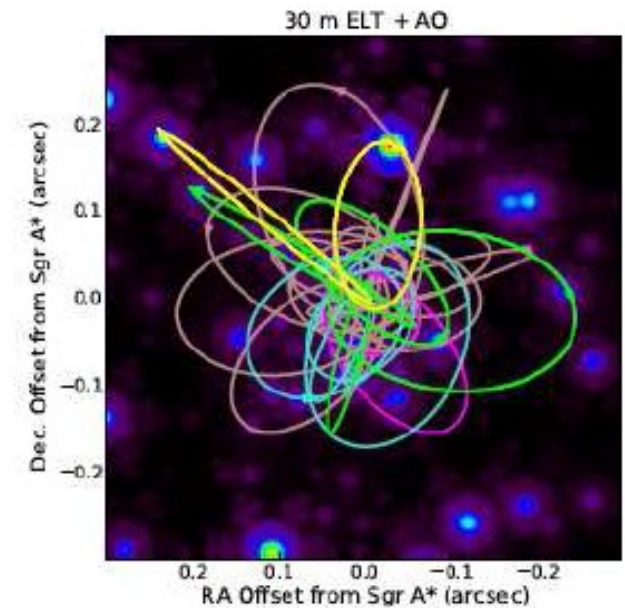
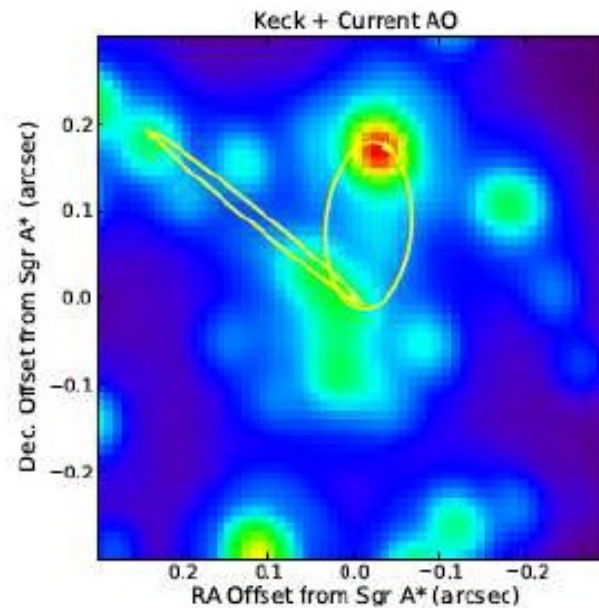
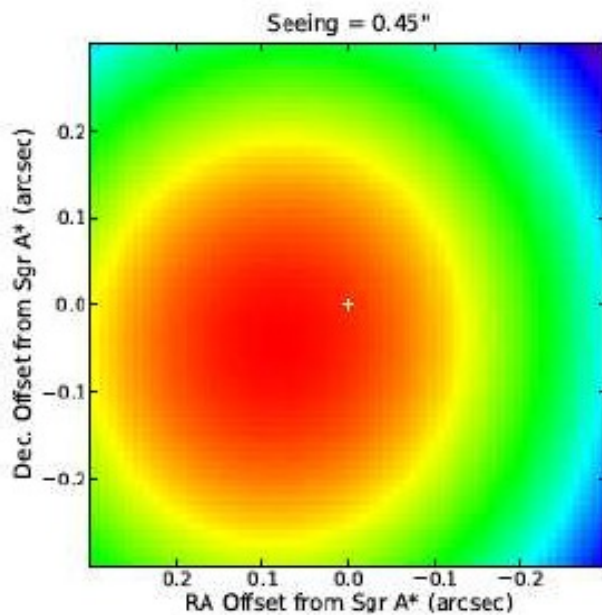


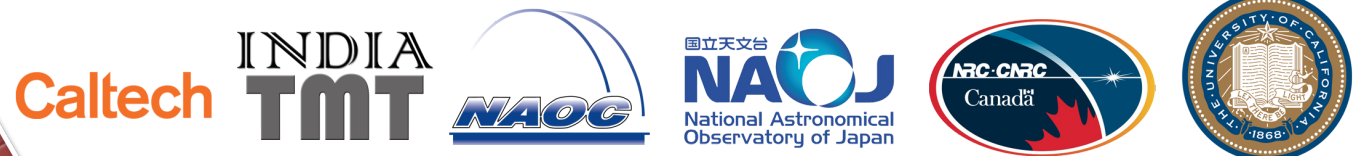
Thirty Meter Telescope - First Light Instrumentation The Infra-Red Imaging Spectrograph (IRIS)



TMT



30 m 望遠鏡
三十米望远镜
तीस मीटर दूरबीन
Thirty Meter Telescope
Télescope de Trente Mètres



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The Infra-Red Imaging Spectrograph (IRIS)

IRIS is diffraction limited integral field spectrograph and imager designed to be operational at first light using TMT's Adaptive Optics system NFIRAOS

Right: Specification of the different observing modes.

Bottom left: Expected Performances.

Bottom right: Section view of IRIS optical components.

Back: Simulation of TMT performance on the galactic center (courtesy of Ghez et al.).

Capability mode	Spatial sampling (mas)	Field of View (arcsec)	Resolution (l/d)	Min/Max wavelength (μm)	Bandpass ³	Coronagraph
Imager	4 mas	16.4 x 16.4 Possible expansion to 32.8x32.8	Set by filter	0.84-2.4	37 filters Variety of bandpasses	Planning mask mounted in OIWFS
Slicer IFS 88x45 Spaxels	50 mas 25 mas	4.4 x 2.25 2.2 x 1.125	4,000, 8,000 4,000, 8,000	0.84-2.4 0.84-2.4	20%,10% 20%,10%	Planning mask mounted in OIWFS
Lenslet IFS 112x128 Spaxels	9 mas 4 mas	1.01 x 1.15 0.45 x 0.51	4,000 4,000	0.84-2.4 0.84-2.4	5% 5%	Planning mask mounted in OIWFS
Lenslet IFS 16x128 Spaxels	9 mas 4 mas	0.144 x 1.15 0.064 x 0.51	8,000-10,000 8,000-10,000	0.84-2.4 0.84-2.4	20% 20%	Planning mask mounted in OIWFS

Performance category	Value	Comment
Expected Strehl ratio for greater than 50% of sky	J band: 0.41 H band: 0.60 K band: 0.75	For on-axis object. Relative Strehl ratio variations of 1.5-2.5% across entire IRIS field on account of multi-conjugate correction.
Airy ring size	J band: 21 mas H band: 28 mas K band: 37 mas	Diameter (FWHM)
Ensquared energy	J band: 0.35 - 0.57 H band: 0.50 - 0.66 K band: 0.62 - 0.72	Over 16.4 x 16.4 arcsec ² imager field. Energy in box with diameter of PSF FWHM Uncertainty originates from different conversions between WFE and EE.
Astrometric accuracy	Relative precision: 10 μas Relative accuracy: 30 μas Absolute accuracy: 2-4 mas	Relies on multiple visits to a particular field and a variety of reference fields.
Limiting magnitude (Imager)	J band: 27.8 H band: 27.3 K band: 26.9	Point source sensitivity. Five hour integration, S/N=100, 2λ/D aperture. AB magnitude.
Limiting magnitude (Spectrograph)	J band: 25.8 H band: 26.0 K band: 25.2	Point source sensitivity for 4 mas pixel scale. Other scales are significantly more sensitive. Five hour integration, S/N=10, 2λ/D aperture. AB magnitude.

