

GW SIG Update

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Many thanks to: Patrick Brady, Francesca Civano, Brian Humensky,
Ira Thorpe, Sean McWilliams, Sarah Vigeland

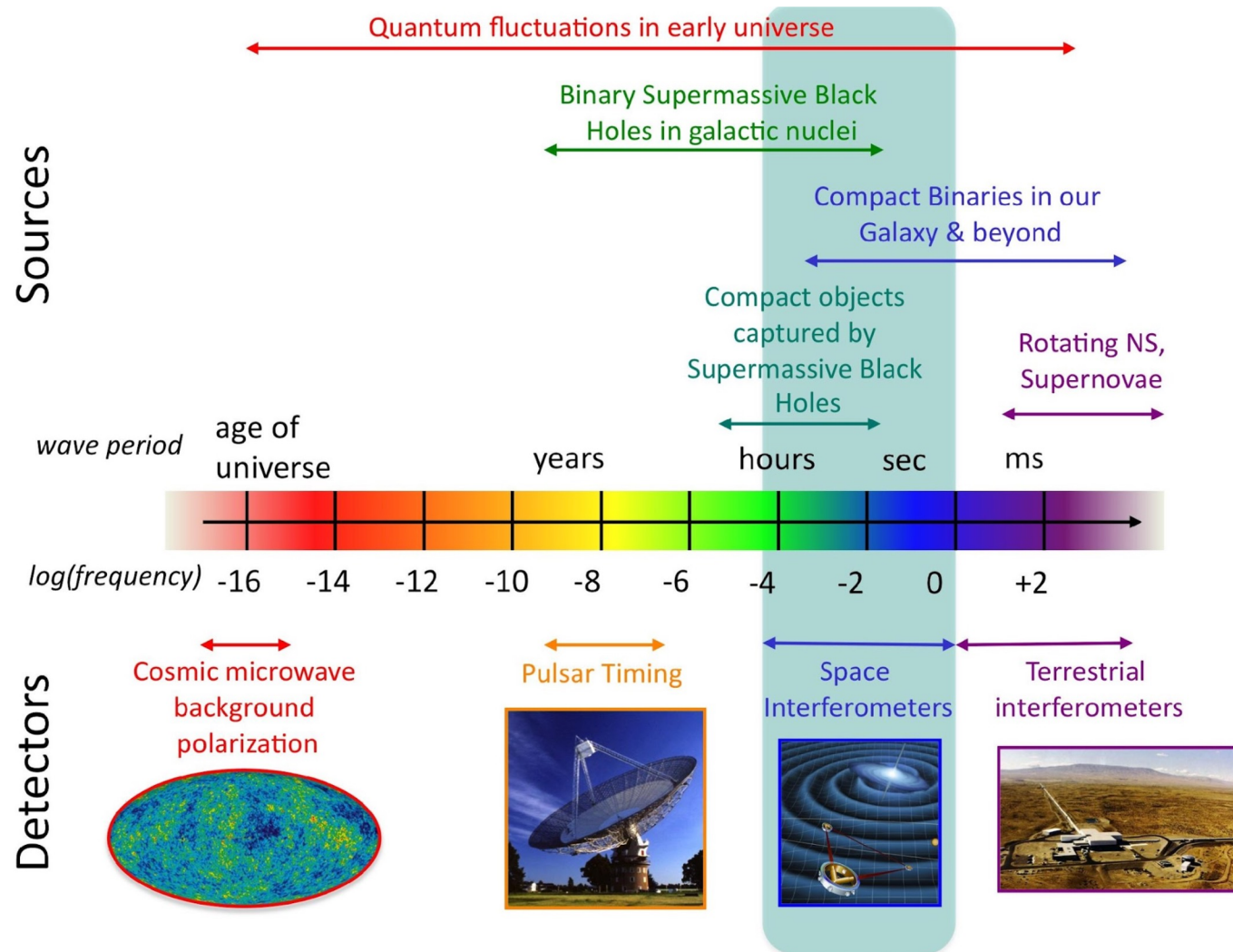
Gravitational Wave Science Interest Group (GWSIG)

<https://pcos.gsfc.nasa.gov/sigs/gwsig.php>

- **Track and analyze evolving science goals and requirements** for NASA GW missions.
- **Support mission studies and concept development** for space-based GW observatories, including when cost savings are sought, or new classes of sources are under consideration.
- **Aid efforts to analyze technology development and prioritization plans** as science goals and mission concepts evolve within the PhysPAG.
- **Advocate for the brand new field of GW astronomy**, build a vibrant community, and promote this new field to the public.



The vast GW spectrum: we have a lot to do!



To better represent a very large community across the GW spectrum, we are putting together an **advisory committee for the GW-SIG**, with one representative per GW frequency band, so we can offer regular updates on current and planned facilities and identify speakers for GW-SIG meetings.

