



WESTFÄLISCHE  
WILHELMS-UNIVERSITÄT  
MÜNSTER



FACHBEREICH  
PHYSIK

# › Allgemeines Physikalisches Kolloquium

› Donnerstag, 18.10.2018 um 16 Uhr c.t.

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## “Multi-Messenger Astronomy with Ultra-High Energy Cosmic Rays”

The origin of ultra-high energy cosmic rays with energies to beyond  $10^{20}$  eV is a most pressing puzzle in high energy astrophysics. The advent of large scale cosmic ray, photon, and neutrino observatories and their combined observations have dramatically advanced our understanding of the extreme Universe and have resulted in a number of surprises during the last few years. The first detection of gravitational waves from a binary neutron star merger and its coincident observation of electromagnetic radiation on August 17, 2017 represents another unprecedented leap and is considered the birth of multi-messenger astronomy. This event brought together different fields of science ranging from general relativity over cosmology to nuclear physics and has produced a wealth of new results. This talk addresses some of these recent observations, and discusses selected future directions.