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### **Status of the LISA Space Gravitational Wave Mission**

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The Laser Interferometer Space Antenna (LISA) is a European Space Agency-led space gravitational wave observatory with expected significant contributions from NASA. LISA will be the first mission to detect and observe low millihertz gravitational waves from compact galactic binaries and binary black holes, including the mergers of supermassive black holes and extreme mass-ratio inspirals. LISA will be the largest instrument ever constructed, consisting of three Sun-orbiting spacecraft that form an equilateral triangle, with each side measuring 2.5 million kilometers in length. Each spacecraft houses two free-floating test masses (TM), which are protected from all disturbing forces so that they follow pure geodesics in spacetime. A “drag-free” control system is supplied with measurements of the TM position and commands external micronewton thrusters to force the spacecraft to fly in formation with the test masses. Laser interferometry is used to measure the minute variations in the distance, or light-travel time, between these free-falling TMs, caused by gravitational waves. The LISA mission is currently in the formulation phase with an expected launch in the early 2030’s. This talk will provide an update on the status of this landmark mission, summarize its science return and its involvement in the Astro2020 decadal survey, and describe activities in the U.S. to develop technology and prepare for the science data analysis.