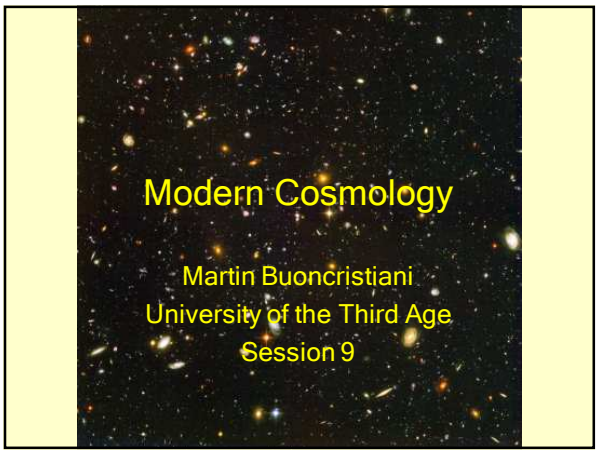


The Birth of Stars

Dr. Daniel Price
Monash Research Fellow
Monash Centre for Astrophysics

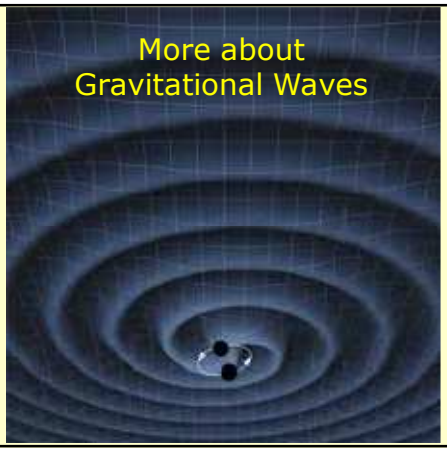
When: 6pm, Thursday 2 August, 2012

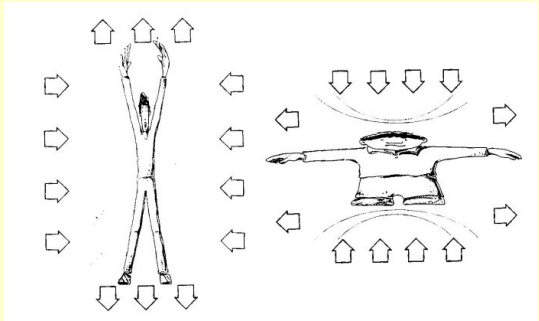
Where: Lecture Theatre S3, Monash University, Clayton Campus

Contact: samantha.penny@monash.edu

News from Mt. Burnett Observatory

More about Gravitational Waves





Resonant Mass Detector

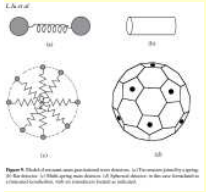
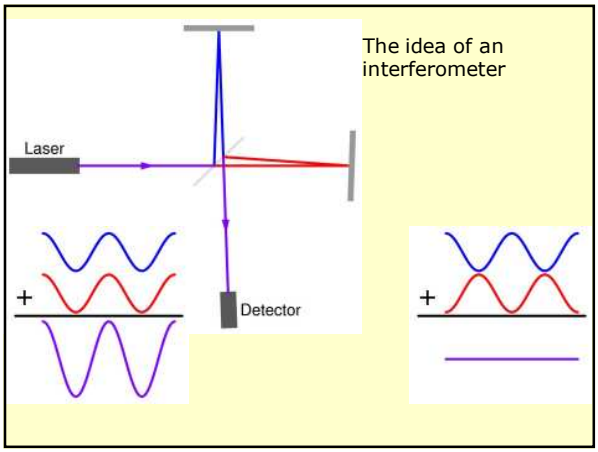
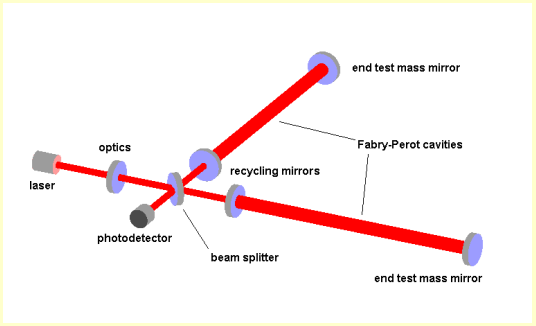


Figure 14. Photograph of the antenna NAUTILUS at Frascati, showing the bar and its cryogenic shields.

