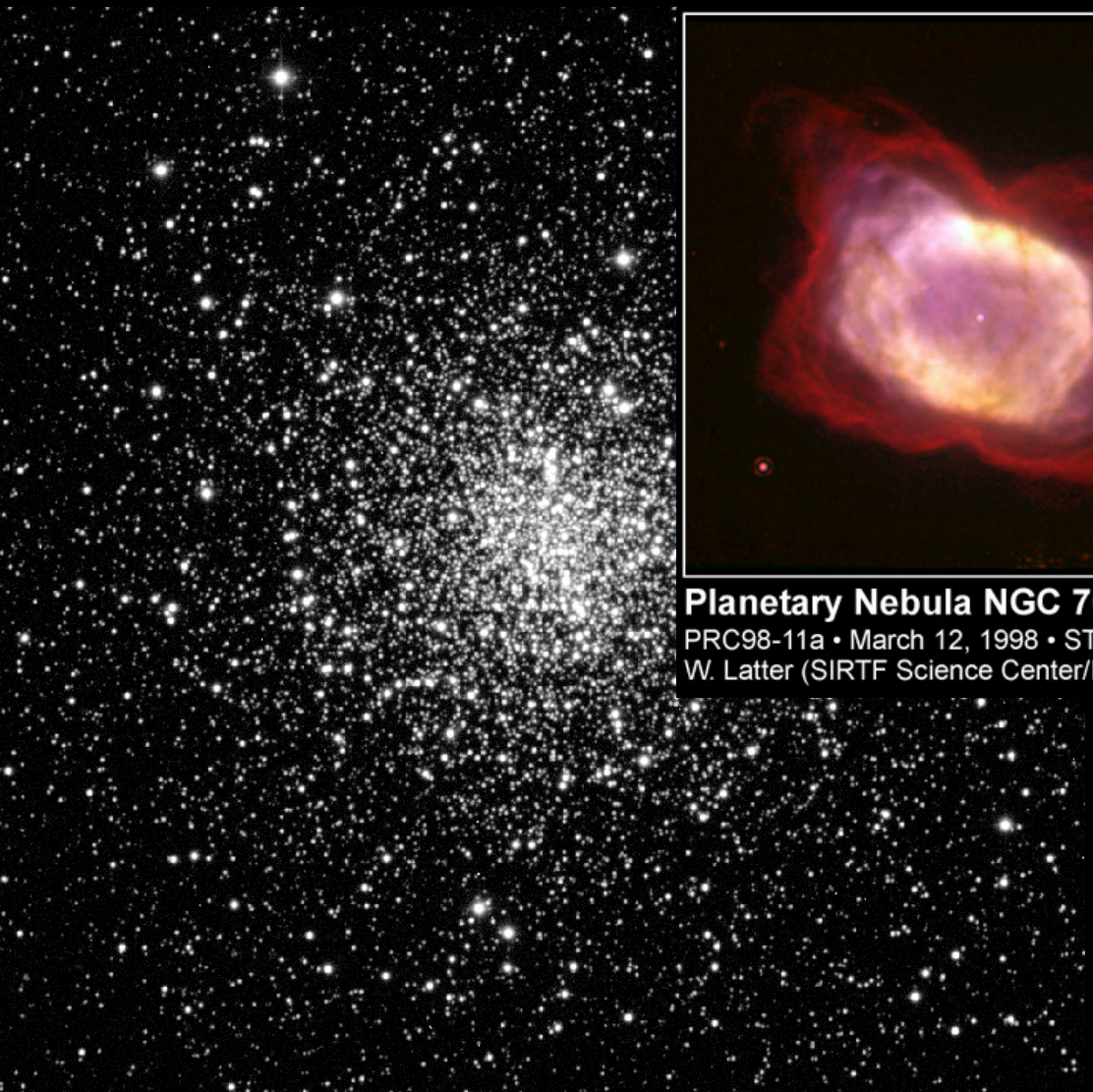
The Universe Speaks

LIGO & the attempt to detect Gravitational Waves

By William Katzman, with funding by the National Science Foundation PHY-0757058

Speaking through light

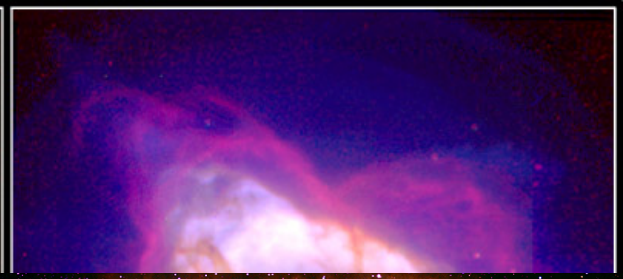
Speaking through light



Planetary Nebula NGC 7027
PRC98-11a • March 12, 1998 • ST ScI OPO
W. Latter (SIRTF Science Center/IPAC/Caltech) and NASA

