



LABORATORY UPDATE FOR USERS

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MARCH
2015

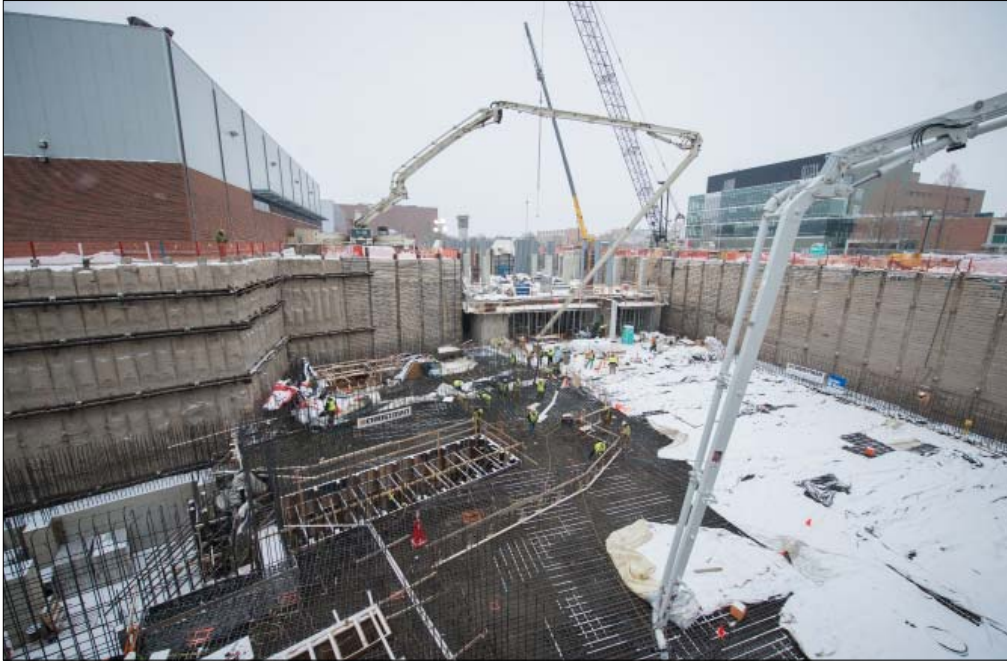


Photo by Greg Kohuth/Michigan State University Communications and Brand Strategy

Looking east, workers place concrete on March 3 for the last tunnel foundation slab. Taking 35 hours and using 3,563 cubic yards of concrete, it was the largest placement of the project.

Civil Construction Steams Ahead Through Frigid Temperatures; Still Eight Weeks Ahead of Schedule

Story contributed by Brad Bull, Conventional Facilities and Infrastructure Division Director

Despite a barrage of extremely cold weather in Michigan, progress on the linear accelerator tunnel is advancing swiftly and FRIB civil construction is eight weeks ahead of schedule.

The surface building will be constructed in two halves in order to accelerate readiness of the east section of the building. This will allow the front end to be installed 16 months earlier than originally planned in the project baseline.

In the linac tunnel, steam and condensate lines are being installed for temporary heat. A third of the mechanical, electrical, and plumbing coordination has been completed for the

tunnel, and will be followed by installation of mechanical and electrical systems in the east end of the tunnel.

Approximately 80 percent of the tunnel lid concrete has been poured, and more than 70 percent of the vertical mechanical, access, and radio frequency (RF) concrete shafts have been installed above the tunnel lid. On the east end of the tunnel lid, the first 200 feet of waterproofing has been completed and leak tested, and mass backfill has begun to fully enclose the tunnel underground.

