

Notes on Gravity Waves

The Astronomers: PBS home video Waves of the Future: 1991
(one of a 6 video series)
Gravity Waves

Soviet Leonard Grishuk

Scottish Ron Dreever (adopted Ray Weis new idea for gravity wave detector: use interferometer)

USA Kip Thorn; Caltech in Pasadena: black holes, gravity waves, time; Hawking concedes to Kip Thorn there are black holes

Caltech & MIT unified for a while

Gravity waves produced by exploding stars & other violent events

Einstein first predicted gravity waves, caused by the bending of space; thought they might be undetectable. Theory of general relativity demand Ripples expand throughout universe

Grishuk's dream is to detect relic gravitons: gravity waves from the big bang; these might have been amplified.

GW not yet discovered as of 1991

Their joint project planned

LIGO

Laser Interferometer Gravity Wave Observatory

In future; may have them in multiple places on earth;

Nothing stops GW; pass thru earth

Joe Weber designed & built first GWD in 1964.

Vladimir Breginski lives in Moscow; led this group out of theoretical and into experimental study of gravity waves.

Made the first gravity wave detector in 1980

Gravity waves from distant events can be detected before the visible light is detected, so the GWD center can alert an optical observatory of an impending super nova.

Quantum cosmology

Neutrino astronomy

Malcolm Perry, a student of Stephen Hawking

Gravity waves have amplitude, frequency, and waveform: black hole waveform; super nova waveform;

A GR prediction for gravity waves: Gravity radiates energy away as waves, causing orbits to shrink: perfect fit to binary pulsar orbit decay nobel prize to Hulse and Taylor 1933

Gravity waves may have been detected in 1987

<http://science.slashdot.org/article.pl?sid=09/03/04/1853253>

In 1987, [Joe Weber](#) claimed to have detected gravitational waves at the same time that other scientists spotted a supernova called SN1987A. His claims were largely ignored because his equipment was not sensitive enough to detect the weak rays. However, a new analysis shows that second order effects can enhance the magnitude of gravitational waves by four orders of magnitude when certain asymmetries are present. It appears those symmetries may have been present for SN1987A, so Weber may have been the first to detect gravity waves.

<http://www.sciencedaily.com/releases/2007/11/071116094829.htm>

ScienceDaily (Nov. 18, 2007) Scientists already have indirect evidence that gravitational waves exist, but have not directly detected them.