



Theory Alliance  
FACILITY FOR RARE ISOTOPE BEAMS



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

# FRIB Theory Alliance and NP long range plan

Filomena Nunes  
FRIB-TA managing director  
Michigan State University



# goals

- to deliver excellent research in theory relevant to FRIB
- to serve as a focal point for **stimulating and continuous interactions between theory and experiment**, drawing theory activity toward those problems relevant for the science at FRIB;
- to **rejuvenate** the field by creating permanent positions in FRIB theory across the country;
- to **attract young talent** through the national FRIB Theory Fellow program;
- to strengthen theory in areas of most need;
- to foster **interdisciplinary collaborations** and build scientific bridges to wider theory communities;
- to coordinate a **sustainable educational program** in advanced low-energy nuclear theory;
- to coordinate **international initiatives** in the theory of rare isotopes.



# programs

- **national FRIB theory fellow program** enhances the visibility of the field and attracts the brightest young people
- **FRIB-TA bridge program** emphasizes the importance of low-energy nuclear theory: enhances the opportunity to create permanent positions in nuclear theory
- **FRIB-TA topical programs** establish a stronger connection to experiment and foster interdisciplinary collaborations
- **FRIB-TA summer schools** engage graduate by exploring the intersections of FRIB theory with other areas
- **EUSTIPEN:** enhances collaborations between Europe and the United States on FRIB science.



# executive board

Sonia Bacca (University of Mainz, Germany, 2021-2024, international)

Jon Engel (University of North Carolina, 2020-2023)

Jutta Escher (**Past Director**, LLNL, 2019-Dec2022)

Kevin Fosse (Florida State University 2022-2025)

Alexandra Gade (FRIB users relations, MSU, 2022-2025)

Gaute Hagen (ORNL, 2022-2025)

Elena Litvinova (WMU, 2022-2025)

Kate Jones (University of Tennessee, 2020-2023)

Amy Lovell (LANL, 2020-2023)

Calvin Johnson (San Diego State University, 2021-2024)

Saori Pastore (**Director-elect**, WashU, 2021-Dec2024)

Daniel Phillips (**Director**, Ohio University, 2020-Dec2023)

Nicole Vassh (TRIUMF, 2022-2025)

Special thanks to:  
Vincenzo Cirigliano,  
Kristina Launey  
Jorge Piekarewicz,  
Sanjay Reddy



