A Gentle Introduction the Physics of the Cosmos Ecosystem and the MMAs (Many Many Acronyms)

PhysPAG Overview

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PhysPAG EC Vice Chair

Physics of the Cosmos Early Career Workshop
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Abbreviations within Abbreviations + Acronyms

PhysPAG EC

abbreviation acronym acronym

not an acronym!

PhysCOS PAG EC

abbreviation acronym acronym

Physics of the Cosmos PAG EC

acronym acronym

Program Analysis Group

Executive Committee

community members appointed by NASA who organized meetings and activities and summarize community input.

community-based, interdisciplinary forum to enable communication between NASA and the community

At NASA Astrophysics, a “Program” is a coordinated effort of space exploration.
Three focused Programs (each with a PAG):

	**How does the universe work?**	Probe the origin and destiny of our universe, including the nature of black holes, dark energy, dark matter and gravity.
	**How did we get here?**	Explore the origin and evolution of the galaxies, stars and planets that make up our universe.
	**Are we alone?**	Discover and study planets around other stars and explore whether they could harbor life.

Physics of the Cosmos (PhysCOS)

Cosmic Origins (COR)

Exoplanet Exploration (ExEP)

Many “Groups” within a “Program”

PhysCOS encompasses a wide breadth of science.

There are many standing groups of scientists that are organized either by waveband or science topic.

We call them Science Interest Groups, or SIGs.

Who are the SIG members?
Scientists in the community, like you!

How do I join a SIG?
Subscribe to its mailing list.

How many SIGs are there?
Currently, there are seven in PhysCOS.

Who are the SIG chairs?
At least one co-chair is on the PhysPAG EC, and there may be other co-chairs not on the EC.

Am I limited to being in just one SIG?
Not at all! Many scientists are in two or more SIGs.

PhysCOS SIGs:

- Cosmic Ray SIG (CR SIG)
- Cosmic Structure SIG (CoS SIG)
- Gamma Ray SIG (GR SIG)
- Gravitational Wave SIG (GW SIG)
- Inflation Probe SIG (IP SIG)
- Time Domain and Multi-Messenger Astrophysics SIG (TDAMM SIG)
- X-ray SIG (XR SIG)

The other Programs also have their own SIGs.

Cross-Program SIG

Image: Jelly Fish Nebula (IC 443) source of cosmic rays. Credit: NASA / DOE / Fermi LAT Collaboration, NOAO / AURA / NSF, JPL-Caltech/UCLA

Cosmic Ray SIG

Co-chairs: Athina Meli (NC A&T), Stephanie Wissel (Penn State)

The goals of the Cosmic Ray Science Interest Group (CR SIG) are to provide quantitative metrics and assessments to NASA in regard to current and future needs of the cosmic-ray astrophysics community and to act as a focal point and forum for the cosmic ray community. It is currently engaged in a survey of the current and planned US and International space and ground-based projects — their energy coverage (from about 10^8 eV to 10^2 eV), sky coverage, and particle type coverage (electrons, positrons, nucleons, anti-nucleons, nuclei, anti-nuclei, neutrinos, and new particles).

Join by sending email to CosmicSAG-join@lists.nasa.gov with Subject="join"

