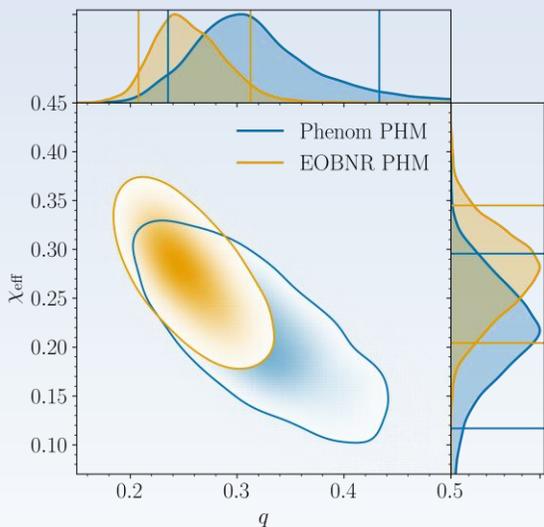
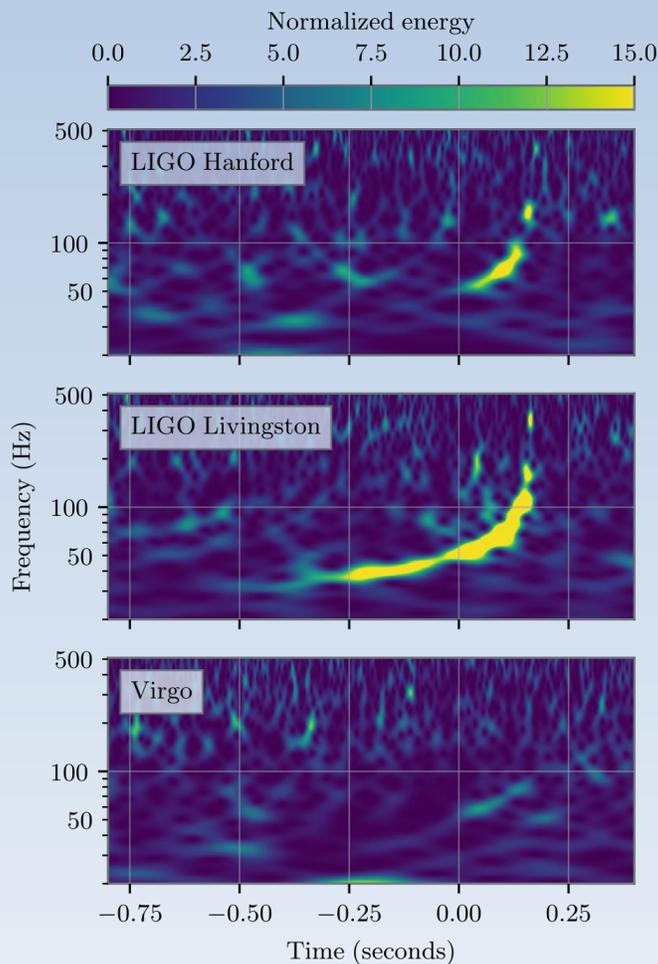


GW190412 FACTSHEET



FIRST DETECTED EVENT WITH STRONG EVIDENCE FOR AN UNEQUAL MASS RATIO AND HIGHER GRAVITATIONAL WAVE MODES PRESENT

Observed by	LIGO Hanford and Livingston, Virgo	Mass of final BH	33.1 to 41.1 M_{\odot}
Source type	Binary black hole merger	Spin magnitude of final BH	0.60 to 0.72
Event time	5:30:44 UTC, April 12, 2019	Initial astronomer alert latency (referenced to time of merger)	60 minutes
Network signal to noise ratio	19.1	Sky area of 90% credible region	156 deg ²
Distance	1.83 to 2.84 billion light years		
Redshift	0.12 to 0.18		
Primary BH mass	24.4 to 34.7 M_{\odot}		
Secondary BH mass	7.4 to 10.1 M_{\odot}		
Ratio of secondary to primary BH mass	0.21 to 0.41		
Effective inspiral spin parameter	0.14 to 0.34		
Effective precession spin parameter	0.15 to 0.49		



Images: **Mass ratio and spin** (left) – from the properties of the signal, it was possible to estimate the mass ratio (q) and the effective spin (χ_{eff}) of the binary BHs. The blue and orange contours represent 90% credible estimates on the values of these quantities from two different models.

GW spectrograms (above) – time-frequency representation of the GW signal data from all three detectors.

GW = gravitational wave, BH = black hole, M_{\odot} =1 solar mass= 2×10^{30} kg

Parameter ranges are 90% credible intervals from combining two models