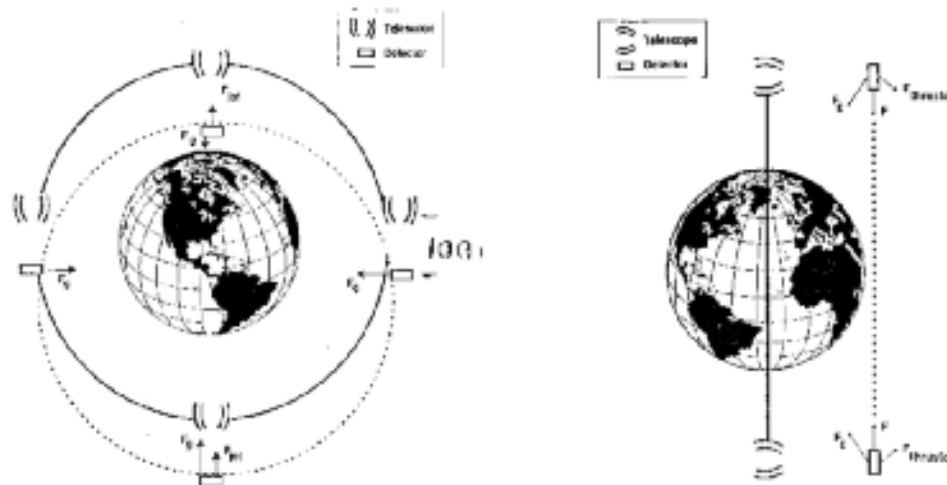


Paul Gorenstein, Smithsonian Institute, Astrophysical Observatory
"An Ultra-High Throughput X-Ray Astronomy Observatory with a New Mission Architecture"

We propose a study of a new mission architecture for an ultra high throughput X-ray astronomy observatory containing a 10 m aperture telescope and a set of detectors. It has potentially much better ratios of effective area to weight and cost than current approaches for the 1 m class AXAF and XMM and "next generation" 3 m class observatories. Instead of a single spacecraft that contains the telescope, the optical bench, and a fixed limited set of detectors in the new architecture, the telescope and an unlimited number of detectors are all on separate spacecraft. Their trajectories are in the same vicinity either in high Earth orbit or the L2 point. Usually, only one of the detectors is active. The active detector places and maintains itself at the telescope's focus by station-keeping. Its distance and aspect sensors provide signals that drive electric propulsion engines on the detector spacecraft which regulate its distance from the telescope to be precisely equal to the focal length.



Unlike current systems, detectors can be replaced and new ones added by launching a small spacecraft that will rendezvous with the others. To reduce its mass, the telescope has a segmented architecture and the segments are actively aligned. The study will identify the nature and magnitude of problems that need to be solved in order to develop a 10 m class X-ray astronomy observatory with these new architectures. The study will involve both analysis and laboratory measurements. The mission architecture is applicable to other observatories.