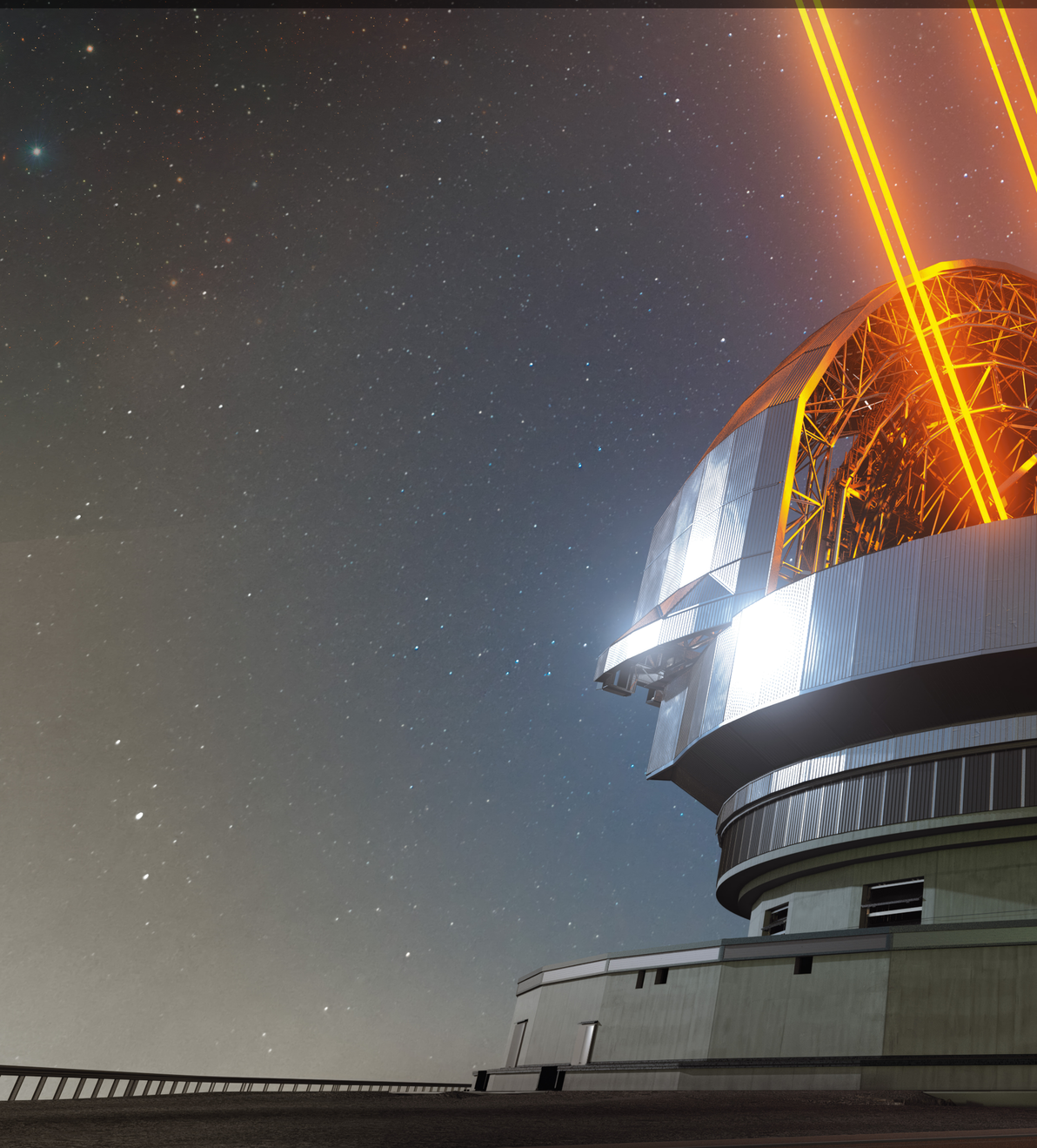
European Southern Observatory

The Extremely Large Telescope — The World's Biggest Eye on the Sky

ESO's Extremely Large Telescope, or ELT for short, is a revolutionary ground-based telescope that will have a 39-metre main mirror and will be the largest visible and infrared light telescope in the world: the world's biggest eye on the sky. In addition to this unparalleled size, the ELT will be equipped with a suite of cutting-edge instruments, designed to cover a wide range of scientific possibilities. ESO, together with its community and the industry, has been working since 2005 to design and develop this telescope. The green light for construction at Cerro Armazones in Chile's Atacama Desert was given in 2014 with first light expected later this decade.

The past decade has brought astronomical revelations that have excited people from all walks of life, from finding planets around Proxima Centauri, the nearest star to the Sun, to the first image of a black hole. In the next epoch of astronomy, with the ELT we will go on to tackle some of the biggest scientific challenges of our time. The ELT will track down Earth-like planets around other stars, and could become the first telescope to find evidence of life outside of our Solar System. It will also probe the farthest reaches of the cosmos, revealing the properties of the very earliest galaxies and the nature of the dark Universe. On top of this, astronomers are also planning for the unexpected — new and unforeseeable questions that will surely arise, given the new capabilities of the ELT. The leap forwards with ESO's ELT may lead to a paradigm shift in our perception of the Universe, much as Galileo's telescope did 400 years ago.

Cerro Armazones is a 3060-metre-high peak in the central part of Chile's Atacama Desert, about 20 kilometres from Cerro Paranal, home of ESO's Very Large Telescope. This site excels in all aspects of astronomical sky quality, which is why ESO selected Cerro Armazones as the future home for the ELT. The telescope will be operated as an integral part of Paranal Observatory.

The sensitive and delicate components of the most sophisticated telescope ground-based astronomy has ever seen require special protection. This is especially true in the rough desert environment, with potentially damaging sand and wind, and in a country that is prone to earthquakes. The 80-metre-tall dome will shelter the ELT in windy conditions during observations and protect it and its delicate optics from the elements during the day. The dome is equipped with more than 100 seismic isolators to dampen earthquake vibrations.