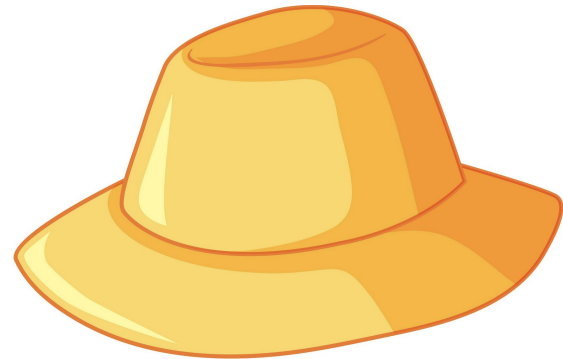




Overview of the LIGO-Virgo-KAGRA Collaboration

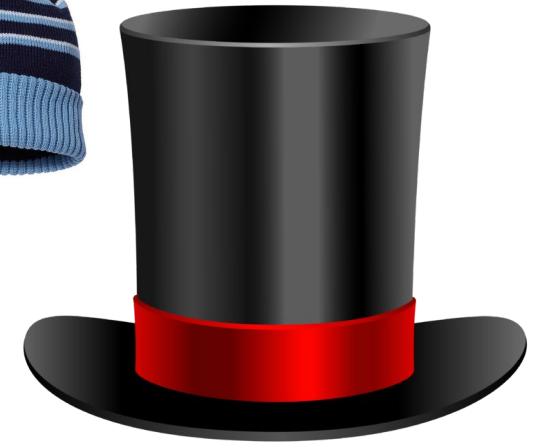


LSC Operations Division Chair

Jenne Driggers
Detection Lead Scientist
LIGO Hanford Observatory
California Institute of Technology



