STScI | SPACE TELESCOPE SCIENCE INSTITUTE

EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

Advancing Technologies for future Segmented Telescopes

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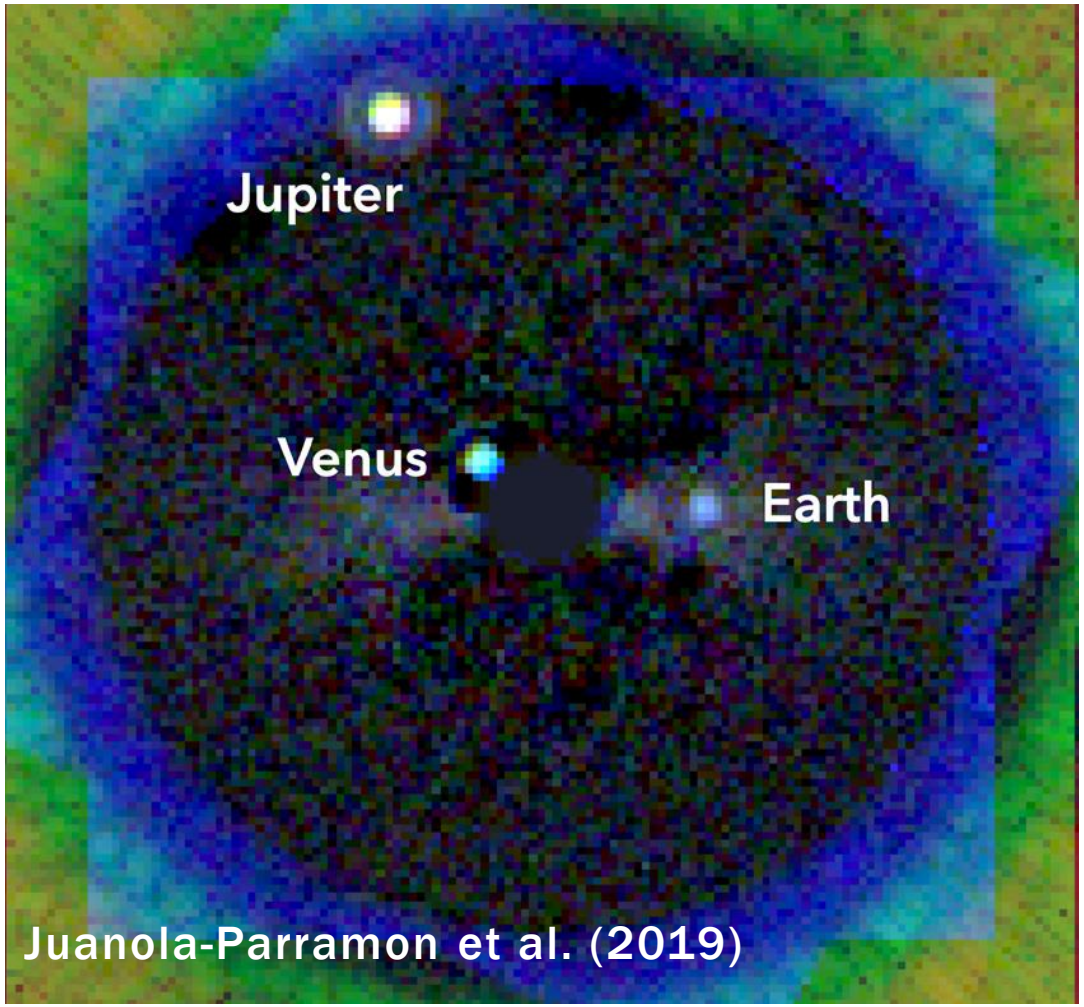
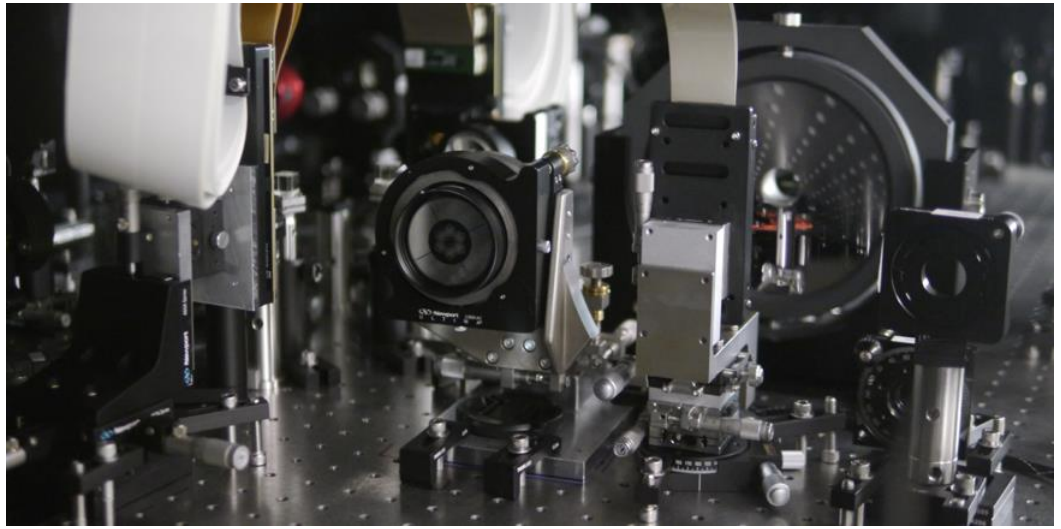
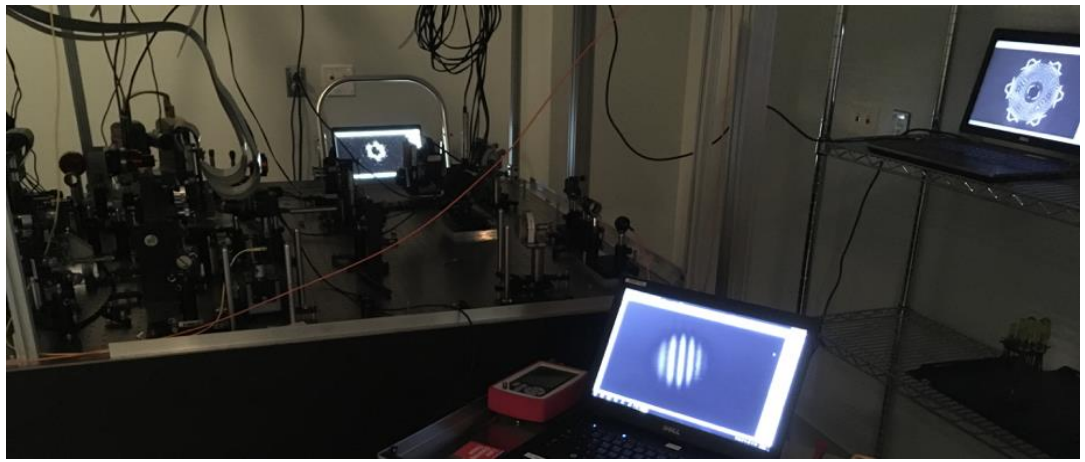
High contrast imaging with segmented apertures

