

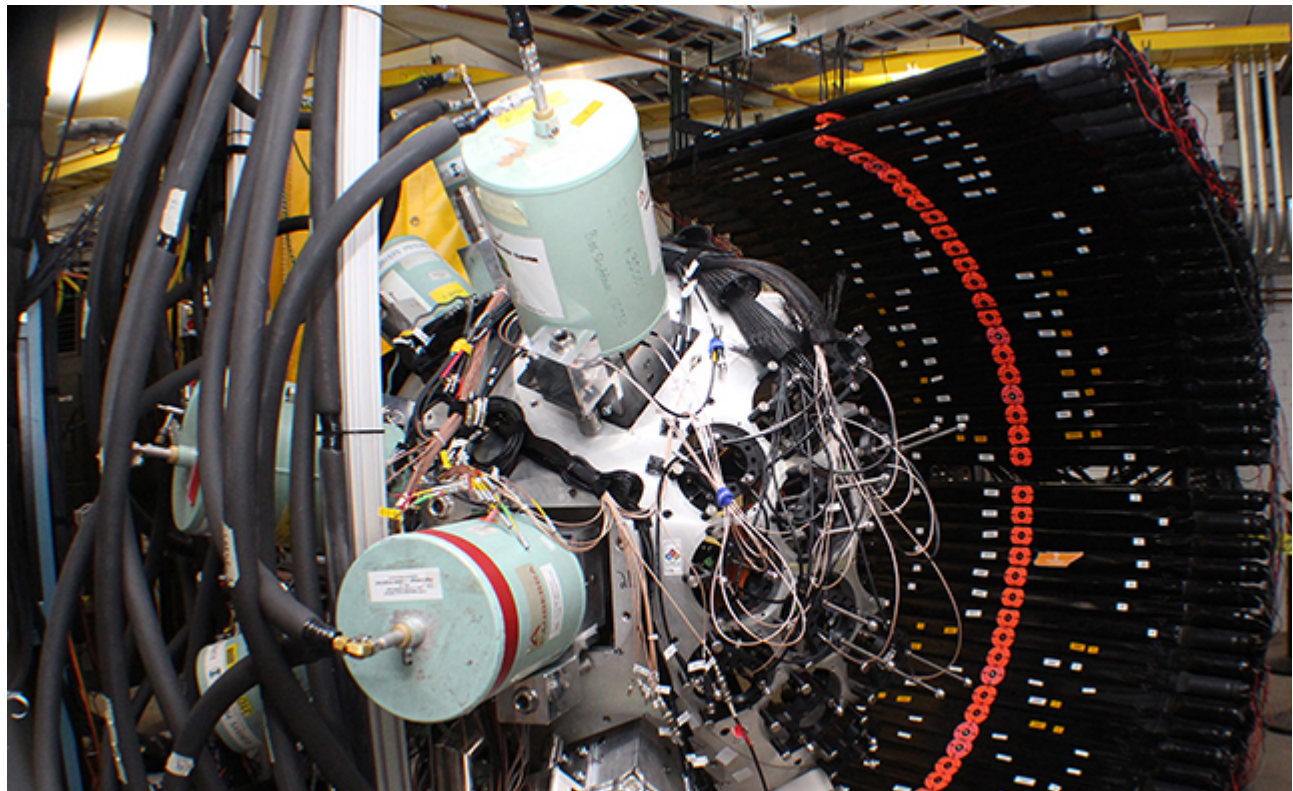
LABORATORY UPDATE for ALUMNI



Winter
2022



We hope all of you are doing well as we close 2022. As we look to 2023, we take a minute to pause and reflect on a year that included the completion of the FRIB Project, the start of FRIB user operation, completion of NSCL operations, and the start of the fee-for-service program with the FRIB Single Event Effects (FSEE) facility operational. [Read more](#)



