GammaSIG Agenda

2:00 - 2:15 Intro (Mark McConnell)

2:15 - 2:30 AGN (Justin Finke)

2:30 - 2:45 Cosmic Diffuse Emission (Tonia Venters / Marco Ajello)

2:45 - 3:00 Classical Novae (Teddy Cheung)

3:00 - 3:15 SNR / PWNe (Terri Brandt)

3:15 - 3:30 Pulsars / Magnetars (Matthew Baring)

3:30 - 3:45 GRBs (Valerie Connaughton / Nicola Omodei)

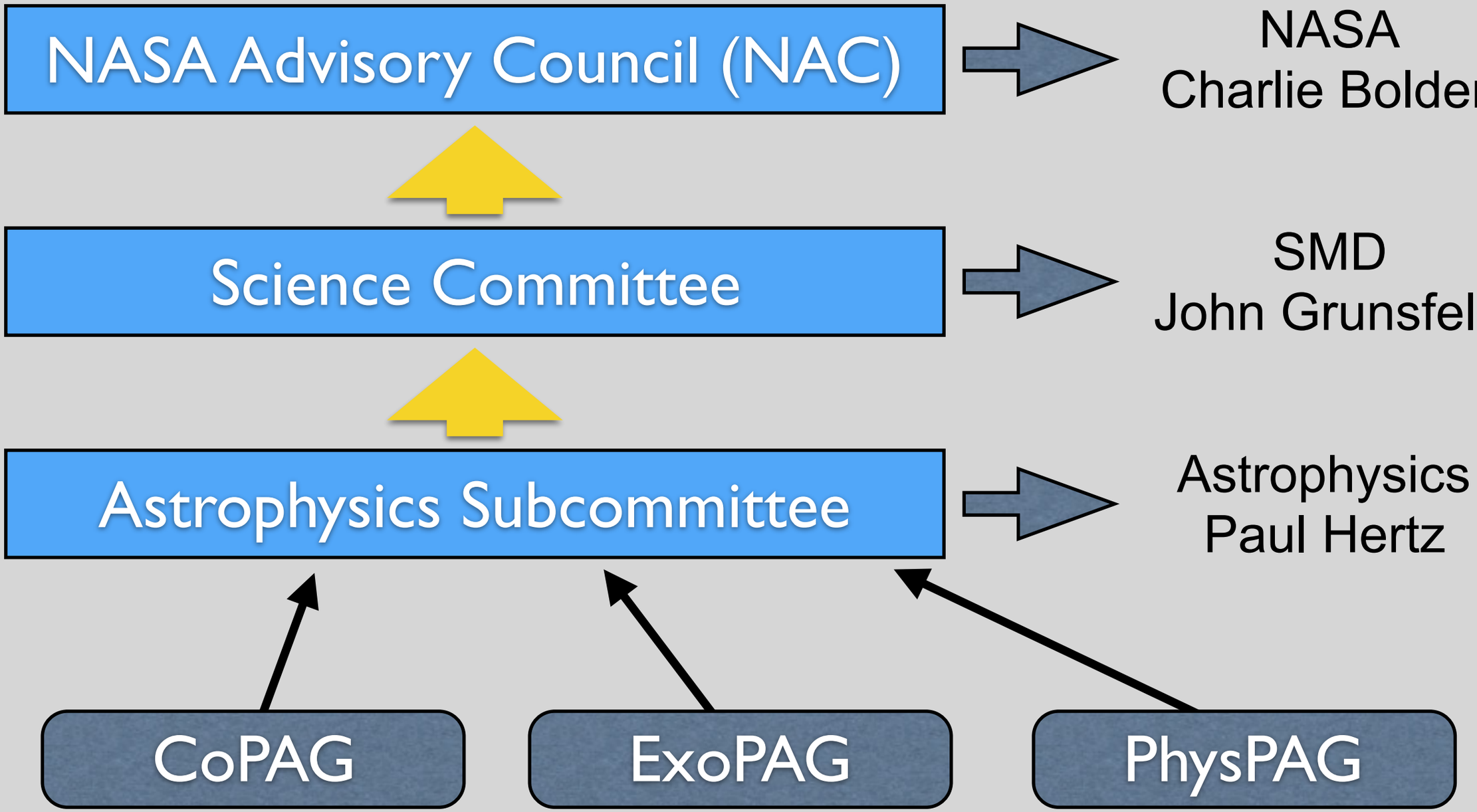
3:45 - 4:00 Fundamental Physics and Dark Matter (Regina Caputo)

4:00 - 4:15 Solar Science (Ron Murphy)

4:15 - 5:00 Summary and Open Discussion

What is the GammaSIG?