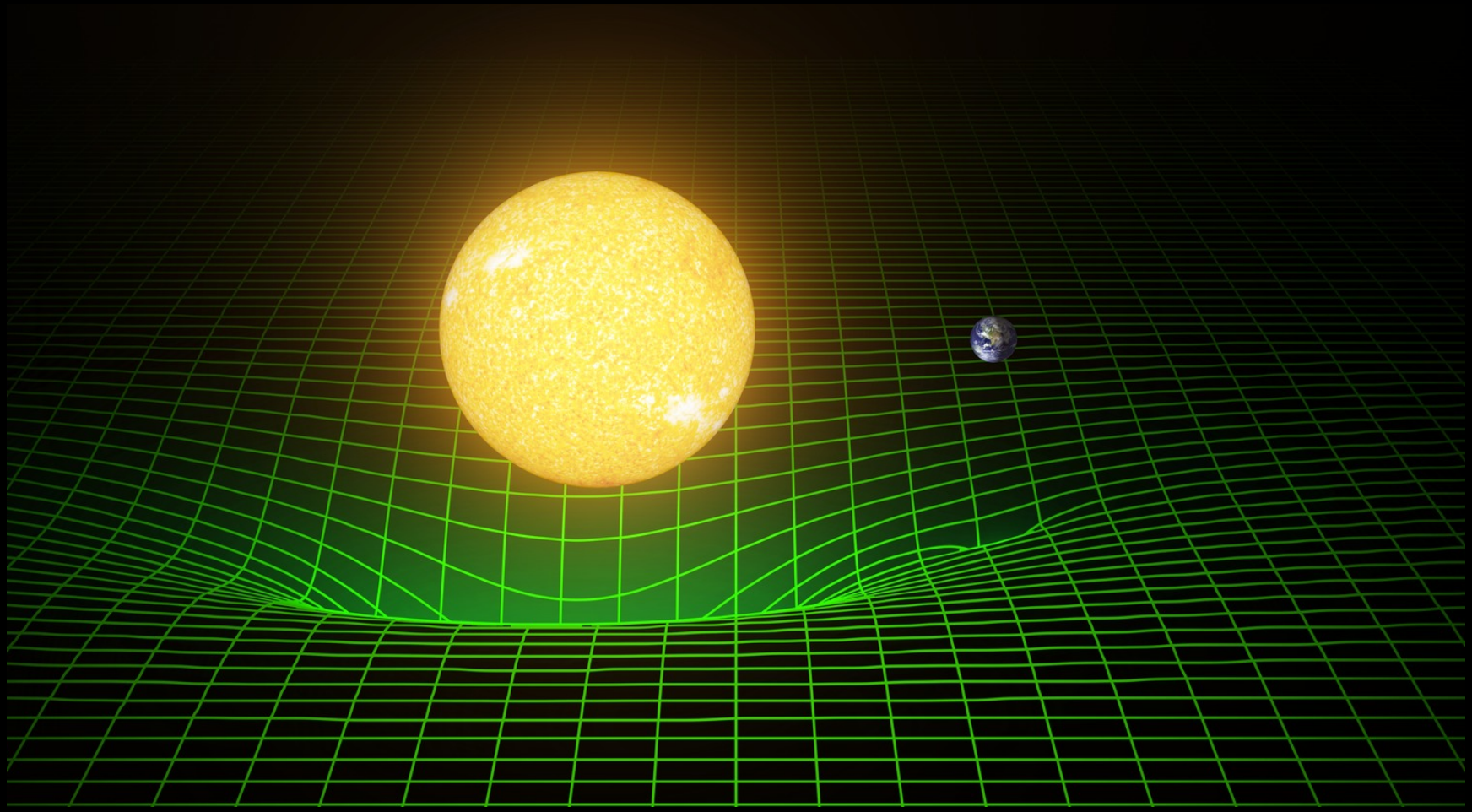
HST • NICMOS • WFPC2

Speaking through light

