

Gravity waves!

Physics we've studied

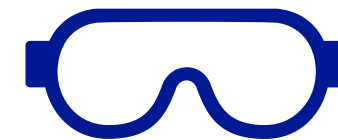
- Longitude problem (celestial mechanics)
- Double slit: moving like a wave, hitting like a particle
- Speed of light/time dilation (special relativity)
- Particle mixing (frequency comb)
- History of computation
- Color range vs. pulse length (spectrum allocation)
- Particle introverts & extroverts
- Telescope resolution & interferometers
- Hanbury Brown & Twiss
- Trapped waves & atomic spectra
- Quantum dots
- Measurement order (polarizers)
- Quantum encryption

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Fresh/Soph



Junior/Senior
Physics Major

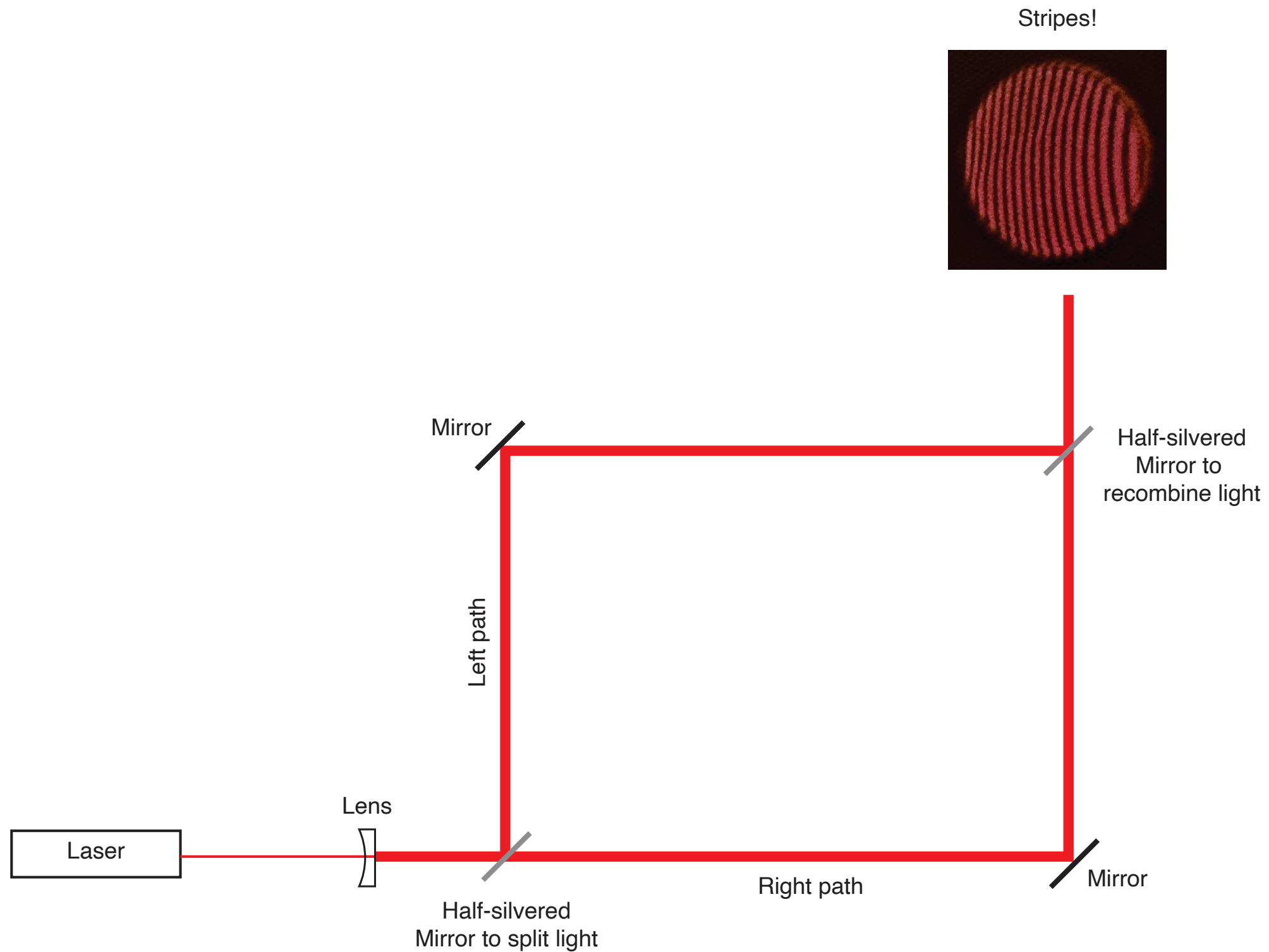


Graduate
Physics

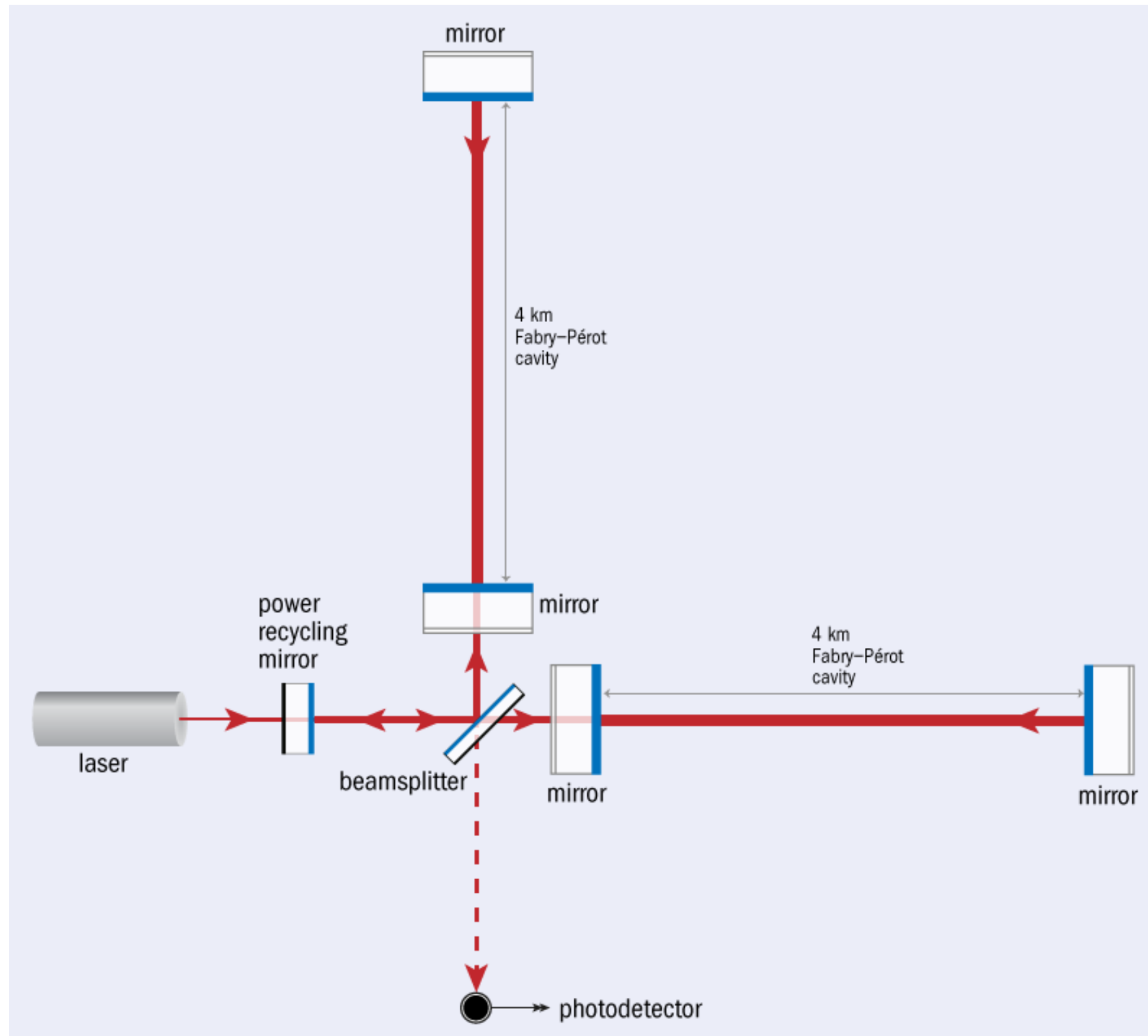
This week

- Gravity waves
- Power generation
- Quantum electronics & computers
- Medical imaging, x-rays to MRI

