

# COPAG & PhysPAG Agenda

Introduction	E. Smith (15 min)
GSFC Program Office	M. Ahmed (15 min)
NASA Technology	M. Moore (10 min)
ExoPAG Report	A. Roberge (10 min)
Break to separate PAG (PhysPAG 303)	

# Cosmic Origins & Physics of the Cosmos PAGs

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Eric P. Smith

Cosmic Origins Program Scientist (acting)

# Program Analysis Groups

- Groups responsible for soliciting and coordinating community input into the development and execution of NASA's Astrophysics Division science-focused programs [Cosmic Origins, Exoplanet Exploration, Physics of the Cosmos]
- Provide findings to the NASA Advisory Council [NAC] through the Astrophysics Subcommittee of the NAC

# Cosmic Origins

- Addresses matter, radiation and physical processes following the Big Bang, and how they led to our current universe. Critical activities include:
  - Observing and cosmic-dating the first generation of stars that both initiated the synthesis of heavy elements and had a major role in reionization of the IGM.
  - Detecting and characterizing the earliest proto-galaxies, including their central black holes, and probing the growth and evolution of galactic systems over cosmic time to the present epoch.
  - Surveying the large-scale structure of the early universe, and quantifying the roles and influences that Dark Matter and Dark Energy had in the development of that structure.
- COR scientific objectives also include cosmic star formation history, stellar populations, star/debris disk/planetary system formation, etc.

# Physics of the Cosmos

- Explores the most fundamental physical laws and properties of the Universe. The highest priority objectives include:
  - Studying the nature of dark energy by mapping the expansion of the Universe and the growth of structure
  - Testing the theory of Inflation by measuring the CMB polarization caused by the gravitational radiation produced during the epoch of inflation.
  - Probing the properties of Black Holes and hence the theory of General Relativity using the x-ray emission from accreting gas, the multi-wavelength beams of radiation from jets, and the gravitational waves generated by merging black holes.
- PCOS objectives also include investigating the nature of Dark Matter, the properties of matter at neutron densities, the origin of cosmic rays, the mass of neutrinos

# PAG Duties

- Articulate and prioritize the key scientific drivers for cosmic origins/physics of the cosmos research
- Evaluate the expected capabilities of potential missions for achieving the science goals of the Program
- Regularly evaluate Program goals, objectives, investigations and required measurements on the basis of the widest possible community outreach
- Articulate and prioritize focus areas for needed mission technologies
- Provide recommendations on related activities such as ground-based observing, theory and modeling programs, and community engagement

# PAG Composition

- Chairperson: Member of Astrophysics Subcommittee
- Executive Secretary: NASA HQ rep.
- Executive Committee: Selected through “Dear Colleague Letter” [July 9, 2010 AAS electronic newsletter]
- You!

# Executive Committees

- Support planning and activities of the Group

COPAG	PhysPAG
Chris Martin, Caltech	Steve Ritz, UCSC
Jonathan Gardner, GSFC	Roger Brissenden, CfA
Paul Goldsmith, JPL	Shaul Hanany, U. Minn.
Chuck Lillie, NGAS	Liz Hayes, GSFC
Ken Sembach, STScI	Jason Rhodes, JPL
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# OK, How does it really work?

- Tasking from NASA, NAC, or Astrophysics Subcommittee [APS]
- Chairs, working with executive committees schedule meetings and [optionally, but hopefully always] organize sub-groups to study tasks/topics given to the PAG
- Groups report back to APS their findings
- APS is the body which renders advice to NASA [formally through the NAC]

# Funding Reminders

Program	Typical Grant Size
Astro. Data Analysis Program ADAP	~ \$85 K/yr
Astro. Theory Program ATP	~ \$140 K/yr
APRA (non suborbital)	~ \$280 K/yr
Strategic Astro. Technology SAT	TBD (~ \$1000K/yr)

