Contribution ID: **119** Type: **Poster**

Nuclear processes in Astrophysics: Recent progress

The origin of the elements has been one of the most fascinating questions scientists have tried to give an answer to in the last 7 decades. The formation of light elements in the primordial universe and heavier elements, both in the intergalactic environment and in the astrophysical sources, occurs through nuclear reactions. We can say that nuclear processes are responsible for the production of energy and synthesis of the elements in the various astrophysical sites. Thus, nuclear reactions have a determining role in the existence and evolution of several astrophysical environments, from the Sun to the spectacular explosions of supernovae. Nuclear astrophysics is responsible for trying to bring answers to the most basic and important questions of our own existence and our future. There are still many issues that are unresolved such as, how stars and our galaxy have formed and how they evolve, how and where are the heaviest elements made, what is the abundance of nuclei in the universe and what is the nucleosynthesis output of the various production processes, why the amount of lithium-7 observed is less than predicted. In this paper we review our current understanding of the different astrophysical nuclear processes leading to the formation of chemical elements and particular attention is paid to the formation of heavy elements occurring during explosive nucleosynthesis in astrophysics catastrophic events. Thanks to the recent multi- messenger observation of a binary neutron star merger, which also confirmed production of heavy elements, explosive events such as short Gamma-ray bursts and the following Kilonovae are now strongly supported as nucleosynthesis sites.

Summary

Authors: Dr LICCARDO, Vincenzo (ITA-Instituto Tecnologico de Aereonautica); Prof. MALHEIRO, Manuel (ITA-Instituto Tecnologico de Aereonautica); HUSSEIN, Mahir (Instituto de Fısica,Universidade de SaoPaulo); Prof. FREDERICO, Tobias (ITA-Instituto Tecnologico de Aereonautica)

Presenter: Dr LICCARDO, Vincenzo (ITA-Instituto Tecnologico de Aereonautica)

Session Classification: Tuesday Posters