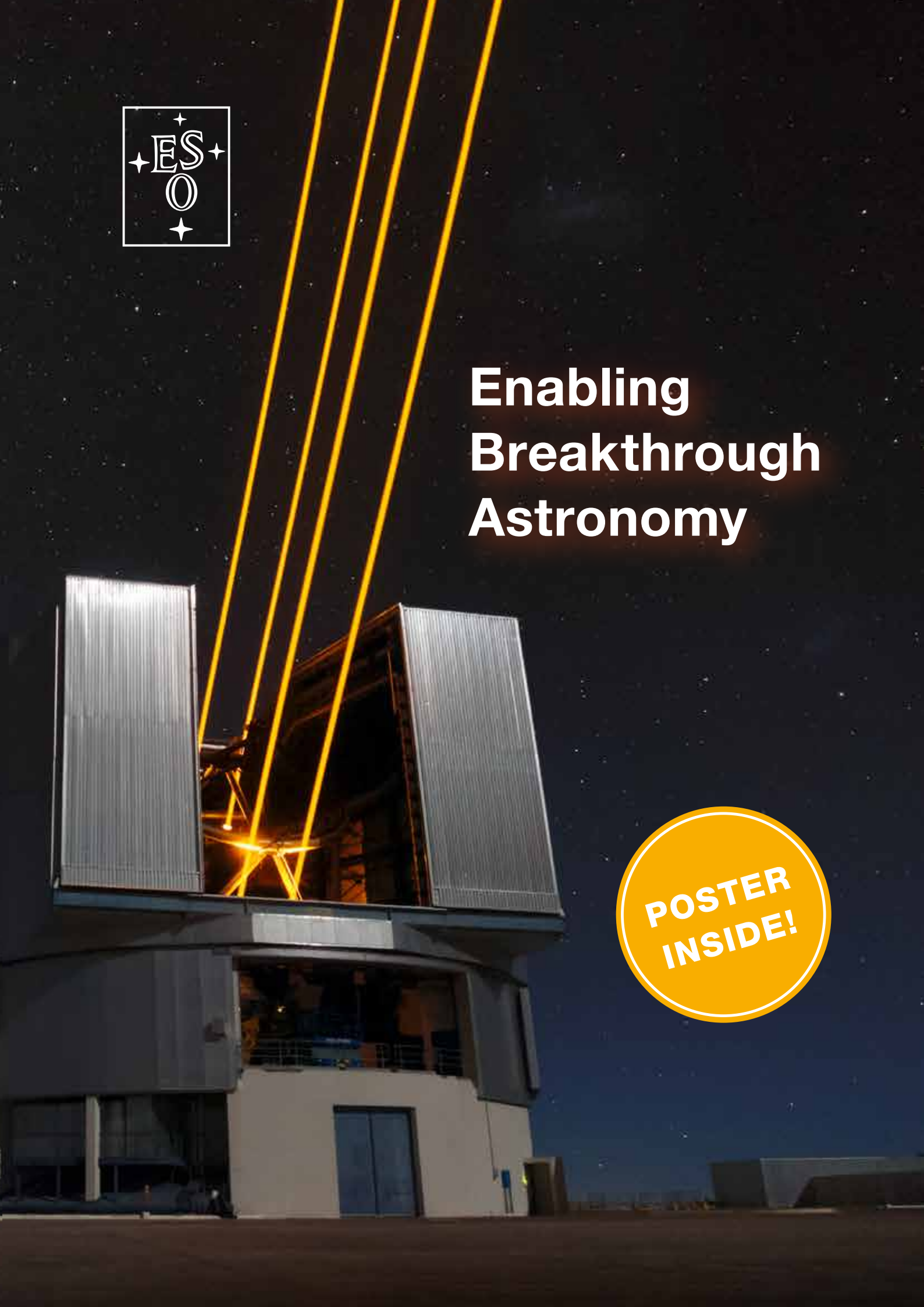

ESO
Enabling
Breakthrough
Astronomy
POSTER
INSIDE!

We are ESO

At the **European Southern Observatory,** we enable scientists worldwide to discover the secrets of the Universe for the benefit of all. We design, build and operate telescopes on the ground, which astronomers use to tackle exciting questions such as:

How did the Universe come to be?

What are black holes?

Are we alone in the Universe?

