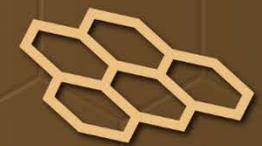
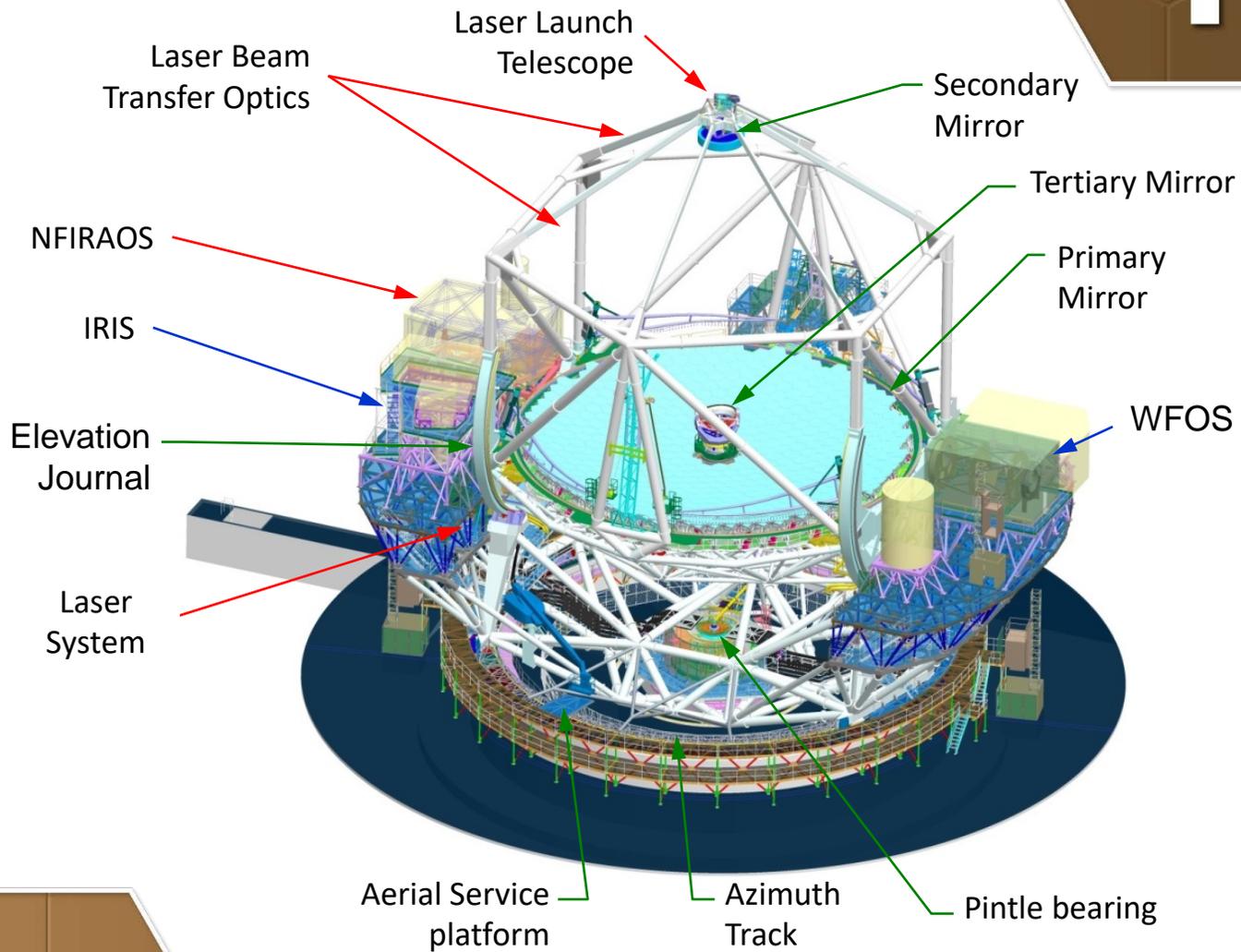


