Emailing: FRIB Laboratory Update for Users

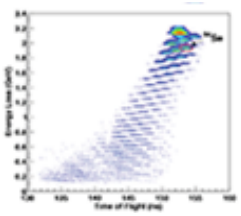
Zlotek, Amanda

Wed 12/22/2021 9:55 AM

To: Zlotek, Amanda <zloteka@frib.msu.edu>;

We hope all of you are doing well as we close 2021. As we head into the new year, we continue to focus on the remaining activity that will bring the FRIB Project to a close and begin the start of user operation in early 2022. **Read more**

MAJOR DEVELOPMENTS



FRIB PROJECT TEAM PRODUCES AND IDENTIFIES FRIB'S FIRST RARE ISOTOPES

On Saturday, 11 December, at 5:46 p.m., the FRIB Project team produced and identified the first rare isotopes in FRIB, including selenium-84 from a krypton-86 beam. This marks the demonstration of the last FRIB Key Performance Parameter required for project completion. **Read more**

TECHNICAL PROGRESS

FRIB COMMISSIONS LIQUID LITHIUM CHARGE STRIPPER IN LINEAR ACCELERATOR: FRIB has successfully commissioned its liquid lithium charge stripper installed in FRIB's linear accelerator (linac). FRIB is the first operating accelerator facility to use liquid lithium to charge-strip heavy-ion beams. The charge stripper helps FRIB's linac achieve design-goal beam energies beyond 200 MeV/u and beam power up to 400 kW. **Read more**

FRIB SETS RECORD FOR HIGHEST URANIUM BEAM ENERGY IN LINEAR ACCELERATORS: On 2 June, FRIB accelerated a uranium-238 beam ($^{238}U^{37+}$) to a beam energy of 20 million electron-volts per nucleon (MeV/u), setting a record for the highest uranium beam energy in linear accelerators (linacs). **Read More**

FRIB COMPLETES MAGNET INSTALLATION: In August, FRIB completed installing all of its magnets in the fragment preseparator. The fragment preseparator serves as the initial filter to purify the desired rare-isotope beam from unwanted beam particles. Two videos show some of the magnets being installed. In October, the five superconducting magnets in the fragment presparator were cooled to 4.5 kelvin. **Read more**

LABORATORY NEWS

FRIB CONNECTED TO WORLD'S FASTEST SCIENCE NETWORK – DOE'S ENERGY SCIENCES NETWORK

FRIB is now connected to the world's fastest science network, the U.S. Department of Energy's (DOE) Energy Sciences Network (ESnet). FRIB, Michigan State University Information Technology, and Lawrence Berkeley National Laboratory collaborated to connect FRIB to ESnet. The high-speed computer network is funded by the DOE Office of Science, serving DOE scientists and their collaborators around the world. **Read more**

UNIVERSITY OF SURREY AND FRIB RESEARCHERS EXPLORE ORIGIN OF ALUMINUM-26

Scientists from the University of Surrey and the FRIB Laboratory at MSU teamed up to explore the origin of aluminum-26, a rare isotope that offers a window into dying stars. Their findings, "Exploiting Isospin Symmetry to Study the Role of Isomers in Stellar Environments," were published in Physical Review Letters. **Read more**

ISOTOPE HARVESTING AT FRIB: Many useful unused isotopes will be created as byproducts of normal FRIB operation. Laboratory staff have researched the processes for recovering them and have shown it will be feasible. The experimental results allow them to model the processes and ensure safety in the design.

FRIB DATA SUPPORT FOR USERS: The FRIB data center will serve to enhance these scientific discoveries by promptly compiling, evaluating and disseminating all new data from FRIB, and will also establish procedures and effectively guide researchers to prepare/publish data. **Read more**

CAREERS AND OPPORTUNITIES FOR JUNIOR SCIENTISTS IN NATIONAL SECURITY AT THE NATIONAL LABORATORIES: Amy Lovell describes how her time at the laboratory prepared her for a career at Los Alamos National Laboratory. **Read more**

INSTRUMENT UPDATES

FRIB is preparing to commence science with fast, stopped, and reaccelerated beams in the PAC1 period. Equipment development continues and plans are in place to support all of the approved experiments. In preparation, two important milestones were met recently.

SECAR: The SEparator for CApture Reactions (SECAR) recoil separator project finished in 2020 and will be optimized for measurements of capture reactions of importance for nuclear astrophysics. The project has been completed and first experiments with ReA3 stand-alone operation have been performed.

SOLARIS: The SOLenoid spectrometer Apparatus for ReactIon Studies (SOLARIS) solenoidal spectrometer system is ready for PAC1 experiments. First ReA stand-alone experiments in AT-TPC mode as well as in Si-array mode with Argonne National Laboratory's Helical Orbit Spectrometer (HELIOS) detectors have been successfully completed.

