

**CENTRE D'ÉTUDES NUCLÉAIRES DE
BORDEAUX-GRADIGNAN**

Vendredi 27 Avril 2018

à 11H

Un café sera servi à partir de 10h45

Matthew BARTON

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**Nuclear structure and dynamics
beyond the mean-field**

My research has been focused on time-dependent aspects of nuclear physics both at the mean-field and at the beyond-mean-field level. This seminar will concentrate on the results obtained at the beyond mean-field level. At this level, the objective of my PhD was to implement a time dependent density matrix (TDDM) theory, self consistently, without symmetry restrictions using the full Skyrme force. TDDM allows an order by order truncation of the Bogoliubov-Born-Green-Kirkwood-Yvon (BBGKY) hierarchy, which relates the evolution of many body densities. If two-body correlations are assumed to dominate the dynamics of the system, the resulting equations incorporate one-particle-one-hole and two-particle-two-hole correlations. A variety of different nuclei below $A=40$ were chosen to study the formation of correlations for different nuclear ground states. Two body correlations were found to have a noticeable effect on the ground state properties of these nuclei. For example, on average 4 - 5 % of the total energy is due to correlations. When time dependent calculations were performed with these correlated nuclei, computational limitations led to problems with conservation laws.

Salle des Séminaires du CENBG

Le Haut Vigneau - BP 120 - F-33175 Gradignan Cedex