

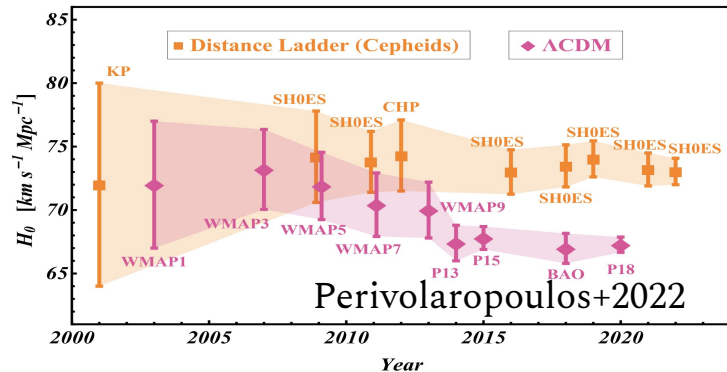
# Fitting for the Hubble Constant with Spectral Sirens

Isaac Rosenberg, supervised by Professor Maya Fishbach

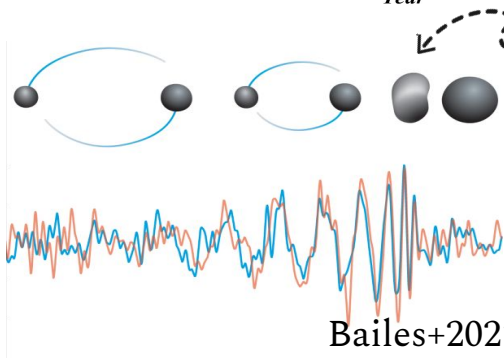


STATSTRO 2025

## Hubble tension



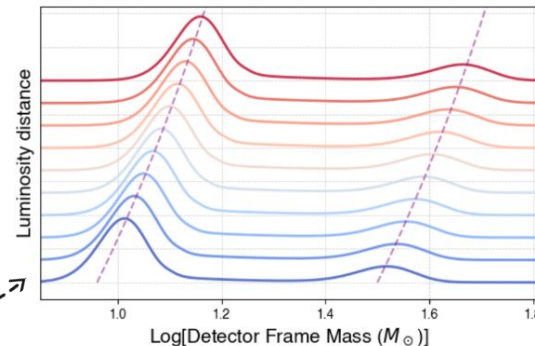
Next-generation detectors **Cosmic Explorer, Einstein Telescope** will give us  $\sim 10^5$  events **per year**.



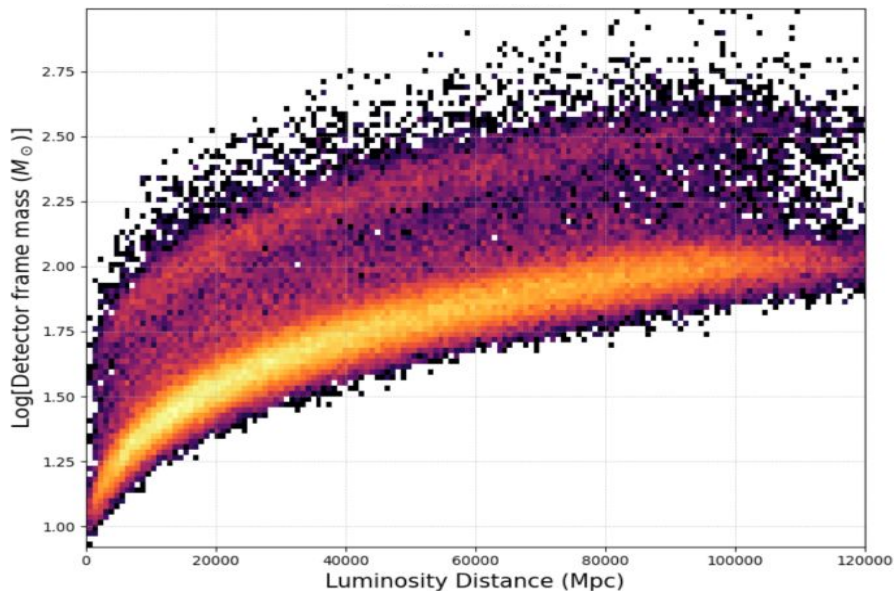
Step 1: Detect **black hole mergers**

Step 2: Extract **detector-frame mass** and **luminosity distance**

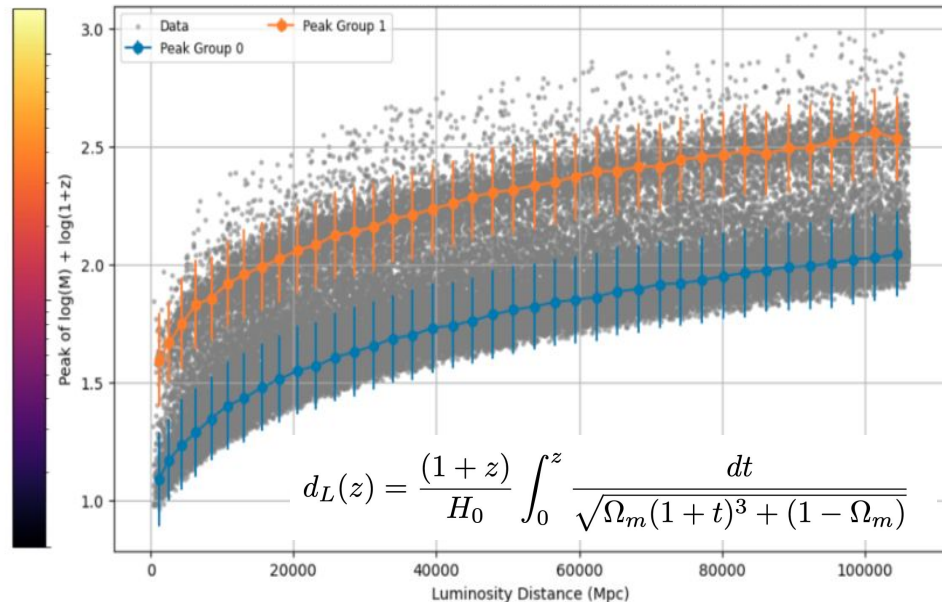
Step 3: Simultaneous fit for **mass distribution** and **cosmology**



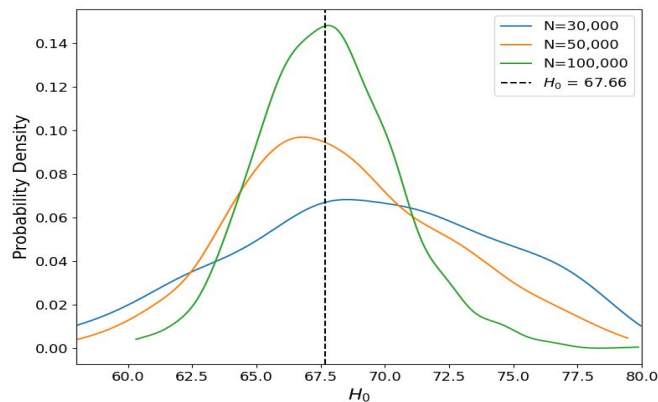
## Generate sample data



## Binned KDE to get peaks and their evolution



How do the **number of events**, the **underlying mass distribution**, the **error**, affect our  $H_0$  **posterior**?



**Next steps:** Expanding the model to fit for  $\Omega_m$ ,  $\Omega_\Lambda$  and dark energy **equation of state** parameters.