Contribution ID: **29** Type: **Contributed talk**

Studying binary neutron star systems with future ground-based gravitational-wave detectors

Wednesday, 2 October 2024 08:30 (20 minutes)

Gravitational waves offer us a unique tool to study binary neutron star (BNS) systems and the supranuclear-dense matter that comprises these objects. The gravitational-wave signal emitted during a BNS coalescence depends on the neutron stars'properties, including their masses, spins, and tidal deformabilities. The increased sensitivity of future-generation detectors, such as the Einstein Telescope, will allow us to measure these parameters with unprecedented accuracy. I will discuss how precisely we expect to determine the properties of neutron stars with the Einstein Telescope, compare results for different proposed designs of the detector, and show how we can use this information to place constraints on the underlying equation of state of dense matter. Additionally, I will present a new tool, based on machine learning techniques, that allows us to predict the postmerger remnant of a BNS system—e.g., whether it undergoes a prompt collapse or not—based on the binary system's parameters inferred from gravitational-wave inspiral signals.

Primary author: PUECHER, Anna (University Potsdam)

Presenter: PUECHER, Anna (University Potsdam)

Session Classification: GW and multi-messenger observational science

Track Classification: GW and multi-messenger observational science