FRIBUO AND FRIB-TA UPDATES

FRIB USERS ORGANIZATION: The FRIB Users Organization Executive Committee recently held its Low Energy Community Meeting. **Read more**

FRIB THEORY ALLIANCE: Recent updates from the FRIB Theory Alliance include news on its annual meeting, award recipients, and summer schools. **Read more**

CONGRATULATIONS TO OUR COMMUNITY MEMBERS

Four members of the FRIB user community have been named 2021 Fellows of the American Physical Society (APS): Jason Clark, Christian Forssen, Yury Litvinov, and Artemis Spyrou. Fellows are selected for their outstanding contributions to physics. **Read more**

The American Physical Society (APS) selected FRIB faculty member Paul Guèye as the 2022 Edward A. Bouchet Award winner. APS recognized Guèye for his "many seminal experimental contributions to understanding the structure of nuclear particles and decades of service to physics outreach, diversity and inclusion." **Read more**

FIRST WINNERS OF FRIB ACHIEVEMENT AWARD FOR EARLY CAREER RESEARCHERS NAMED: The FRIB Users Organization Executive Committee and the FRIB Theory Alliance Executive Board have announced the winners of the inaugural FRIB Achievement Award for Early Career Researchers. Jack Bishop, from Texas A&M University, and Wei Jia Ong, from Lawrence Livermore National Laboratory, are the co-recipients of the 2021 experimental award. FRIB Theory Fellow Christian Drischler, from Michigan State University, is the recipient of the 2021 theory award. **Read more**

FRIB THEORY ALLIANCE BRIDGE FACULTY MEMBER EARNS NSF CAREER AWARD: Sebastian König, an assistant professor of physics at North Carolina State University and FRIB Theory Alliance bridge faculty member, has received a Faculty Early Career Development Award from the National Science Foundation. **Read more**

DO YOU HAVE ADDITIONAL GOOD NEWS? LET US KNOW! Email communications@frib.msu.edu

REVIEW ROUNDUP

Reviews of FRIB progress, science, and initiatives continued remotely this year, including:

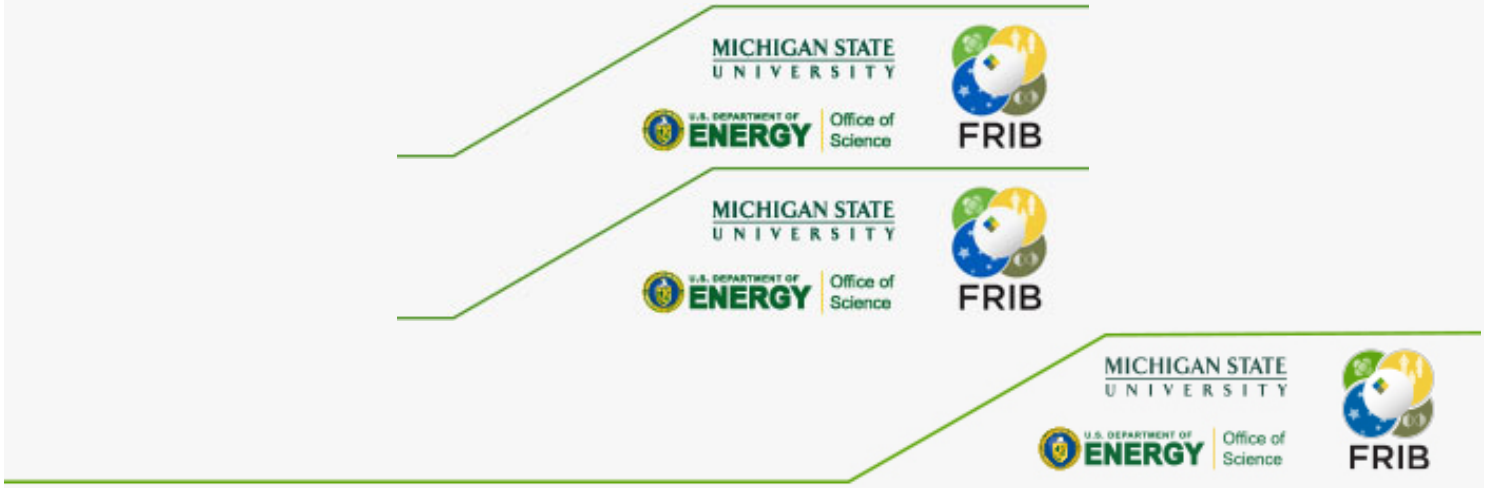
HRS DIRECTOR'S REVIEW & HRS REVIEW (October): The High Rigidity Spectrometer (HRS) project recently underwent two independent reviews: A Director's Review of HRS was held 15-16 July in preparation for the DOE-SC Office of Project Assessment (OPA) Project Review of HRS held 31 August–2 September. **Read more**

LOOKING AHEAD

12-13 January 2022	Seventh Accelerator Readiness Review (ARR07)
1-3 February 2022	DOE Office of Project Assessment Critical Decision-4 Review of FRIB

THANK YOU TO OUR CONTRIBUTORS THIS ISSUE: Jun Chen, Jutta Escher, Amy Lovell, Greg Severin

The FRIB Laboratory Update for Users is published by the FRIB Laboratory and distributed via email. Please e-mail questions, comments and contributions to communications@frib.msu.edu.



Facility for Rare Isotope Beams | Michigan State University | 640 South Shaw Lane | East Lansing, MI 48824 | (517) 355-9672 | frib.msu.edu

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.