

Toward the 2030 Decadal Science Cases for Potential Future X-ray Mission Concepts

**Special Session at AAS 248 by the
X-ray Science Interest Group (XR SIG)**
part of NASA's Physics of the Cosmos Program Analysis Group (PhysPAG)

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.), Scott Randall (CfA)

2026 June 17

Agenda

- Introduction (Dave Pooley, Breanna Binder) — 10 minutes
- HiReX SAG (Kim Weaver, Scott Randall, Herman Marshall) — 20 minutes
- Lynx2030 SAG (Steven Elhert, Fabio Pacucci) — 20 minutes
- BBX SAG (Chien-Ting Chen, Kristin Madsen, Daniel Stern) — 20 minutes
- X-ray Timing SAG (Tom Maccarone) — 20 minutes

Recap & Updates

- To prepare for the next decadal, XR SIG began forming Science Analysis Groups (SAGs) in early 2025 to identify key science cases for future missions.
 - Sessions at HEAD22 in St. Louis (Oct. 2025) and at AAS 247 in Phoenix (Jan. 2026)
- The original output of those SAGs were to be ~15-page reports, due in summer 2026.
 - That is still the plan, and most of this session will feature updates from the SAGs.
- NASA caught up to XR SIG in March 2026, and Astrophysics Division (APD) announced the ASTRA Initiative, which includes
 - Formation of an STD T for a future X-ray flagship mission “soon”
 - Input from the community, through the Program Analysis Groups (PhysPAG, COPAG, ExoPAG), to provide feedback on a small set (4 to 6) of strategic (>\$1b) mission concepts for consideration as entrants into the ASTRA technology incubator program.

Recap & Updates

- SORRY, WE DO NOT HAVE ANY UPDATES ON THE X-RAY FLAGSHIP STDT. Its formation status remains “soon.”
- In response to the ASTRA Initiative, some SAGs are also submitting Mission Concept Templates to ASTRA, in addition to completing their reports.
- Mission concept ideas do not have to come from a SAG. Anyone is welcome to submit a Mission Concept Template to ASTRA.

<https://science.nasa.gov/astrophysics/programs/physics-of-the-cosmos/studies/astra-initiative/>

Submit Your Concept

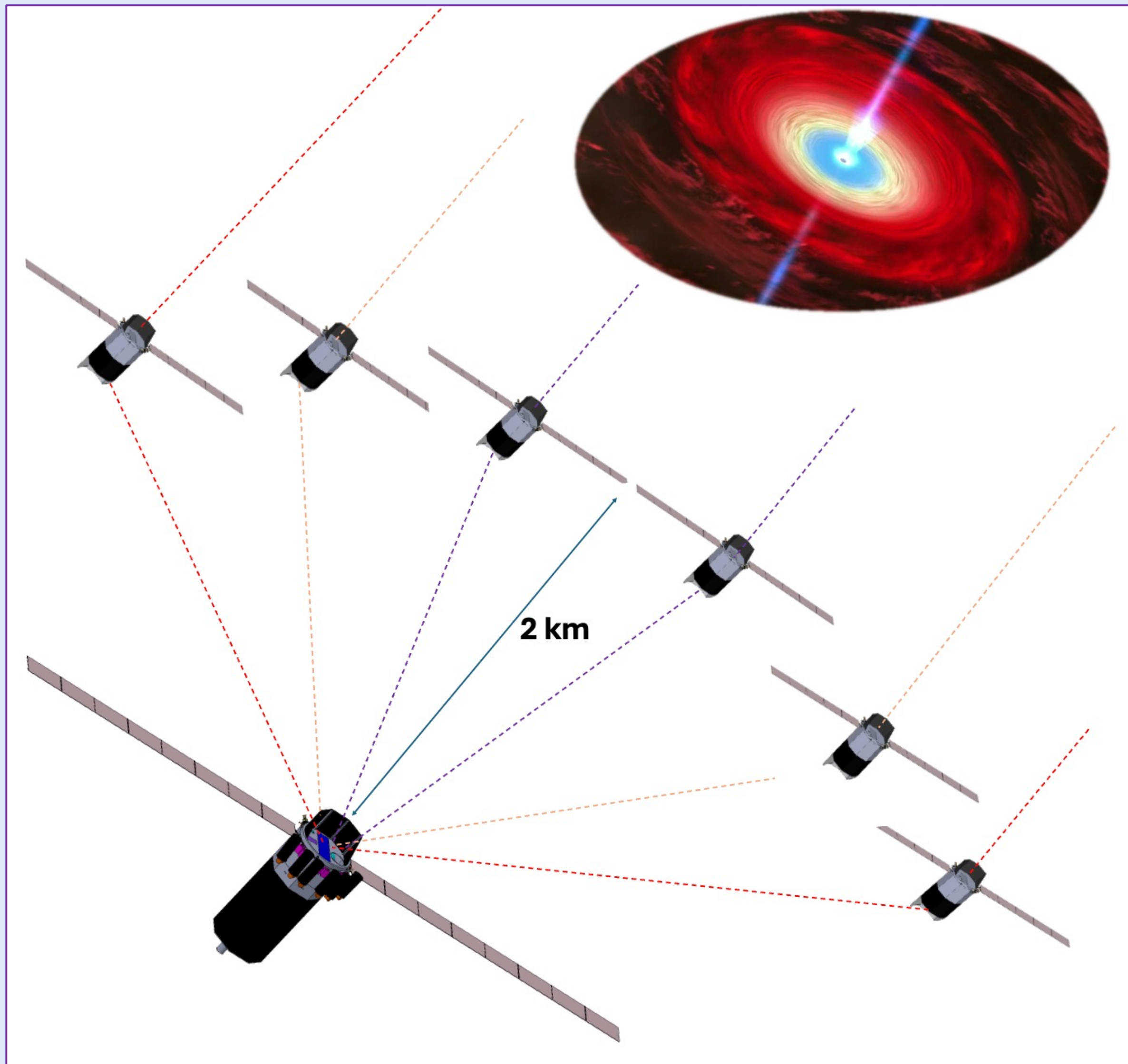
ExoPAG, COPAG, and PhysPAG request input from the community in the form of brief Concept Study Description documents.

- A template is provided [here](#).
- We request that Concept Study Descriptions are submitted using [this form](#).

The deadline for submission is **11:59 pm PT on 26 June 2026**.

XR SIG asked via email if any teams would like to be highlighted today.

The Accretion Explorer Interferometer (AEI)



X-ray interferometer with μas angular resolution

- * **Formation flying** array; $\sim 0.7\text{--}2.2\text{ keV}$, $\sim 5\text{--}7.5\text{ keV}$
- * **100 picometer** precision along science boresight (with LISA telescope adaptation; microthruster technology)
- * **Two** X-ray spotting telescopes for target acquisition, have $\sim 0.1''$ and $\sim \text{mas}$ angular resolution
- * **Area** (preliminary) $\sim 100\text{ cm}^2$; exposures of days to weeks
- * **FoVs**: span from $\sim 100 \times 400\ \mu\text{as}$ to $\sim 0.3'' \times 0.3''$ to $\sim 10' \times 10'$

Science includes SMBH (accretion, corona), dual and binary AGN, jets, stellar flares and exoplanet habitability

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Relative Beam Combiner throughput vs Baseline