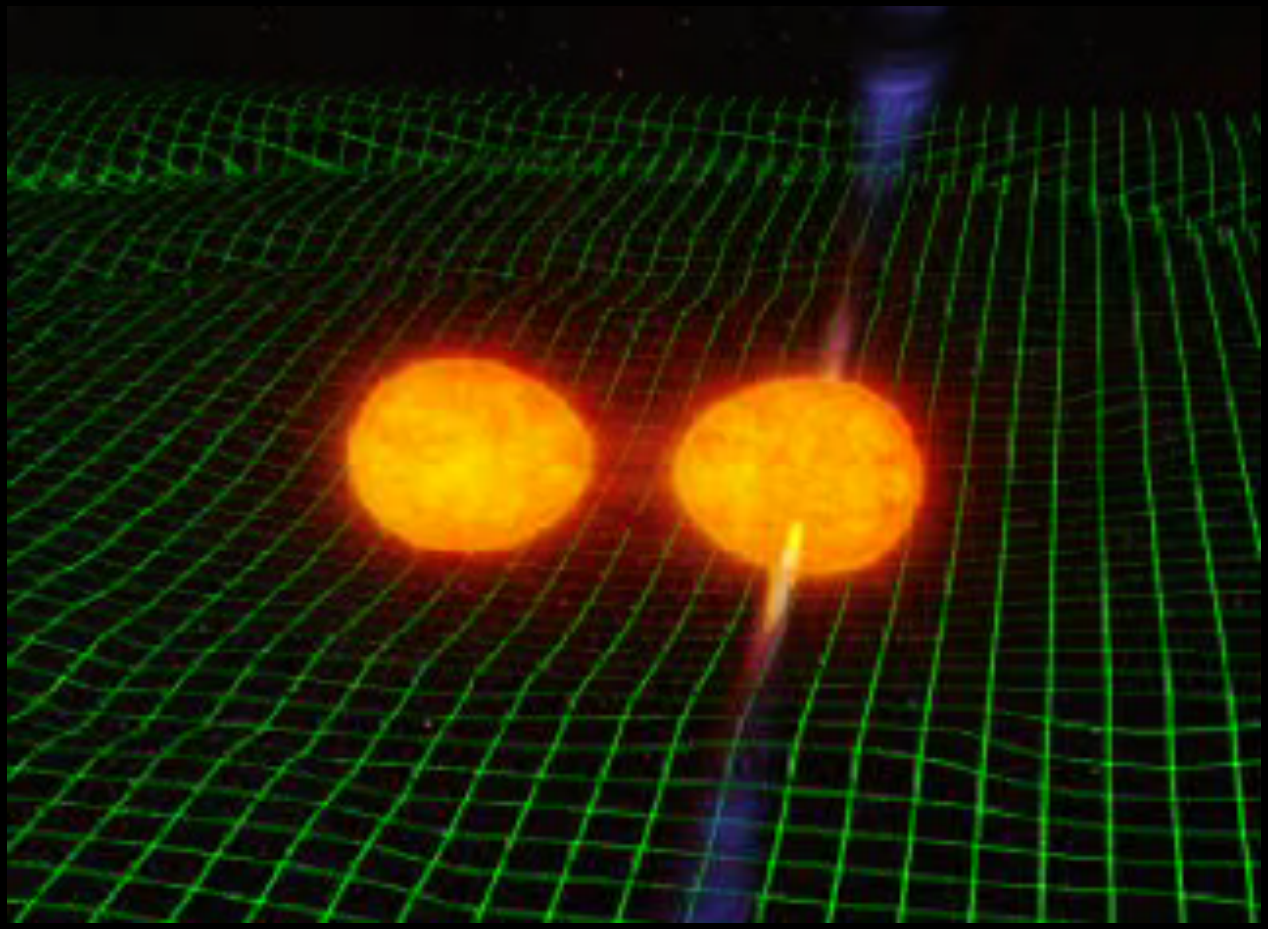


Planetary Nebula NGC
PRC98-11a • March 12, 1998 •