In the target area, work is also continuing on the target and hot-cell

See CONSTRUCTION on Page 4

FRIB Project and NSCL Transition to FRIB Laboratory

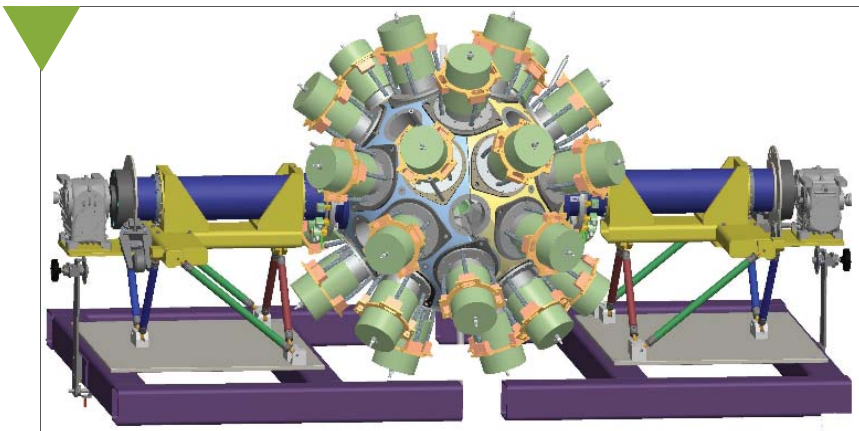
Story contributed by Karen King, FRIB Communications Manager

Effective March 1, the MSU President has reorganized the reporting functions for the National Superconducting Cyclotron Laboratory and the FRIB Project. FRIB now reports to the MSU Executive Vice Presidents and NSCL reports through FRIB. The reorganization initiates the transition to a unified laboratory organization, the next natural step in realizing an advanced rare isotope beam facility for the nuclear science community.

Some roles have changed in support of this transition:

- Thomas Glasmacher is Laboratory Director and Paul Mantica is the Deputy Laboratory Director.
- Konrad Gelbke is NSCL Director and Brad Sherrill is the NSCL Deputy Director.

To reflect this change to the FRIB Laboratory, you'll note that our logo and publication's look have changed as well. We will also start to feature contributions from users who are an integral part of the future laboratory, beginning with a first contribution from Augusto Macchiavelli about GRETA. As before, we will strive to send this update quarterly to keep you apprised of all the latest happenings at the FRIB Laboratory. We welcome your suggestions and questions; please email them to communications@frib.msu.edu.



Gamma-Ray Energy Tracking Array (GRETA) Central to Maximizing Physics Output of FRIB

Story contributed by Augusto Macchiavelli, GRETA Project Manager Designee, Lawrence Berkeley National Laboratory

Gamma-ray spectroscopy continues to play a crucial role in our quest to understand the structure of atomic nuclei. The scientific program at FRIB is broad and exciting and, in fact, the majority of envisioned benchmark experiments rely on high-resolution, high-efficiency, in-flight γ -ray detection. A 4π tracking array will provide a large increase in sensitivity and resolving power over existing arrays.



Top: An engineering drawing, based on the current GRETINA frame, of the 4π configuration of GRETA consisting of 30 of these modules. Above: A photograph of a GRETA quad module consisting of 4 HPGe capsules (6x6 segmented) closely packed in a common cryostat.

Thus, GRETA will be central to maximizing the physics output of FRIB research, both using fast-fragmentation beams and reaccelerated beams. For example, a marriage of GRETA with the High Resolution Spectrometer will deliver a unique flagship capability of this facility. A white paper on GRETA science opportunities is available at lecmeeting.org/white-papers/GRETA_WP_LE_TM_Full.pdf.

The GRETA project builds upon GRETINA (1π coverage), which has successfully demonstrated the technology and scientific impact of a gamma ray tracking array with extremely productive physics campaigns at NSCL and ATLAS. GRETA requires the addition of 18 detector modules, new electronics, computing, and mechanical support. The current proposal aims for Critical Decision 0 (CD-0) in 2015, and optimizes the schedule for Day-one experiments and completion when FRIB reaches full power operations.

For more information please refer to the GRETINA/GRETA website physics.fsu.edu/GRETINA.org/.

Workshop Held to Assess Opportunities at FRIB for Fundamental Symmetry Tests with Rare Isotopes

Story contributed by Oscar Naviliat-Cuncic, NSCL Professor of Physics

In October 2014, the Amherst Center for Fundamental Interactions at the University of Massachusetts hosted a joint three-day workshop, co-organized with FRIB, to assess the opportunities for fundamental symmetry tests at FRIB.

