

## PhD position in nuclear theory

---

### Collective phenomena at the particle emission thresholds

---

Light weakly bound or resonant nuclei have unique properties, such as neutron halos or ground state particle emission. They play an important role in various stellar nucleosynthesis processes. The comprehensive understanding of these nuclei requires a simultaneous description of their structure and reaction properties. This in turn demands a correct treatment of the multi-particle continuum.

The Gamow Shell Model (GSM) has been developed recently to include the continuum couplings in the shell model framework. This model provides a unitary generalisation of the standard nuclear shell model for the description of both well bound, weakly bound and unbound nuclear states. GSM allows to treat an arbitrary number of particles in the continuum states what allows to describe consistently all aspects of couplings to the scattering continuum in nuclear structure and reactions.

The objective of this thesis is to study salient effects of clusterisations and correlations in near-threshold states using the unitary framework of GSM in both the Slater determinant and the reaction channel representations.

#### Expected skills:

Good knowledge of quantum mechanics, nuclear theory and excellent skills in programming and computational methods are required.

#### Contact: Marek Ploszajczak

GANIL, BP 55027, 14076 Caen France

Phone: +33 (0)2 31 45 45 90

mail: ploszajczak@ganil.fr