international research laboratories worldwide, and IRL NPA at FRIB is the first dedicated to nuclear physics and astrophysics.

Read more

Low Energy Community Meeting

The 2024 Low Energy Community Meeting (LECM) took place on 7-9 August in Knoxville, Tennessee. Over the course of the three days, 250 participants from 65 institutions and eight countries attended the meeting. LECM 2024 included plenary

sessions, four parallel working group sessions that included 17 individual working groups, and four workshops: Modular Neutron Array (MoNA) collaboration, fission studies with rare isotope beams, early careers, and public engagement. Read more

Betty Tsang receives Glenn T. Seaborg Award for Nuclear Chemistry

Betty Tsang, professor of nuclear science at FRIB, has been selected as the 2025 recipient of the American Chemical Society (ACS) Glenn T. Seaborg Award for Nuclear Chemistry, sponsored by the ACS Division of Nuclear Chemistry and Technology. The Seaborg award recognizes and encourages research in nuclear and radiochemistry or their applications. Tsang will be presented with her award on 25 March 2025 at the ACS Spring 2025 meeting in San Diego, California.

Read more

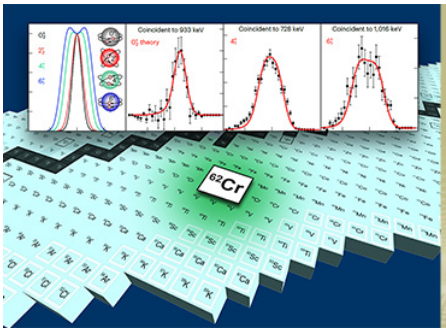
ALUMNI SPOTLIGHT

Terri Poxon-Pearson earned a PhD in nuclear physics from Michigan State University, and she was at the National Superconducting Cyclotron Laboratory (NSCL) from 2014-2020.

She is currently a physical scientist at the National Nuclear Security Administration (NNSA).

Read more

News



CHROMIUM-62 STUDY HELPS RESEARCHERS BETTER UNDERSTAND SHAPES AROUND ISLANDS OF INVERSION

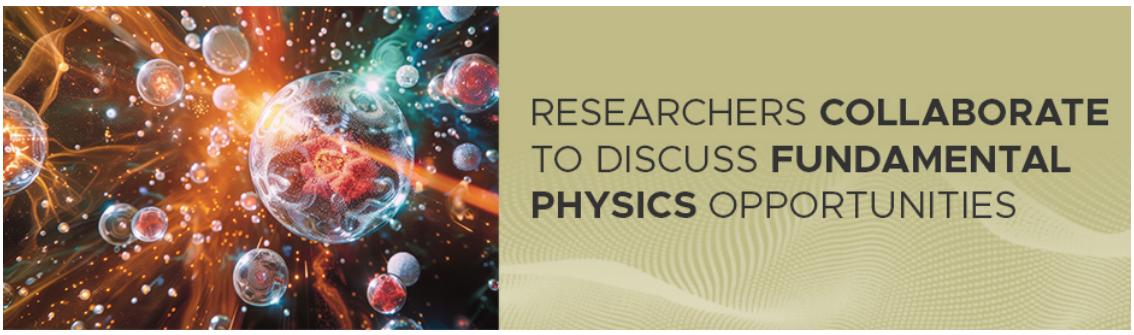
In a recent paper in *Nature Physics*, an international research collaboration used world-class instrumentation at FRIB to study the rare isotope chromium-62. Researchers used a gamma-ray spectroscopy experiment in tandem with theoretical models to identify an unexpected variety of shapes in chromium-62. The finding provides more insight into so-called “islands of inversion,” or regions in the nuclear chart where certain nuclides diverge from traditional viewpoints based on the properties of stable nuclei. The work involved the joint effort of 23 researchers with 12 different affiliations among them. Led by Alexandra Gade, professor of physics at FRIB and in MSU's Department of Physics and Astronomy and FRIB scientific director, the collaboration also included Robert Janssens, Edward G. Bilpuch Distinguished Professor at the University of North Carolina at Chapel Hill, and Brenden Longfellow, former FRIB graduate researcher and current staff scientist at Lawrence Livermore National Laboratory, as significant contributors.