GWANW
25 June 2024

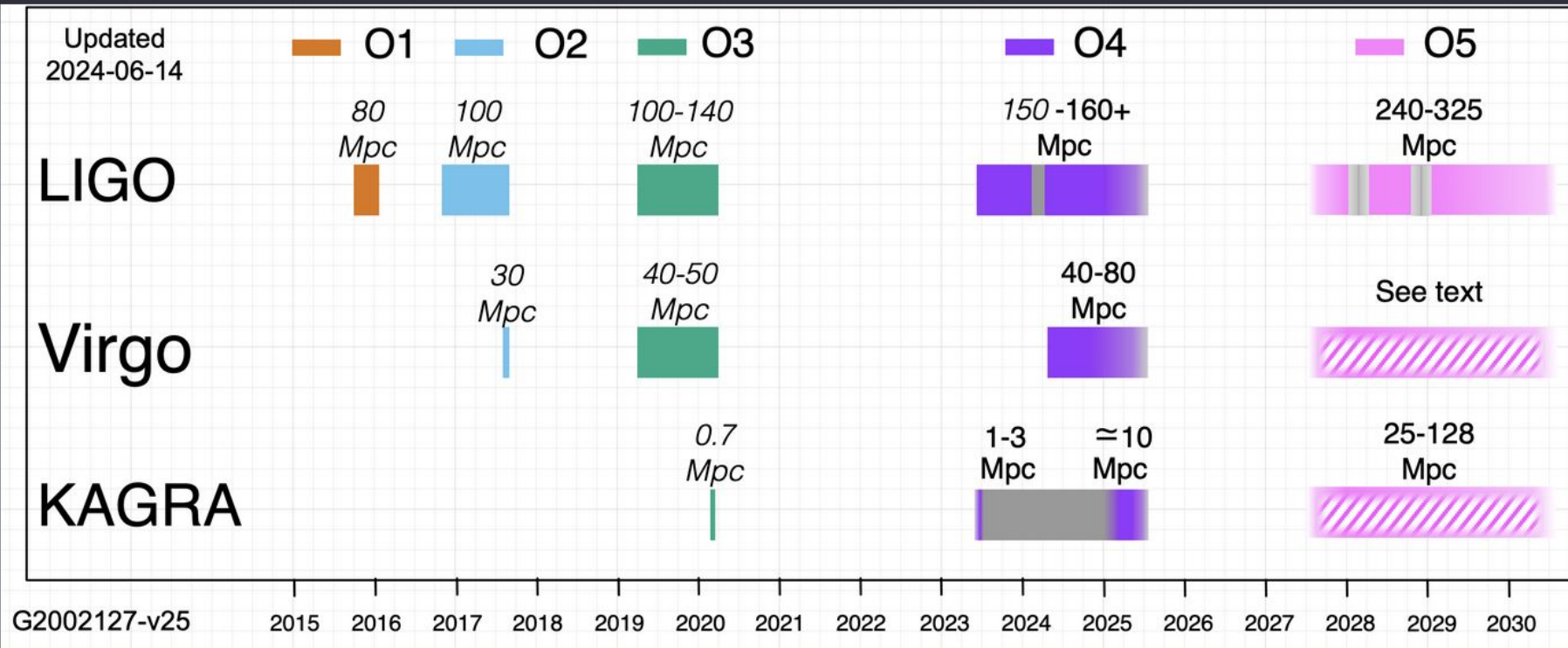


APS DGRAV Vice Chair

The LIGO-Virgo-KAGRA Collaboration is a collaboration of collaborations

- Each Collaboration brings an Observatory, and a large set of scientists who work on:
 - The gravitational wave detectors themselves
 - Advanced instrumental techniques to improve current and future versions of the detectors
 - Data analysis
 - Online / low latency (“right now!”)
 - Offline (more detailed look, but after more data has been gathered)
 - Rapid human response to Significant Candidates
 - Theoretical work to interpret the astrophysics that comes from our detections
 - Service to the Collaboration (eg “chair” a working group)
 - Communicating our science outside the collaboration
 - And more!