Our interferometer

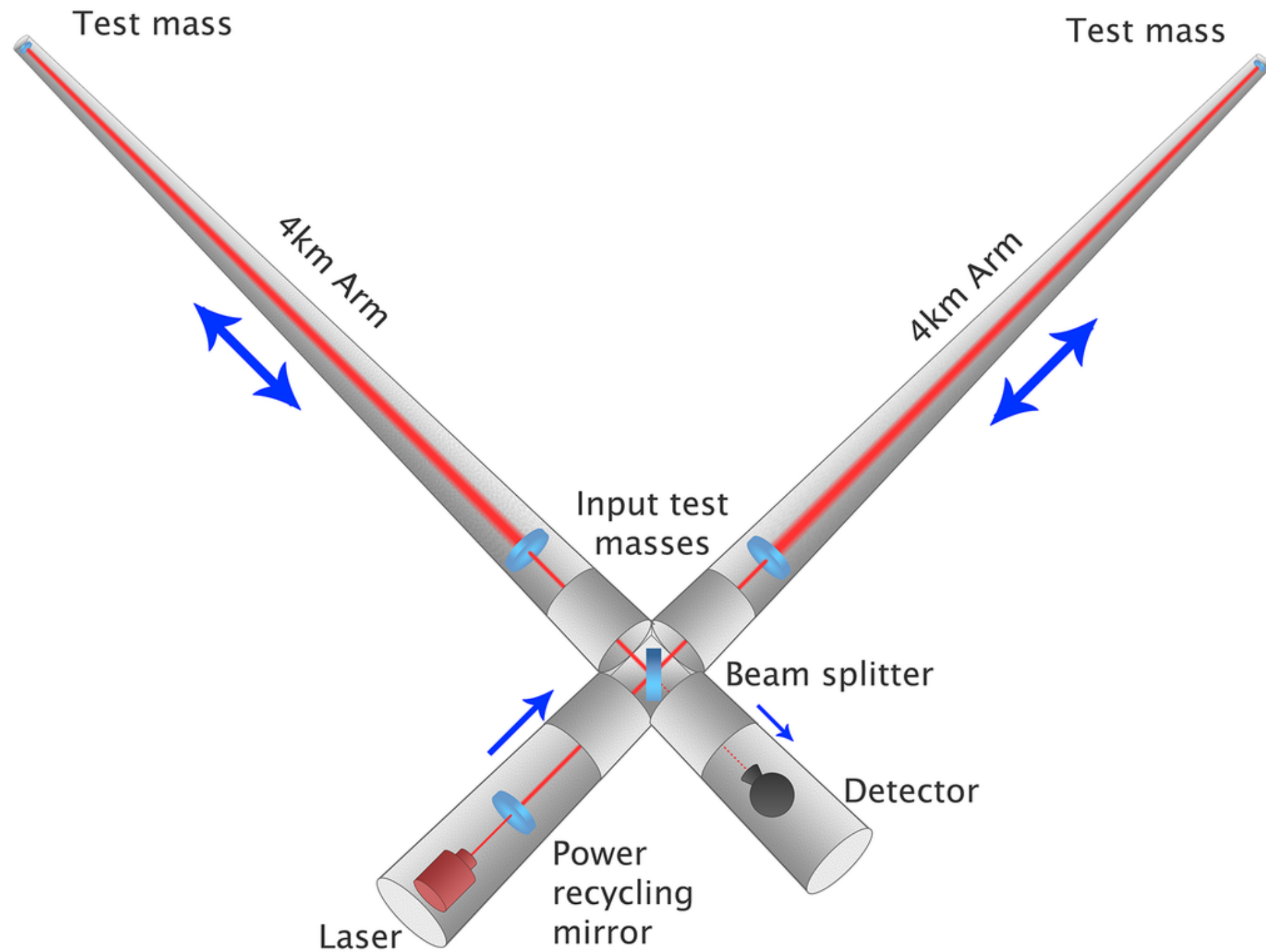


LIGO





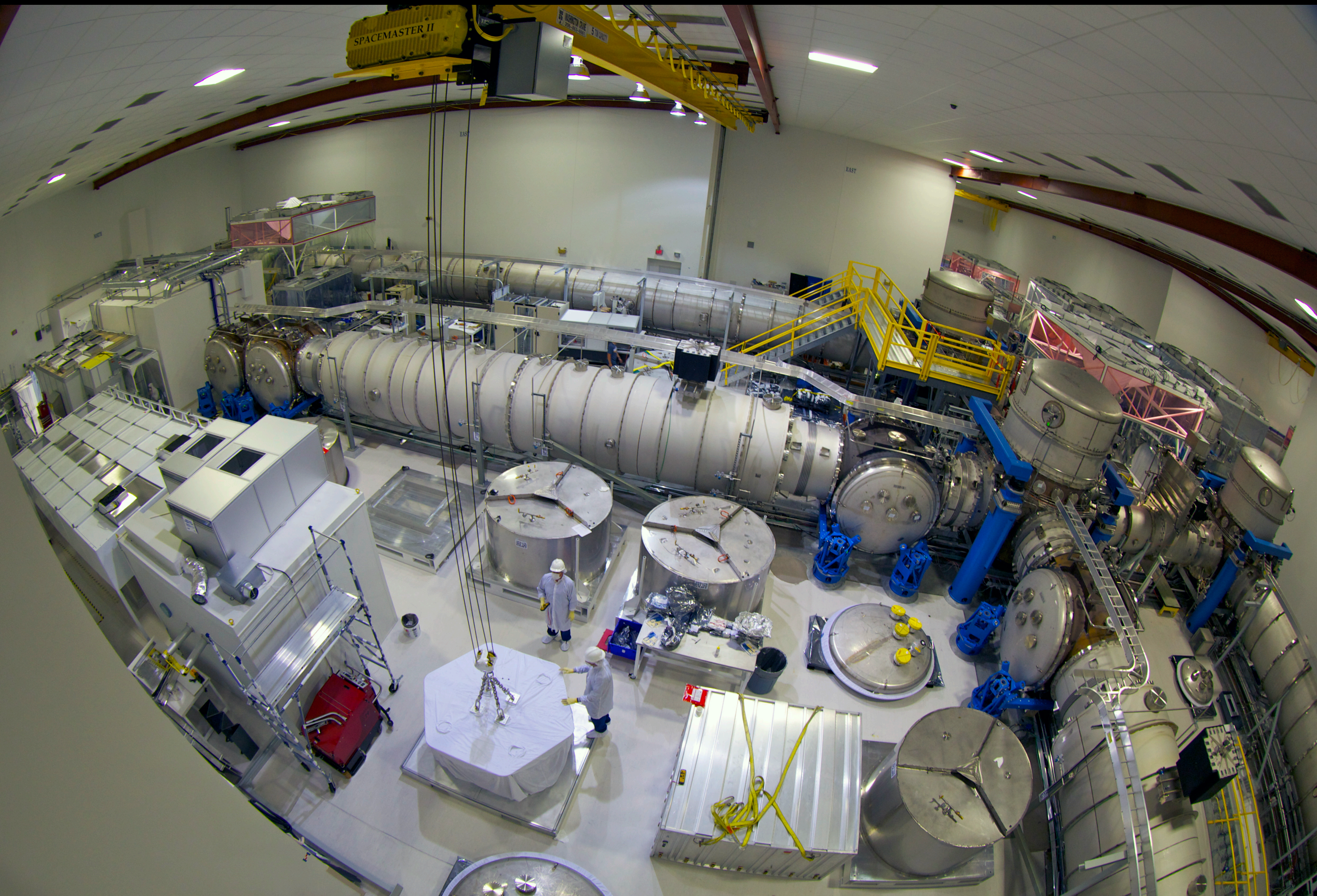