NASA Advisory Structure



Program Analysis Groups (PAGs)

CoPAG	Cosmic Origins	Explore the origin and evolution of the galaxies, stars and planets that make up our universe.	cor.gsfc.nasa.gov
ExoPAG	Exoplanet Exploration	Discover and study planets around other stars, and explore whether they could harbor life.	exep.jpl.nasa.gov
PhysPAG	Physics of the Cosmos	Probe the origin and destiny of our universe, including the nature of black holes, dark energy, dark matter and gravity.	pcos.gsfc.nasa.gov

PhysPAG

Physics of the Cosmos Program Analysis Group

Science Interest Group	Description	Website
IPSIG	Inflation Probe (CMB)	pcos.gsfc.nasa.gov/sigs/ipsig.php
GWSIG	Gravitational Wave	pcos.gsfc.nasa.gov/sigs/gwsig.php
XRSIG	X-Rays	pcos.gsfc.nasa.gov/sigs/xrsig.php
GammaSIG	**Gamma Rays**	**pcos.gsfc.nasa.gov/sigs/gammasig.php**
CosmicSIG	Cosmic Rays (Particle Astro)	pcos.gsfc.nasa.gov/sigs/cosmicsig.php
CoSSIG	Cosmic Structure (Dark Energy)	http://pcos.gsfc.nasa.gov/sigs/cossig.php

PhysPAG Executive Committee

Name	Affiliation	Area of Expertise	Term Ends
J. Bock, Chair	Caltech/JPL	CMB	December 2016
M. Bautz	MIT	X-ray astrophysics	December 2016
R. Bean	Cornell University	Dark Energy	December 2016
N. Cornish	Montana State University	Gravitational Waves	December 2016
M. McConnell	Univ. of New Hampshire	Gamma-ray astrophysics	December 2016
Eun-Suk Seo	Univ. of Maryland	Particle astrophysics	December 2016
J. Conklin	Univ. of Florida	Gravitational Waves	December 2017
O. Doré	JPL	Dark Energy	December 2017
H. Krawczynski	Washington University	Gamma-ray astrophysics	December 2017
A. Miller	Columbia University	CMB	December 2017
E. Wollack	NASA/GSFC	CMB	December 2017
I. Moskalenko	Stanford University	Particle astrophysics	December 2018
R. Kraft	SAO	X-ray astrophysics	December 2018

2020 Decadal Survey

2015-16 Mid-Decade Review

http://sites.nationalacademies.org/SSB/CurrentProjects/SSB_161177

- The NASA Authorization Act of 2005 requires assessments of NASA's science programs that include mid-decade reviews.
- The Astrophysics Mid-Decade Review is currently underway.
- Three committee meetings from Oct to Jan.
- Community input has been requested.
- Splinter meeting at Jan AAS.

Preparations for 2020 Decadal Survey

January, 2015

NASA Astrophysics Director Paul Hertz charged the three PAGs to write a report recommending 3-4 large space mission concepts.

NASA plans to set up a Science & Technology Development Team (STDT) for each concept, with funding sufficient to develop the science case and necessary engineering & costing required for a full Decadal submission. Although the reports are to focus on Large missions, he also invited the PAGs to include appendices, at their discretion, discussing Medium class ("Probe") missions at the <$1B level.

PAG Report

Final PAG report was issued on in October

The report recommended consideration of four flagship missions :

- Far IR Surveyor
- Habitable-Exoplanet Imaging Mission
- UV/Optical/IR Surveyor
- X-ray Surveyor

The report also expressed its support for a new “Probe” class of PI-led Explorer missions.

Probe Class Missions

NASA Astrophysics Chief Wants To Put $1 Billion Missions Out for Competition

by **Dan Leone** — October 27, 2015

"For an Astrophysics Probe line to become reality, the White House will have to request annual funding from Congress. This is likelier to happen if astronomers throw their weight behind Hertz's proposal, which they could do in the next astrophysics decadal survey, which is due in 2020."

Mission Classes

- **Flagship (Large) Missions (> $1B)**
- **Probe (Medium) Missions (< $1B)**
- Explorers
  - MIDEX (< $250M)
  - SMEX (< $125M)
- Cubesats ($2-10M)
- Balloons ($2-10M)

Gamma Ray Roadmap

- ✦ Prepare for the 2020 Decadal Review
- ✦ Articulate a common vision for the space-based gamma ray community.
- ✦ Define the science objectives.
- ✦ Define the instrument requirements.
- ✦ Summarize possible mission concepts.

