



Lynx 2030: Getting Involved

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Intention of this Speaker Series



The Astronomy Mid-Decade Review is coming, and the next Decadal Study will soon follow behind it. The XRSIG wants to make sure X-ray astronomy is properly represented.

The XRSIG is putting together three Special Analysis Groups (SAG's) for different possible architectures. One of these SAG's is for a mission similar in architecture to the Lynx flagship submitted to the 2020 Decadal.





A (far-too) brief description of Lynx



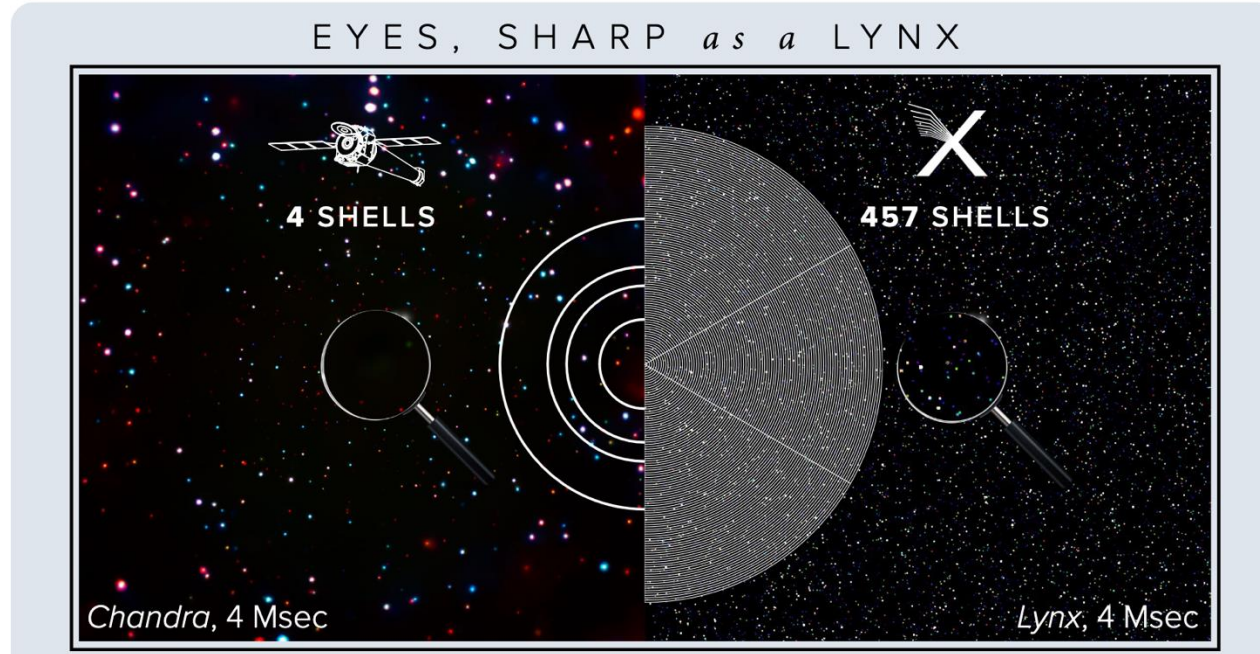
The Science Drivers of Lynx



1. The Dawn of Black Holes
 - High redshift AGN
 - Population studies of AGN at redshifts of $z \sim 1-2$
 - Low mass black hole seeds in the Milky Way
2. The Drivers of Galaxy Evolution
 - The cosmic web
 - The circumgalactic medium
 - AGN feedback
3. Stellar Evolution and Ecosystems
 - High mass stars and star formation in the Milky Way
 - Stellar winds and coronae
 - High resolution spectroscopy of supernova remnants