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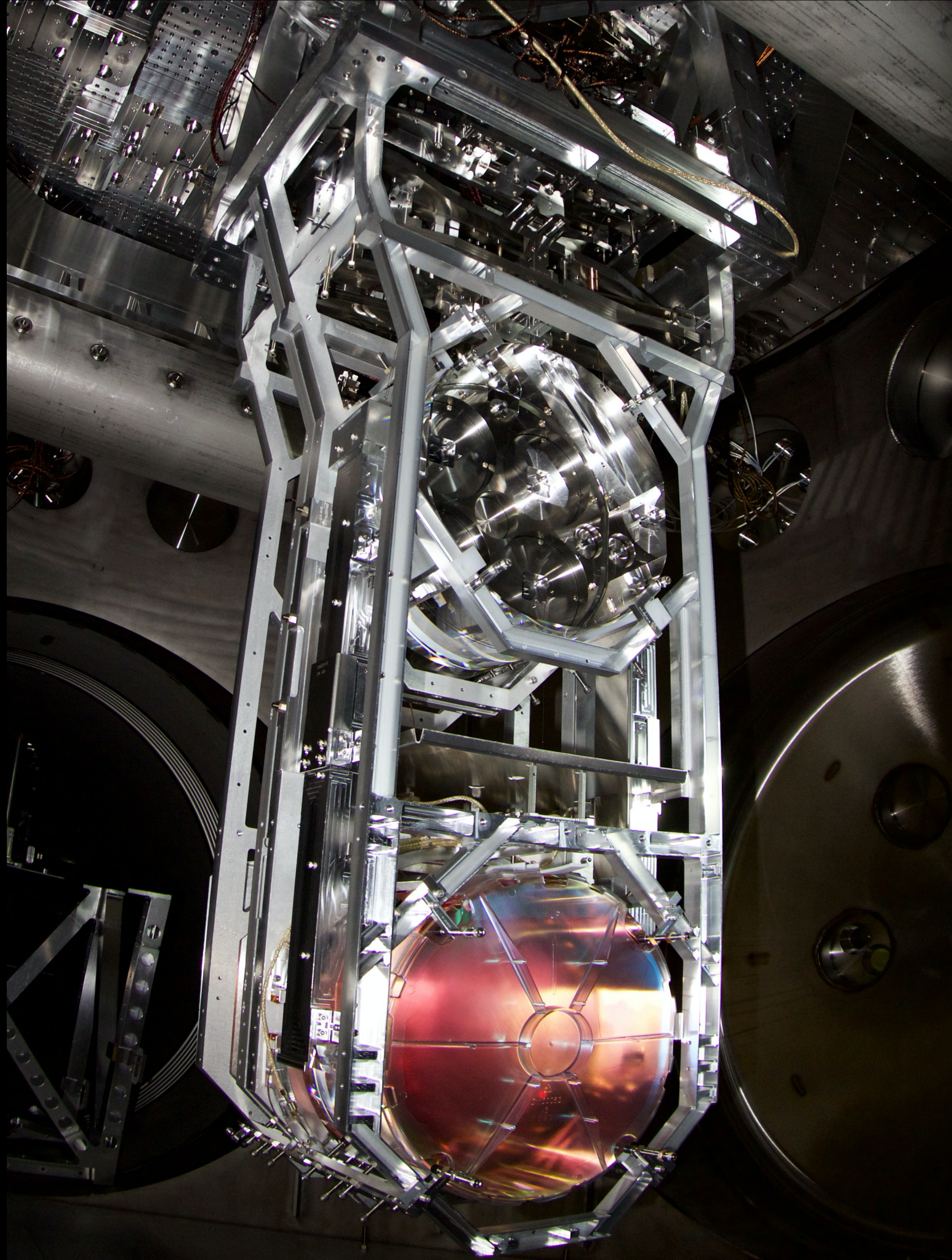


