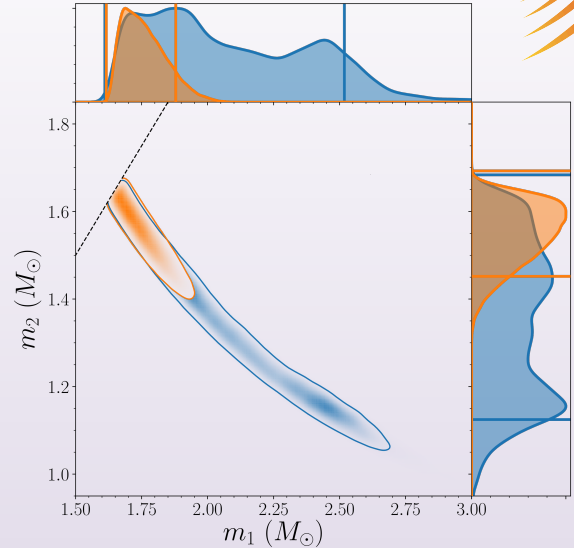
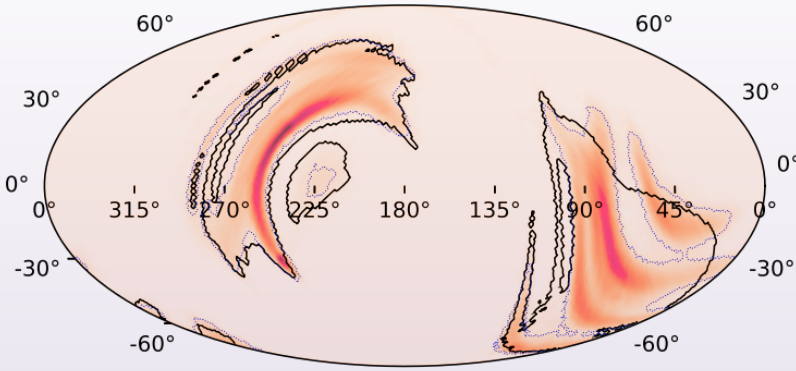


GW190425 FACTSHEET



observed by LIGO Livingston, Virgo

source type most likely a binary neutron star merger

date 25 April 2019

time of merger 08:18:05 UTC

Livingston signal-to-noise ratio 12.9

Virgo signal-to-noise ratio 2.5

false alarm rate 1 in 69 000 years

distance 287 to 744 million light-years

redshift 0.01 to 0.04

total mass 3.3 to 3.7 M_{\odot}

primary NS mass 1.61 to 2.52 M_{\odot}

secondary NS mass 1.12 to 1.68 M_{\odot}

mass ratio 0.4 to 1.0

effective inspiral spin parameter 0.01 to 0.17

effective precession spin parameter unconstrained

core density of primary NS 70 to 140 trillion times density of lead

inferred # of GW cycles from 19.4 Hz to 2048 Hz* ~ 3900

initial astronomer alert latency** ~43 min

sky area[†] 8284 deg²

improved binary NS merger rate 7 to 81 mergers per year per cubic billion light-years

Images: **GW sky map** (left): initial (black contours) and final (red and orange with grey contours) regions where source is likely to be located. Darker shading indicates increased likelihood source is in that region of sky. **Component mass distribution** (right): darker shading indicates an increased likelihood the pair of stars had that set of masses. The blue and orange lines denote 90% confidence intervals for two different assumptions – NS spins are allowed to be large (blue) and NS spins are constrained to be small (orange). The black diagonal line is the line $m_1=m_2$.

GW=gravitational wave, NS=neutron star, M_{\odot} =1 solar mass= 2×10^{30} kg

Parameter ranges are 90% credible intervals.

*maximum likelihood estimate

**referenced to the time of merger

[†]90% credible region