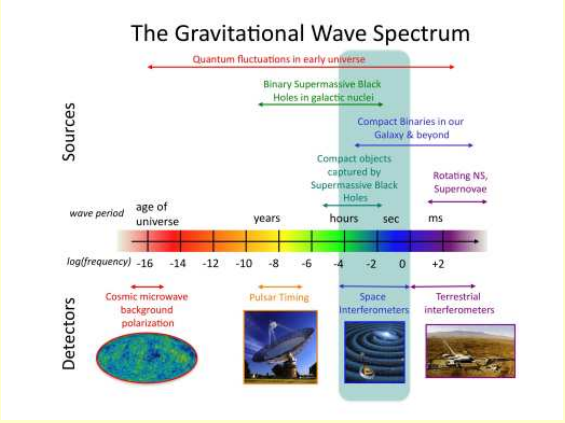
The idea of an interferometer

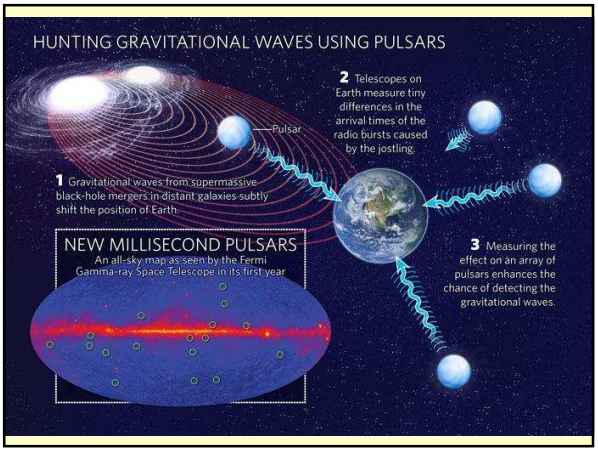


Laser Interferometer



The Gravitational Wave Spectrum





History of Gravitational Wave Detectors

1915: Postulation of gravitational waves by Albert Einstein in his Theory of General Relativity

1960: Joseph Weber tries to detect gravitational waves with resonance-mass detectors.

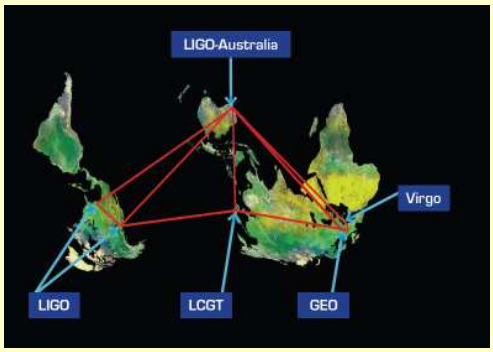
First he used a 2 ton aluminum-cylinder, without cooling. Later he thought, he had measured a gravitational-wave-signal, but this has never been verified

History of Gravitational Wave Detectors

1972: first test with laser-interferometer-detectors – Indirectly detection of gravitational wave emission by Taylor & Hulse at the binary-pulsar PSR J1915+16 (Nobel-prize in 1993)

No direct measuring of gravitational wave until today

Next Generation of Laser Interferometer Gravitational Wave Detectors



GEO 600 – British/German collaboration
600 meter baseline instrument (to 3 km)
Sarstedt (Harz Mts) (running since 2006)

Virgo – Italian/French collaboration
3km baseline (running since 2007)

LIGO – USA – Two 4 km baseline instruments
Louisiana and Washington

LCGT (KAGRA) – Large Scale Cryogenic Gravitational Telescope in the Kamioka mine 3km (1 km below ground)

AIGO - Australia – more to come

GEO 600 – British/German collaboration 600 meter baseline instrument (to 3 km)
Sarstedt (Harz Mts)
(running since 2006)

http://www.geo600.org/

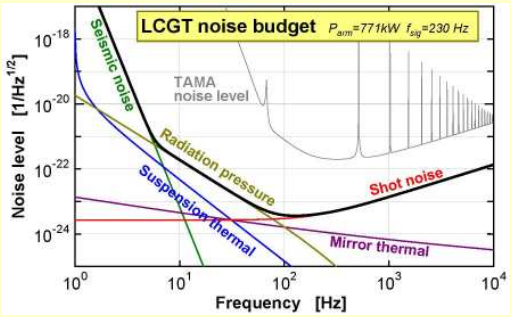
Virgo – Italian/French collaboration
3km baseline (running since 2007)

http://www.ego-gw.it/public/virgo/virgo.aspx

LIGO – USA – Two 4 km baseline instruments
Louisiana and Washington

http://www.ligo.caltech.edu/

LIGO at Hanford, Washington

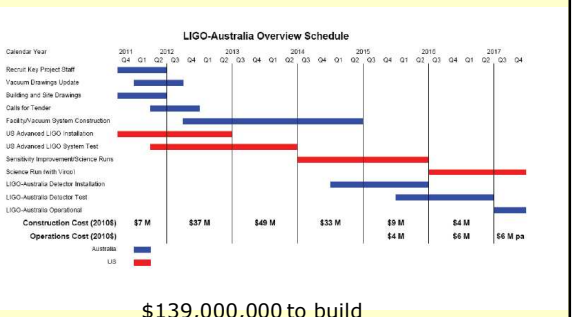


LCGT (KAGRA) – Large Scale Cryogenic Gravitational Telescope in the Kamioka mine 3km (1 km below ground)