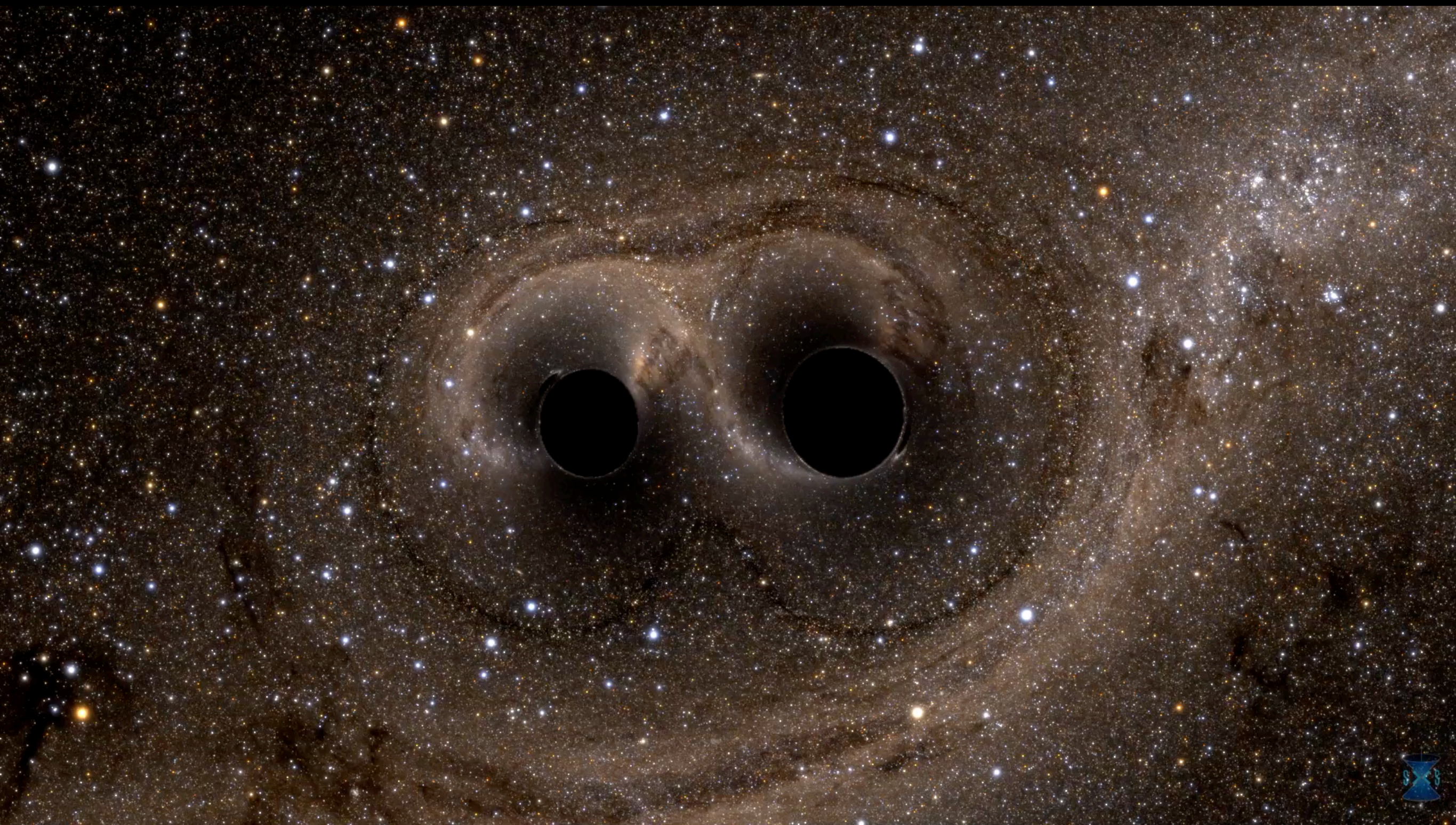




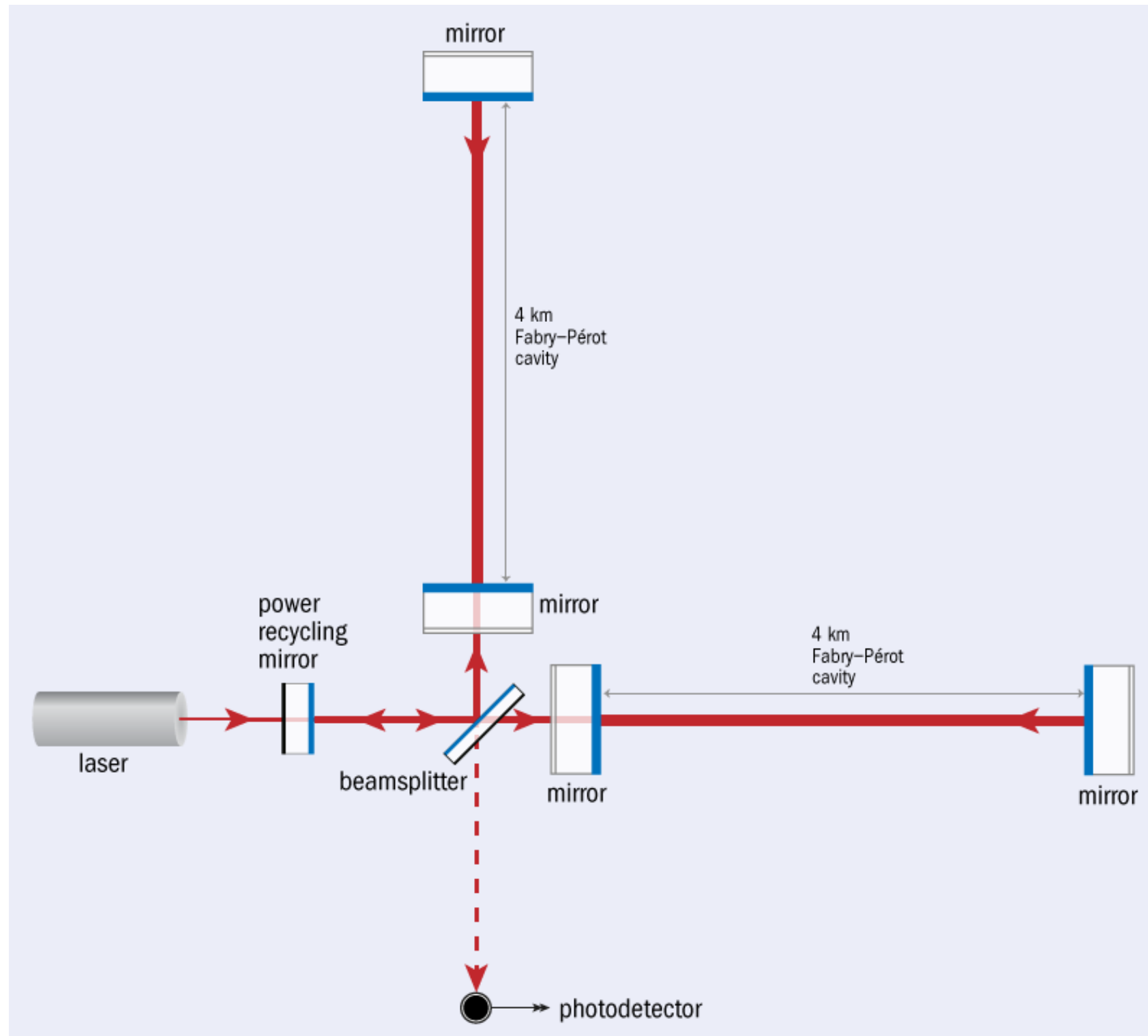




