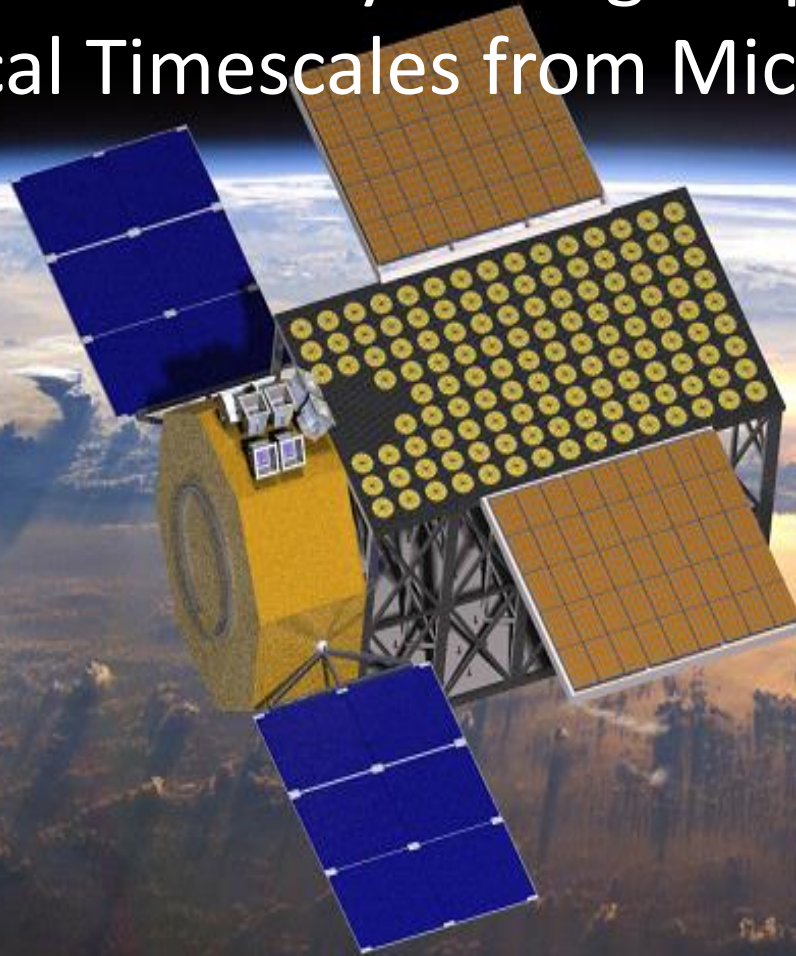
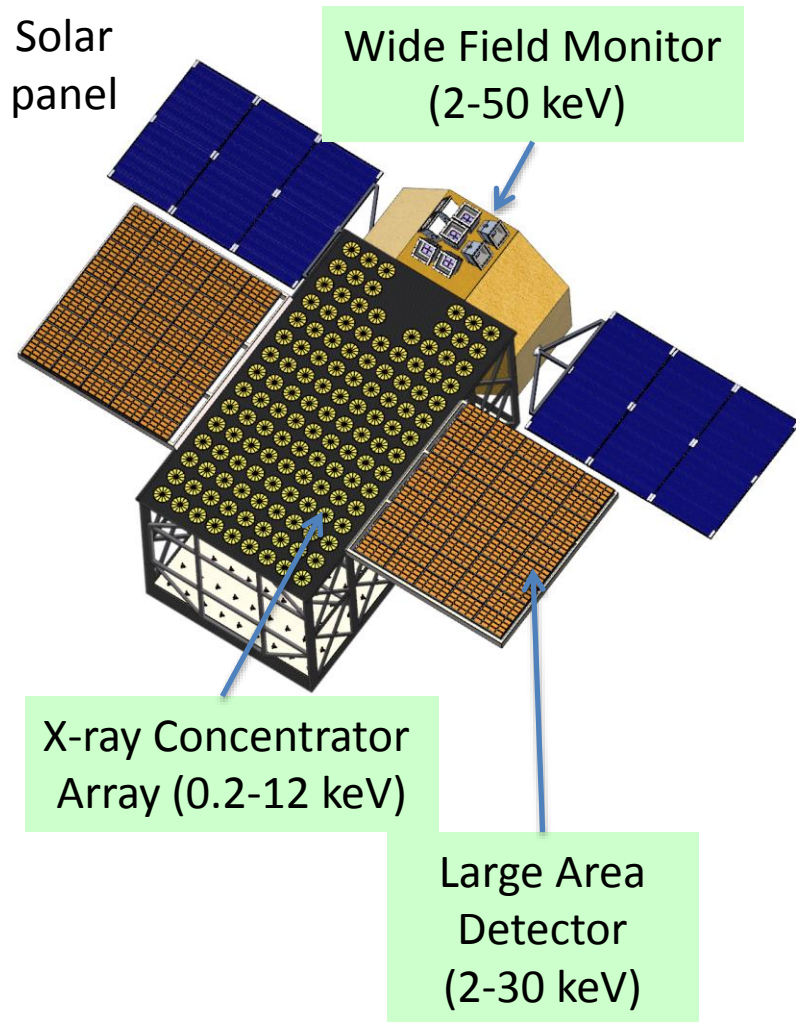


