

## **NOVEL TECHNIQUES FOR CONSTRAINING NEUTRON-CAPTURE RATES RELEVANT TO HEAVY-ELEMENT NUCLEOSYNTHESIS**

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All elements found in our Universe, except for the very lightest ones, have been created during stars' lives and/or deaths. Burbidge, Burbidge, Fowler and Hoyle, and independently Cameron, pointed out the slow neutron-capture (s-) and the rapid neutron-capture (r-) process to be the main contributors for producing elements from iron to uranium.

As of today, the r-process is still not well understood. On the one hand, the astrophysical site(s) is(are) not yet clearly identified. On the other hand, as the r-process inevitably involves highly neutron-rich nuclei, there is a severe lack of relevant nuclear data such as beta-decay rates and neutron-capture rates. Well away from the valley of stability, different theoretical predictions for neutron-capture rates may vary with several orders of magnitude.

In this talk I will discuss new indirect methods to infer neutron-capture rates on moderately neutron-rich nuclei, with focus on the so-called Oslo method in inverse kinematics and in particular the beta-Oslo method. These methods present a first step towards constraining neutron-capture rates of importance to the r-process.