

Searching for gravitational waves

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Louisiana State University

For the LIGO Scientific Collaboration and
the Virgo Collaboration
AAAS meeting, Washington DC, USA
Feb 12, 2016



LIGO-G1600262



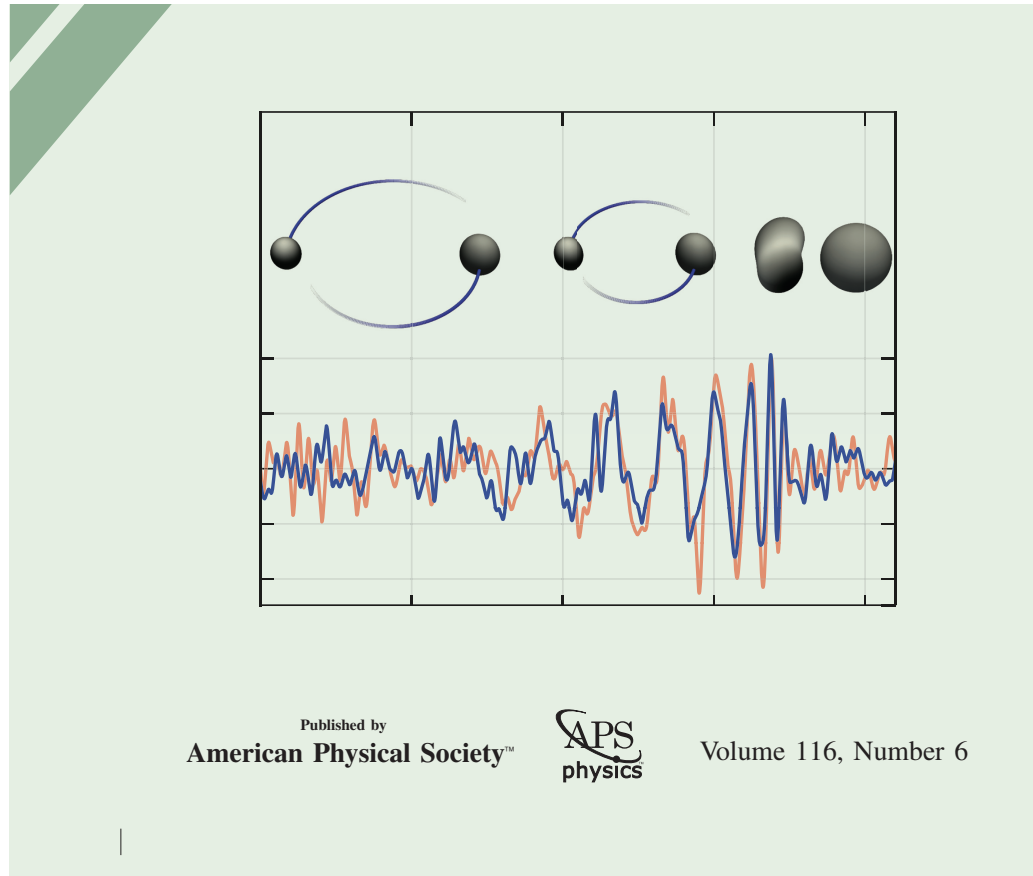


Observation of Gravitational Waves from a Binary Black Hole Merger

B. P. Abbott *et al.**

(LIGO Scientific Collaboration and Virgo Collaboration)

(Received 21 January 2016; published 11 February 2016)

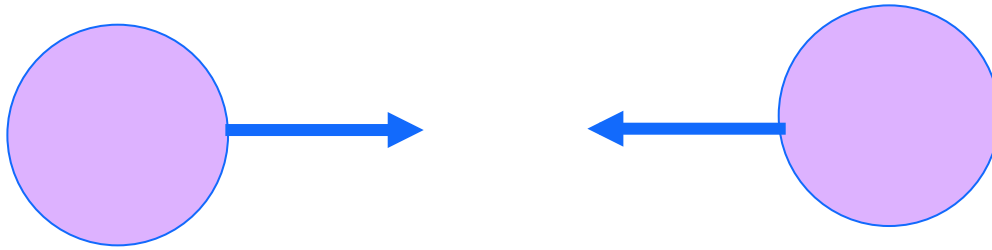


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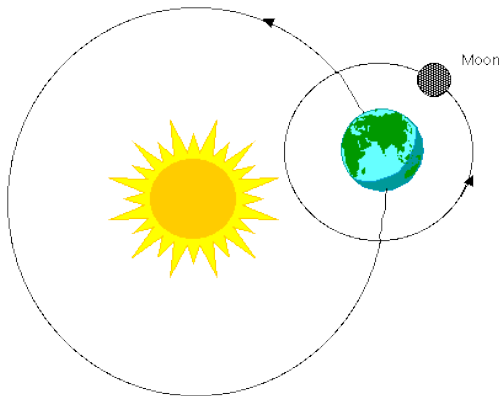
Newton's gravity



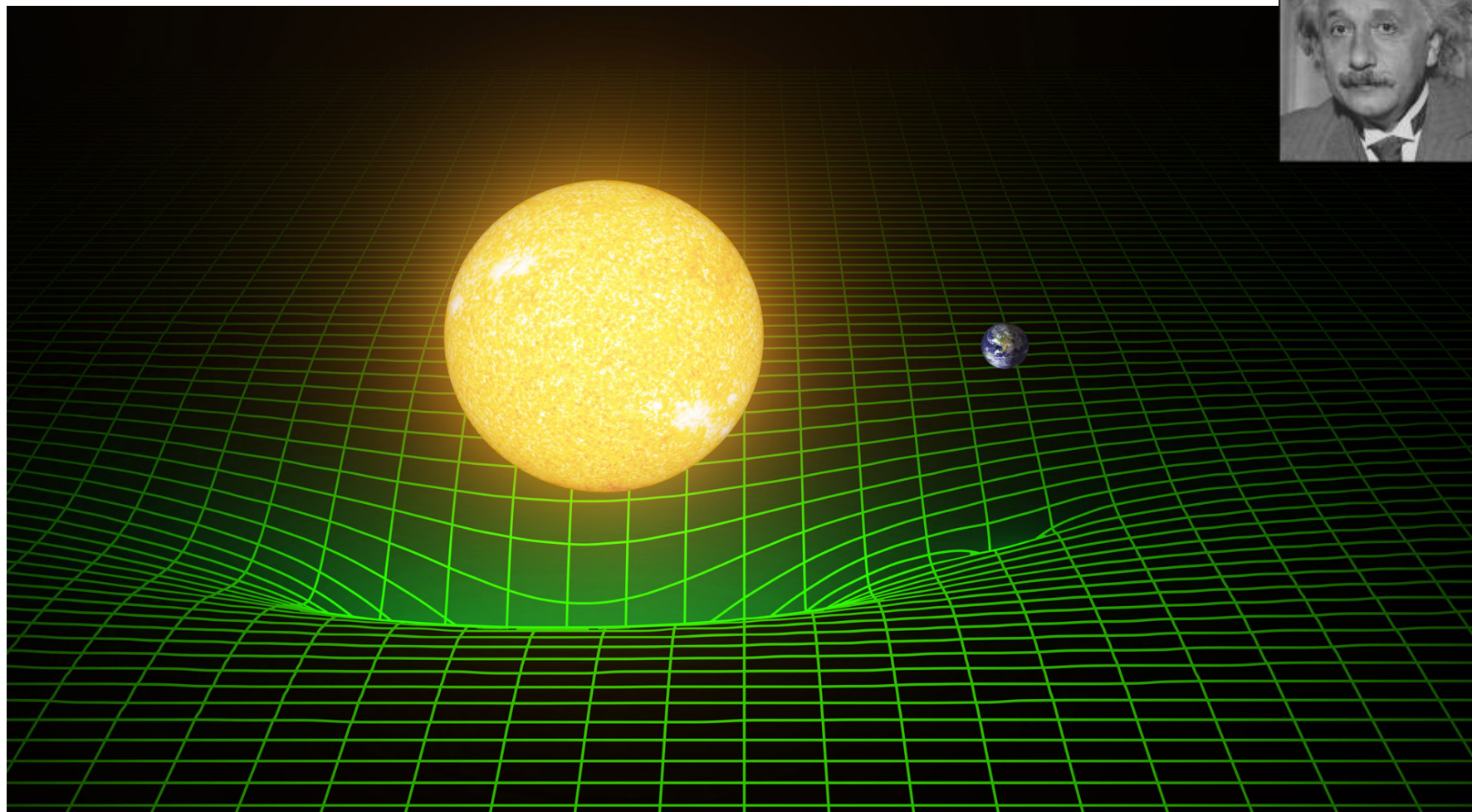
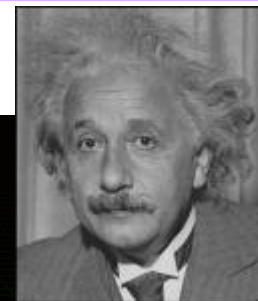
“Newton’s law”: $F = Gm_1m_2/r^2$



