

PHYSICS OF THE COSMOS  
PROGRAM ANALYSIS GROUP (PhysPAG)

TERMS OF REFERENCE

The PhysPAG serves as a community-based, interdisciplinary forum for soliciting and coordinating community analysis and input in support of Physics of the Cosmos objectives and of their implications for architecture planning and activity prioritization and for future exploration. It provides findings of analyses to the NASA Astrophysics Division Director.

The strategic goal of NASA's Physics of the Cosmos (PCOS) Program is to probe the origin and destiny of our universe, including the nature of black holes, dark energy, dark matter, and gravity. The objective of the Program is to explore fundamental questions regarding the physical forces and laws of the universe including the nature of spacetime, the behavior of matter and energy in extreme environments, the cosmological parameters governing inflation and the evolution of the universe, and the nature of dark matter and dark energy

The PhysPAG enables direct regular communication between NASA and the community, and within the community, through public meetings that give the community opportunities to provide its scientific and programmatic input. Structurally, the PhysPAG Chair and the PhysPAG Executive Committee (EC) are appointed members whose responsibilities include organizing meetings and collecting and summarizing community input with subsequent reporting to the Astrophysics Division Director. The full PhysPAG consists of all members of the community who participate in these open meetings.

The PhysPAG may be tasked, as described below, to carry out the following:

- Articulate and prioritize the key scientific drivers for Physics of the Cosmos research ;
- Evaluate the expected capabilities of potential PCOS missions for achieving the science goals of the Program ;
- Evaluate PCOS goals, objectives , investigations and required measurements on the basis of the widest possible community outreach;
- Articulate and prioritize focus areas for needed mission technologies ; and
- Provide findings on related activities such as ground-based observing, theory and modeling programs, laboratory astrophysics, suborbital investigations, data archiving and community engagement.

MEMBERSHIP

The Chair of the PhysPAG is drawn from the U.S. astrophysics community and is appointed by the Astrophysics Division Director following consultation with the Associate Administrator (AA) for the Science Mission Directorate (SMD). The Chair is assisted by an Astrophysics Division staff member who serves as Executive Secretary and is a single point of contact within NASA, and the Executive Committee, which supports planning and conducting activities of the PhysPAG. The PhysPAG Executive Secretary is appointed by the Astrophysics Division Director. Nominations for the PhysPAG executive committee are solicited through an open "Dear Colleague" letter to the community, and appointments are made by the Astrophysics

Division Director following consultation with the PhysPAG Chair, the PCOS Program Scientist, and the PCOS Chief Scientist. The PhysPAG executive committee is constituted to achieve a functional balance and diversity among members of the Physics of the Cosmos Program community. The nominal term for executive committee members is three years.

## MEETINGS

The PhysPAG will typically meet biannually or as otherwise needed as their tasks dictate. Tasking for PhysPAG activities will be initiated from the Astrophysics Division, in consultation with the PhysPAG Chair. The PhysPAG Chair will set the regular annual meeting schedule in consultation with the executive committee.

The PhysPAG may choose to organize sub-groups (e.g., Science Analysis Groups – SAGs, Science Interest Groups - SIGs) to deal with specific issues and report their findings to the full group. A SAG is typically tasked with reporting on a specific issue, and when the analysis of that issue is complete the SAG is disbanded. A SIG is typically tasked with collecting community input from a specific community on a longer-term basis. Establishment of such subgroups should address a clearly-defined NASA programmatic need or represent an acknowledged component of NASA's PhysPAG portfolio (in the case of SIGs), and must be approved by the Astrophysics Division Director.

## REPORTING

The findings and analysis activity of each meeting of the PhysPAG will be reported through written reports to NASA as well as presentations at public forums including, when requested by the Astrophysics Division Director, meetings of the NASA Astrophysics Advisory Committee (APAC). All findings and analyses submitted to NASA by the PhysPAG will be made publicly available through the PCOS web site.

## ADMINISTRATIVE PROVISIONS

Logistical and organizational support to the PhysPAG Chair and Executive Committee members will be provided through the PCOS Program Office at Goddard Space Flight Center on behalf of the SMD Astrophysics Division. This support includes such functions as maintaining the PhysPAG web site and email notification list, arranging logistics for PhysPAG meetings (e.g. arranging for meeting space, travel for EC members), collecting presentations from PhysPAG meetings and posting them on the web site, taking and distributing minutes of the PhysPAG meetings, etc.

## DURATION

The PhysPAG may be terminated at the discretion of the Astrophysics Division Director. If the PhysPAG terminates, the PhysPAG terms of reference also terminate, and all appointments to the PhysPAG EC terminate.



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Paul Hertz  
Astrophysics Division Director  
Science Missions Directorate

3/6/17

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Date

## Appendix A: Science Analysis Groups (SAGs)

In order to address a specific PCOS issue, a SAG may be established in order to perform analysis and report findings to the PhysPAG. SAGs are established with the approval of the Astrophysics Division Director and the concurrence of the PhysPAG chair, the PCOS Program Scientist, and the PCOS Chief Scientist. The Astrophysics Division Director may consult with the Astrophysics Advisory Committee before approving the establishment of a SAG.

Once the findings are reported, the SAG is closed out. The report may take the form of a white paper, or a presentation to the PhysPAG. The Astrophysics Division Director may require the SAG report to be accepted by the Astrophysics Advisory Committee before it is closed out.

The Chair of a SAG is either a member of the PhysPAG EC or a member of the wider PhysPAG, and membership is drawn from the EC and the wider PhysPAG community.

## Appendix B: Science Interest Groups (SIGs)

In order to collect community input and address longer-term community interests, SIGs may be established. A SIG will have a single, well-defined area of interest (for example, a wavelength band or science topic). SIGs will report to the PhysPAG at each face-to-face meeting. SIGs are established with the approval of the Astrophysics Division Director and the concurrence of the PhysPAG chair, the PCOS Program Scientist, and the PCOS Chief Scientist. The Astrophysics Division Director may consult with the Astrophysics Advisory Committee before approving the establishment of a SIG.

The Chair of a SIG is either a member of the PhysPAG EC or a member of the wider PhysPAG, and membership is drawn from the EC and the wider PhysPAG community.