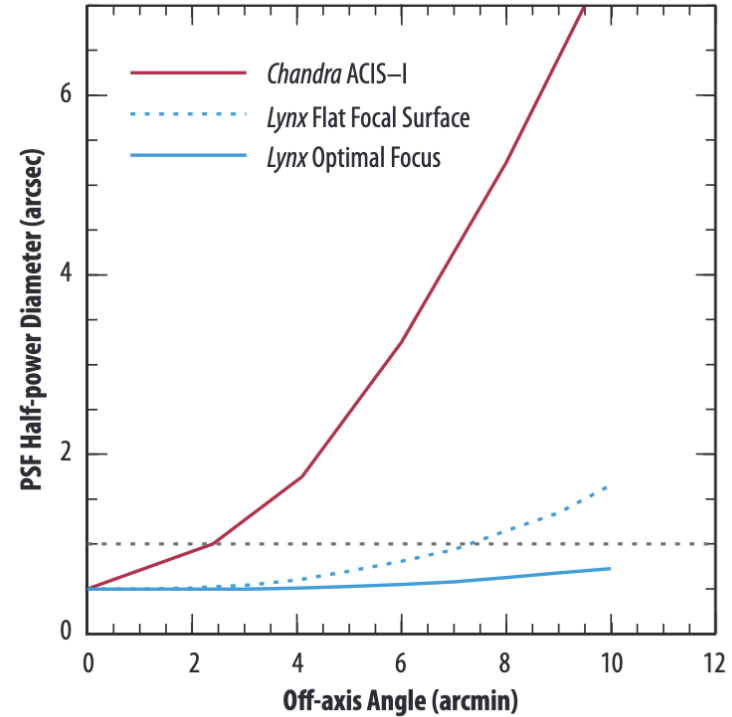
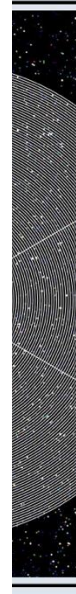
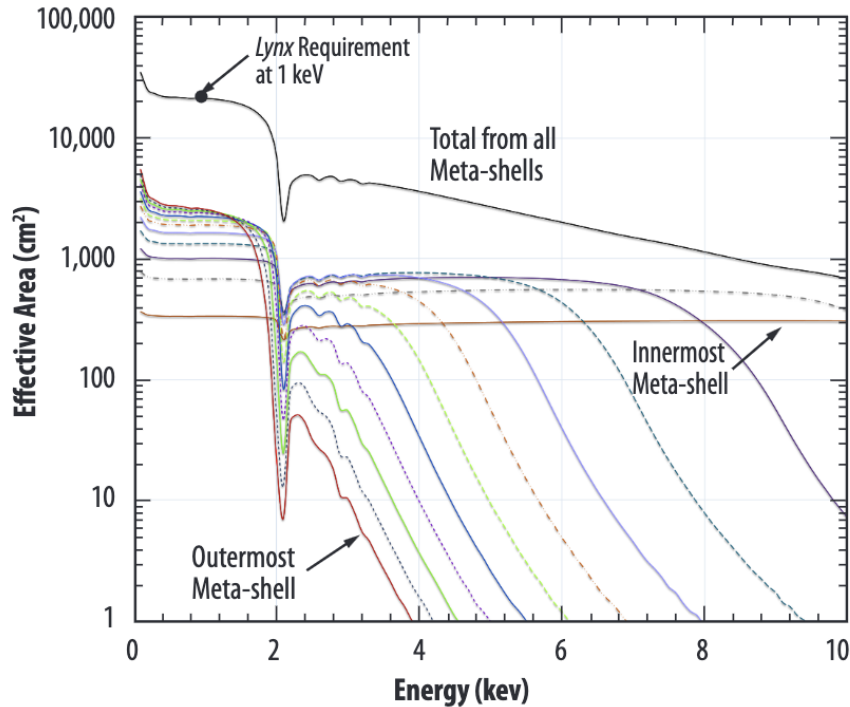
Lynx 2020 Mission: Mirrors