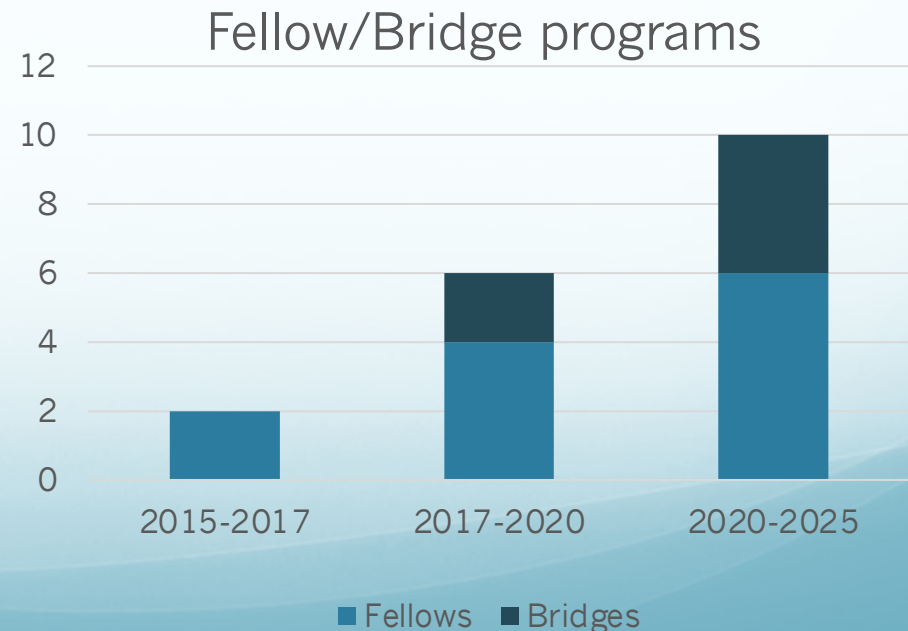
# committees

- **Organization Committee** (chair: Kate Jones)
- **Theory fellow search committee** (chair: Saori Pastore and co-chair Calvin Johnson)
- **Bridge committee** (chair: Daniel Phillips and co-chair Amy Lovell)
- **Broader impacts committee** (chair: Gaute Hagen)
- **Education and topical programs committee** (chair: Jon Engel)
- **International links committee** (chair: Sonia Bacca)
- **Webpage committee** (chair: Kevin Fosseze)
- **Diversity, equity and inclusion** (chair: Amy Lovell)



# growing the effort

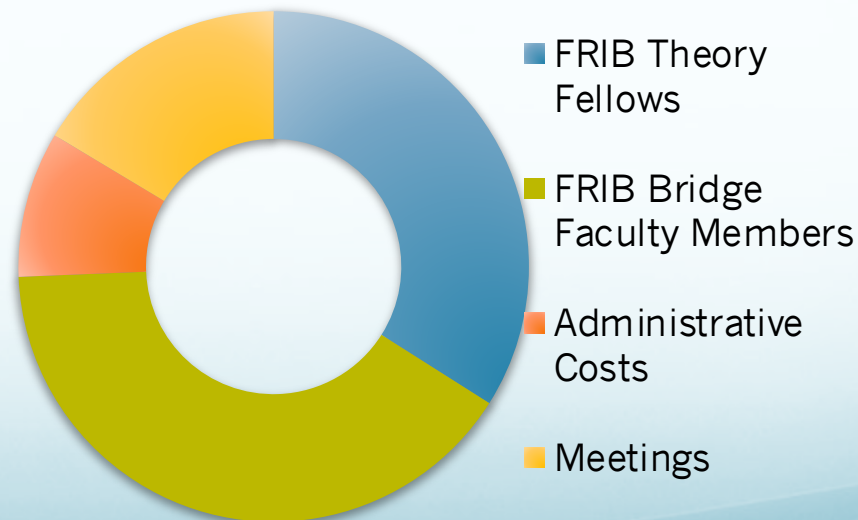
- Third cycle: June 2020 – May 2025
  - Fellow program: growing from 4 to 5 (number adjusted)
  - Bridge program: growing from 2 bridges to 4 bridges
  - Research administrator at 75%
  - Significant funding for topical programs and summer schools
  - Continued funding for EUSTIPEN





# budget update

- Significant savings in year 2 of this cycle due to the pandemic, rotation and delayed start dates for personnel
- Adjustment of budget for year 3 by DOE (budget reduced by \$500k)







# fellow program

- Christian Drischler (Hosting Institution: MSU, 2020 - 2022)
- Chloe Hebborn (Hosting Institution: LLNL, 2020 - 2023)
- Xilin Zhang (Hosting Institution: MSU, 2021 - )
- Chieh-Yeah Seng (Hosting Institution: UW, 2022 - )
- Anna McCoy (Hosting Institution: WashU, 2022 - )

(previous fellows: Kevin Fosse, Gregory Potel and Diego Lonardoni)

**New search to take place Fall 2022 – to hire two fellows!**  
**One to be located at MSU and another to be located at LANL**





# bridge program

- Saori Pastore  
(Institution: Wash U; start year 2018-2022, tenured)
- Maria Piarulli  
(Institution: Wash U; start year 2018)
- Sebastian Konig  
(Institution: NCSU; start year 2020)
- Kevin Fosse  
(Institution: FSU; start year 2021)
- Christian Drischler  
(Institution: OU; start year 2022)