Multi-institutional team publishes paper on first scientific experiment at FRIB

The first experimental result from FRIB was published in November in Physical Review Letters. In the [first experiment](#), a multi-institutional team of scientific users measured how long it takes for several kinds of exotic nuclei to decay. More than 50 participants from ten universities and national laboratories were involved in the first experiment. [Read more](#)

Read more:

- [FRIB experiment pushes elements to the limit](#) (Lawrence Berkeley National Laboratory)

- [FRIB experiment pushes elements to the limit](#) (Brookhaven National Laboratory)
- [Twitter feed highlighting article and related information](#) (Oak Ridge National Laboratory)
- [It may be possible to cram more neutrons into atomic nuclei than previously thought](#) (Science)
- [Half-lives of rare isotopes revealed](#) (Chemical & Engineering News)
- [How long can exotic nuclei survive at the edge of stability?](#) (Science Daily)

Event celebrates 40 years of science at NSCL

We celebrated "[40 Years of Science at NSCL](#)" on 12 August to recognize the impact of NSCL as an NSF-funded user facility. NSCL supported nearly 1,000 experiments resulting in 3,600 publications and almost 500 students receiving a doctoral degree. A similar number of postdoctoral researchers and undergraduates received equally valuable training. All NSCL employees have been transferred to FRIB completing the transition from NSCL to FRIB. [Read more](#)

NEWS CENTER

New MSU Space Electronics Center to benefit student research: At the new [MSU Space Electronics Center](#), a collaboration of [MSU's College of Engineering](#), FRIB, and [Texas Instruments](#), students and researchers will focus on the effects of ionizing radiation on electrical circuits and systems. Read more in the MSU College of Engineering's [article about the MSU Space Electronics Center](#).

FRIB400 update: The energy upgrade of the FRIB linear accelerator to 400 MeV/u for uranium (FRIB400) will double the reach of FRIB along the neutron dripline from Z=30 (zinc) to Z=60 (neodymium) into a region relevant for neutron-star crusts and to allow study of extreme, neutron-rich nuclei such as calcium-68. FRIB400 will expand the scientific impact of harvested isotopes by increasing the available yield of many isotopes by 10 times. The FRIB science community laid out the scientific opportunities in the [FRIB400 Whitepaper](#) that was subsequently endorsed at following Low Energy Community Meetings and most recently also as second resolution of the Nuclear Structure, Reactions, and Astrophysics Town Hall Meeting. Currently, selected sections of the whitepaper are being updated to prepare the document for submission to the NSAC Long Range Plan Writing Group.

FRIB invites scientific users to submit non-proprietary research proposals for second Program Advisory Committee: FRIB issued its second call for proposals on 28 October. With this call, FRIB invites proposals for beam time to be considered at the second [FRIB Program Advisory Committee's](#) (PAC2) meeting scheduled for 1-3 March 2023. The PAC is a group of international experts who review proposals for non-proprietary beam time requests submitted to FRIB. The PAC makes recommendations to the FRIB Laboratory Director about beam-time allocation. [Read more](#)

Rohlfing event/video: Joan Rohlfing, president and chief operating officer of the Nuclear Threat Initiative (NTI), gave a lecture titled "Pushing Nuclear Frontiers" on 6 October at the FRIB Laboratory. Rohlfing's lecture was part of MSU's Distinguished Nuclear Policy Lecture series. [Watch the video of Rohlfing's lecture.](#)

MIT team builds new laser spectroscopy system: Ronald Fernando Garcia Ruiz, an assistant professor at the Massachusetts Institute of Technology (MIT), and his team designed, fabricated, and installed a new laser spectroscopy system, the Resonant ionization Spectroscopy Experiments (RiSE), for use at FRIB. [Read more](#)

FRIB's year in review: For a video summary of the year's highlights, check out [FRIB's "A Year in Review: 2022" video.](#)

INSTRUMENT UPDATES

High Rigidity Spectrometer update: The High Rigidity Spectrometer (HRS) project is underway and will significantly extend FRIB's scientific impact, enabling broad science programs with the furthest reach at FRIB. New federal funding from the Inflation Reduction Act for FY23 allows us to baseline the project and start long-lead procurements. The

detailed design of HRS is currently ongoing. The HRS project has achieved mission need (CD-0) and alternative design selection and cost range (CD-1). The project goal is to achieve performance baseline (CD-2) in the next year.

