

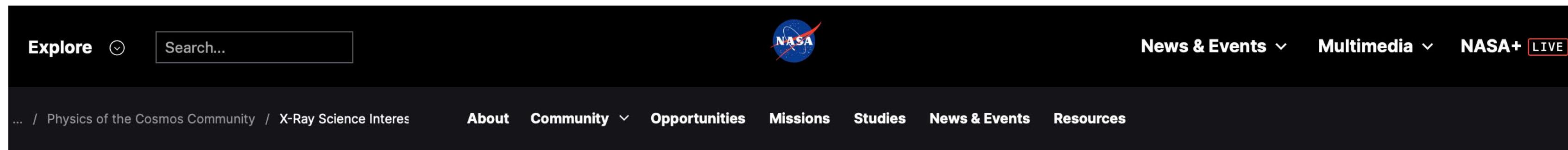
NASA's Physics of the Cosmos Program X-Ray Science Interest Group

Splinter Session at AAS 247

XR SIG co-chairs: Breanna Binder (Cal Poly Pomona), Chien-Ting Chen (USRA/MSFC), Steven Ehlert (MSFC),
Fabio Pacucci (CfA), David Pooley (Trinity / Eureka Sci.)

New website

<https://science.nasa.gov/astrophysics/programs/physics-of-the-cosmos/community/xr-sig/>



The screenshot shows the top navigation bar of the NASA Astrophysics website. It includes a 'Explore' button with a dropdown arrow, a search bar, the NASA logo, and top-level navigation links: 'News & Events', 'Multimedia', and 'NASA+' with a 'LIVE' indicator. Below the main navigation, a secondary navigation bar shows the current page path: '... / Physics of the Cosmos Community / X-Ray Science Interes' and a list of categories: 'About', 'Community', 'Opportunities', 'Missions', 'Studies', 'News & Events', and 'Resources'.

Science Interest Group

X-Ray

The X-Ray Science Interest Group (XR SIG) serves as an active communication forum for X-Ray astrophysics. XR SIG is open to the scientific community.

About

[Join the X-Ray SIG Email List](#)

Leadership

[News & Events](#)

Documents

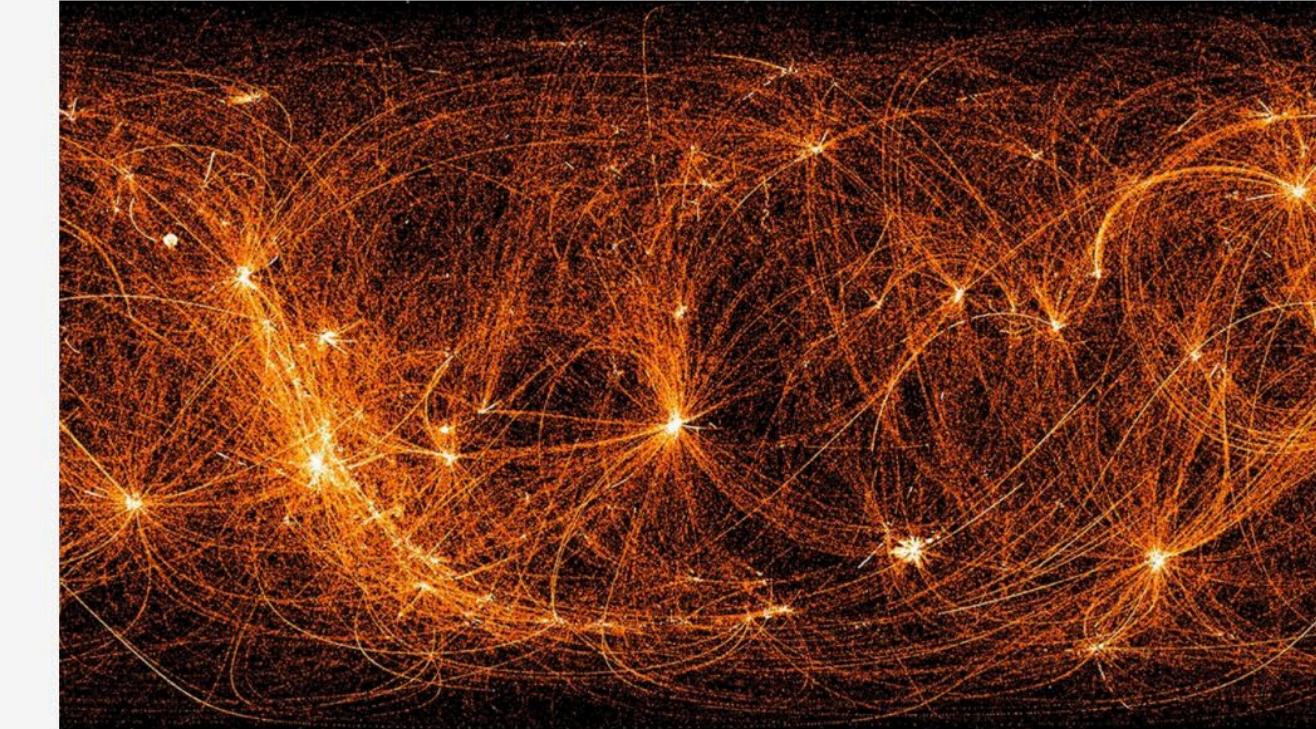
About XR SIG

Supporting Mission Studies and Concept Development for Future X-Ray Observatories

The X-Ray Science Interest Group (XR SIG) will provide quantitative metrics and assessments to NASA with regard to future X-Ray observatories.