GW-SIG plan going forward: We need YOUR help!

We would like GW-SIG regular meetings to focus on matters useful for the community.

Please answer the google form accessible via the QR code!

- Which topics would you like to be discussed during GW SIG meetings?
- Do you have any questions about NASA grants?
- Would you like to volunteer for a talk during the GW SIG telecons?
- Would you like to subscribe to the GW SIG mailing list?



Laser Interferometer Space Antenna Update

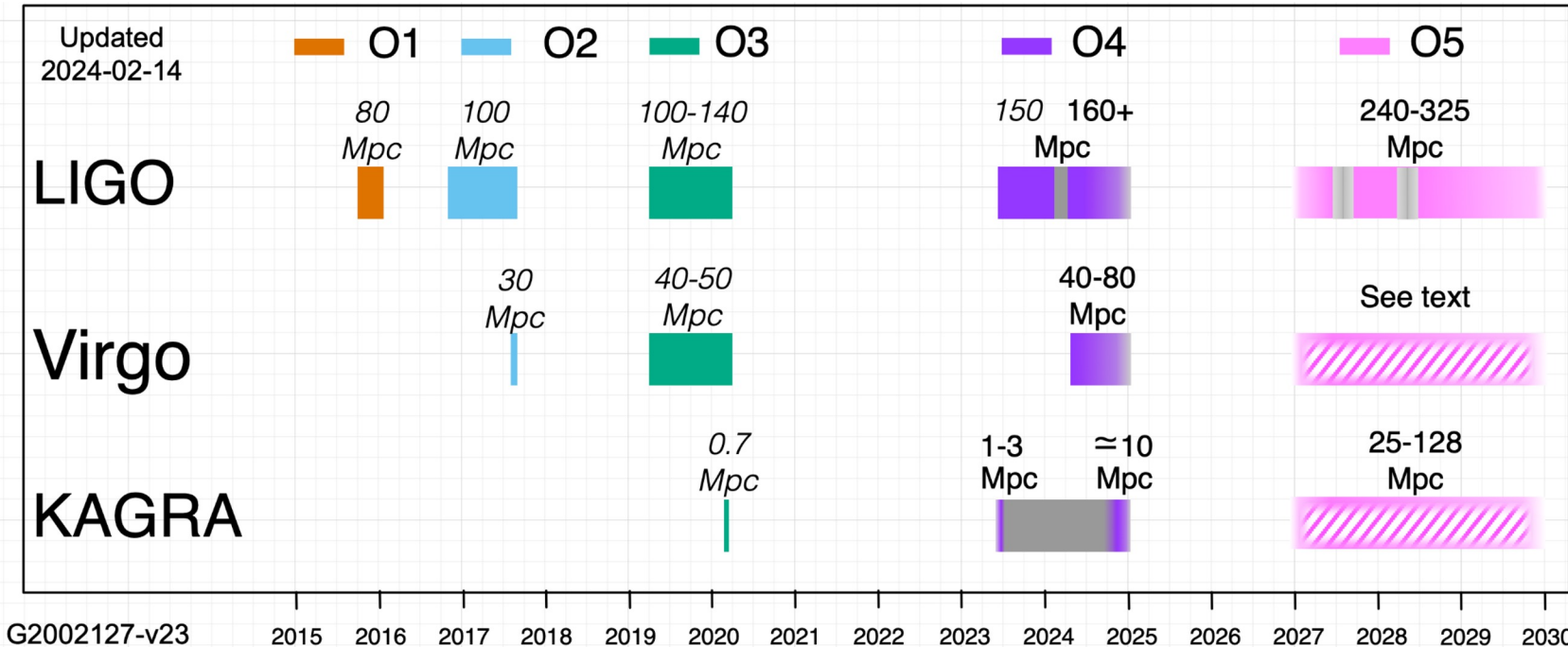
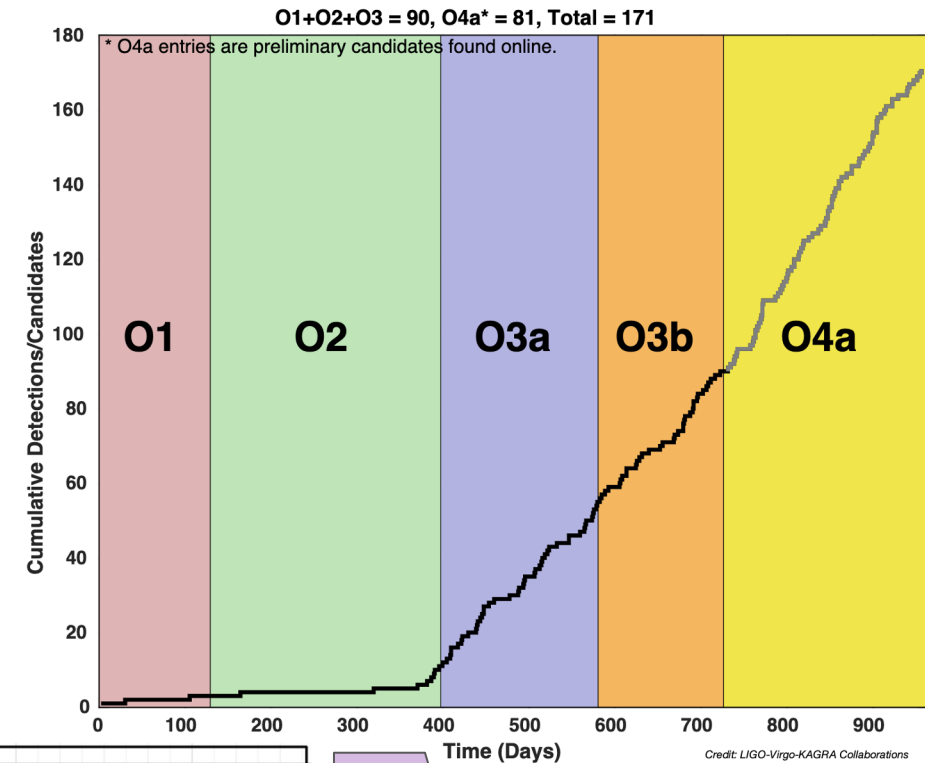
- **LISA has been promoted to a flight project by ESA**
 - “Mission Adoption” milestone [passed in January 2024](#)
 - Science case, mission concept, hardware, etc. described in [Definition Study Report](#)
- **ESA, NASA, & other partners working to implement LISA**
 - Issue contracts, build and test flight hardware
 - Develop ground segment and analysis pipelines
 - Launch targeted for 2035
- **LISA will feature open science & public data**
 - “Early release science phase” for first 12mo of science operations
 - First public data release at 12mo
 - Public releases at 6mo intervals afterwards
- **Opportunities to get involved**
 - US reps to LISA Science Team ([applications due Apr. 15th](#))
 - [LISA Symposium](#), July 7-12, Dublin
 - [LISA Preparatory Science](#) research grants (Due March 2025)



