Contribution ID: **62**   Type: **not specified**

Orbital eccentricity in general relativity from catastrophe theory

Tuesday, 17 September 2024 16:20 (20 minutes)

Eccentricity is one of the key parameters to describe a binary system, however, defining it in General Relativity is a highly nontrivial problem. Nevertheless, achieving a consistent definition of orbital eccentricity is a pressing issue for both current and future gravitational wave observations. We present a new approach to consistently define the binary eccentricity in General Relativity which has a solid foundation in the branch of mathematics called "catastrophe theory". In particular, we discover the existence of catastrophes in numerical relativity waveforms and exploit them to derive a robust and gauge invariant estimator of the orbital eccentricity.

Primary authors: Prof. GEROSA, Davide (University of Milano-Bicocca);   FUMAGALLI, Giulia (Istituto Nazionale di Fisica Nucleare);   BOSCHINI, Matteo (University of Milano-Bicocca);   LOUTREL, Nicholas (Istituto Nazionale di Fisica Nucleare)

Presenter: BOSCHINI, Matteo (University of Milano-Bicocca)

Session Classification: Contributed Talks