

# CENTRE D'ETUDES NUCLÉAIRES DE BORDEAUX-GRADIGNAN

**Jeudi 16 Octobre 2014**

**à**

**14H30**

*Un café sera servi à partir de 14h15*

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## **Beta-delayed fission: from neutron-deficient to neutron-rich nuclei**

In the last decade, through technological, experimental and theoretical advances, the situation in experimental low-energy fission studies has changed dramatically. With the use of advanced production and detection techniques, much more detailed fission information can be obtained for traditional regions of fission research and, very importantly, **new regions of nuclei** have become accessible for fission studies.

The talk will, first of all, give a review of recent low-energy fission experiments in very proton-rich nuclei in the lead region. Results of experiments at ISOLDE (CERN) on the very exotic process of beta-delayed fission ( $\beta$ DF) of the neutron-deficient isotopes  $^{178,180}\text{Tl}$ ,  $^{194,196}\text{At}$  and  $^{200,202}\text{Fr}$  will be presented. The studies of Tl and At isotopes were facilitated by the use of the highly-selective Resonance Ionization Laser Ion Source of ISOLDE. As a result of these experiments, a new region of asymmetric fission was established, which includes isotopes  $^{178,180}\text{Hg}$  ( $N/Z=1.22-1.25$ ), in addition to the previously known broad area of asymmetric fission in the heavy actinides with  $N/Z\sim 1.55-1.6$ . The much more intense beams of the future ISOL-based facilities will allow in-depth studies of these and neighbouring  $\beta$ DF isotopes.

The talk will also address the prospects of detailed  $\beta$ DF studies in the neutron-rich isotopes, which will become possible with the new generation of ISOL-based facilities and approaches using the multi-nucleon transfer reactions. As some examples, possible  $\beta$ DF studies of very neutron-rich isotopes of Fr, Ac and Pa will be presented.

The recent complementary fusion-fission experiments in the lead region, performed by our collaboration at the tandem of Japan Atomic Energy Agency (JAEA) will also be reviewed.

**Salle des Séminaires du CENBG**

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