ESO

European Organisation
for Astronomical
Research in the
Southern Hemisphere

Annual Report 2007

ESO

European Organisation
for Astronomical
Research in the
Southern Hemisphere

Annual Report 2007

presented to the Council by the
Director General
Prof. Tim de Zeeuw

ESO is the pre-eminent intergovernmental science and technology organisation in the field of ground-based astronomy. It is supported by 13 countries: Belgium, the Czech Republic, Denmark, France, Finland, Germany, Italy, the Netherlands, Portugal, Spain, Sweden, Switzerland and the United Kingdom. Further countries have expressed interest in membership.

Created in 1962, ESO provides state-of-the-art research facilities to European astronomers. In pursuit of this task, ESO's activities cover a wide spectrum including the design and construction of world-class ground-based observational facilities for the member-state scientists, large telescope projects, design of innovative scientific instruments, developing new and advanced technologies, furthering European cooperation and carrying out European educational programmes.

ESO operates the La Silla Paranal Observatory at several sites in the Atacama Desert region of Chile. The first site is La Silla, a 2400 m high mountain 600 km north of Santiago de Chile. It is equipped with several optical telescopes, with mirror diameters of up to 3.6 metres, dedicated to high-profile long-term programmes. The 3.5-m New Technology Telescope was the first in the world to have a computer-controlled main mirror.

Whilst La Silla remains one of the scientifically most productive observing sites in the world, the 2600 m high Paranal site with the Very Large Telescope array (VLT) is the flagship facility of European astronomy. Paranal is situated about 130 km south of Antofagasta in Chile, 12 km inland from the Pacific Coast in what is probably the driest area in the world.

The VLT's design, instrument complement and operating principles set the standard for ground-based optical and infrared astronomy. The VLT is composed of four 8.2-m Unit Telescopes and four movable 1.8-m Auxiliary Telescopes. Scientific operations began in 1999 and have resulted in a high number of extremely successful research programmes.

La Silla.

One of the most exciting features of the VLT is the possibility to use it as a giant optical interferometer (VLT Interferometer or VLTI). This is done by combining the light from several of the telescopes, allowing astronomers to observe up to 25 times finer details than can be done with the individual telescopes. The soon to come survey telescopes, VST (optical) and VISTA (infrared), will enhance the capabilities of Paranal even further.

In 2007, about 1900 proposals were made for the use of ESO telescopes and more than 700 peer-reviewed papers based on data from ESO telescopes were published.

ESO is also a major partner in the Atacama Large Millimeter/submillimeter Array (ALMA), one of the largest ground-based astronomy projects of the next decade. ALMA will have a main array of fifty 12-m

The VLT at Paranal.

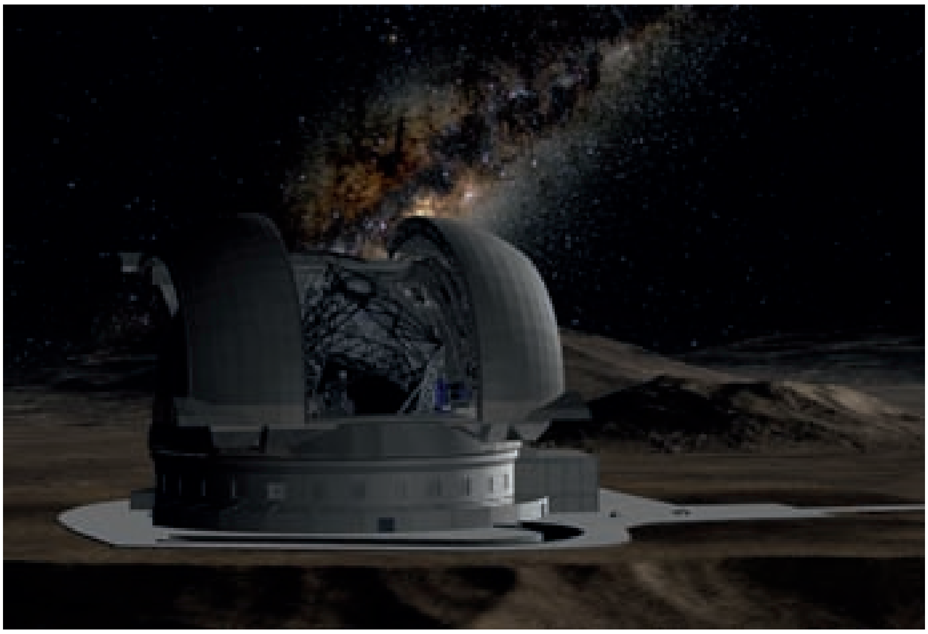
submillimetre quality antennas, with baselines of several kilometres. An additional compact array of four 12-m and twelve 7-m antennas complements the main array. Construction of ALMA started in 2003 and will be completed in 2012; it will become incrementally operational from 2010 on. ALMA is located on the 5 000 m high Llano de Chajnantor, east of the village of San Pedro de Atacama in Chile. The ALMA project is a partnership between Europe, East Asia and North America in cooperation with the Republic of Chile. ALMA is funded in Europe by ESO, in East Asia by the National Institutes of Natural Sciences of Japan in cooperation with the Academia Sinica in Taiwan, and in North America by the US National Science Foundation in cooperation with the National Research Council of Canada. ALMA construction and operations are led on behalf of Europe by ESO, on behalf of East Asia by the National Astronomical Observatory of Japan and on behalf of North America by the National Radio Astronomy Observatory, which is managed by Associated Universities, Inc.