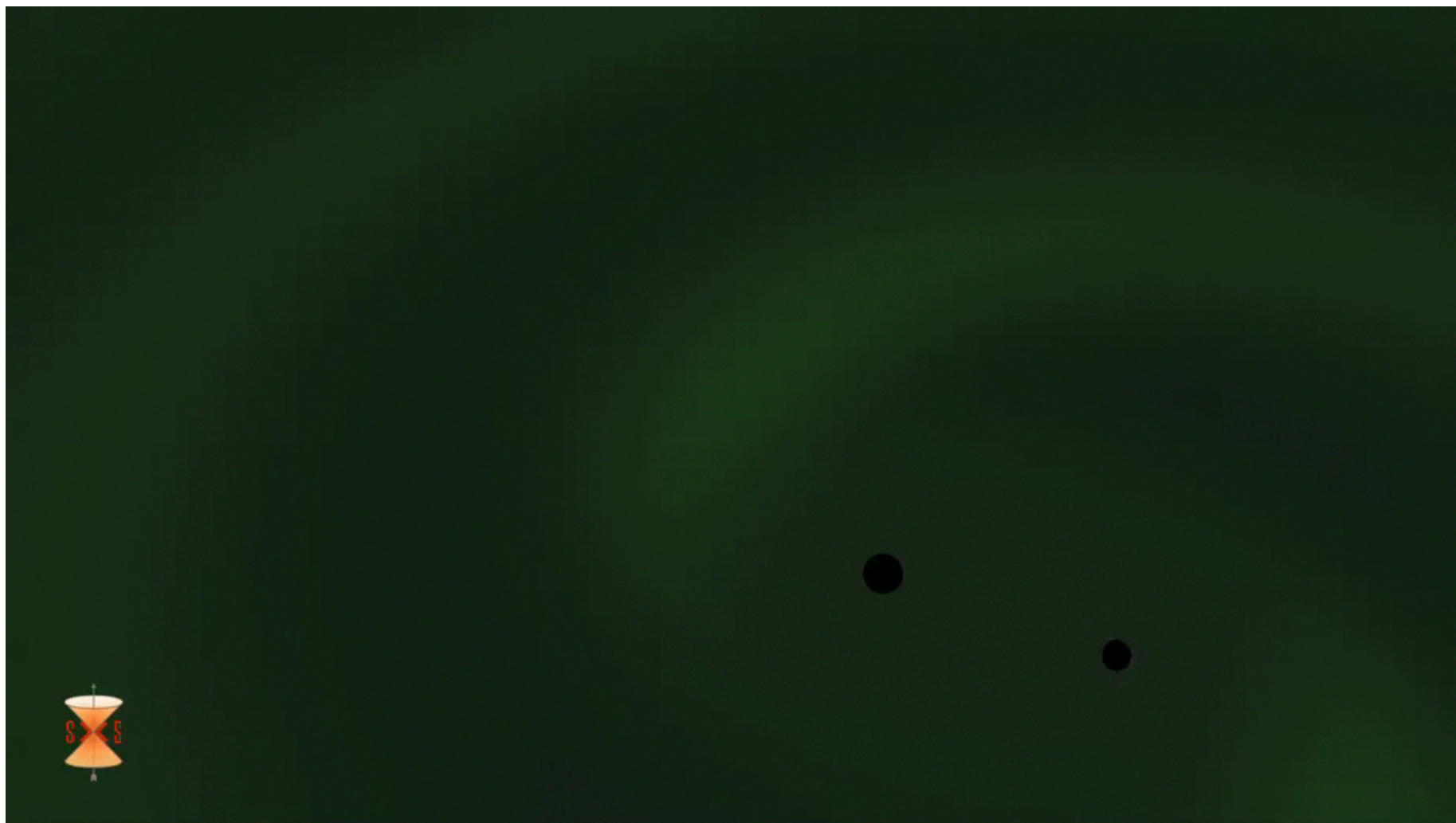
Explains why apples fall, why the planets move around the Sun,...

