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# Development of Mirror Segments for the Constellation-X Observatory

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## Abstract

As NASA's next major X-ray observatory, Constellation-X will have a photon collection area of  $30,000 \text{ cm}^2$  at 1 keV, which, after folding other instrumental responses, translates into an effective area of  $15,000 \text{ cm}^2$ . The observatory consists of four identical satellites each of which carries a spectroscopic X-ray telescope mirror assembly (SXT) that is 1.6 m in diameter and has a focal length of 10 m and a collection area of  $7,500 \text{ cm}^2$  at 1 keV and an angular resolution of  $15''$  HPD (half-power diameter) at the system level. Each mirror assembly consists of a large number of mirror segments precisely assembled together. Our development of the mirror segments is divided into two steps. The first one is to develop the basic approach and fabricate segments within the constraints of existing infrastructure to meet the angular resolution requirement, but not mirror segment size requirement. We have all but successfully completed this part of the development. We are now on the verge of going into the second step, that is to fabricate mirror segments of larger sizes to reduce the number of segments that have to be aligned and integrated. In this paper, we report on the requirements and the development status of the mirror segments. These assembly and other requirements of the SXT are reported elsewhere (Podgorski et al. and Hair et al.).