Lynx 2020 Mission: Mirrors



EYES, SHARP *a s a* LYNX

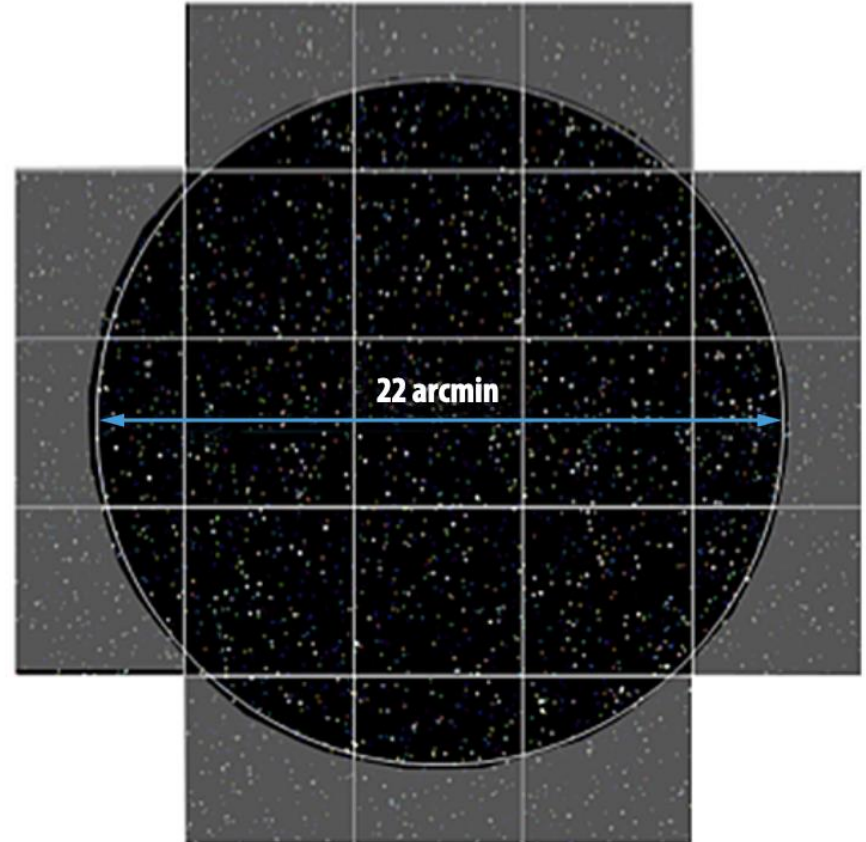


Lynx 2020 Mission: Imaging Detector

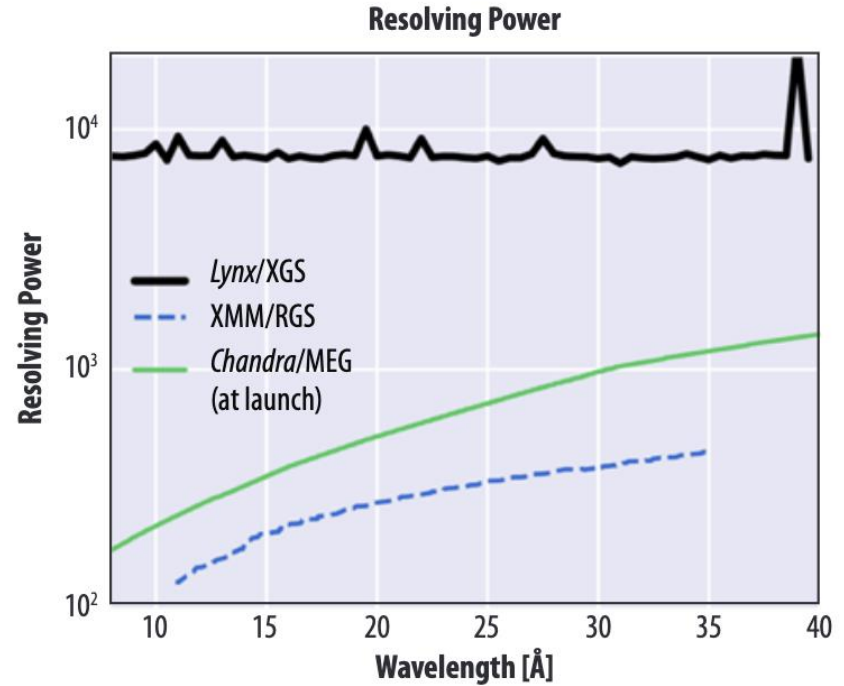