**New call to come out later 2022!**

**Input: contact Daniel Phillips**



## Topical programs:

- Optical potentials in Nuclear Physics (03/21/2022– 04/01/2022)  
Wim Dickhoff, Chloe Hebborn, Jeremy Holt, Filomena Nunes, Gregory Potel
- Nuclear Isomers in the era of FRIB (05/9/2022-05/20/2022)  
Filip Kondev, G Wendell Misch, Matt Mumpower
- Few-body cluster in exotic nuclei (08/15/2022– 08/26/2022)  
Sebastian Konig, Kevin Fosse, Chloe Hebborn, Lucas Platter
- Theoretical Justifications and Motivations for Early High-Profile FRIB (05/16/2023 – 05/26/2023)  
Alex Brown, Alex Gade, Ragnar Stroberg

## Summer school:

- Quantum computing and nuclear few-body and many-body problems ran 20-22 June 2022 with 50 participants (10 online)



# broader impacts

## **Dialogues in Nuclear Physics (new initiative during pandemic)**

- Reactions at FRIB with heavy nuclei
- Electroweak interactions in nuclei
- Study of neutron matter with gravitational waves
- Challenges in nuclear structure theory
- Nuclear short-range correlations (part 1 + part 2)
- Nuclear Physics and Astrophysics of Accreting Neutron Stars

Committee is restructuring this initiative

**Feedback is welcome!**  
**(Gaute Hagen)**



# FRIB achievement award for early career researchers

- Joint FRIB-TA and FRIB UO effort
- Theory and experimental awards
- Announcement went out late April
- Deadline for applications: 7<sup>th</sup> June
- Many excellent candidates



Amy Lovell (FRIB theory board member)  
selected as the theory awardee this year!  
**Talk Plenary Session tonight 17:25 CDT**