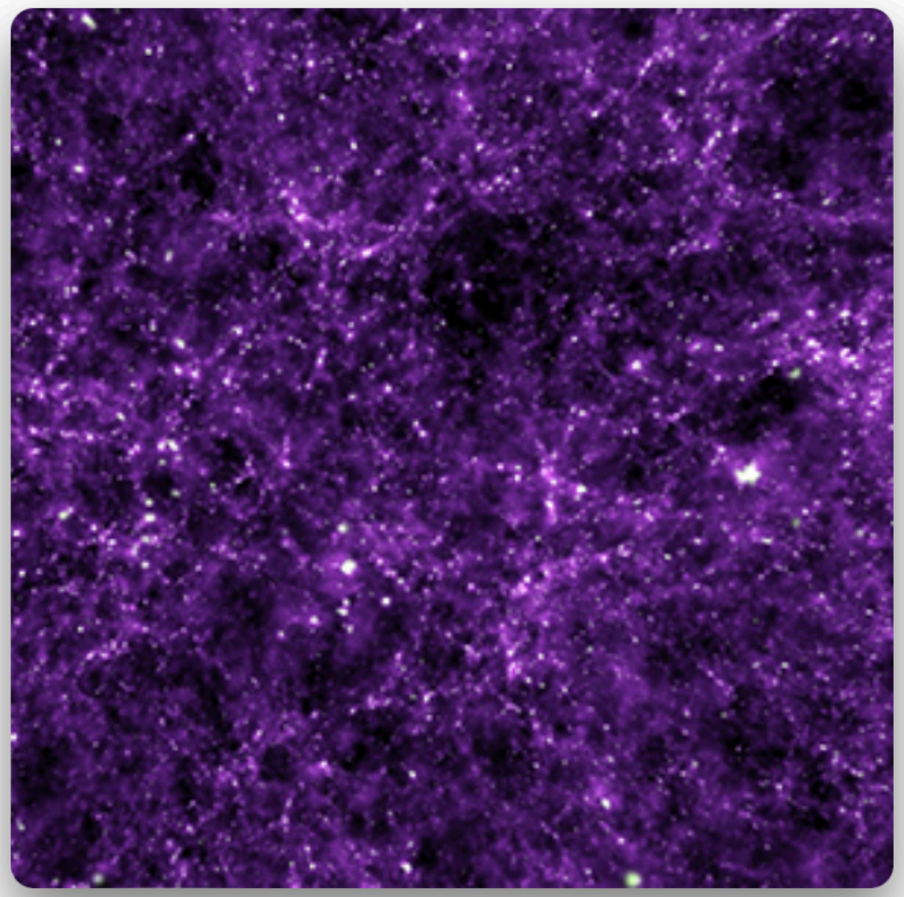

Image: Cosmic Web. Credit: NASA/NCSA University of Illinois Visualization by Frank Summers, Space Telescope Science Institute, Simulation by Martin White and Lars Hernquist, Harvard University.

Cosmic Structure SIG

Co-chairs: Rebekah Hounsell (UMBC/GSFC), Vivian Miranda (Stony Brook)

The goal of the Cosmic Structure Science Interest Group (CoS SIG) is to serve communities interested in utilizing measures of cosmic structure based on 3-dimensional spectroscopic and photometric surveys of galaxies, galaxy clusters, supernovae, and gravitational lensing. Science drivers for the SIG include understanding the nature of dark energy, dark matter, neutrinos, and tests of inflation, as well as astrophysical galaxy evolution, amongst others.

Join by sending email to CoSSIG-join@lists.nasa.gov with Subject="join"

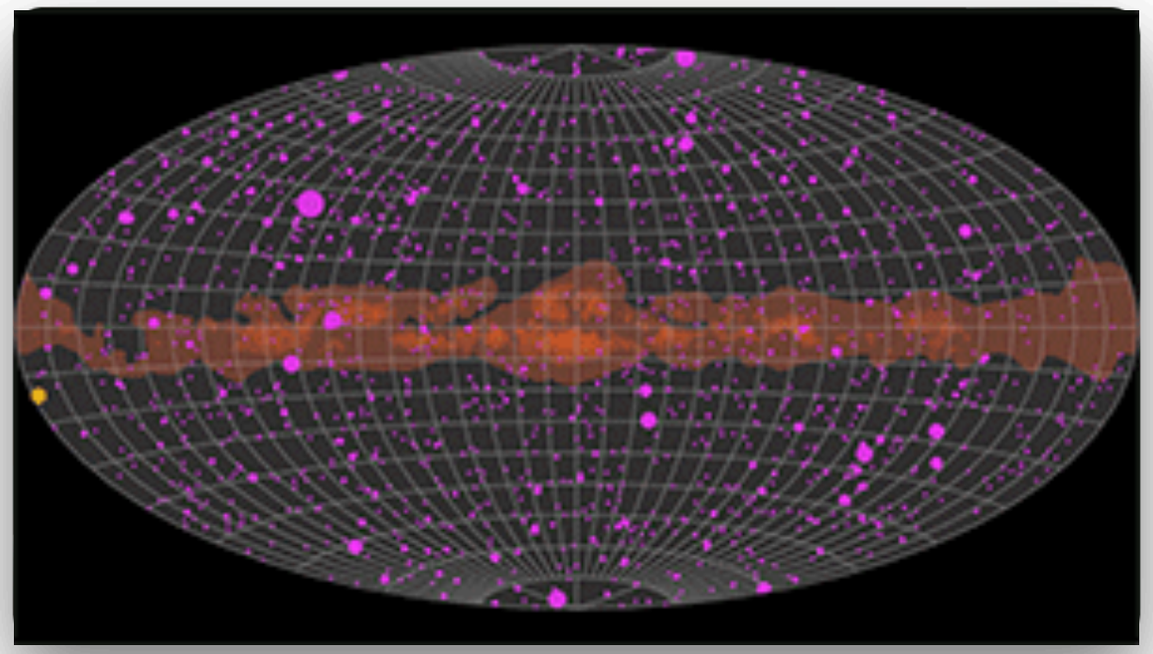

Image: Fermi Captures Dynamic Gamma-ray Sky. Credit: NASA Goddard Space Flight Center.