W. Latter (SIRTF Science Cente

Speaking through light

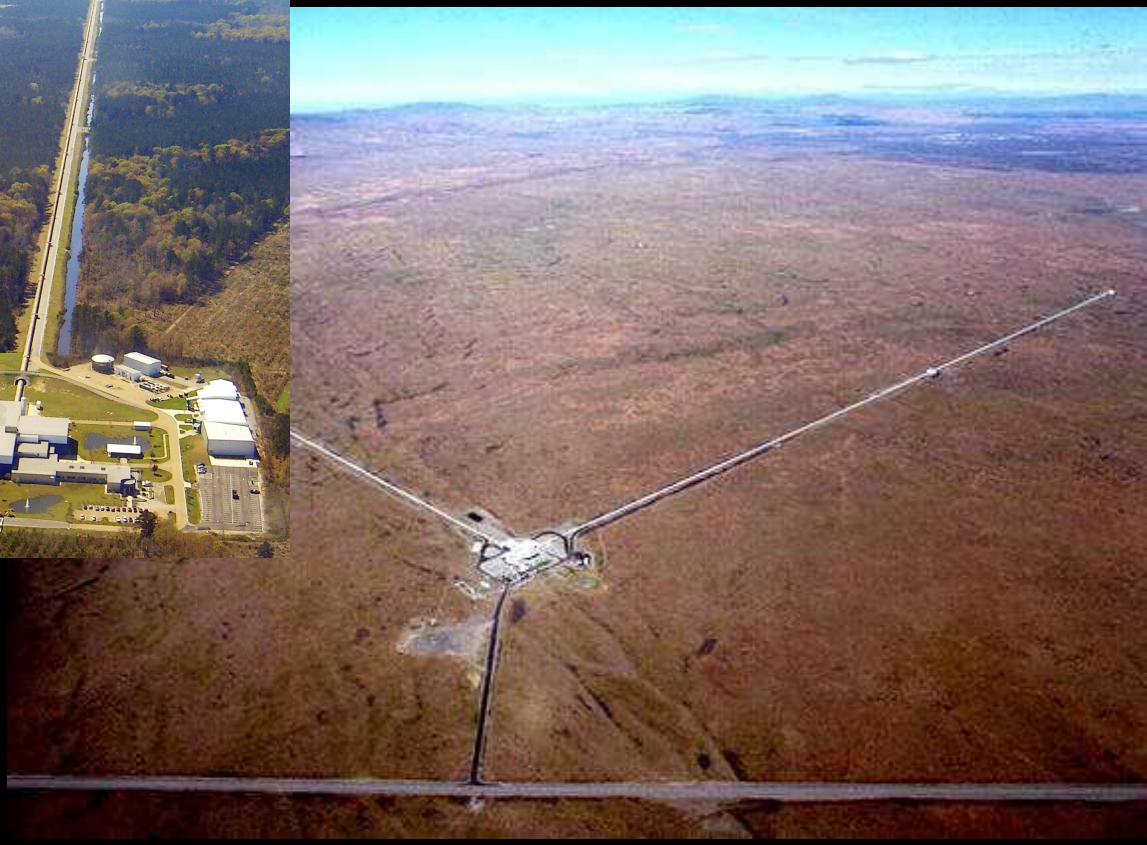


