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## The LISA orbiting gravitational wave observatory

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In January 2025, the European Space Agency (ESA) adopted the Laser Interferometry Space Antenna (LISA) to be implemented as the second “Large Mission” of the Cosmic Vision program, with a target launch date of 2035. LISA aims to create an orbiting observatory for gravitational waves, opening the astrophysically rich band from 0.1 mHz to 1 Hz. It will use laser interferometry to measure the gravitational tidal deformation on a constellation of geodesic reference test masses, which are free-falling inside three drag-free satellites at the corners of an orbiting triangular configuration with sidelength 2.5 million km. LISA promises high resolution observation of sources ranging from solar mass binaries in our galaxy out to supermassive black hole mergers at cosmological distances. In this talk we present the scientific potential for a mHz observatory and discuss the status of the mission, particularly regarding the two main measurement science challenges: pm-level interspacecraft interferometry and sub-femto-g free-falling test masses.

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