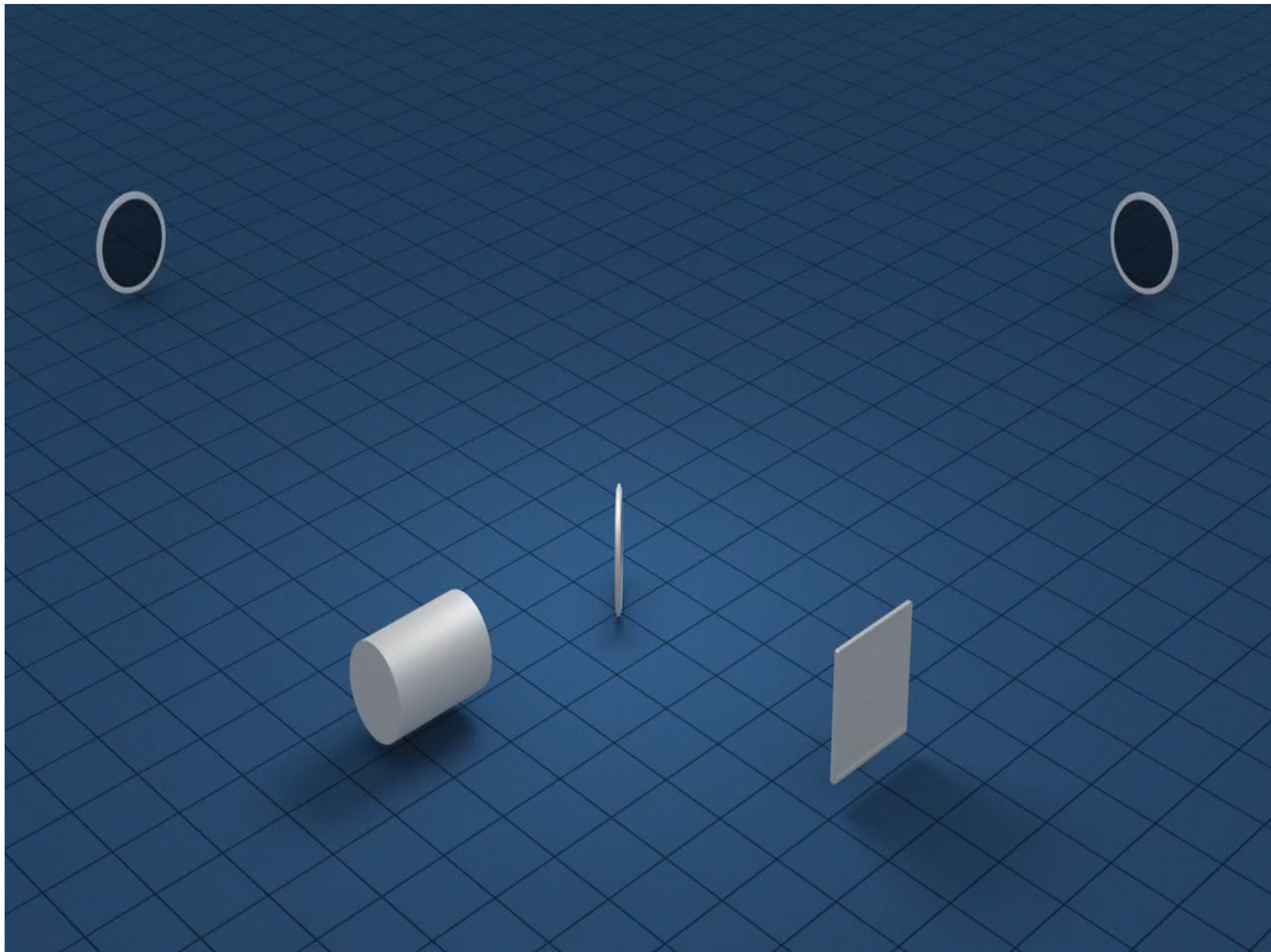


Einstein's gravity

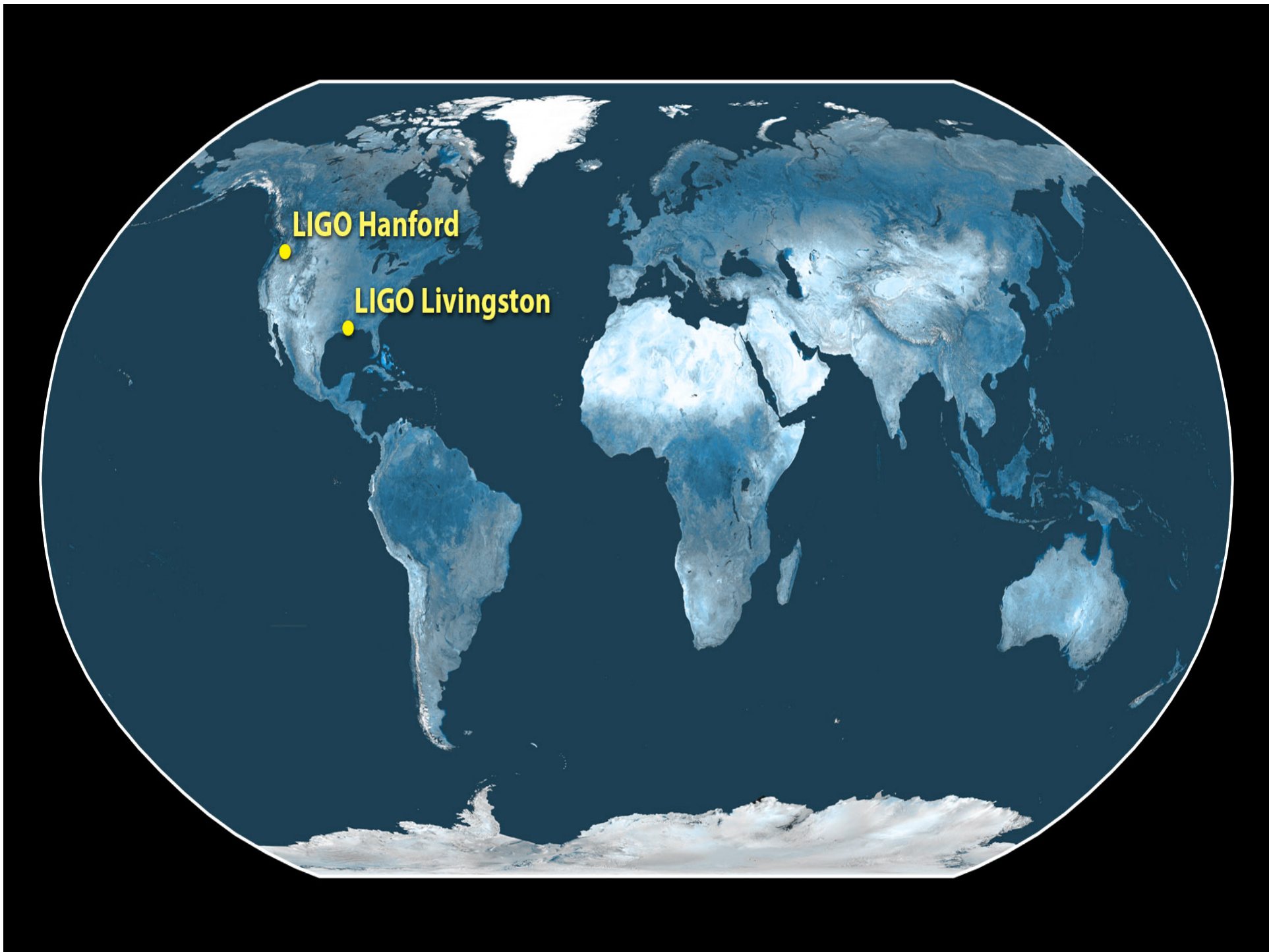


Einstein's gravity



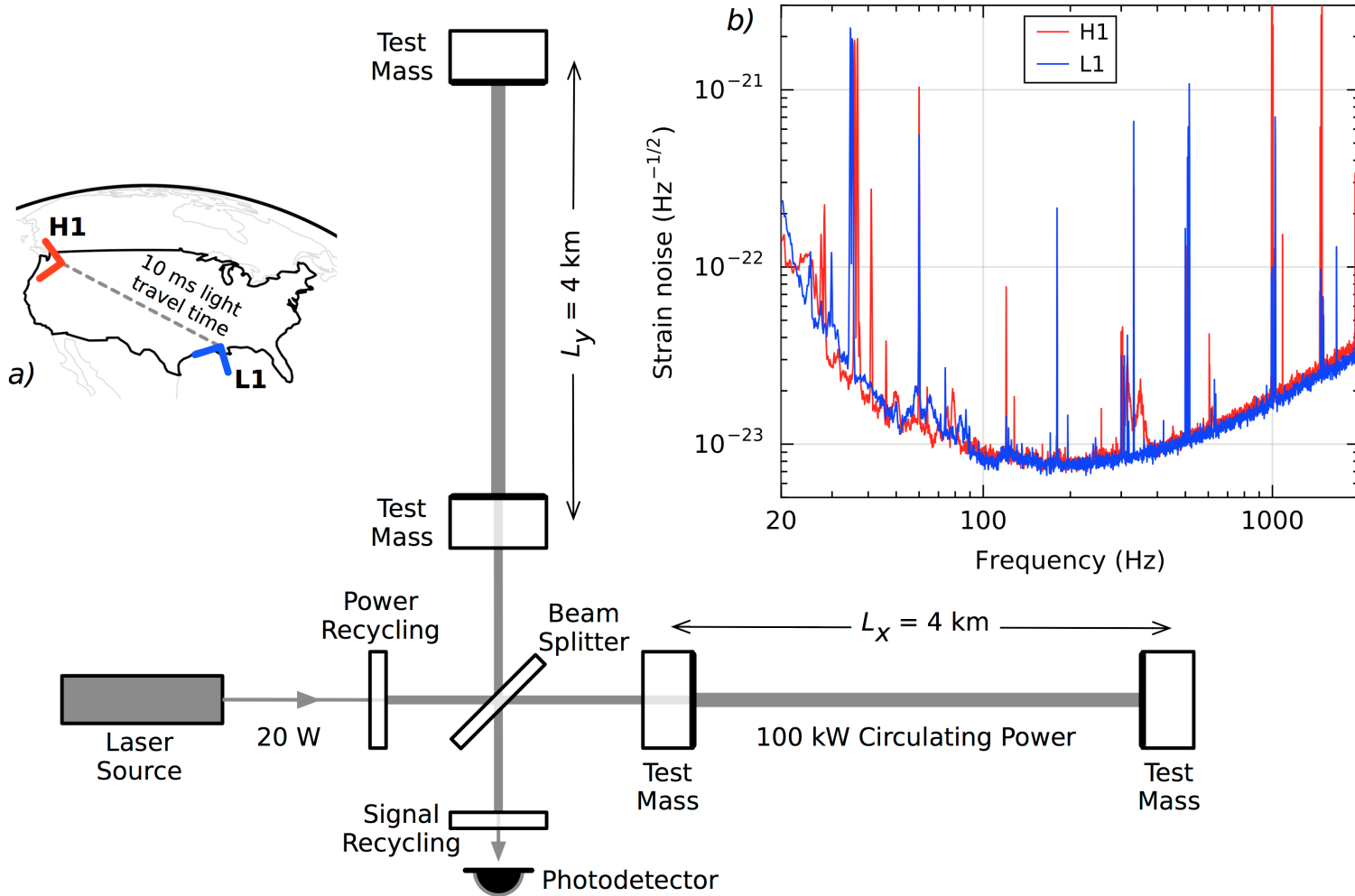




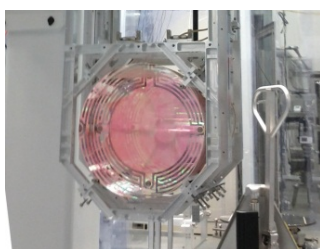
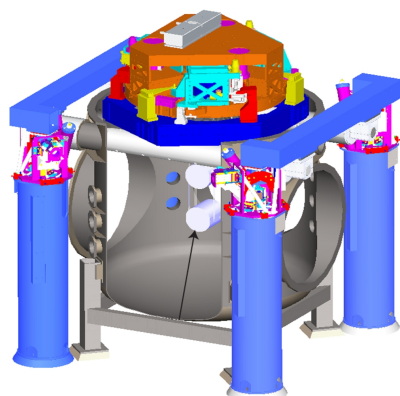
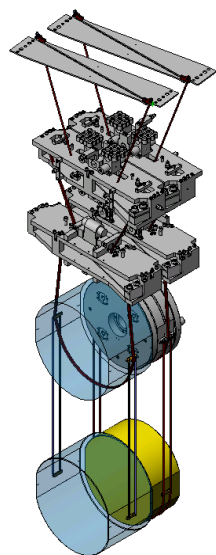
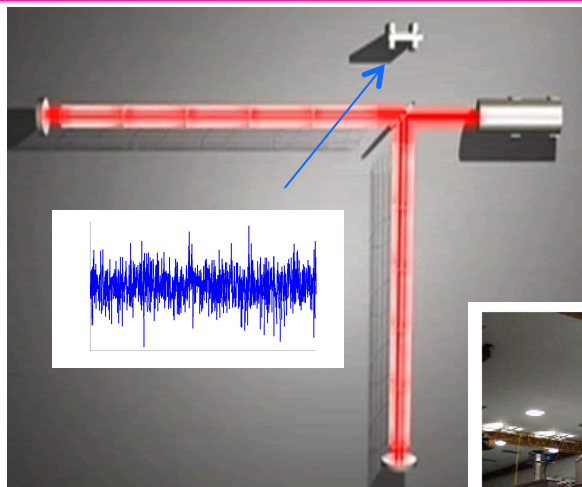


