Contribution ID: **129** Type: **Oral**

Nucleosynthesis: a field with still many open nuclear physics questions

Tuesday, 22 May 2012 14:30 (30 minutes)

Stellar nucleosynthesis is a vastly interdisciplinary field. There is a large number of different problems invoked calling for a variety of different and complementary research fields. Impressive progress has been made for the last decades in the various fields related to nucleosynthesis, especially in experimental and theoretical nuclear physics, as well as in ground-based or space astronomical observations and astrophysical modellings. In spite of that success, major problems and puzzles remain. As far as nuclear physics is concerned, good quality nuclear data is known to be a necessary condition for a reliable modelling of stellar nucleosynthesis. Important effort has been devoted to measure reaction cross sections, but still nuclear astrophysics requires the use of theoretical predictions to estimate experimentally unknown rates. Most of the nuclear ingredients in the calculations of reaction cross sections need to be extrapolated in an energy or/and mass domain out of reach of laboratory simulations. In addition, some nucleosynthesis applications often involve a large number of unstable nuclei, so that only global approaches can be used. For these reasons, when the nuclear ingredients to the reaction models cannot be determined from experimental data, it is highly recommended to consider preferentially microscopic global predictions based on sound and reliable nuclear models which, in turn, can compete with more phenomenological highly-parametrized models in the reproduction of experimental data. However, such microscopic models need to reproduce as accurately as possible all available experimental data of relevance. Through some selected examples, the need for further theoretical or experimental developments is critically discussed in view of their impact on nucleosynthesis predictions

Primary author: GORIELY, Stephane (Universitè Libre de Bruxelles,Belgium)

Presenter: GORIELY, Stephane (Universitè Libre de Bruxelles,Belgium)

Session Classification: Nuclear Astrophysics

Track Classification: Nuclear astrophysics