We have been increasing our knowledge of the Universe and our ability to explore it since 1962 by bringing countries and people together, fostering international collaboration for astronomy. We help ensure a sustainable future for astronomy and engineering through our training programmes, open data policies and new telescopes and instruments. Through our outreach and education projects, which include tours of ESO observatories and the ESO Supernova Planetarium & Visitor Centre, we harness the public excitement for astronomy to increase society's engagement with science and technology.

ESO Facts

16
Member States and partners Chile and Australia

750
employees from over **30** countries

€216 million
Annual contributions from ESO's Member States and Australia (2023)

Garching near Munich, Germany
ESO Headquarters

Santiago, Chile
ESO's local organisational hub

Our Telescopes

All our telescopes are located in Chile's Atacama Desert, a special place with unique conditions to observe the night sky. This is where we operate our three observing sites: La Silla, Paranal and Chajnantor. It's also where we are building our most advanced telescope yet: ESO's Extremely Large Telescope (ELT) will dramatically change what we know about the Universe and will make us rethink our place in the cosmos.

Paranal

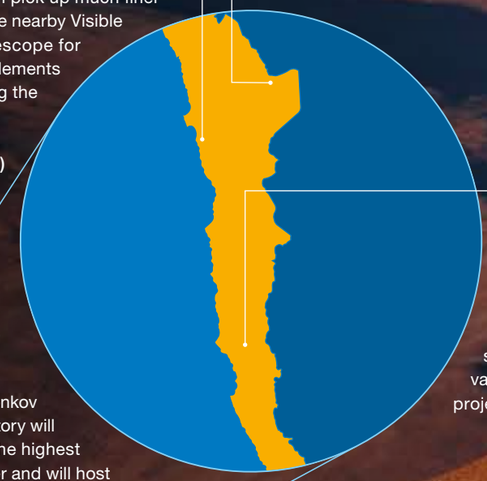
VLT/VLTI — the Very Large Telescope is the world's most advanced optical and near-infrared observatory. Its telescopes work individually or together to form the Very Large Telescope Interferometer, which can pick up much finer details of the cosmos. The nearby Visible and Infrared Survey Telescope for Astronomy (VISTA) complements the VLT/VLTI by surveying the night sky.

ELT (under construction) — the Extremely Large Telescope is a revolutionary 39-metre optical and near-infrared telescope that will explore the Universe in unprecedented depth and detail.

CTAO South (planning phase) — the future Cherenkov Telescope Array Observatory will explore the Universe at the highest energies. ESO is a partner and will host and operate the southern array.

Chajnantor

ALMA — together with international partners, ESO operates the Atacama Large Millimeter/submillimeter Array, the most powerful telescope for observing the cold Universe.



La Silla

ESO's first observatory hosts pioneering telescopes, such as the ESO 3.6-metre Telescope and the New Technology Telescope (NTT), along with various hosted telescope projects.

ESO 3.6-metre telescope

NTT

Other ESO Locations

Garching near Munich, Germany — where ESO Headquarters and the ESO Supernova are located. It's in Garching that most telescope design and development takes place, and it's from here that ESO staff manage data from our observatories, including archiving and user support.

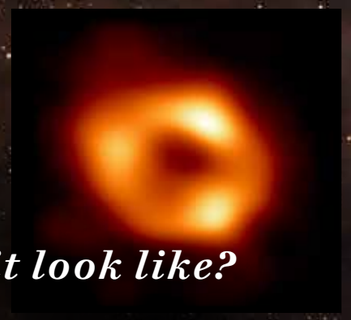
Santiago, Chile — hosts ESO's organisational hub in our partner and host country. It's from Santiago that we support ESO operations in Chile and collaborate with local authorities, scientific community and society.

Groundbreaking Science

ESO's telescopes have enabled remarkable discoveries, answering such questions as:

Is there a black hole at the centre of our galaxy?

Using ESO's facilities over three decades, astronomers tracked stars at the centre of our galaxy, finding that they orbit a supermassive black hole. The discovery was awarded a Nobel Prize in 2020.



What does it look like?

A network of telescopes around the world, including ESO's, allowed astronomers to capture the first image of this black hole.

What planets are out there?

The first direct image of a planet outside our Solar System, called 2M1207 b, was obtained in 2004 by ESO's Very Large Telescope (VLT).

ESO's telescopes have imaged the birth of planets in extraordinary detail, helping us find out how planets like ours come to be.

Our telescopes have also revealed planets orbiting the closest star to our Sun, including one that might have water on its surface.