Gamma Ray Roadmap

Current list of working groups.

- X-Ray Binaries (Tomsick)
- Pulsars / Magnetars (Baring, Harding)
- SNR / PWNe (Brandt, Hewitt)
- Classical Novae (Cheung, Comiuk)
- Supernovae (Boggs, Grefensette, Leising)
- Active Galactic Nuclei (Falcone, Finke, Madejski, Ojha)
- Diffuse Galactic Emission (Digel, Hartmann, Moskalenko)
- Cosmic Diffuse Emission (Ajello, Venters)
- Gamma Ray Bursts (Connaughton, Omodei, Zhang)
- Fundamental Physics and Dark Matter (Buckley, Caputo, A. Smith, Krawczynski)
- Solar Physics (Murphy, Pesce-Collins, Ryan)
- Terrestrial Gamma Flashes (Briggs, Dwyer, Grove, Smith)

Gamma Ray Roadmap

Contents

- Science Goals
  What are the outstanding science issues that should be addressed?
- Instrument Requirements
  What are the instrument requirements needed to address the science goals?
- Strawman Mission Concepts
  How many missions would be required? What might they look like?
- Specific Mission Concepts
  What are some of the specific mission concepts being investigated by community members?

Roadmap Timetable

Nov 2015 - Fermi Workshop
Presentation of science requirements

Dec 2015 - Collect Science Requirements

Jan 2016 - AAS Meeting
Summary of science requirements
Presentation of Mission Concepts?

Apr 2016 - AAS-HEAD Meeting
Presentation of Mission Concepts

Jun 2016 - SPIE Astro
Presentation of Mission Concepts

Sep 2016 - Final Roadmap

Science Requirements

Each working group will be asked to provide a 2-5 page summary by Jan 1 (in time for AAS meeting).

Summary should include a list of science objectives and a list of instrument requirements needed to meet those objectives:

- energy range
- angular resolution
- continuum flux sensitivity
- line flux sensitivity
- timing accuracy
- polarization sensitivity

Today's Agenda

2:00 - 2:15 Intro (Mark McConnell)

2:15 - 2:30 AGN (Justin Finke)

2:30 - 2:45 Cosmic Diffuse Emission (Tonia Venters / Marco Ajello)

2:45 - 3:00 Classical Novae (Teddy Cheung)

3:00 - 3:15 SNR / PWNe (Terri Brandt)

3:15 - 3:30 Pulsars / Magnetars (Matthew Baring)

3:30 - 3:45 GRBs (Valerie Connaughton / Nicola Omodei)

3:45 - 4:00 Fundamental Physics and Dark Matter (Regina Caputo)

4:00 - 4:15 Solar Science (Ron Murphy)

4:15 - 5:00 Summary and Open Discussion

Recent GammaSIG Events

Future Space-Based Gamma-Ray Observatories
Feb 5-7 workshop @ NASA/GSFC

Mini-Symposium on Future Gamma-Ray Missions
April APS Meeting @ Baltimore

Physics of the Cosmos Mini-Symposium
April APS Meeting @ Baltimore

Special HEAD Meeting
High Energy Large and Medium-class Space Missions in the 2020s
Jun 29 - Jul 1 @ Chicago

Fermi Workshop
Fall, 2015 @ Washington, DC

Future GammaSIG Events

227th AAS Meeting
Jan 4-8, 2016 @ Kissimmee, FL
summary of science requirements

15th AAS-HEAD Meeting
Apr 3-7, 2016 @ Naples, FL
presentation of instrument concepts

SPIE - Space Telescopes and Instrumentation
June 26 - July 1, 2016 @ Edinburgh, UK
presentation of instrument concepts
abstract deadline - Dec 14

Possible Discussion Topics

- ✦ One theme vs 2-3 themes vs many themes?
- ✦ Should we come together on one 1 or 2 Probe concepts?
- ✦ Implications of proposed Probe class Explorer line?
- ✦ How do we appeal to broader community?
- ✦ Are we on the right path?

Gamma Ray Roadmap

Contents

- Science Goals
  What are the outstanding science issues that should be addressed?
- Instrument Requirements
  What are the instrument requirements needed to address the science goals?
- Strawman Mission Concepts
  How many missions would be required? What might they look like?
- Specific Mission Concepts
  What are some of the specific mission concepts being investigated by community members?

Gamma Ray Science Interest Group

GammaSIG Website
(http://pcos.gsfc.nasa.gov/sags/gammasag.php)

Mailing List
(http://pcos.gsfc.nasa.gov/sags/gammasag/gammasag-maillist.php)