

ESO Calendar 2020

European Southern Observatory



Cover

Pacman and the Moon



Taken at sunset, this image captures one of the Auxiliary Telescopes at Paranal at the start of a long night of hard work.

Credit: ESO/E. Lagadec

January

Guide star in the Milky Way



Three of the four Unit Telescopes that make up ESO's Very Large Telescope reflect the glow of the laser light being sent up by the fourth. It is part of the Adaptive Optics system; state-of-the-art technology that corrects for the blurring effects of the Earth's atmosphere to produce high quality observational data. Our own galaxy, the Milky Way, can be seen as a bright band across the sky. The four Unit Telescopes of the ESO's VLT are called Antu, Kueyen, Melipal and Yepun — Mapuche names for the Sun, Moon, the Southern Cross and Venus.

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

February

ALMA's binoculars



A cluster of ALMA antennas on the remote Chajnantor Plateau in the Chilean Atacama Desert. The dishes work together as one large instrument through a technique known as interferometry. This creates a virtual telescope far larger than could be constructed as a single dish. Like a powerful set of binoculars ALMA allows researchers to probe the cool universe, from the most distant galaxies to the building blocks of life.

Credit: ESO

March

ELT foundations under moonlight



The foundations of the ELT are lit up by the Moon as the centre of the Milky Way passes overhead. The Small and Large Magellanic Clouds can be seen just above the horizon and Jupiter is the brightest "star" near the centre of the Milky Way. Airglow effects from Earth's upper atmosphere add to the richness of this scene.

Credit: ESO/M. Zamani

April

The ESO Supernova Planetarium & Visitor Centre star-roof



On 26 April 2018, the ESO Supernova Planetarium & Visitor Centre was officially inaugurated, and its doors were opened to the public two days later. The centre, located at ESO's Headquarters in Garching, Germany, provides visitors with an immersive experience of astronomy as well as an introduction to scientific results, projects, and technological breakthroughs enabled by ESO's facilities.

This picture shows the spectacular star-roof of the centre, which weighs almost 30 tonnes and consists of glass panels set into a metal framework made of triangular sections — 262 in total — arranged to artistically represent the constellations of the southern sky.

Credit: ESO/P. Horálek

May

3.6-metre eye on the sky



The ESO 3.6-metre telescope sits under a star-filled sky at ESO's La Silla Observatory. After seeing first light towards the end of 1976, this telescope began scientific operations in 1977, and has been helping astronomers to study the Universe ever since. Multiple upgrades have helped the telescope to maintain its place as one of the most productive engines of astronomical research. It has also hosted many instruments, notably the High Accuracy Radial velocity Planet Searcher (HARPS), the world's foremost exoplanet hunter, which has discovered scores of alien worlds.

Credit: ESO

June

Dynamic inner corona



This image is a deep high dynamic range composite of a series of different exposures that reveals the finest details of the solar corona that were visible during the total solar eclipse on 2 July 2019, as seen from ESO's La Silla Observatory. The solar corona is a plasma of free electrons scattering the Sun's light. These electrons are affected by the Sun's magnetic field, so the shape formed by the scattered light reveals the contours of the magnetic field. During this eclipse, the corona had a dipolar shape, which is characteristic of a minimum in the 11-year solar activity cycle. The thin streamers emanating from the top and bottom of the solar disc indicate the two poles, while the solar equator is highlighted by large magnetic loops. In reality, the corona extends much farther than the edges of this image.

Credit: ESO/P. Horálek

July

Total solar eclipse, La Silla Observatory, 2019



On 2 July 2019 a total solar eclipse was visible from ESO's La Silla Observatory in Chile. The eclipse lasted roughly two and a half hours, with almost two minutes of totality at 20:39 UT, and could be seen across a narrow stretch of land across Chile and Argentina. To celebrate this rare event ESO invited 1000 people, including school children, the general public, media and dignitaries to come to the observatory and watch the eclipse from this stunning location.

Credit: P. Horálek/ESO

August

Sunset at Paranal



Regular visitors to Paranal, the home of ESO's Very Large Telescope, are often treated to beautiful views of sunsets from the observing platform.

Credit: S. Robbe-Dubois/ESO

September

First image of a black hole



The Event Horizon Telescope (EHT) — a planet-scale array of eight ground-based radio facilities forged through international collaboration — has been designed to capture images of black holes at the centres of galaxies. In coordinated press conferences across the globe, EHT researchers revealed that they succeeded, unveiling the first direct visual evidence of the shadow of a supermassive black hole in the centre of the galaxy Messier 87.

Although the constituent telescopes of the EHT are not physically connected, they are able to synchronise their data precisely using atomic clocks — hydrogen masers. The observations for this result were collected at a wavelength of 1.3 mm during a 2017 global campaign. Each telescope of the EHT produced enormous amounts of data — roughly 350 terabytes per day — which were stored on high-performance helium-filled hard drives. These data were flown to highly specialised supercomputers — known as correlators — at the Max Planck Institute for Radio Astronomy and the Massachusetts Institute of Technology Haystack Observatory to be combined. They were then painstakingly converted into an image using computational tools developed by the collaboration.

