

Hunting for Mystery Waves

If you sat at the edge of a small pond, and someone dropped objects into the water, you could tell something about those objects from the ripples. One small stone dropped into the water would make waves different from the waves made by two big stones. Scientists hope to learn about objects in space in a similar way. By detecting gravitational waves, they'll get clues about large objects like black holes.

Gravity is what keeps your clothes on the floor where you left them. It's why the moon stays in orbit around the Earth. We know what gravity does, but scientists still aren't sure what it is. The scientist Albert Einstein believed that space curves around objects. The bigger the object, the more space would curve. Huge things, like the sun and planets, would curve space so much, other objects (like the moon), would orbit around them.

According to Einstein, humongous objects, like two suns in orbit around each other, are like big rocks dropped into a pond. They make ripples of gravity that spread out into space. With the right equipment, we may be able to detect these gravitational waves.

The Laser Interferometer Space Antenna (LISA) could let scientists find and measure these ripples. The antenna would actually be three spacecraft flying five million kilometers (three million miles) apart. Each spacecraft would be a point in a triangle. Sensitive laser beams would connect them. As gravitational waves passed through LISA, the distance or positions between the three ships would change. Scientists would know the strength and shape of the waves by measuring those changes. If you put three small boats in your pond, and connected them with string, you could detect tiny ripples by watching the way the string moved.

If NASA approves LISA, it will be launched in 2009. For more information about LISA and gravitational waves, visit The Space Place at http://spaceplace.nasa.gov/lisa_fact2.htm .

This article was written by Eric Elkins and provided by the Jet Propulsion Laboratory, California Institute of Technology, in Pasadena.

Caption: LISA's three spacecraft will be 3 million miles apart, connected only by laser beams.