The Magellan Telescopes are twin 6.5m Gregorians

Located at LCO (near La Silla) in Chile (near the GMT site). The Magellan site is excellent for seeing <0.7” median. The MagAO system will go to the Clay (scope on the right).

A Few Magellan AO Key Science Goals (two science cameras)

1. The detailed analysis of Exoplanet atmospheres in the thermal IR.

>> need very high Strehl imaging (hence super-resolution) and coronagraphy 2-5 μm (***Clio2 camera***).

2. Extremely high resolution imaging of binaries, faint companions, asteroid surfaces, solar system moons, Hα/[SII]/Ca triplet line imaging etc. (0.65-1.05 μm science)

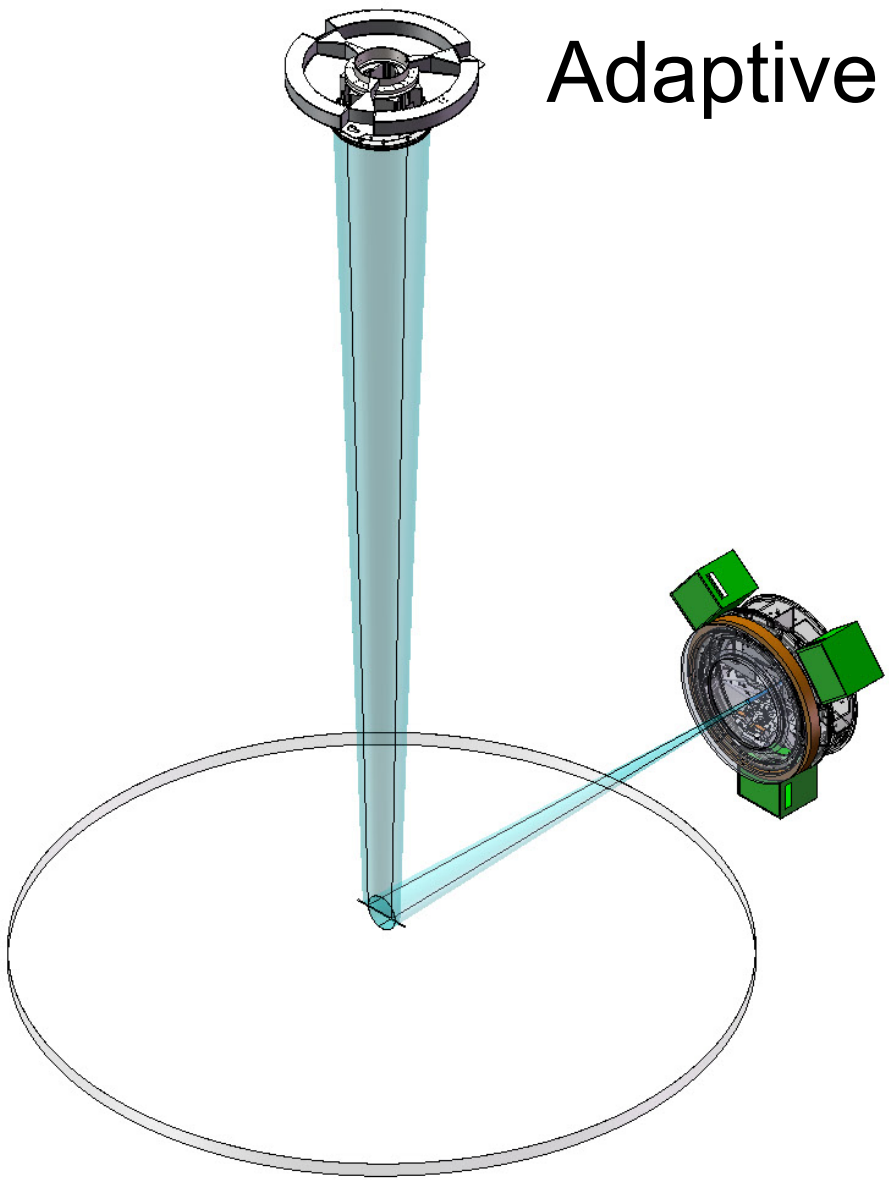
3. Very deep optical imaging of circumstellar and extragalactic environments

>> need broad-band far-red Visible 0.65-1.05 μm wavelength AO (***VisAO***) CCD camera & coronagraph

The P.I. of MagAO is Laird Close, University of Arizona.