**(part of activities of Education and Topical Program committee)**

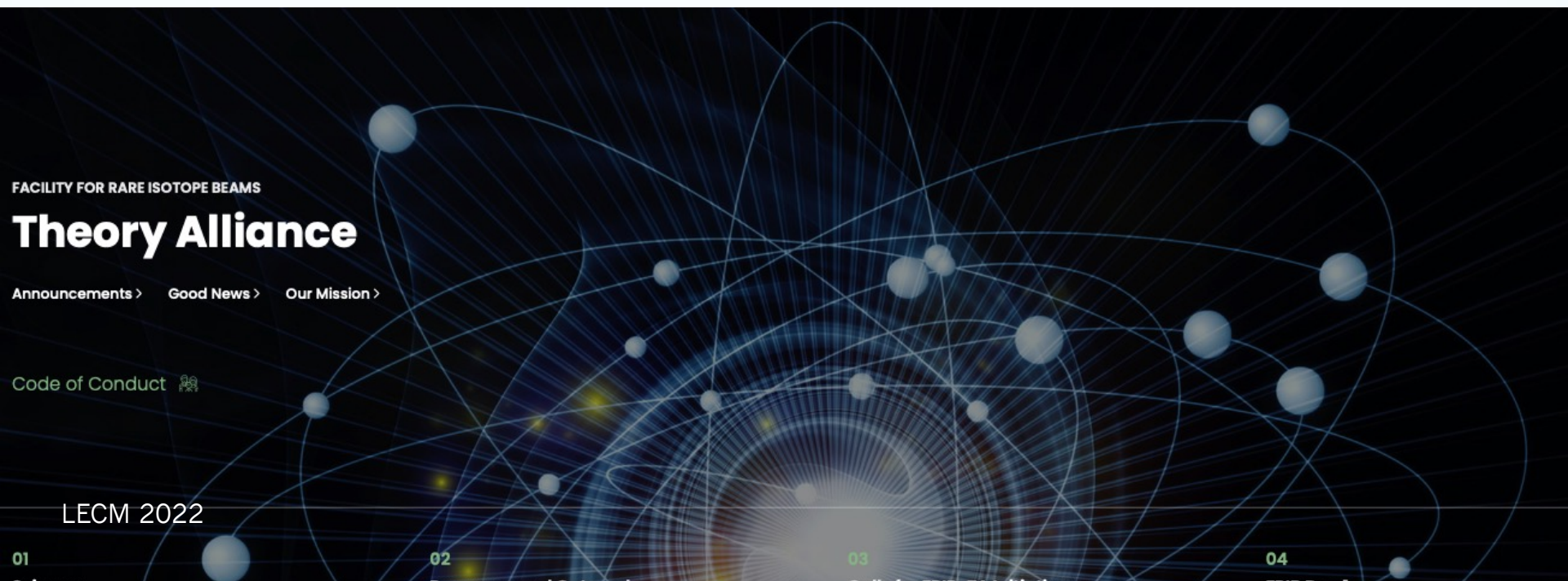


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# Other news

- Theory list for Experimentalists for PAC1 (available on webpage)
- New website (many thanks to Kristina Launey!)
- Conflict of Interest rules instated
- DEI committee looking into collecting demographics for assessment purposes

**Feedback to the board is welcome!**







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# Long Range Plan

July 2022: Charge presented to NSAC (Chair: Gail Dodge)

Sep-Nov 2022: Town meetings

- hot and cold QCD (MIT)
- nuclear reactions, structure and astrophysics (ANL)
- fundamental symmetries, neutrinos and neutrons (TUNL)
- computational efforts in nuclear physics (SURA)

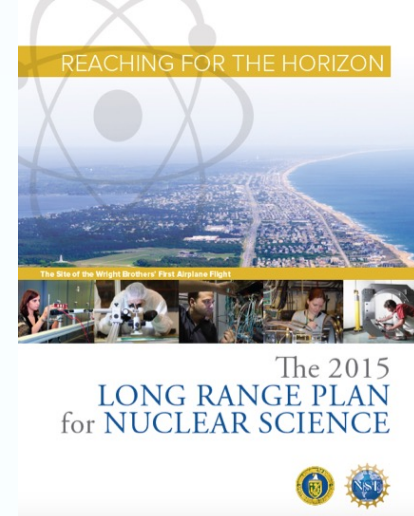
Feb 2023: White papers for each town meeting submitted

Apr/May 2023: Working group resolution meeting

Fall 2023: LRP should be approved by NSAC and present at DNP

Typically LRP working group: NSAC+additional members (#60)

