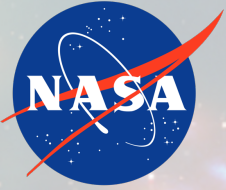


First Early Career Workshop

Nov 19-21, 2024

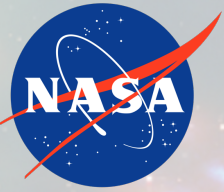


Goal of the workshop

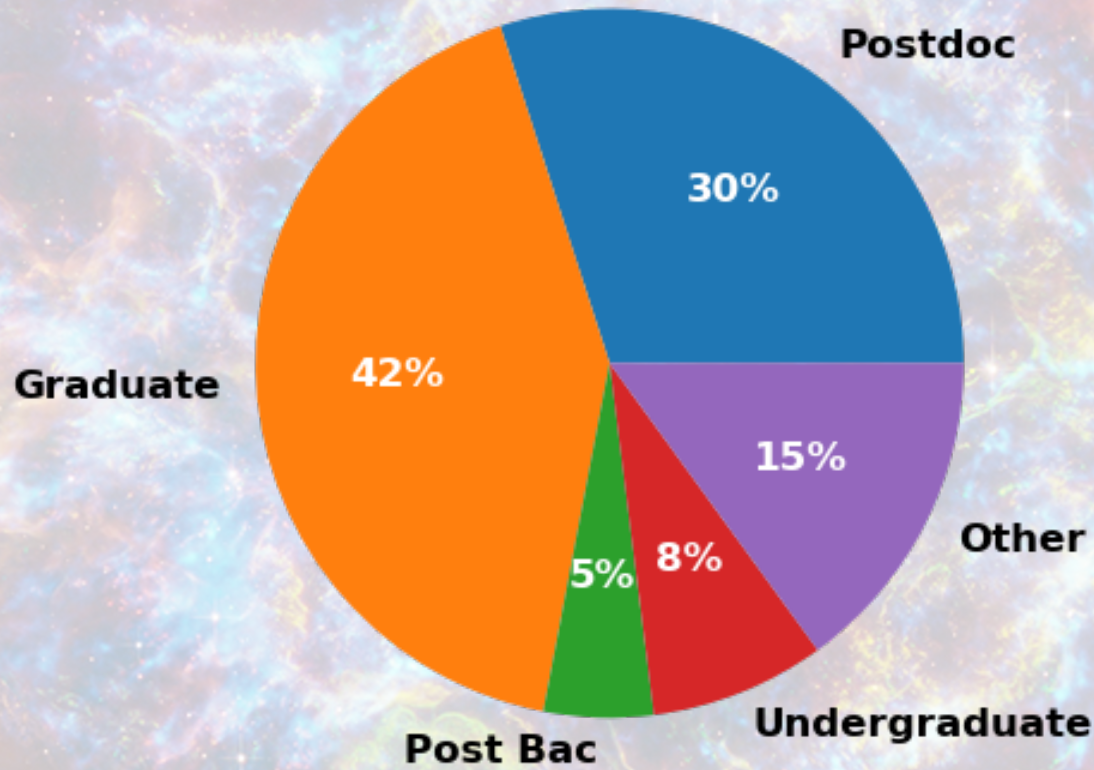


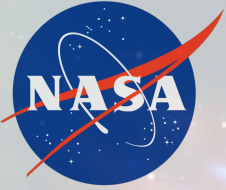
- Provide insights to early career scientists about the fascinating work done in the Physics of the Cosmos Program
- Showcase NASA Astrophysics missions
- Explain and demonstrate tools available
- Connect with other scientists
- Provide information on opportunities at NASA

**Empower the next generation of
astrophysics leaders**

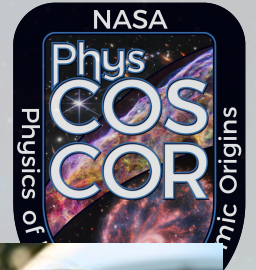


Who are you?





Who are we?



