



## World's Largest Optical Telescope Being Developed with Autodesk Vault Software

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### European Southern Observatory Telescope to Record Images of Earth-Like Planets Outside Solar System

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What do Earth-like planets outside the Solar System look like? The European Southern Observatory (ESO) is in the midst of designing the world's largest optical telescope with help from [Autodesk Vault](#) data management software, among other [Autodesk, Inc.](#) (NASDAQ: ADSK) solutions, to record images of these planets for the first time.

One of the world's preeminent institutions for astronomical research, the ESO is currently fine-tuning the design of the European Extremely Large Telescope (E-ELT), which is expected to become operational early in the next decade. The core of the E-ELT is a mirror measuring nearly 40 meters (132 feet) in diameter. This mirror consists of nearly 800 segments each 1.4 meter (about 4.5 feet) across and 50 millimeters thick. The telescope main structure weighs about 2,700 tons. The E-ELT will be capable of gathering 15 times more light than today's current cutting-edge telescopes -- all of which are about 10 years old, with mirrors measuring just 8 to 12 meters (24 to 40 feet) in diameter -- and gather a staggering 100 million times more light than the human eye.

The improvements will enable astronomers to more precisely study primordial galaxies and black holes. The E-ELT's powerful instruments will also help scientists probe more deeply for organic molecules and water, the essential signs of life, in the planetary disks that surround distant stars.

Ensuring the accuracy and functionality of the E-ELT is of paramount concern to the ESO and will require the coordinated efforts of scientists, engineers, contractors and other professionals over the next several years. Autodesk Vault software helps engineers start the design with a common understanding and allows the numerous individuals involved with the project to generate, examine, compare and update CAD models generated by different teams.

Additionally, ESO designers and engineers use [Autodesk Inventor](#) software for 3D mechanical design, product simulation and design communication in conjunction with Vault to keep the team synchronized throughout the design project while collaborating to design critical systems that require extra attention.

"All that perfect light that's been traveling for 13 million light years gets distorted once it hits the atmosphere in those last few micro-seconds," said Paul Jolley, head of mechanical and cryogenic engineering for ESO. "The E-ELT will help us re-image this light and study the distant universe like we have never been able to before. Autodesk software is saving us design costs and training time as our teams more quickly and effectively compare and visualize 3D designs."

#### The Astronomical Benefits of Digital Prototyping

ESO engineers leverage Autodesk software to design the specifications for the optical system inside the E-ELT. Inventor software is the tool used to help define the "space envelope" around different mechanisms. [Autodesk Navisworks](#) software is also being used to help designers and non-CAD users compare multiple CAD drawings, visualize them and check for interferences in 3D.

Autodesk Vault coordinates workflow and translates underlying data models to ensure work proceeds in a timely manner. Although the ESO is a European organization, the E-ELT will be located in Chile's Atacama Desert, an area subject to earthquakes. Some instruments will operate in cryogenic chambers chilled to 77 degrees Kelvin, or as cold as liquid nitrogen. Housing will also have to be built to accommodate people working on the project and researchers who will later study the universe with the E-ELT. Additionally, the telescope will be inside a purpose-built enclosure that is 86 meters (282 feet) in diameter and 79 meters (259 feet) in height.

"To say that precision is necessary for ESO's work is a huge understatement," said [Robert "Buzz" Kross](#), senior vice president, Manufacturing Industry Group at Autodesk. "Minute changes on one aspect of the project can have tremendous repercussions elsewhere, and Autodesk software is helping ESO alleviate the possibility of unforeseen consequences."

#### About European Southern Observatory

ESO, the European Southern Observatory, is the foremost intergovernmental astronomy organization in Europe and the world's most productive astronomical observatory. It is supported by 15 countries: Austria, Belgium, Brazil, the Czech Republic, Denmark, France, Finland, Germany, Italy, the Netherlands, Portugal, Spain, Sweden, Switzerland and the United Kingdom. ESO carries out an ambitious programme focused on the design, construction and operation of powerful ground-based observing facilities enabling astronomers to make important scientific discoveries. ESO also plays a leading role in promoting and organizing cooperation in astronomical research. ESO operates three unique world-class observing sites in Chile: La Silla, Paranal and Chajnantor. At Paranal, ESO operates the Very Large Telescope, the world's most advanced visible-light astronomical observatory and two survey telescopes. VISTA works in the infrared and is the world's largest survey telescope and the VLT Survey Telescope is the largest telescope designed to exclusively survey the skies in visible light. ESO is the European partner of a revolutionary astronomical telescope ALMA, the largest astronomical project in existence. ESO is currently planning a 40-meter-class European Extremely Large optical/near-infrared Telescope, the E-ELT, which will become "the world's biggest eye on the sky." For more information, visit <http://www.eso.org/public/>.

#### About Autodesk

Autodesk, Inc., is a leader in [3D design](#), engineering and entertainment software. Customers across the manufacturing, architecture, building, construction, and media and entertainment industries -- including the last 16 Academy Award winners for Best Visual Effects -- use Autodesk software to design, visualize and simulate their ideas. Since its introduction of AutoCAD software in 1982, Autodesk continues to develop the broadest portfolio of state-of-the-art software for global markets. For additional information about Autodesk, visit [www.autodesk.com](http://www.autodesk.com).

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