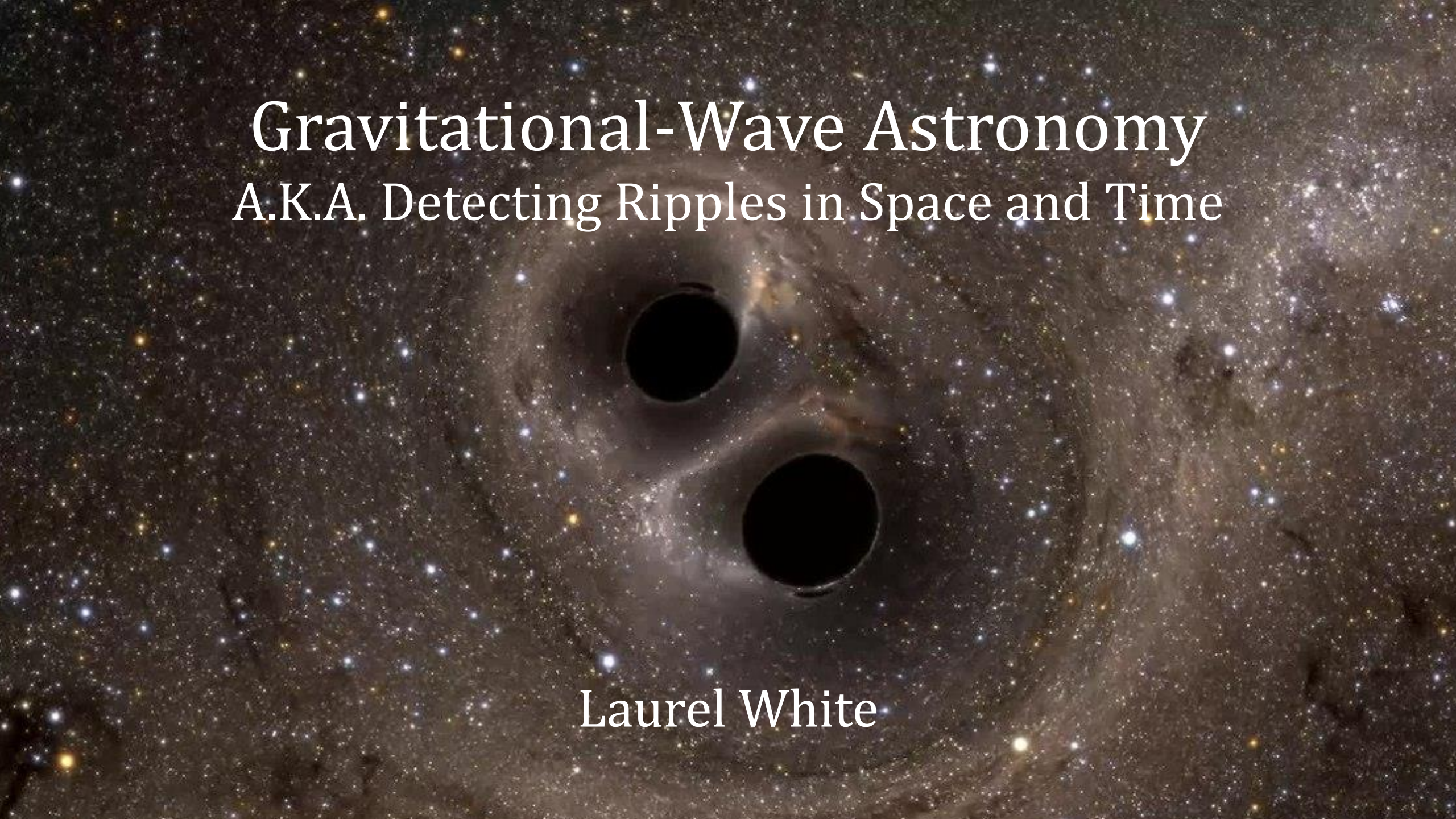


Gravitational-Wave Astronomy

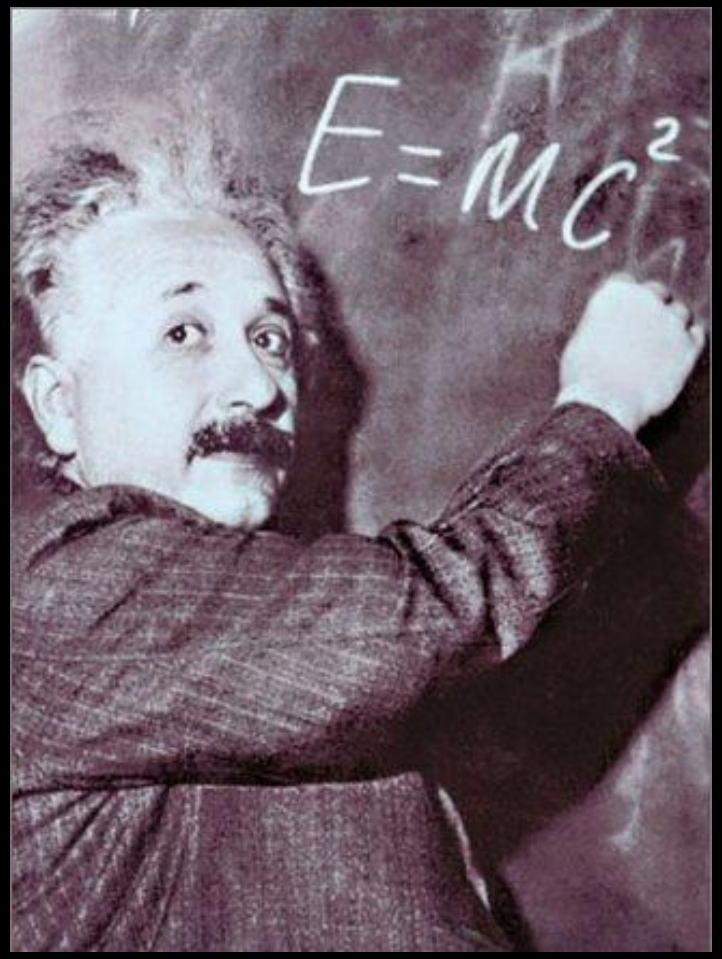
A.K.A. Detecting Ripples in Space and Time

Laurel White

What I’ m going to talk about

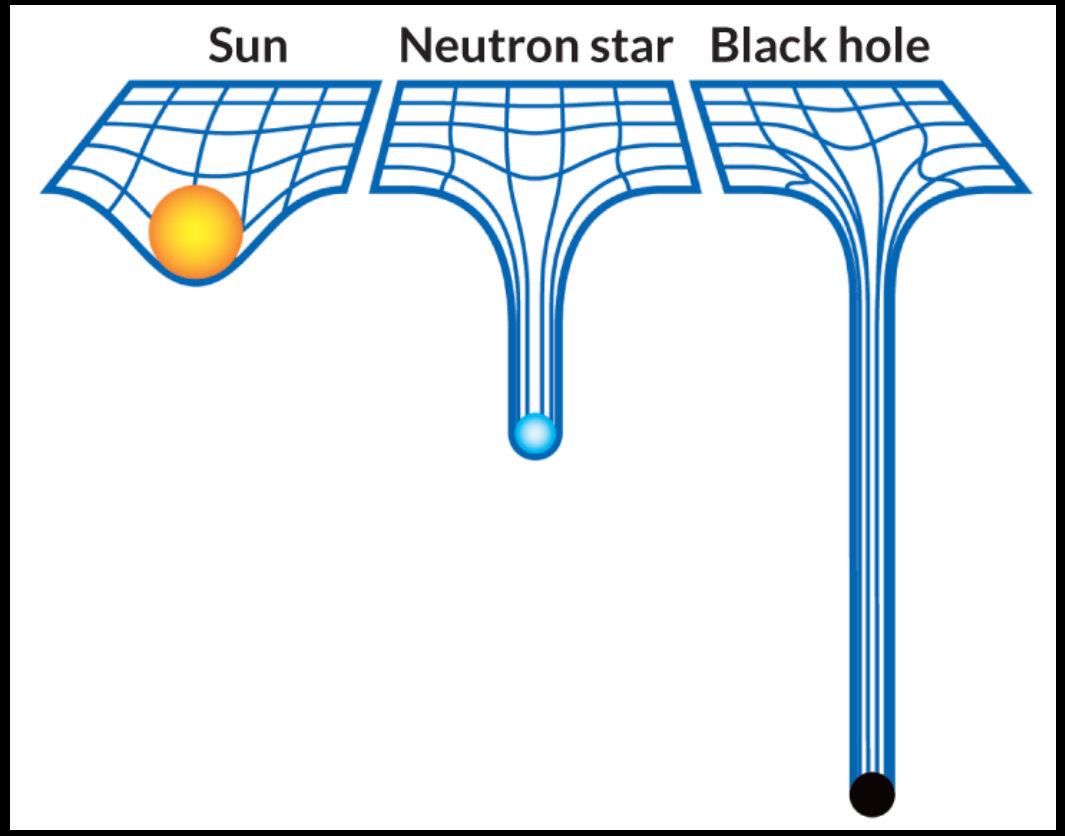
- What is a gravitational wave?
- What is LIGO and how does it work?
- What is my research about?