MagAO

Adaptive secondary ASM

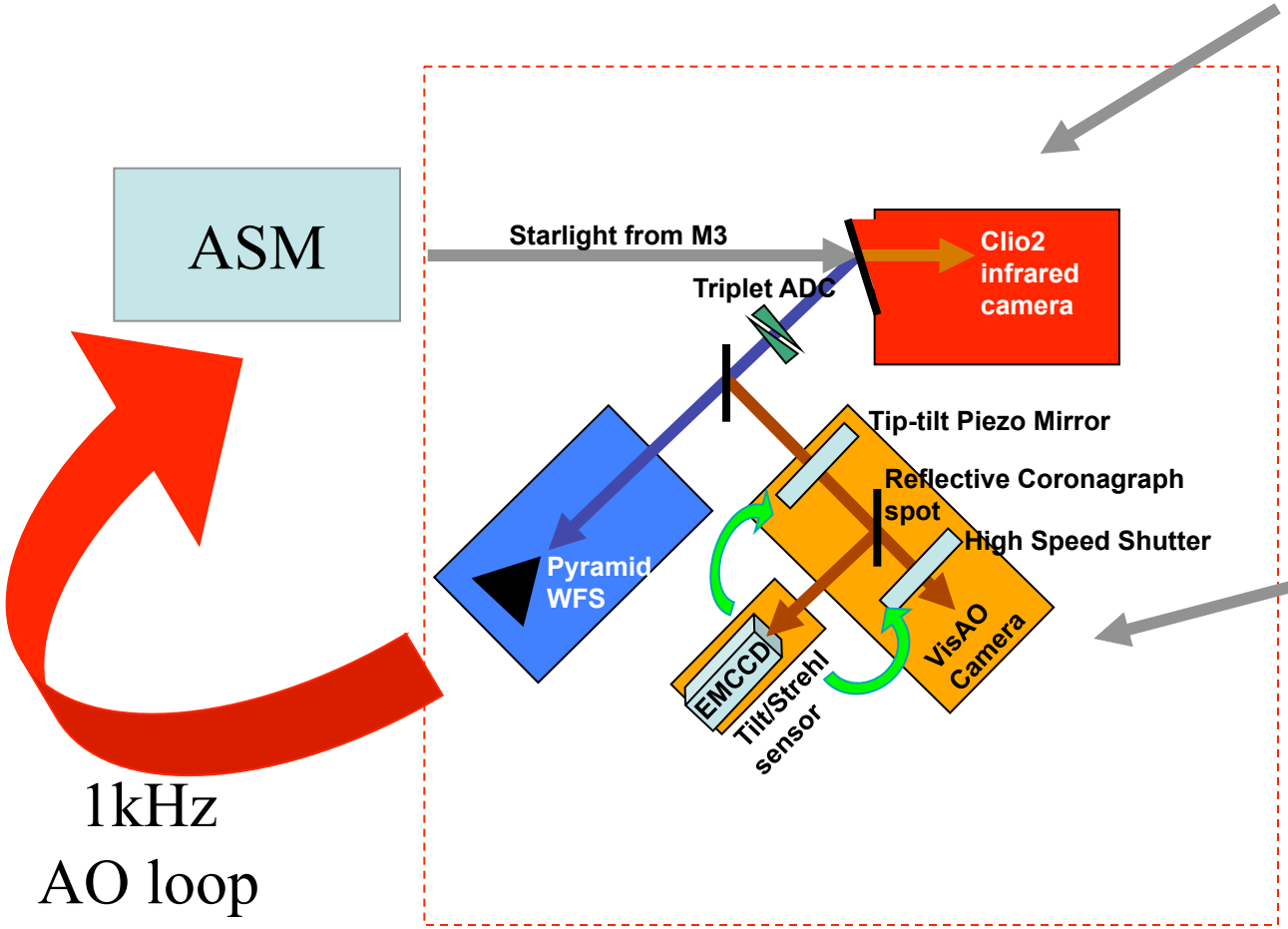


NAS UNIT

Schematic of MagAO

Clio2 (1-5.3 μm)