Workshop Scientific Organizing Committee

Athina Meli - (North Carolina A&T)

David Pooley - (Trinity University)

Francesca Civano (NASA GSFC)

Brian Humenski (NASA GSFC)

Bernard Kelly (NASA GSFC)

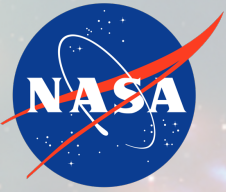


Workshop Local Organizing Committee

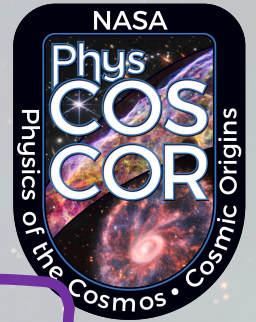
Stephanie Clark (NASA GSFC)

Pat Tyler (NASA GSFC)



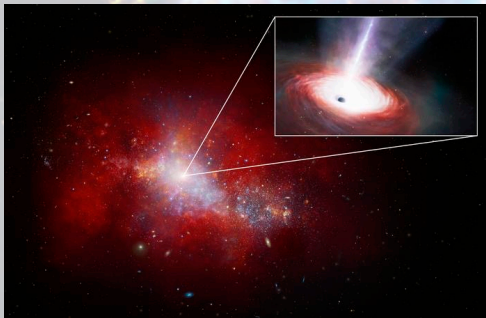


Structure of the workshop



Day 1

Science



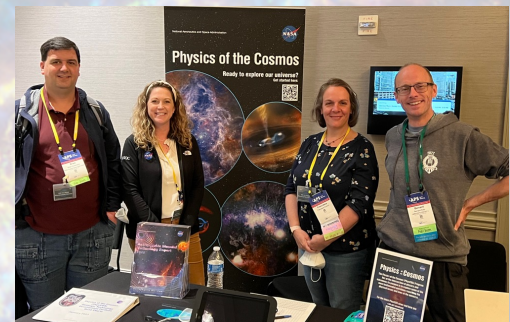
Day 2

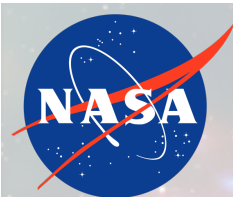
Missions and
Technology



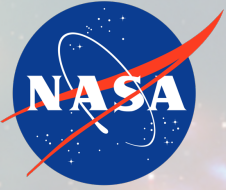
Day 3

Careers





ECW - November 2024



The Physics of the Cosmos Program



Francesca Civano and Brian Humensky

PhysCOS Chief Scientists

NASA – GSFC



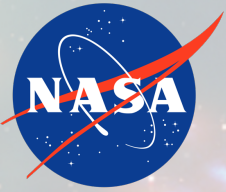
NASA Astrophysics

A vibrant, swirling cosmic scene with a child looking up. The background is a deep space filled with stars, nebulae, and a large, colorful, swirling structure that resembles a galaxy or a nebula. The colors range from deep blues and purples to bright oranges and yellows. In the foreground, a young child in a blue shirt and dark shorts stands with arms outstretched, looking up at the vastness of space. The overall mood is one of wonder and exploration.

Physics of the Cosmos
How does the universe work?

Cosmic Origins
How did we get here?