Starting with Einstein…



https://d.gr-assets.com/books/1176674634l/643669.jpg

Gravity is not a force



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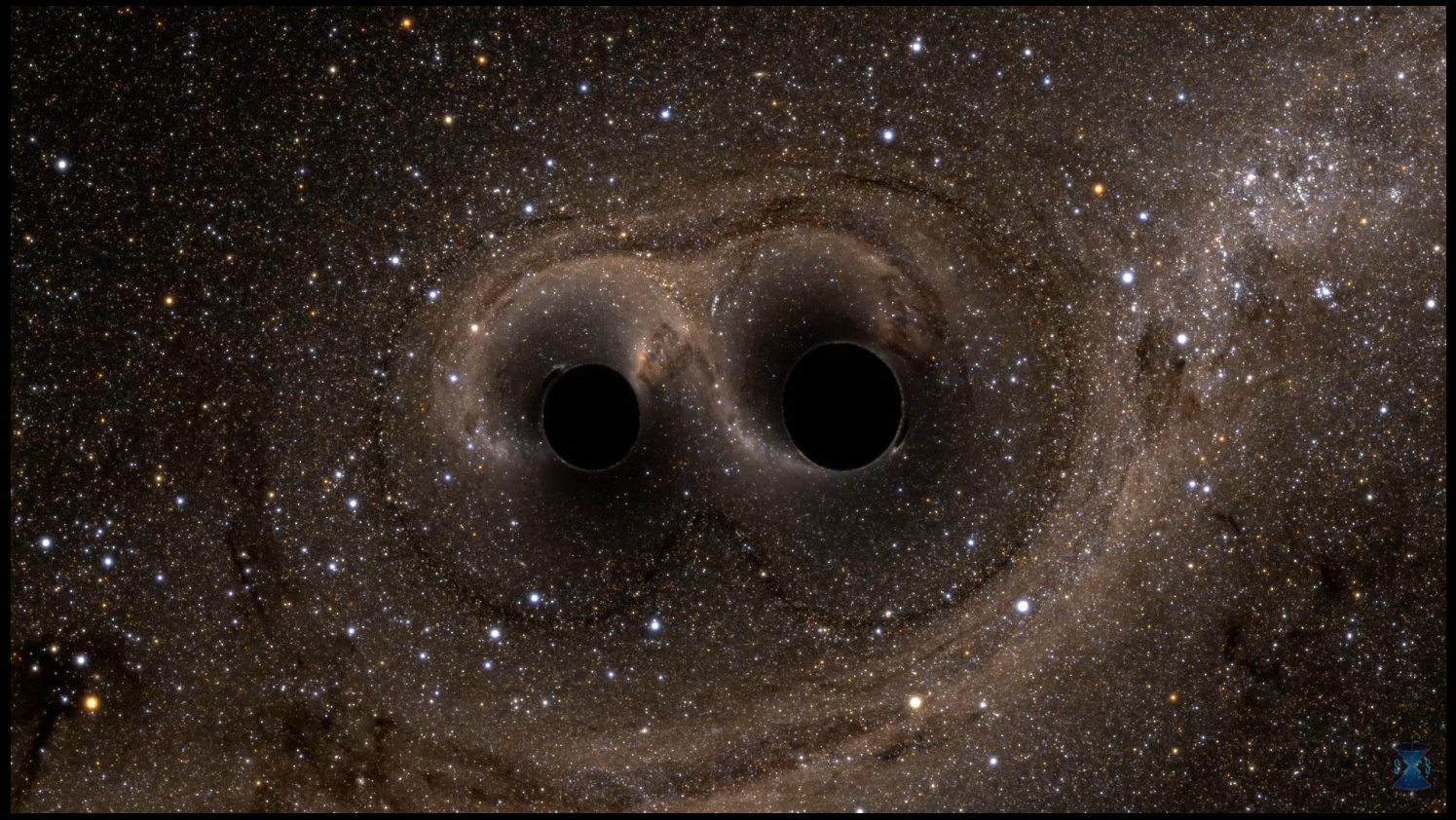
Black holes collide



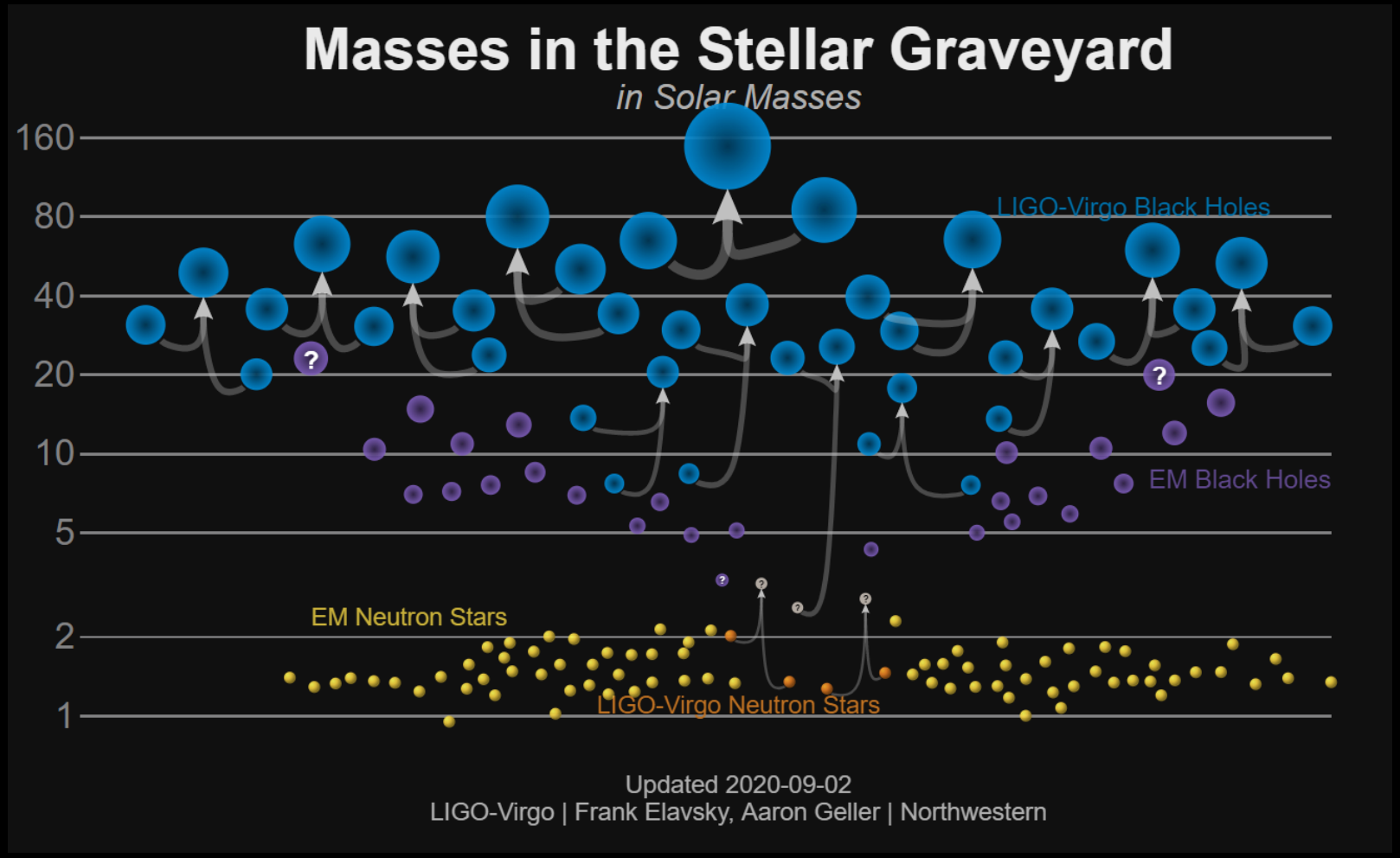
Courtesy of Simulating eXtreme Spacetimes

