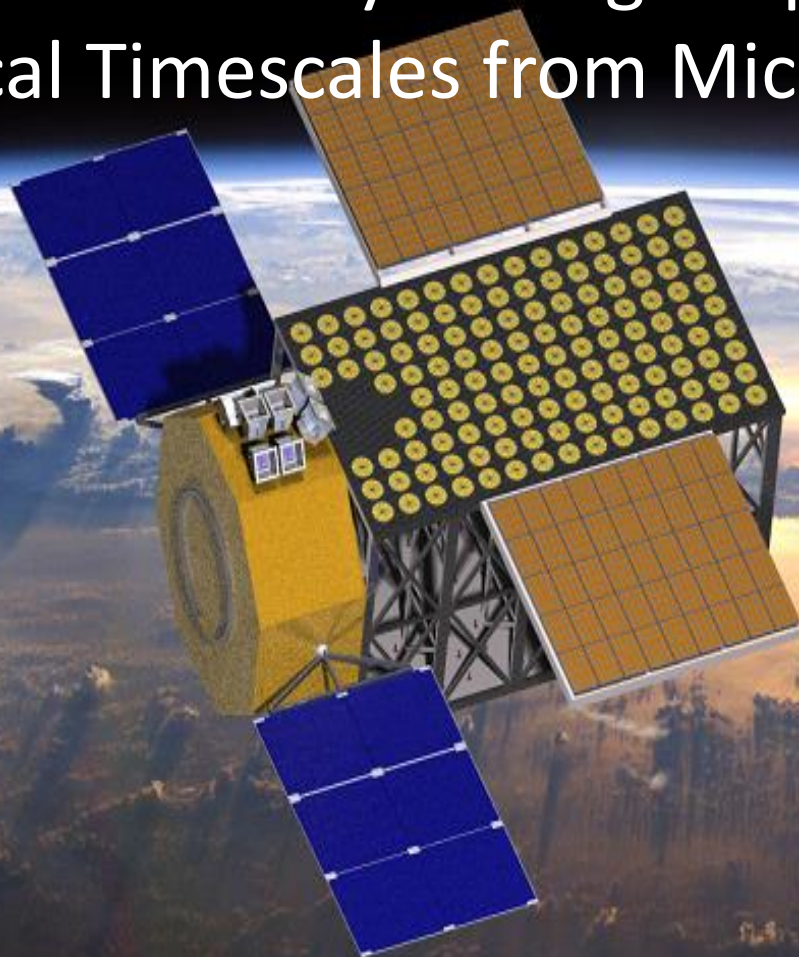# STROBE-X: X-ray Timing & Spectroscopy on Dynamical Timescales from Microseconds to Years
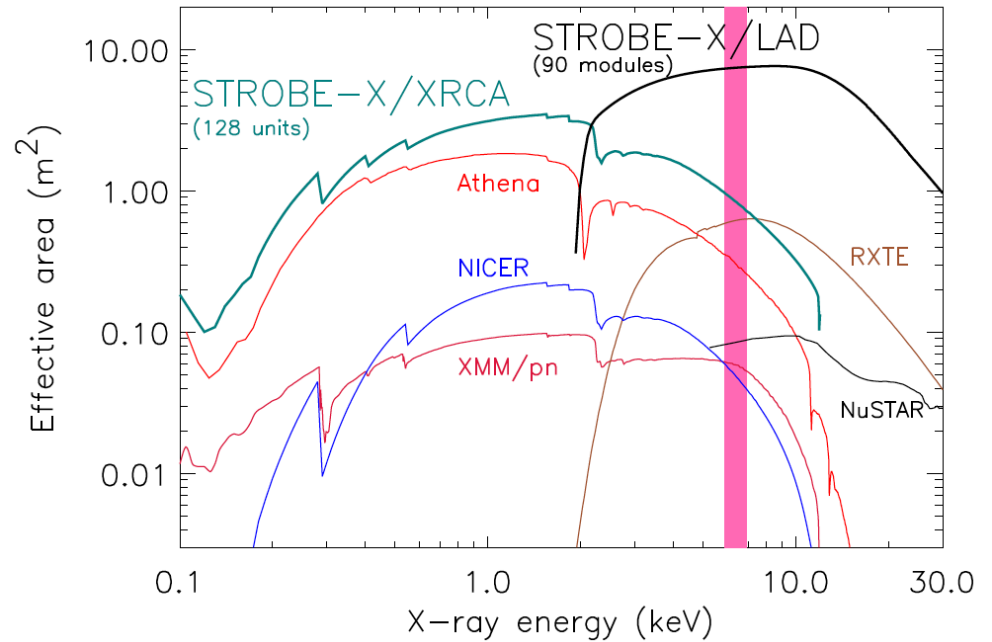
Colleen A. Wilson-Hodge (NASA/MSFC), Paul Ray (NRL), Keith Gendreau (NASA/GSFC), Deepto Chakrabarty (MIT), Marco Feroci (INAF-IASF/INFN), Tom Maccarone (TTU), Zaven Arzoumanian (CRESST/GSFC), Ron Remillard (MIT), Kent Wood (Praxis/NRL), Christopher Griffith (NRC/NRL), Peter Jenke (UAH)

