



## PCOS Structure

**NASA HQ:** Provides programmatic direction and overall guidance to the Program and Project Offices; administers the PCOS budget; solicits and manages calls for technology development, and makes strategic decisions on technology support and implementation; works with the PCOS Chief Scientist to identify, develop, and implement PCOS science goals; oversees the science and technology content of the program ensuring it remains faithful to its mission statement.

Program Director: Andrea Razzaghi  
Program Executive: Lia LaPiana  
Program Scientist: Rita Sambruna  
Deputy Program Scientist: Wilt Sanders

**Program Office at GSFC:** Reports directly to the Program Director and provides risk-based insight/oversight of the projects during all phases; interfaces with science community; facilitates future mission development; conducts advanced mission concept studies; supports research; identifies and develops enabling technologies; facilitates international partnerships; supports education and public outreach. Interacts on a day-by-day basis with HQ through the Program Executive and Program Scientist.

Program Manager: Mansoor Ahmed  
Deputy Program Manager: Tom Griffin  
Program Chief Scientist: Ann Hornschemeier  
Program Chief Technologist: Bernard Seery  
Technology Development Manager: Thai Pham

## Upcoming Events

### PhysPAG Meetings

American Astronomical Society Meeting, Seattle, WA  
Sunday, January 4, 2015

PAG Plenary 12:30–2:00 PM in Room 6B  
(Discussion with PhysPAG, COPAG, ExoPAG,  
and Paul Hertz)

PhysPAG Town Hall 2:00–6:00 PM Room 6C  
<http://pcos.gsfc.nasa.gov/physpag/>

### Special Talk Session

**2015: Centennial of GR**

American Astronomical Society Meeting, Seattle, WA  
Monday, January 5, 2015

Co-hosted with HEAD, Room 610 (10 AM and 2 PM)

### PAG Talk Session

**(PhysPAG, ExoPAG, COPAG Chairs)**

American Astronomical Society Meeting, Seattle, WA  
Wednesday, January 7, 2015, 10 AM, Room 606

### SIG Meetings

- AAS Meeting, Seattle, WA, January 4–8, 2015
  - GammaSIG, Sunday, January 4, 9 AM–12 PM, Room 6B
  - XRSIG, Sunday, January 4, 9 AM–12 PM, Room 6C
  - CMB Workshop (IPSIG discussion planned)  
Minneapolis, MN, January 14–16, 2015
  - GWSIG Meeting, at LIGO-Virgo Collaboration Meeting  
Pasadena, CA, February 2015, TBC

## Physics of the Cosmos (PCOS) Program

### How does the Universe work?

The Physics of the Cosmos (PCOS) Program addresses questions about the origin and evolution of the Universe, the conditions of matter in extreme environments, and the nature of dark energy and dark matter. PCOS supports a vibrant program in both observational and theoretical research, and technology development for future missions.

The PCOS Program Analysis Group (PhysPAG) provides input to the program and includes all interested members of the community. Visit <http://pcos.gsfc.nasa.gov/> or <http://pcos.gsfc.nasa.gov/physpag/> for more information.



## Science Themes:

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The Physics of the Cosmos (PCOS) program incorporates cosmology, high-energy astrophysics, and fundamental physics projects aimed at addressing central questions about the nature of complex astrophysical phenomena such as black holes, neutron stars, dark energy, dark matter, and gravitational waves. The ultimate quest is to understand how the Universe works, from the very small to the very large scales.

PCOS maps directly into one of the three Science Objectives identified by the Decadal 2010 report, Physics of the Universe: Understanding Scientific Principles.

### PCOS science objectives are to:

- Test the validity of Einstein's Theory of Relativity and investigate the nature of spacetime
- Explore the behavior of matter and energy in its most extreme environments
- Expand our knowledge of dark energy
- Precisely measure the cosmological parameters governing the evolution of the Universe
- Test the inflation hypothesis of the Big Bang
- Uncover the connection between galaxies and supermassive black holes

## The Einstein Fellowship

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PCOS supports research investigations—theoretical, observational, and instrumental—in science areas closely related to the program themes through Fellowships to young scientists—three years or less after the Ph.D. date.

Scientists apply from institutions worldwide to work in U.S.-based institutions. About 10–15 Fellows are peer-selected each year for a Fellowship tenure of three years each.

See <http://cxc.harvard.edu/fellows/> for details. Einstein Fellowship Program Coordinator: Andrea Prestwich, Chandra X-ray Center

## How to get involved:

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- Program Analysis Groups (PAGs) provide community input to NASA via proper channels.
- PAGs include ALL interested scientists and technologists from the broad community. Everyone is invited to participate in the PAGs' yearly meetings and to contribute to the discussion.
- PAGs conduct trade studies via their Science Interest Groups. These are used as guidelines by NASA to plan for future investments. Your input matters to NASA!
- PCOS PAG: PhysPAG [pcos.gsfc.nasa.gov/physpag/](http://pcos.gsfc.nasa.gov/physpag/)  
Cosmic Origin PAG: COPAG [cor.gsfc.nasa.gov/copag/](http://cor.gsfc.nasa.gov/copag/)  
Exoplanet PAG: ExoPAG [exep.jpl.nasa.gov/exopag/](http://exep.jpl.nasa.gov/exopag/)

## PhysPAG:

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### Executive Committee

Coordinates the PhysPAG activities; organizes annual meetings; coalesces input from Science Interest Groups (SIGs) to be transmitted to NASA via the NASA Advisory Committee (NAC) Astrophysics subcommittee.

- James Bock (Caltech/JPL), Chair
- John Nousek (PSU), Past Chair
- Mark Bautz (MIT)
- Rachel Bean (Cornell)
- Jay Bookbinder (CfA)
- John Conklin (University of Florida)
- Neil Cornish (Montana State University)
- Olivier Doré (JPL)
- Henry Krawczynski (Washington University in St. Louis)
- Mark McConnell (University of New Hampshire)
- Amber Miller (Columbia University)
- Angela Olinto (University of Chicago)
- Eun-Suk Seo (University of Maryland)
- Edward Wollack (NASA/GSFC)

### PhysPAG Science Interest Groups (SIGs):

**Inflation Probe** (Lead: Jamie Bock): Coordinate community activities and preparations for a future cosmic microwave background polarization mission.

**Gravitational Waves** (Lead: Neal Cornish): Coordinate community activities and preparations for a future gravitational wave mission.

**X-rays** (Lead: Jay Bookbinder): Coordinate community activities and preparations for a future X-ray astronomy mission.

**Gamma Rays** (Lead: Mark McConnell): Coordinate community activities and preparations for a future gamma ray astronomy mission.

**Cosmic Rays** (Lead: Angela Olinto): Coordinate community activities and preparations for a future cosmic ray astronomy mission.