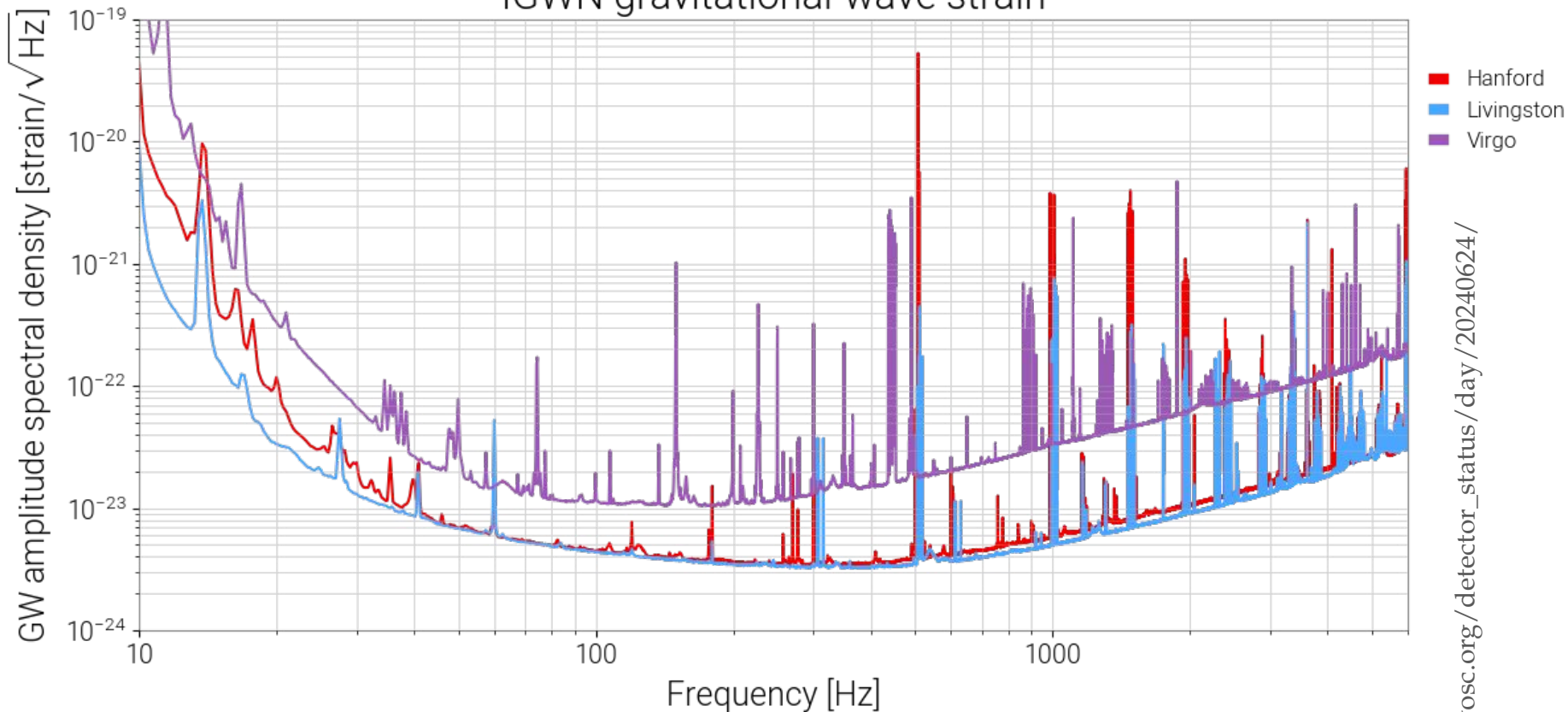


The O5 start dates, duration, and sensitivities are current best guesses, and will likely be adjusted as we approach that run for all the detectors (see text).

<https://observing.docs.ligo.org/plan/#>

[1403222418-1403308818, state: Observing]