LIGO and friends

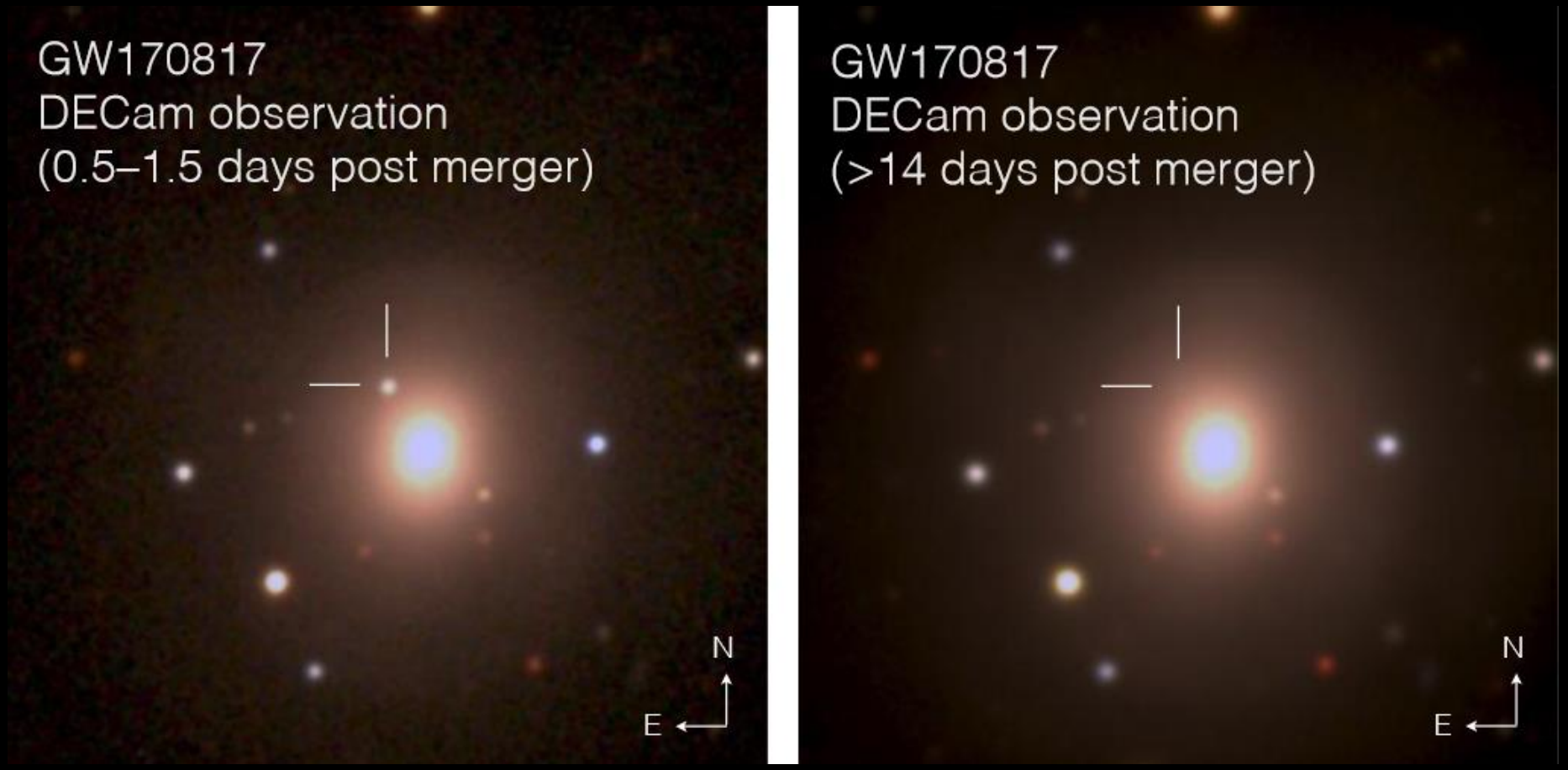
- LIGO
- Virgo
- KAGRA

Courtesy of Caltech

LIGO detections

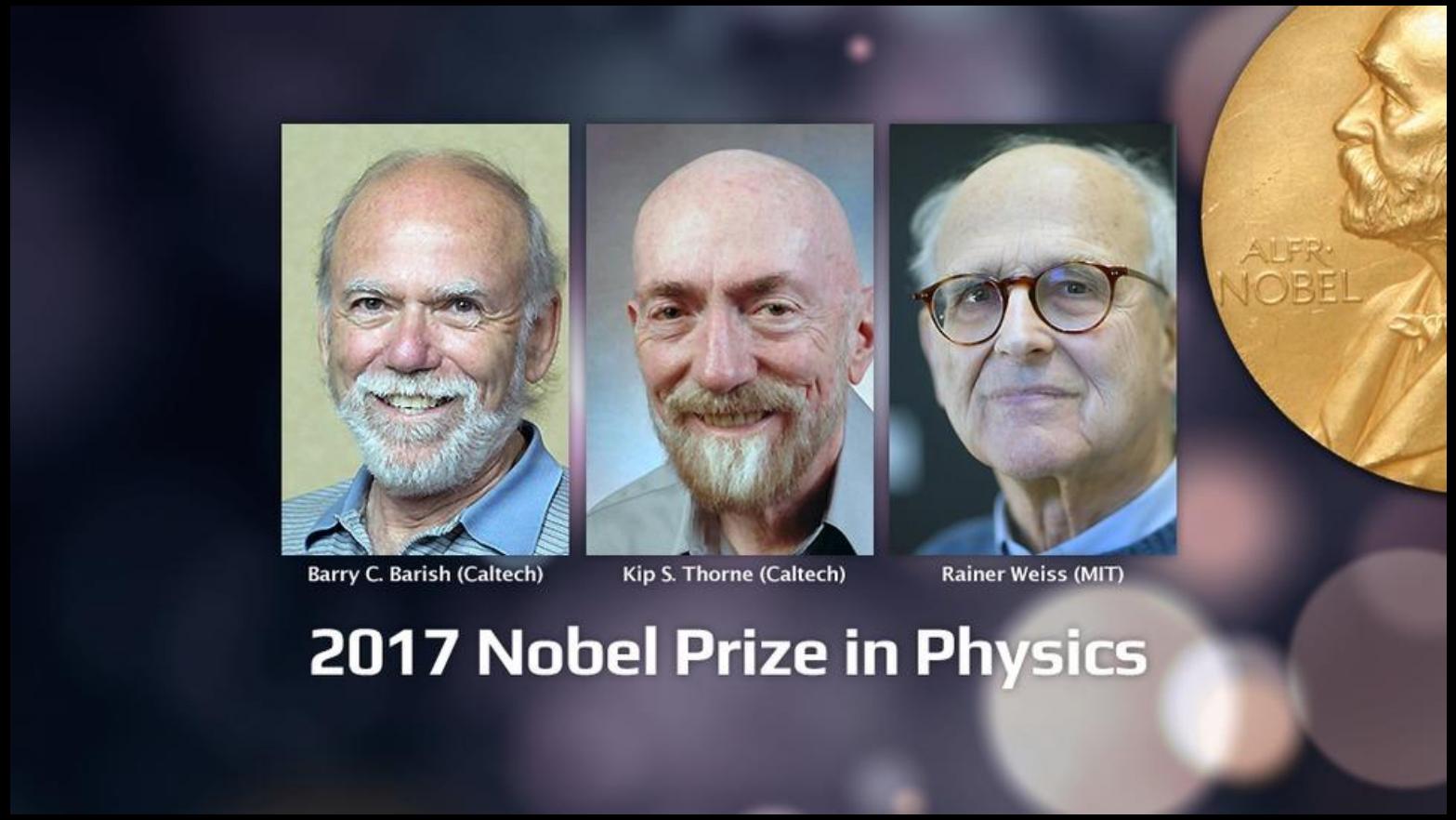


Multi-messenger astronomy



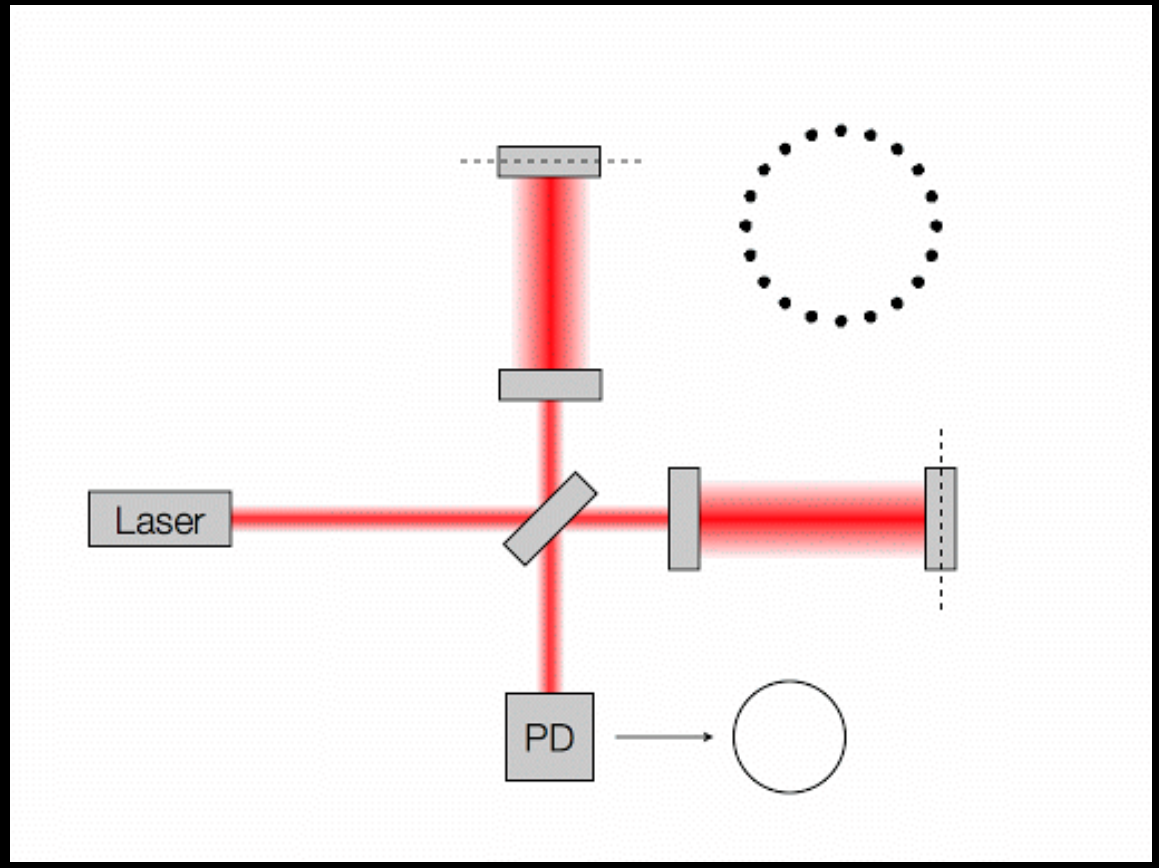
