

# ESO Calendar 2021

European Southern Observatory



## Cover

Wide-field view of the Gum 15 star formation region



This wide-field view captures the spectacular landscape around the relatively unknown central object, GUM 15, a nebula in which stars are being born.

The stellar cluster NGC 2671 is also visible in the lower left part of the image and part of the Vela Supernova Remnant can be seen in the lower right. This particular supernova exploded between 11 000 and 12 300 years ago and, at 800 light-years away, is one of the closest supernova remnants to Earth.

Credit: ESO/Digitized Sky Survey 2  
Acknowledgement: Davide De Martin



## January

Jewels of the Chilean night sky



The jewels of the night are revealed in the Chilean Atacama Desert. The Milky Way stretches up the sky in this beautiful nighttime photograph.

A combination of clear skies and low light pollution makes this Chilean desert the perfect location for ESO's telescopes, including the Very Large Telescope, ALMA and, soon, the Extremely Large Telescope.

Credit: ESO/B. Tafreshi



## February

Supermoon rising behind Cerro Armazones



The road to astronomy: a spectacular supermoon rises behind the majestic Cerro Armazones mountain in Chile. Supermoons, while magnificent, are relatively frequent occurrences which take place when the Moon's orbit is closest to Earth and the lunar phase is full.

By 2025, the Extremely Large Telescope, "the world's biggest eye on the sky," will sit on the peak of Cerro Armazones. This mountain, at 3046 metres high and with 320 clear nights every year will provide a spectacular environment for astronomical observations.

Credit: G. Hüdepohl (atacamaphoto.com)/ESO



## March

ALMA



This stunning image shows the ALMA antennas on the Chajnantor plateau with the bright band of the Milky Way arcing above. With its 66 antennas, ALMA scours the sky for light from some of the coldest objects in the Universe, the building blocks of stars, planetary systems and galaxies.

This area of science, known as submillimetre astronomy, requires incredibly dry, high locations. As one of the driest places on Earth, the 5000-metre-high plateau at Chajnantor is perfect for this kind of astronomy.

Credit: Y. Beletsky (LCO)/ESO



## April

ESO Supernova in the clouds



This mind-bending photograph captures the ESO Supernova Planetarium & Visitor Centre. Located at the site of ESO's Headquarters in Garching bei München, the ESO Supernova provides a free, cutting-edge, immersive experience of the Universe we live in.

The visitor centre is free to visit and a fantastic source of science outreach for local schools and communities. With its visionary architecture designed to resemble a binary star system, it's the perfect place to get inspired by space.

Credit: P. Horálek/ESO



## May

Moon halo at La Silla



When light from the Sun or Moon passes through cirrus clouds high up in the Earth's atmosphere, a halo such as this is formed. The tiny crystals that make up these clouds act as miniature prisms, changing the direction of the light that passes through them.

In the foreground of this angelic scene sits ESO's 3.6-metre telescope which hosts the HARPS instrument. In 2016, HARPS was one of two instruments that detected the exoplanet Proxima b, which orbits around the star closest to the Sun, Proxima Centauri.

Credit: ESO/B. Tafreshi



## June

A luminous arc above the VLT



The entire arc of the Milky Way stretches across the sky above the ESO-operated Very Large Telescope (VLT). Full of gas and dust, star clusters and emission nebulae, the Milky Way is home to an estimated hundreds of billions of stars.

Based at the Cerro Paranal site in the Atacama Desert of northern Chile, the VLT is made up of four telescopes, seen in the foreground. These are named in the indigenous Mapuche language: Antu (Sun), Kueyen (Moon), Melipal (Southern Cross) and Yepun (Evening star).

Credit: M. Claro/ESO



## July

The Orion Nebula



OmegaCAM — the wide-field optical camera on ESO's VLT Survey Telescope (VST) — captured this spectacular image of the Orion Nebula and its associated cluster of young stars. At a distance of about 1350 light-years, the Orion Nebula is one of the closest stellar nurseries to Earth.

Stars form when clumps of gas contract under their own gravity and, if the gas gets hot enough, they ignite. The Orion Nebula is home to approximately 700 stars in various stages of formation.

Credit: ESO/G. Beccari



## August

Otto the transporter



High up on the Chajnantor Plateau sits the Atacama Large Millimeter/submillimeter Array (ALMA) comprised of 66 high-precision antennas. The ability to reposition these antennas is part of what makes ALMA such a powerful telescope. Each antenna weighs over 100 tons, so moving them around requires specially designed vehicles.