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

Solar panel

Wide Field Monitor (2-50 keV)
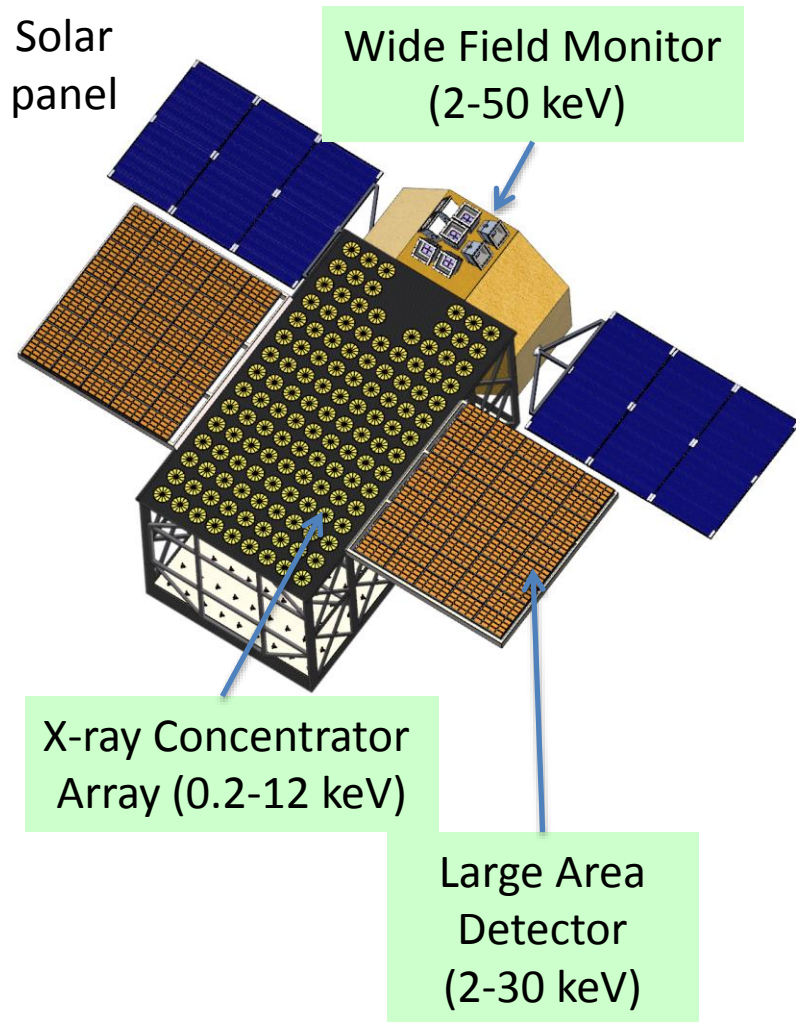
Large effective area 10m² @ 6 keV

X-ray Concentrator Array (0.2-12 keV)

Large Area Detector (2-30 keV)

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

Proposed to NASA's 2016 Call for Astrophysics Probe Mission Concept Studies (PI P. Ray (NRL))
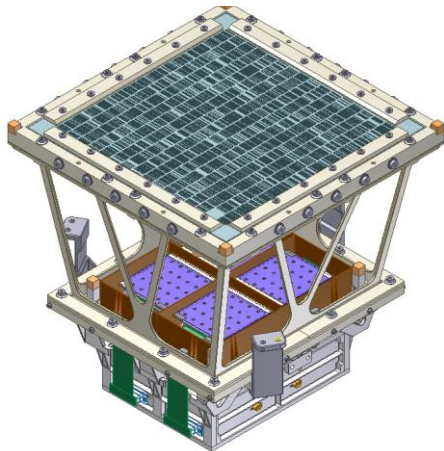
STROBE-X Instruments