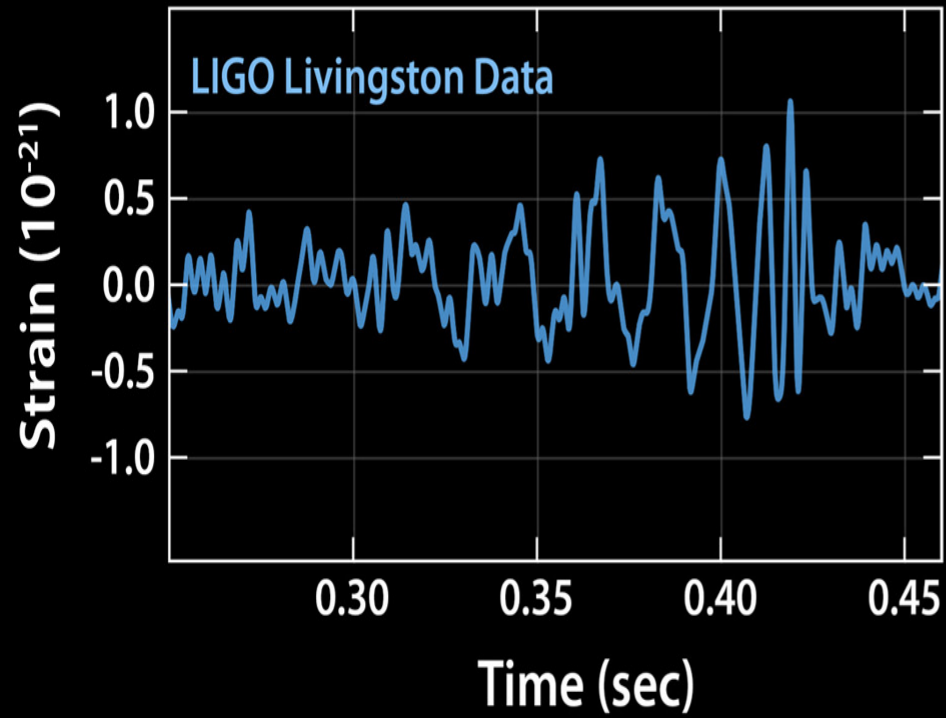
LIGO Hanford

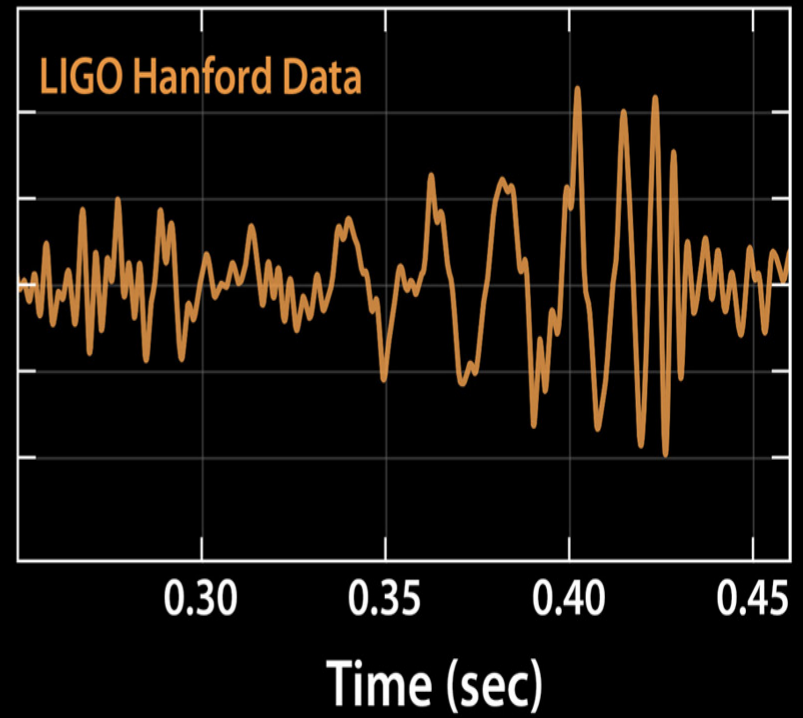
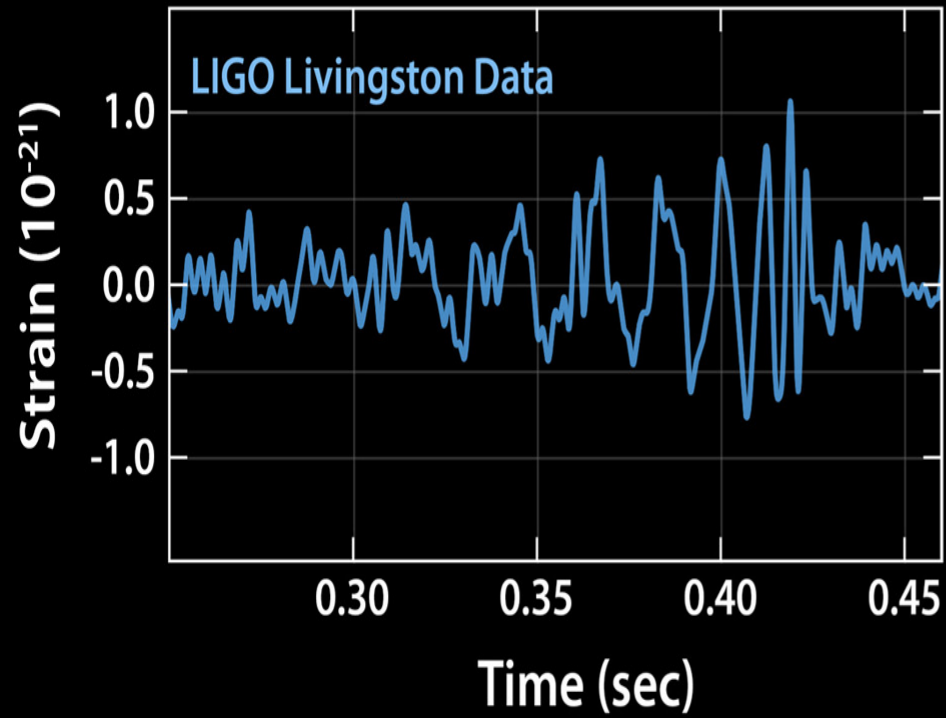
LIGO Livingston

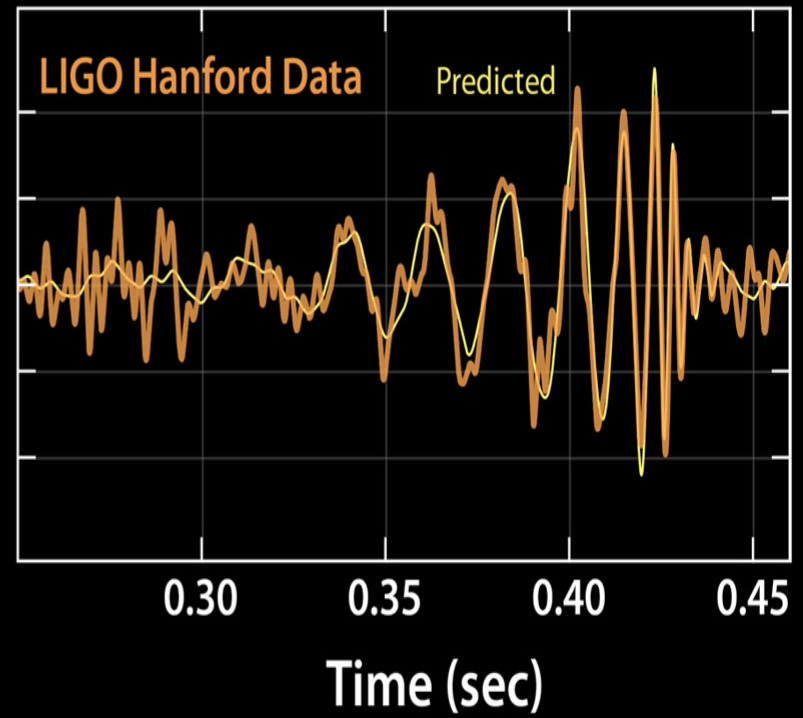
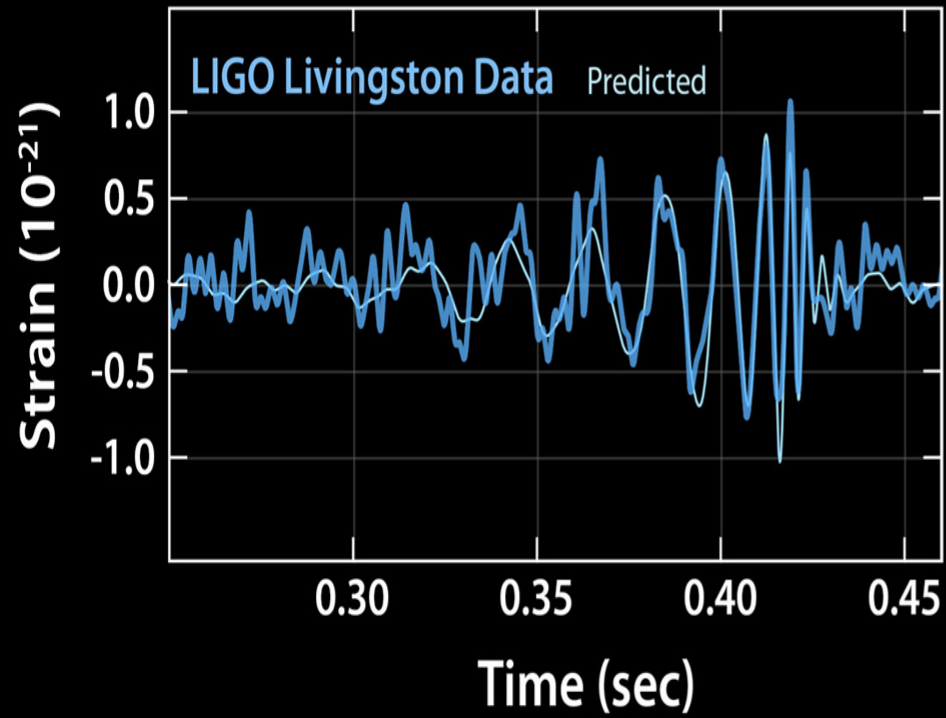