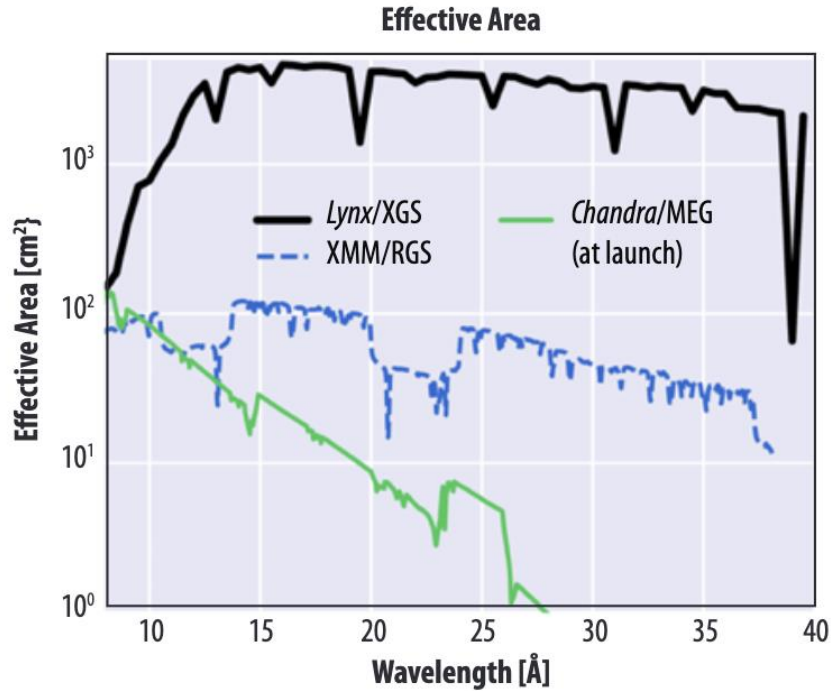


Multiple CMOS chips with:

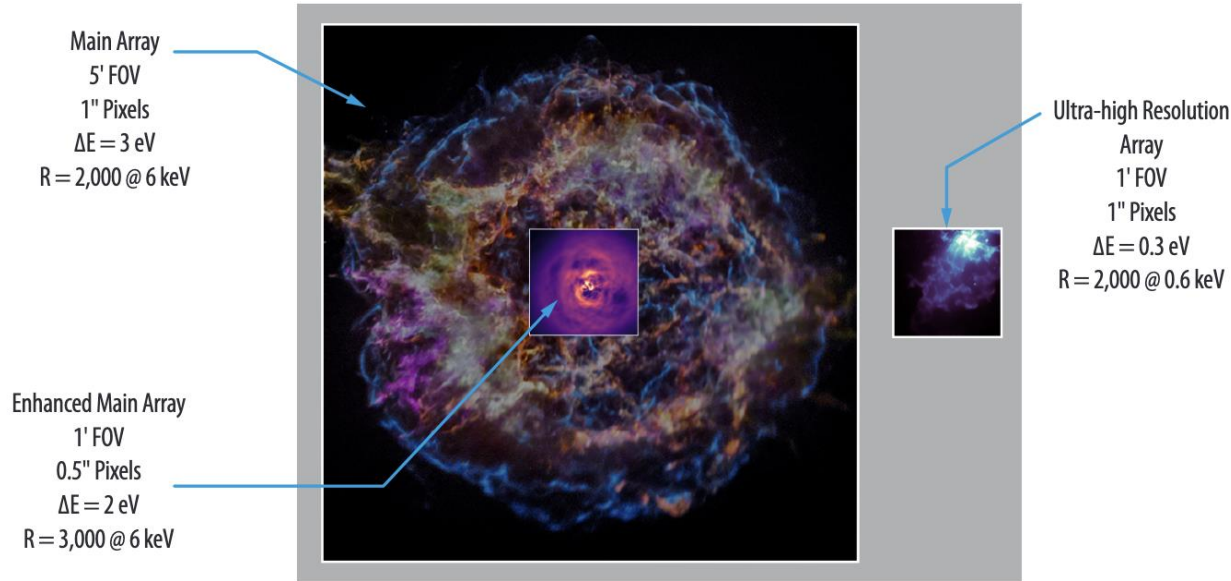
- 0.33" pixels
- 100 frame/s readout for full FOV
- 0.2-10 keV bandpass



