

MASTER SUMMER TRAINING PROPOSAL

Academic Year 2026/2027

TITLE: Heavy Ion Collisions from nuclear physics to astrophysics.

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UNIVERSITY/RESEARCH CENTER of the TRAINING:

Michigan State University, Facility for Rare Isotope Beams (FRIB), East Lansing Michigan, USA;
International Research Laboratory NPA, East Lansing Michigan, USA;
SUBATECH, Nantes.

LEVEL: Master 1 or 2.

DURATION: 3 months at FRIB, 1 month at SUBATECH Nantes (in person or remote).

TOPIC: Heavy Ion Collisions from nuclear physics to astrophysics.

ABSTRACT

We are a group specializing in the dense nuclear matter theorized to compose neutron stars and created in laboratories by colliding two heavy nuclei. The project aims to understand how pressure builds under these extreme conditions, with densities beyond those found in atomic nuclei, by providing a theoretical description of data from both terrestrial experiments and various astronomical observations.

To that end, light nuclear fragments are important constituents of dense matter that require refined modeling. Potentially formed at the late stages of heavy-ion reactions or found in the crusts of neutron stars, they impact our ability to infer the correct behaviour of the pressure.

By treating clustering in a heavy-ion collision, you will have the opportunity to advance the field by applying expertise in theoretical physics, data-driven modeling, software engineering and scientific computing, while collaborating with the research communities at Subatech, France, and the Facility for Rare Isotope Beams, USA.

Please note that this spring-summer training does not imply a continuation for a PhD, but a CNRS grant and support for local expenses are included.

More information is available on the website <https://npa.in2p3.fr/summer-training-program/> and registration is mandatory on the following website: <https://indico.frib.msu.edu/event/87/>