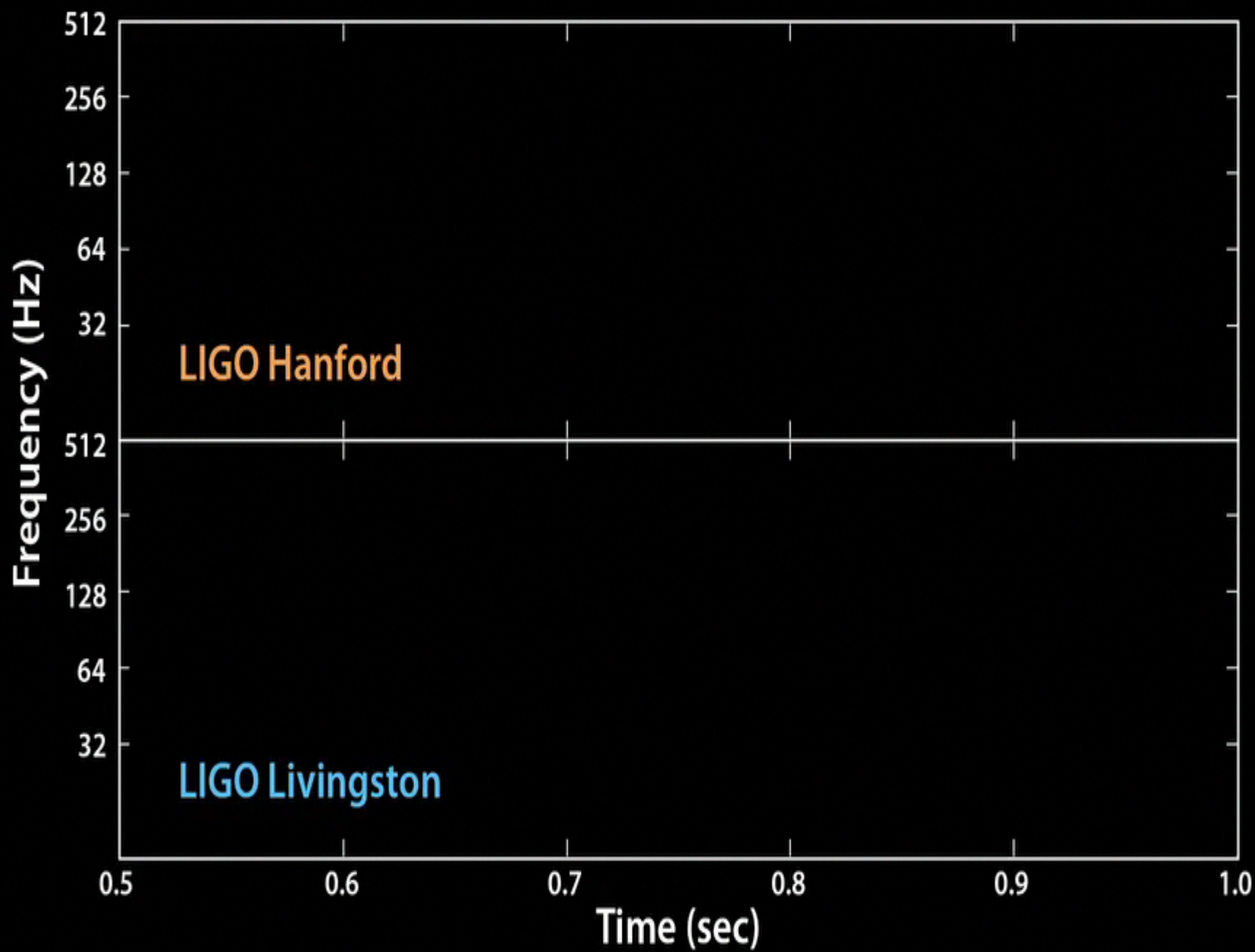
Advanced LIGO detectors

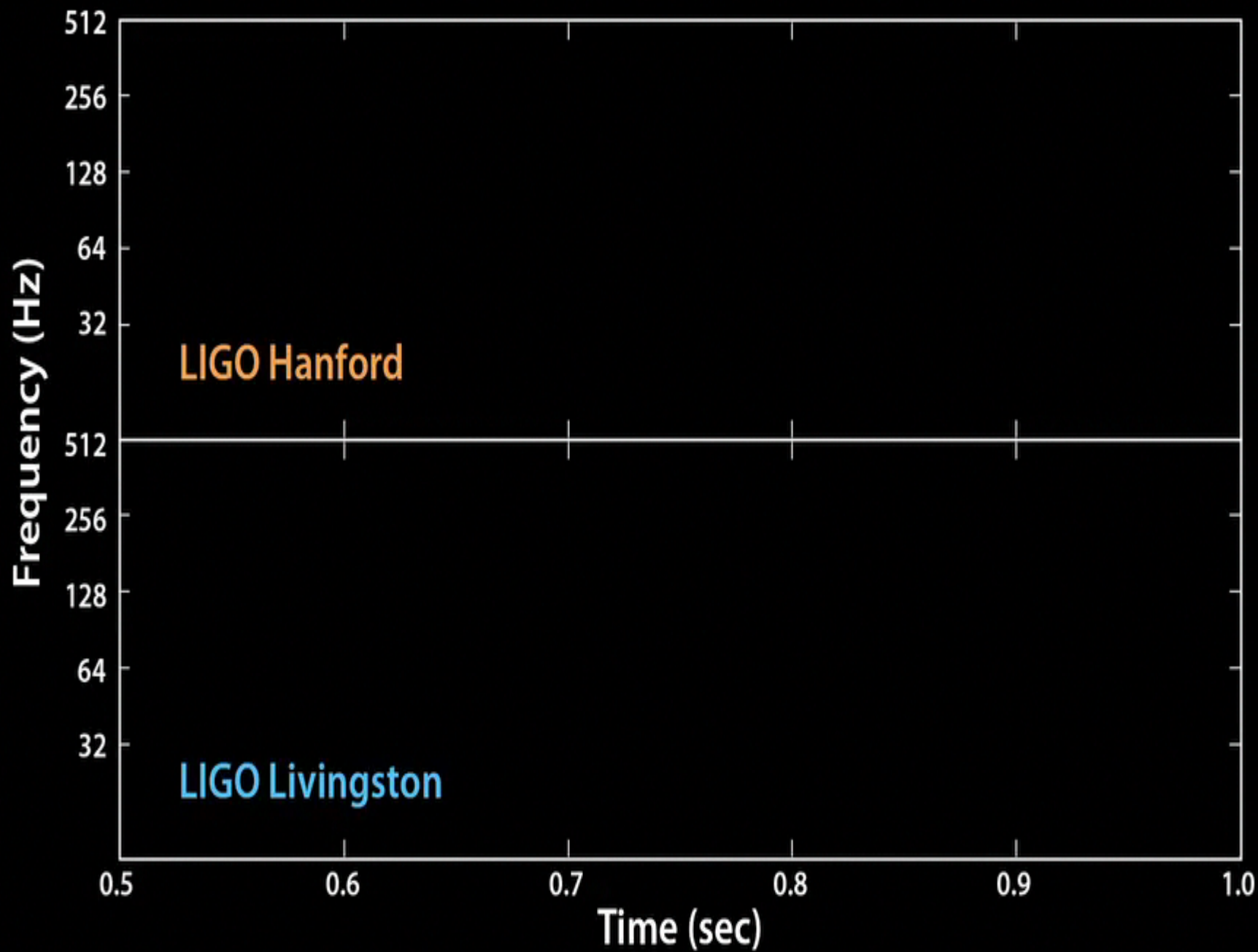






