

Intro and Welcome

PhysPAG August 2012 Meeting

S. Ritz
Chair, PhysPAG Executive Committee

See
<http://pcos.gsfc.nasa.gov/physpag.php>

Includes email sign-up for news and announcements. Reports from previous meetings, links to APS reports, ...

NASA National Aeronautics and Space Administration
Goddard Space Flight Center

- Goddard Space Flight Center
- Sciences and Exploration Division
- Astrophysics Science Division

Physics of the Cosmos

Overview Projects Science Technology Studies Program Office Education

Links

- PhysPAG

Study Analysis Groups (SAGs)

- IPSAG (Inflation Probe SAG)
- GWSAG (Gravitational Wave SAG)
- XRSAG (X-ray SAG)
- GammaSAG (Gamma ray SAG)
- TechSAG (Technology, no longer active as of January 2012)

PhysPAG

Objective

The Physics of the Cosmos Program Analysis Group (PhysPAG) serves as a forum for soliciting and coordinating input and analysis from the scientific community in support of the PCOS program objectives. The PhysPAG enables direct and regular communication through public meetings that give the community opportunities to provide its scientific and programmatic input. All interested scientists can contribute to the PhysPAG by participating in the PhysPAG meetings and by providing their input. The Executive Committee (EC) is the steering body of the PhysPAG. Its members are appointed by NASA with the concurrence of the **Astrophysics Subcommittee**, and their responsibilities include collecting and summarizing community input with subsequent reporting to NASA SMD via the **NAC**.

Upcoming Meetings

Fourth Meeting: PhysPAG Meeting 2012
August 14-16, 2012
Holiday Inn Capitol
550 C Street SW
Washington, D.C.

Past Meetings

- **First Meeting of the PhysPAG** — 13 Jan 2011, Seattle, WA
- **Second Meeting of the PhysPAG** — 1 May 2011, Anaheim, CA
- **Third Meeting of the PhysPAG** — 8 January 2012, Austin, TX

PhysPAG Announcements

Sign up for **PhysPAG announcements**.

Executive Committee

Steve Ritz (Chair) - University of California, Santa Cruz
Jason Rhodes - Jet Propulsion Laboratory
Shaul Hanany - University of Minnesota
Jay Bookbinder - Harvard-Smithsonian Center for Astrophysics
Liz Hays - NASA Goddard Space Flight Center
Guido Mueller - University of Florida

Rita Sambruna (Executive Secretary, Ex-Officio) - NASA HQ
Ann Hornschemeier (PCOS Program Office, Ex-Officio) - NASA GSFC

Contact

- **Rita Sambruna**
HQ PCOS Program Scientist
- **Ann Hornschemeier**
PCOS Program Office Chief Scientist

Program News

25 June 2012
Fourth PhysPAG Meeting Breakout Agendas Posted
» [Details](#)

31 May 2012
Euclid Science Team AO Frequently Asked Questions (FAQ) Now Posted » [Details](#)

23 May 2012
Euclid Science Team Membership (NOI Deadline: June 15, 2012; Deadline: August 31, 2012) » [Details](#)

11 May 2012
IPSAG One-Day Meeting, Aug. 15, 2012, Washington, D.C. » [Details](#) [[PDF](#)]

2 May 2012
Fourth PhysPAG Meeting announced: Aug 14-16, 2012 in Washington, D.C. » [Details](#)

Project News

Chandra News
3 July 2012
X-raying the beating heart of a newborn star » [Details](#)

Fermi News
26 June 2012
Committee on Space Research Honors NASA's Neil Gehrels for Science Contributions » [Details](#)

Planck News
13 Feb 2012
Planck steps closer to the cosmic blueprint » [Details](#)

XMM-Newton News
31 May 2012
XMM-Newton reveals light 'echo' around supermassive black hole » [Details](#)

Related News

Suzaku News
3 July 2012
X-raying the beating heart of a newborn star » [Details](#)

Swift News
28 June 2012
Hubble, Swift Detect First-Ever

PCOS Science and Missions

- *Physics of the Cosmos spans the fields of high-energy astrophysics, cosmology, and fundamental physics, and includes a wide range of science goals. These include the following:*
 - **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 the most extreme environments**
 - **Study the origin and acceleration of cosmic rays**
 - **Particle Signals of Dark Matter**

