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The Laser Interferometer Space Antenna: A space-based Gravitational Wave Observatory

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After decades of persistence, scientists have recently developed facilities which can measure the vibrations of spacetime caused by astrophysical cataclysms such as the mergers of black holes and neutron stars. The first few detections have presented interesting astrophysical questions and it is clear that with an increase in the number and capability of ground-based facilities, gravitational waves will become an important tool for astronomy. A space-based observatory will complement these efforts by providing access to the milliHertz gravitational wave band, which is expected to be rich in both number and variety of sources. The European Space Agency (ESA) has recently selected the Laser Interferometer Space Antenna (LISA) as a Large-Class mission in its Cosmic Visions Programme. The modern LISA retains the basic design features of previous incarnations and, like its predecessor, is expected to be a collaboration between ESA, NASA, and a number of European National Agencies. In this talk, I will present an overview of the current LISA design, its scientific capabilities, and the timeline to launch.