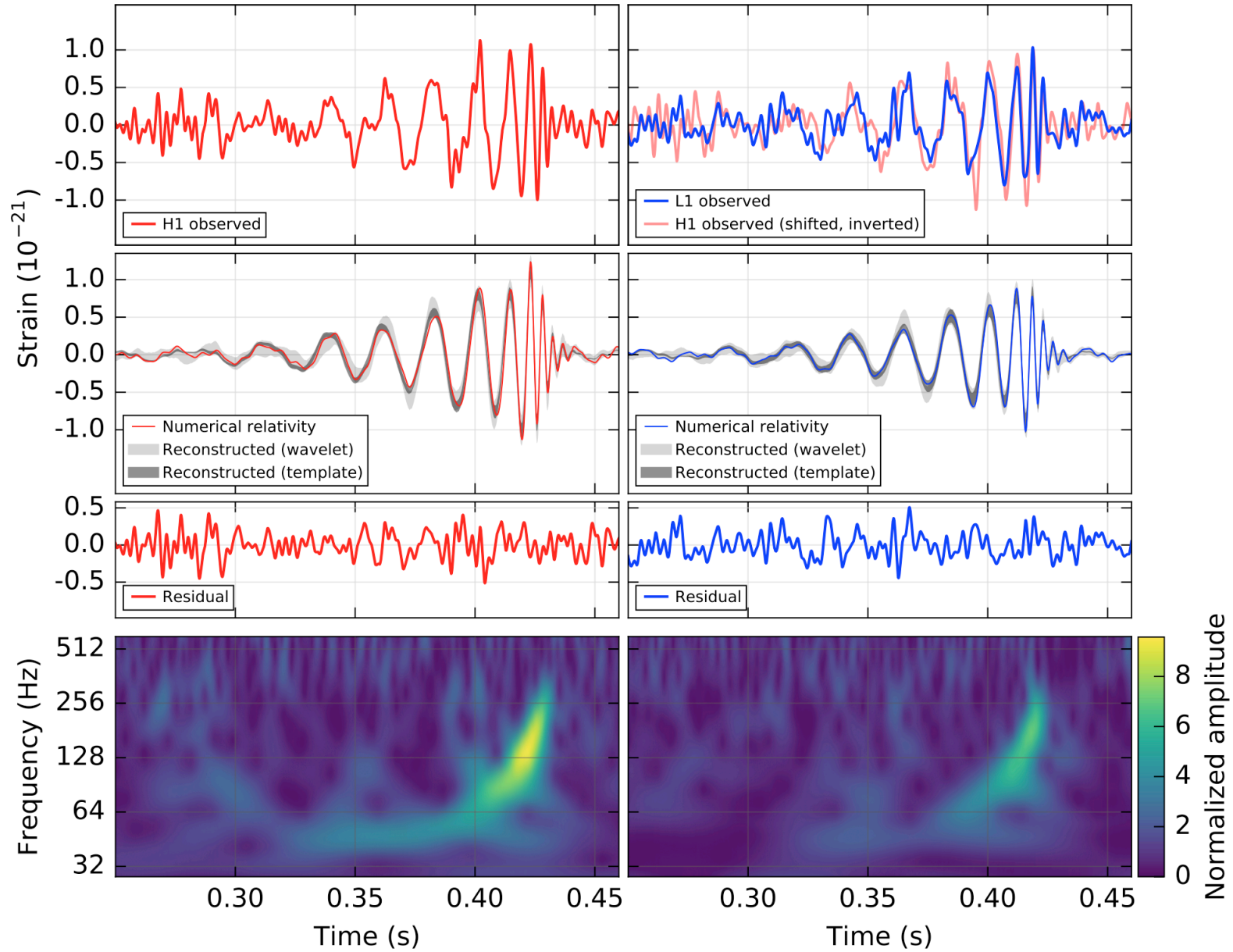


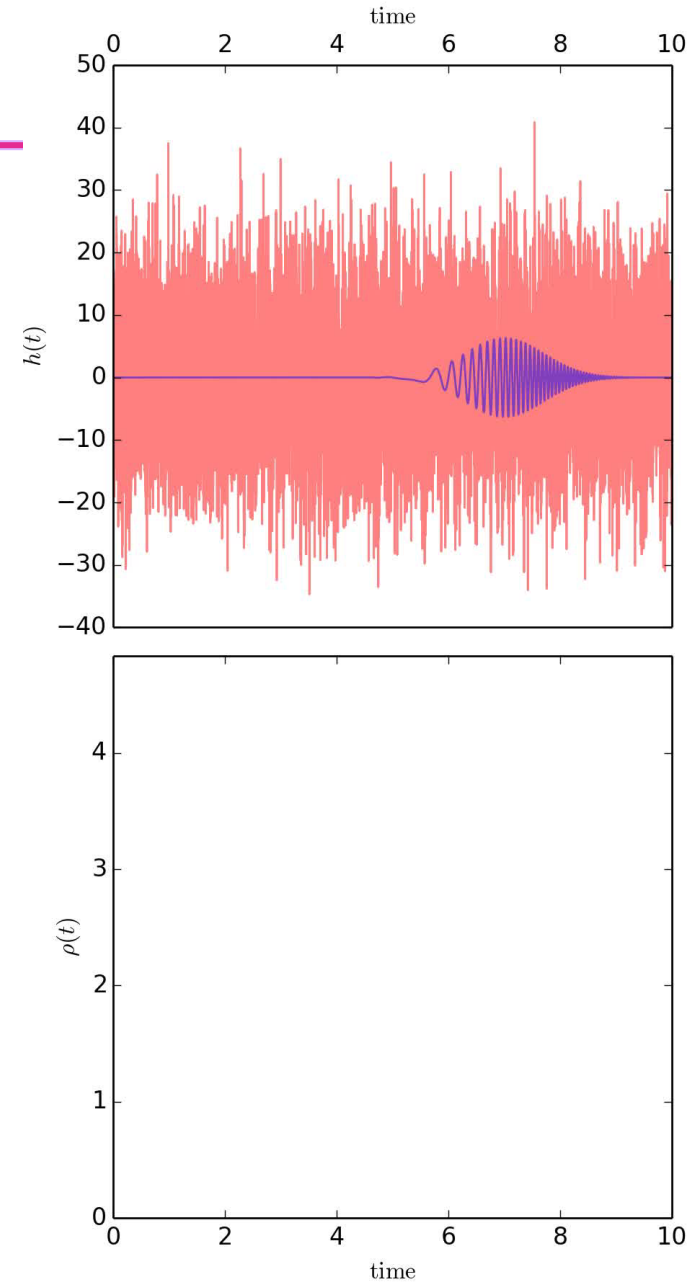
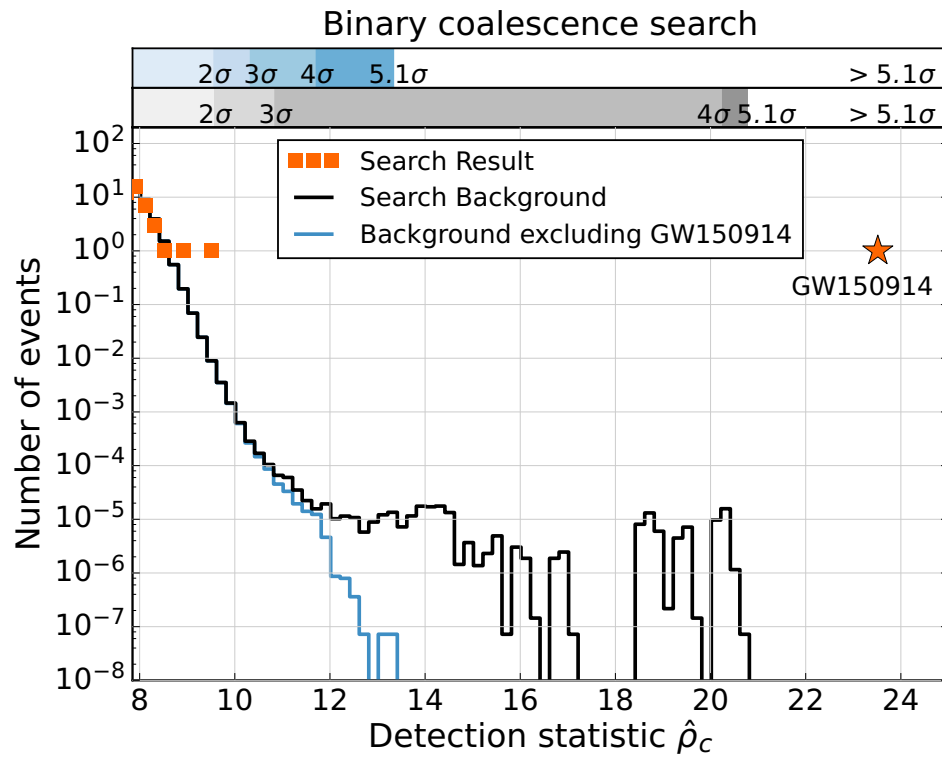