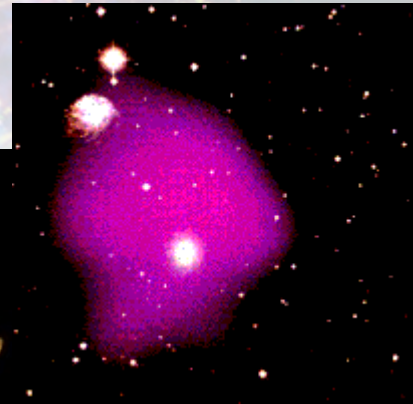
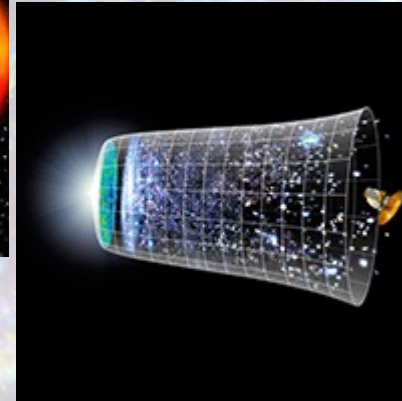
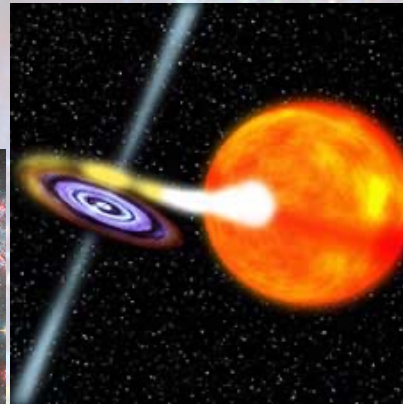
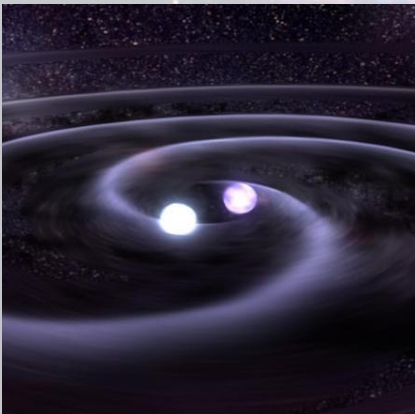
Exoplanets
Are we alone?

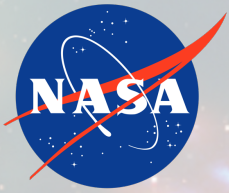


How does the universe work?



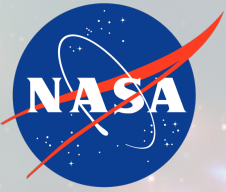
Physics of the Cosmos spans the fields of high-energy astrophysics, cosmology, and fundamental physics, to explore some of the most fundamental questions regarding the physical forces and laws of the universe:





What do we actually do?

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Provide a two-way
communication conduit
between community & NASA



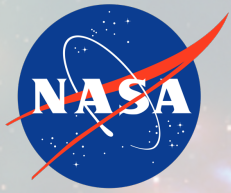
NASA
Astrophysics Division

Physics of the Cosmos
Program




Subscribe to
mailing list

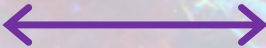




Physics of the
COSMOS
Program
Analysis Group

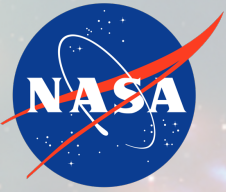
NASA 
Astrophysics Division

Physics of the Cosmos
Program 



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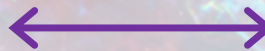
NASA
Astrophysics Division

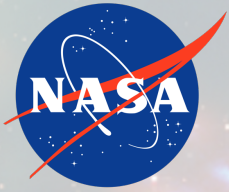
Physics of the Cosmos
Program

Physics of the
COSMOS
Program
Analysis Group

Science Interest
Groups

Science Analysis
Groups





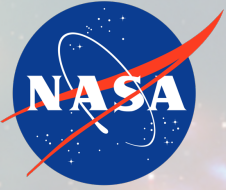
Activities



- Inform community of upcoming funding and engagement opportunities;
- Solicit community-identified science and technology gaps;
- Manage funded technology projects with benefits to PhysCOS science;
- Maintain science cognizance to enable more successful NASA strategic planning;
- Community engagement: AAS, HEAD, APS, SACNAS, NSBP