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^2

Large Area Detector

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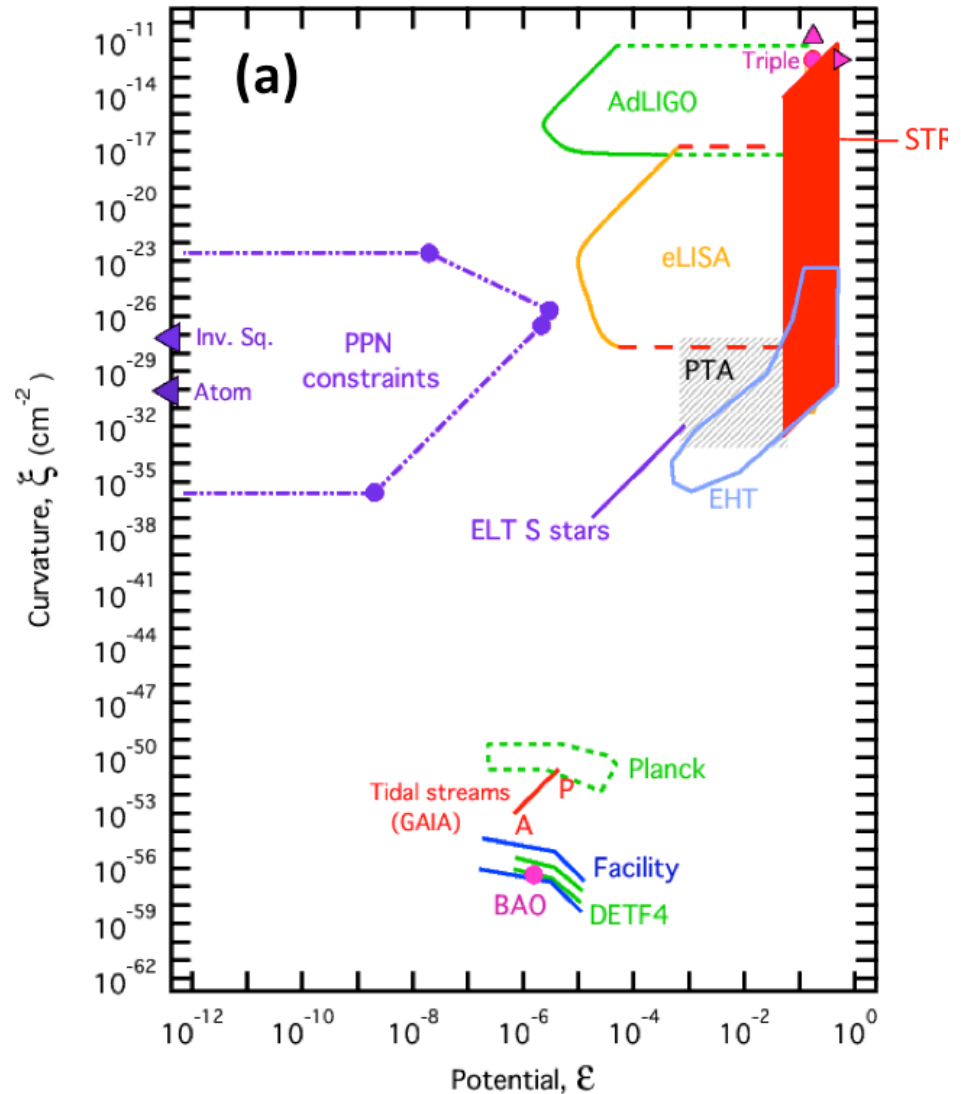- Energy resolution: 200-240 eV FWHM
- Effective Area @ 10 keV 7.6 m^2