# STROBE-X: X-ray Timing & Spectroscopy on Dynamical Timescales from Microseconds to Years

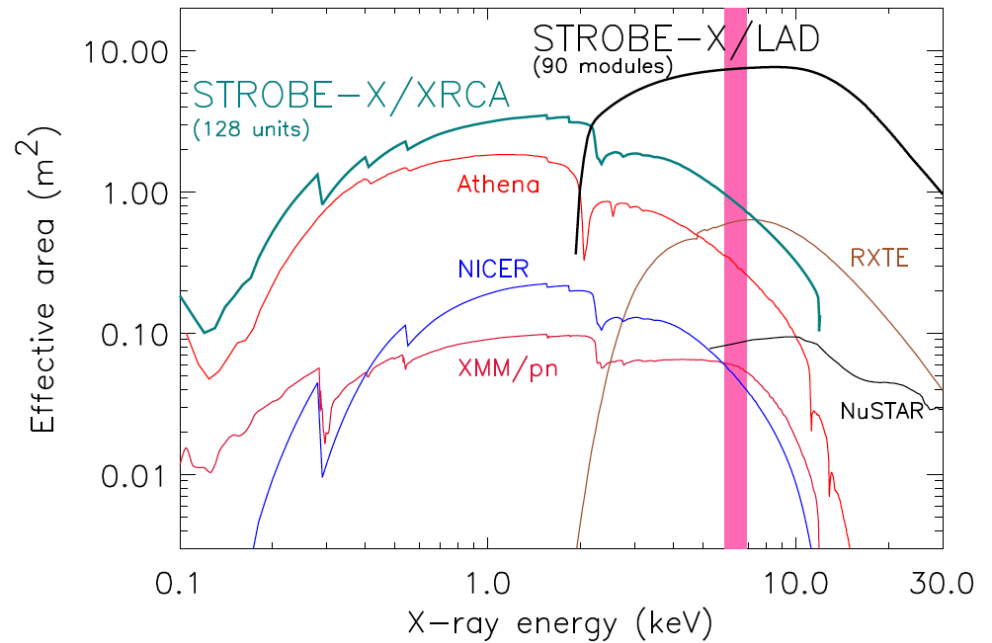


**Colleen A. Wilson-Hodge (NASA/MSFC), Paul Ray (NRL), Keith Gendreau (NASA/GSFC), Deepto Chakrabarty (MIT), Marco Feroci (INAF-IASF/INFN), Tom Maccarone (TTU), Zaven Arzoumanian (CRESST/GSFC), Ron Remillard (MIT), Kent Wood (Praxis/NRL), Christopher Griffith (NRC/NRL), Peter Jenke (UAH)**