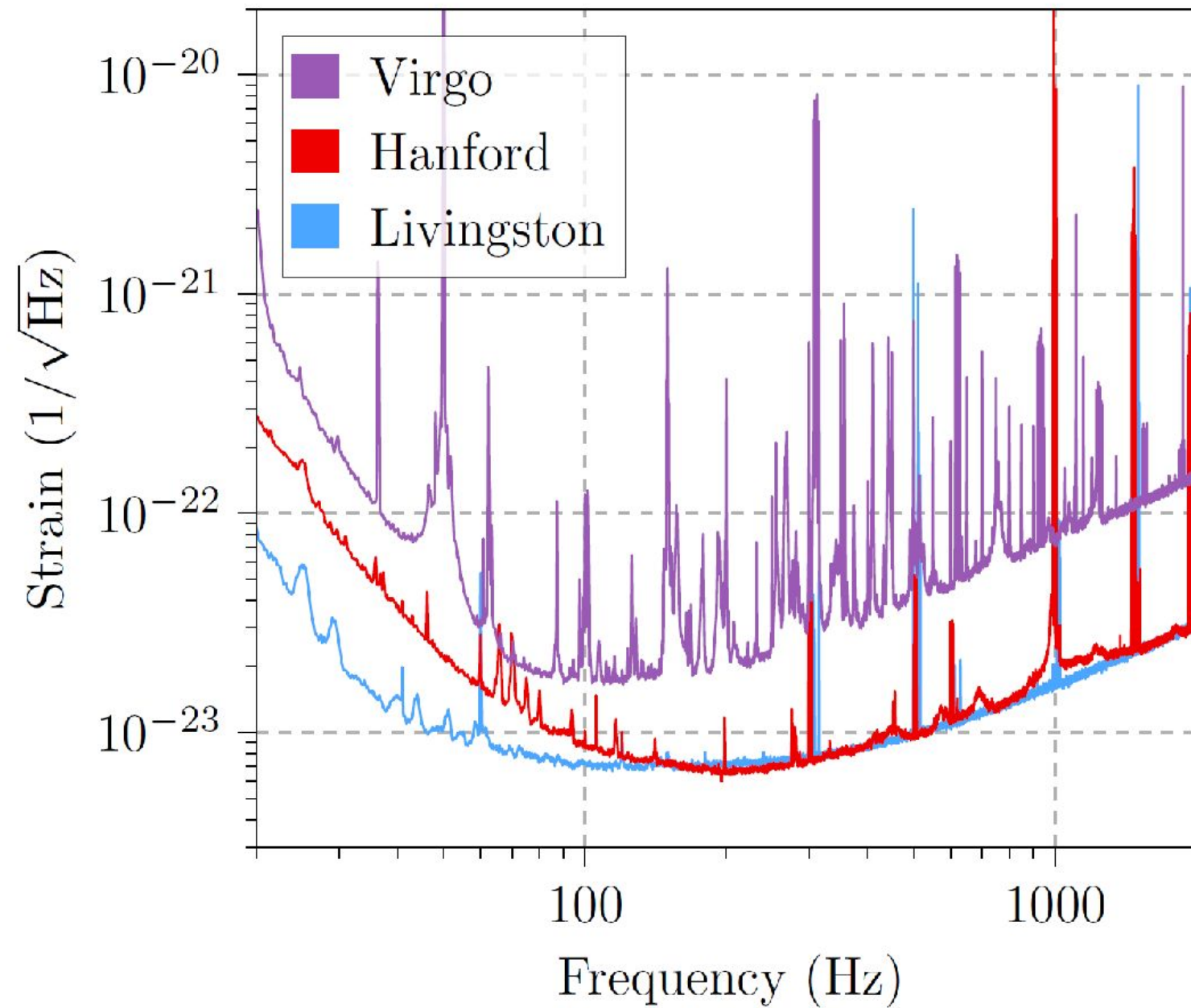


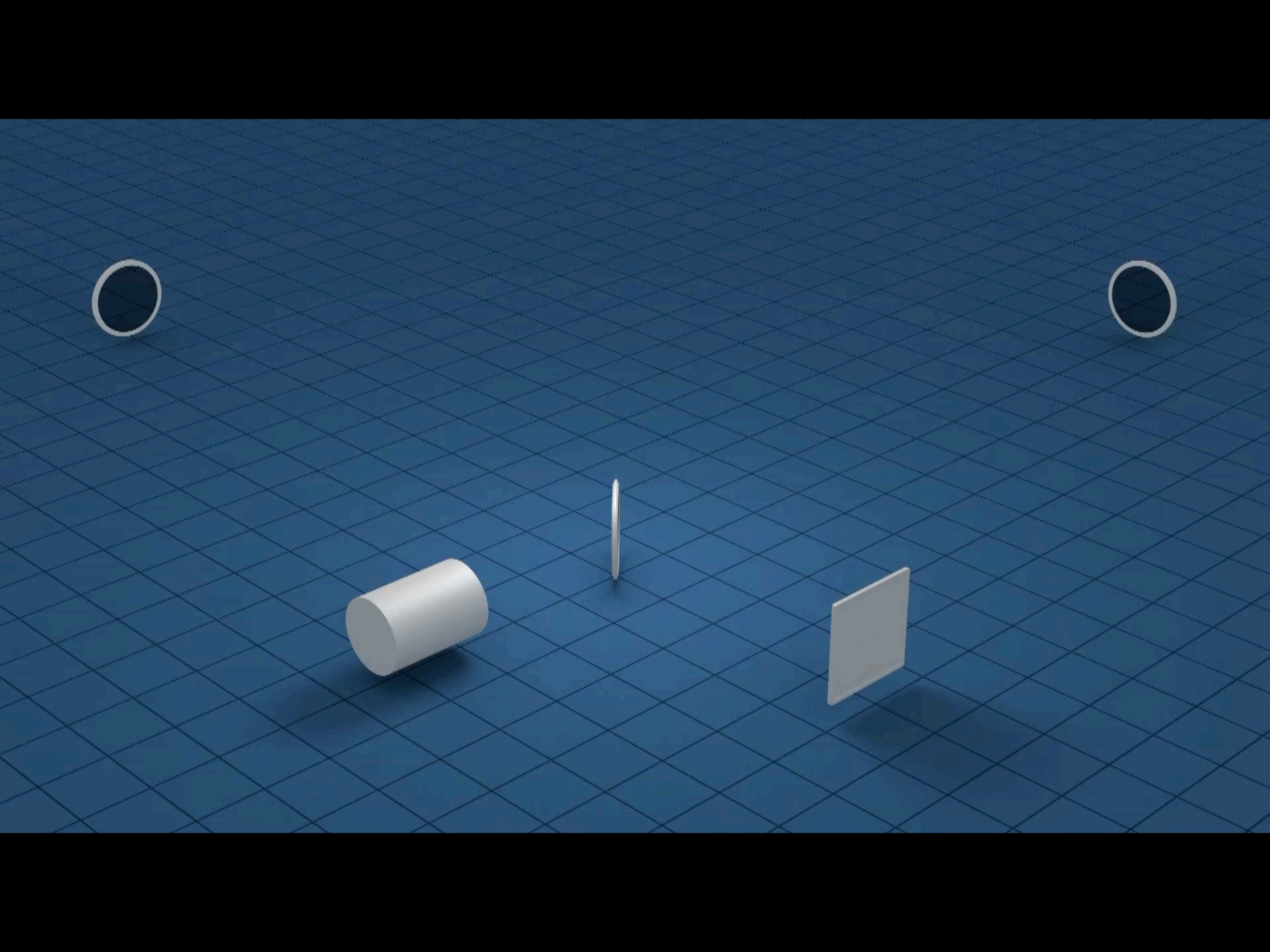