Gamma Ray SIG

Co-chairs: Justin Finke (NRL), Manel Errando (WashU St Louis)

The goal of the Gamma Ray Science Interest Group (GR SIG) is to provide quantitative metrics and assessments to NASA in regard to current and future needs of hard X-ray and gamma-ray astrophysics community. Specifically, the activities of the GR SIG include acting as a focal point and forum for the hard X-ray and gamma ray communities, organizing bi-weekly telecons to discuss recent science results, and current and future missions, maintaining a list of technology needs for future hard X-ray and gamma-ray missions, producing suggestions to help support the specific needs of this unique community: organizational, scientific, funding.

Join by sending email to GammaSAG-join@lists.nasa.gov with Subject="join"

Image: Gravitational Waves Detected 100 Years After Einstein's Prediction.. Credit: The SXS (Simulating eXtreme Spacetimes) Project

Gravitational Wave SIG

Co-chairs: Chiara Mingarelli (Yale), Alessandra Corse (JHU)

The goal of the Gravitational Wave Science Interest Group (GW SIG) is to provide quantitative metrics and assessments to NASA in preparation for a future gravitational wave mission. It will track and analyze evolving science goals and requirements, especially as our understanding of three standard sources of gravitational waves (supermassive black hole binaries, extreme mass ratio inspirals, galactic binaries) continues to improve. It will support mission studies and concept development for future space-based gravitational wave observatories

Join by sending email to GWSAG-join@lists.nasa.gov with Subject="join"

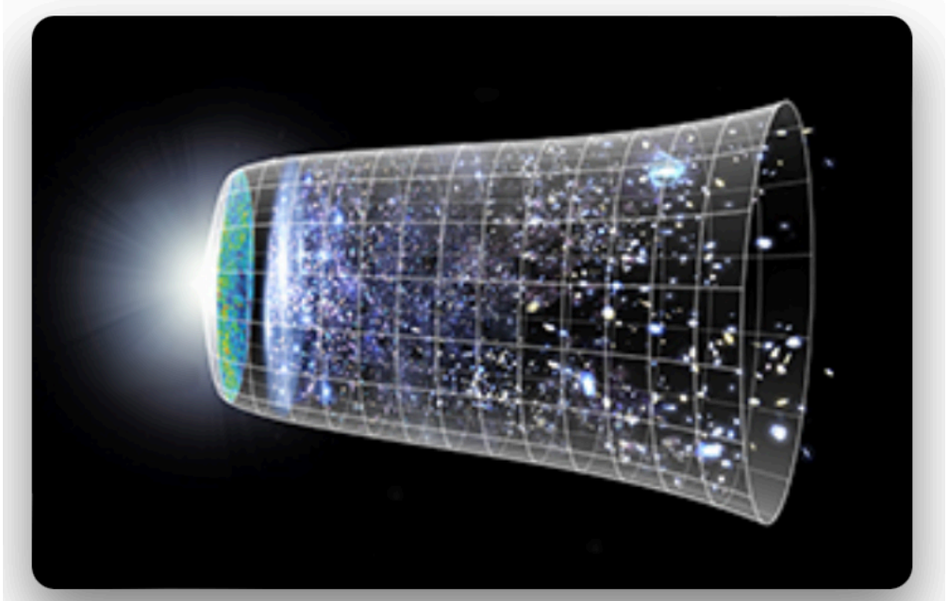

Image: Timeline of the Universe. Credit: NASA / WMAP Science Team

Inflation Probe SIG

Chairs: Roger O'Brient (JPL)

The goal of the Inflation Probe Science Interest Group (IP SIG) is to provide quantitative metrics and assessments to NASA in regard to a future Inflation Probe mission. Specifically, the IP SIG will review and update mission science goals following current developments in the field (e.g., Planck, sub-orbital measurements), review and update information about and requirements on potential foreground contaminants and their removal, review and update requirements on and developments in control of systematic errors, and assess necessary technology developments and prioritize areas for increased technical emphasis.

Join by sending email to IPSAG-join@lists.nasa.gov with Subject="join"

Image: Time Domain and Multi-Messenger Astrophysics Science Interest Group (TDAMM SIG)

Time Domain and Multi-Messenger Astrophysics SIG

Co-chairs: Eric Burns (LSU), Rebekah Hounsell (UMBC/GSFC), Brad Cenko (NASA/GSFC), Ian Crossfield (Kansas)

The goals of the TDAMM SIG are to provide analysis and feedback to NASA on the impact of the Astronomy & Astrophysics Decadal Survey on the subfield and to identify and articulate gaps between the current state of knowledge in the subfield and the goals outlined by the Decadal Survey.