# Spectroscopic Time-Resolving Observatory for Broadband Energy X-rays (STROBE-X)



Large effective area  $10\text{m}^2$  @ 6 keV

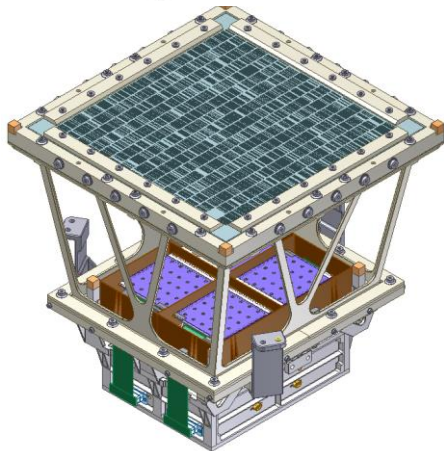


STROBE-X combines the strengths of NICER and LOFT: High throughput X-ray timing with good spectroscopy

# STROBE-X Instruments

## X-ray Concentrator Array

- Concentrator optics and detectors, scaled up from NICER
- Energy resolution: 85-175 eV FWHM
- Effective area @ 1.5 keV: 3.4 m<sup>2</sup>



## Large Area Detector

- SDDs and micropore collimators from ESA's LOFT M3 & M4
- Energy resolution: 200-240 eV FWHM
- Effective Area @ 10 keV 7.6 m<sup>2</sup>