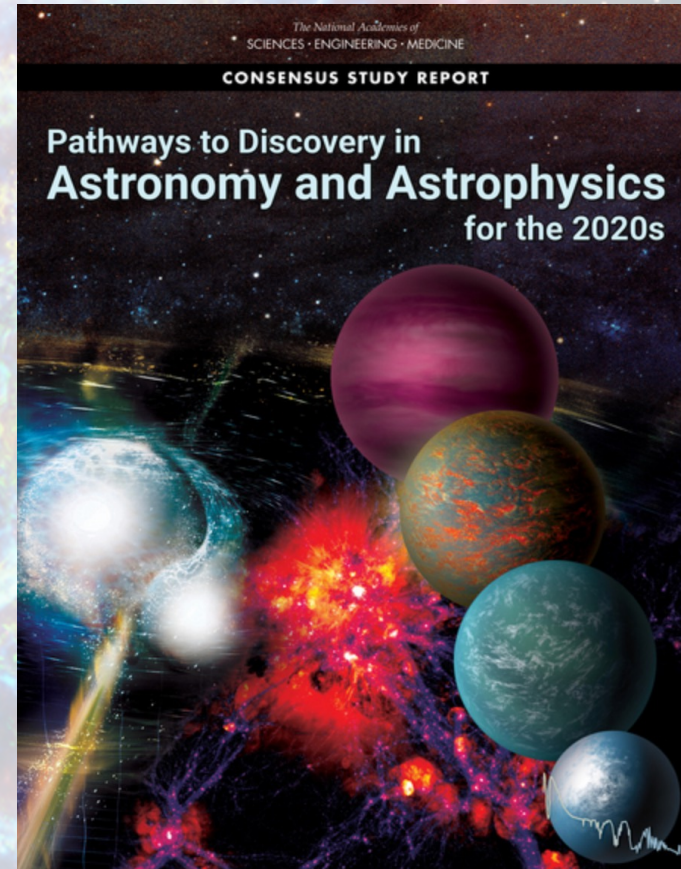


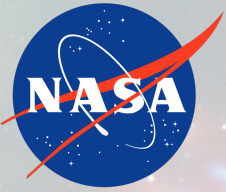
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PhysCOS & the Astro2020 Report

- What PhysCOS science should drive the design of the Future Great Observatories?
- Technology investments to enable X-ray Probes
- Infrastructure development to support coordinated observations in Time Domain and Multi-Messenger Astrophysics



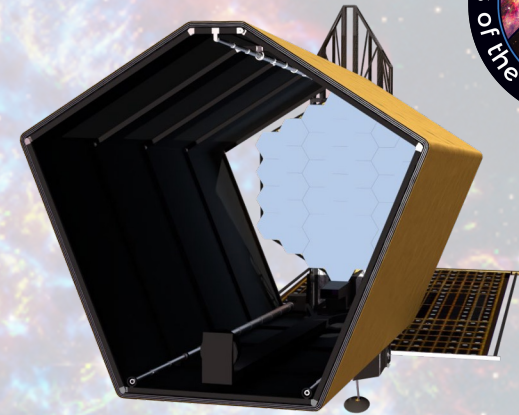
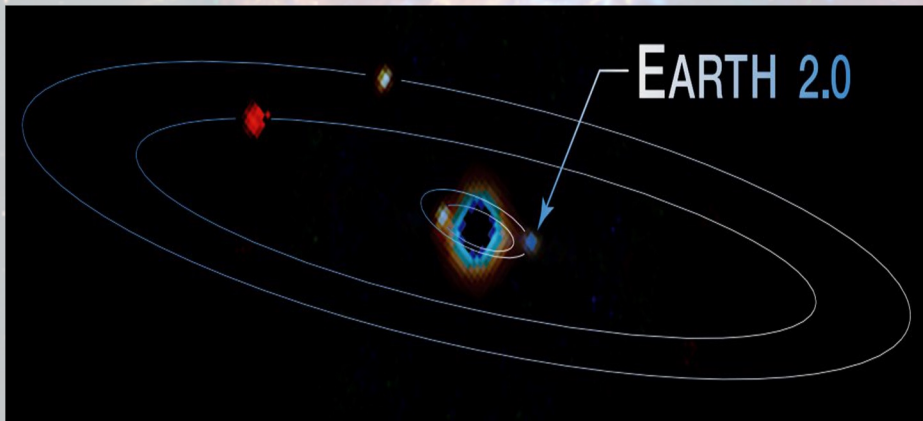


What is Habitable Worlds Observatory?

