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.

Technology / Application

NASA Ames Instrumentation Workshop

September 16, 2015

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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Readiness level:
- ☑️ TRL 1-3: Concept
- ☐ TRL 4-6: Prototype
- ☐ TRL 7-9: Demonstrated