Courtesy of Soares-Santos

2017 Nobel Prize in Physics



Courtesy of LIGO

Laser interferometry



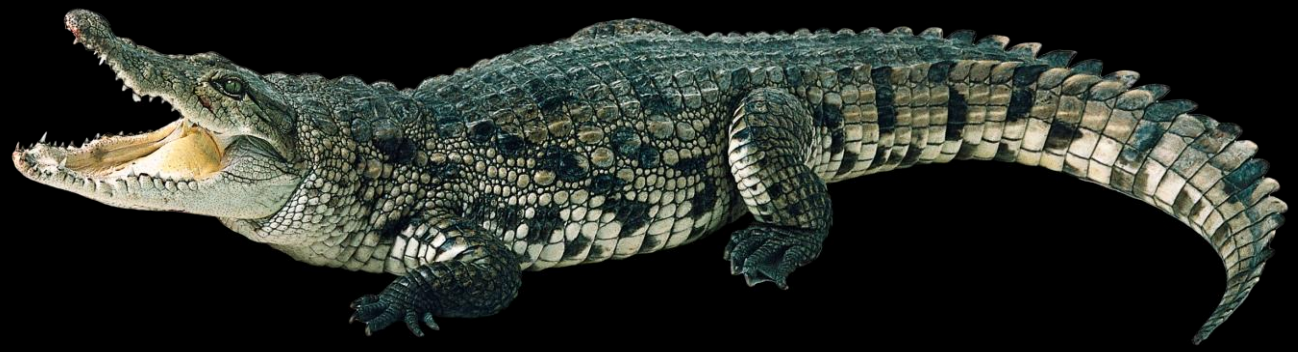
Courtesy of Les Wade

Really big interferometers

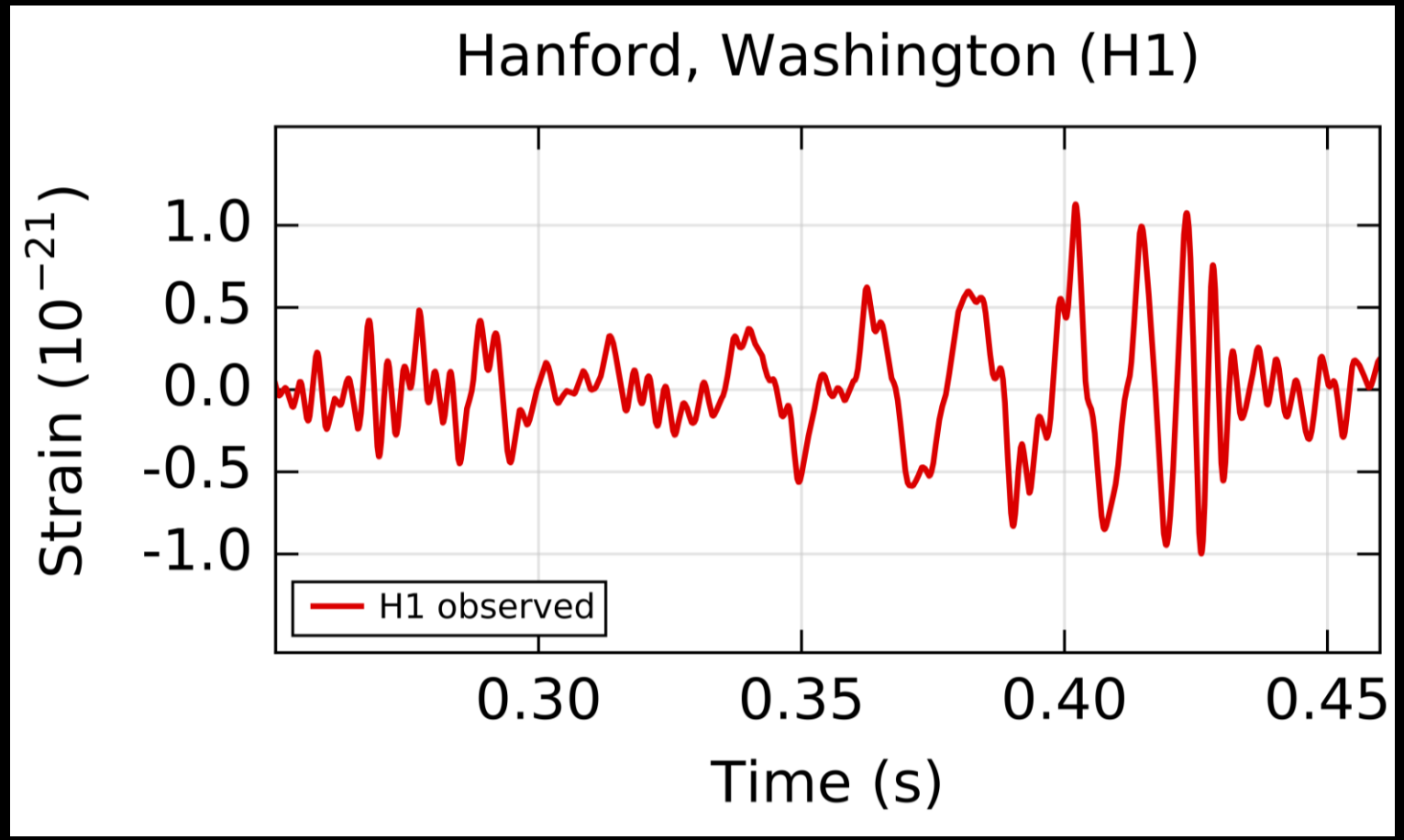
Courtesy of LIGO

