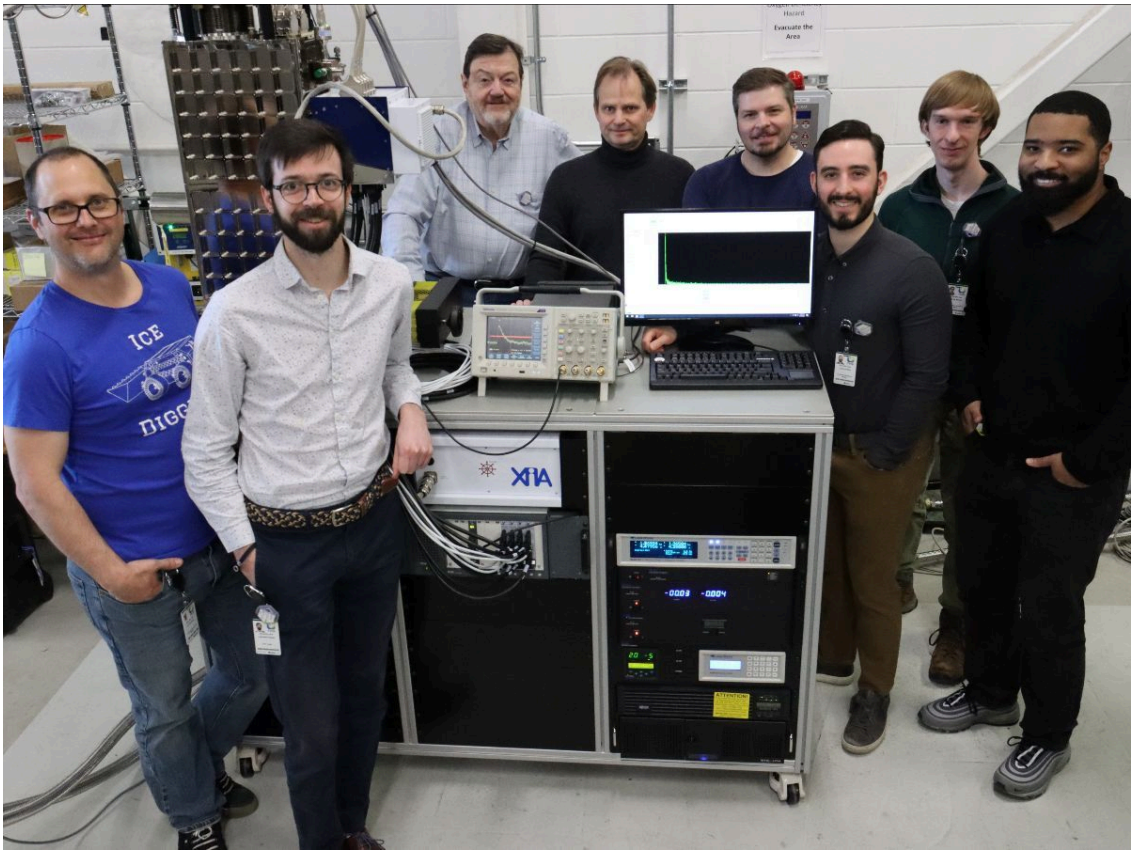
FRIB LABORATORY UPDATE for USERS June 2024

## SALER arrives at FRIB



*Pictured: The Superconducting Array for Low-Energy Radiation (SALER) team with first pulses from the Superconducting Tunnel Junction (STJ) array detector.*

The spectrometer for the Superconducting Array for Low-Energy Radiation (SALER), a scientific instrument project led by Colorado School of Mines, arrived at FRIB in March. The SALER spectrometer was developed by Star Cryoelectronics in partnership with the Colorado School of Mines and Lawrence Livermore National Laboratory. SALER will, for the first time, employ superconducting quantum sensors for fundamental symmetry tests through the precision detection of sub-keV nuclear recoils from short-lived rare isotopes.

FRIB's beam-stopping capability is the prerequisite for converting FRIB's high-energy rare isotope beams into high-quality lower-energy beams with FRIB's reaccelerator facility (ReA). SALER is one of the recent additions of scientific instrumentation in ReA that allows for the expansion of superconductor technology to search for a wide variety of exotic new physics making use of rare isotopes FRIB can provide.

