



## PHYSIKALISCHES KOLLOQUIUM

*Referentin:* **Prof. Dr. Almudena Arcones**  
Technische Universität Darmstadt  
Institut für Kernphysik (Theory Center)  
and  
GSI Helmholtzzentrum für Schwerionenforschung GmbH



*Thema:* **Heavy element production in neutron star mergers and core-collapse supernovae**

*Zeit und Ort:* Dienstag, 04.02.2019, 16:40 Uhr  
Recknagel-Bau, Hörsaal REC/C213, Haeckelstr. 3

*Leiter:* Prof. Dr. Michael Kobel

*Kurzfassung:* Heavy elements like Gold and Uranium are produced by the rapid neutron capture process (r-process). Extreme neutron-rich conditions are necessary for this process, which is linked to neutron stars. Two possible astrophysical scenarios have been suggested as the site of the r-process: core-collapse supernovae (where neutron stars are born) and neutron star mergers. In 2017, gravitational waves were detected from the merger of two neutron stars, GW170817, opening a new multimessenger era. Observations of this event revealed that heavy, neutron-rich nuclei were produced. These nuclei are unstable and their decay leads to a kilonova light curve. In the talk, I will present the nucleosynthesis in neutron star mergers and discuss the critical contribution of core-collapse supernovae to the chemical history of the universe.

*Biographie:* Almudena Arcones studied Physics in Madrid and in 2002 she moved to Germany for her master thesis (Diplomarbeit). She did her PhD in the Max Planck Institut for Astrophysics (Garching) and TU München working in core-collapse supernova simulations with Thomas Janka as supervisor. In 2017, she moved to Darmstadt for her first postdoc at the theory group of GSI. Her second postdoc (2010-2012) was in Basel with a Feodor Lynen Postdoctoral Fellowship in the group of Prof. Thielemann. In 2012, she got a Helmholtz Young Investigator Group at GSI and moved back to Darmstadt where she was appointed as assistant professor (W1) at the TU Darmstadt. Since 2016, she is associate professor and is leading the ERC starting-grant group EUROPIUM.

**After the colloquium (approx. 6 p.m.), female students and staff are invited to a get-together with Almudena Arcones in room REC/B202. Over drinks and snacks there will be the opportunity to talk to the speaker in person and discuss female perspectives on challenges in studies and professional life.**

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