The Chajnantor site is also home of the 12-m APEX submillimetre/millimetre-wavelength telescope, operated by ESO on behalf of the Onsala Space Observatory, the Max-Planck Institute for Radio Astronomy and ESO itself.

ESO has built up considerable expertise in developing, integrating and operating large astronomical telescopes at remote sites. Furthermore, for several years, ESO has been engaged in conceptual studies for an extremely large optical and infra-red adaptive telescope. This expertise forms the backbone of efforts to develop a next-generation extremely large ground-based optical/infrared telescope for Europe's astronomers. For this project, currently known as the European Extremely Large Telescope (E-ELT), ESO has developed a basic reference design for a 42-m telescope with a novel five-mirror optical concept. The current detailed design phase is scheduled to be completed by the end of 2009.

ALMA at Chajnantor (3D computer rendering).

The ESO headquarters are located in Garching, near Munich, Germany. This is the scientific, technical and administrative centre of ESO where technical development programmes are carried out to provide the observatories with the most advanced instruments. It is also home for the Space Telescope European Coordinating Facility (ST-ECF), operated jointly by ESO and the European Space Agency.



Artist's impression of a possible design for the E-ELT.

Contents

Foreword

From modest beginnings in the 1960's, ESO has moved inexorably onwards to assume the mantle of a world leader in ground-based optical/NIR astronomy and partner in the global adventure that is ALMA. Its suite of four 8m-class telescopes at Paranal along with their associated interferometric capabilities, the VLT/I, and the older but powerful facilities on La Silla, are now producing around seven hundred refereed papers per year. With these developments, ESO has empowered a vibrant and diverse community of astronomers in Europe.

On the ground in Chile, the ALMA project is rapidly becoming a tangible reality with the delivery of the first antennas and the progress towards the completion of the support facilities at and near Chajnantor. Astronomers in Europe, North America and East Asia are tooling-up for the exploitation of these dramatically powerful new capabilities.

The E-ELT project has moved up a gear and is now engaged in a fully-fledged design study of a 42-m aperture telescope. Several substantial industrial contracts are now in progress. The various advisory committees have been energetic in monitoring and advising ESO on an endeavour that is moving forward at breathtaking speed.

During 2007, the final formalities were completed to bring Spain and the Czech Republic into ESO as full members.
It is highly likely that other new member states will follow within the next few years.

In September, Dr. Catherine Cesarsky handed the Director General's baton to Prof. Tim de Zeeuw. Catherine steered ESO through a remarkable period of growth and development. We all owe her a great debt of gratitude for her strenuous efforts that resulted in an extraordinarily vibrant organisation. Tim inherits an organisation with a very substantially enlarged membership and a portfolio of projects that was probably unimaginable to ESO's founders.

