Configurable Aperture Space Telescope

CAST Telescope

- An spherical telescope that can grow on space offering “unlimited FoV”
- The telescope can grow on space utilizing identical interchangeable segments:
- Spherical aberration corrector on each segment
- Configuration evaluated

Apertures range: 0.6m based on a 2.4m
F/#: 22.3
FoV: 2’
R primary: 14,000mm
R sec: 8,750mm
D Primary: 600mm
D sec.: 216mm
Primary to secondary distance: 4,250mm

- This could be a scalable way to replace Hubble in the visible regime.
- Longer wavelengths NIR would relax alignment tolerances
- Challenges: Design correctors for 2x2’ FOV that are Diffraction Limited
- Achieve structure stiffness enough to maintain the mirrors in place.

Relevance for Ames
- Co-phasing segments algorithms has been developed
- Creating larger apertures based on small segments in space is key to enable astrophysics with cube-sats.
- Possible extension to adaptive spherical segments that can morph into aspheric segments.

Funding / Timeline
- Sept 2014, CIF for CAST awarded
- April 2015, Theoretical design work mostly completed
- August 2015, co-phasing lab demo completed
- September 2015, corrector implemented
- Possible application to APRA funding for next year