

# CENTRE D'ETUDES NUCLÉAIRES DE BORDEAUX-GRADIGNAN

**Vendredi 27 Juin 2014**

**à**

**11H00**

*Un café sera servi à partir de 10h45*

**Werner RICHTER**

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## **Nuclear structure studies applied to astrophysical calculations**

In astrophysical reaction rate calculations many important quantities such as masses or the detailed level structure of nuclei require theoretical input. While many measurements are being extended to the proton and neutron drip lines in radioactive beam experiments, much of the required input data is not available yet, and some will never be.

Two examples of rp-process rate calculations are discussed. In one masses in the  $A = 41 - 75$  range for proton-rich are required (to provide one- and two-proton separation energies), and these are calculated from a Skyrme Hartree-Fock mean field approach, which relies on the accurate calculation of Coulomb displacement energies. The masses are then used in astrophysical network calculations for type I X-ray bursters. In a second application the detailed level structures of nuclei in the 1s0d shell are calculated for final nuclei in  $(p,\gamma)$  reactions with generally few well-established levels. The method is based on the use of the Isobaric Mass Multiplet Equation and known levels in the isobaric analogue partners. The relevant spectroscopic properties of the levels, based on the new interactions USDA and USDB, are then input into reaction rate calculations for the rp process.

**Salle des Séminaires du CENBG**

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