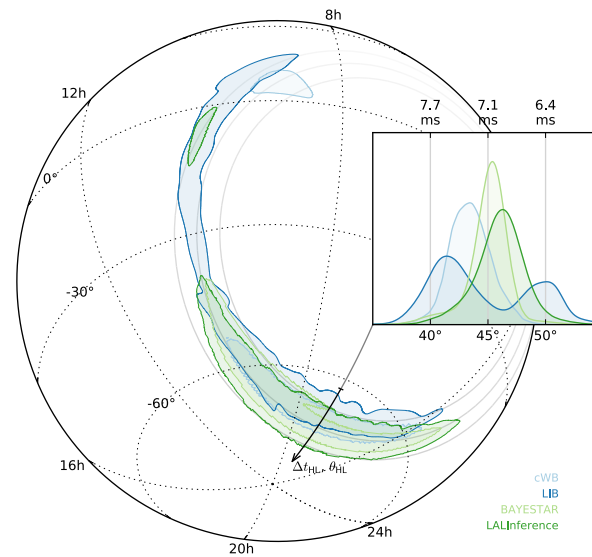
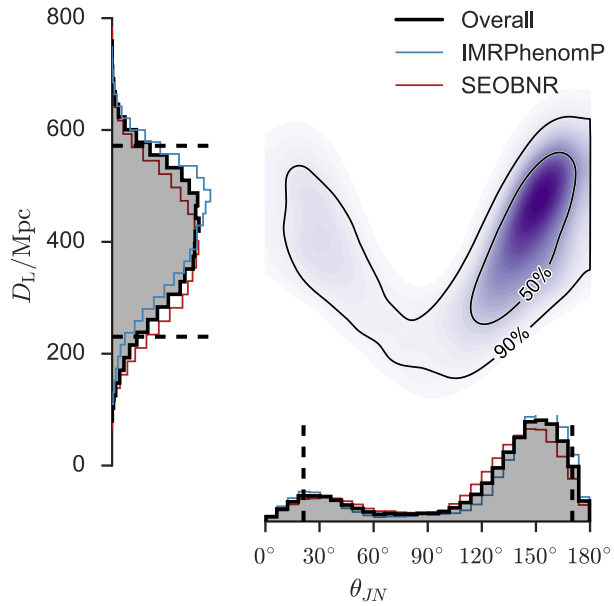
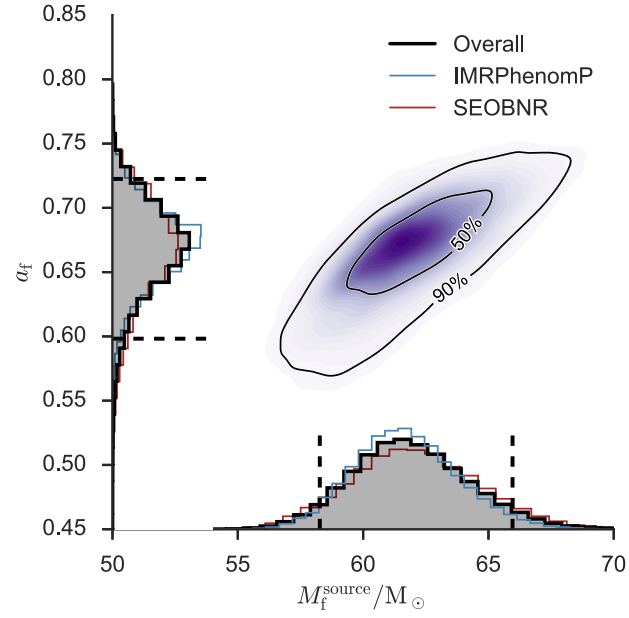
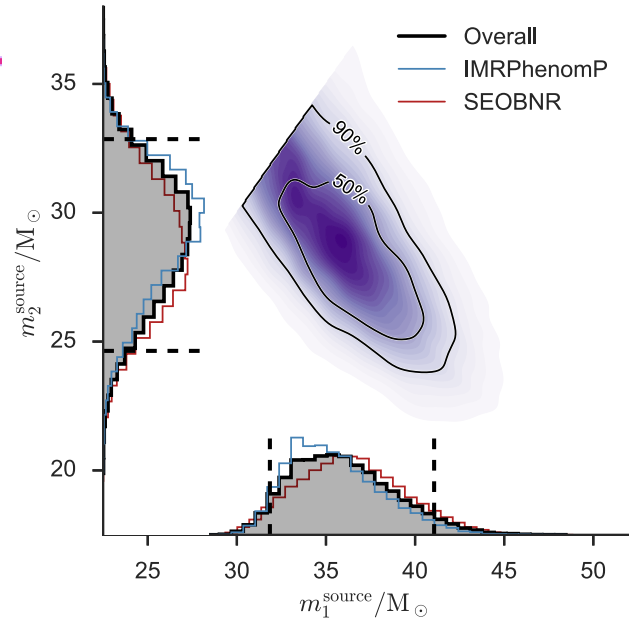


Hanford, Washington (H1)

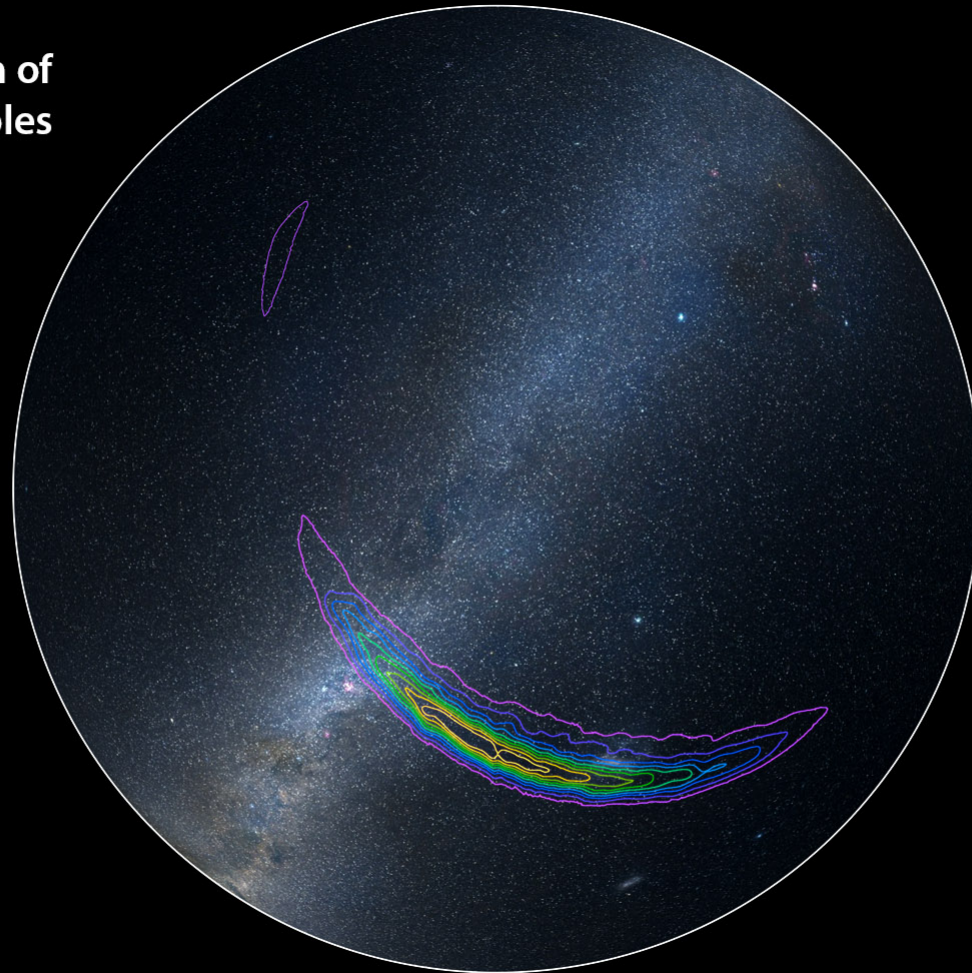
Livingston, Louisiana (L1)