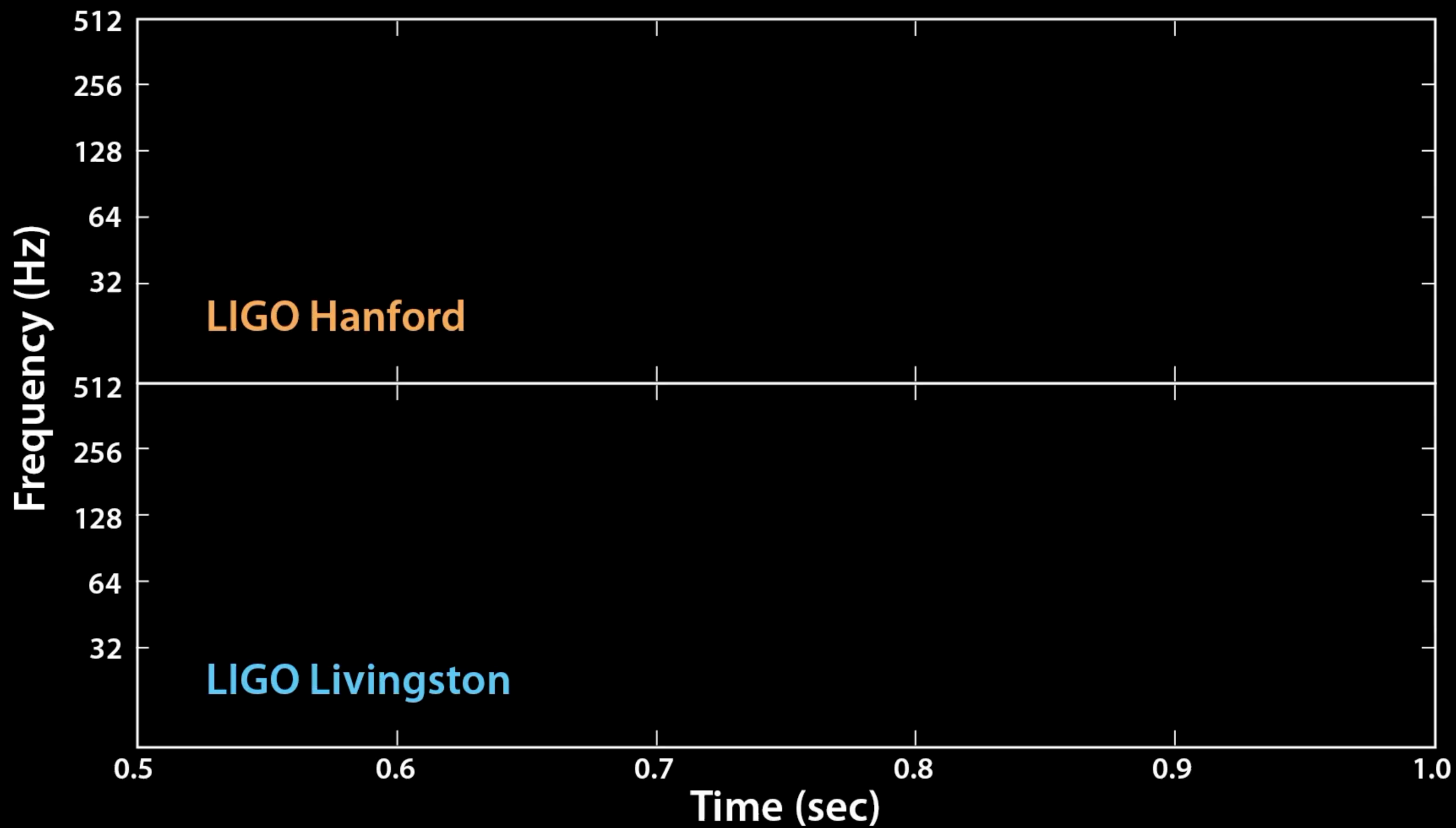
LIGO



Sensitivity vs. 'color'