Really big interferometers

Location, location, location

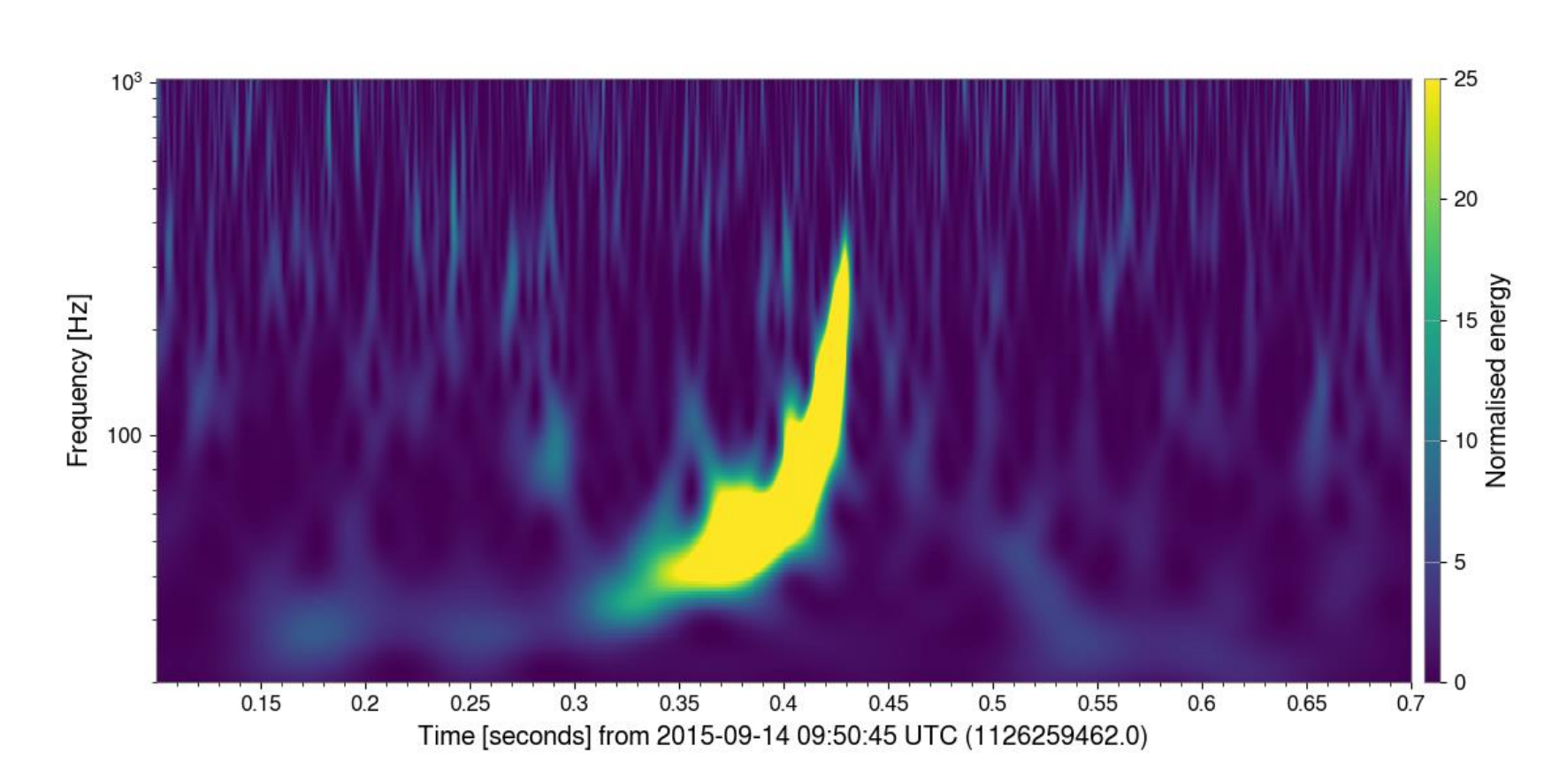


What does a gravitational wave look like…



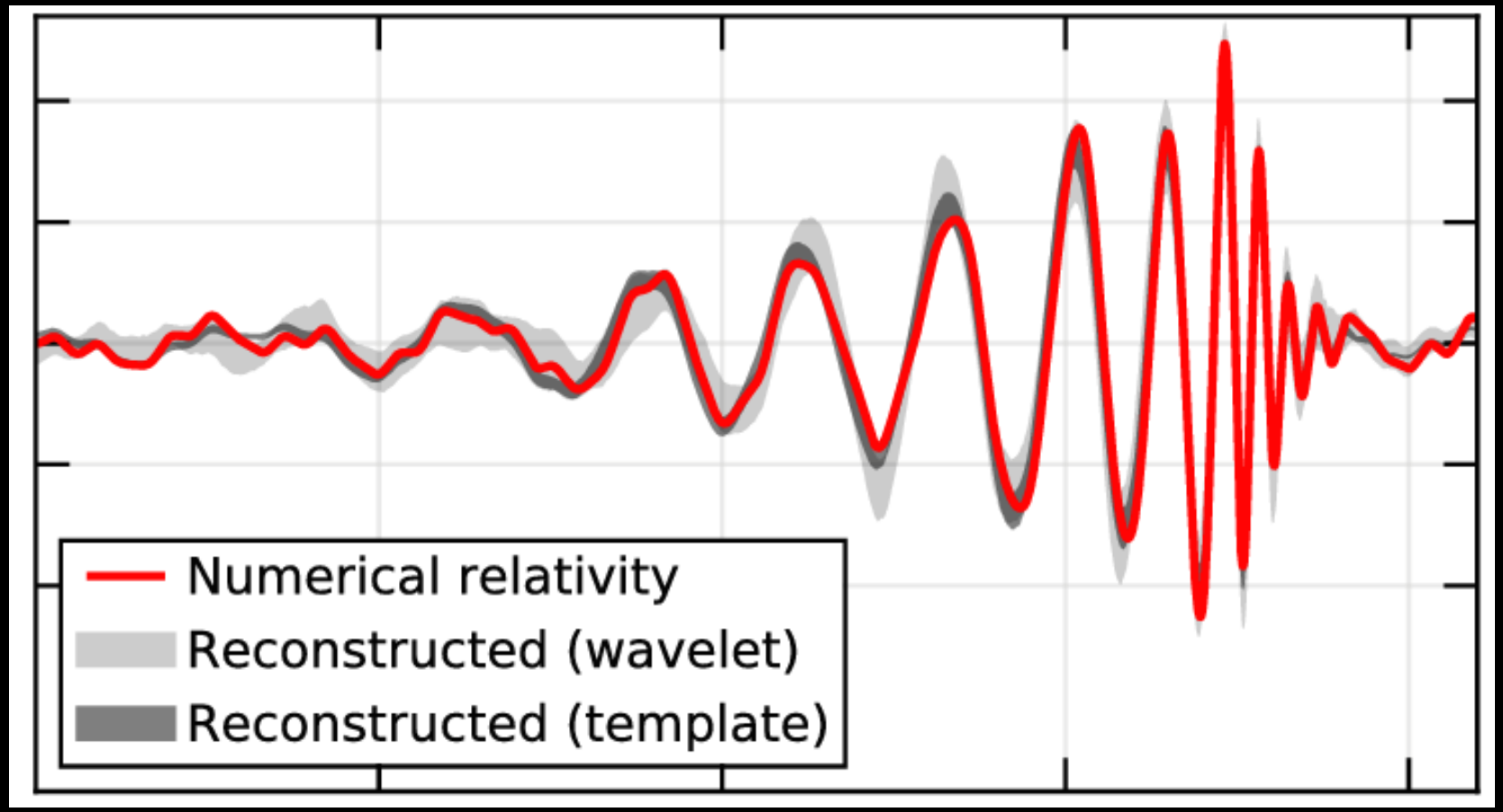
Courtesy of LIGO

…and what does it “sound” like?