Credit: EHT Collaboration

October

The Very Large Telescope platform at sunset



The Very Large Telescope platform at sunset on Cerro Paranal.

Credit: M. Cabral/ESO

November

Rendering of the M2 mirror in position on the ELT telescope



This image shows an artist's impression of the M2 mirror in position on ESO's Extremely Large Telescope (ELT). Designed and manufactured by the SENER group (Spain), the mirror will be 4.2 metres in diameter with a convex shape. The total weight of the M2 system will be close to 12 tonnes.

Credit: SENER

December

The rosy glow of a cosmic seagull



The colourful and wispy cloud Sharpless 2-296 forms the "wings" of an area of sky known as the Seagull Nebula — named for its resemblance to a gull in flight. This celestial bird contains a fascinating mix of intriguing astronomical objects. Glowing clouds weave amid dark dust lanes and bright stars. The Seagull Nebula — made up of dust, hydrogen, helium and traces of heavier elements — is the energetic birthplace of new stars.

Credit: ESO/VPAS+ team/N. Wright

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.

2020





January 2020

Guide star in the Milky Way

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February 2020

ALMA's binoculars

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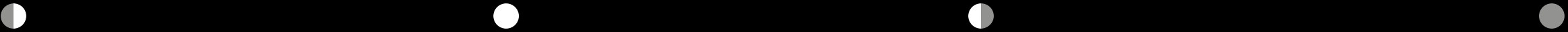
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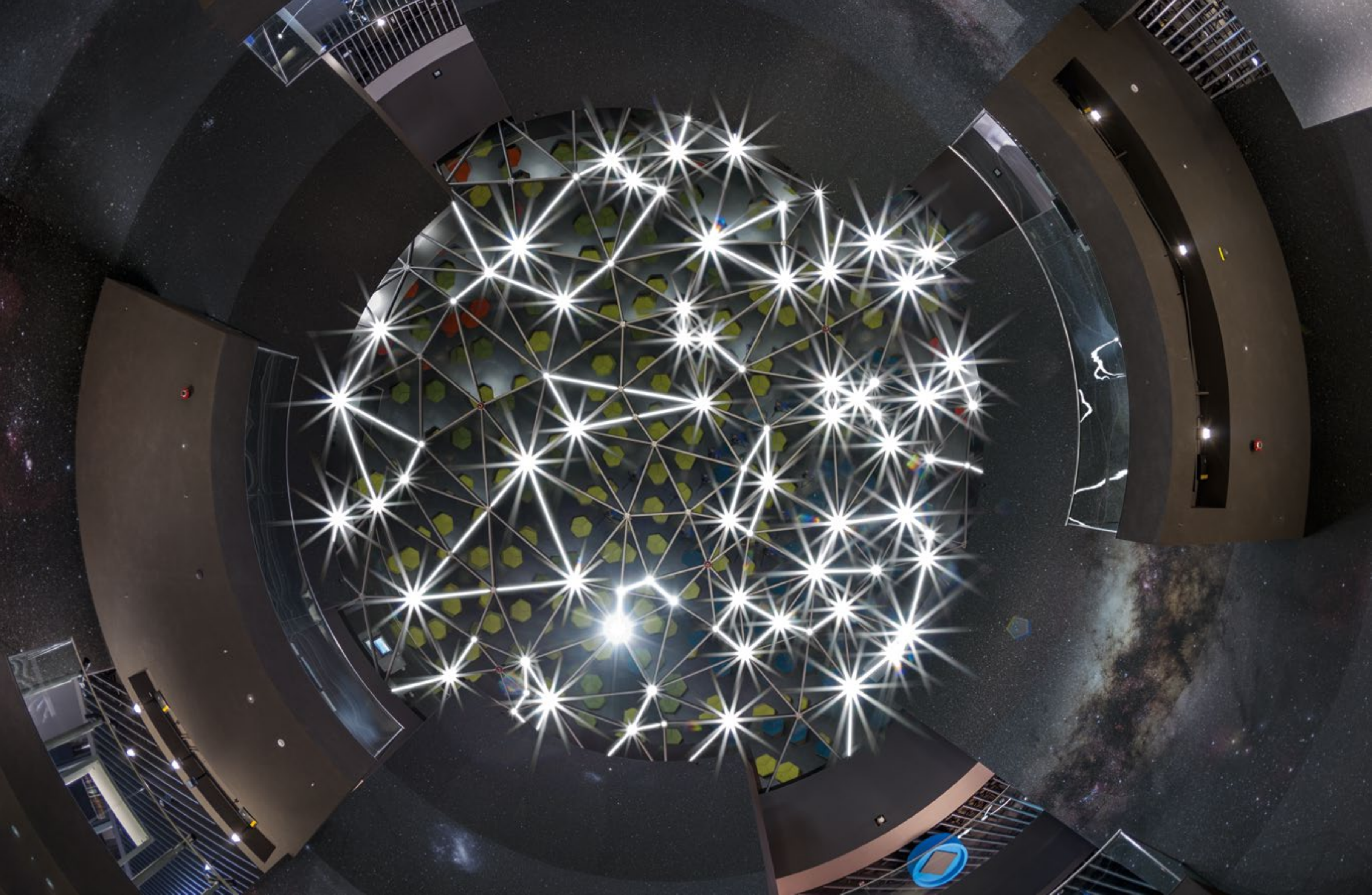