Camera, coronagraph



VisAO CCD

20 mas resolution

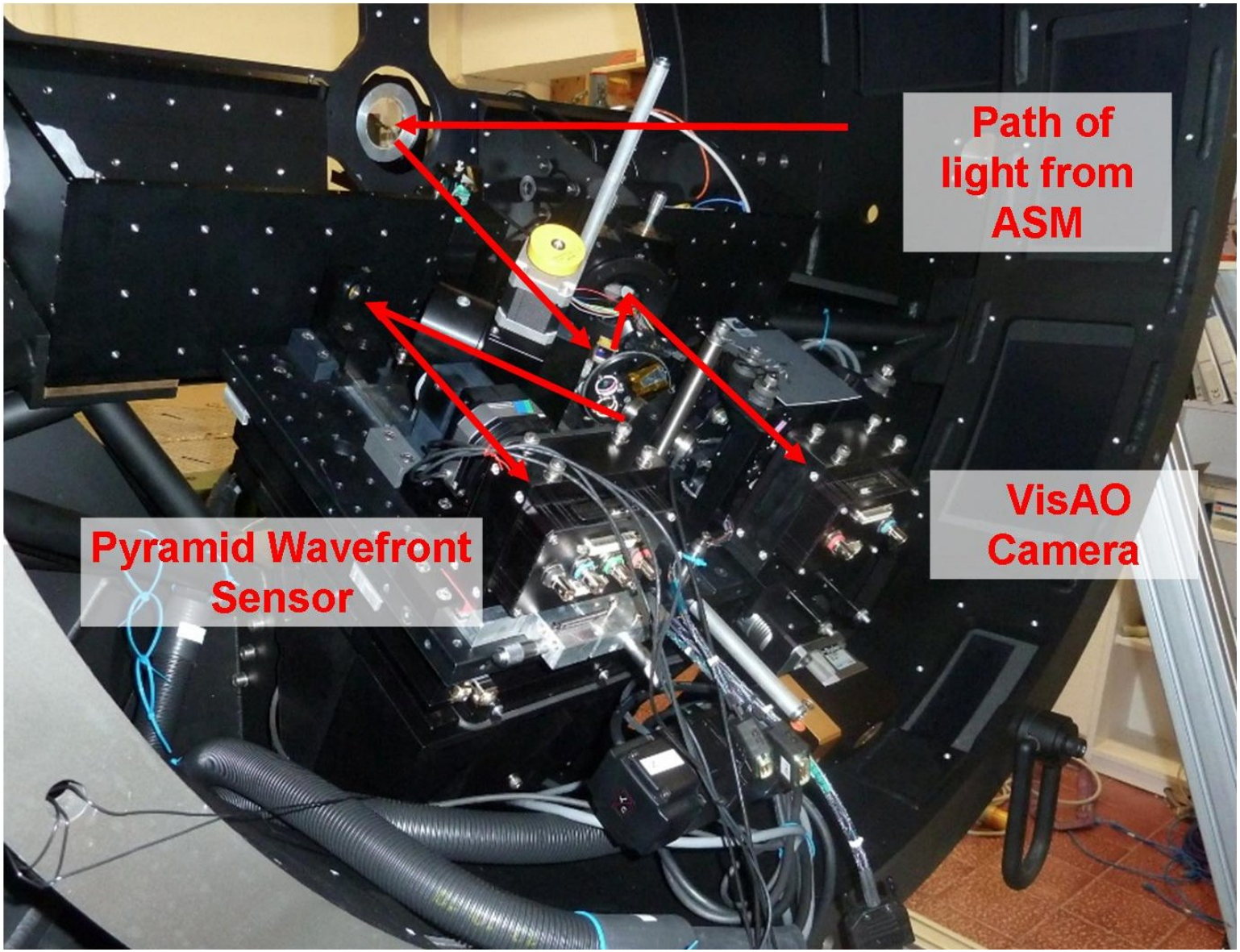
