

# Neutron Star Mergers and High Density Matter

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The first unambiguous detection of a neutron-star merger in 2017 marks a break-through not only in astronomy and astrophysics. The observations have immediate consequences for nuclear astrophysics, general relativity, nucleosynthesis, high-density matter physics and many other fields. This event established that half of all heavy elements beyond the iron group are created in collisions of neutron stars. The detections also lead to constraints on the incompletely known properties of high-density matter. I describe these main implications for nucleosynthesis and the physics of high-density matter and point out some prospects for the not so far future. Moreover, the talk highlights the tight connections between neutron-star merger physics and upcoming experiments at the Facility for Antiproton and Ion Research (FAIR), which is currently under construction in Darmstadt.