Atomic nuclei provide sensitive laboratories for testing nature's fundamental symmetries and for searches of new interactions. With the broader variety and increased intensities of rare isotopes that FRIB will make available, new and improved tests of fundamental symmetries will be possible.

The workshop brought together about 25 theorists and experimentalists from laboratories and universities all over the country, working on topics related to fundamental symmetry tests with rare isotopes. The experimental topics presented at the workshop included measurements in nuclear beta decay, searches for electric dipole moments and tests of atomic parity violation. Workshop talks are posted online at www.physics.umass.edu/acfi/seminars-and-workshops/fundamental-symmetry-tests-with-rare-isotopes.

The discussions addressed in particular the theory needs for the interpretation of fundamental measurements related to searches for neutrino-less double beta decay, electric dipole moments, atomic parity violation, studies of radioactive decays, and dark matter searches. The workshop also offered the opportunity to describe new developments in the production of rare isotopes of interest for tests of fundamental symmetries, in order to make the most efficient use of FRIB capabilities.

Scientific Advisory Committee Provides Advice, Input to FRIB

*Story contributed by Brad Sherrill,
NSCL Deputy Director*

The FRIB Scientific Advisory Committee, SAC, met on March 2-3 at Michigan State University. The SAC was asked to provide advice to the FRIB Laboratory Director regarding material provided by the user community as part of NSAC long-range planning process. Included in the charge to the SAC was a request for them to comment on the importance of the various initiatives to the FRIB scientific program and the relative priorities. The SAC was also asked to comment on the importance and priority of upgrades to ReA3. Input from the various user equipment working groups was collected and reviewed. The SAC presented a report including their conclusions to the FRIB Laboratory Director. Present members of the SAC are: David Dean (chair), Ani Aprahamian, Klaus Blaum, Rolf Ent, Kate Jones, Robert Janssens, Augusto Macchiavelli, Gail McLaughlin, Witek Nazarewicz, Michael Ramsey-Musolf, Michael Smith.

Executive Summary from Town Meetings Available

*Story contributed by Witek Nazarewicz,
FRIB Chief Scientist*

The joint Executive Summary from the Nuclear Astrophysics and Low-Energy Nuclear Physics Town Meetings has been posted (phy.anl.gov/nsac-lrp/Whitepapers/NAP_LEN_P_Joint_Summary_toNSACWritingGroup_2.pdf) on the NSAC Long Range Plan 2015 website at ANL.phy.anl.gov/nsac-lrp/. The joint resolutions were condensed from the individual recommendations of the two town meetings in order to recognize the highest priorities of the two fields. The full white paper documents have been posted on the meeting website: lecmeeting.org/.



First FRIB-China Workshop on Physics of Nuclei and Hadrons set for May at MSU

Story contributed by Witek Nazarewicz, FRIB Chief Scientist

The First FRIB-China Workshop on Physics of Nuclei and Hadrons will be held on May 28-30, 2015, at Michigan State University. The purpose of this meeting, jointly organized by U.S. and Chinese physicists, is to bring together scientists, theorists, and experimentalists, from China and from the United States, with interests in the physics of radioactive nuclei. The goal of the workshop will be to explore various forms of collaborative endeavors in experiment and in theory relevant to the science program of FRIB. The plenary part of the workshop's scientific program will cover the recent progress in collaborative efforts tied to FRIB and in the interdisciplinary connections. The parallel sessions will be devoted to meetings of working groups. The working group reports will be presented during the last day of the workshop together with workshop conclusions. If you have ongoing collaborations with China, or if you wish to develop ones, this workshop is for you! Please find more information at custipen.pku.edu.cn/meeting/1st-frib-china-workshop.html or contact P. Danielewicz at daniel@nscl.msu.edu. The registration deadline is April 3, 2015.