Photo: B. Farncombe, STFC

Before assuming the directorship, Tim de Zeeuw had been leading the ASTRONET Science Vision exercise that is now being followed by the construction of the Facilities Roadmap that will guide the European funding agencies over the next decade or so. He is now in a strong position to influence the process that will enable the fulfilment of the dreams of the European astronomers who participated so energetically in this exercise. These are exciting times for European and World astronomy and ESO is well poised to continue its leading role.

Prof. Richard Wade
President of the ESO Council

Introduction

This is the first Annual Report to appear since I took over from Catherine Cesarsky on 1 September 2007. Most of the activities and developments covered in this report were carried out under her responsibility. It is a pleasure to acknowledge her eight years of leadership which saw many changes at ESO.

New member states

At the beginning of the year, Spain completed the formal procedure for ratification of its accession. The Czech Republic completed its accession soon afterwards, so that ESO now has thirteen member states. The June Council Meeting was held in Barcelona in celebration of the Spanish membership.

An ESO information day for Czech industry was organised by the Czech Academy of Sciences in Prague in June. In October, the Czech-ESO Committee met to discuss plans for establishing a Technology and Training Centre at the Ondřejov Astronomical Institute aimed at supporting Czech participation in both ESO and ESA.

Negotiations with Austria progressed with a meeting for Austrian research institutes and industry to identify possible in-kind contributions. This was followed by formal meetings between the Council In-kind Negotiating Team and the Austrian counterpart, which led to a set of agreed in-kind contributions. Completion of the accession agreement could not be achieved before the end of the year, but important progress was made at a meeting with the Austrian Science Minister Johannes Hahn in November.

Science

A team of Swiss, French and Portuguese astronomers discovered a five Earth-mass companion to the red dwarf star Gliese 581 with the HARPS instrument on the 3.6-m telescope on La Silla. This 'super-Earth' generated worldwide attention. Gliese 581 was already known to be orbited by a Neptune-mass planet, and there is evidence for a third planet of about eight Earth masses. This discovery continues the regular flow of new and exciting results on exoplanet research where HARPS has effectively cornered the market.

The rapid-response mode of the Very Large Telescope (VLT) makes it possible to observe gamma-ray bursts within minutes of notification. It has provided some of the earliest spectra of these enigmatic objects. In one case, changes in the foreground intergalactic material could be observed. The intense UV radiation from the burst ionised the intervening gas in the first hour of the outburst.

A striking example of joint observations in very different wavelength regimes was the series of coordinated observations of three separate layers in the outer envelope of the star S Orionis, carried out with the VLT Interferometer (VLTI) and the Very Long Baseline Array in North America.

The demand on ESO telescopes continues to increase, with 943 Period 80 and 952 Period 81 proposals submitted, both record numbers. The number of Large Programmes continues to increase as well. A new category of short proposals was introduced to reduce the load on the Observing Programmes Committee (OPC). New panels were also added to cope with the increased number of proposals.

More than 700 refereed papers were published in 2007 based on data obtained with ESO facilities (including the science archive). Amongst these was a string of impressive first results with AMBER published in a single issue of *Astronomy & Astrophysics*.

The third ESO Fellow Symposium took place in Santiago in November. The research carried out by our Fellows spans all of astrophysics and often involves collaboration with astronomers in the community.

Operations

The start of science operations of the high-resolution infrared spectrograph CRIRES on Antu (Unit Telescope 1 of the VLT – UT1) in April marked the completion of the entire suite of the first-generation VLT instruments, a major milestone.

The Laser Guide Star Facility (LGSF) achieved its First Light on Yepun (UT4) in 2006 and had its first year of science operations in 2007, demonstrating its great potential. The reliability of the system remains, however, a concern.

The fourth Auxiliary Telescope (AT) was accepted at the beginning of the year, and provides additional flexibility for VLTI operations. AMBER was offered to the community for the first time with the FINITO fringe tracker and the ATs.

In November, a major earthquake hit the Tocopilla region of northern Chile. It registered 5.7 on the Richter scale at Paranal, and shook the mountain for nearly two minutes in the early afternoon. The Observatory survived this without a scratch, and regular observations resumed the same evening!