Read more

FRIB/ARGONNE NATIONAL LABORATORY COLLABORATION ON SOLARIS INSTRUMENT BEARS FRUIT

Using the SOLenoid Spectrometer Apparatus for ReactIon Studies (SOLARIS), a research team created a reaction that added a neutron to silicon-32—a long-lived isotope—creating silicon-33 and comparing the experimental results with shell model calculations. Ben Kay, experimental nuclear-structure physicist at Argonne National Laboratory (ANL), and Daniel Bazin, research professor at FRIB, led the team. The first findings from SOLARIS experiments have been published in *Physics Letters B*.

Read more



Researchers from the California Institute of Technology; the Massachusetts Institute of Technology; the University of California, Santa Barbara; the University of York; University of Warsaw; and FRIB, among several others, collaborated to discuss the scientific motivations for studying radioactive molecules and recent advances in nuclear physics. The advances will provide the foundation for studying radioactive molecules at the facilities where the molecule production will occur. The team recently published its review in *Reports on Progress in Physics* (“Opportunities for fundamental physics research with radioactive molecules”).

Read more

MSU welcomes international artist Violeta López López of Ávila, Spain, as the fall 2024 MSUFCU Arts Power Up Artist in Residence. This new residency aims

to foster collaboration, exploration, experimentation and innovation, culminating in the creation of groundbreaking artworks at the intersection of art, science and technology.

Read more

Katharina Domnanich is helping set up a lab at FRIB that will provide a bounty of isotopes useful for medicine, plant science, and more.

Read more

In The News

Below are some recent FRIB-focused articles from selected outlets. For more, visit the FRIB website.

- **Reaching a new milestone in isotope studies**
  Phys.org: Scientists accelerate uranium beam with record power
- **Laboratory portrait of FRIB**
  Nuclear Physics News: The Facility for Rare Isotope Beams: Providing new opportunities for science
- **Undersecretary of Education visits FRIB**
  MSU Today: US Under Secretary of Education visits MSU to tour facilities, learn about programs
- **Answering fundamental questions about our origins**
  Phys.org: Experimental data help unravel the mystery surrounding the creation of heavy elements in stars

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Upcoming Events

Below is a list of upcoming events. For more, visit the FRIB website.

- 28 October-1 November – Dense Matter Equation of State from Nuclear Theory and Experiments Workshop
- 3 November – Advanced Studies Gateway at FRIB public Zoom talk: Chetan Nayak, technical fellow at Microsoft and professor of physics, UC Santa Barbara
- 24 November – Advanced Studies Gateway at FRIB public Zoom talk: Tracy Slatyer, Massachusetts Institute of Technology
- 6 December – Advanced Studies Gateway at FRIB public talk: David DeMille, University of Chicago
- 8 December – Advanced Studies Gateway at FRIB public Zoom talk: Doris Tsao, University of California Berkeley

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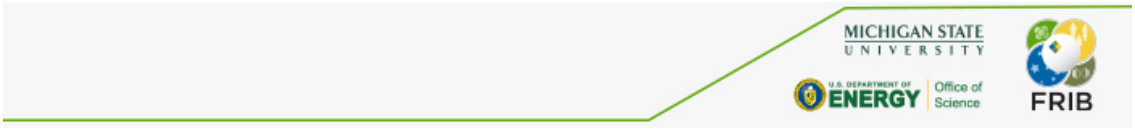
Update your information in FRIB Alumni Directory

The FRIB Laboratory has an alumni directory form to communicate with laboratory alumni and to track their career paths. Please take a couple of minutes to fill out or update the form by answering a few simple questions. This will ensure our records are accurate and build a more reliable network we hope you find useful. Visit the online alumni directory form to enter and update information.

We want to hear from you

Send us your story ideas! Let us know what you are up to! We want to feature at least one story each issue about you—our alumni, so please email us story tips about you and/or your fellow alumni to alumni@frib.msu.edu. Tell us about discoveries, business ventures, partnerships, awards, and other professional developments, and we may feature them in a future issue. Also let us know if there are other types of laboratory updates you'd like to see in future alumni issues.



Michigan State University operates FRIB as a user facility for the U.S. Department of Energy Office of Science (DOE-SC), with financial support from and furthering the mission of the DOE-SC Office of Nuclear Physics.

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