

ESO

European Organisation
for Astronomical
Research in the
Southern Hemisphere

Paranal



About ESO

ESO is the European Southern Observatory. Created in 1962, ESO provides state-of-the-art research facilities to European astronomers and is supported by thirteen member states: Belgium, the Czech Republic, Denmark, Finland, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Whilst the headquarters are located in Germany, ESO operates three observational sites in the Chilean Atacama desert. At La Silla, near La Serena, ESO operates several medium-sized telescopes. The Very Large Telescope is located on Paranal, near Taltal, which also hosts the VLT Interferometer, and, soon, two survey telescopes, the VST and VISTA. The third site is the 5 000 m high Llano de Chajnantor, near San Pedro de Atacama, where APEX is in operation, and a giant array of 12-m submillimetre antennas (ALMA) is being constructed in collaboration with North America, East Asia and Chile.

The annual member state contributions to ESO are approximately 120 million Euros, and ESO employs around 600 staff members.



Spiral Galaxy NGC 1350



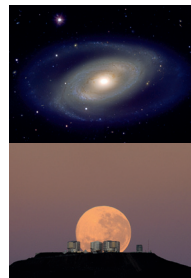
Photo: G. Gillet, ESO

The Very Large Telescope

In 2008, the Very Large Telescope (VLT) array is celebrating the tenth anniversary of its 'First Light', a decade as the world's most advanced optical and infrared observatory. The VLT consists of four Unit Telescopes (UTs) with main mirrors of 8.2-m diameter, and four movable 1.8-m Auxiliary Telescopes (ATs).

The large Unit Telescopes can be used individually and are able to see objects that are four billion times fainter than what can be seen with the unaided eye. The UTs and ATs can also work together in groups of two or three, so that they act as one giant telescope: the 'VLT Interferometer'. Thus, astronomers can observe detail up to 25 times finer than can be observed with the individual telescopes.

The Adaptive Optics technology allows the instruments on the VLT to overcome the blurring effects of the atmosphere, producing images almost as sharp as if taken from space. In theory, Adaptive Optics allows the VLT to read a newspaper headline at a distance of more than 10 kilometres.



Moonset over Paranal



Scientific Highlights

Astronomy tackles vast questions that challenge our minds and our imagination: Is there life elsewhere in the Universe? What lies at the centre of the Milky Way? How old is our Universe? The VLT's arsenal of sophisticated instruments enables observations that are essential to investigate key issues, helping us better understand the world we live in.

In 2005, the VLT provided a major breakthrough, allowing astronomers to spot the faint glow of a planet outside our Solar System and thus to take the first ever picture of an exoplanet. This new world is a giant one, some five times more massive than Jupiter.

Scientists have long suspected that a black hole lurks at the heart of the Milky Way. The VLT finally provided conclusive evidence of a supermassive black hole, almost three million times more massive than our Sun, and discovered that it emitted powerful flashes. Scientists also use the VLT to peer into the centre of galaxies far beyond our own.

The VLT has also detected the light of a cosmic fireball that took place when the Universe was a mere infant, only 7 % of its current age, setting a new record for the discovery of the oldest and farthest explosion of a star yet seen.



Spiral Galaxy NGC 613



Residencia Specifications

Architects: Auer+Weber (Germany)
Constructor: Vial y Vives Ltda. (Chile)
Total surface: 10 000 m²
L-shape: 176 m x 53 m
Levels: 4
Gardens: 1000 m²
Rooms: 108
Offices: 18
Other facilities: restaurant, music room, library, swimming pool, sauna
Cost: 12 million Euros
Inauguration: February 2002



The Residencia and 007

Since early 2002, the Residencia has accommodated visiting astronomers and the Paranal Observatory's staff during their working shifts. This award-winning construction was designed by German architects Auer+Weber as a subterranean L-shape, with a 35-metre dome covering an indoor garden; the use of natural materials and colours allows for a smooth integration in the Atacama's landscape.

The Residencia was conceived as a comfortable retreat for professionals and technicians working under extreme dryness and isolation, far from their families, for long periods of time. It boasts 108 bedrooms over four levels and 10 000 square metres, as well as facilities such as a restaurant, music room, library, swimming-pool and sauna. The construction cost 12 million Euros – including the interior design and furniture by Chilean architect Paula Gutierrez.

This singular building provides a unique backdrop for the James Bond film "Quantum of Solace". The movie producer, Michael G. Wilson, said: "The Residencia of Paranal Observatory caught the attention of our director, Marc Forster and production designer, Dennis Gassner, both for its exceptional design and its remote location in the Atacama desert. It is a true oasis and the perfect hide out for Dominic Greene, our villain, whom 007 is tracking in our new James Bond film."



The Residencia



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Spiral Galaxy NGC 4565