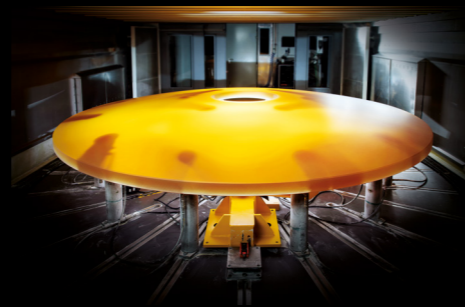
Pictured here is one of the ALMA transporters, Otto, made by Scheuerle Fahrzeugfabrik in Germany. Without Otto and its twin, Lore, ALMA would not have been possible.

Credit: Y. Beletsky (LCO)/ESO



## September

The ELT's M2 mirror blank



Displayed here is the massive 3-tonne blank for the Extremely Large Telescope's (ELT) secondary mirror, M2. To create a mirror for a telescope, a mirror blank is cast and then polished and coated to form a finished mirror.

This particular mirror was successfully machined by the German company SCHOTT and will be the largest secondary mirror ever employed on an optical telescope. A truly remarkable example of pioneering optical engineering, the mirror and its support system will hang upside-down above the 39-metre primary mirror of the ELT.

Credit: SCHOTT



## October

The Milky Way rising over the Residencia



This beautiful image features the Milky Way rising over the Residencia at ESO's Paranal Observatory, which can be seen on the top of the mountain in the distance. Paranal Observatory hosts several world-class telescopes, including the Very Large Telescope and the Visible and Infrared Survey Telescope for Astronomy.

The Residencia is a home away from home for the astronomers, engineers, technicians and other visitors to Paranal. Known as an "oasis for astronomers", the building was featured in the James Bond film "Quantum of Solace" in 2008.

Credit: ESO/P. Horálek



## November

Sun halo at Paranal



Like the Moon halo pictured for May, a Sun halo shines from the sky above ESO's Paranal Observatory in Chile. One of the four Unit Telescopes of the Very Large Telescope (VLT) reflects this breathtaking daylight phenomenon.

The VLT is the world's most advanced optical instrument and the world's most productive ground-based facility, enabling it to take advantage of the 300 clear nights Paranal has every year. With the VLT, the first image of a planet outside our Solar System was obtained in 2004.

Credit: ESO/G. Hüdepohl



## December

The Milky Way



By using a zooming technique on an image of the Milky Way, this image makes it appear as if the viewer is speeding towards the centre of our galaxy.

This hazy band is the Galactic center of the Milky Way. The light from an accumulation of unresolved stars shines out from behind interstellar dust. Scientists believe that at the very centre of our galaxy sits a supermassive black hole of 4 million solar masses, known as Sagittarius A\*.

Credit: A. Ghizzi Panizza/ESO



## ESO

European Southern Observatory



ESO is the foremost intergovernmental astronomy organisation in Europe and the world's most productive ground-based astronomical observatory by far. It is supported by 16 countries: Austria, Belgium, the Czech Republic, Denmark, France, Finland, Germany, Ireland, Italy, the Netherlands, Poland, Portugal, Spain, Sweden, Switzerland and the United Kingdom, along with the host country of Chile and with Australia as a Strategic Partner. 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 organising 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. The Visible and Infrared Survey Telescope for Astronomy 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 a major partner in the revolutionary astronomical observatory Atacama Large Millimeter/submillimeter Array (ALMA) and operates the Atacama Pathfinder Experiment (APEX), both located in the Chajnantor Plateau. ESO is currently building the 39-metre Extremely Large Telescope, the ELT, which will become "the world's biggest eye on the sky".

Moon phases are indicated in Universal Time.

Produced by the ESO Department of Communication.

# 2021

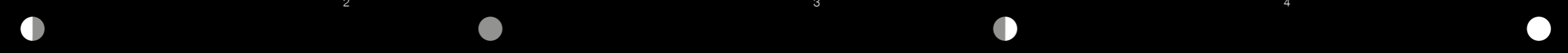




# January 2021

Jewels of the Chilean night sky

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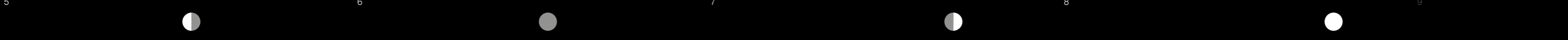




Supermoon rising behind Cerro Armazones

# February 2021

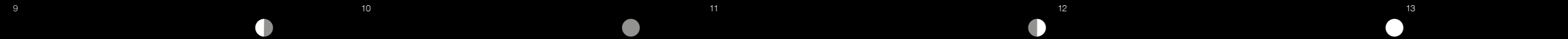
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# March 2021