CCD/coronagraph

AO imaging at Hα and longer

1kHz

AO loop

NAS ring



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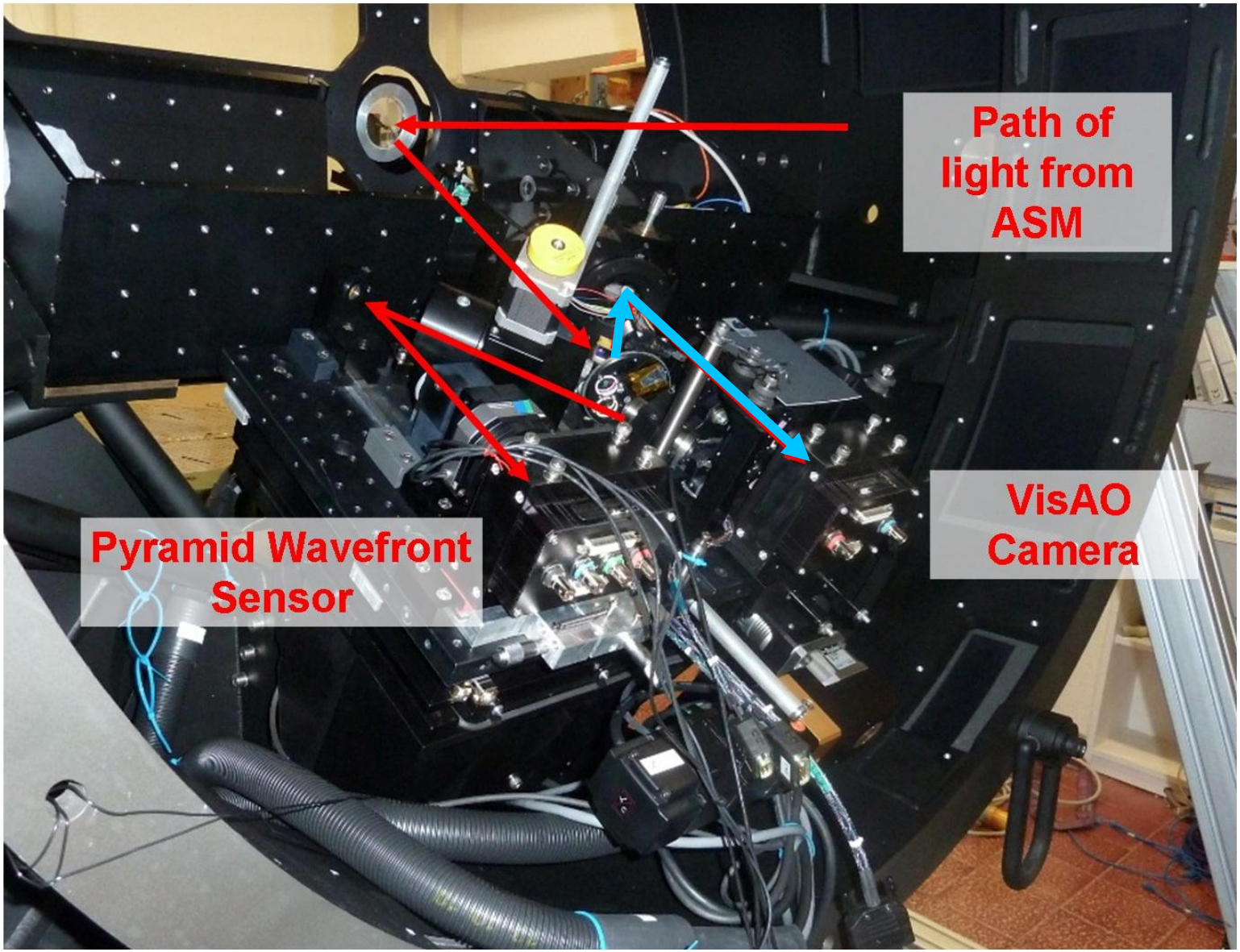
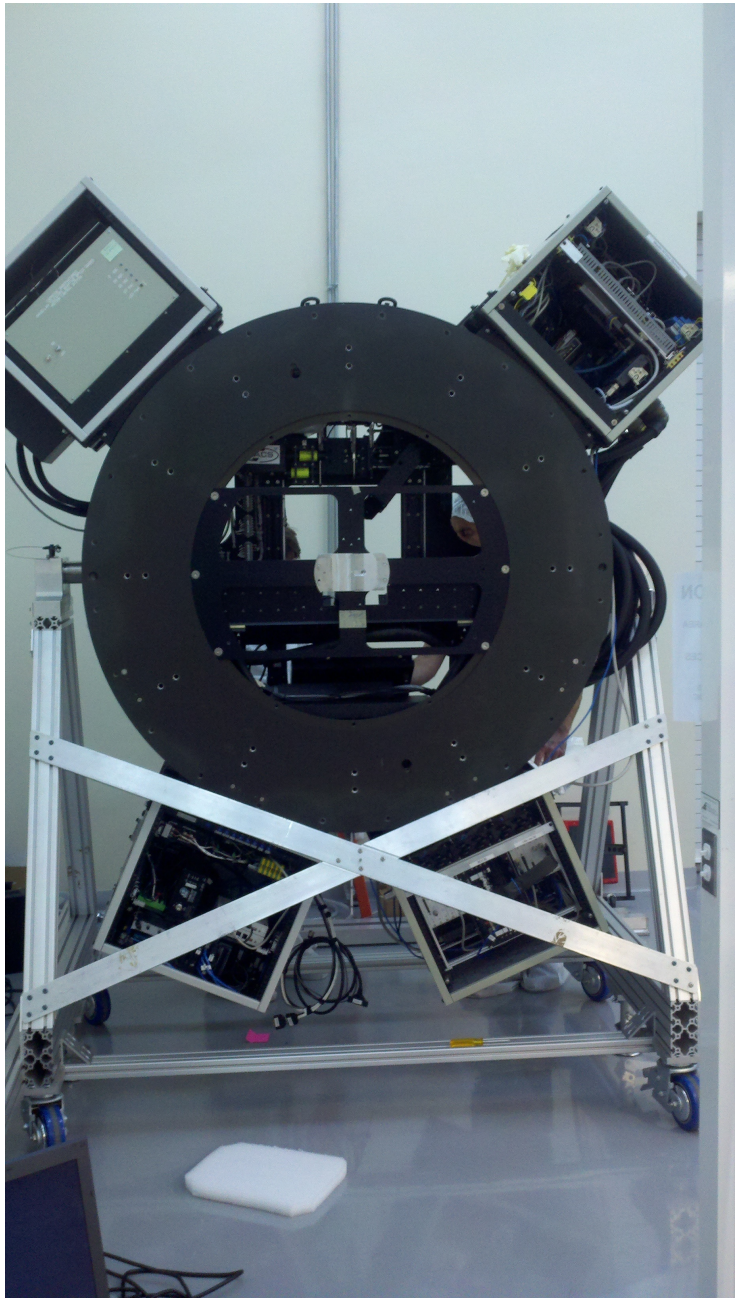

