



MASTER SUMMER TRAINING PROPOSAL
Academic Year 2025/2026

TITLE: Precision laser spectroscopy of ThO molecules for testing fundamental symmetries

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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

Measurements of electric dipole moment (EDM) of fundamental particles place the most stringent constraints on time-reversal violating new physics beyond Standard Model. Precision spectroscopy on cold ^{232}ThO neutral molecules provides one of the best bounds on electron electric dipole moment. In addition, ^{227}ThO neutral molecules provides excellent opportunity to search for nuclear Schiff moment. In this project, the student will be developing the laser and optics system for performing precision spectroscopy measurement on cold ThO molecules. The project will also involve development of the vacuum beamline and cryogenic system necessary to produce the ThO molecules.

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/>