What we want.



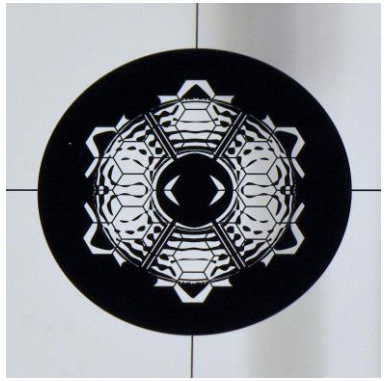
What we are working on.



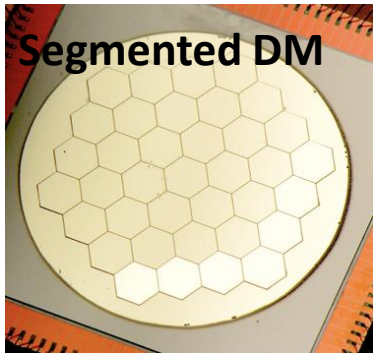


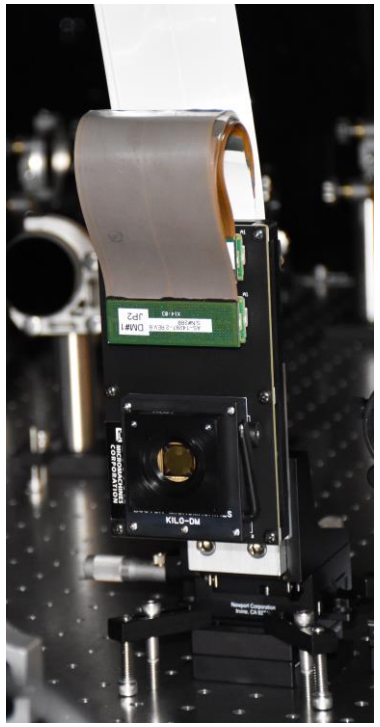
First result with fully segmented aperture

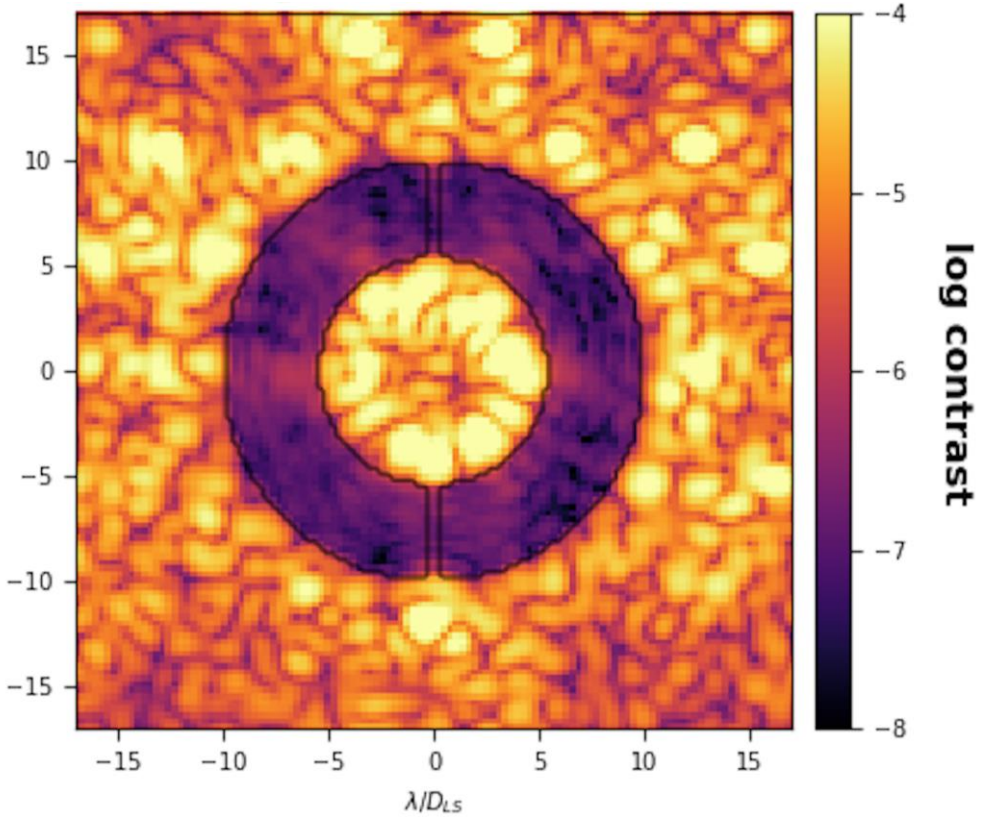
Coronagraph



WF sensing & control







Contrast with monolithic aperture 6e-8

Contrast with segmented aperture 2e-7
(partial calibration, circa December 2020)

Wavefront Maintenance under in the presence of artificial drifts

- Unobstructed monolithic aperture
- 0.01 nm random drift per iteration (4000 iterations)
- 8e-8 stable contrast over 6 hours compared to 4e-7 open loop measured contrast
- Susan Redmond (PhD student Princeton), SPIE astronomical instrumentation 2020