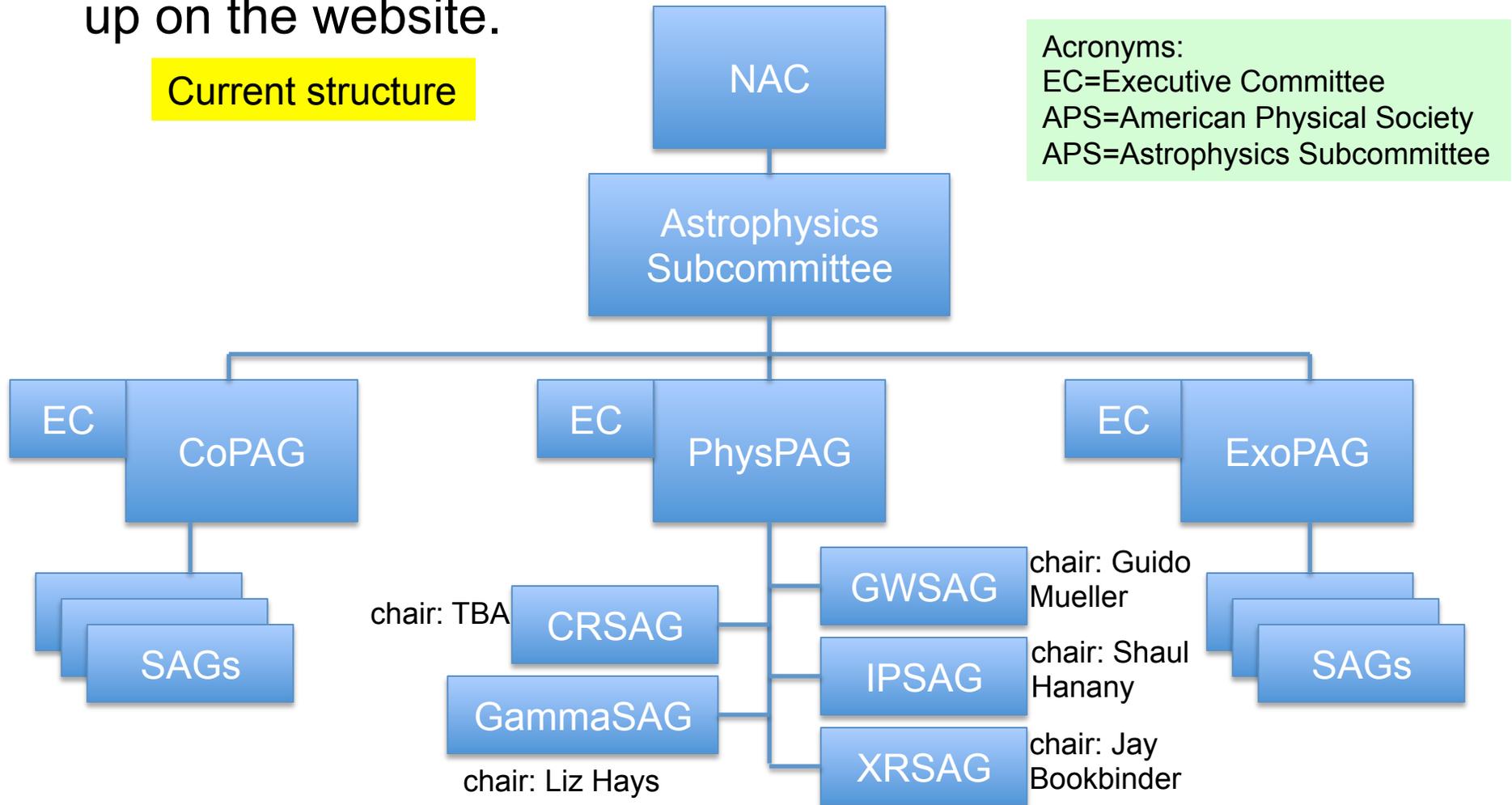
The screenshot shows the NASA website page for 'Physics of the Cosmos'. The header includes the NASA logo and the text 'National Aeronautics and Space Administration Goddard Space Flight Center'. Below the header is a navigation bar with tabs for OVERVIEW, PROJECTS, SCIENCE, TECHNOLOGY, STUDIES, and PROGRAM OFFICE. The main content area is titled 'Physics of the Cosmos' and 'Projects'. It features several sections: 'Links' with a list of documents and a sign-up for PCOS news; 'Operating Missions' with three entries: 'Chandra X-ray Observatory' (launched 23 July 1999), 'Fermi' (launched 11 June 2008), and 'Planck' (launched 14 May 2009); 'Program News' with several news items from 2011, including '5 January 2012 Draft Agenda for PhysPAG Meeting at AAS in Austin, Texas, is posted.' and '1 December 2011 PCOS Program Annual Technology Report (PATR) now available.'; 'Project News' with items like '17 November 2011 NASA's Chandra Adds to Black Hole Birth Announcement.' and '28 November 2011 In the Heart of Cygnus, NASA's Fermi Reveals A Cosmic-ray Cocoon.'; 'Related Missions News' with items like '28 September 2011 RXTE Special Session at January 2012 AAS Meeting: Abstract Deadline.' and '1 September 2011 Suzaku AO 7 Proposals Due on Nov 10, 2011.'; and 'Previous Missions'.