NASA's next flagship mission concept recommended by Astro2020 Decadal Survey

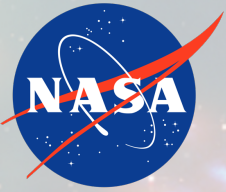


First telescope designed to search for signs of life on planets outside our solar system



Notional architecture option

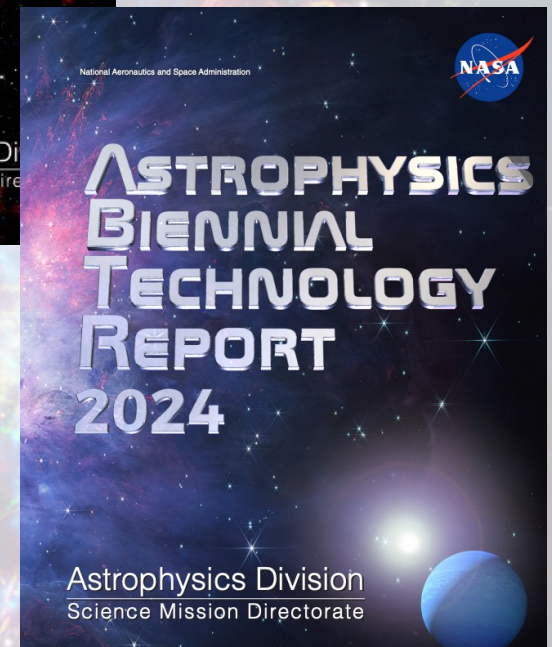
Large-aperture UV / Optical / NIR observatory performing transformative astrophysics

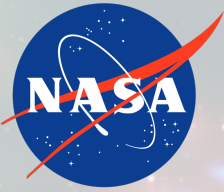


Strategic Technology Development



- The Program Office monitors and manages the PhysCOS and COR Strategic Astrophysics Technology (SAT) and direct-funded technologies
- Astro2020-related technology development (Future Great Observatories, Probes, and more)
- Conduct Technological Readiness Level (TRL) assessments





Physics of the Cosmos

Exploring fundamental questions regarding the physical forces of the universe

Due 9 February 2024

TESS Users Committee Community Survey due 19 January 2024

Technology Gaps Solicitation: Submissions d

About Physics of the Cosmos

The Physics of the Cosmos (PhysCOS) Program is one of three focused programs contained within NASA's Astrophysics Division (APD), together with Cosmic Origins (COR) and the Exoplanet Exploration Program (ExEP). PhysCOS lies at the intersection of physics and astronomy. Its purpose is to explore some of the most fundamental questions regarding the physical forces and laws of the universe: the validity of Einstein's General Theory of Relativity and 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.

Located at the Goddard Space Flight Center, the PhysCOS Program Office supports, tracks, and studies a suite of science missions and enabling technologies that focus on specific aspects of these topics. PhysCOS activities include:

- Facilitating the [PhysCOS Program Analysis Group \(PhysPAG\)](#), which comprises standing Science Interest Groups (SIGs) engaged in particular branches of high-energy astrophysics, and shorter-term Science Analysis Groups (SAGs) convened to address related science and technology topics.

<https://pcos.gsfc.nasa.gov>

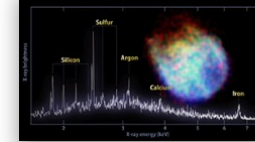
developments and funding opportunities, both within NASA technology activities.

- Soliciting, and prioritizing community-identified technology gaps that must be closed to enable or enhance future strategic Astrophysics missions with benefits to PhysCOS science. This technology gap prioritization informs APD's strategic technology development solicitation, selection, and funding.

- Managing funded technology projects with benefits to PhysCOS science.

NASA / JAXA XRISM Mission Reveals Its First Look at X-ray Cosmos

XRISM Resolve's Recipe for Supernova Remnant N132D



The Japan-led XRISM (X-ray Imaging and Spectroscopy Mission) observatory has released a first look at the unprecedented data it will collect when science operations begin later this year.

"XRISM will provide the international science community with a new glimpse of the hidden X-ray sky," said Richard Kelley, the U.S. principal investigator for XRISM at NASA's Goddard Space Flight Center in Greenbelt, Maryland. "We'll not only see X-ray images of these sources, but also study their compositions, motions, and physical states." [Read more >](#)

News

10 January 2024