Path of light from ASM
VisAO Camera
Pyramid Wavefront Sensor

The MagAO ASM in Chile

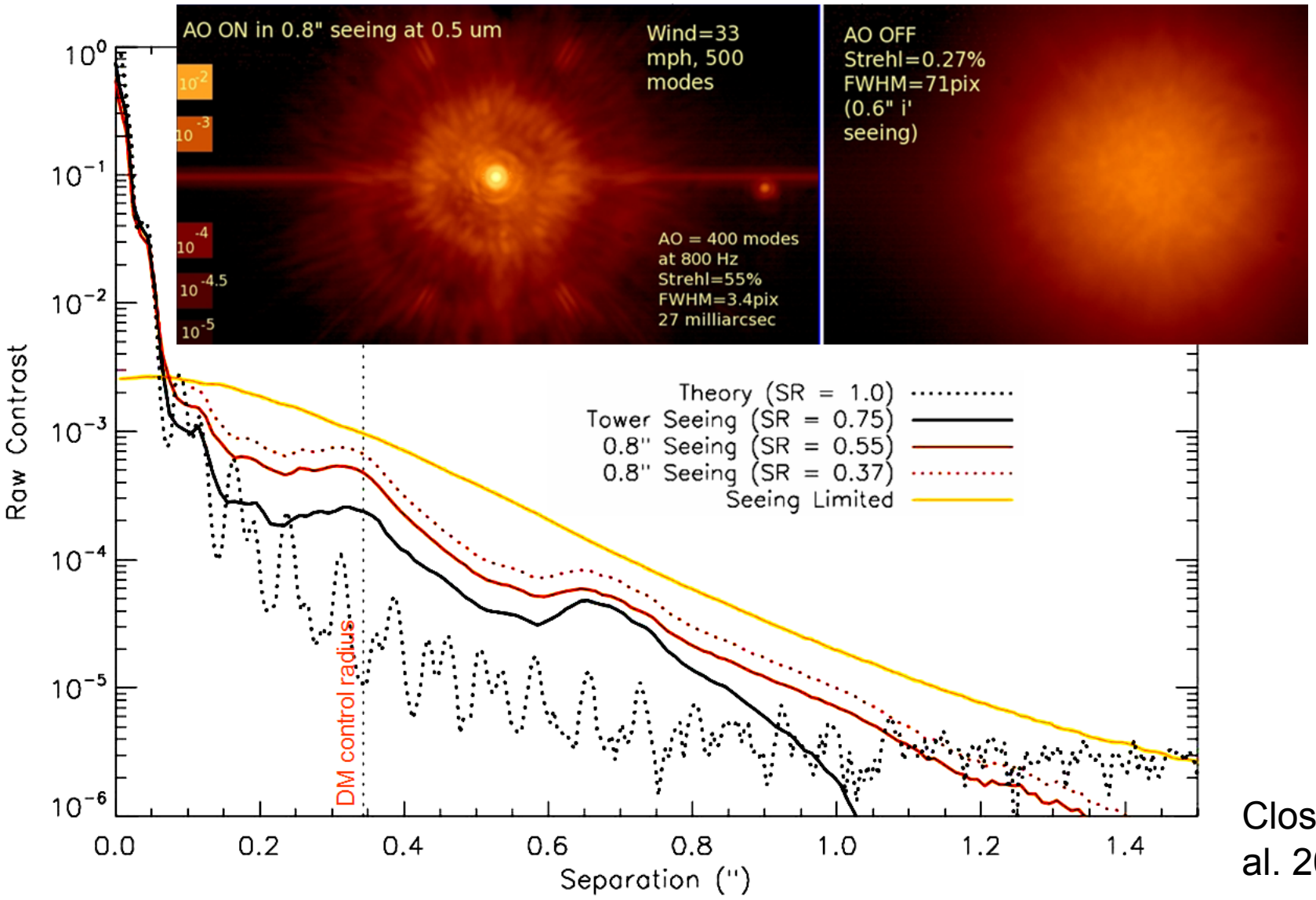
- Here the ASM is running turbulence tests in the Clean room at Magellan