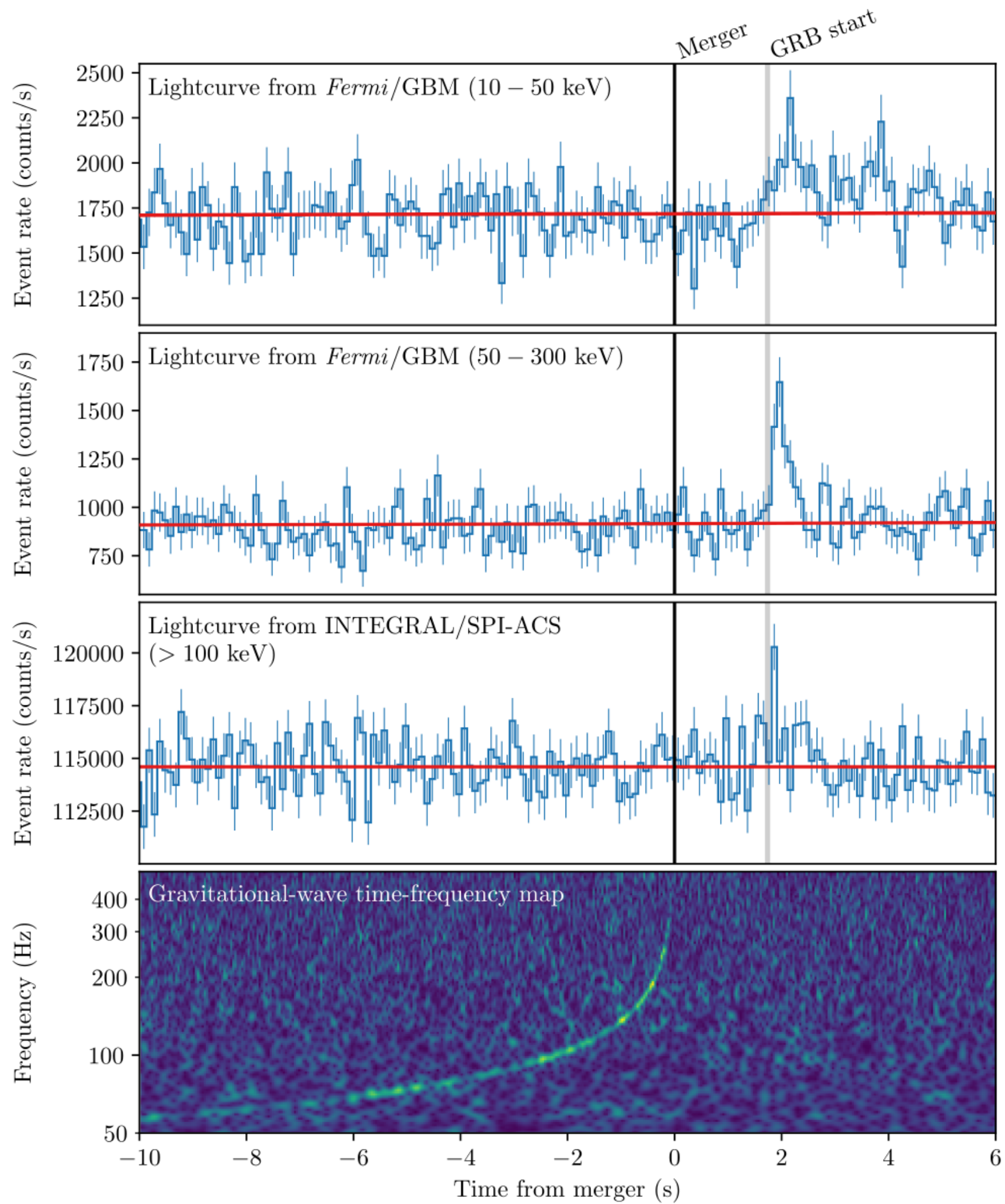


Neutron stars and the birth of multi-messenger astronomy

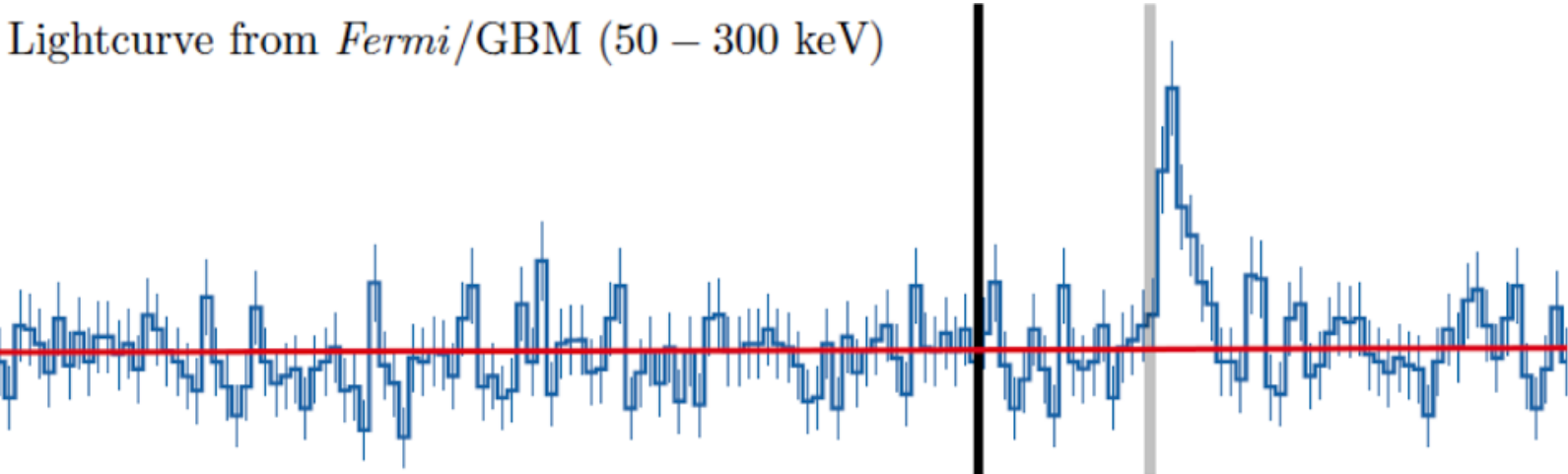
Simulation of BH mergers

Hearing BH mergers

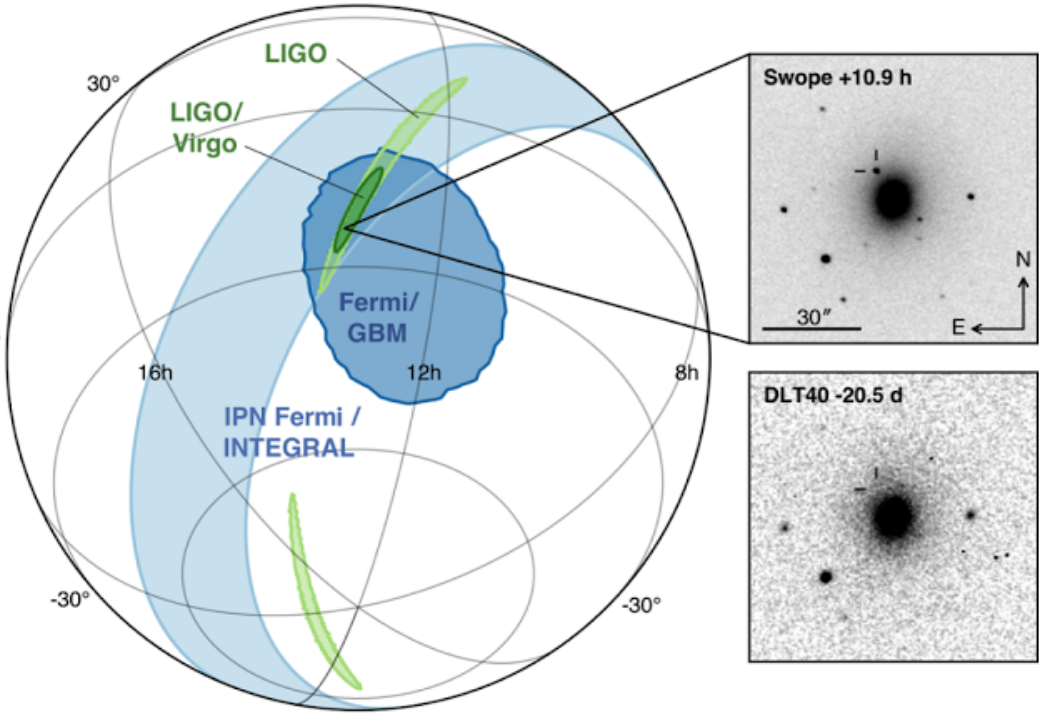
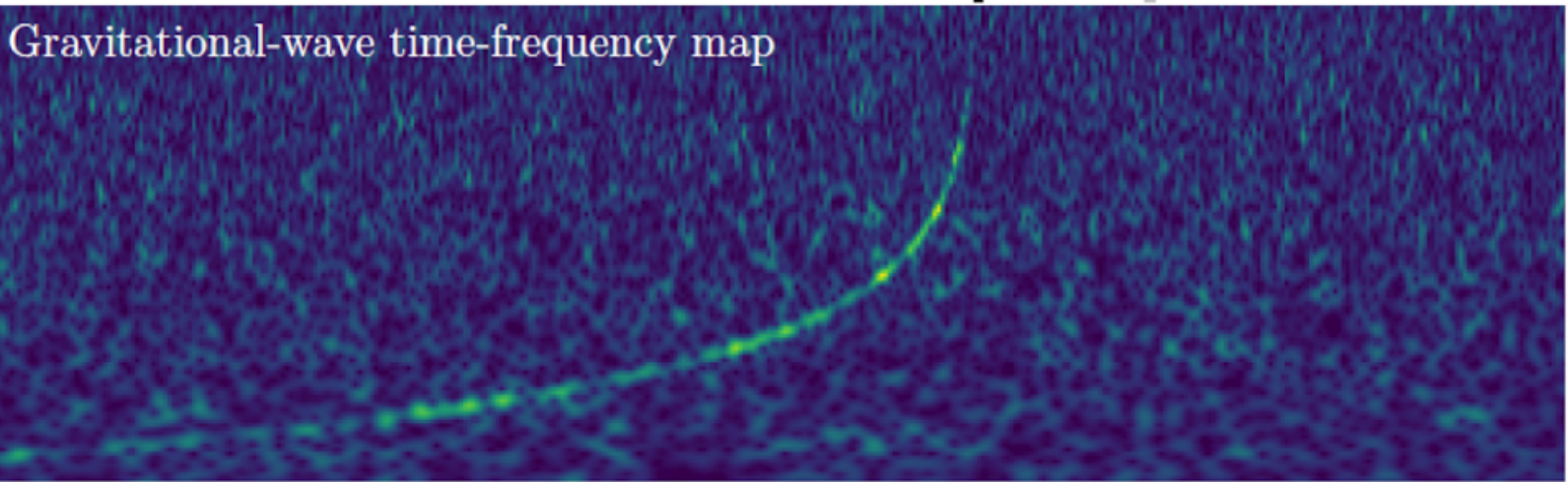
Hearing the NS merger