Gravitational Waves



The Observatory

← Livingston, Louisiana



Hanford, Washington →

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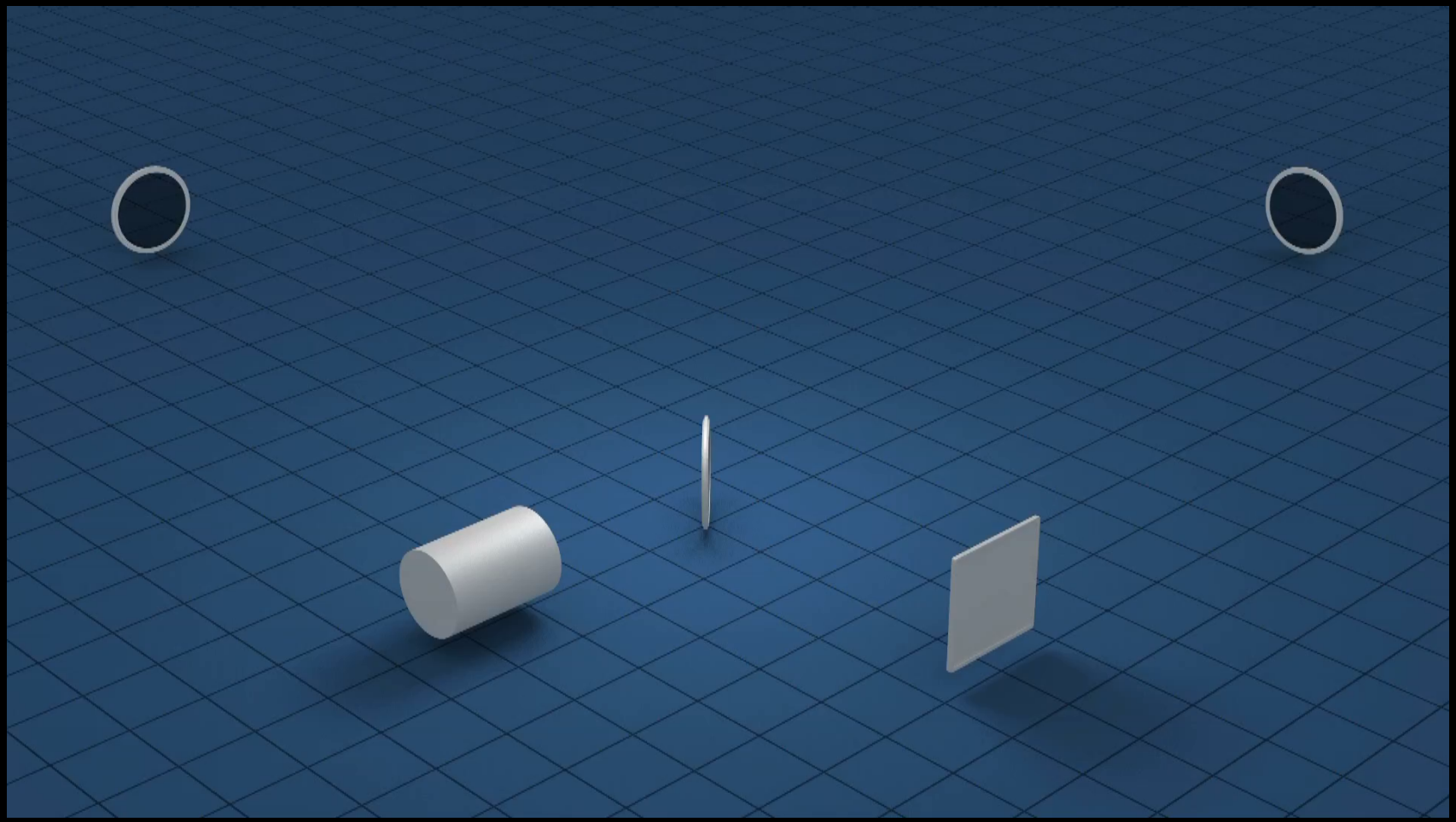
