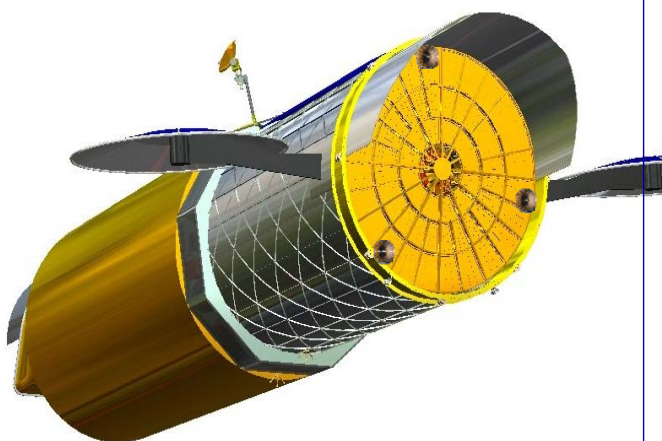


Observing Hard X-Rays with IXO

Paul Gorenstein, CFA



IXO with 3 HXT's



IXO has a hard X-ray telescope (HXT) to measure the continuum spectrum needed to accurately determine the intensity and profile of broadened atomic lines, and observe other effects occurring in the hard X-ray band. There is an issue of where the HXT should be situated. The options are:

1. Insert a single HXT (with a low energy filter) in the vacant central region of the main telescope. The two focii will overlap.
2. Place one or more HXT's at its periphery.

With (1) the principal detector of IXO, the cryogenic imaging spectrometer (CIS), will not be at the focus when IXO observes hard X-rays.

With (2) the area of the main telescope is slightly reduced and IXO mass is slightly larger but the CIS is at the focus much more often. The HXT is always "on".

Option 1 is the current selection. We provide reasons for option 2

- More efficiency: soft & hard X-ray exposures are simultaneous not sequential → more observing time and/or number of targets
- True simultaneous observing of soft & hard X-rays from variable sources
- More HXT effective area, and/or bandwidth with up to 3 units

- Many fewer changes of focal plane detectors → more reliability
- HXT supports other IXO detectors: the CIS, X-ray timer, and Polarimeter
- With full-time HXT observing there will be more serendipitous discoveries in target or field objects

Large increase in CIS observing time or number of targets with peripheral HXT's always active more than compensates for the small reduction in area of the main telescope