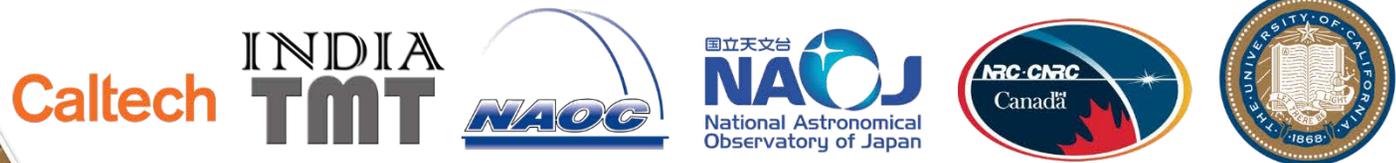
Thirty Meter Telescope: Engineering Subsystems Telescope



TMT



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



Significant funding provided by the Gordon and Betty Moore Foundation

Telescope Subsystems

Optics

Telescope optical parameters

- f/15 Ritchey-Chrétien optical design
- 20 arcmin field of view with 2.62m focal plane diameter

Primary Mirror (M1)

- 30m diameter hyperboloid, f/1
- Formed with 492 phased segments
 - 82 different types
 - 1.44m point-to-point “hexagons”
- 45mm thick glass ceramic
- 2.5mm gaps (0.6% lost area)

Secondary Mirror (M2)

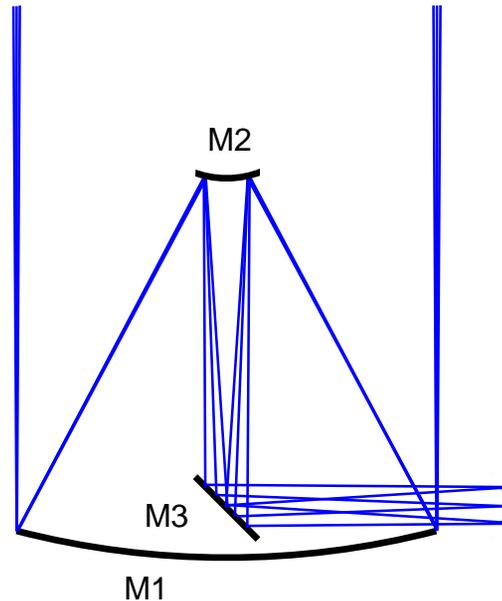
- 3.1m diameter convex hyperboloid
- 100mm thick low expansion glass/ceramic
- Positioned by hexapod
 - Corrects optical focus & coma

Tertiary Mirror (M3)

- 2.5 x 3.5m flat
- 100mm thick low expansion glass/ceramic
- 2-axis gimbal positioner
 - Tracks to point optical beam toward active instrument

Alignment & Phasing System (APS)

- Modified Shack-Hartmann instrument
- Measures wavefront and segment edges
 - Used to align and phase M1 segments



Adaptive Optics Systems

- Launcher of laser guide star
 - Laser
 - Laser Beam Transfer Optics
 - Laser Launch Telescope
- Narrow Field Infrared Adaptive Optics System (NFIRAOS)
 - 2 deformable mirrors at telescope conjugate locations
 - Corrects atmospheric wavefront distortions
 - Feeds 3 IR instruments (2 at first light)

First Light Science Instruments

- WFOS
- IRIS (via NFIRAOS)

Drive Systems

- Axes of motion:
 - Azimuth axis – outer track with pintle bearing for lateral loads
 - Elevation axis – journal track
- On both axes:
 - Hydrostatic bearings
 - Direct drive motors
 - Tape encoders

Maintenance

- Aerial service platform in azimuth assembly
 - Provides access to M2 and M3 on telescope for cleaning, maintenance, removal access
- M1 segment handling system and M1 cleaning wands in elevation assembly
- Top end service platform provides access to LGSF and M2