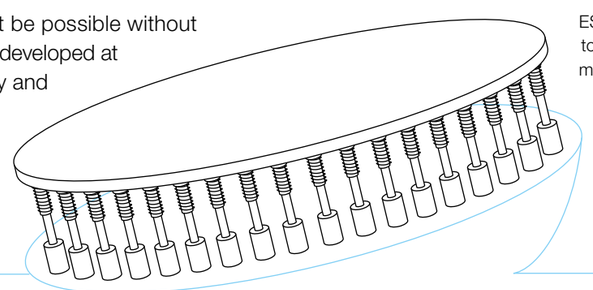
How fast is the Universe expanding?

Astronomers have used ESO's facilities to measure the expansion of the Universe, finding that it keeps expanding faster and faster. The discovery was awarded a Nobel Prize in 2011.

Advancing Technology

ESO pushes the frontiers of technology. We have increased the mirror size of our telescopes from one metre to the current 8.2 metres of the four VLT Unit Telescopes and plan for a main mirror of 39.3 metres for our upcoming Extremely Large Telescope (ELT).

Such large telescopes would not be possible without the game-changing technologies developed at ESO in collaboration with industry and academia. Two examples include active and adaptive optics.

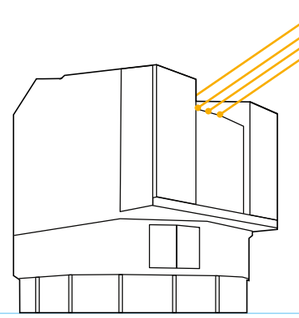


Active Optics

ESO staff developed this key technology to build bigger and optically accurate primary mirrors for telescopes. It was first introduced with ESO's New Technology Telescope.

Adaptive Optics

This technology, used on the VLT and other telescopes, allows ground-based telescopes to capture extremely sharp images by using deformable mirrors, lasers and sensors to correct for the blurring caused by Earth's atmosphere.



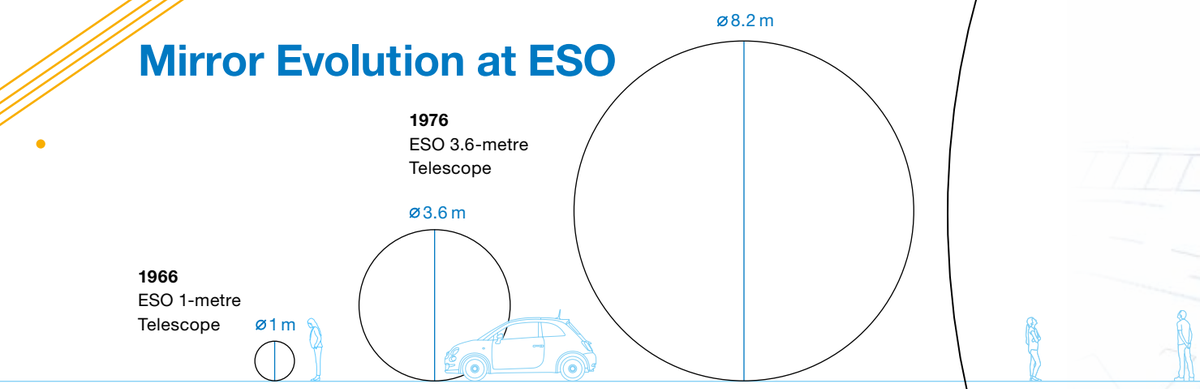
International Collaboration

Today's telescopes are huge science powerhouses the size of stadiums. Building them requires bringing together hundreds of scientists, engineers, construction workers, industry and other suppliers from all over the world to work hand in hand.

ESO is one of the first intergovernmental scientific organisations, and its pooling of resources in a stable legal structure, coupled with its close ties to both the international astronomy community and industry, has allowed ESO's Member States to complete world-leading projects together that they wouldn't have been able to do alone.

ESO also has a long-standing cooperation for mutual benefit with Chile, its host and partner. ESO is privileged to have access to the world's best locations for astronomy. It has helped generate business opportunities and stimulate local development and it plays a role in training Chile's next generation of astronomers and engineers.