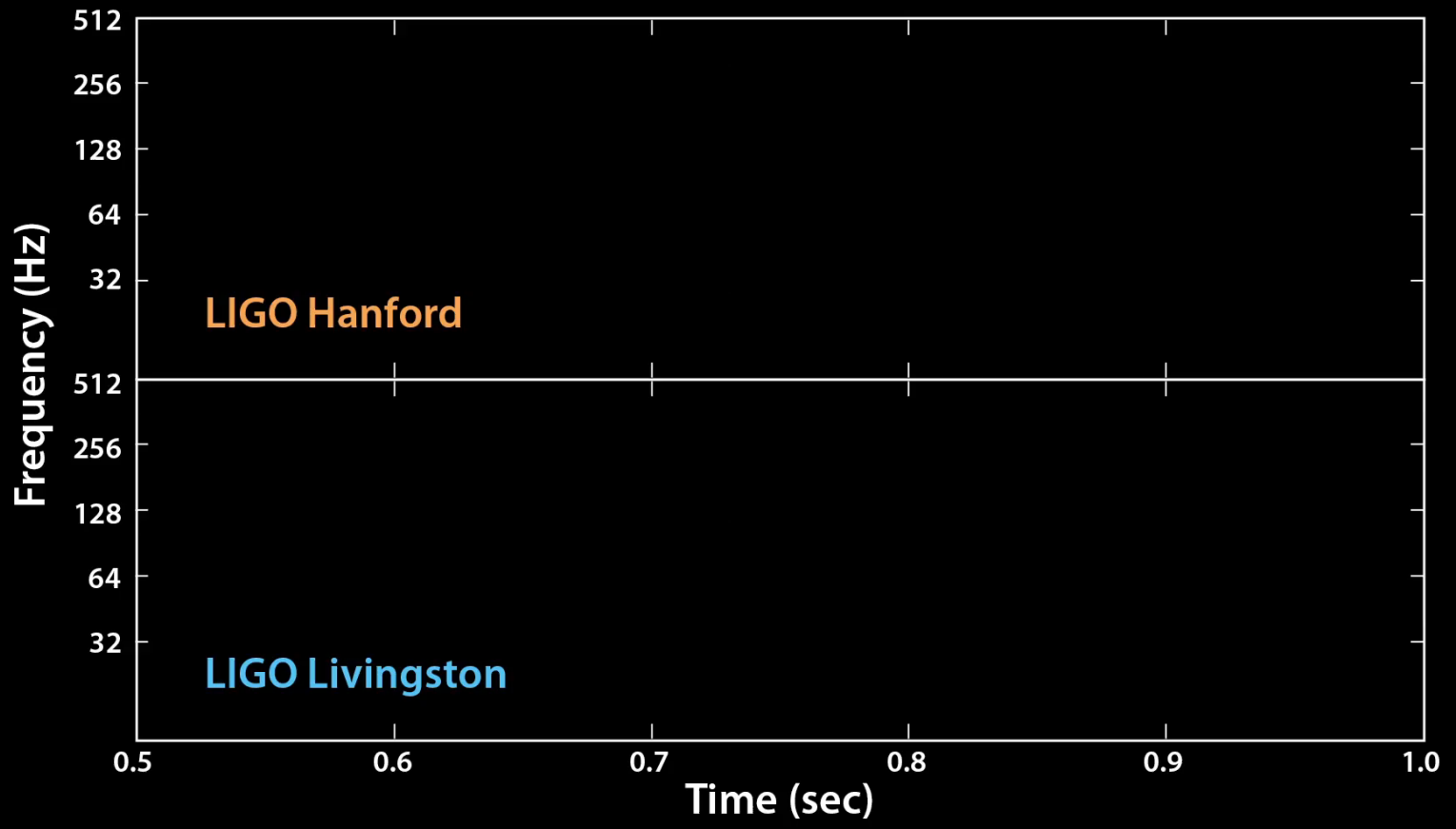
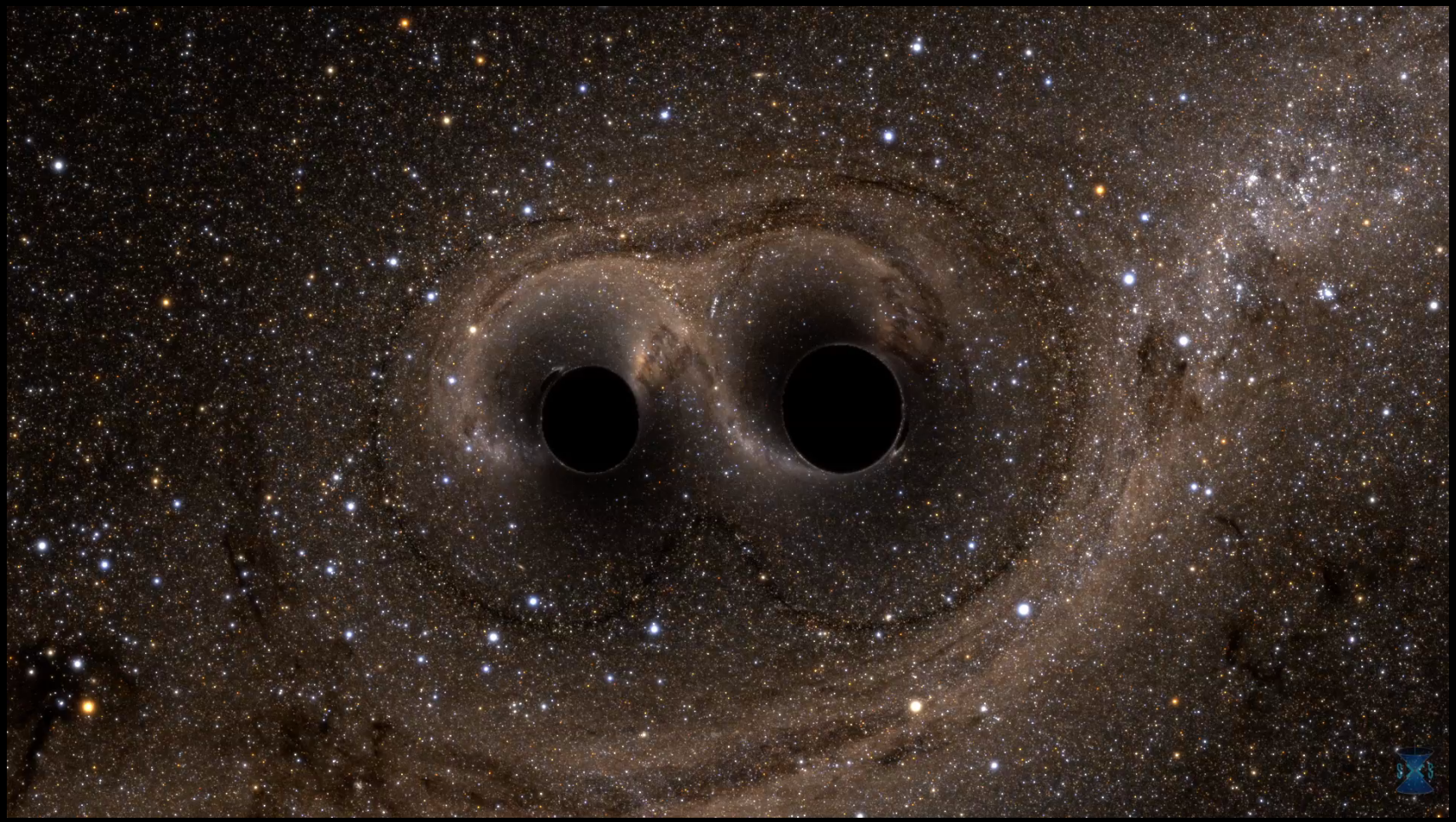
Laser Interferometer