LECM 2022





# LRP discussion

Town meeting on nuclear reactions, structure and astrophysics

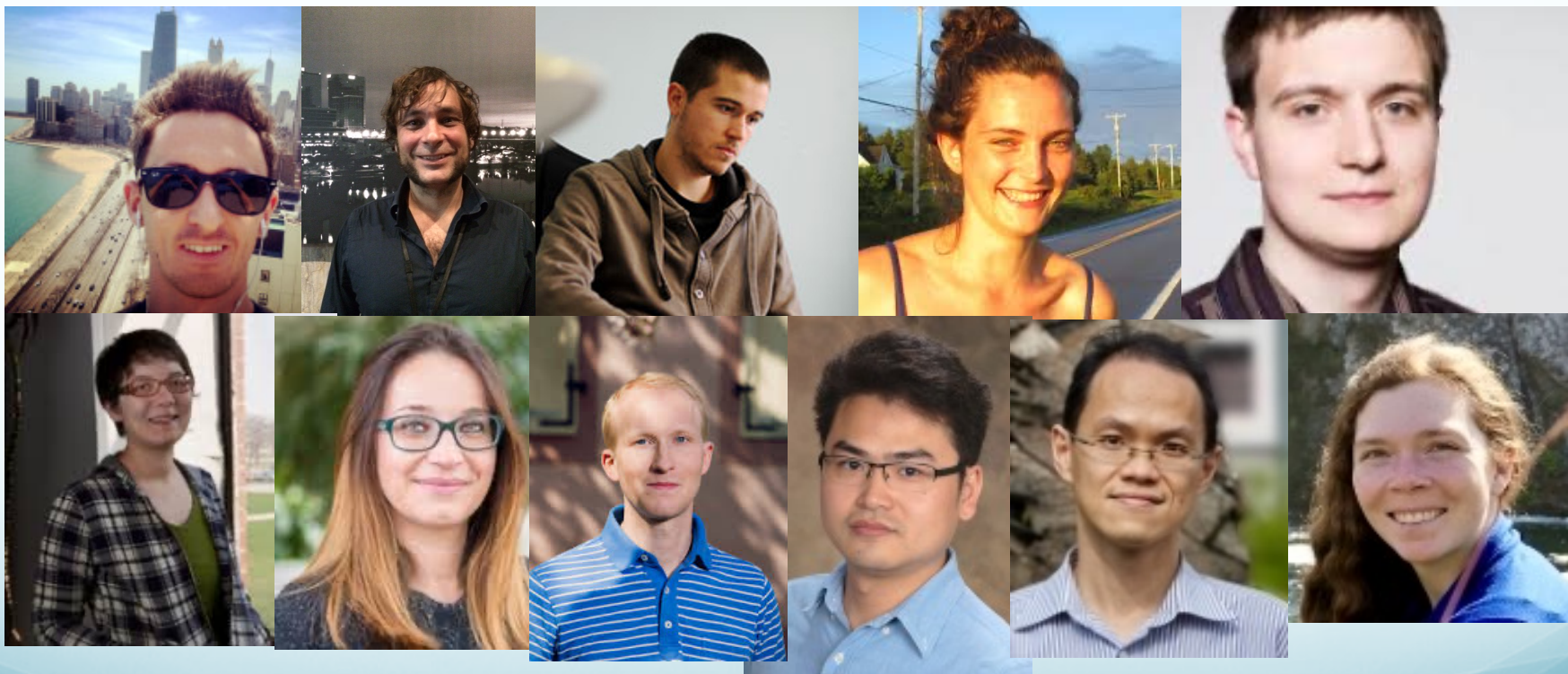
Conveners: Alexandra Gade, Sofia Quaglioni, Grigory Rogachev, and Rebecca Surman





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# thank you to fellows and bridges





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# thank you to all of you

an engaged community  
makes for a strong theory alliance





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# backup



**Code of Conduct:** The FRIB Theory Alliance is committed to fostering a safe, diverse, and equitable environment that values mutual respect and personal integrity. The diversity of people, ideas, cultures, and educational backgrounds enables the FRIB Theory Alliance's scientific research program and is an essential aspect of its mission. Members of the Theory Alliance, while participating in professional activities, are expected to behave in an ethical, professional, and respectful manner. We are committed to working with our partners to promote diverse and inclusive spaces for those affiliated with the alliance.

FRIB-TA does not tolerate harassment of any kind, including sexual harassment, bullying, intimidation, violence, threats of violence, retaliation, or other disruptive behavior. Discrimination in any guise (verbal, written or physical) based on an individual's race, color, sex, religion, disability, etc. is not acceptable. When such behavior is brought to the attention of the FRIB-TA, it will be investigated by the FRIB DEI investigator. If claims are verified, the harasser will face consequences up to and including removal from the FRIB-TA membership, at which point the harasser will not be granted permission to attend FRIB-TA events. To file a complaint please contact FRIB DEI investigator Melanie Trowbridge ([trowbridge@frib.msu.edu](mailto:trowbridge@frib.msu.edu)) and/or the Chair of the FRIB-TA DEI committee Amy Lovell ([lovell@lanl.gov](mailto:lovell@lanl.gov)).





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# Long Range Plan

April 2014: Charge to NSAC

August 2014: Town meetings

September 2014: White papers

November 2014: LRP working group organizational meeting

April 2015: LRP working group resolution meeting

October 2015: LRP accepted by NSAC

LRP working group: NSAC+additional members (~ 60 scientists)

