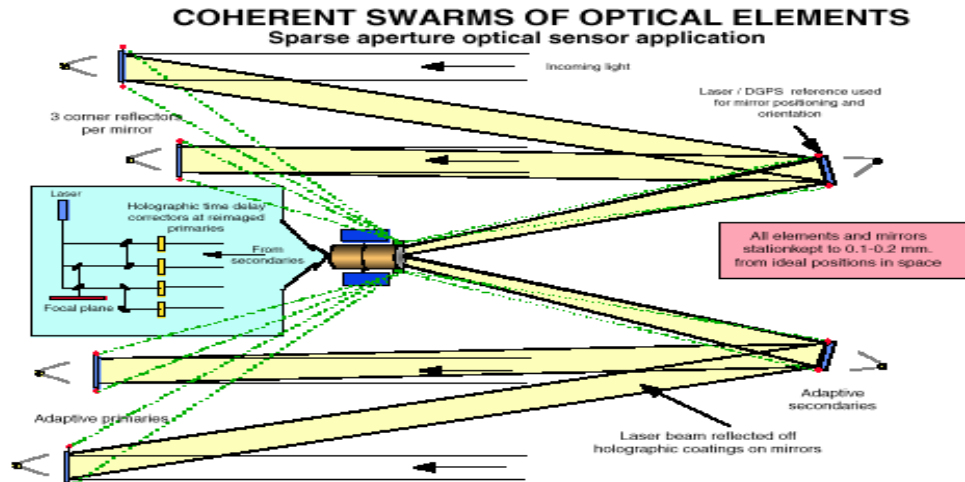


Ivan Bekey, Bekey Designs

"A Structureless Extremely Large Yet Very Lightweight Swarm Array Space Telescope"

A new and original concept is described for a revolutionary space telescope. It implements a continuously corrected adaptive membrane for the primary reflector element, a holographically driven liquid crystal second stage of correction and a complete absence of any truss or other structure with all elements being station-kept with respect to each other. The combination of these techniques will create an optical telescope of 20-30 meters diameter, yet weigh 125 times less than the Hubble Space Telescope or 50 times less than the NGST.



A number of these adaptive primary elements can be coherently combined when employed in a loosely station-kept "swarm," creating coherent sparse optical arrays that can be hundreds of meters or kilometers across. The resolution and light gathering power of the resulting instruments is such that images of Earth-sized planets around other stars can feature 10,000 pixels of resolution, or detect objects at the edge of the universe and at the beginning of time. Conventional or even NGST-level technology telescopes to perform these missions would weigh up to millions of Kg., as well as be impossible to launch. No planned programs even come close. Though there is little question that this concept can work in principle, the proposed task structure will allow systematic assessment of the ability of the key techniques to function as a system, and will assess its likely performance. The preferred architecture of the concept will be explored, and its utility to NASA's future assessed via one or more Design Reference Missions, chosen from the Grand Challenges or NASA's Strategic and Enterprise plan goals. Lastly, the technologies and risks will be assessed and an overall feasibility of the concept addressed.