The NAS In Chile

- Contains the PWFS, VisAO camera, and Shack Hartmann active optics systems

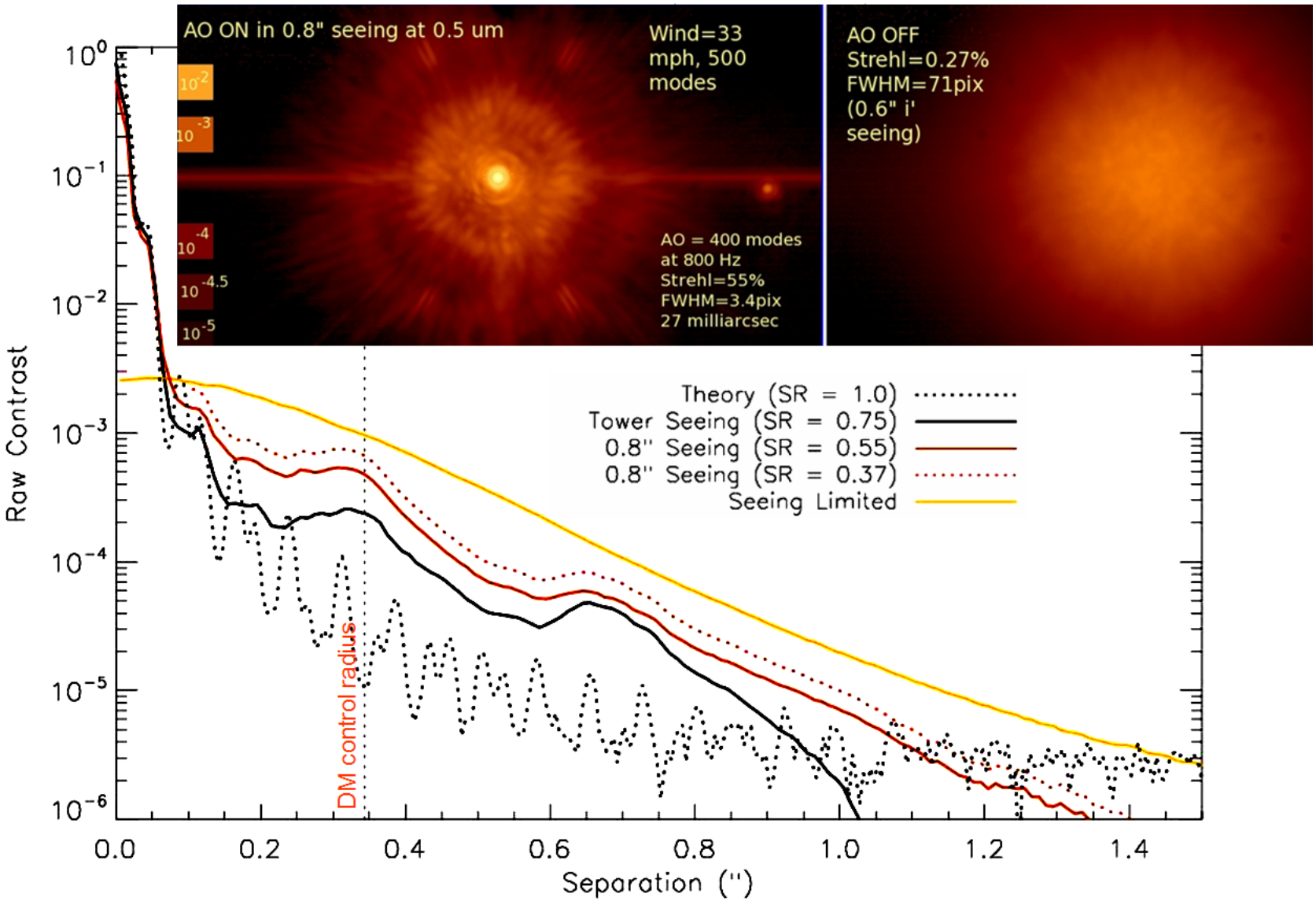
MagAO's VisAO PSF is excellent: 55% Strehl lab (>37% "sky") at i' (0.76 μm)



