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Introductory course: GW detection

Wednesday 7 February 2024 09:00 (1h 15m)

In this lecture, we will discuss a number of fundamental questions concerning gravitational wave detection with a particular focus on the space-based gravitational wave detector LISA. With these questions and their high-level answers, we will work on an overview spanning all relevant aspects: What are gravitational waves, what is their effect, and how can they be measured? Why do we need multiple detectors on the ground and, additionally, a space-based detector (or several)? What do we learn from gravitational wave detection? What are the key differences between ground-based and space-based detectors, and how does a space-based gravitational wave detector like LISA actually work? We will substantiate the fundamental and conceptual overview with a number of technical details. For example, we will speak about Gaussian beams, laser frequency noise, time-delay interferometry, power spectral densities, the computation of LISA sensitivity curves, and many more.

Presenter: WANNER, Gudrun