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
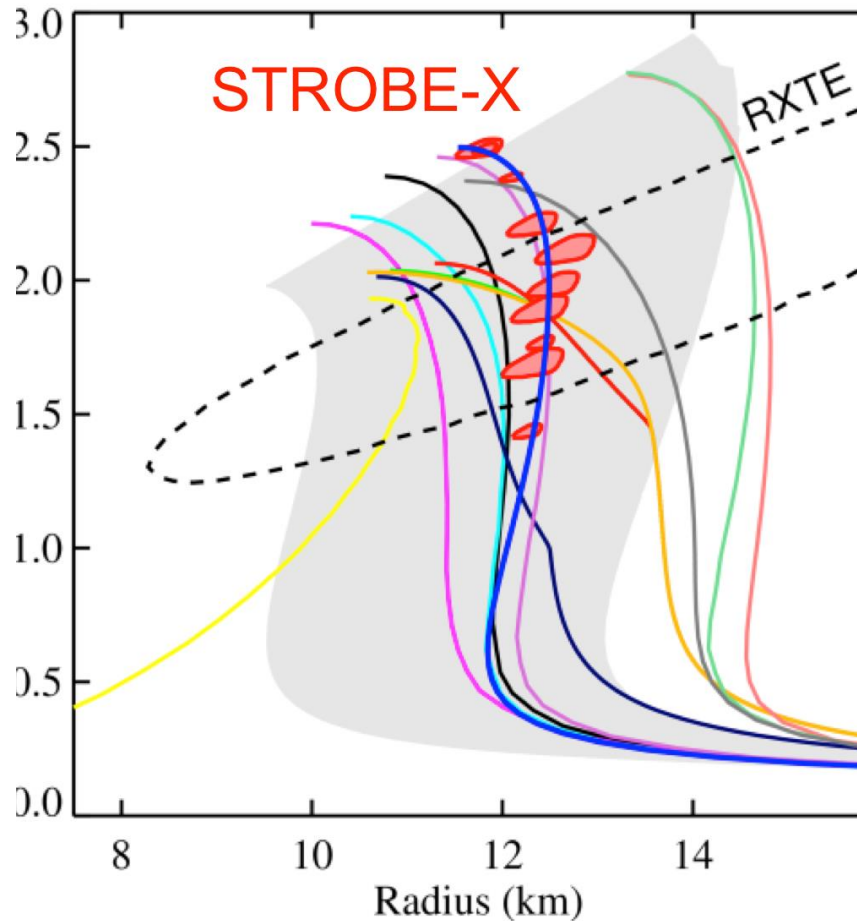
STROBE-X Black Hole Science

- Measures BH spin using QPOs

- Exploits X-ray reverberation mapping of BH accretion flows across all mass scales from stellar mass to supermassive
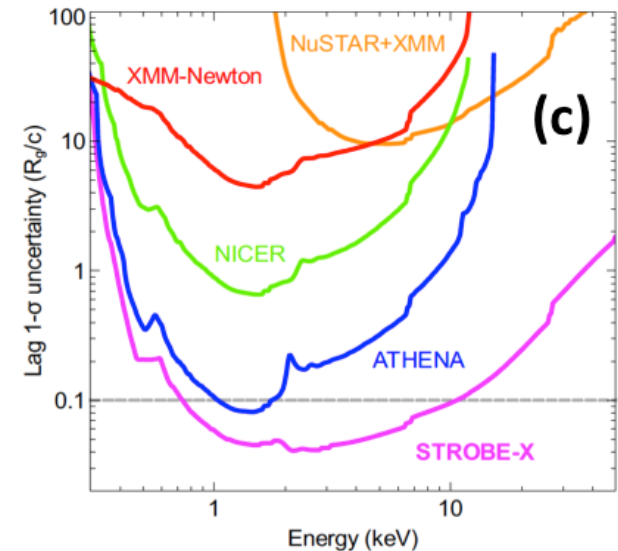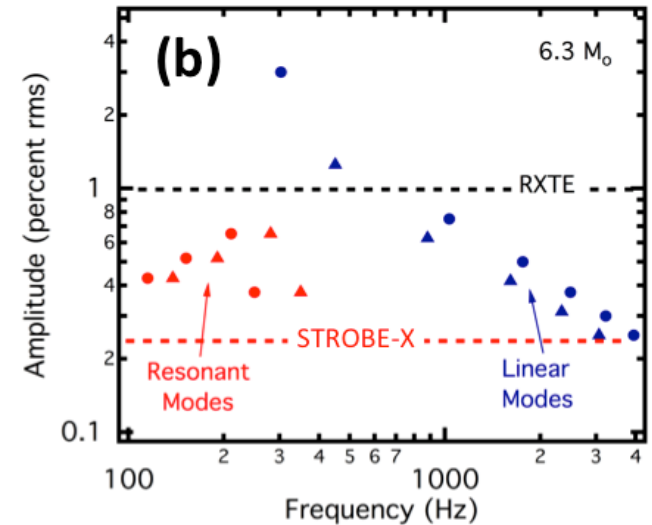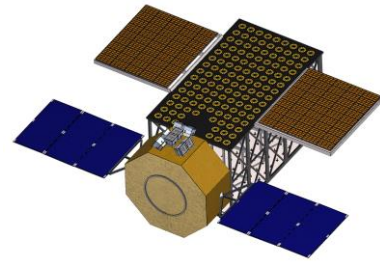
STROBE-X Science

- Fully determines the ultradense matter equation of state using > 20 pulsars

- Explores cosmic chemical evolution for ~100 high redshift clusters

- Continuously surveys the dynamic X-ray sky with large duty cycle and high spectral and time resolution
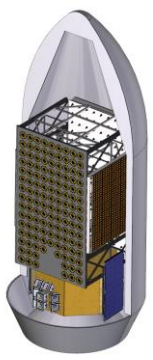
Summary

- 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