APEX received its eagerly awaited facility bolometer array LABOCA, developed by the *Max-Planck-Institut für Radioastronomie* in Bonn. The 11-arcmin field of view allowed very sensitive mapping of the Chandra Deep Field South, surpassing the largest submillimetre surveys previously achieved. APEX operations have now reached a mature and stable state.

The new ESO User Portal was released at the end of 2007. The User Portal facilitates access by astronomers to a broad variety of services provided by ESO (proposal preparation tools, observations archive, reports on progress of observations, etc.) by means of a single user account. The number of registered users is close to 4000.

The flexible scheduling offered by Service Observing continues to be preferred by the users. Approximately 70 % of the observing time is requested in this mode, and ESO supports over 1000 such observing runs per year.

The ESO archive currently contains 74 terabytes (TB) of data of which 15 TB were added during 2007, and its content continues to be upgraded. Nearly 60 000 pipeline-processed spectra obtained with UVES since it started operations have been released, as well as all the pipeline-processed spectra obtained with HARPS until the end of 2006. The accessibility of the archive has been improved by new interfaces such as VirGO, an archive visual browser allowing data requests and interaction with other virtual observatory tools.

The ESO Data Centre, a state-of-the-art computer room designed for extremely high safety and reliability, was completed in 2007. In addition to most mission-critical operations computer systems, the ESO Data Centre hosts the ESO primary archive and a copy of the Hubble Space Telescope Archive, and it will also host the European copy of the ALMA archive.

Visible-infrared projects

While the complete suite of VLT first generation instruments is now operational, HAWK-I (High Acuity, Wide field *K*-band Imaging) – occasionally described as a 'generation 1.5' instrument – had its First Light on Yepun on 31 July, followed by commissioning and science verification which confirmed the anticipated significant gains in field, depth and image quality now achievable at the VLT in the near infrared.

In March, the Multi-Conjugate Adaptive Optics Demonstrator (MAD) saw First Light at the Visitor Focus of Melipal (UT3). MAD demonstrated for the very first time that it is possible to perform multi-layer adaptive optics corrections in the *K*-band (around 2.2 μm) over a field of view as large as 2 × 2 arcmin using multiple relatively bright natural guide stars.

The second-generation VLT instruments continue to make good progress. Testing of X-Shooter started in Europe and the designs of KMOS, MUSE and SPHERE all advanced well. Much work has also been done on technology development for detectors, electronics and lasers.

The ESO workshop on "Science with the VLT in the ELT era" – organised as a forum to discuss the long-term future of VLT and VLTI instrumentation – was attended by astronomers from all over the world. The Scientific Technical Committee (STC) followed this up with recommendations to take the VLTI instrument concepts GRAVITY, and MATISSE, and later on also VSI, beyond their Phase A studies. It also recommended launching studies of one or more third-generation VLT instruments. This includes an ultra-stable spectrograph at the incoherent combined focus, which will enable the next step in exoplanet research.

Survey Telescopes

In mid-2007 the 2.6-m optical VLT Survey Telescope (VST) arrived at Paranal and its integration was started. The remaining components are now in the hands of industry in Italy, and are expected on Paranal in the course of 2008.

The giant infrared camera for the 4.2-m Visible Infrared Survey Telescope (VISTA) arrived on Paranal. The telescope enclosure made good progress, and polishing of the primary mirror continued at LZOS in Moscow. Six exciting Public Surveys were selected, which together will fill most of the first five years of VISTA observing time. ESO actively interacted with the respective Principal Investigators to ensure an optimal definition of the observing strategy and of the derived science data products.

ALMA

ESO represents Europe in the construction of the Atacama Large Millimeter/submillimeter Array (ALMA) in Northern Chile, a global astronomy project carried out in partnership with North America and East Asia. ESO is responsible for a number of major deliverables, including front ends, antennas, roads, power supply, and various buildings.

