Outreach and graduate recruiting efforts at FRIB

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Faculty Outreach Advisor
Facility for Rare Isotope Beams, FRIB
Michigan State University Campus

- Next Generation Nuclear Science Facility
- $730 million scientific user facility
- By DOE Office of Science Project, Michigan State University and the State of Michigan
- Expected in 2022
- >50 years of experience
The Education Pipeline @ MSU

Pre-High School
- GUPPY (grades 4-6)
- MST@MSU (grades 7-10)

High School
- PAN@MSU (& PAN@ND)
  - PAN for teachers
  - High School Honors Science Program

College
- NS³ – Nuclear Science Summer School
- Research Assistantships
- Summer Research Experiences/REU
- Conference Experiences for Undergrads

Graduate School
- Workshops/Schools
- Conferences
  - Connections to open positions

Online activity: “Pennies are protons”

Virtual in 2020
Outreach & Education

Coordination/Collaboration/Complementarity of Outreach and Education efforts

- **Leadership:** Associate Director for Education, Faculty Outreach Advisor
- **Outreach Coordinator:** Zach Constan
- **Web Content & Graphic Designer:** Erin O’Donnell
- **Outreach committee:** with representation from faculty, research associates and graduate students
- **Graduate Recruiting Committee:** works closely with departments
- **Valuable Collaborators:** Joint Institute for Nuclear Astrophysics (JINA-CEE), and MSU partners, University of Notre Dame
Engaging the community

Larger audience/Less interaction

- Social Media/Website
- Digital Games, I5 museum
- Science Festivals
- Open Houses, Art shows
- Talks/Webinars
- Tours
- Lessons/Activities
- Camps/Workshops/Research

COVID-19 era

Smaller audience/More interaction
Traditional Engagements

- Summer camps (elementary, middle, high school)
- Research experiences for MSU undergrads during semester
- REU students over the summer
- CEU at the DNP meeting in the Fall
- Graduate recruiting booth at the DNP meeting in the Fall
- Laboratory tours (4000 visitors/year)
- Open houses (~3000 visitors)
- Public talks, school visits, science festivals
Teacher Engagement

- **In person trainings for teachers**
  - **PAN** for teachers: week-long summer program
  - One-day on-campus **seminars** (Coming up mid-March 2021)
  - **PAN-cake**: teacher conference workshops at different states

- **Provide resources**
  - Online website resources
  - Demos + lesson plans (marble nuclei, lego, shadow box)
  - **Isotopolis** video game + lesson plans
  - Support teachers to train their peers

*Constan, The Physics Teacher 48, p114 (2010)*
Digital Game: Isotopolis

Free to download on multiple platforms

- Touch-based game that guides the player through various stages of creating an isotope (ionization, separation, fragmentation)
- Funded by APS, NSCL, JINA, MSU partners
- Game available at Science museums, science festivals, the MSU Planetarium and more.
- Used in summer camps for hands-on activities with students
- Lesson plans under development
- Number of unique users > 15,000

Collaboration with Games for Entertainment and Learning (GEL) @ MSU
Impression 5 Science Museum

- Impression 5: Lansing Science Museum
- Annual number of visitors: 120,000
- Collaboration for a nuclear science exhibit
- Sponsored by: NSCL + external community partners
- Since Aug. 2019
Art – Science Connections

Advanced Studies Gateway – Dean Lee (MSU)

Initiative that brings together researchers, innovators, creative thinkers, artists, and performers from all fields and strengthens ties between Michigan State University and the community.

All events are free and open to the public.

Photo Exhibit

Since 2018 Lab is hosting a photo exhibit created by Elena Litvinova (WMU) as part of her NSF-CAREER award. Photos by Physicist Olga Pechenova (GSI).

Art-Science showcase by MSU SciCom

Art inspired by Science – exhibit at FRIB

+ public talk by YouTuber Dianna Cowern (aka Physics Girl)
Of Equal Place: Isotopes in Motion

The Partners:
- **Dance Exchange** (Dance Company based in MD, founding director Liz Lerman received MacArthur “Genius Grant”)
- **MSU partners**: Wharton Center for performing arts, Office for vice president for research, Center for community and economic development
- **WaMPS** (Women and Minorities in Physical Sciences)
- **Community** (Happendance, Schools)

The event
- 50-min dance performance
- Dance/physics workshops
- Physics Demos
- Laboratory tour
- Careers booth

March 24-26, 2022
2 days for schools
1 day for general public
Dedicated MSI Programs Build Pipeline of Students Pursuing Nuclear Science

HS
PING
High school

BS
PEGASUS
Undergrads

PhD
MSI Research
Grad Students

Faculty
Fellowship
Faculty

Physicists Inspiring the Next Generation Research (AY) Experiments

Two-Day Visit
Interest to MSU/FRIB

Thesis Research

MSU/FRIB-MSI Bridge

Student Training and Engagement Program for Undergraduates in Physics (STEP-UP)

Coordinator: Paul Gueye, MSU

U.S. Department of Energy Office of Science
National Science Foundation
Michigan State University

Artemis Spyrou, WANDA 2021, Slide 12
Opportunities for a diverse population of undergraduate students in STEM to engage in forefront research at FRIB

Primary objective
- Increase the population of minority and female researchers in STEM
- Training the next generation of scholars, scientists, and leaders
- Providing role models for future generations

Some facts
- Started in 2015
- Funded over twenty-five undergraduate students

Some research projects
- Nuclear astrophysics
- Accelerator physics
- Heavy ion therapy

Enhancing diversity in undergraduate research at FRIB
COVID-19 opportunities

- MSU Science Festival partnership
  - Virtual Tour of the lab
  - Nuclear Physics Demos with material you can find at home
  - Nuclear Science Lectures
  - Talk on careers at FRIB
  - Connections between art and science

- Website update

- Social Media
  - Sharing new and old videos
  - School virtual field trips
  - Summer camps online
  - Open virtual tours of the lab
Summary

- FRIB offers a broad range of opportunities that **engage, inform and inspire** the general public and to attract a diverse pool of students.
- Activities range in time, intensity and engagement
- Continuously developing new programs and activities to reach diverse audiences
- New opportunities for outreach during the COVID-19 era