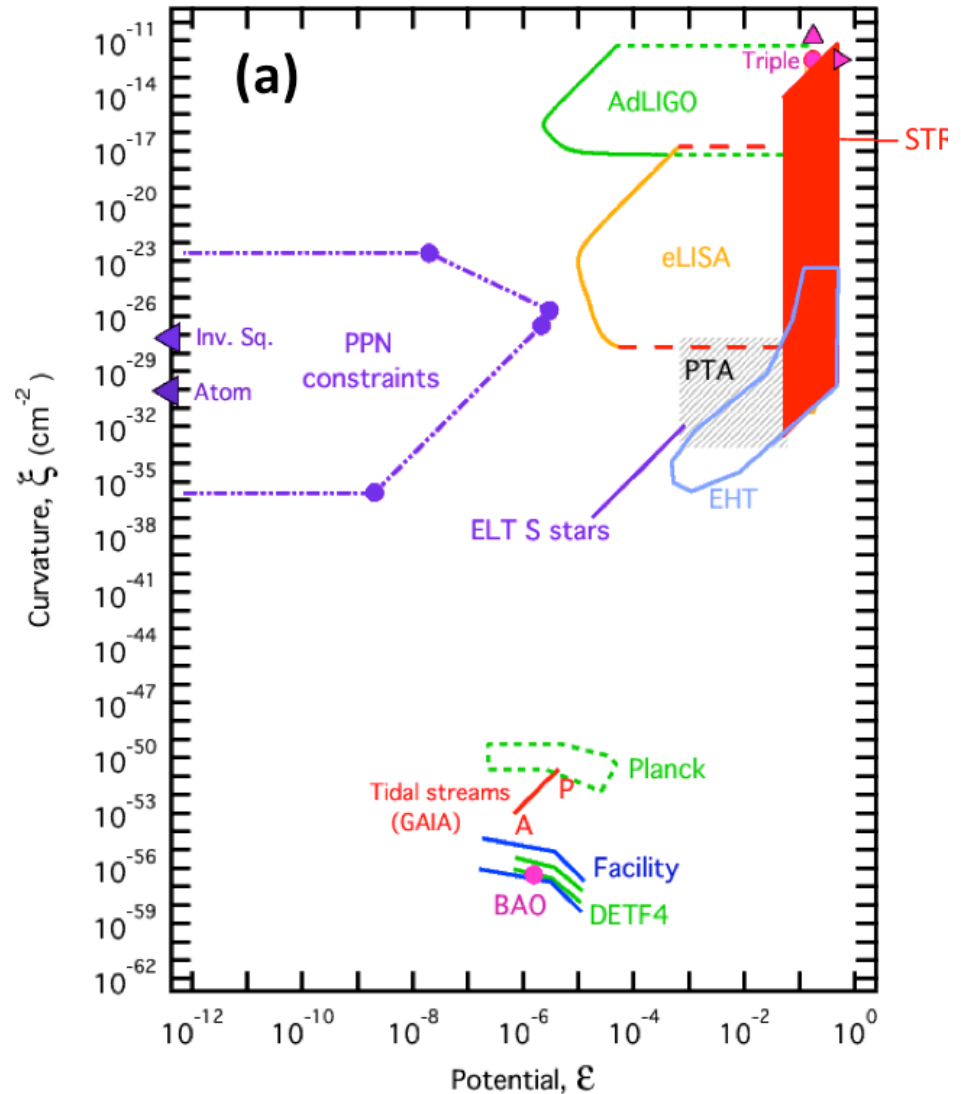
## Wide Field Monitor

- LOFT SDDs and mask
- Energy resolution: 300 eV FWHM
- Instantaneous FoV: 1/3 of sky



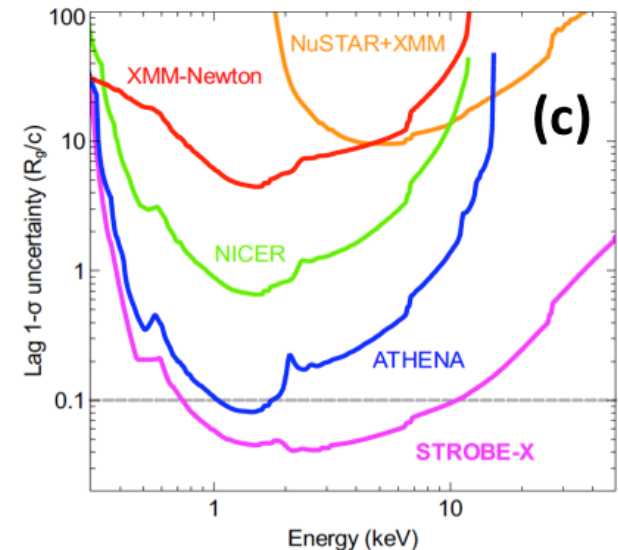
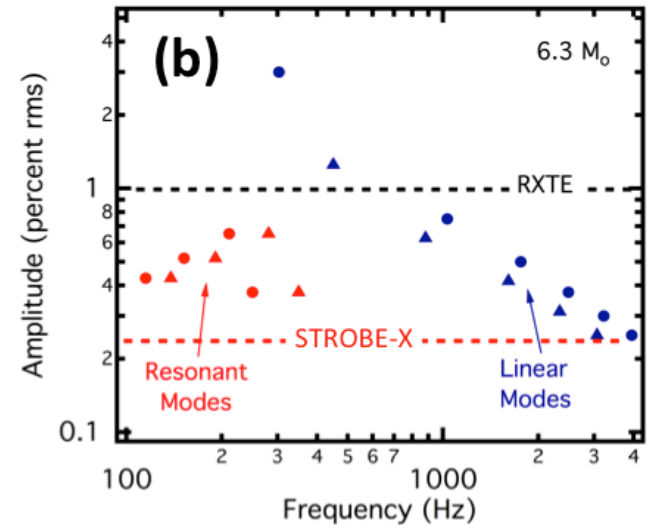
# STROBE-X Black Hole Science

- Probes stationary spacetimes near black holes to explore effects of strong gravity
- Complementary to gravitational wave measurements that probe dynamic spacetimes