GW150914


512
256
128
64
32
LIGO Hanford
512
256
128
64
32
LIGO Livingston
Frequency (Hz)
0.5
0.6
0.7
0.8
0.9
1.0
Time (sec)

What if we were there?



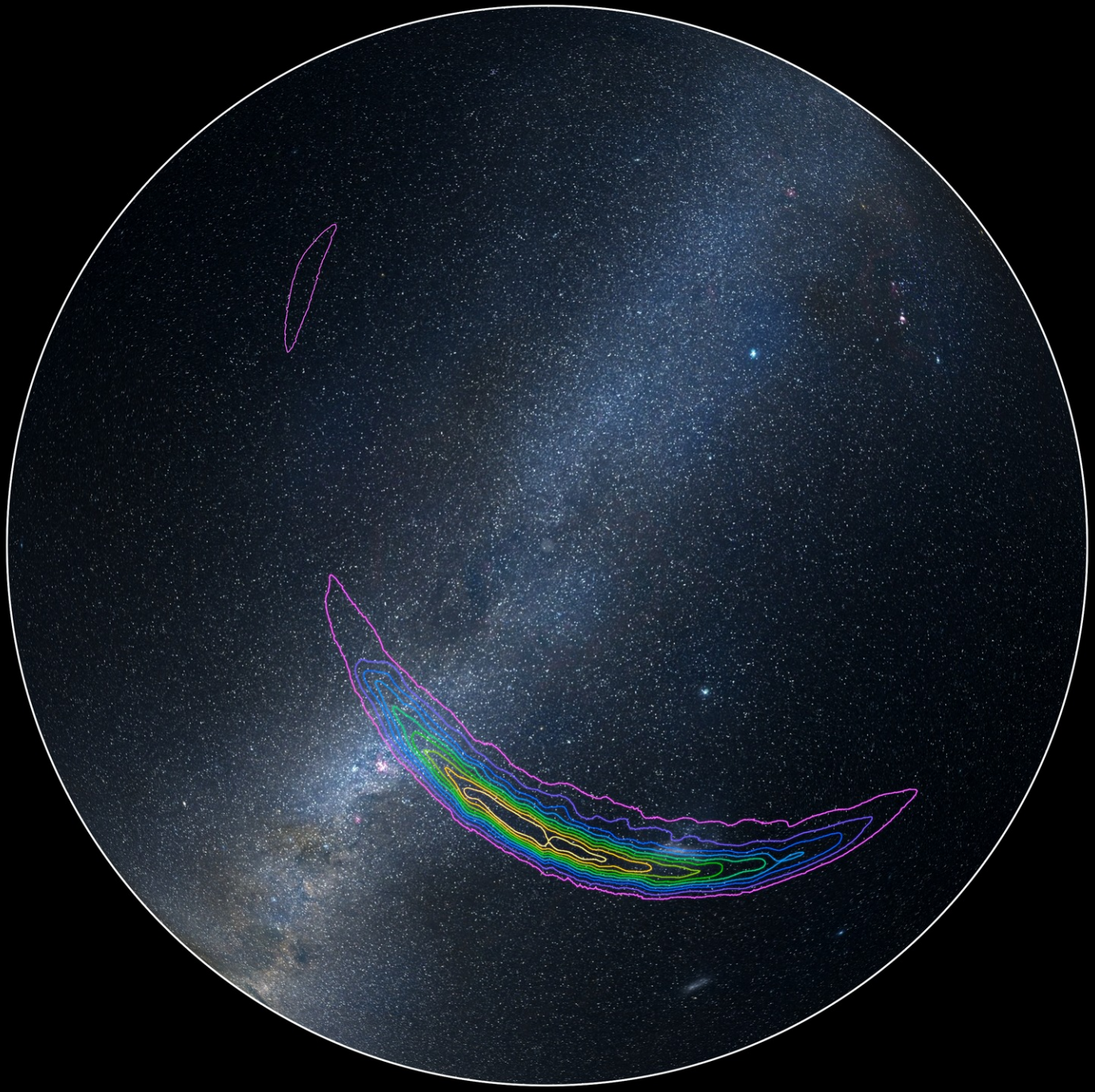
Two black holes collide

- Over a billion years ago
- 2 black holes (36 solar mass and 29 solar mass)
- 36 + 29 = 62 + 3 solar mass radiated
  - Equivalent to 1 million earth's energy
- More power than all the stars in the universe
- Just the beginning…other instruments such as LISA and the Pulsar Timing Array
- Scientific Discoveries are just BEGINNING!

Find out more

- ligo.caltech.edu/detection
- ligo.org

- Livingston Observatory open the 3rd Saturday of each month… visit ligo.caltech.edu/LA



If we could see space-time…