XR SIG will track and analyze evolving science goals and requirements in X-Ray astronomy, especially as current hot topics evolve. XR SIG will also analyze technology development and prioritization plans and assist the Physics of the Cosmos Program Analysis Group in determining technology needs.

[The X-Ray Sky](#)



This image of the whole sky shows 22 months of X-ray data recorded by NASA's Neutron star Interior Composition Explorer (NICER) payload aboard the International Space Station during its nighttime slews between targets. NICER frequently observes targets best suited to its core mission ("mass-radius" pulsars) and those whose regular pulses are ideal for the Station Explorer for X-ray Timing and Navigation Technology (SEXTANT) experiment. One day they could form the basis of a GPS-like system for navigating the solar system.

Credits: NASA/NICER

Agenda

Focus on SAG Updates & Plans

- Overview / Motivation / History — David Pooley (Trinity University & Eureka Scientific, Inc.)
- BBX SAG — chairs Chien-Ting Chen (USRA/MSFC), Kristin Madsen (GSFC), Daniel Stern (JPL/Caltech)
- Lynx 2030+ SAG — chairs Steven Ehlert (MSFC), Fabio Pacucci (CfA | Harvard & Smithsonian)
- HiReX SAG — chairs Breanna Binder (Cal Poly Pomona), Herman Marshall (MIT), Mark Schattenburg (MIT), Kim Weaver (GSFC)
- Q&A

Motivation / History

ensure a viable and exciting future for X-ray astrophysics

- August 2023: APD Director informs *Chandra* Users' Committee about coming cuts; magnitude uncertain
- February 2024: NASA immediately cuts *Chandra* funding; GO budget reduced by 30%
- March 2024: NASA portion of FY25 PBR effectively cancels *Chandra* mission (confirmed by OPCR)
- August 2024: under Congressional pressure, NASA keeps *Chandra* operating; GO funding eventually restored
- Winter 2024: initial thinking about Astro2030 prep begins; three SAGs envisioned to start in early 2025
- February 2025: NASA PAGs and subsidiary groups (including XR SIG) pause activities; DOGE arrives at NASA
- March 2025: NASA's Astrophysics Advisory Committee (APAC) is abolished (no longer a clear way to start a SAG)
- April 2025: “skinny budget” leaked with proposed 66% cuts to APD (all science in U.S. faces existential threat)
- Summer/Fall 2025: Senate and House approps bills support science in general, APD and *Chandra* in particular
- October 1 to November 12, 2025: longest government shutdown in history
- Now: appropriations bills still not passed; budget uncertainty continues

Throughout 2025: almost no direction from APD on Astro2030 preparations because of uncertainty.

Motivation / History

ensure a viable and exciting future for X-ray astrophysics

- Early in 2025, we realized that we could not afford to wait for clarity; too much time would be lost.
- April 2025: drafted Terms of Reference for three SAGs (despite no APAC)
- Reasoning: without clear direction from APD on whether there would be full STDTs for mission concepts, we realized we could use the framework of the PhysPAG to lay the groundwork for future mission studies.
- The PhysCOS Program Office cannot support a full STDT, but it can support the XR SIG forming focused SAGs.
- These SAGs will deliver reports to the APD Director, and those will help inform APD activities for Astro2030.
- We also began the Future of X-ray Astrophysics online seminar series (roughly biweekly, started 2025 Aug 8)

<https://science.nasa.gov/astrophysics/programs/physics-of-the-cosmos/community/xr-sig/>

recordings and
slides here

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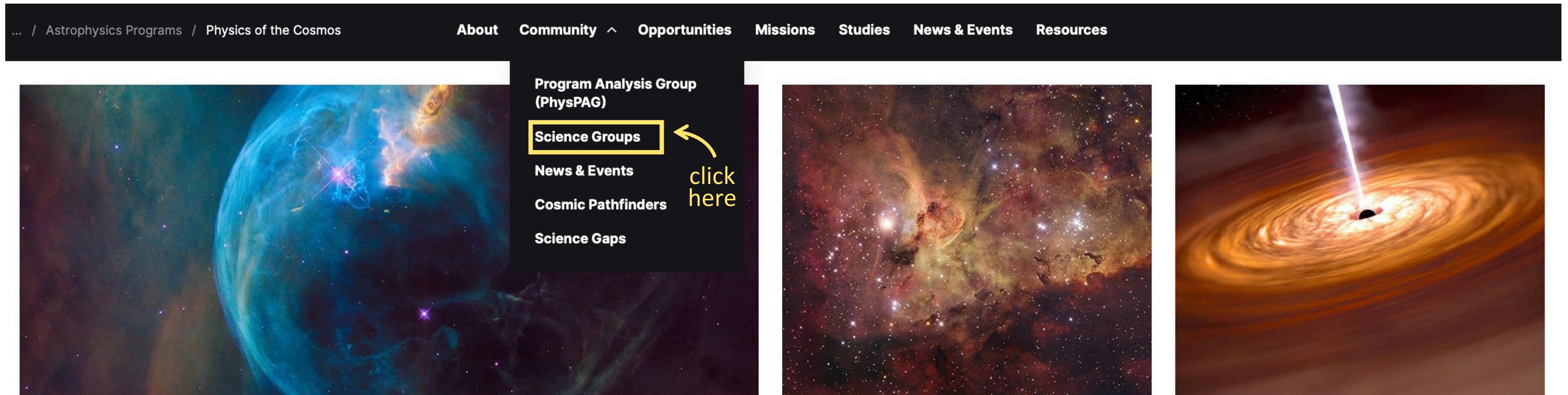
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More Information on SAGs