Lynx 2020 Mission: Grating Spectrometer



Lynx 2020 Mission: Microcalorimeter



The Lynx microcalorimeter has many more TES's than XRISM or NewAthena, with subarrays designed to trade off FOV with energy resolution.



Key Question of the Lynx SAG



Are there adjustments/augmentations to the Lynx architecture that make for a better mission for the 2030 Decadal? There are several dimensions to consider:

1. New scientific discoveries have been made.
2. New detector technologies have been developed.
3. The current and future fleet of missions is different than anticipated in 2019.



Primary Studies of SAG



The XRSIG has identified a few key questions centered on understanding what new science could be done with different variations. What new science could be unlocked with:

1. Higher angular resolution (0.2", 0.1", and 0.05")?"
2. A broader bandpass (down to 100 eV or up to 20 keV)?
3. A larger field of view?
4. A microcalorimeter array with ultra-high energy resolution (< 2 eV) across the entire field of view?
5. Additional capabilities such a polarization-sensitive detector?

Additional studies could added/subtracted within the group.



The Mission Landscape

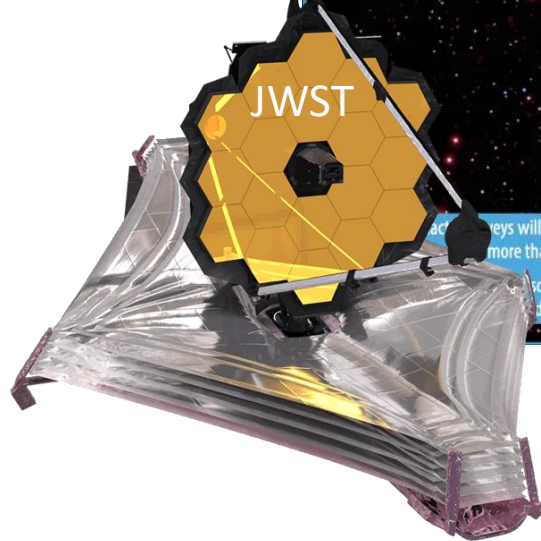


AXIS answers the big questions posed by the Astro2020 Decadal Survey

AXIS Deep Extragalactic Survey

The AXIS Science Pillars

Astro 2020 asks...	...AXIS answers
Why X-rays?	Why AXIS?
Pillar 1: "What seeds supermassive black holes and how do they grow?"	
AXIS determines the origin of massive black holes X-rays identify clean census of black holes in distant JWST galaxies AXIS' PSF and large area enable imaging of distant, faint sources	
Pillar 2: "How do gas, metals, and dust flow into, through, and out of galaxies?"	
AXIS shows how supernovae and AGN transform X-rays uniquely probe the million-degree gas High resolution imaging separates diffuse gas and	



Current Status of NASA Astrophysics



1. President's Budget Request is apocalyptic for NASA SMD/APD.
2. Current House and Senate budgets for NASA buy back most of those cuts, including an explicit line item for Chandra
3. Situation remains precarious.
4. Predictions are hard, especially about the future.
5. APD still wants to keep the mid-decadal and decadal surveys on schedule



Summary/Conclusions



1. We need start preparing for 2030 Decadal now.
2. Lynx architecture is a great place to start.
3. A SAG is being propped up to study how to iterate on Lynx capabilities for 2030.
4. The priority right now is building the science case.
5. We welcome the entire community's input!