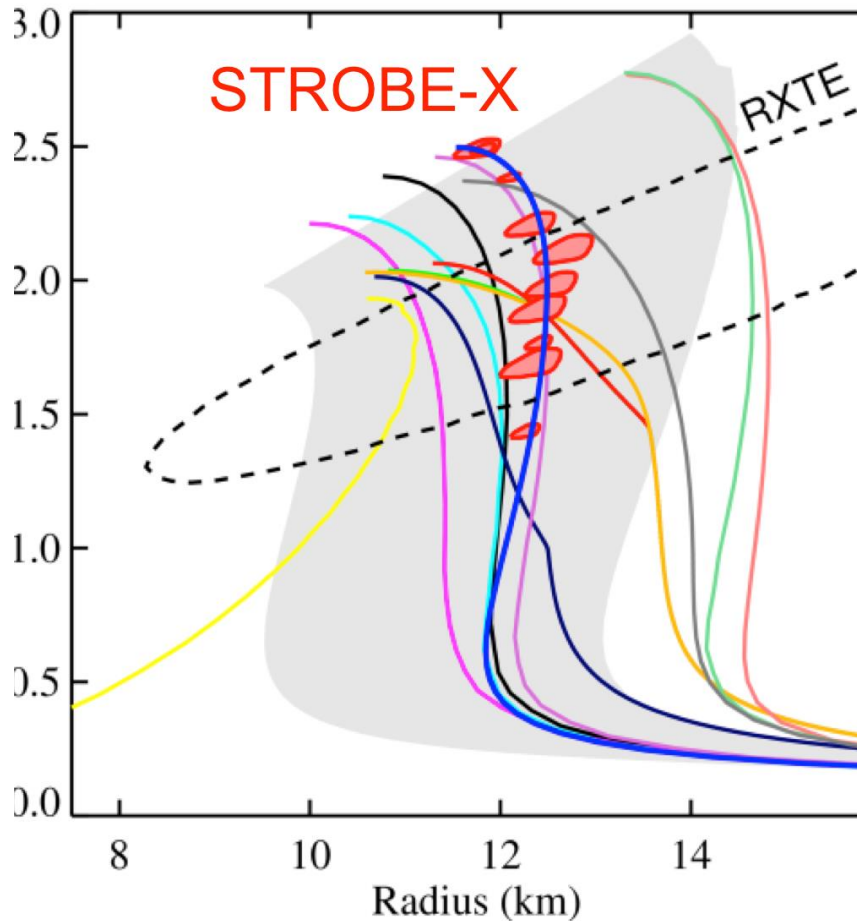


# STROBE-X Black Hole Science

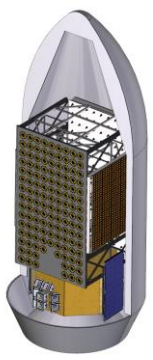
- Measures BH spin using QPOs
- Exploits X-ray reverberation mapping of BH accretion flows across all mass scales from stellar mass to supermassive



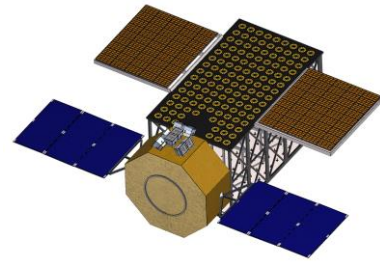
# STROBE-X Science



- Fully determines the ultradense matter equation of state using  $> 20$  pulsars
- Explores cosmic chemical evolution for  $\sim 100$  high redshift clusters
- Continuously surveys the dynamic X-ray sky with large duty cycle and high spectral and time resolution



# Summary



- STROBE-X is a probe class (<\$1B) observatory designed for X-ray timing and spectroscopy in the 0.2-30 keV band
- STROBE-X has huge collecting area and good spectral resolution
- It is optimized for the study of matter in the most extreme conditions in the universe