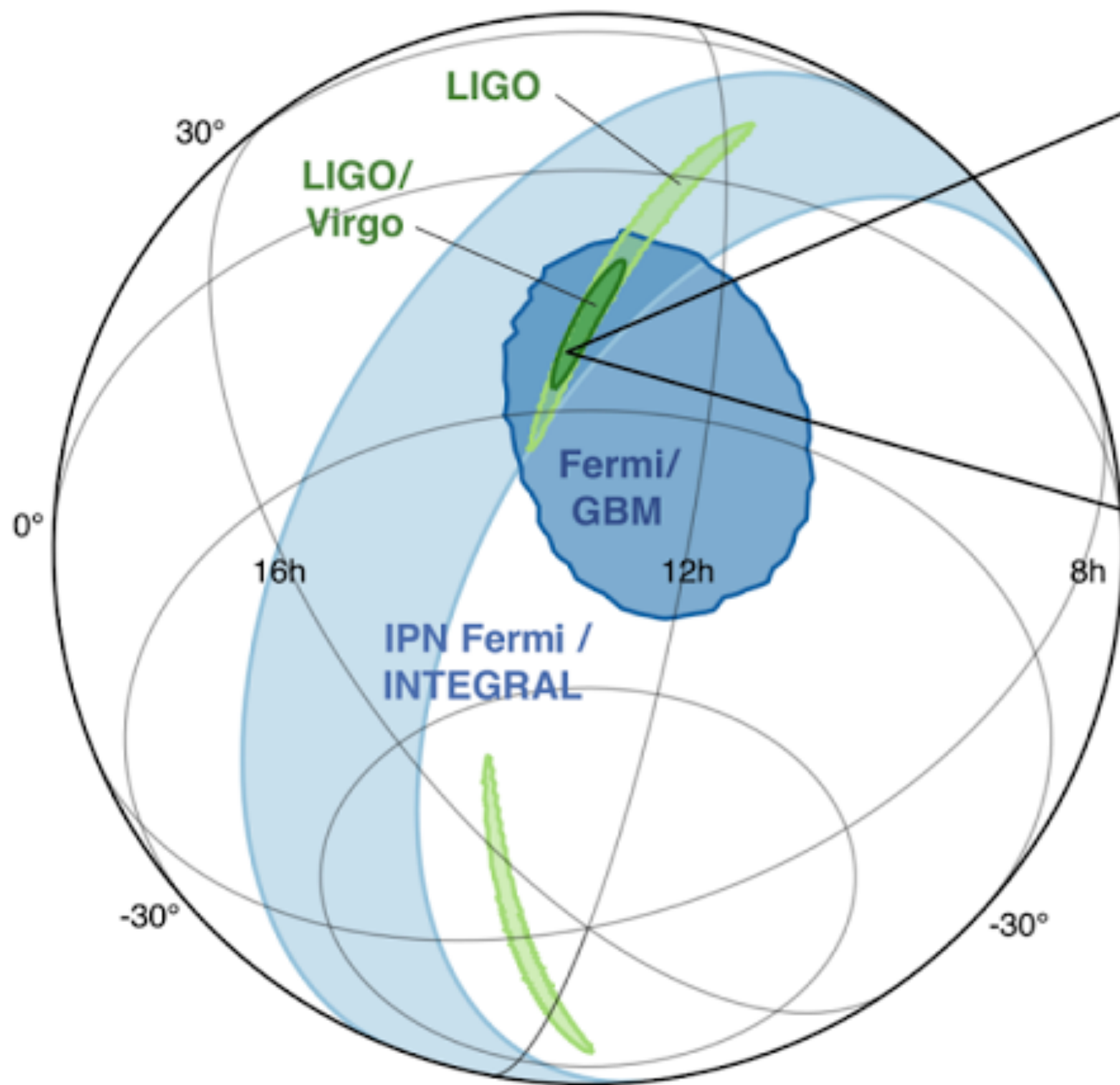


Lightcurve from *Fermi*/GBM (50 – 300 keV)

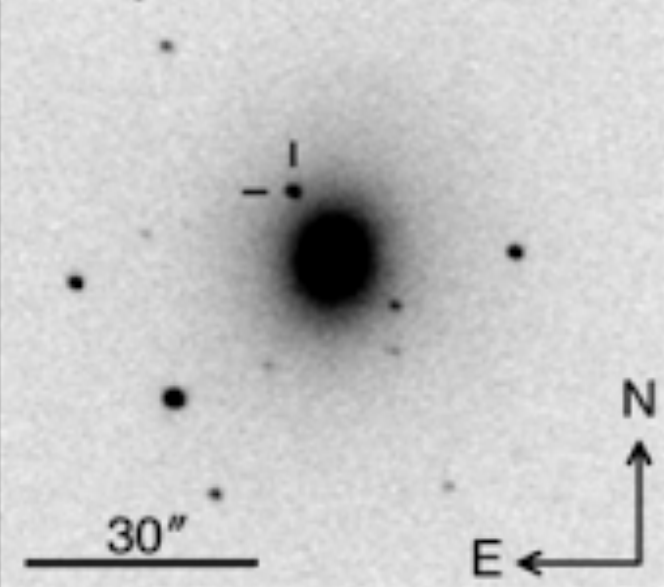


Gravitational-wave time-frequency map

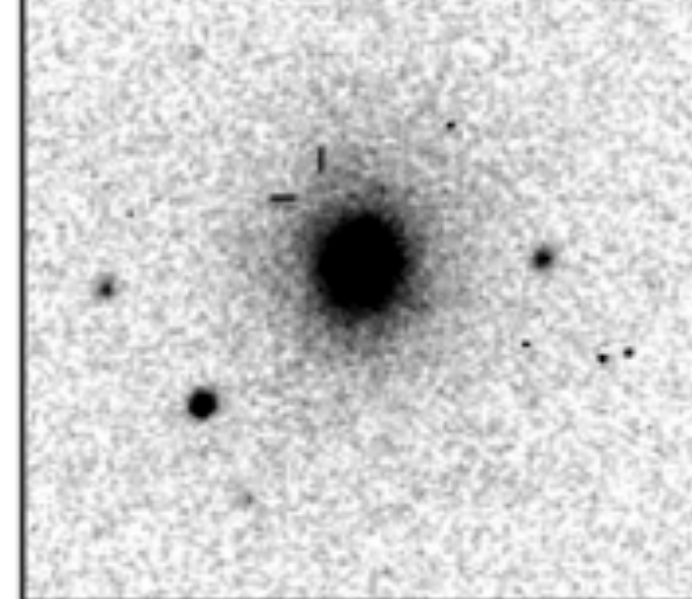




Swope +10.9 h



DLT40 -20.5 d



Birth of 'Multi-messenger Astronomy'

- Neutron stars merge into black holes
- Most of the elements heavier than iron come from NS mergers (Gold, etc.)