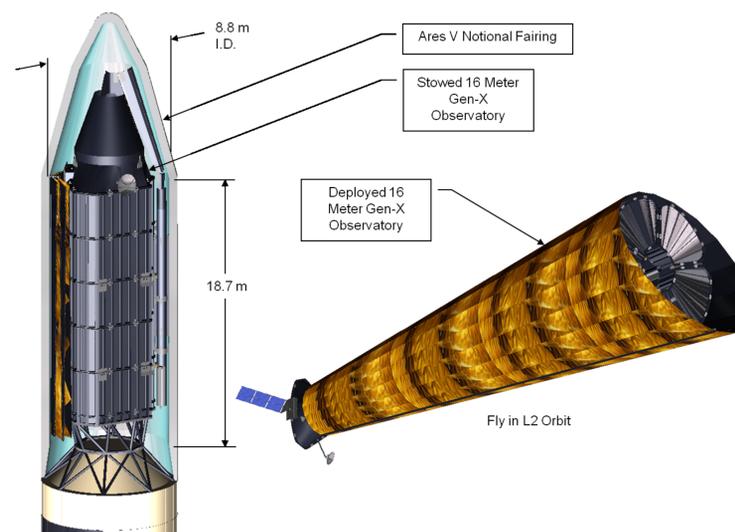


# Design Concepts for the Generation-X Mission

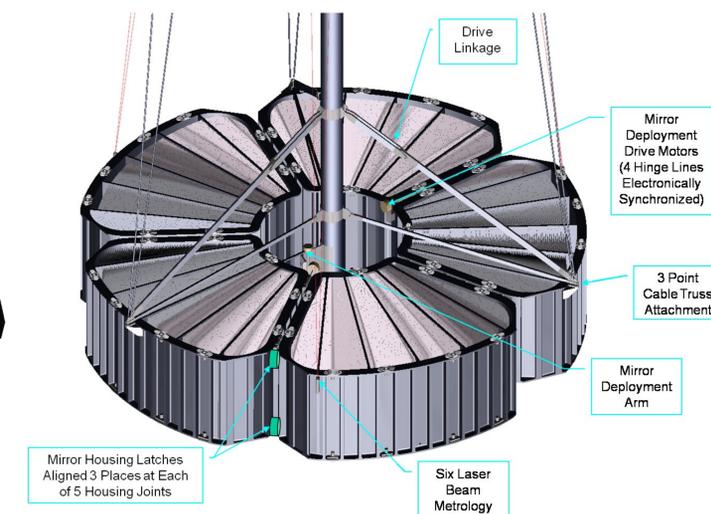
C. Lillie, D. Dailey, R. Danner, D. Shropshire, D. Pearson - Northrop Grumman Corporation

The Generation-X mission, proposed by Roger Brissenden at SAO, is one of the Advanced Strategic Mission Concepts that NASA is considering for development in the post-2020 time period. As currently conceived Gen-X would be a follow-on to the International X-ray Observatory (IXO), with a collecting area  $\geq 50 \text{ m}^2$ , 60-m focal length and 0.1 arc-second spatial resolution, which would be launched in ~2030 with an Ares V Cargo Launch Vehicle to an L2 orbit. Our design concept assumes an Ares V with a 10-m diameter, 1,400  $\text{m}^3$  volume fairing (or an equivalent launch vehicle) will be developed for NASA's exploration program. The key features of this design include a 16-m diameter deployable x-ray mirror provides a collecting area of  $136 \text{ m}^2$ ; a 60-m deployable optical bench which utilizes a Tensegrity structure to achieve high stiffness with low mass; and adaptive grazing incidence optics. Gen-X's combination of large collecting area and high spatial resolution will provide 4 to 5 orders of magnitude greater sensitivity than IXO, enabling scientists to study the formation and growth of the first black holes at  $z \approx 8-15$  with 0.1 to 10 keV fluxes of  $\approx 10^{-20} \text{ erg cm}^{-2} \text{ s}^{-1}$ .