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April 2021

ESO Supernova in the clouds

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Moon halo at La Silla

# May 2021

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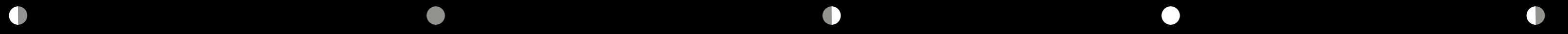




A luminous arc above the VLT

# June 2021

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The Orion Nebula

# July 2021

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# August 2021

Otto the transporter

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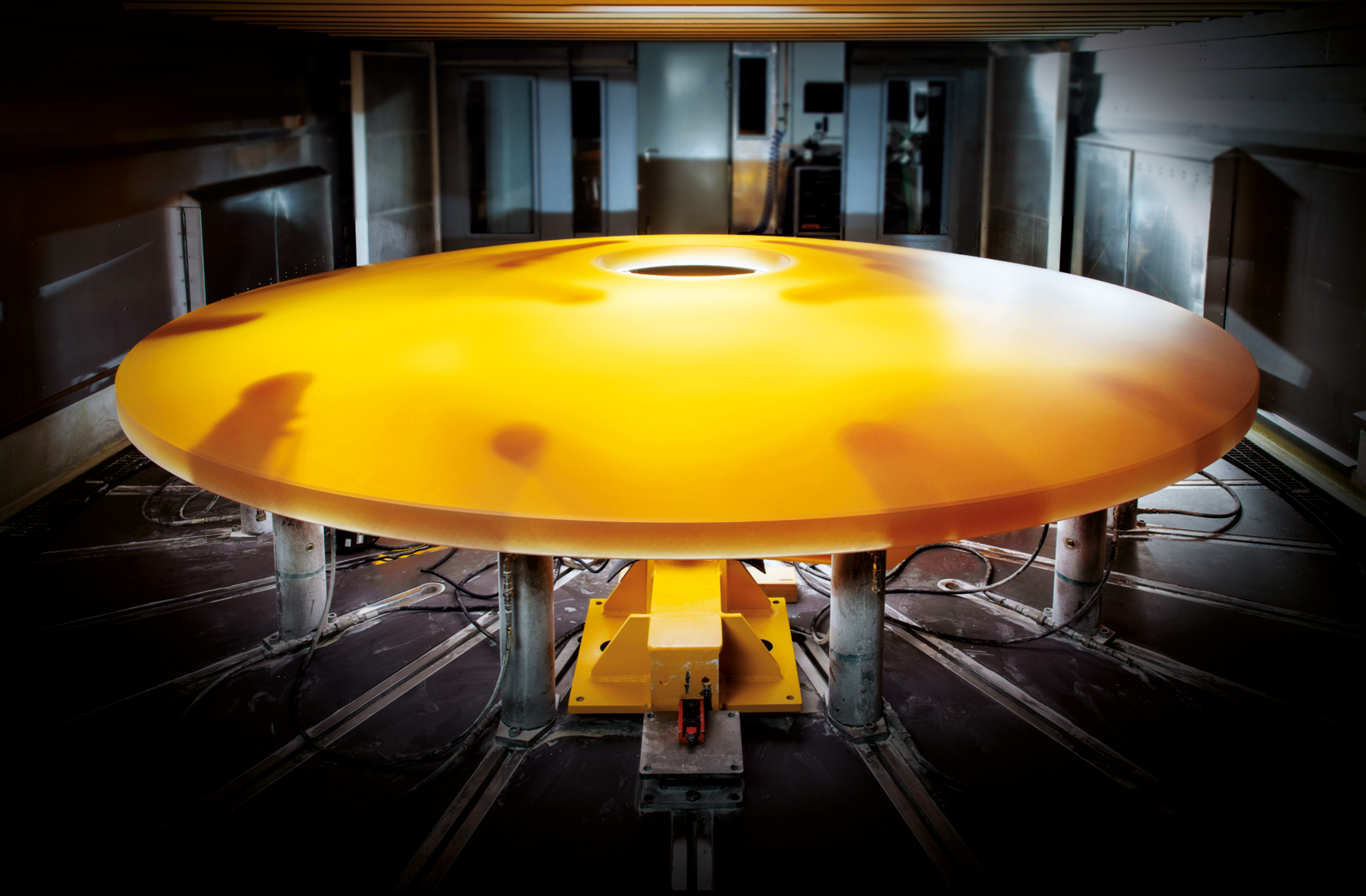
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The ELT's M2 mirror blank

September 2021

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The Milky Way rising over the Residencia

# October 2021

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Sun halo at Paranal

# November 2021

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The Milky Way

# December 2021

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