IGWN gravitational-wave strain

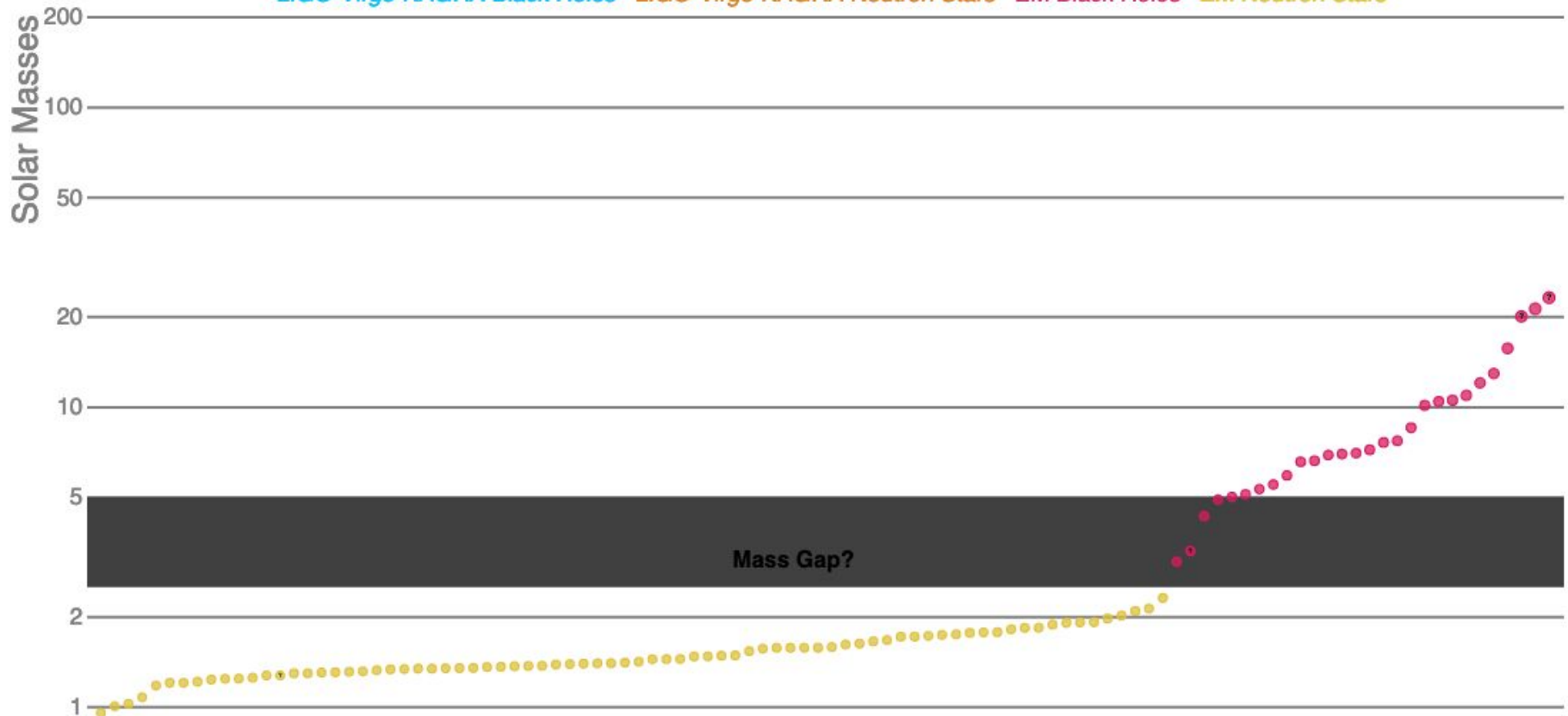


Sensitivity is impressive from all our detectors!

https://gwosc.org/detector_status/day/20240624/

Masses in the Stellar Graveyard

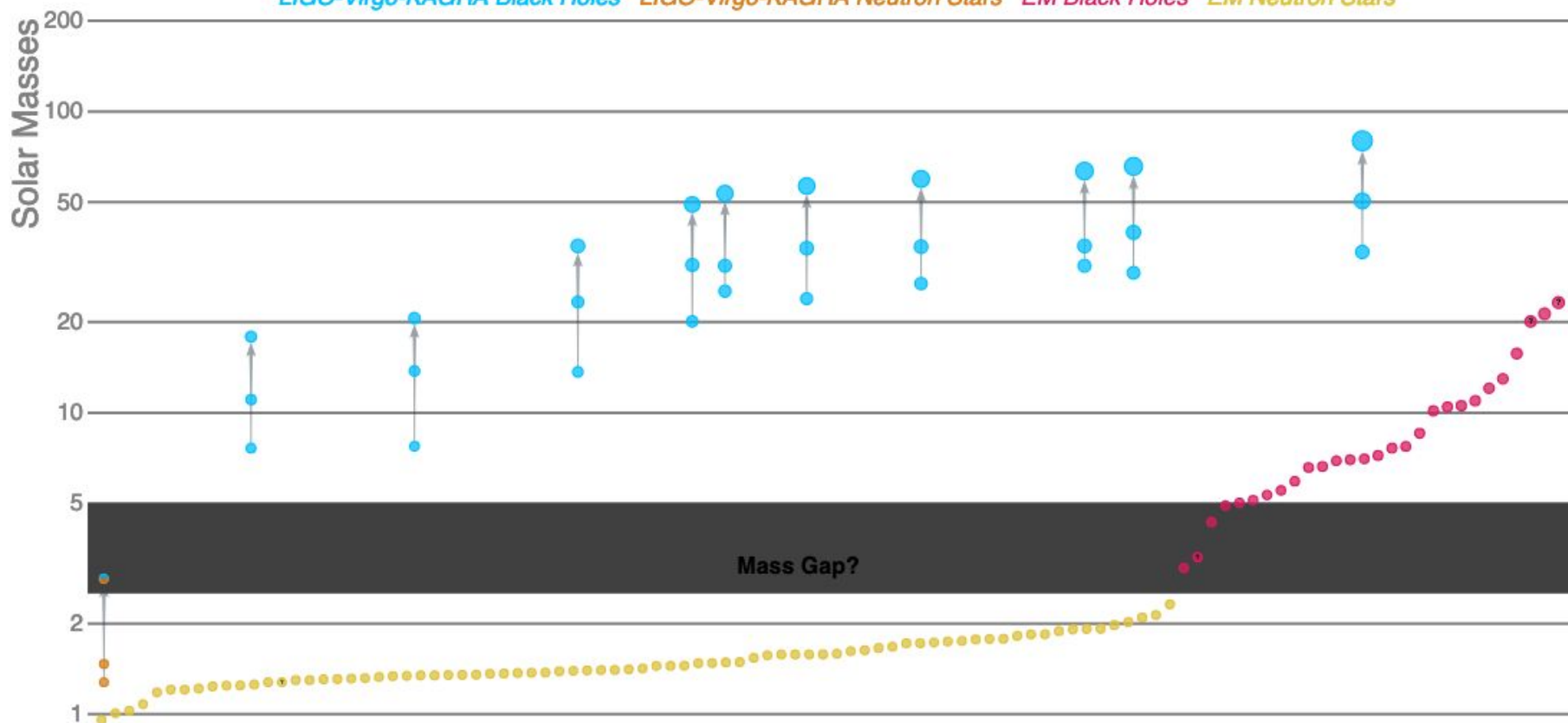
LIGO-Virgo-KAGRA Black Holes LIGO-Virgo-KAGRA Neutron Stars EM Black Holes EM Neutron Stars