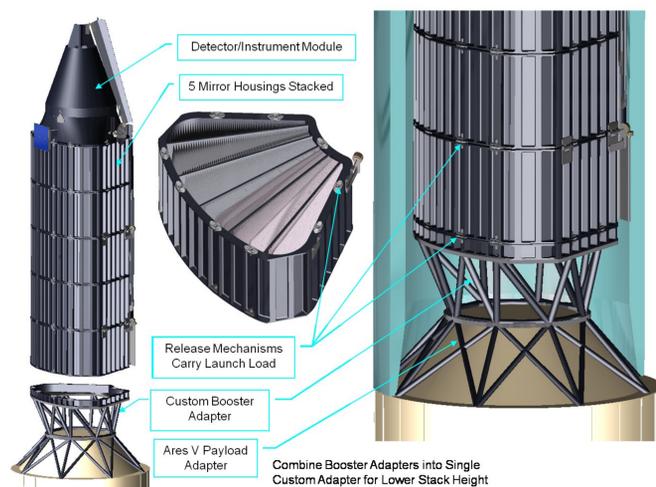
16 Meter Gen-X Observatory in Ares V



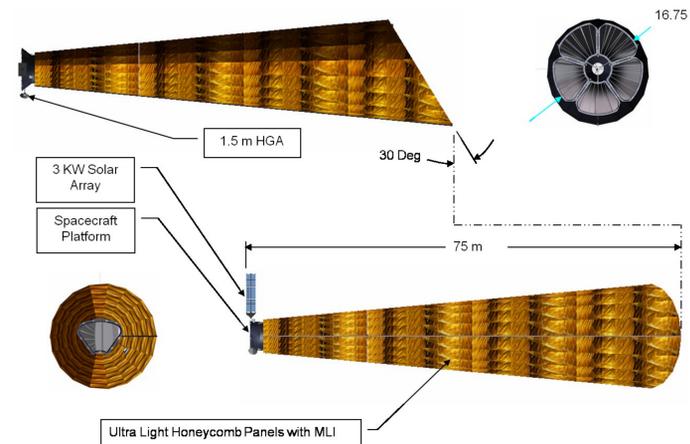
16 Meter Deployed Mirror Assembly



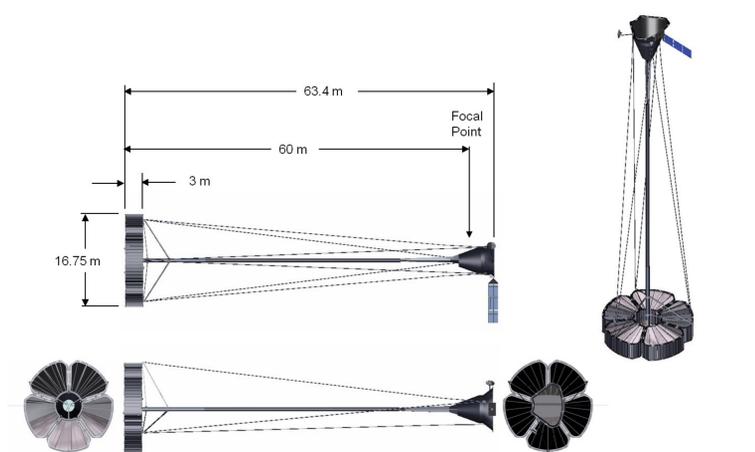
Stowed Load Path



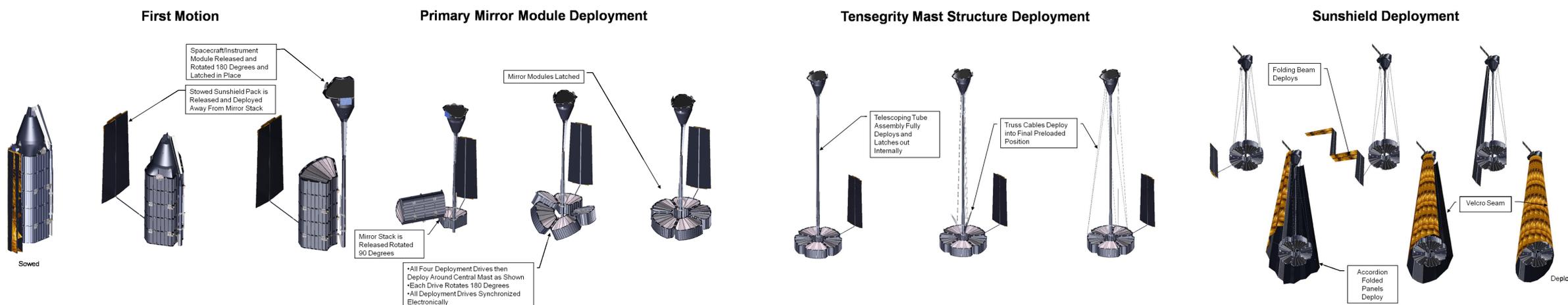
Deployed Observatory Layout



16 Meter Gen-X Observatory Without Sunshield



Deployment Sequence



Adaptive Grazing Incidence Optics

