

In search of black holes

NASA's *Nuclear Spectroscopic Telescope Array* (*NuSTAR*) mission aims to deploy the first focusing telescope that uses high energy X-rays to look for black holes. If successful it will supply images that are up to 100-times clearer than those taken by previous craft – comparable to that of the human eye

LAUNCH

NuSTAR will launch on *Pegasus XL* rocket in June

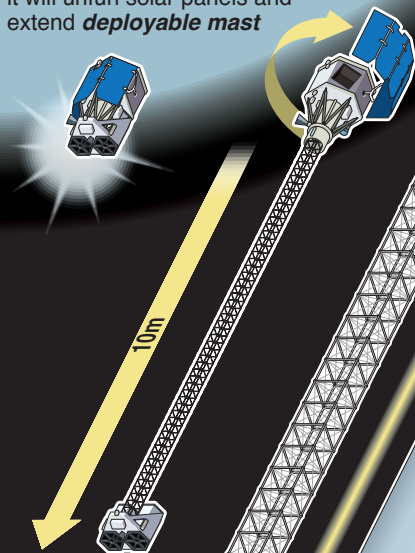


Altitude:
12,000 metres

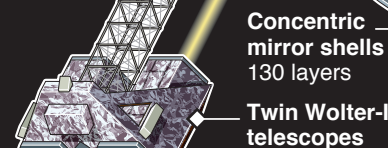
Pegasus XL

DEPLOYMENT

When *NuSTAR* reaches correct orbit, it will unfurl solar panels and extend **deployable mast**



Deployable mast
Stiff, stable and reliable enough to hold two telescopes



Concentric mirror shells
130 layers

Detector

Housing surrounded by **Caesium-iodine crystals** to shield instruments from interfering cosmic rays



Hyperboloid reflector

Paraboloid reflector

Single solar array

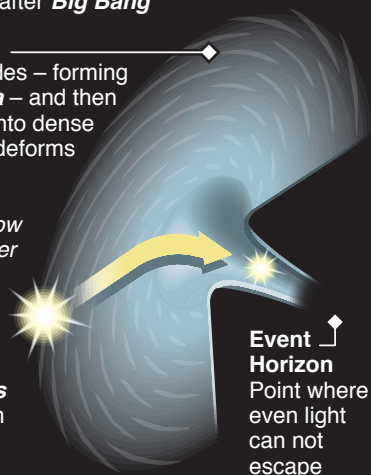
Twin focal plane detectors

SUPERMASSIVE BLACK HOLES

Thought to have evolved 300-800 million years after **Big Bang**

Formation

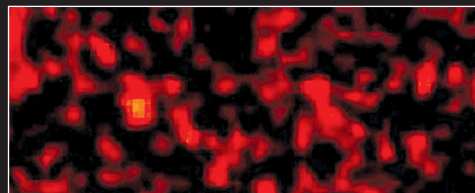
Star explodes – forming **supernova** – and then collapses into dense mass that deforms spacetime. This **black hole** will now absorb other stars



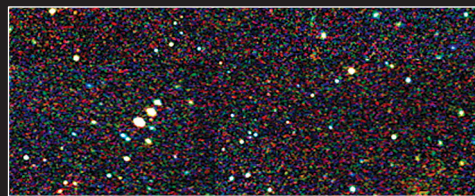
WOLTER-I X-RAY TELESCOPE

Invented by German scientist **Hans Wolter** in 1952 – uses double reflection technique to focus and image X-rays

IMPROVED IMAGE CLARITY



How current X-ray telescopes, like **Chandra**, view universe (above)



How *NuSTAR* will see cosmos (above)