



MASTER SUMMER TRAINING PROPOSAL
Academic Year 2025/2026

TITLE: Centrifuge decelerator of radioactive molecules & atoms for fundamental symmetry tests.

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UNIVERSITY/RESEARCH CENTER of the INTERNSHIP:

Michigan State University; Facility for Rare Isotope Beams (FRIB);
International Research Laboratory NPA.

LEVEL

Expected level of student: Master.

DURATION

Max 4 months, including max 3 months at FRIB.

ABSTRACT

Precision metrology on atoms and molecules benefits tremendously when the particles are prepared in the ultracold regime. This enables control and detection of atoms or molecules at the single-quantum-state level. In this project, we are developing a unique method to decelerate radioactive atoms and molecules to a standstill by centrifugal force. A spinning magnetic guide will be used to guide neutral atomic/molecular species from the periphery to the center of the rotating frame, and an electromagnetic trap will be used to collect the decelerated particles after they exit the centrifuge decelerator. This work will open the avenue to precision spectroscopy of superheavy species like Radium or Thorium containing molecules, as well as light species like Tritium atoms.

Please note that this spring-summer training does not imply a continuation for a PhD.

More information is available on the website <https://npa.in2p3.fr/summer-training-program/>