*Read the Physics Today article about advances in precision-measurement techniques.*

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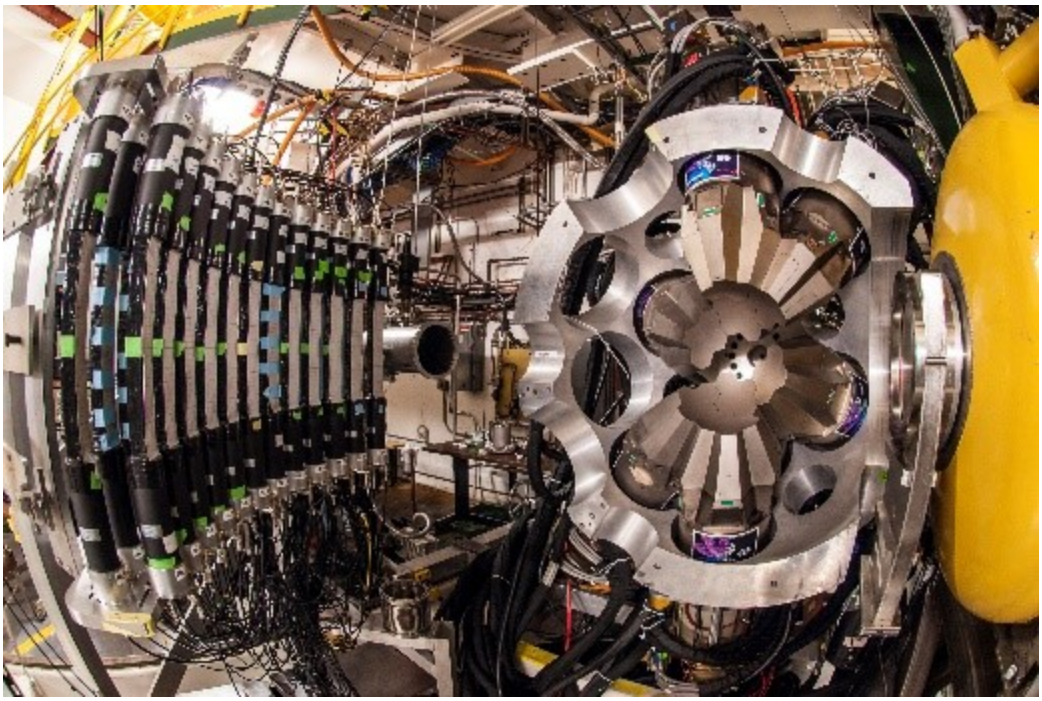

**GRETINA successfully delivers science at FRIB; GRETA to arrive soon**

The Gamma-Ray Energy Tracking In-beam Nuclear Array (GRETINA), combined with FRIB's large-acceptance high-resolution magnetic spectrograph S800, successfully delivered science up to summer 2024. GRETINA moved to Argonne National Laboratory for experiments there. In 2025, the new state-of-the-art gamma-ray detector array GRETA is anticipated to arrive at FRIB and brought into operations for experiments with fast and reaccelerated beams. New capability will arise with the FRIB Accelerated-beams for Understanding Science and Technology (FAUST) instrument. FAUST is the United Kingdom-funded project led by the University of Surrey for a new multi-configuration Si-based (CsI-backed) charged-particle detector. In conjunction with GRETA, the added detection capability for light charged particles will benefit many and enable new experiments at S800.

## Summer shutdown to prepare for future user experiments

The final installation of beamlines to the S1 and S2 fast beam vaults, including cryo-distribution, will start during the summer shutdown at FRIB. The beamlines are planned to be operational for experiments in early 2025. In addition, the S1 vault will become the new home for the FRIB Decay Station Initiator (FDSi). The S2 vault preparation for accommodating the magnet sweeper and the Modular Neutron Array/Large multi-Institutional Scintillator Array (MoNA/LiSA) is ongoing, while the magnet sweeper is planned to be moved into the S2 vault by the end of September.


The FRIB Users Organization Executive Committee and the FRIB Theory Alliance Executive Board have announced the winners of the 2024 FRIB Achievement Award for Early Career Researchers: Timothy Gray from the University of Tennessee, Knoxville for the experimental award, and Chloë Hebborn from FRIB for the theory award. READ MORE


Yassid Ayyad from the University of Santiago de Compostela in Spain and Erich Leistenschneider from Lawrence Berkeley National Laboratory are the award recipients for the 2024 FRIB Visiting Scholar Program for Experimental Science. READ MORE

## FRIB Theory Alliance hosts topical program at FRIB

FRIB hosted the FRIB Theory Alliance (FRIB-TA) topical program titled "The path to superheavy isotopes" 3-14 June.