LIGO-Virgo-KAGRA | Aaron Geller | Northwestern

Masses in the Stellar Graveyard

LIGO-Virgo-KAGRA Black Holes LIGO-Virgo-KAGRA Neutron Stars EM Black Holes EM Neutron Stars

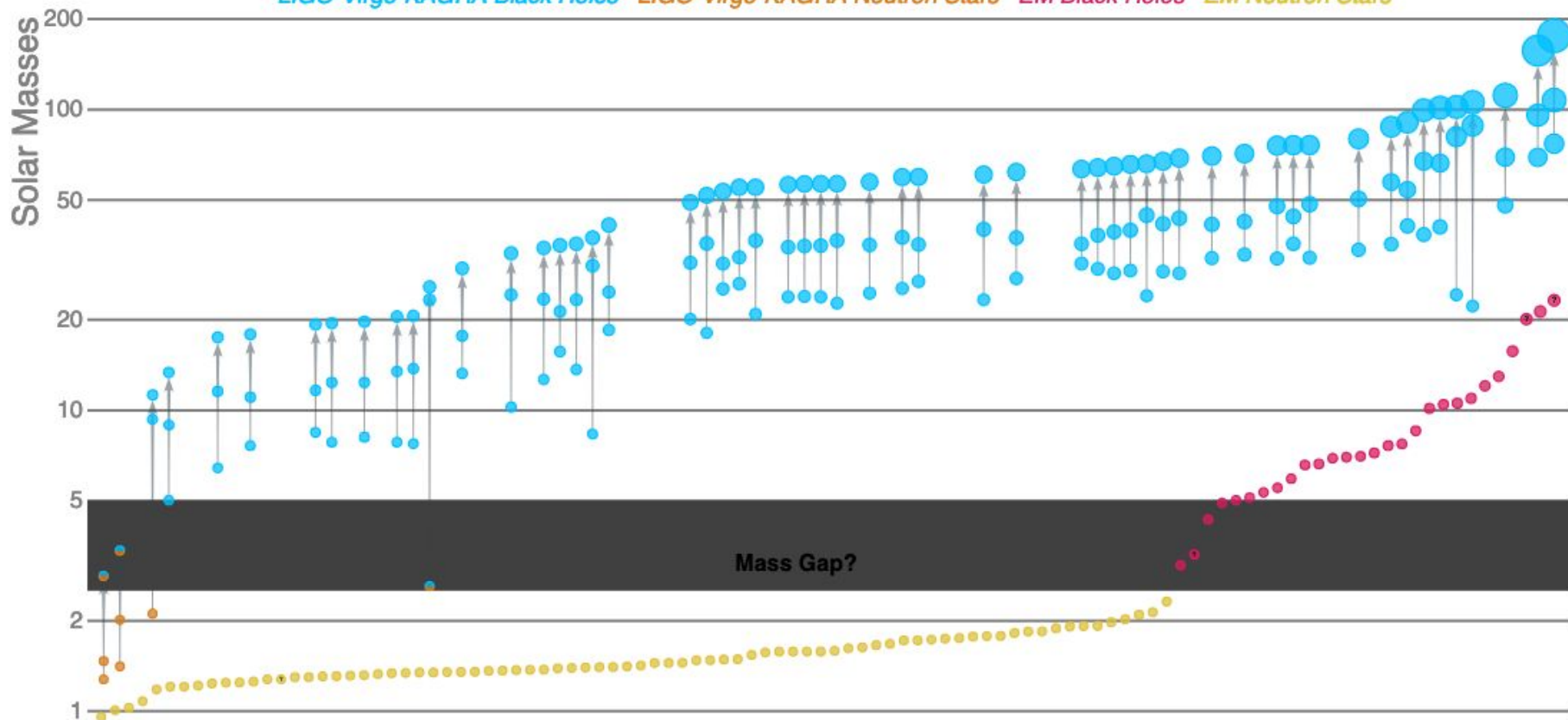


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GWTC-1 = O1, O2

Masses in the Stellar Graveyard

LIGO-Virgo-KAGRA Black Holes LIGO-Virgo-KAGRA Neutron Stars EM Black Holes EM Neutron Stars