TRAINING THE NEXT GENERATION

DOE grants enable FRIB graduate students to conduct doctoral thesis research at national laboratories:

Cristhian Gonzalez-Ortiz is a fourth-year physics graduate student studying under the support of FRIB's Accelerator Science and Engineering Traineeship program. As part of its education program for accelerator students, FRIB sends some to national laboratories in order to contribute to the development of the national workforce. Gonzalez-Ortiz is doing his doctoral thesis research at Fermi National Accelerator Laboratory. [Read more](#)

FRIB graduate students receive awards: Several FRIB graduate students received awards for their work at conference competitions, including the following.

- Madison Howard, a third-year physics graduate student, won a bronze award for best poster at the North American Particle Accelerator Conference in Albuquerque, New Mexico. Her poster was titled "Studying the Emission Characteristics of Field Emission Cathodes with Various Geometries."
- Duncan Kroll, a third-year mechanical engineering graduate student, won an outstanding student presentation at the American Society of Mechanical Engineers 2022 International Mechanical Engineering Congress and Exposition in Columbus, Ohio. His presentation was titled "Modeling Frost Formation in Freeze-out Purification of Gases for Cryogenic Applications."
- Cristhian Gonzalez-Ortiz, a fourth-year physics graduate student, was awarded the best student poster prize at the 2022 International Particle Accelerator Conference in Bangkok, Thailand. His poster was titled "Third-order Resonance Compensation at the FNAL Recycler Ring."

CONGRATULATIONS TO FRIB COMMUNITY

FRIB's Artemis Spyrou receives a 2022 Madame Figaro 'Women of the Year' award: Artemis Spyrou, a professor of physics at FRIB and in the MSU Department of Physics and Astronomy, recently received the 2022 Madame Figaro "Women of the Year" Award in the scientist/academic category. [Read more](#)

FRIB's Jie Wei receives 2022 Outstanding Faculty Award from the MSU College of Natural Science: Jie Wei, professor of physics at FRIB and in the MSU Department of Physics and Astronomy and FRIB's Accelerator Systems Division Director, received a 2022 Outstanding Faculty Award from the MSU College of Natural Science. [Read more](#)

FRIB's Nusair Hasan receives 2022 Roger W. Boom Award: The Cryogenic Society of America (CSA) has awarded Nusair Hasan, cryogenics staff engineer at FRIB, with the 2022 Roger W. Boom Award. The award is given "to a young professional (under 40 years of age) who shows promise for making significant contributions to the fields of cryogenic engineering and applied superconductivity." [Read more](#)

Visiting professor at FRIB awarded a grant by the Gordon and Betty Moore Foundation: Kyle Leach, associate professor of physics at the Colorado School of Mines and visiting professor at FRIB, was awarded a grant by the Gordon and Betty Moore Foundation. [Read more](#)

Members of FRIB user community named 2022 American Physical Society Fellows: Seven members of the FRIB user community have been named 2022 Fellows of the American Physical Society (APS): Daniel Bardayan (University of Notre Dame), Jose Crespo Lopez-Urrutia (Max Planck Institute for Nuclear Physics in Germany), Anna Frebel (Massachusetts Institute of Technology), Carla Fröhlich (North Carolina State University), Daniela Leitner (Lawrence Berkeley National Laboratory), Elizabeth Ricard-McCutchan (Brookhaven National Laboratory), and Andrew Steiner (University of Tennessee, Knoxville). [Read more](#)

FRIB graduate student receives DOE-SC grant: MSU graduate student Julie Butler is the recipient of a highly competitive U.S. Department of Energy (DOE) Office of Science Graduate Student Research Program (SCGSR) grant. [Read more](#)

ALUMNI SPOTLIGHT



Becky Lewis

Becky Lewis earned a PhD in nuclear chemistry from MSU, and she was at NSCL from 2014-2019.