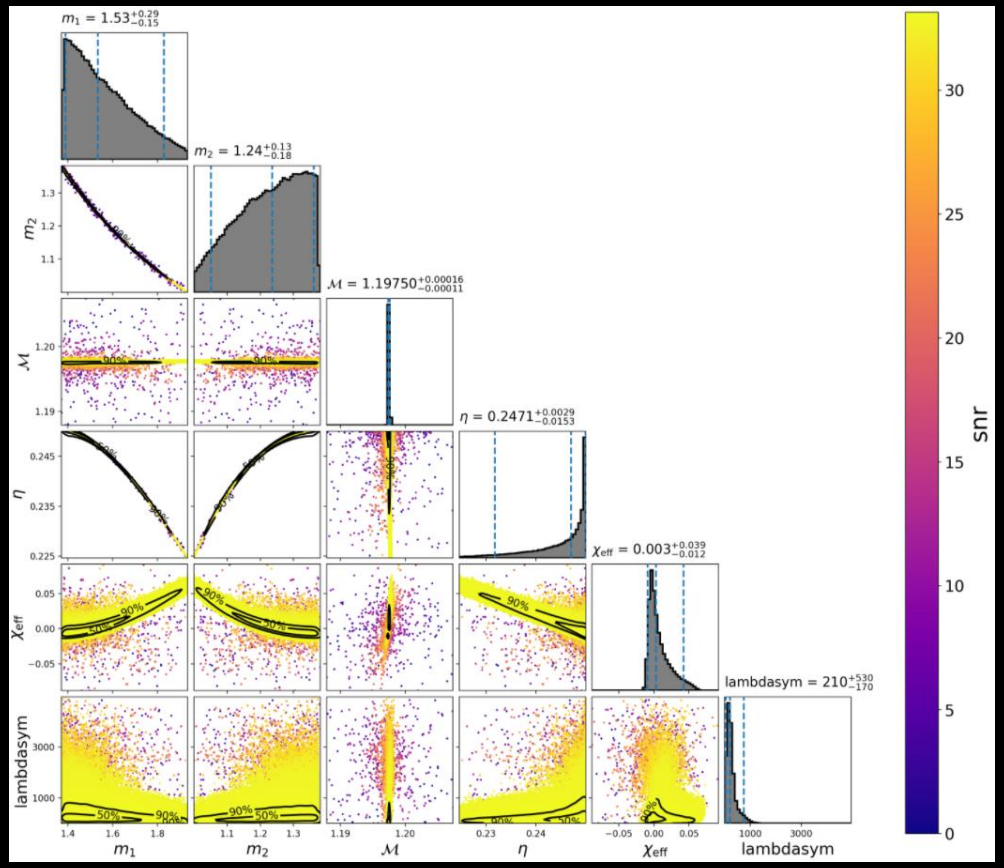
Courtesy of LOSC

Turning squiggles into cool astrophysics

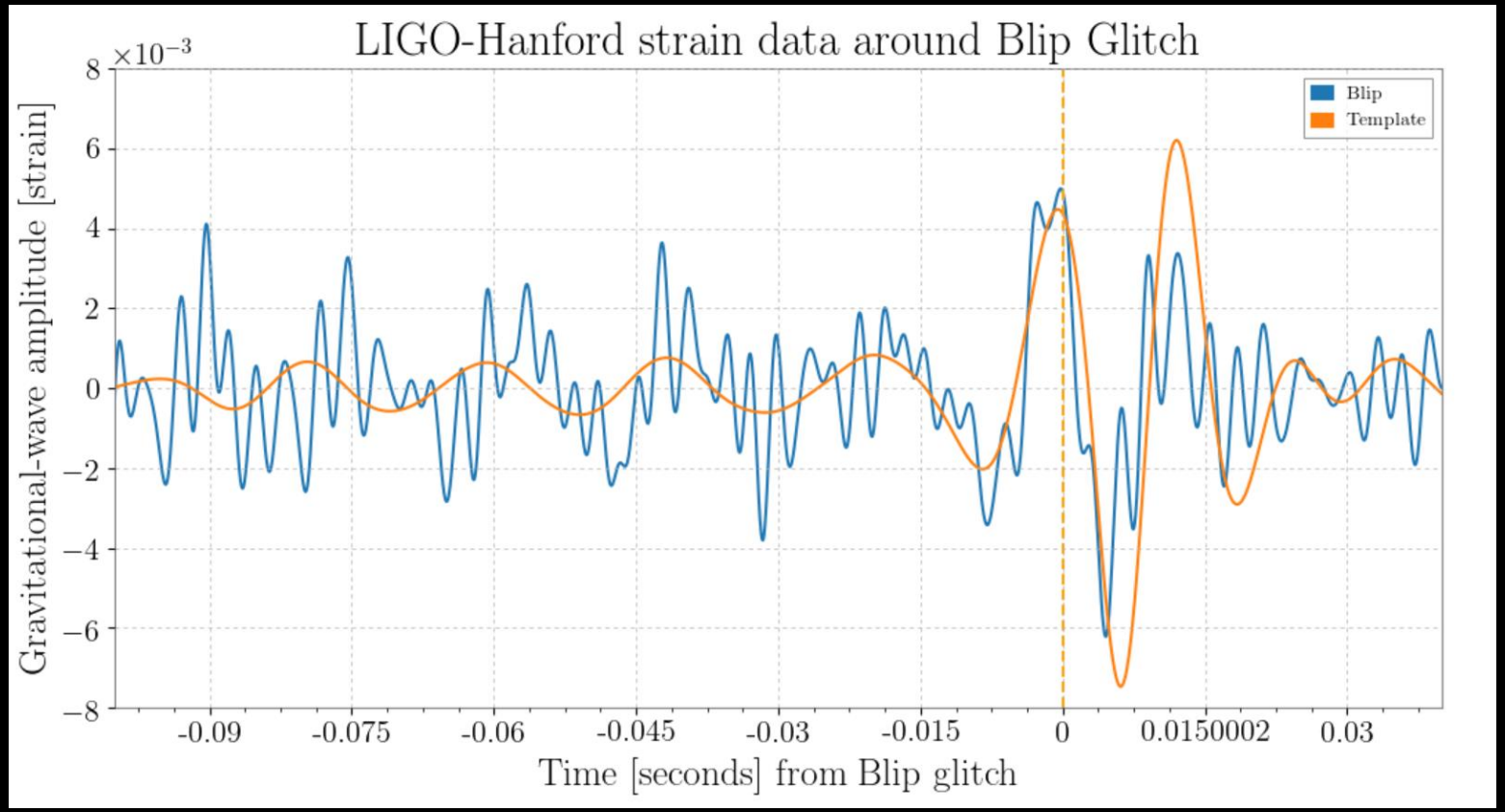


Courtesy of LOSC

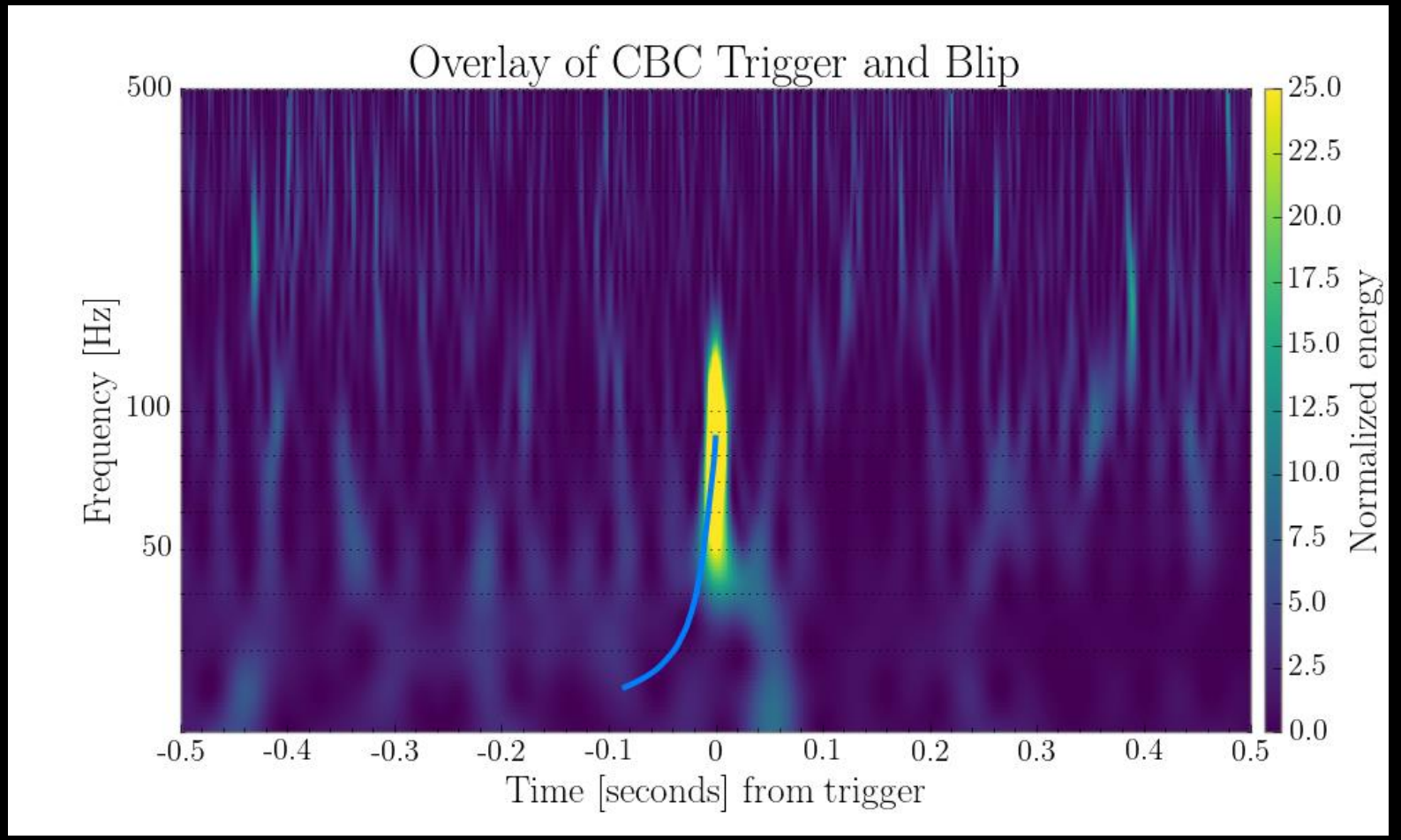
Effects of Spin Priors on Masses Recovered from Binary Neutron Star Gravitational-Wave Signals



Noise or gravitational wave?



Noise or gravitational wave?

