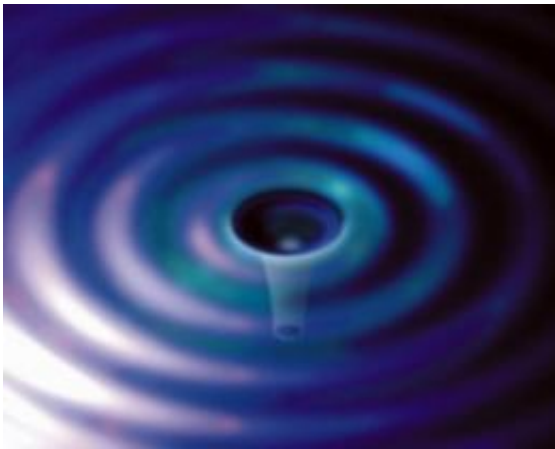


Galaxy-Sized Observatory for Gravitational Waves

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Artist's impression of a gravitational wave. Image: NANOGRV

(PhysOrg.com) -- Astronomers are making plans to create a galaxy-sized observatory to look for gravitational waves. The project is part of a joint effort with astronomers from Australia and Europe, who also aim to try to detect gravitational waves.

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Einstein's general [theory of relativity](#) predicts the existence of

gravitational waves, which are usually described as ripples in space-time produced by masses, rather as a boat produces waves in water as it travels. Gravitational waves pass through matter and their strength weakens as they travel away from their source. The effect of the waves is to cause incredibly tiny fluctuations in the distance between the observer and the source.

Gravitational waves have not yet been detected directly in practice (although they have been shown to exist by indirect means). It should theoretically be possible to detect them through minute disturbances in the time that light or radio waves take to travel from the source in space to an observer.

The new project has been proposed by a consortium of astronomers known as the North American Nanohertz Observatory for Gravitational Waves (NANOGrav). The proposal is to study the radio waves from pulsars to identify these disturbances, which should be detectable as fluctuations in the times of arrival of the radio pulses. In effect, the pulsars seem to shimmer as the waves wash over them. They described their proposal in a submission by F. Jenet et al. to the Astro2010 Program Prioritization Panel on Particle Astrophysics and Gravitation earlier this month.

At present, a precision of

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