



## 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: Shahid Habib  
Program Scientist: Rita Sambruna  
Deputy Program Scientist: Daniel Evans

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 Deputy Chief Scientist: Peter Bertone  
Program Chief Technologist: Bernard Seery  
Technology Development Manager: Thai Pham

## Upcoming Events

### American Astronomical Society

High Energy Astrophysics Division  
HEAD Fifteenth Divisional Meeting  
April 3–7, 2016  
Naples, FL

- PCOS Townhall, Tuesday, April 5th, 12:30 P.M. In Room Royal Palms 5
- GammaSIG Meeting, Monday, April 4th, 7:00 P.M.–10:00 P.M. In Royal Palms 1
- XRSIG Meeting, Tuesday, April 5th, 7:00 P.M.–10:00 P.M. In Royal Palms 1

### American Physical Society

APS April Meeting 2016  
April 16–19, 2016  
Salt Lake City, UT

- PCOS Mini-Symposium  
Session H11 on Sunday @ 8:30AM, Room 250C
- IPSIG Special Session  
Session J11 on Sunday @ 10:45AM, Room 250C
- GWSIG Special Session  
Session J12 on Sunday @ 10:45AM, Room 250DE
- Cosmic Ray SIG Special Session  
Session J13 on Sunday @ 10:45AM, Room 250F

### Einstein Fellows Symposium

Harvard-Smithsonian Center for Astrophysics  
October 2016  
Cambridge, MA

## 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 early-career 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 analysis findings 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)
- Mark Bautz (MIT) (Vice Chair)
- Rachel Bean (Cornell)
- Jay Bookbinder (CfA)
- John Conklin (University of Florida)
- Neil Cornish (Montana State University),
- Olivier Doré (JPL)
- Henric Krawczynski (Washington University, St. Louis)
- Mark McConnell (University of New Hampshire)
- Amber Miller (Columbia)
- John Nousek (Penn State University)
- Angela Olinto (University of Chicago)
- Eun-Suk Seo (University of Maryland)
- Edward Wollack (NASA Goddard Space Flight Center)

### PhysPAG Science Interest Groups (SIGs):

**Inflation Probe** (Leads: Amber Miller, Edward Wollack): Coordinate community activities and preparations for a future cosmic microwave background polarization mission.

**Gravitational Waves** (Leads: John Conklin, Neil 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: Eun-Suk Seo): Coordinate community activities and preparations for a future cosmic ray astronomy mission.

**Cosmic Structure** (Leads: Rachel Bean and Olivier Doré): Coordinate community activities and preparations for missions related to understanding the nature of dark energy, dark matter and large scale structure of the Universe.