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Data Challenges in "Gravitational-Wave Paleontology"

Friday, 8 April 2022 10:15 (45 minutes)

The rapidly increasing population of detected gravitational wave sources carries valuable information about the properties of black holes and neutron stars, such as their rates,
masses and spins, that we aim to use to probe their progenitors and answer two of the big open questions in Astronomy today: "How do these sources form?"and "What can we learn from their gravitational waves about the birth, lives and explosive deaths of stars?"New gravitational-wave
observing runs and next generation detectors will rapidly provide data with ever increasing precision and volume. However, on the theory side we are limited in answering these questions due to "the great gravitational-wave formation channel challenge": uncertainties within the modeling of the formation channels leading to gravitational-wave sources are so large, that disentangling formation channels, and learning about their progenitors is computationally expensive and seems completely out of reach for the gravitational-wave field in the coming decades. In this talk we will interactively discuss these challenges, and how to overcome them using modern-day machine learning techniques.

Presenter: BROEKGAARDEN, Floor

Session Classification: Astrophysics and Cosmology