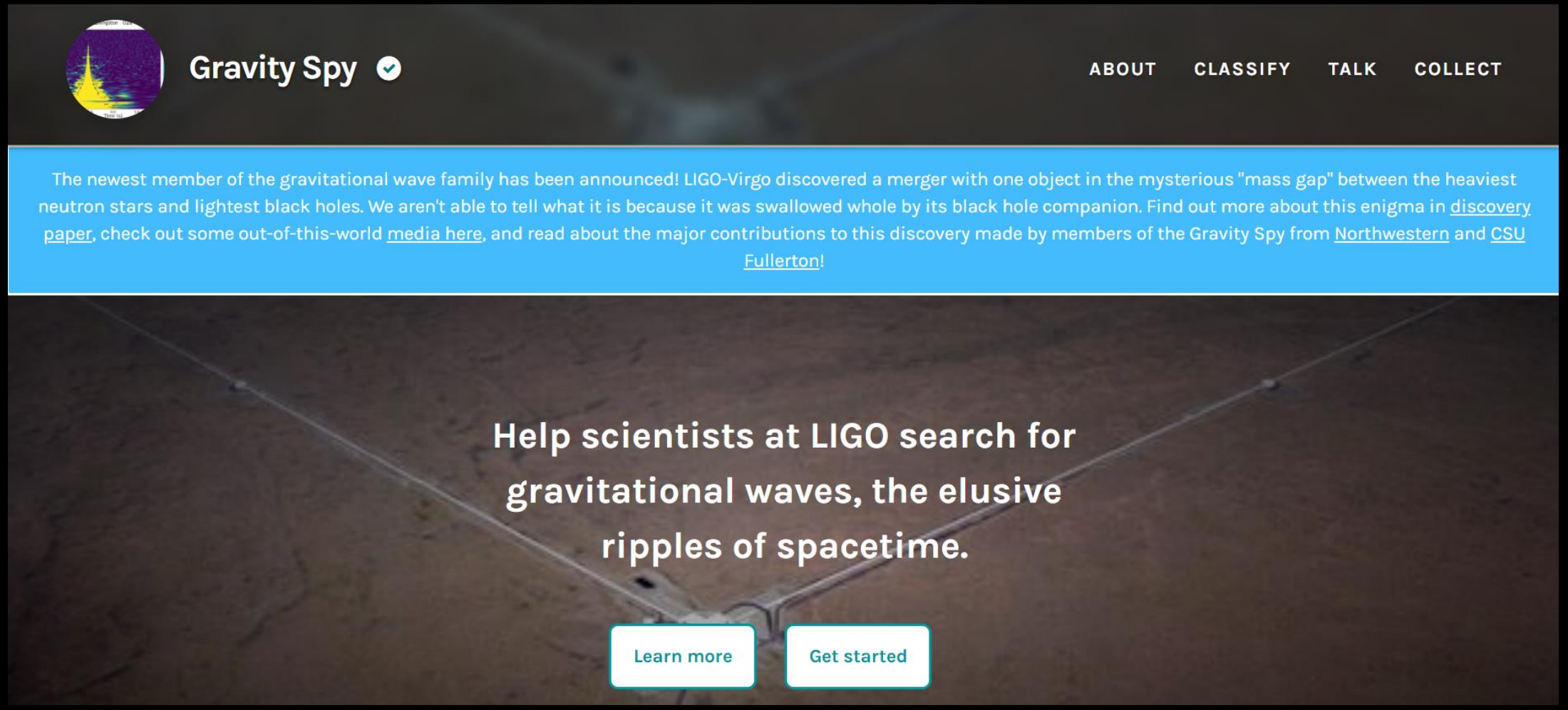


Courtesy of Derek Davis

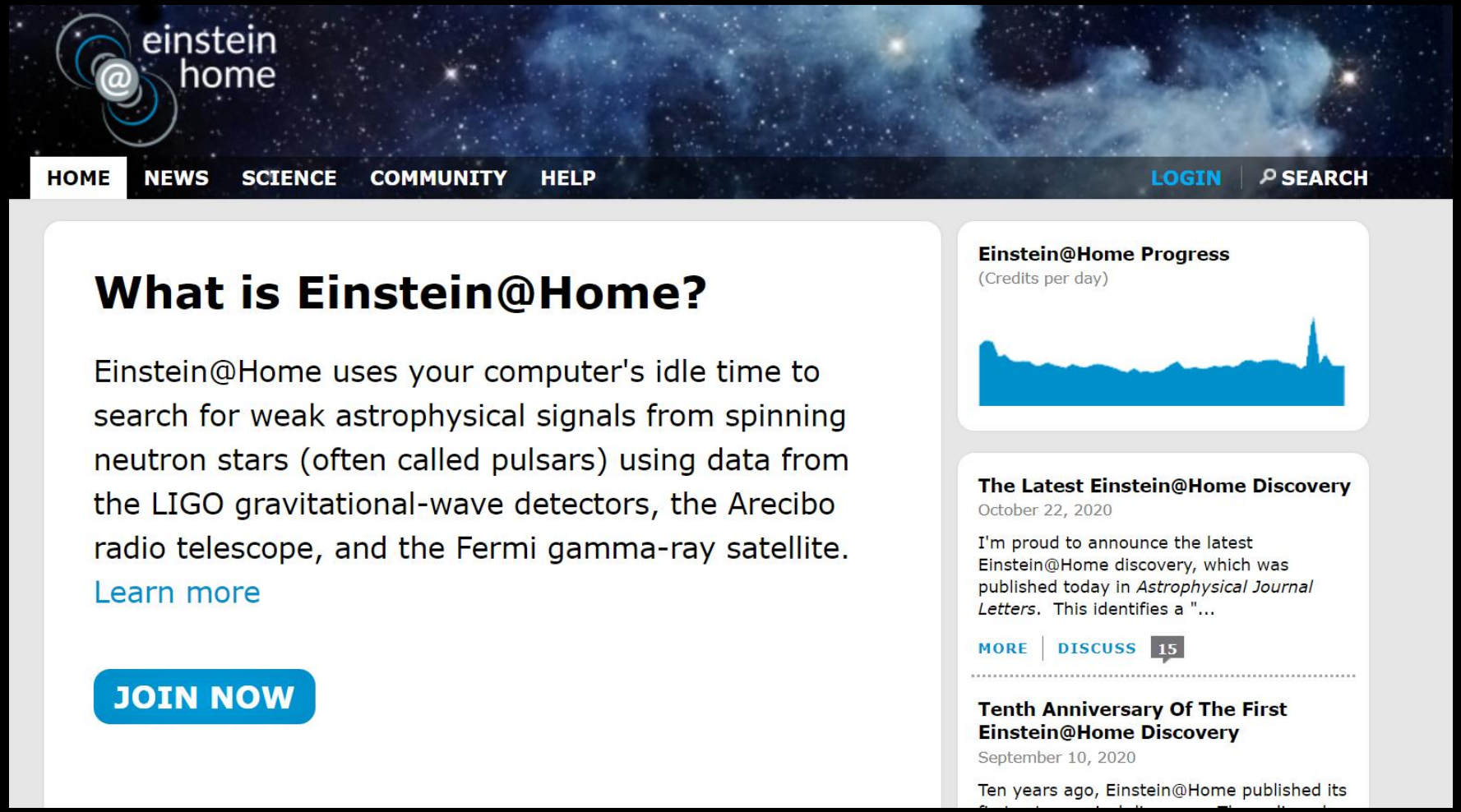
What's it like to be a GW data scientist?

- Lots of coding
- Lots of pretty plots
- Group meetings
- Papers
- Presentations
- Travel!

How you can get involved

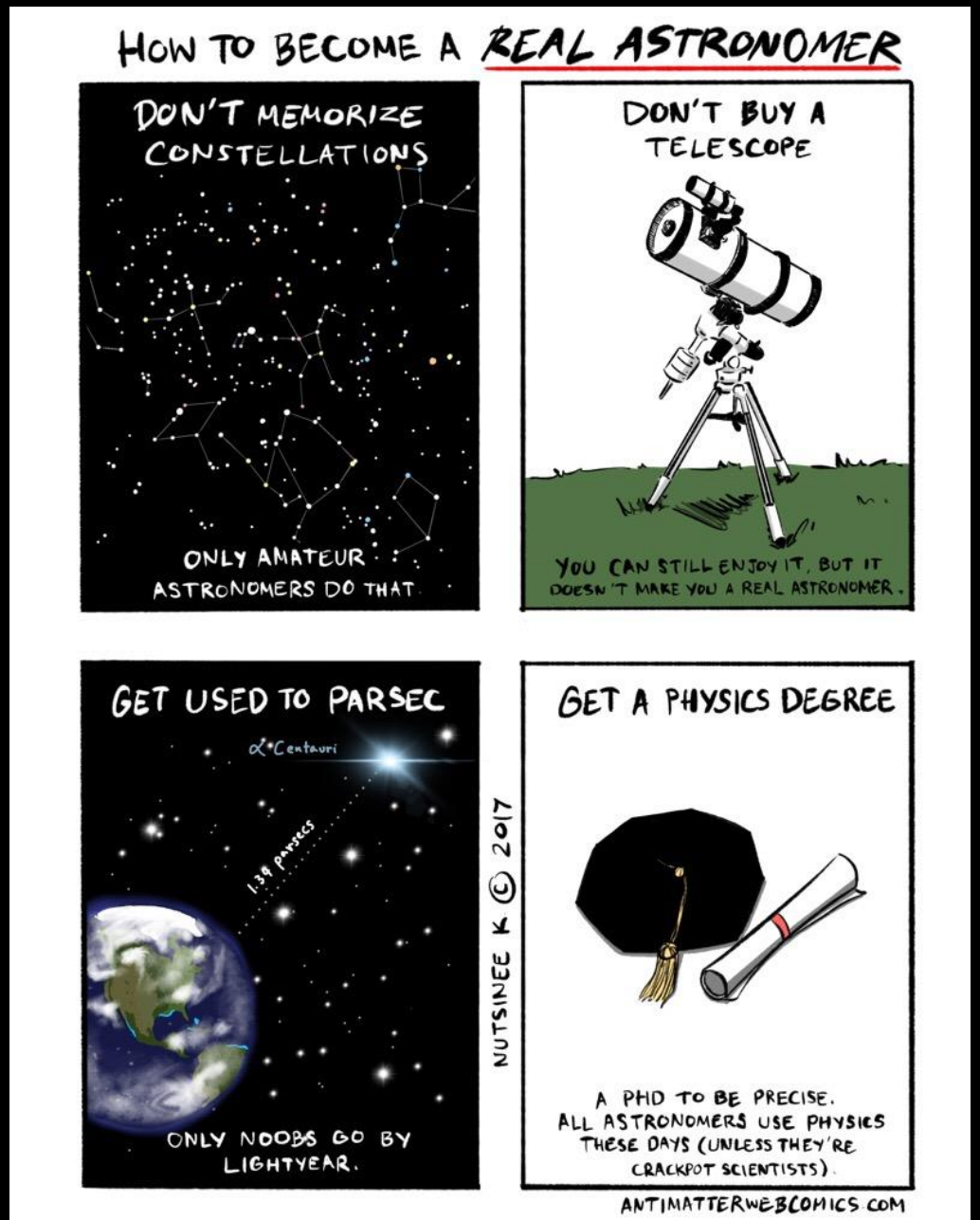


How you can get involved



What’s next?

