

Plenary Talk

PV IX Wed 9:45 HSZ/AUDI

The origin of the chemical elements — ●MARIALUISA ALIOTTA
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Questions around the composition and origin of our material world have fascinated mankind since ancient times, but it wasn't until the advent of the Mendeleev's periodic table in 1869 that it became clear how ordinary matter is made up of a finite number of different building blocks, the chemical elements. Yet, deeper questions remained: where, when, and how did the chemical elements originate?

These questions are still at the core of nuclear astrophysics research today. Thanks to the advances of the last century and to the interplay

of astronomical observations, nuclear physics experiments, and astrophysical models of stellar evolution and nucleosynthesis, we now know that only hydrogen, helium and few other light species were produced during the first few minutes of existence of the Universe, while all other elements, from carbon to gold, to uranium, were (and still are!) forged through nuclear reactions in different stages of stellar evolution.

In my talk, I will present an overview of the main processes responsible for the creation of the elements and recall the astrophysical sites in which these processes occur. I will also address the experimental challenges that we face in replicating stellar reactions on Earth in our attempt to reveal the origin of every chemical element and the intimate connection we bear with long-gone stars.