Close et al. 2012

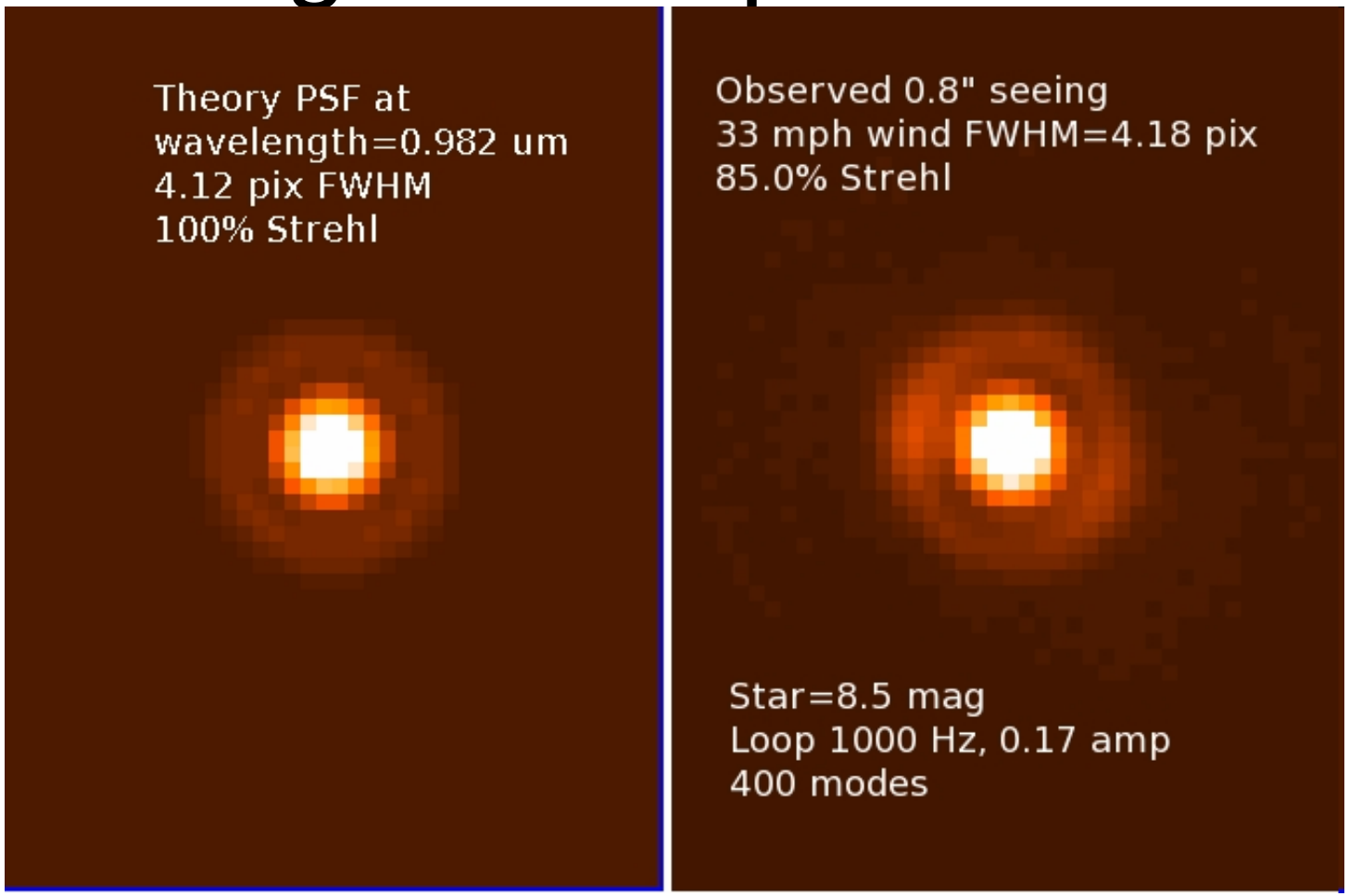
RESULTS OF CLOSED LOOP OPTICAL TESTS IN ARCETRI TEST TOWER

MagAO's VisAO PSF is excellent: 55% Strehl lab (>37% "sky") at i' (0.76 μm)



Achieved "on-sky" 122 nm rms wavefront error at 800 Hz --- much better than 190nm goal

Closing the Loop at 1000 Hz



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At 1000 Hz closed loop we can achieve 65 nm rms error in tower ~95nm “on-sky”.

NOTE that ***this is a linear stretch***. **This is much better than the CDR 190 nm rms top level requirement.**

MagAO Status, June 2012

- The ASM has been successfully delivered and final calibration at Magellan in Chile
- The NAS unit, and VisAO camera, have also had final alignments and tests in Chile
- Clio2 will have its PreShip Review July 4, 2012.
- First Light for MagAO is officially scheduled from Nov 16- Dec 9, 2012.