

ASTROPHYSICS SEMINAR SERIES



Dr. Benoit Côté

Research Staff, Konkoly Observatory, Budapest, Hungary

ChETEC COST Action

NuGrid Collaboration, co-PI

JINA Center for the Evolution of the Elements

Tuesday, March 3 12:30 pm – Rm 184 NSH

Cosmological Simulations of the Early Universe and Modern Spectroscopic Surveys

Metal-poor stars in the Galactic halo and in local dwarf galaxies are windows into the nature and nucleosynthesis of the first stars that formed during the first billion years of cosmic evolution. To best interpret the chemical signatures locked in today's metal-poor stars, the mixing of heavy elements and the formation and assembly of galaxies in the early stages of the Universe must be understood. Indeed, the chemical evolution cycle, which drives the chemical enrichment of gas and stars, depends on the way elements are transported inside and around galaxies before being recycled into new generations of stars. In this seminar, I will present my ongoing efforts in using statistical tools, semi-analytic models, and cosmological hydrodynamic simulations to address the following questions: How do the major physical processes driving the evolution of a galaxy affect its chemical evolution history? What can we learn about the past of a galaxy by looking at the chemical signatures locked in its stars? How reliable are numerical predictions? What can we learn from simple models and complex simulations? The ultimate goal of this research is to better understand the formation and evolution of galaxies, and to build bridges between nuclear astrophysics, spectroscopic surveys, and cosmological simulations.



PHYSICS