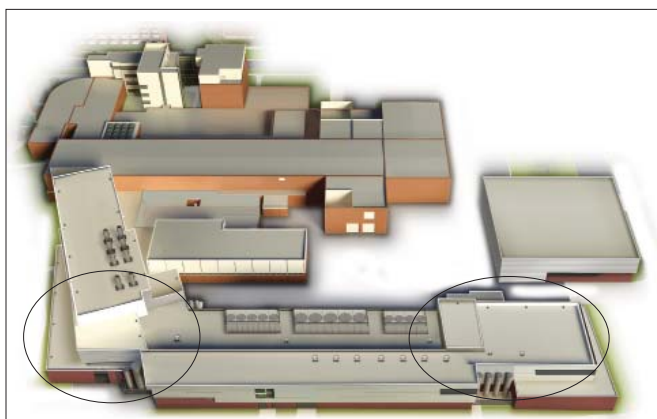


Low-Energy Community Meeting to be Held at Michigan State University in August

Story contributed by Alexandra Gade, NSCL Chief Scientist

The annual Low-Energy Community Meeting will be held August 21-22, 2015, at Michigan State University. The tentative plan is for the community meeting program to begin on Friday morning and continue until noon on Saturday, August 22. The meeting will be preceded on Thursday, August 20, by a one-day workshop on science opportunities with ReA6-12. Also on August 20 will be a meeting on the science of the AIRIS project at ATLAS, and a JINA collaboration meeting. The ReA topical workshop will be the kickoff for a whitepaper outlining the science opportunities at the ReA facility. A satellite meeting on the HRS project will be held in the evening of Friday, August 21. GRETINA will hold a siting workshop following the community meeting on Saturday afternoon.

The Low-Energy Community Meeting provides an excellent opportunity for nuclear scientists to interact and discuss future plans, initiatives, and facilities. Working group meetings and a plenary program are being planned. Please visit the meeting website at 2015.lecmeeting.org/ for details. Suggestions are always welcome and can be addressed to any member of the organizing committee listed at 2015.lecmeeting.org/organizing%20committee.html.



Above: A peek inside the linac tunnel looking east. Left: As a point of reference, the circled region on the left in the rendering shows where the concrete was placed, while the circle on the right shows where the tunnel is enclosed.

CONSTRUCTION from Page 1

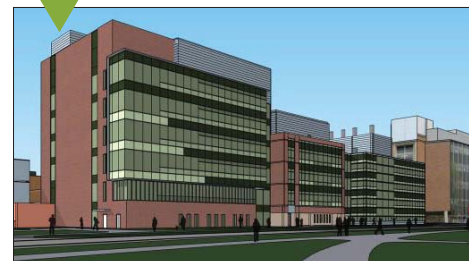
concrete walls, with reinforcing steel installation and form work continuing.

On March 3, the largest concrete placement of the project took place, on the west end of the tunnel. Over a span of 35 hours, 3,563 cubic yards of concrete was placed for the last foundation slab, which measures up to 14 feet thick in areas. In preparation for the “big pour,” 265 tons of reinforcing steel was placed in the weeks leading up to the placement.

It took 360 truckloads of concrete to supply the 3,563 cubic yards.

Overall, 18,200 cubic yards of concrete have been placed representing 43 percent of the concrete required for the project. Currently 1,600 tons of reinforcing steel (57 percent of required total) have been installed. Backfill operations continue and are currently 16 percent complete.

Follow along with FRIB progress by checking the construction camera at frib.msu.edu.



The new office tower (on far left in above rendering) will connect to the existing building.

MSU Board of Trustees Approves New FRIB Office Tower Addition

On February 6, the MSU Board of Trustees approved construction for a new FRIB office addition, east of the most recent office tower addition. The new office tower will house both permanent FRIB staff and visiting researchers. The six-story addition will be approximately 74,000 square feet and will provide private and open offices, as well as flexible laboratory and collaborative space, including conference rooms and a 265-seat lecture hall. The project involves demolishing an existing one-story building to construct the new tower. Demolition will start in the next month, and the goal is to occupy the new addition in August 2016.

Looking Ahead

March 31- April 2

DOE-SC Office of Project Assessment Review

May 21

President's Project Advisory Committee

June 2-4

Accelerator Systems Advisory Committee

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

MICHIGAN STATE UNIVERSITY