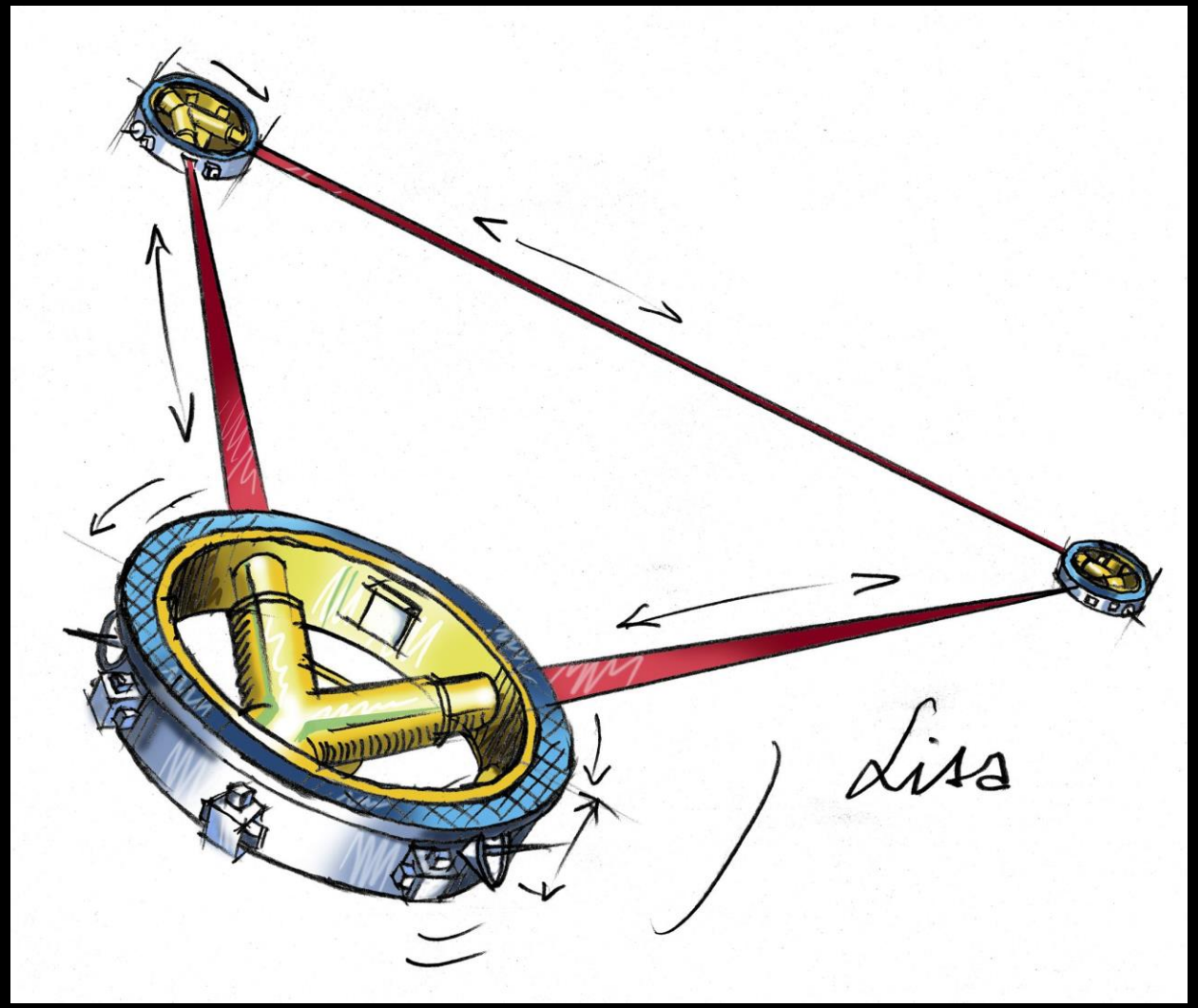
- A+
- Cosmic Explorer
- LISA



Courtesy of Nutsinee Kijbunchoo.

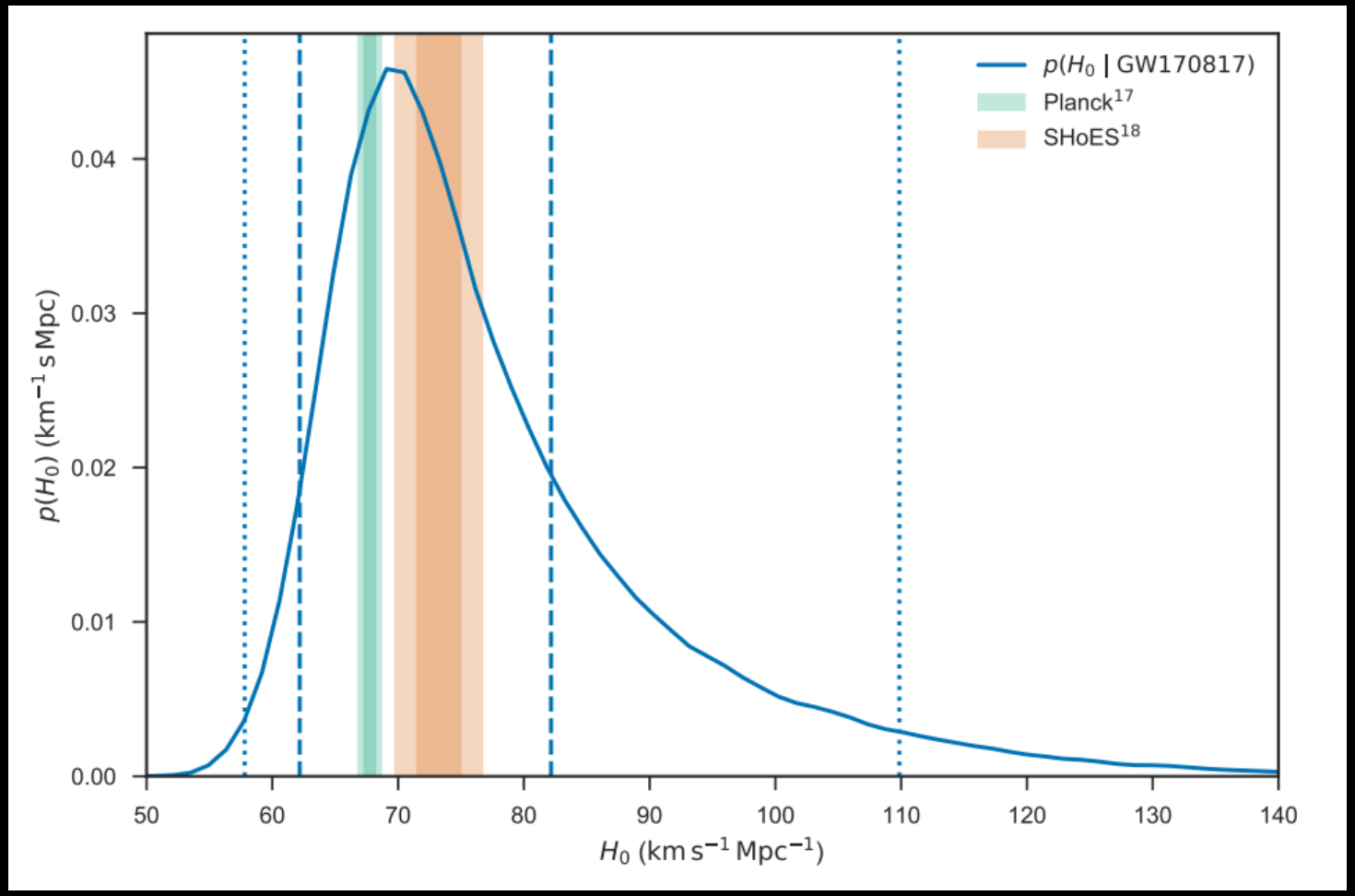
Extra Slides

LISA



Courtesy of ESA

NSBH Mergers



Courtesy of Salvatore Vitale, Hsin-Yu Chen