

MICHIGAN STATE UNIVERSITY

April 21, 2023

MEMORANDUM

To: Committee on Budget and Finance

From: Daniel Bollman
Vice President for Strategic Infrastructure Planning and Facilities

Subject: **Authorization to Proceed**
Chemistry Building - Laboratory Upgrades FRIB
Radiochemistry

RECOMMENDATION

The Trustee Committee on Budget and Finance recommends that the Board of Trustees authorize the Administration to proceed with renovation of laboratories in the Chemistry Building.



Office of the
Vice President
for Strategic
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RESOLUTION

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby authorize the Administration to proceed with the project entitled "Chemistry Building - Laboratory Upgrades FRIB Radiochemistry," with a project budget of \$12,400,000.

BACKGROUND

Michigan State University operates the Facility for Rare Isotope Beams (FRIB) as a user facility for the U.S. Department of Energy (DOE) Office of Science, supporting the mission of the Office of Nuclear Physics. During routine operation for its nuclear physics mission—without interfering with FRIB's primary users—extra, unused isotopes can be "harvested." These harvested rare isotopes can have a role in multiple fields of study, such as medicine, biochemistry, materials science, horticulture, and astrophysics.

With FRIB isotope harvesting, MSU is poised to be a leader in radiochemistry and nuclear chemistry education, and MSU can offer a fast development path for any rare isotope leading to innovations, generate intellectual property and stimulate external investment, meet a national need, and grow the program to leverage increasing federal interest and grant funding.

FRIB's isotope harvesting program will be operational in 2024. FRIB and the College of Natural Science have hired three new faculty members to establish and lead a world-class research and education program in radiochemistry at MSU. The radiochemistry laboratory renovations in the Chemistry Building will support these faculty members' research and education efforts.

Description of Project:

The Chemistry Building is on Shaw Lane in the central academic district and adjacent to the FRIB Facility. The project includes renovations to provide wet bench laboratories designed to support radioisotope research and associated spaces, including offices. The renovations include a new exhaust system and radiochemistry hoods with HEPA filters serving these laboratories to provide the highest level of safety measures. This renovation is planned in conjunction with the College of Natural Science/Department of Chemistry teaching and research laboratory renovations.

The Construction Manager is Barton Malow. The Architect/Engineer is SmithGroup.

Communication Feedback:

As construction proceeds, the schedule will be shared with the campus community.

Project Cost and Timetable:

The budget for this project is \$12,400,000. The construction management project will be funded by the Facility for Rare Isotope Beams via a short-term loan to manage cash flow.

cc: Board of Trustees, T. Woodruff, T. Jeitschko, N. Beauchamp, M. Woo, S. Fletcher, M. Zeig, B. Quinn, V. Gore, L. Frace, T. Glasmacher, K. Tobin, B. Kranz, M. McCabe, L. Gremel, L. Adams, P. Duxbury, T. Warren, A. Taneja



Radiochemistry Labs

New radiochemistry laboratories in the Chemistry Building to leverage FRIB to expand multi-disciplinary collaboration, generate new intellectual property, and stimulate additional federal investment.



REASON FOR PROJECT

Michigan State University operates the Facility for Rare Isotope Beams (FRIB) as a user facility for the U.S. Department of Energy (DOE) Office of Science, supporting the mission of the Office of Nuclear Physics. During routine operation for its nuclear physics mission—without interfering with FRIB’s primary users—extra, unused isotopes can be “harvested.” These harvested rare isotopes can have a role in multiple fields of study, such as medicine, biochemistry, materials science, horticulture, and astrophysics.

With FRIB isotope harvesting, MSU is poised to be a leader in radiochemistry and nuclear chemistry education, and MSU can offer a fast development path for any rare isotope leading to innovations and funding opportunities.

FRIB’s isotope harvesting program will be operational in 2024. FRIB and the College of Natural Science have hired three new faculty members (Associate Professor of Chemistry Greg Severin in 2016 and two Assistant Professors of Chemistry in 2022) to establish and lead a world-class research and education program in radiochemistry at MSU. The Radiochemistry Laboratory renovations in Chemistry support these faculty members’ research and education efforts.

Meeting a national need

Isotope harvesting at FRIB was recommended by the *Nuclear Science Advisory Committee Isotopes* (NSACI), a federally chartered advisory committee to the U.S. Department of Energy. NSACI recommended it in its 2015 NSAC Isotope Long Range Plan: “*Research quantities of many of these isotopes, which are of interest to various applications including medicine, stockpile stewardship and astrophysics, are currently in short supply or have no source other than FRIB operation.*”

MSU's opportunity to capitalize on federal interest

The DOE Isotope Program supports isotope harvesting at FRIB with a grant worth \$13 million over four years to build up FRIB's isotope harvesting capabilities, with subsequent grants to operate the isotope harvesting laboratory, and research grants for faculty with graduate student support. The intent is to grow this program and to leverage increasing federal interest.

The DOE Isotope Program's base budget grew 33% to \$109 million in the FY23 budget, with bipartisan and bicameral support, additionally bolstered with \$158 million in Inflation Reduction Act funds to support projects to increase domestic isotope production. For 2024, the President's Budget Request to Congress includes an additional 60% increase.

Collaboration across MSU

Leveraging FRIB's world-unique isotope capabilities, MSU can generate intellectual property and stimulate external investment. To foster this opportunity, the MSU Vice President for Research and Innovation is hosting a workshop on 14 April 2023 on Radiochemistry and Innovative Uses of Radioisotopes, with participants from MSU, Henry Ford, BAMF in Grand Rapids, and beyond.

PROJECT BACKGROUND

- To position MSU as a world leader in radiochemistry, and to realize the opportunities to attract federal investment, the establishment of the radiochemistry laboratories is required.
- This project will be done in conjunction with other laboratory renovations in the Chemistry Building. Those renovations will accommodate high-priority research needs for the Department of Chemistry and return existing space in the building to productive use.
- The MSU Board of Trustees authorized planning for Chemistry Building lab renovations in October 2022 and is expected to consider authorizing construction at its April 2023 meeting.

POINTS FOR CONSIDERATION

- The project provides capacity to increase research productivity. The renovations will create new research laboratories and associated spaces, including offices.
- The proposed research meets a national need and can be supported by the growing appropriations to the DOE Isotope Program.
- Safety is a key consideration. Isotopes should never leave their enclosures in the radiochemistry hood. The radiochemistry hoods are exhausted through HEPA filters with a radiation detector after the HEPA filter. Should any radiation be detected past the HEPA filter, the dedicated air handler will shut down and the hood and air duct will be decontaminated. To not affect the rest of the Chemistry Building, the dedicated air duct is to be mounted to the building exterior, leading to rooftop exhaust fans. A new decorative screenwall will stand post-mounted directly in front of the riser and braced to the building along its height. The two new post locations require the existing sidewalk and adjacent landscape to be reconfigured.

FUNDING PLAN

The project budget is \$12.4 million to be paid for by FRIB via a short-term loan.