

Configurable Aperture Space Telescope

Readiness level:

☐ TRL 1-3: Concept ☐ TRL 4-6: Prototype

☐ TRL 7-9: Demonstrated

NASA Ames Instrumentation Workshop

September 16, 2015

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

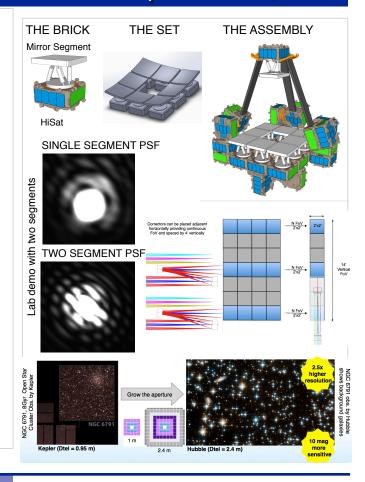
F/# : 22.3 FoV : 2'

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

POC

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