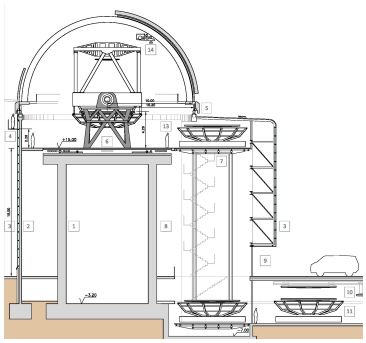
What is HEXA?

HEXA is the next generation telescope for the Calar Alto Observatory. The schedule is six years after funds availability. HEXA will take advantage of the existing Spanish expertise in telescope building, and will contribute to develop the competiveness of Spanish industry in this field. HEXA will complement the current and future European (ESO: Paranal, La Silla, E-ELT) and Spanish facilities (GTC and other telescopes in Calar Alto, El Roque, Izaña, Javalambre and elsewhere), providing an unprecedented scientific and technical return.

The Site



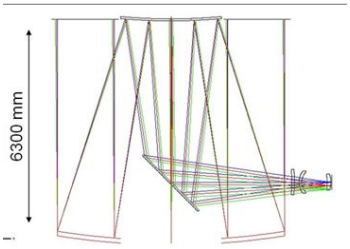
HEXA will be installed at the Calar Alto Observatory, in the province of Almería in Andalusia, in Southern Spain.

Calar Alto is a superb astronomical site specially suited for spectroscopy due to its very low seeing, with a median below 0.8 arcsec. The sky quality is protected by a specially designed law by the Andalusian regional government.

The Telescope

HEXA telescope has an aperture of 6.5m diameter on the primary mirror, a Ritchey-Chrètien configuration and a large Field of View of 1 degree.

HEXA optics at conceptual design is composed by M1 (Primary Mirror), M2 (Secondary Mirror), M3 (Tertiary Mirror) and a lens corrector to provide good image quality over the whole 1 degree Field Of View in diameter. The 3-lenses corrector is placed behind the M3 (and therefore there is one corrector per Nasmyth station) to allow a good telescope packaging.



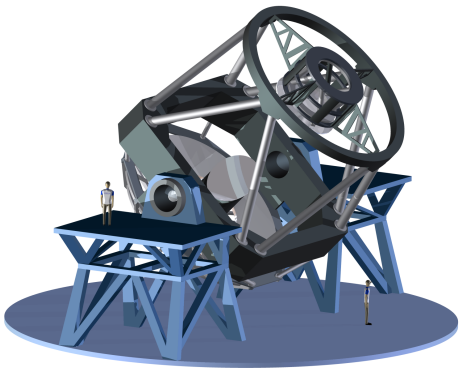
The telescope has been designed with the following drivers:

- ✓To provide a 1º FOV focal plane, telecentric and flat
- ✓To optimize image quality over the whole FOV for a seeing below one arcsec
- ✓To provide a fast beam optimized for optical fibers instruments (F#3.6)

Current plate scale is 8.84 arcsec/mm, which implies that 1arcmin on sky is less than 7mm size on HEXA focal plane.

Current entrance beam (F#3.6) makes the telescope highly optimized for fibers, implying also fast (and difficult) collimator and cameras (although in reasonable sizes due to the plate scale).

The R-C configuration provides two Nasmyth focal stations (with rotators and A&G systems included in the budget). The Cassegrain focus could also be available (although Cassegrain elements are not included in the baseline budget at this moment). The current design (very fast beam at Nasmyth) prevents the use of the primary focus.



Although HEXA can host different types of instruments, the telescope will be optimized for high-quality spectroscopic surveys with large multiplexing capabilities.

HEXA Industrial participation in Spain

HEXA project is of high interest for the Spanish industry to maximize the return of the investment and to make an optimum use of the know-how gained with projects like the GTC 10-m telescope and the ESO E-ELT. Our industry is prepared to accomplish most of the subsystems of this project. Also, it is expected that the instruments will be led by Public Research Centers and will be built by Consortia including both scientists and engineers from Public Centers and Companies.

Contact: HEXA Coordinator: Dr. David Barrado y Navascués (Calar Alto Observatory Director, e-mail: barrado @ caha.es)