see talk by Ann Hornschemeier

NAC, APS, PAGs, SAGs...

- PAGs provide opportunities for communication among communities and with NASA. Open membership – just sign up on the website.

Current structure



Current Executive Committee

- Jay Bookbinder (CfA)
- Shaul Hanany (Minnesota)
- Liz Hays (GSFC)
- Guido Mueller (UFL)
- Jason Rhodes (JPL)
- Steve Ritz (UCSC), chair

PhysPAG is much,
much more than the
EC!

physpag-ec@bigbang.gsfc.nasa.gov

Previous Meetings and Activities

- 2011 January AAS
 - defined first tasks: TechSAG, Inflation Probe SAG (IPSAG), build community outreach
- 2011 May American Physical Society Meeting
 - SAG reports and planning next steps, technology discussion with PCOS program office, LISA and IXO changes, possible GammaSAG, grow community and plan special sessions
- 2012 January AAS
 - Reports from TechSAG and IPSAG, discussions about next steps
 - Community Special Focus Sessions on X-ray and Gravitational Wave Opportunities in a Changing Landscape. Reports on NASA studies startup.
 - Three new SAGs proposed: GammaSAG, XRSAG, GWSAG. Approved by the NAC/APS. Start work at conclusion of studies (now!).
 - Idea for this (August) meeting
 - ...plus AAS Town Hall jointly with EXOPAG and COPAG
- Many SAG and EC telecons, presence at topical meetings... including the 2012 April APS DAP business meeting
 - Proposal for Cosmic Ray CRSAG

TechSAG 2011 Summary

- Major activity, led by Roger Brissenden
- A community input gathering activity, not a critical assessment.
- Inputs to NRC review of NASA technology roadmaps:
 - check for gaps against PCOS needs, provide updates
- Assessment for PCOS Program office for Program Annual Tehnology Report (PATR)
 - Draft for Community comment on website, then updates and presentation to the Astrophysics Subcommittee
 - Assessment materials provided to the PCOS office and placed on TechSAG website: <http://pcos.gsfc.nasa.gov/sags/techsag.php>
 - Material included in Program Annual Technology Report (PATR)
 - Recommend an annual update as an ongoing task for the PhysPAG in consultation with PCOS office on format



TechSAG done.
Work to move to
new discipline
SAGs

CRSAG PROPOSAL

Proposal for a Cosmic-ray Science Analysis Group (CosmicSAG)

Angela Olinto and Eun-Suk Seo
June 20, 2012

approved by NAC/APS July 2012

Goals

- Provide an assessment to NASA HQ and the PCOS program office of the status and the current and future needs of the cosmic-ray astrophysics community.
- Act as a focal point and forum for the cosmic ray community.

CRSAG PROPOSAL

Deliverables

1) White paper:

major open science questions

brief survey of current state-of-the-art capabilities:

current and planned, US and International, space and ground-based

energy coverage: from $\sim 10^8$ eV to above 10^{20} eV

particle types: nucleons, nuclei, anti-nucleons, anti-nuclei, $e^+ e^-$, neutrinos
(energy and sky coverage for each particle type)

Possible leaps in capabilities over the next 10-15 years,

Potential science return corresponding to those capabilities.

Techniques used in each cosmic-ray band for both balloon and satellite platforms.

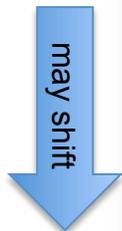
2) List of **technology development needs** with timelines.

3) Suggestions to help **support the specific needs** of this community: organizational, scientific, funding.

CRSAG PROPOSAL

Timescale

- “June 2012”: open meeting at CR2012 requesting input from the community.
- July 2012 – at COSPAR
- Teleconferences and email input: for further information gathering.
- August - December 2012: compile/write white paper.
- January 2013: Circulate to the community for feedback
- February 2013: Deliver white paper to PhysPAG (+ NAC)
- Present white paper at April 2013 - APS meeting.