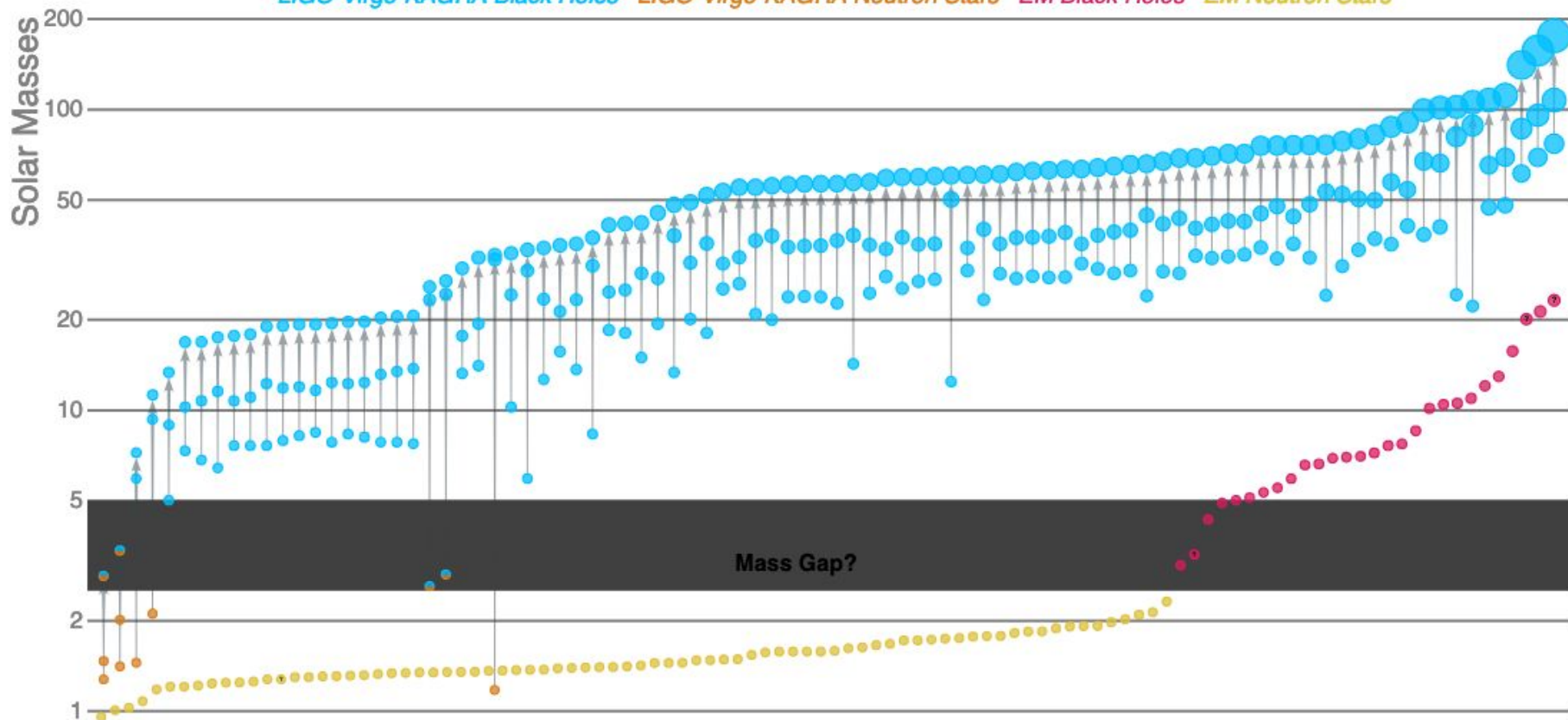


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GWTC-2.1 = O1, O2, O3a

Masses in the Stellar Graveyard

LIGO-Virgo-KAGRA Black Holes LIGO-Virgo-KAGRA Neutron Stars EM Black Holes EM Neutron Stars

