



Contribution ID: 80

Type: talk

Modeling the strong-field dynamics of binary neutron stars

Thursday 4 September 2025 09:50 (50 minutes)

Binary neutron star mergers (BNSM) are associated with powerful gravitational and electromagnetic astronomical transients. Multimessenger observations of BNSMs promise to deliver unprecedented insights on fundamental physics questions, including constraints on dense matter models and the production of heavy elements. Detailed theoretical predictions of the merger dynamics are crucial for extracting information from such observations. This talk reviews recent progress in the modeling of BNSMs using simulations in 3+1 numerical general relativity. I will first discuss the first predictions for the complete (inspiral-merger-postmerger) gravitational-wave spectrum and their application in gravitational-wave astronomy. Afterwards, I will focus on recent results on the merger remnants and mass ejecta, the mechanisms behind kilonova light and their application to the analyses of astrophysical data.

Primary author: Prof. BERNUZZI, Sebastiano (FSU Jena)**Presenter:** Prof. BERNUZZI, Sebastiano (FSU Jena)**Session Classification:** Morning