She is currently the senior program manager for infrastructure at Zeno Power Systems in Washington, D.C. [Read more](#)

COMMUNITY ENGAGEMENT



Physics and dance event introduces grade-school students to FRIB

FRIB welcomed more than 1,000 attendees for a physics and dance event that included a performance and a variety of activities to explore dance and science on 3, 4, and 6 November. The performance and activities on 3 and 4 November were held for area schoolchildren, while the general public attended on 6 November. FRIB sponsored this event to attract non-science, technology, engineering, and math (STEM) students to FRIB to reach populations that don't normally identify with STEM. [Read more](#)

Read more:

- [Rare performance combines dance and physics](#) (WILX)
- [The science of dance: Performance combines physics, art after years of collaboration](#) (Lansing State Journal)

FRIB encourages scientific exploration

through outreach programs

FRIB's outreach programs this summer offered attendees the opportunity to explore the world of science. Elementary, middle-school, and high-school students, undergraduate college students, and science teachers participated in the activities. The programs are designed to excite attendees about nuclear science and to grow the nuclear science community as attendees progress in their educational paths.

This summer's outreach programs included:

- The Michigan State University (MSU) Department of Physics and Astronomy's Research Experiences for Undergraduates (REU) Summer Internship Program
- The MSU Gifted and Talented Education (GATE) Program's Gifted University for Parents and Precocious Youth (GUPPY) program
- MSU Extension's 4-H Exploration Days
- MSU GATE's Mathematics, Science, and Technology (MST) program
- FRIB's Physics of Atomic Nuclei (PAN) program
- FRIB's Physics of Atomic Nuclei Classroom Activities and Knowledge for Educators (PAN-CAKE) program
- FRIB's Physicists Inspiring the Next Generation: Exploring the Nuclear Matter (PING) program

Watch a video about [all of the summer outreach programs](#), and read more about [the Physics of Atomic Nuclei program](#).

IN THE NEWS

FRIB's work with chip testing and the liquid-lithium charge stripper received media attention. Below are some highlights from select outlets.

[Rare performance combines dance and physics](#) (WILX)

[The science of dance: Performance combines physics, art after years of collaboration](#) (Lansing State Journal)

[Innovative liquid-lithium charge stripper boosts accelerator performance](#) (Phys.org)

For more FRIB "In the News" items, visit the [FRIB website](#).

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.

LOOKING AHEAD

5 January 2023

Accelerator Readiness Review (ARR09): Held prior to FRIB seeking authorization to operate with a primary beam power of up to 5 kW. As the beam power is increased from 3 kW to 5 kW, higher rare isotope beam rates are available.

- 17-18 January 2023** **Isotope Harvesting U.S. Department of Energy Review:** Assesses the progress of the isotope-harvesting equipment installation. The equipment will allow the collection of unused isotopes that can be used for applications and other experiments.
- 1-3 March 2023** **Second FRIB Program Advisory Committee (PAC2) meeting:** Reviews proposals submitted in response to FRIB's second call for proposals. The PAC will recommend which of the submitted proposals should get beam time.
- 25-30 June 2023** **2023 International Conference on RF Superconductivity:** Provides a forum for scientists, engineers, students, and industrial partners to present and discuss the latest developments in SRF science, technology, and applications.

For more upcoming FRIB events, visit the [FRIB website](#).

THANK YOU TO OUR CONTRIBUTORS THIS ISSUE: Becky Lewis, Alexandra Gade, Remco Zegers, Richard York

The FRIB Laboratory Update for Alumni is published by the FRIB Laboratory and distributed via email. Please email questions, comments, address changes, story tips, contributions, or requests to unsubscribe from this list to alumni@frib.msu.edu. If you are in touch with other FRIB alumni, please forward this to them and invite them to contact us to subscribe.



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Michigan State University operates 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](#).