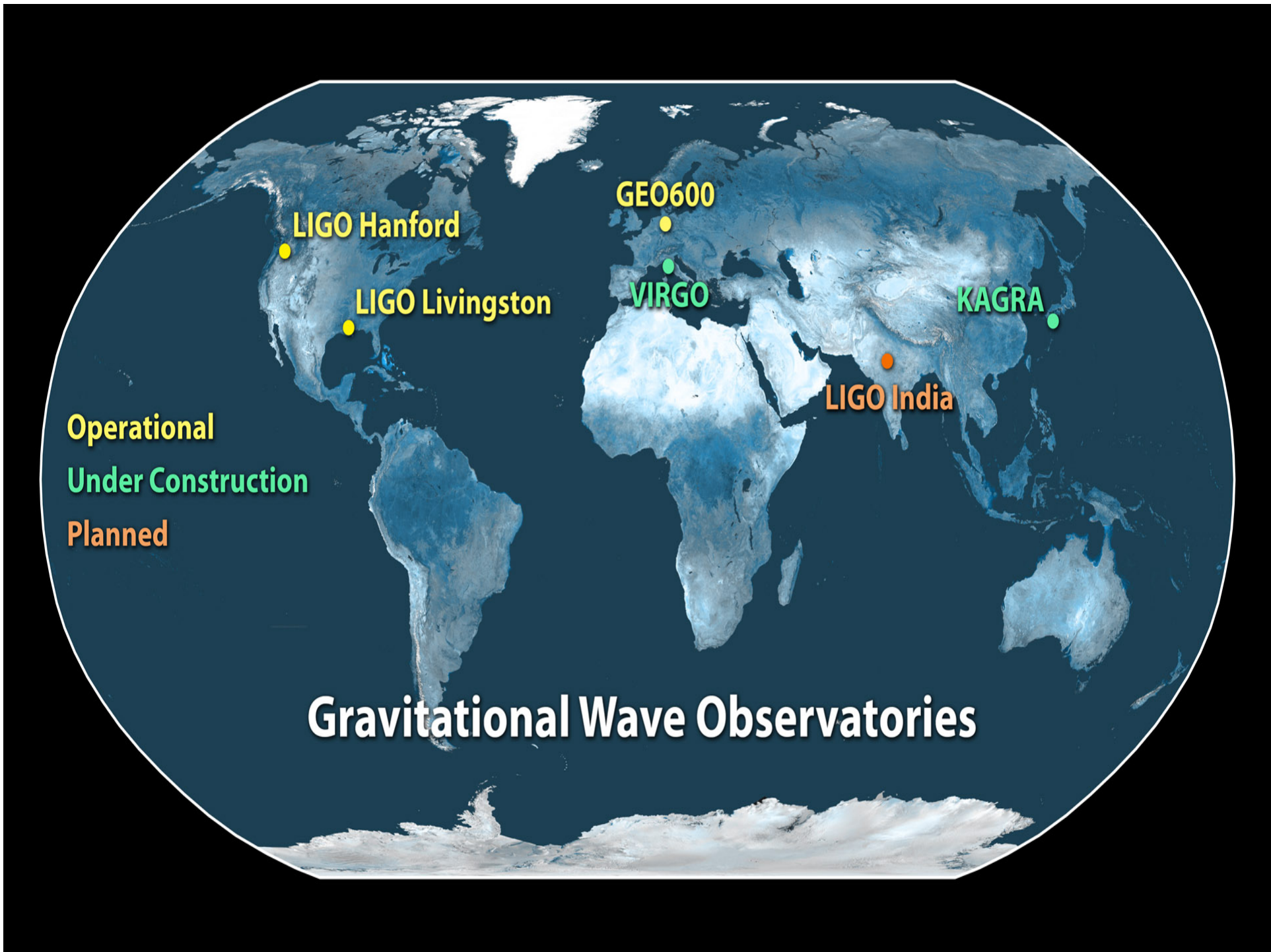






Probable location of
merging black holes



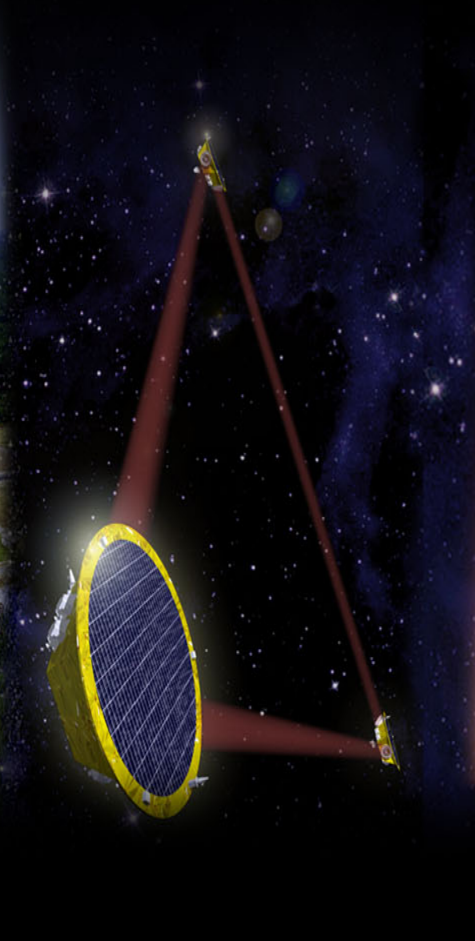


Gravitational Wave Periods

Milliseconds



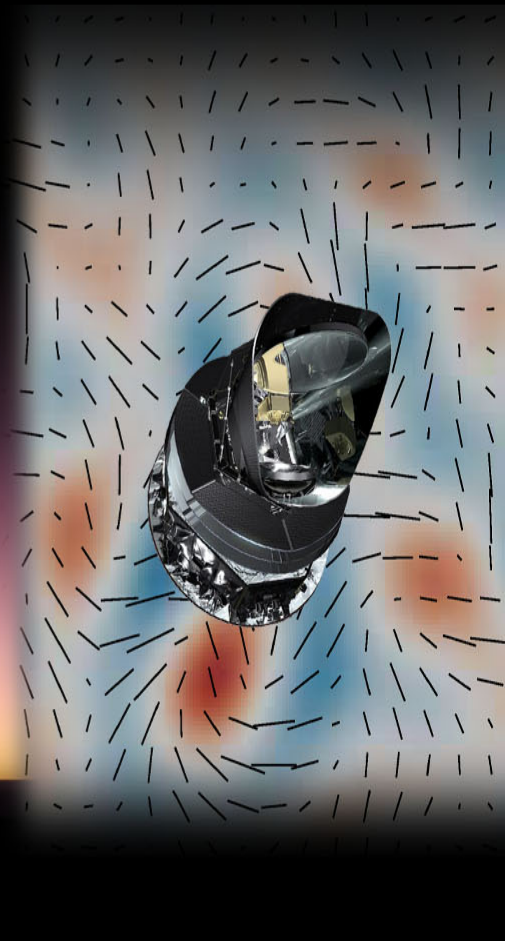
Minutes
to Hours



Years
to Decades

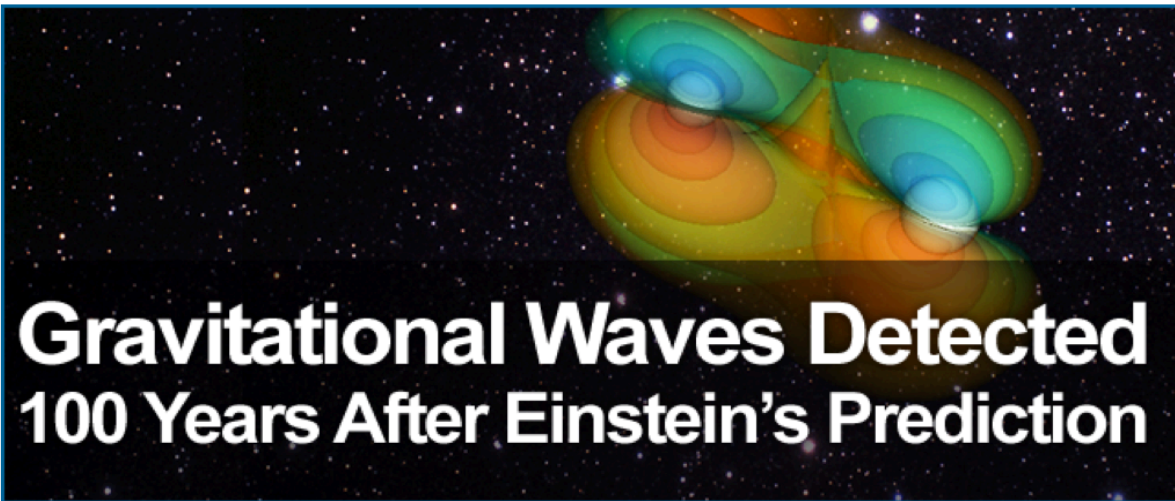


Billions
of Years





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NEWS

- Feb 11, 2016** [LIGO announces the detection of gravitational waves](#)
- Feb 8, 2016** [Media Advisory: Scientists to provide update on the search for gravitational waves](#)
- Jan 16, 2016** [LSC Statement on Harassment](#)
- Jan 12, 2016** [First Observing Run \(O1\) ends](#)
- Dec 23, 2015** [Planning for a bright tomorrow: prospects for gravitational-wave astronomy with Advanced LIGO and Advanced Virgo](#)
- Nov 24, 2015** [Stuck in the middle: an all-sky search for gravitational waves of intermediate duration](#)

PRESS RELEASE

Feb 11, 2016
[Gravitational Waves Detected 100 Years After Einstein's Prediction](#)

[More at the LIGO Lab website](#)

ABOUT LSC

LIGO Scientific Collaboration is a group of **more than 1000 scientists worldwide** who have joined together in the search for gravitational waves.

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[Get involved!
Find out how](#)