March 2020

ELT foundations under moonlight

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The ESO Supernova Planetarium & Visitor Centre star-roof

April 2020

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May 2020

3.6-metre eye on the sky

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Dynamic inner corona





Total solar eclipse, La Silla Observatory, 2019

July 2020

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August 2020

Sunset at Paranal

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September 2020

First image of a black hole





The Very Large Telescope platform at sunset

October 2020

Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
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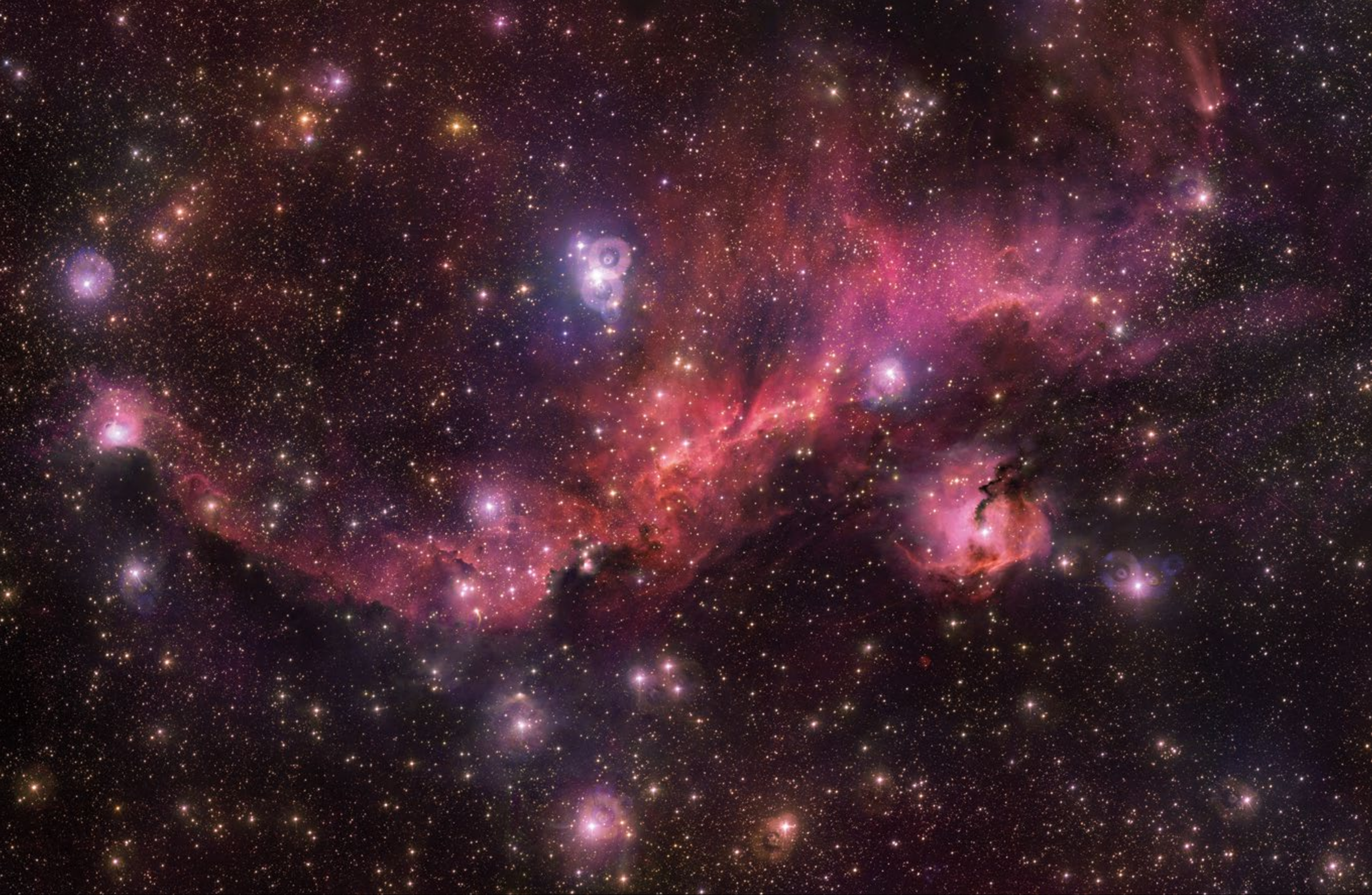


Rendering of the M2 mirror in position on the ELT telescope

November 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday
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The rosy glow of a cosmic seagull

December 2020

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