Status update

- O4a: 24 May 2023 to 16 Jan 2024. LIGO detectors only.
- **O4b: 10 April 2024** to Feb 2025 (after 2 months maintenance)
- Binary detection rates: O3 ~ 1 / 5 days & O4 ~ 1 / (2.8 days)
- Hear more about O4 in [APR24/Session/M09!](#)

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



Anticipate observing into the 2030s

NANOGrav Update – Sarah Vigeland

Release of 15-year data set in June 2023:

- **Gravitational wave background (GWB)**
 - GWB search found evidence for Hellings-Downs correlations (*leads: S. Vigeland and S. Taylor*)
 - GWB signal interpreted in the context of supermassive binary black holes (*lead: L. Kelley*) and new physics (*leads: A. Mitridate and K. Schmitz*)
 - Constraints on the degree of anisotropy of the GWB (*lead: N. Pol*)
 - Search for non-Einsteinian polarizations (*lead: D. DeGan*)
- **CW search found no evidence for an individual supermassive binary black hole (*leads: B. Becsy and N. Cornish*)**

NANOGrav Update – Sarah Vigeland

- **Upcoming GW searches of the 15-year data set:**
 - *GWB posterior predictive checking (leads: P.M. Meyers, M. Vallisneri, K. Chatziioannou); GWB search with advanced noise modeling (leads: B. Larsen, J. Baier, J. Hazboun, C. Mingarelli, J. Simon); GWB harmonic analysis (leads: J. Nay, K. Boddy, T. Smith, C. Mingarelli)*
 - *Targeted CW search (leads: L. Willson, C. Mingarelli, S. Burke-Spolaor, N. Aggarwal)*
 - *Burst with memory search (leads: R. Burnette, J. Sun)*
- **Work underway combining NANOGrav 15-year data set with data from EPTA, InPTA, PPTA, and MeerTime to create IPTA DR3**
- **Work is beginning on the next NANOGrav data set (NG19*)**

* Name and length is still to be determined

The GW SIG is open to all members of the community!

If you are interested in contributing to the work of the GW SIG, please subscribe:

- **SUBSCRIBE** :) Send an email to GWSAG-join@lists.nasa.gov with Subject="join"
- **UNSUBSCRIBE** :(Send an email to GWSAG-leave@lists.nasa.gov with Subject="leave"
- **CONTACT THE LIST OWNER:** Send email to GWSAG-owner@lists.nasa.gov
- **OTHER INQUIRIES:** e-mail co-chairs alessandra.corsi@ttu.edu & chiara.mingarelli@yale.edu

NOTE: To maintain uninterrupted communications, the GWSIG mailing list remains under the GWSAG name.

Please encourage potentially interested colleagues and students to sign up!

