

# Großes Physikalisches Kolloquium an der Universität zu Köln

**Prof. Dr. Dennis Mücher**  
Institut für Kernphysik,  
Universität zu Köln



## **Nucleosynthesis: The Origin of the Chemical Elements**

We are all made from nuclear matter, with carbon, nitrogen and oxygen being among the most essential to form all life on earth. Although Earth's complex organic life is dictated by the rules of biology and organic chemistry, the fact that these elements are available in large quantities is a direct consequence of their nuclear properties. Nuclear astrophysicists have a detailed understanding about how lighter elements are formed by nuclear fusion reactions in dying stars. Thus, Carl Sagan was correct when he famously said, "*We are made of starstuff.*" Fusion reactions are however not able to explain the creation of heavier elements, whose exact origin is a complex puzzle with many open questions.

In this presentation I will provide an overview about current experimental efforts in the field of explosive nucleosynthesis.

I will discuss the origin of the rare  $^{60}\text{Fe}$  isotope detected via Accelerated Mass Spectrometry at the University of Cologne, as well as our efforts to enhance the sensitivity for detection of this key isotope in the future. I will also show recent results from Radioactive Ion Beam facilities which enable us to study neutron-rich nuclear matter, playing a pivotal role in neutron star merger events.

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16<sup>30</sup> Uhr  
HS III

