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