LISA

http://lisa.jpl.nasa.gov/

Expected Launch: 2008

Laser Interferometer Space Antenna

Mission

The Laser Interferometer Space Antenna (LISA) is planned as a joint NASA/ESA mission. LISA will fly three spacecraft in the formation of an equilateral triangle, five million kilometers apart. It will measure the distortion of space caused by passing gravitational waves that come from the violent motion of large, dense masses in the Universe. LISA will detect binary star systems in our Galaxy and other galaxies, observe and measure the rate of massive black hole mergers, observe compact stellar objects spiraling into massive black holes, and observe gravitational waves from the early Universe.

Education and Public Outreach Program

LISA's Education and Public Outreach Program has been developed to promote an understanding of the use of gravitational waves to study the origin and structure of the Universe. The LISA EPO team will develop curriculum supplements, posters, and lithographs. It will also participate in NASA public events and in educator and professional conferences. The LISA Education and Public Outreach Program will use proven NASA outreach programs, including The Space Place to make information accessible to all audiences. Be sure to visit The Space Place LISA interactive crossword puzzle at: *http://spaceplace.jpl.nasa.gov/lisaxword/lisaxword.htm*

Seeing and Exploring the Universe

As the first space observatory for gravitational wave science, LISA will capture a new vision of the Universe. Three spacecraft will travel through space in an equilateral triangle, sensing gravitational waves created by large cosmic disturbances. Although these waves have not yet been directly detected there is strong indirect evidence that they exist. Albert Einstein proposed the idea that mass curves space, and that rapidly moving masses create ripples in space. These ripples are called gravitational waves. As in our oceans on Earth, very large disturbances cause very large waves. Large cosmic events in space cause large gravitational waves. But even the biggest of these waves can be very weak by the time they reach us here on Earth, making them very hard to detect. Although gravitational waves get weaker as they travel across space, they aren't changed when they pass through matter. Therefore, the signals they carry will be unchanged across time and space and through them we may even be able to learn how the Universe began.

LISA will not observe the EM spectrum; it will detect gravitational waves in the frequency range of 0.0001 to 1 Hz.