

The European Extremely Large Telescope — The Telescope

The telescope structure of the E-ELT will weigh approximately 2700 tonnes and support about 600 tonnes of moving optical, mechanical and electronic components. This structure will be supported by hydrostatic bearings.

The telescope design uses five mirrors to provide the image to the instruments. The primary, secondary and tertiary mirrors (M1, M2 and M3) are used in a high-performance optical configuration with a wide, diffraction-limited field of view.

– The 39-metre primary mirror, M1, is composed of 798 hexagonal segments, each about 1.45 metres from corner to corner. Each segment is about 50 millimetres thick and weighs 165 kilograms.

– The secondary, M2, is a convex mirror 4.2 metres in diameter.

– The M3 mirror is a concave mirror 3.8 metres in diameter.

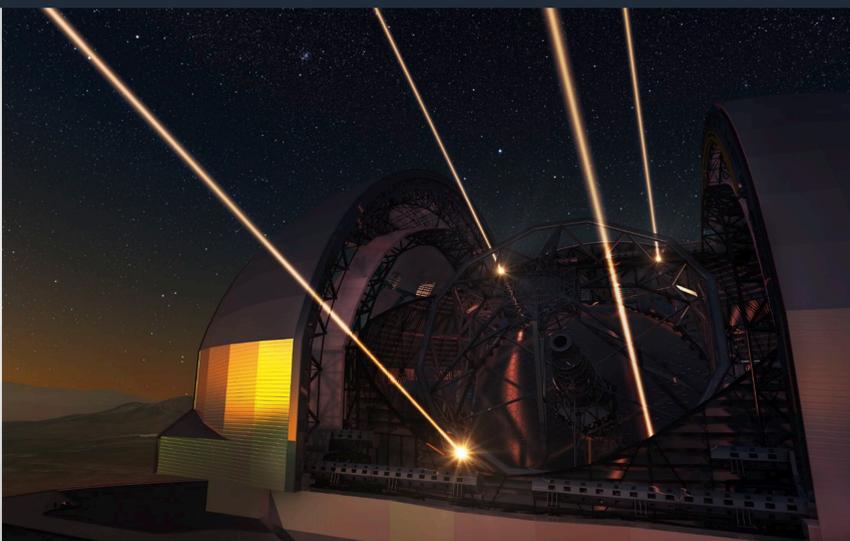
– M4 is an adaptive mirror that compensates for the blur in stellar images introduced by atmospheric turbulence. The M4 mirror is supported by more than 6000 actuators that can change the mirror's shape a thousand times per second.

– M5 is a flat mirror that corrects for image motion from atmospheric turbulence. It also directs light towards one side of the telescope tube or the other.

The telescope will have several science instruments mounted on the platforms on either side of the telescope. It will be possible to switch from one instrument to another within minutes.



Artist's impression of the E-ELT design.



Artist's view of the future 39-metre telescope using lasers to create artificial stars. These form part of the telescope's sophisticated adaptive optics system, which removes much of the blurring effect of the Earth's atmosphere. Credit: ESO/L. Calçada/N. Risinger (skysurvey.org)



www.eso.org/e-elt