Thirty-three participants joined to address the current challenges creating superheavy elements. This included exploring new methods for populating this region of the periodic table using modern theoretical tools. The program also concentrated on research that can be studied along the pathway to the superheavy region, including reactions only possible at rare-isotope beam facilities like FRIB.

Theorists and experimentalists in nuclear structure and reactions attended the conference, and participants ranged from undergraduate students to faculty members.

This is the ninth FRIB-TA topical program, which started in 2018 and are hosted at FRIB. The topical programs bring together theorists and experimentalists to address issues relevant for FRIB. The researchers discuss issues, identify strategies, and collaborate on solutions. At the end of each program, the researchers produce a deliverable.

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## FRIB User Organization Update

*by Andrew Ratkiewicz, FRIBUO Chairperson, Lawrence Livermore National Laboratory*

**FRIB Users Organization holds annual election**

The FRIB Users Organization elected three new members of the executive committee in January. The new general member is Andrea Richard (Ohio University). Steven Pain (Oak Ridge National Laboratory) was elected to the Operations Subcommittee, which focuses on FRIB operations, and Chloë Hebborn was elected as the Theory Representative. The FRIB Users Organization also voted to adopt a Code of Conduct and to add a seat to the executive committee for postdoctoral researchers. This new seat will be filled in the upcoming election, which will be held in fall 2024.

The new members of the executive committee replace Kyle Brown (Michigan State University), Augusto Macchiavelli (Oak Ridge National Laboratory), and Ragnar Stroberg (Notre Dame). The FRIB Users Organization Executive Committee thanks them for their service. The executive committee also thanks all the candidates of the 2024 elections.

**FRIBUO members on Capitol Hill for Nuclear Physics DC Day**

In April, members of the FRIB Users Organization were among those who participated in the annual Nuclear Physics DC Day to advocate for robust funding for nuclear physics. Researchers and their students from 21 states met with more than 50 legislative offices, representing all five community user groups: RHIC, EIC, ATLAS, FRIB, and JLAB.

FRIBUO members met with elected officials and congressional staff to emphasize the importance of nuclear physics research and to encourage support of the priorities outlined in the 2023 Long Range Plan. The FRIB Users Organization Executive Board thanks the participants in this important effort for their advocacy on behalf of low-energy nuclear physics.

**Low Energy Community Meeting to be held 7-9 August at the University of Tennessee-Knoxville**

The annual Low Energy Community Meeting will be held at the University of Tennessee, Knoxville, from 7-9 August. Registration is open until 15 July, and there is no registration fee. **New this year** there is limited support available to fund graduate student travel. The deadline to apply for this travel grant is 17 June.

The meeting will begin with several workshops on 7 August. Plenary talks, including presentations from the winners of the 2024 FRIB Achievement Award for Early Career Researchers, will be given on 8 August. The meeting will conclude on 9 August with presentations from funding agencies, FRIB, ATLAS, ARUNA, and the FRIB Theory Alliance.

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## News

**UK-funded FAUST project to enable new experiments at FRIB**
University of Surrey article details how sensors will shine new light on why stars

explode. READ MORE

**Collaboration fuels high-speed, data-intensive research to understand how nuclei decay**
A technical evaluation using data from a recent scientific-user experiment demonstrated how the U.S. Department of Energy's (DOE) Energy Sciences Network (ESnet) FRIB scientists to send large amounts of data across the country, analyze it in near real-time, and return results, enabling quicker data-informed experimental choices. READ MORE

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## In The News

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

- **Expanding the Periodic Table**
  *Scientific American:* Superheavy elements are breaking the periodic table
- **Solving quantum problems**
  *Phys.org:* New method of wavefunction matching helps solve quantum many-body problems

## Upcoming Events

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

- 17-28 July – Physicists Inspiring the Next Generation (PING 2024)
- 21-26 July – Physics of Atomic Nuclei (PAN) camp
- 12-14 August – FRIB Theory Alliance Summer School

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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.*

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