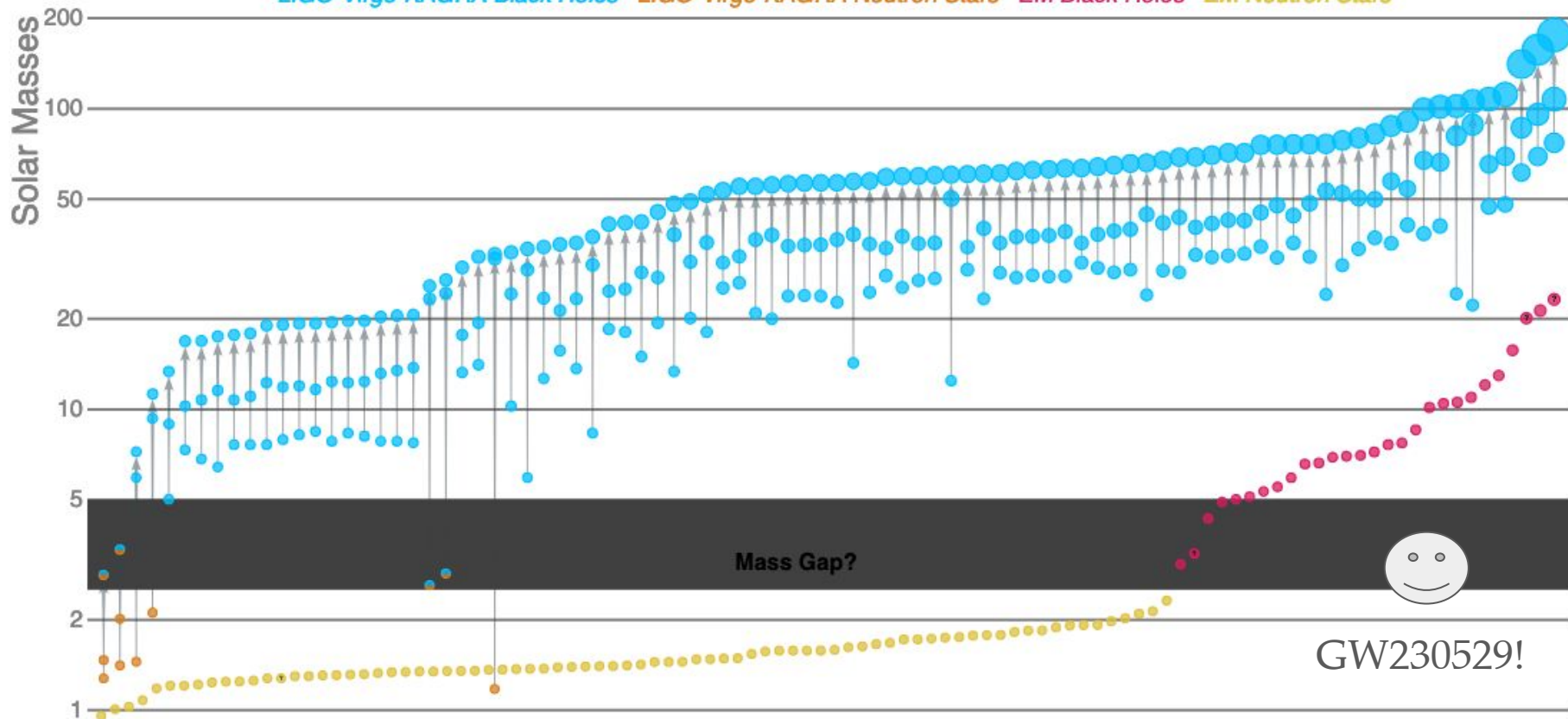


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GWTC-3 = O1, O2, O3a, O3b

Masses in the Stellar Graveyard

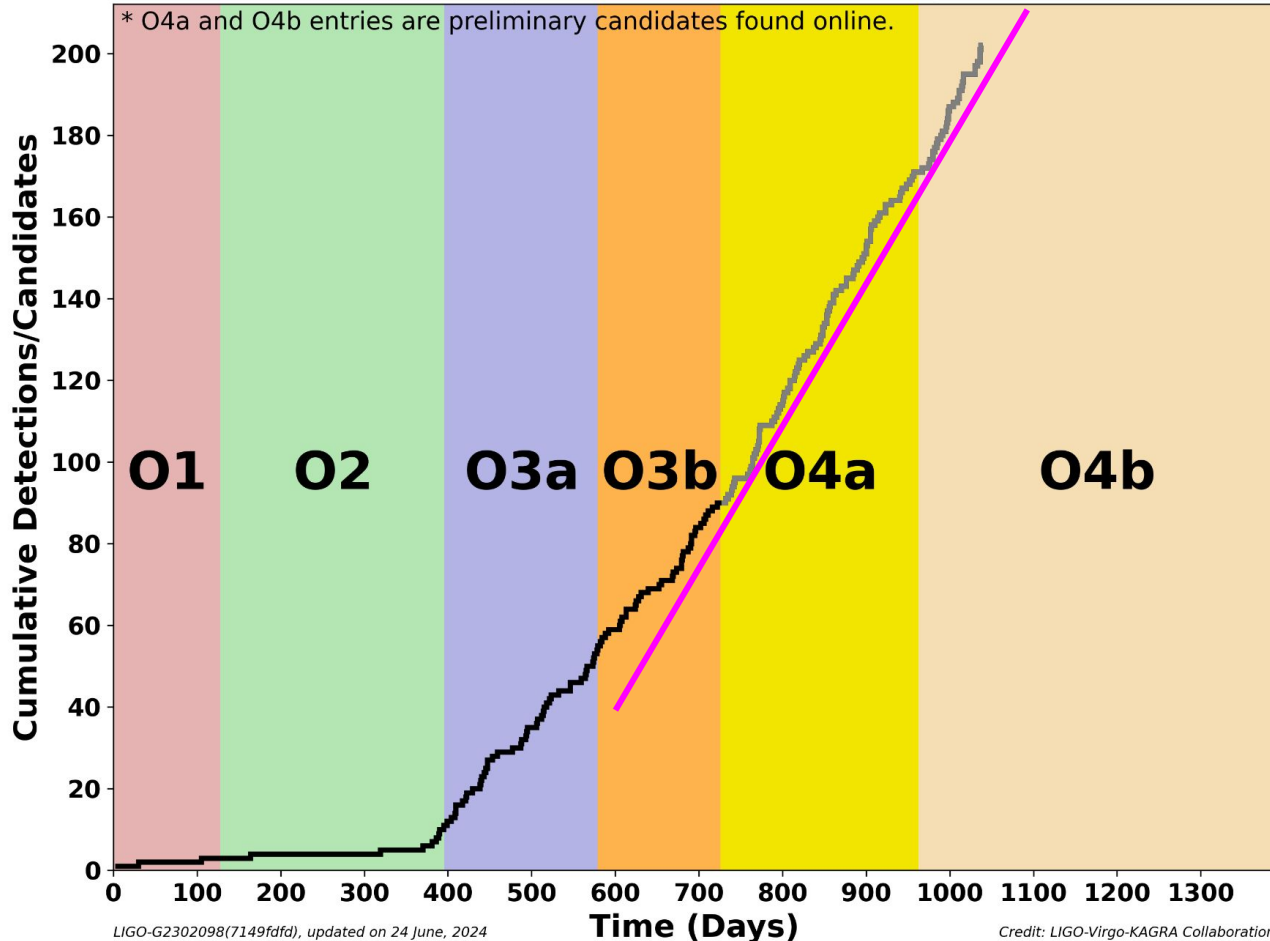
LIGO-Virgo-KAGRA Black Holes LIGO-Virgo-KAGRA Neutron Stars EM Black Holes EM Neutron Stars



LIGO-Virgo-KAGRA | Aaron Geller | Northwestern

GWTC-3 = O1, O2, O3a, O3b

O1+O2+O3 = 90, O4a* = 81, O4b* = 31, Total = 202



Always looking forward to more detections!

Excited about the potential to detect new types of gravitational wave sources, like continuous waves, or unmodeled bursts!

The best is the unknown!