

Characterising GW bursts with minimal assumptions

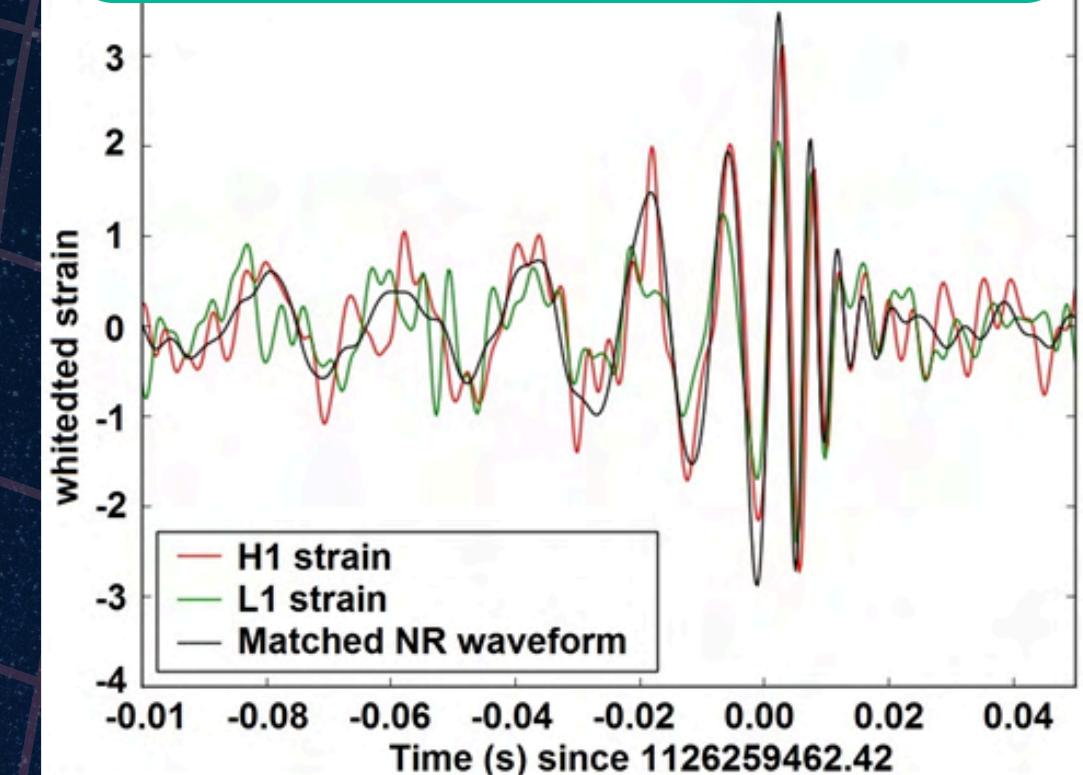
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Matched filtering

Well-modelled
Compact binary coalescences



Poorly-modelled
Core-collapse supernovae,
Gamma Ray Bursts



BayesWave

- Minimal assumptions
 - Data reconstructions with generic frame functions
- Bayesian inference
 - Is it an instrumental glitch or a real GW burst?

Multi-detector networks





#1 Glitches against efficiency

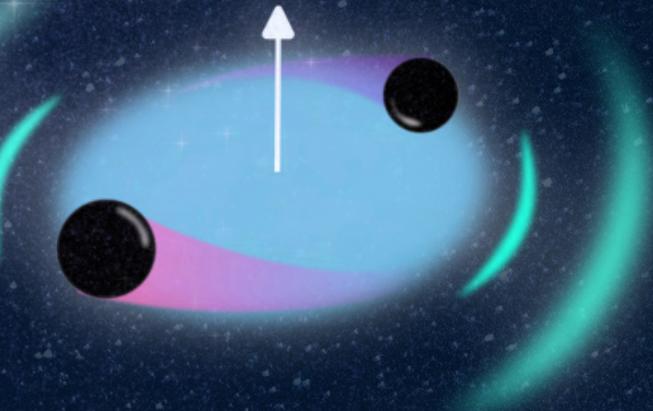
- More detectors = increased sensitivity
 - More astrophysical triggers
 - More glitches, i.e. false alarms (noise triggers)
 - So....is adding more detectors better or worse?
 - **KEY RESULT**
 - Adding Virgo does ***not*** improve burst detection efficiency **O3**



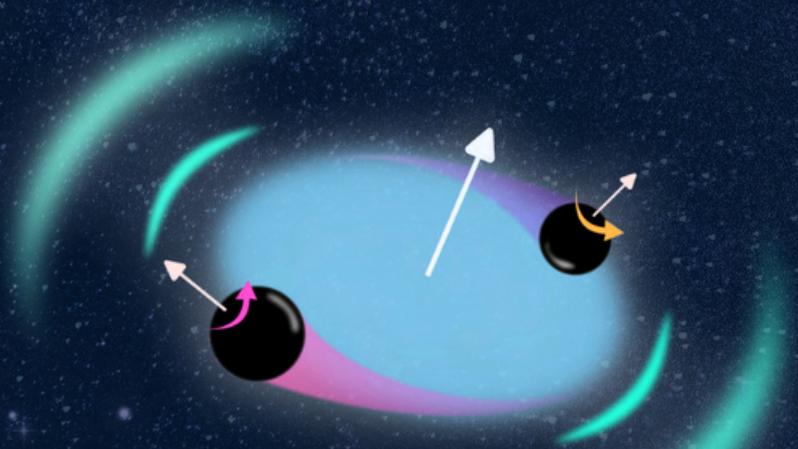
NON-PRECESSING (ELLIPTICALLY POLARISED)

#2 Characterising burst polarisations

- Can we tell whether a burst signal polarisation is elliptical or not?
 - Yes, by comparing the Bayes factor between *BayesWave*'s elliptical and non-elliptical polarisation models
- Can *BayesWave* measure the polarisation content of the signal?
 - Yes, with Stokes parameters
- Both improves with more detectors!



PRECESSING



#3

Constraining core-collapse supernovae models

in collaboration with **coherent WaveBurst (cWB)**

- What are we looking for?
 - Evidence of the standing accretion shock instability (SASI)
 - Low-frequency GW emissions, below ~ 250 Hz
- How?
 - Two-step analysis: cWB + *BayesWave*
 - Reanalysing the detected signal, but ignoring the data in high-frequency (i.e. above 250 Hz)
- Results coming soon!

Come chat with me!

- Bayesian inference
- Minimally-modelled GW burst characterisation
 - *BayesWave*
- GW polarisations and binary precession
- Core-collapse supernovae
- OUTREACH AND TEACHING (AND CATS!)

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