

# **Generation-X: The Next High Resolution X-ray Astronomy Mission**

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Chandra has made clear the need for high resolution imaging in X-ray astronomy, but the low effective area/unit mass of the Chandra optics precludes simply scaling the Chandra design to much larger areas.

We have been studying a new concept: active X-ray optics. These optics allow a mirror to be adjusted in orbit to achieve an excellent figure, yet have thin substrate shells, so enabling a large area. We find that this mirror concept is highly promising, and has achieved a high technical readiness level for such an early stage.

With this backing, we describe the Generation-X concept: 0.1 arcsec HPD, 100 sq.meters effective area at 1keV, 0.1-10 keV energy band, R=10,000 grating spectroscopy plus non-dispersive 1eV integral field spectroscopy, and a wide-field imager. Some examples of the science goals of Generation-X are given: detecting the first galaxies and black holes and witnessing their growth, exploring extreme physical environments, understanding the birth of stars and planetary systems.

This work was supported in part by NASA.