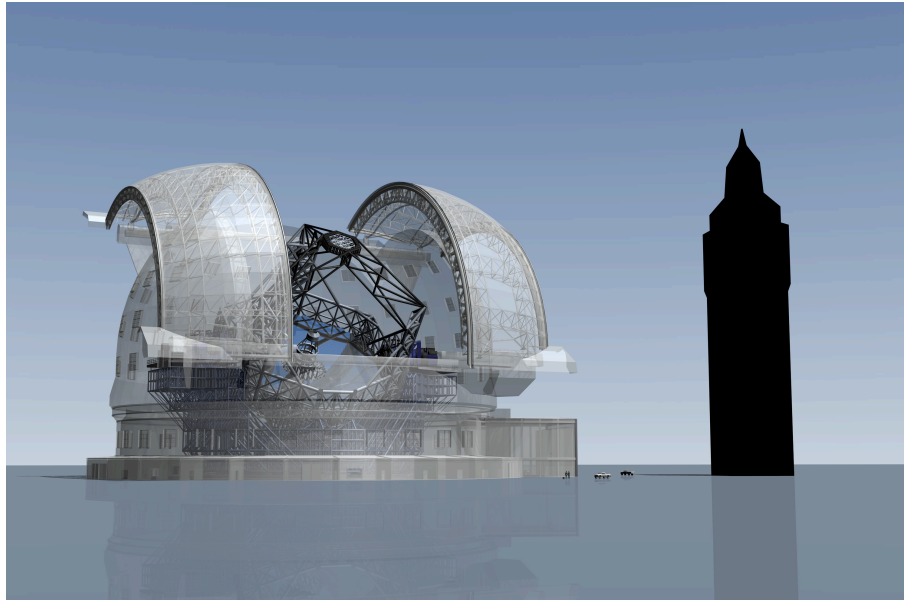




How the biggest eye on the sky will benefit us all



The E-ELT here seen in a scale comparison with London's 96m tall Big Ben (Credit: ESO)

The European Extremely Large Telescope (E-ELT), to be built in Chile, will be the biggest optical and infrared telescope in the world.

It will have an enormous global impact by enabling astronomers to probe and understand a whole range of phenomena, from Earth-like planets around nearby stars to the origin and development of the most distant galaxies at the edge of our observable Universe.

The telescope development, led by the European Southern Observatory (ESO), is currently in the design phase and is expected to be operational by 2020.

The UK is playing a leading role in the E-ELT, leading the generation of the science requirements, developing instrument designs and adaptive optics technologies, designing telescope systems and developing manufacturing processes for the optical elements.

In addition to the considerable impacts that this increased scientific knowledge will bring, there will be huge social and economic impacts to the UK from being a lead partner in this international project.

Inspiring and training

Astronomy and the wonder of space are particularly appealing to the general public, and as such, the E-ELT will be a beacon of inspiration for the next generation leading to careers in science, engineering and technology. Public interest in astronomy is already high and this project represents a significant opportunity to engage the public even more. The UK Project Office, based at the UK Astronomy Technology Centre in Edinburgh, has already undertaken significant public outreach work including a successful exhibition the Royal Society's 350th anniversary celebrations in the summer of 2010.

Another outcome from building this giant telescope will be a cohort of highly accomplished engineers and scientists with skills honed on this great challenge who will be capable of applying their talents in a broad range of areas of great benefit to the UK economy and society.

Industrial contracts

One of the key strategic aims of the E-ELT is to ensure that UK industry wins contracts for the construction of the telescopes, and its systems and instruments. The UK has appointed an

The Science and Technology Facilities Council

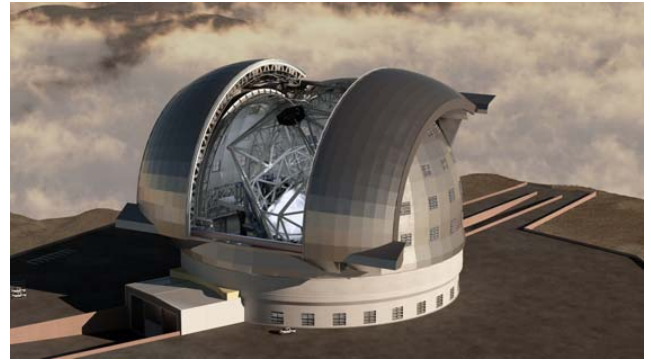
Industry Liaison Manager to ensure that the UK's industry fully benefits from the industrial contracts which are expected to account for 80% of the total cost of the facility. This industrial return has already had impact to UK industry totalling £9 million of new contracts, and is expected to be hundreds of millions of pounds by the end of the project.

For example, a UK consortium based at the OpTIC Technium in North Wales is developing prototypes for the advanced mirror design that will be required for the huge mirror segments in the project. This development is aimed at securing a potential £150 million order for manufacturing the production segments in UK industry. Companies already benefiting from contracts include ARUP, Observatory Sciences Ltd, SciSys Ltd and e2v.

New technology addressing grand challenges

Additional economic benefits will accrue from capability-building in industry and from the innovations needed to meet the ambitious technology targets presented by this challenging project. These advancements in technology are being applied to solve a variety of important problems across many sectors, including enhancing the longevity of artificial knee joints, diagnoses of vascular diseases of the eye, improving the performance of industrial lasers and laser fusion research. The increased global economic activity due to these developments could be over £1 billion per year within the next 10 years.

Hence in addition to the scientific impacts that the E-ELT will bring, direct economic and social benefits will occur through the inspiration and training of scientists and engineers, the development of new technology and direct contracts and capacity building in industry.



Concept drawing of the E-ELT showing the telescope at work
(Credit: Swinburne Astronomy Productions/ESO)

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