



Seminar

**Date: Monday 02nd Oct. 2017 / Time: 2:00 pm – 3:00 pm / Place: Room 408F, Building T1
Campus: 334 Nguyễn Trãi, Thanh Xuân, Hà Nội**

Kính mời thầy cô và các bạn quan tâm đến dự / Everyone is welcome !

Speaker: Prof. Mark A. Caprio (Department of Physics, University of Notre Dame, USA)

Title: Nuclei from scratch: *Ab initio* nuclear structure and emergent symmetries

Abstract: Atomic nuclei are highly-correlated, nonperturbative quantum many-body systems. A rich variety of collective phenomena emerge from the correlations in the nuclear many-body wave function, from pair condensation and superfluidity to the formation of tightly-bound cluster substructures within the nucleus. A successful theoretical description of these phenomena must encompass multi-scale physics, involving interactions and correlations at multiple length, momentum, and energy scales.

Our goal in an *ab initio* (that is, “from the beginning”) theoretical treatment of nuclei is to predict nuclear phenomena, in quantitative detail, starting from the underlying physics of the internucleon interactions. However, as we consider nuclei with larger numbers of nucleons, and as we attempt to improve the resolution of the treatment, the dimension of the many-body problem rapidly explodes and becomes intractable. We must therefore seek out approaches which allow us to efficiently describe the correlations in the nuclear many-body wave function.

This talk will provide an introduction to *ab initio* nuclear theory in the no-core configuration interaction (NCCI) framework. We will explore the emergence of nuclear rotation and of “symplectic” symmetry in the nuclear wave function.