go to <https://science.nasa.gov/astrophysics/programs/physics-of-the-cosmos/>



The screenshot shows the top navigation bar of the Physics of the Cosmos website. The menu items are: About, Community, Opportunities, Missions, Studies, News & Events, and Resources. Below the menu, there is a sidebar with the text "Program Analysis Group (PhysPAG)" and a list of links: Science Groups, News & Events, Cosmic Pathfinders, and Science Gaps. The "Science Groups" link is highlighted with a yellow box and a yellow arrow points to it with the text "click here". The background of the sidebar features a blue and orange nebula image. To the right of the sidebar, there are two images: a star-forming region in the Orion Nebula and a black hole with an accretion disk.

Physics of the Cosmos

The Physics of the Cosmos (PhysCOS) Program seeks to answer some of the deepest questions about the universe. How do matter and energy behave in the most extreme corners of the cosmos — near black holes, neutron stars, and the first moments after the Big Bang? What forces set the universe in motion and continue to shape its growth? What are the hidden ingredients — dark matter and dark energy — that make up most of the universe but remain invisible to us? PhysCOS seeks to uncover these mysteries, helping us better understand the cosmos and our place within it.

More Information on SAGs

each SAG page has detailed information, including how to join

Science Analysis Group

Broad-Band X-ray Observatory

The Broad-Band X-ray (BBX) Science Analysis Group (SAG) will focus on identifying the scientific opportunities that require coverage beyond the typical capabilities of focusing soft X-ray facilities like Chandra, XMM-Newton, and Swift/XRT. Membership, including volunteers from the PhysPAG and broader astrophysics and technology communities, is open.

About BBX SAG

Astrophysics Will Critically Need a High Angular Resolution Broad-Band X-ray Mission

Possibilities to be explored include a flagship-class mission with multiple instruments, or multiple missions operating in tandem.



Science Analysis Group

Lynx 2030

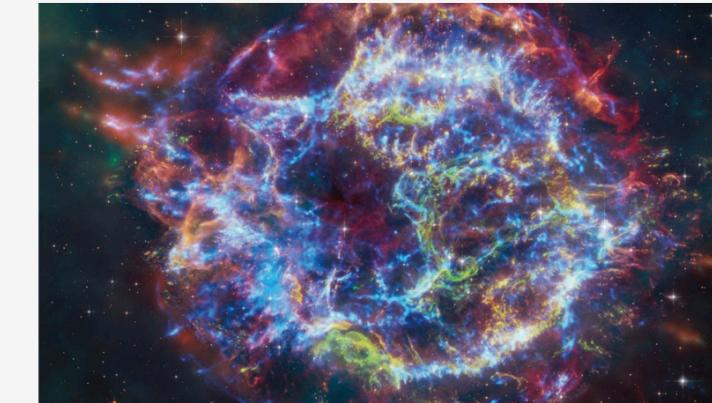
The Lynx 2030 Science Analysis Group (SAG) will investigate the science case of an updated flagship X-ray observatory concept based heavily on the Lynx mission submitted for the 2020 Decadal Astronomy Study. This SAG has open membership, including volunteers from PhysPAG and the broader astrophysical community.

About Lynx 2030 SAG

Lynx 2030 SAG Will Build On the Work of the Lynx Concept Study Report

The Lynx concept study report is an excellent baseline for what the flagship X-ray mission submitted to the 2030 Decadal Survey may look like.

The primary goal of this Science Analysis Group is to revisit the Lynx science portfolio and reference design model in the context of the current astronomy landscape.



Science Analysis Group

High Angular Resolution X-ray Imager

The High Angular Resolution X-ray Imager SAG will address the scientific opportunities enabled by ultra-high angular resolution X-ray imaging across broad scientific categories. Hi-ReX SAG membership is open to the astrophysics and technology communities.

About Hi-ReX SAG

Scientific Analysis for an Ultra-High Angular Resolution X-ray Imager Observatory

Recent advances in X-ray optics, precision formation flying, and high-resolution detectors have made it feasible to pursue milli- to micro-arcsecond (mas to pas) imaging in the X-ray band. Such capability would exceed Chandra's angular resolution by more than two orders of magnitude and could enable transformative discoveries across a broad spectrum of high-energy astrophysics.