PhysPAG August 2012 Agenda

TUESDAY, 14 AUGUST

COLUMBIA BALLROOM

- 08:30 WELCOME, PHYSPAG INTRODUCTION, MEETING PLAN – S. RITZ
- 08:45 NEWS FROM HQ – PAUL HERTZ (10+5)
- 09:00 PCOS PROGRAM BRIEF – ANN HORNSCHEMEIER (15+5)
- 09:20 Q&A
- 09:30 COPAG REPORT (20+10) – C. MARTIN
- 10:00 EXOPAG REPORT (20+10) – S. GAUDI
- 10:30 BREAK *SEE NOTE REGARDING COFFEE
- 11:00 X-RAY STUDY RESULTS AND DISCUSSION (45+30) – R. PETRE
- 12:15 LUNCH
- 13:45 GW STUDY RESULTS AND DISCUSSION (45+30) – J. LIVAS/I. THORPE
- 15:00 OPPORTUNITIES FOR COSMIC RAY SCIENCE (20+10) – A. OLINTO
- 15:30 BREAK *SEE NOTE REGARDING COFFEE
- 16:15–18:00 PARALLEL SESSIONS
 - COLUMBIA BALLROOM 1: GWSAG – GUIDO MUELLER (CHAIR)
 - COLUMBIA BALLROOM 2: XRSAG – JAY BOOKBINDER (CHAIR)
- 18:00 ADJOURN

WEDNESDAY, 15 AUGUST

- 08:30–10:30 **DISCOVERY 2: DARK ENERGY FOCUS TOPIC PLENARY SESSION:**
 - RACHEL BEAN (VIA TELECON) – DARK ENERGY OVERVIEW AND THE BIG PICTURE
 - NEIL GEHRELS – WFIRST STATUS UPDATE (15)
 - PAUL SCHECHTER – WFIRST AND EUCLID SCIENCE (30)
 - DAVID WEINBERG – BEYOND WFIRST, LSST, AND EUCLID (30)
- 08:30–10:30 **COLUMBIA 2: IPSAG** PARALLEL SESSION
- 10:30 BREAK *SEE NOTE REGARDING COFFEE
- 11:00 **DISCOVERY 2: GROUP DISCUSSIONS** WITH PAUL HERTZ
- 12:00–13:30 LUNCH
- 13:30–18:00 PARALLEL SESSIONS
 - **DISCOVERY 2: DARK ENERGY FROM SPACE** – JASON RHODES (CHAIR)
 - **COLUMBIA 2: IPSAG** – SHAUL HANANY (CHAIR)
 - **DISCOVERY 1: GWSAG** – GUIDO MUELLER (CHAIR)
 - **COLUMBIA 1: XRSAG** – JAY BOOKBINDER (CHAIR)
 - **SATURN/VENUS: GAMMASAG** – LIZ HAYS (CHAIR)
- 18:00 ADJOURN

THURSDAY, 16 AUGUST

DISCOVERY

- 08:30 DARK ENERGY REPORT (20+10) – J. RHODES
- 09:00 GRSAG REPORT (20+10) – E. HAYS
- 09:30 IPSAG REPORT (20+10) – S. HANANY
- 10:00 BREAK *SEE NOTE REGARDING COFFEE
- 10:45 GWSAG REPORT (20+10) – G. MUELLER
- 11:15 XRSAG REPORT (20+10) – J. BOOKBINDER
- 11:45 FURTHER DISCUSSIONS – HQ, ALL
- 13:00 MEETING WRAP-UP, ADJOURN

Please check here for agenda updates:

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

Breakout Sessions

XRSAG

Tues 08/14 - 14:00 - 15:30 - 1.5 hours

- Detailed update on the Concept Studies & Discussion – R. Petre (45 min + 15)
 - AXSIO, N-XGS, N-WFI, X-CAL, future missions
 - Recommendations from the study
 - Next steps
- Discussion on mission costings – lessons' observed and how to improve the process Daelmans/Bookbinder – (20 +10 min)

Wed 08/15 – 13:30 – 15:00 -1.5 hours

- Update on recent mission activities: Var - (30 min)
 - NuSTAR launch and first results
 - Astro-H status
 - Implications of GEMS cancellation - impact on the science and the community
- Upcoming instrument/mission flight opportunities - MoO, SMEX, other? Open Discussion (15 min)
- International participations – TBD speaker & Open discussion (20 min)
 - L1 status and process: impact of non-selection of ATHENA & NGO & plan re-submittal
 - developing int'l collaborations - new ideas and approaches.
 - How to partner ESA (junior/senior partner)
 - Potentials for other countries: Brazil, China, India - risks and opportunities

