

Scientists from across the world came together at the ICNT/JINA-CEE workshop “r-Process Nucleosynthesis: Connecting FRIB with the Cosmos,” held in June 2016 at Michigan State University.

The workshop was supported by the Joint Institute for Nuclear Astrophysics - Center for the Evolution of the Elements, and the Facility for Rare Isotope Beams (FRIB) within the framework of International Collaborations in Nuclear Theory (ICNT).

The goal was to discuss the scientific opportunities created by FRIB in the context of other major developments in computational science and observations. The scientists discussed, among other topics, the exciting prospect that FRIB will provide unprecedented access to nuclei that we suspect nature has used as stepping stones during stellar collisions and explosions to create the elements heavier than germanium.

A focus was the development of strategies for first experiments and for establishing the necessary links to theory and astronomy to maximize the impact of the early FRIB scientific program to advance our understanding of the origin of the elements.

The workshop brought together sixty scientists from multiple areas that included experiments with rare isotopes, theoretical predictions of the properties of rare isotopes, astrophysics theory of supernova explosions and colliding neutron stars, and astronomical observations.

The three-week program offered formal presentations, discussions, and collaborative work in a unique interdisciplinary environment. A particularly exciting development discussed at the workshop is the ongoing search for neutron star collisions using the Laser Interferometer Gravitational Wave Observatory (LIGO), following the historic observation of gravitational waves earlier this year. FRIB will create many neutron-rich isotopes that are likely present in the ejecta from explosive stellar events. Together, FRIB and LIGO will offer powerful clues to the answers to the fundamental questions about the origin of heavy elements in nature. The findings of the workshop will appear in a currently prepared review article.



Yuhri Ishimaru from the International Christian University in Tokyo, Japan, (far right) speaks at the ICNT/JINA-CEE workshop.