


20/03/2025, 10:30 a.m.

IFIN-HH/ELI-NP Training and Conference Center

Nuclear Astrophysics With Gamma Beam

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Monochromatic Gamma-Beams are a new tool for nuclear physics. They allow us to study nuclei with unprecedented accuracy. Specifically in Nuclear Astrophysics they allow us to make significant progress toward solving the five-decade problem of the formation of carbon and oxygen (the C/O ratio) in stellar helium burning. Aside from addressing the origin of life itself (the Anthropic Principle), the C/O ratio is the single most important nuclear input to Stellar Evolution.

I will present a bird eye view of our two-decade program for measurements at the high intensity gamma source (HIGS) at Duke University using Time Projection Chamber (TPC) detectors. Anticipating gamma-beams at the ELI-NP we look forward to extending the HIGS research to the ELI-NP. I will also review our ten-year effort to establish a US-Romania collaboration that culminated last year by extending the NSF-UEFISCDI agreement for collaboration in Physics.