Wed 08/15 - 15:30 – 17:30 -2 hours

- Technology Development planning – var. speakers
 - status of current efforts in optics – 30 min
 - status of current efforts in detectors – 20 min
 - Future needs for tech development – 20 min
 - near term – FY 13, 14
 - far term
 - Developing an integrated technology development plan/roadmap – 20 min
- And other potential sources of funding outside of the traditional (NASA/NSF)

16:00-16:45 The situation in Europe and the rest of the world (Danzmann)

- L1 process:
 - NGO Consortium construct
 - SSAC and SPC decisions
- L2/Cornerstone process:
 - NGO/eLISA Organization in Europe
 - Partnership options for Europe

16:45 - 17:00 Discussion

17:00 - 17:30 Role of the GW-SAG (GM, Someone from PCOS) 30min

- GW-SAG within PhysPAG
 - Depends on existence or non-existence of a Study team at GSFC/JPL and a GW-Science team
 - If GW-SAG is all, do we have to push for an expansion of number of supported people (travel support)?

08/15 Parallel Session GW SAG

13:30 - 15:00 Exploring options for the NASA

- Junior Partner with ESA
- Full partner with ESA
- Doing it alone
- China

in light of expected funding profiles

Different technology programs/plans for different options

- Being aware of ESA's way of doing business.
- How to prioritize technology plans?

15:30 - 17:30 How do we continue?

Wrap up

Physpag Meeting 15 August 2014

DE plenary Session 8:30 AM- 10:30 AM

Rachel Bean (via telecon): Dark Energy Overview and the Big Picture (30 mins)

Neil Gehrels : WFIRST status update (15 mins)

Paul Schechter: WFIRST and Euclid Science (30 mins)

David Weinberg: Beyond WFIRST, LSST and Euclid (30 mins)

Parallel Sessions:

Issues to be considered:

13:30-15:00

Benefit of an IFU on a dark energy mission (Greg Aldering)

Ground based projects (Gary Bernstein)

Computing Needs (Julian Borrill)

15:30-17:30

Technology needs (Jason Rhodes)

2.4M NRO WFIRST, benefits and advocacy (Gehrels and Schechter)

GWSAG

DE Session
Organized by
Jason Rhodes

Agenda

| | |
|---------------|---|
| 8:00 – 8:30 | Coffee |
| 8:30 – 8:45 | Background (15 min) - Hanany |
| | Bring the audience up to speed on recent IP history, decadal panel recommendations, status within NASA HQ, Goals of Workshop. |
| 8:45 – 9:35 | Planck (40 min) – Lawrence + Crill Discussion (10 min) |
| | What have we learned from Planck about technology, foregrounds, calibration and systematics. |
| 9:35 – 10:35 | Progress by sub-orbitals: Balloons (25 min) - Jones Ground-based (20 min) – Lee Discussion (15 min) |
| | What progress can we anticipate by sub-orbitals by the time of the mid-decade review? What else do we want to achieve by mid-decade and later in term of sub-orbital experiments? |
| 10:35 – 11:00 | Break |
| 11:00 – 12:00 | Meeting with Paul Hertz |
| 12:00 – 1:15 | Lunch break |
| 1:15 – 2:25 | CORE (15 min) - de Bernardis, EPIC (15 min) - Bock, PIXIE (15 min) - Kogut, LiteBIRD (15 min) - Hazumi Discussion (10 min) |
| 2:25 – 3:20 | Technology development Detector Arrays and Focal Plane Coupling (25 min) - Moseley Multiplexing (15 min)- Irwin Discussion (15 min) |
| | What are the key immediate areas for development? Where is the technology heading in the near term (<2015) and mid-term (>2015)? |
| 3:20 – 3:30 | Break |
| 3:30 – 4:10 | NASA HQ and Program office |

IPSAG

...plus GammaSAG
whitepaper organization
session

Beyond This Week...

- Many SAG activities
- Planning for PhysPAG meetings in 2013 at AAS, American Physical Society, HEAD...plus presence at smaller topical meetings.
 - ideas/suggestions welcome!

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Thanks

- *Thanks to all SAG members for their hard work and the PCOS office for all the support*
- *Thanks to all the speakers and the EC, the scientific organizers for this meeting*
- *Thanks to Ann Hornschemeier, the PCOS Program Office/LOC!*