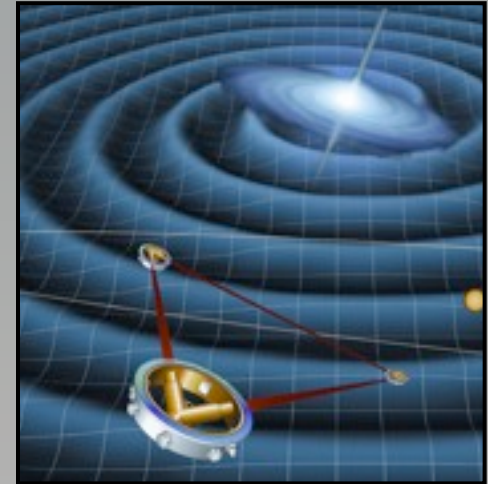
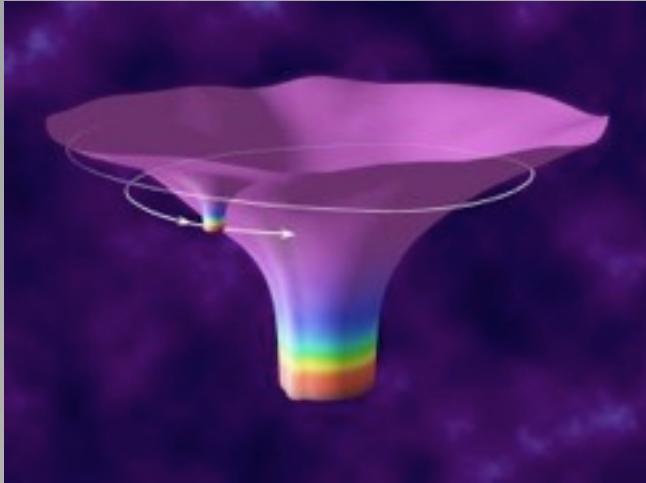


Gravitational Wave Science Analysis Group GW-SAG



**Inaugural meeting
Washington, DC
August 14-15, 2012**

PCOS within NASA

Physics of the Cosmos (PCOS) Program

<http://pcos.gsfc.nasa.gov/>

- intersection of physics and astronomy
 - General relativity and spacetime
 - Cosmology
 - Dark matter and dark energy
- Operating missions
 - X-ray: Chandra, XMM-Newton
 - Gamma-ray: Fermi
 - μ -wave background: Planck
- Related missions:
 - Suzaku, Swift, RXTE, WMAP



Chandra



Fermi

PCOS within NASA

Science covered by PCOS

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

A space-based Gravitational wave Observatory addresses several if not all of these bullets.

This is our home!

PCOS within NASA

Program Office:

- Program Manager: [Mansoor Ahmed](#)
- Deputy Program Manager: [Thomas Griffin](#)
- Chief Scientist: [Ann Hornschemeier](#)
- Deputy Chief Scientist: [Alan Smale](#)
- Chief Technologist: [Mark Clampin](#)
- ACTO Chief Technologist: [Thai Pham](#)
- Business Manager: [Vince Elliott](#)
- Advanced Mission Concepts Manager: [Jackie Townsend](#)
- HQ Program Executive: [Jaya Bajpayee](#)
- HQ Program Scientist: [Rita Sambruna](#)

PhysPAG within PCOS

PCOS Program Analysis Group (PhysPAG)

- **Forum for** soliciting and coordinating **input and analysis** from the scientific community
 - enables direct and regular communication through public meetings
- **Open:** All interested scientists can contribute to the PhysPAG by participating in the PhysPAG meetings and by providing their input.
 - The **Executive Committee (EC)** is appointed by NASA with the concurrence of the [Astrophysics Subcommittee](#) (APS)
 - Collect and summarize community input with subsequent reporting to NASA SMD via the [NAC](#) (NASA Advisory Council).

