



GWSIG Overview

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American Astronomical Society
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GWSIG Membership and Plans

- Many thanks to Kelly Holley-Bockelmann for her years of service!
- New co-chairs Sean McWilliams (me) and Jillian Bellovary join Nico Yunes (Dec 2019 – Dec 2022) and PCOS Chair Emeritus John Conklin
- Four GWSIG co-chairs sets a record high for any SIG within the PhysPAG EC!
- Next up: GWSIG session at April 2020 APS, organized by Nico Yunes

Physics of the Cosmos Science Objectives

- Increase our knowledge of dark energy
- Precisely measure cosmological parameters governing evolution of the universe and test inflation hypothesis of Big Bang
- Test validity of Einstein's General Theory of Relativity and investigate nature of spacetime
- Understand formation and growth of massive black holes and their role in evolution of galaxies
- Explore behavior of matter and energy in its most extreme environments

Communicating with NASA Astrophysics via the Program Analysis Groups (PAGs)

- The Physics of the Cosmos Program Analysis Group (PhysPAG) coordinates input and analysis from the scientific community in support of the PCOS program objectives.
- Study Analysis Groups (SAGs) conduct specific analyses. PCOS started a SAG on Multi Messenger Astrophysics (MMASAG)
- Science Interest Groups (SIGs) are longer-standing discipline fora.
 - **GWSIG**, IPSIG, XRSIG, GRSIG, CRSIG, CoSSIG

Science Mission
Directorate

Astrophysics Science
Division

Exoplanets

Physics of the
Cosmos

Cosmic Origins

SIGs, SAGs

SIGs, SAGs

SIGs, SAGs

GWSIG: More than “Just” LISA

- Keep Abreast of Broader GW Landscape
 - Ground-based beyond Advanced LIGO/Virgo
 - NANOGrav, SKA
- Alternative Technologies
 - E.g. Atom Interferometry
- Future missions beyond LISA
 - Heliocentric *a la* Folkner (2012)
 - Geocentric *a la* GADFLI/GEOGRAWI (2012), TianQin

GWSIG Updates

- Helped organize the community regarding 3 APC white papers for Astro2020:
 - LISA mission APC, building the WG field, GW Astronomy Beyond LISA
- Helped organize the community regarding four Voyage2050 white papers
 - Improved sensitivity in LISA band, Low frequencies, Mid-band frequencies, Improved sky localization
- Continued interactions with the LISA Consortium regarding development of LISA
- Organized this GWSIG session!

GWSIG Session Agenda

- 10 min: GWSIG overview – Sean McWilliams
- 20 min: LISA mission update – Terry Doiron
- 20 min: Multimessenger Signatures of Intermediate Mass Black Holes – Jillian Bellovary
- 20 min: Waveform modeling to meet the needs of LISA and beyond – Sean McWilliams
- 20 min: NASA LISA Study Team update – Kelly Holley-Bockelmann