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 lager 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

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