Join by sending email to TDAMM-SIG-join@lists.nasa.gov with Subject="join"

TDAMM observations cover a wide range of time-varying and multi-messenger phenomena that include detection of neutrinos and/or gravitational waves from astrophysical sources, characterization of exoplanet host stars, variable stars, fast radio bursts, and the regions closely surrounding supermassive black holes, to mention just a few.

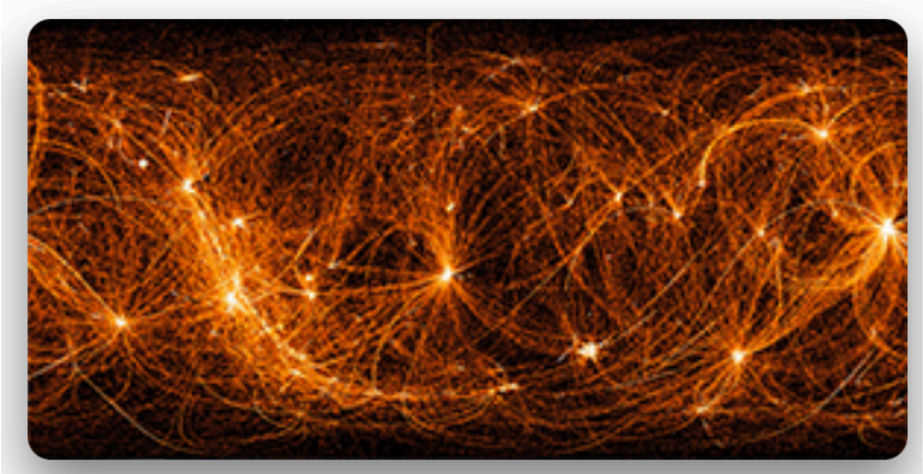

Image: NICER's Night Moves Trace the X-ray Sky. Credit: NASA / NICER

X-ray SIG

Co-chairs: Chien-Ting Chen (USRA/MSFC), Brian Grefenstette (Caltech), Kristin Madsen (UMBC/GSFC), David Pooley (Trinity)

The goal of the X-ray Science Interest Group (XR SIG) is to provide quantitative metrics and assessments to NASA in regard to future X-ray observatories. Specifically, it will track and analyze evolving science goals and requirements in X-ray astronomy, provide an active communication forum, support mission studies and concept development for future X-ray observatories, and analyze technology development and prioritization plans with respect to redefined science goals and the evolution of mission concepts.

Join by sending email to XRSAG-join@lists.nasa.gov with Subject="join"

PhysCOS Program Analysis Group Executive Committee - 2024

Fifteen Members

R. O'Brient – JPL
IP SIG

M. Errando - WU SL
GR SIG

B. Grefenstette - Caltech
XR SIG

A. Corsi – TTU
GW SIG

D. Pooley – Trinity U.
XR SIG – Vice Chair

E. Burns – LSU
TDAMM SIG

C-T. Chen - USRA
XR SIG

A. Meli – NC A&T
CR SIG & Chair

V. Miranda – Stony Brook
CoS SIG

C. Mingarelli - Yale
GW SIG

R. Hounsell - UMBC
CoS SIG

Stephanie Wissel - PSU
CR SIG

K. Madsen - GSFC
XR SIG

J. Finke - NRL
GR SIG & Chair Emeritus

J. Perkins - GSFC
GR SIG

Other “Groups” within a “Program”

Singular topics will come up that need to be studied.

This calls for the creation of a single purpose group whose goal is to address a specific question and produce one or more reports at the end of its term for the NASA Astrophysics Division Director.

We call them Science Analysis Groups, or SAGs.

Who are the SAG members?
Scientists in the community, like you!

How do I join a SAG?
There is usually a call for members when it is formed.

Who are the SAG chairs?
Scientists in the community, like you!

How many SAGs are there?
Currently, there are four in PhysCOS.

PhysCOS SAGs:

Astrophysics With Equity: Surmounting Obstacles to Membership (AWESOM SAG)

Future Innovations in Gamma Rays Science Analysis Group (FIG SAG)

New Great Observatories (NGO SAG, Cross-PAG)

TDAMM Communications Science Analysis Group (TDAMM Comm SAG)

Cross-Program SAGs

The other Programs also have their own SAGs.