Energetic X-ray Imaging Survey Telescope (*EXIST*)

(as the *Black Hole Finder Probe* for the Beyond Einstein Program)

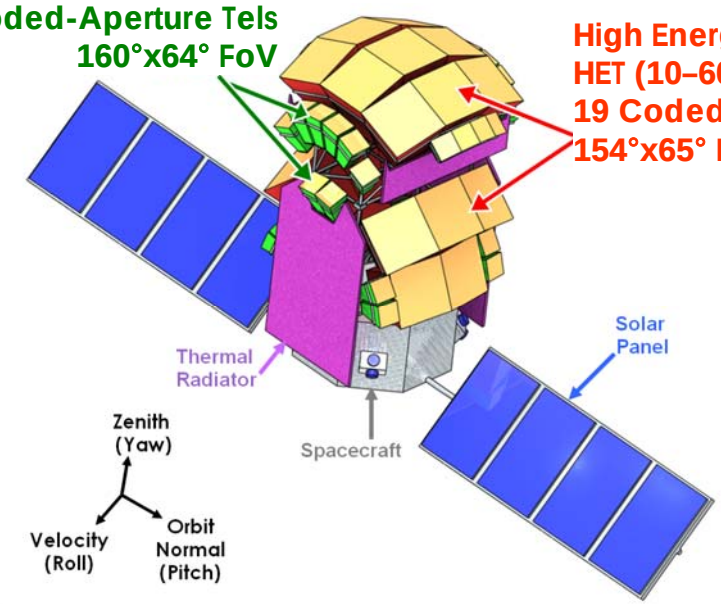
***Hard X-ray (~3–600keV) all-sky imaging survey each 95 min orbit* to measure, as *Primary Objectives*:**

- **Obscured or dormant SMBHs to probe SMBH properties & evolution, CXB origin & accretion luminosity of the universe**
- **The birth of stellar BHs from cosmic GRBs to probe GRB origins, derive photo-z's & cosmic structure/evol. out to z >6-10**
- **Non-thermal jets from BHs to constrain BH-jet physics, cosmic IR background & nuclear luminosity of the universe**
- **Stellar and IMBHs in the Galaxy & Local Group to constrain BH numbers, properties, formation & evolution**

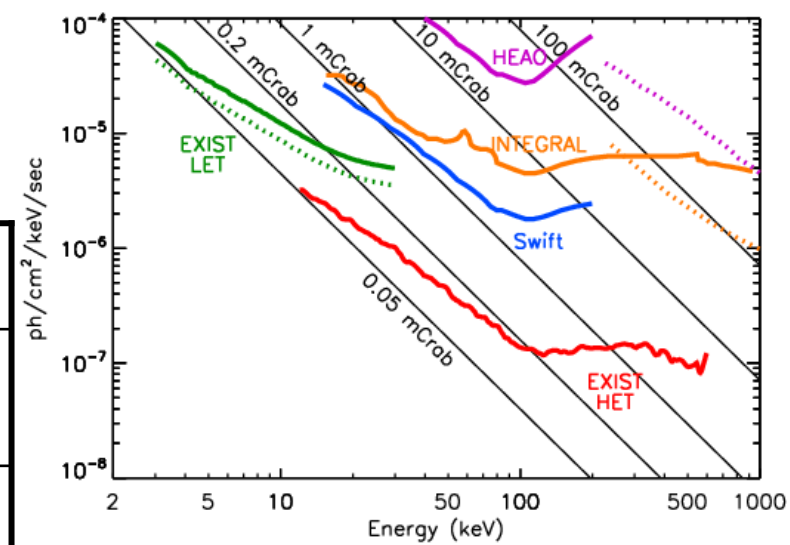
***Plus Secondary Objectives*: 511keV from BHs & novae; SGRs/magnetars out to 150Mpc; ^{44}Ti survey & SN rate in Galaxy**

Low Energy Telescope
LET (3–30 keV)
32 Coded-Aperture Tels
160°x64° FoV

High Energy Telescope
HET (10–600 keV)
19 Coded-Aperture Tels
154°x65° FoV



Survey	No. Obj >
AGN	>3. E4
GRBs	700/y
Flux lim	**Full sky**
dE=E/2 in:	**1y (cgs)**
3-100 keV	5 E-13
≤600 keV	5 E-12
Time Res.	**Units**
ea. Photon	0.1msec
GRB pos.	10sec
Mission dur	5y
En. Resol.	**dE/E (%)**
3-600 keV	2 – 6%



***EXIST* 1yr survey continuum sensitivity (5σ source, dE/E=1)**

- **All-sky image ea. orbit with 1.2' (3-30keV) & 6.8' (10-600keV) resol. & ≤11" positions,10μsec timing, ~20% duty cycle**
- **Two wide-field scanning coded aperture telescopes: HET:10–600 keV (6m^2 CZT) & LET: 3– 30 keV (1.3m^2 Si); 5Mbs cont**
- **Recommended by 2000 Decadal Survey; strong synergy with GLAST, JWST, LSST, Con-X & LISA if launched in 2015**

http://EXIST.gsfc.nasa.gov