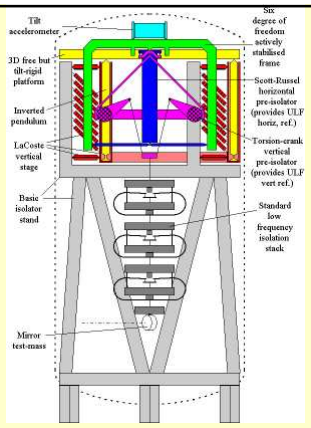
http://gw.icrr.utokyo.ac.jp/lcgt/

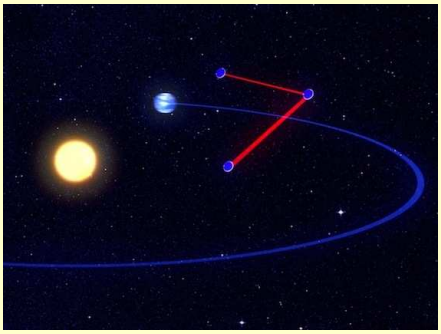
Australian International Gravitational Observatory AIGO

http://www.aigo.org.au/



$139,000,000 to build
$6,000,000 to operate

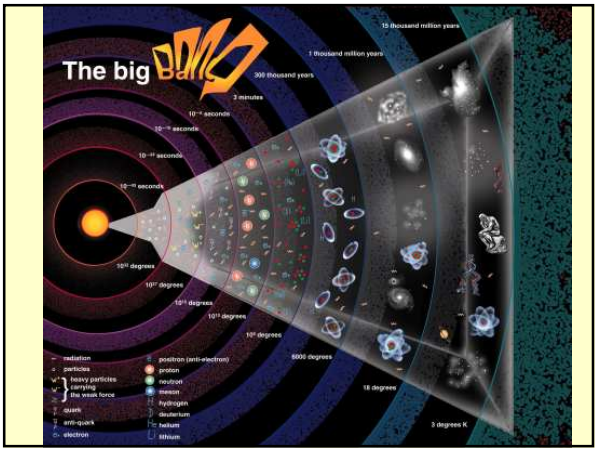




Advanced LIGO or LISA

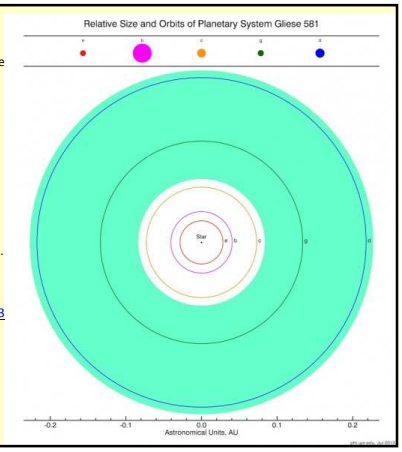
http://einstein.phys.uwm.edu/

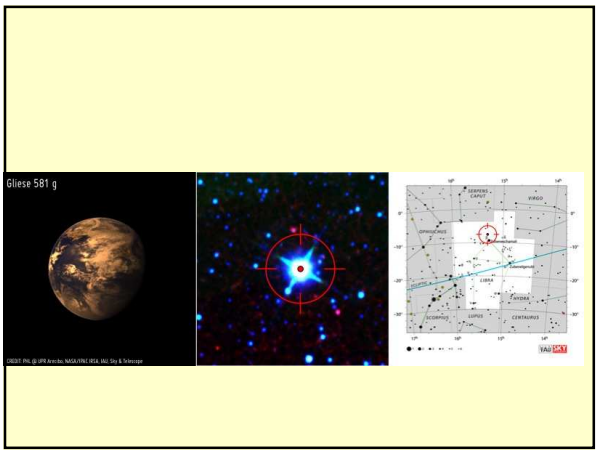
http://www.einstein-online.info/



Exoplanet Gliese 581g is back, and "officially" ranking #1 on a list of potentially habitable worlds outside of our solar system thanks to new research from the team that originally announced its discovery in 2010.
Orbiting a star 20 light-years away, the super-Earth is now listed alongside other exoplanets Gliese 667Cc, Kepler-22b, HD85512 and Gliese 581d in the University of Puerto Rico at Arecibo's Habitable Exoplanets Catalog as good places to look for Earthlike environments... and thus the possibility of life.

Read more:
http://www.universetoday.com/96374/exoplanet-gliese-581g-makes-the-top-5/#ixzz21ssyGLaX




Gliese 581 g
SERPENS CAPUT
VIRGO
OPHIUCHUS
LIBRA
HYDRA
SCORPIUS
LUPUS
CENTAURUS