PhysPAG within PCOS

PhysPAG: Executive Committee (EC)

Steve Ritz (Chair) - University of California, Santa Cruz

Jason Rhodes - Jet Propulsion Laboratory - WFIRST

Shaul Hanany - University of Minnesota - Inflation Probe

Jay Bookbinder - Harvard-Smithsonian Center for Astrophysics - X-ray

Liz Hays - NASA Goddard Space Flight Center - Gamma Ray

Guido Mueller - University of Florida - GW

Rita Sambruna (Executive Secretary, Ex-Officio) - NASA HQ

Ann Hornschemeier (PCOS Program Office, Ex-Officio) - NASA GSFC

- Many disciplines are represented in the EC
 - Most disciplines have a study (or science) analysis group
- The PhysPAG is **NOT** a group that will advocate for a specific GW-mission or any other specific mission

GW-SAG within PhysPAG/PCOS/NASA

The goal of the Gravitational Wave Science Analysis Group (GWSAG) is to provide quantitative metrics and assessments to NASA in regard to a future Gravitational Wave mission. Specifically, the GWSAG will

- **Track and analyze evolving science goals and requirements**, especially as our understanding of three standard sources of gravitational waves (SMBH, EMRI, GB) continues to improve.
- **Support mission studies and concept development** for future space-based gravitational wave observatories, including where cost savings are sought and/or new classes of sources are to be considered (e.g., stochastic GW background from the Big Bang).
- **Analyze technology development and prioritization plans** with respect to redefined science goals and the evolution of mission concepts (i.e., the GWSAG will aid the PhysPAG in analyzing technology needs).
- **Advocate for gravitational wave astrophysics and astronomy** and explain the importance of this new field to the wider scientific community and also to the public.

The GWSAG is open to all members of the community ... and has a mailing list

Subscribe at: GWSAG-subscribe@lists.nasa.gov 

GW-SAG within PhysPAG/PCOS/NASA

These are the task, but

- How do we fit into the bigger picture?
- How do we organize this?
- What are the concrete plans/tasks?
- Where does the information go?

The bigger picture

Former LISA organization:

- LISA International Science Team (LIST)
 - 10 Europeans Scientists
 - 10 US Scientists
 - Science Case for LISA
 - Provided a forum for LISA Science and Technology
- LISA Project Office(s)
 - ESA/ESTEC
 - GSFC, JPL (+ University affiliates)

A happy family until early last year ...

The bigger picture

What exists?

- 10 Europeans Scientists ⇔ European Consortium (EC)
- European Project Office ⇔ No official GW activity at ESA
 - Still have Pathfinder + Scientists (O.J.) in Astrophys. div.
 - Technology development shifts more to national agencies (via EC)
- US Project Office ⇔ US GW-Core Team
 - Technology development planing and (in part) execution

My view:

- GW-SAG
 1. US Counterpart of the scientific part of the EC
 2. Provides community input and outside expertise for Technology development plans
 - Includes or partner of the US GW-Core Team

Compare with the goals of GW SAG

- GW-SAG

1. US Counterpart of the scientific part of the EC
2. Provides community input and outside expertise for Technology development plans

covers

- **Track and analyze evolving science goals and requirements**, especially as our understanding of three standard sources of gravitational waves (SMBH, EMRI, GB) continues to improve.
- **Support mission studies and concept development** for future space-based gravitational wave observatories, including where cost savings are sought and/or new classes of sources are to be considered (e.g., stochastic GW background from the Big Bang).
- **Analyze technology development and prioritization plans** with respect to redefined science goals and the evolution of mission concepts (i.e., the GWSAG will aid the PhysPAG in analyzing technology needs).

How do we organize this?

Currently have two weekly telecons in US:

1. Former project telecon incl. our former European partners
2. US Core Team to discuss technology (US only)

My suggestion:

- GW SAG members can join them
 - to stay up to date on current developments and future events
- Organize additional telecons/web meetings as needed

PCOS office organized mailing list and offered to support a wiki page.

How do we organize this?

We probably need three subgroups

- Science (Lead: Neil Cornish)
- Technology (Lead: GM for now)
- Advocacy (Lead: ??)

Leads will activate/organize subgroup for specific tasks/events

Examples:

- Calculate detection rates and parameter for new mission design
(Science group)
- Develop technology plan, prioritize technologies, evaluate new ideas
(Technology)
- Organize/Coordinate activities at meetings (Advocacy)

How do we organize this?

Some other activities:

- Push for invited talks and dedicated sessions at APS, AAS, HEAD, COSPAR, MG and other meetings and conferences
- Replace the LIST in the organization of the LISA Symposium
 - Most of that work is done by local host
 - next June/July @ UF
 - Program or Scientific Advisory Boards
 - LIST: WG chairs did organize parallel sessions
 - Selecting next host