Mirror Evolution at ESO



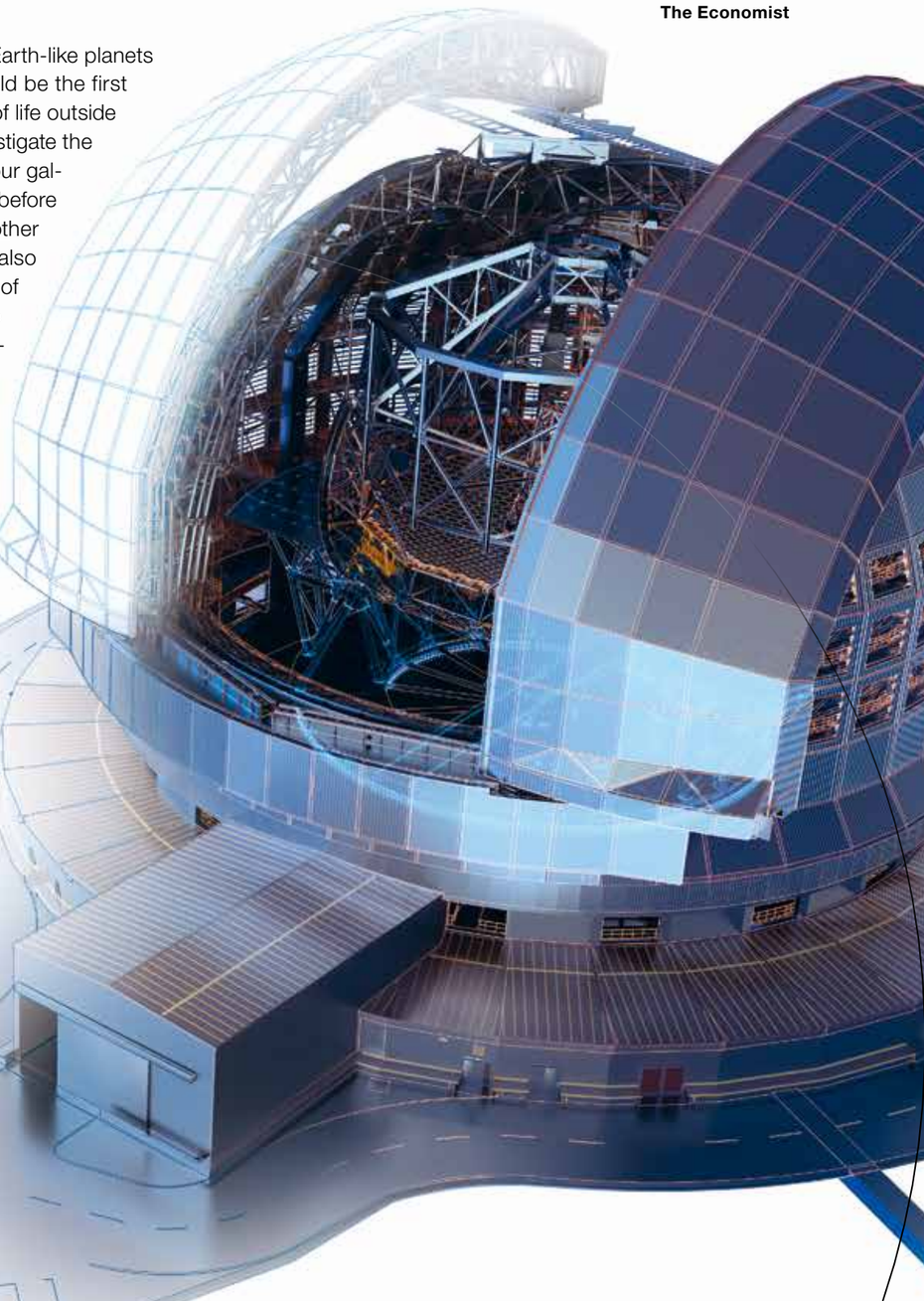
The Telescope of the Future

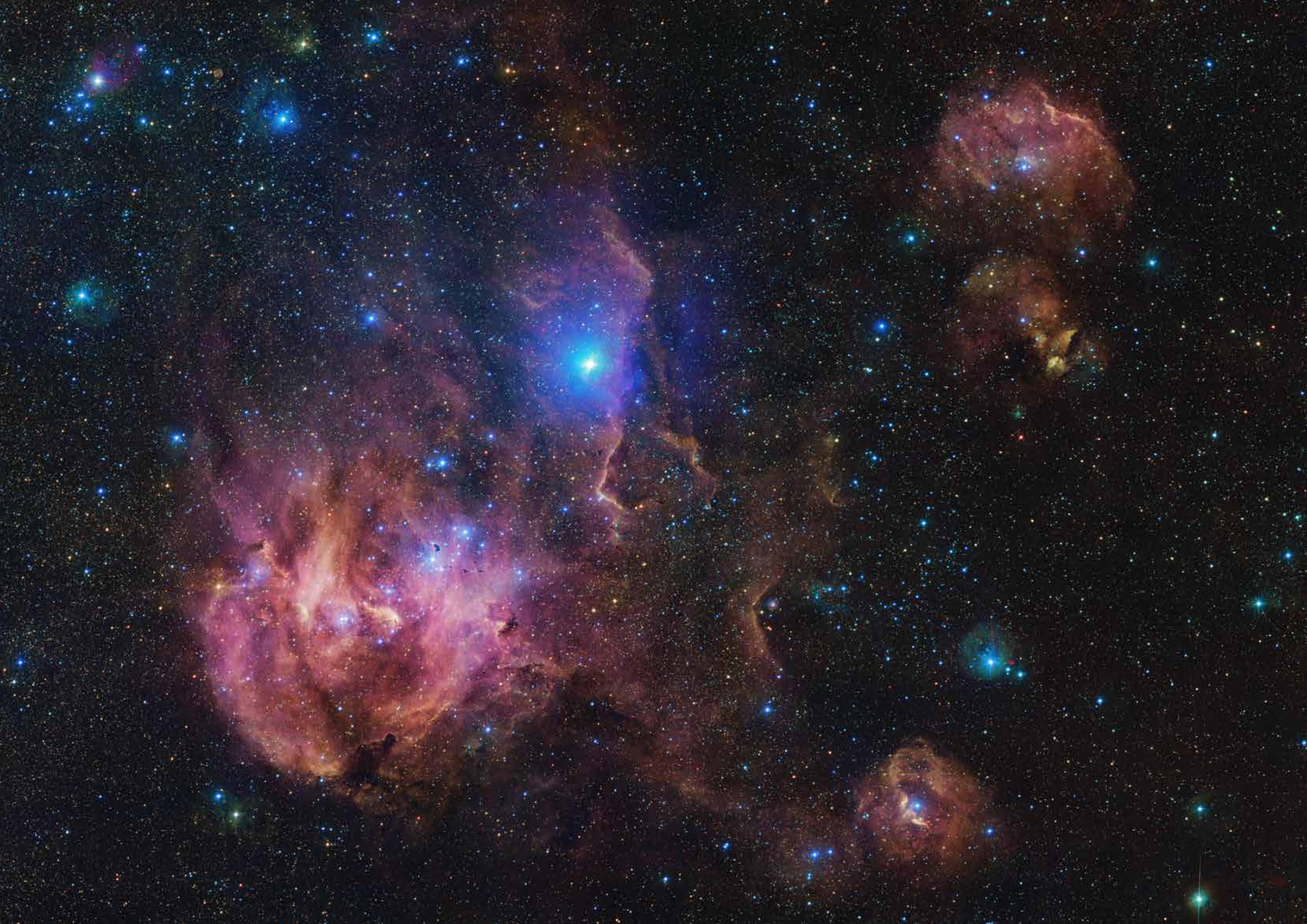
There's much still to discover about the Universe. To tackle the biggest astronomical questions of our time, ESO is building the Extremely Large Telescope (ELT) on a mountain just a few kilometres away from ESO's Very Large Telescope. With a mirror over 39 metres in diameter, the ELT is the largest optical and near-infrared telescope ever built. It will start operating in the later 2020s and will be part of ESO's Paranal Observatory.

ESO's ELT will track down Earth-like planets around other stars and could be the first telescope to find evidence of life outside our Solar System. It will investigate the black hole at the centre of our galaxy in more detail than ever before and explore black holes in other galaxies. The telescope will also probe the furthest reaches of the cosmos, revealing the secrets of the very first galaxies and the nature of the mysterious, dark Universe. On top of this, astronomers are also planning for the unexpected — given its size and technological capabilities, the ELT will make as yet unimaginable discoveries.

"(...) quite possibly the most ambitious telescope that will ever grace the surface of the Earth."

The Economist





Want to Know More?

Go to **eso.org** to find out more about ESO, including:

– Visiting our observatories in Chile or watching a planetarium show at the ESO Supernova in Germany.
– Following ESO on social media.
– Checking out ESO's stories, images and videos.

European Southern Observatory

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Poster inside!

IC2944 – The Running Chicken Nebula

This 1.5-billion-pixel image spans across 270 light years and was captured by the VLT Survey Telescope, hosted at ESO's Paranal Observatory.

Credit: ESO/VPHAS+ team
Acknowledgement: CASU