Contracts for cryostats, water vapour radiometers, front-end cartridges (Bands 7 and 9) and low noise amplifiers were signed with institutes in the UK, Sweden, France, the Netherlands, and Spain, respectively. The first eight cryostats, and Band 7 and Band 9 receiver cartridges were delivered. The large technical building at the ALMA Operations Support Facility (OSF), south of San Pedro de Atacama, progressed substantially, as did work on the road up to the Array Operations Site on the Chajnantor plateau at 5 000 m.

The first of two custom-built antenna transporters for ALMA had its 'roll out' at the factory in Germany in July and successfully passed a series of demanding tests. The transporter was presented to the press and members of the ESO Council in October before being readied for shipment to Chile.

ALMA operations will be supported by the European ALMA Regional Centre, a network of nodes coordinated by ESO. The main activity in 2007 was to set up the structure with the ARC nodes, testing software, and participating in the organisation of community events.

Other highlights in the ALMA project included the arrival at the OSF of the first 12-m antennas (from the Japanese and North American vendors), and obtaining First Fringes with two prototype 12-m antennas at the ALMA Test Facility near Socorro, New Mexico.

Extremely Large Telescope

The design study for the Extremely Large Telescope (E-ELT) is in full swing. The baseline design consists of an innovative five-mirror telescope, with a 42-m segmented primary mirror. Many industrial contracts were placed for design of the telescope structure and enclosure, and for prototypes of key optical and mechanical components. Instrument studies with consortia of research institutes in the member states are also advancing well.

The European Commission awarded an EC FP7 contract to ESO for support of the so-called Preparatory Phase of the E-ELT. ESO is the ‘mono-partner’ and represents 25 institutions in the member states. The E-ELT features prominently on the European Strategy Forum on Research Infrastructures (ESFRI) list, and also in the ASTRONET Science Vision for European astronomy.

Headquarters building extension

Significant progress was made towards the construction of an extension of the ESO Headquarters building. A contract was signed in July for the acquisition of additional land to the south of the current premises. An international architectural competition took place for the development of a conceptual design for the extension. There were 20 entries from architectural offices in the member states, which were ranked by a jury. Council approved going ahead with a further refinement of the top three prize-winning concepts.

Visiting Committee

Every three years an external Visiting Committee consisting of senior scientists with broad expertise reports to Council about the state of the ESO programme and organisation. The 2007 Visiting Committee was chaired by Prof. Günther Hasinger. The resulting report has as its main conclusion that: “ESO has become the premier observatory for optical-infrared astronomy on a world-wide basis”, and contains valuable advice regarding the further evolution of ESO’s internal structure and expansion of its programme into the era of ALMA and the E-ELT. There is much to look forward to!

Prof. Tim de Zeeuw
ESO Director General

VLT image of supernova SN 2006dr (centre left) in the spiral galaxy NGC 1288.

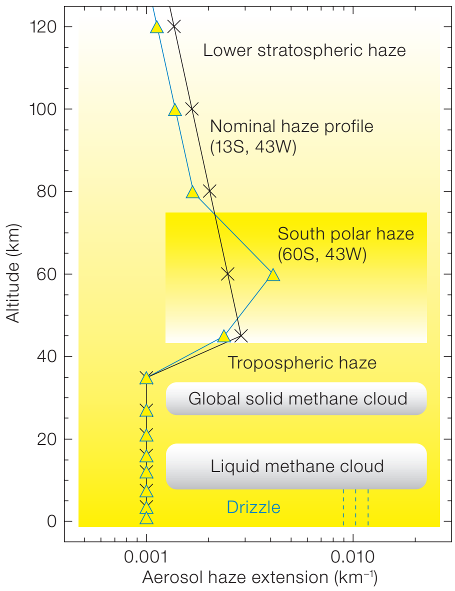
The ESO facilities are true science machines. The telescopes and the archive were the source of data that resulted in 729 refereed publications in 2007, an increase of 10 % over the publication rate in 2006. This increase is due to many factors. Several instruments have become available over the past few years, expanding the capabilities and opening new parameter space. The delay of publications, the time it takes to reduce and analyse the observations, is quite often of the order of a year or more. Some survey-type projects take even longer until completion, especially when they span more than one observing period. Typical examples are surveys or the ESO Large Programmes, which can be approved for up to two years. The coming years will see the start of large public surveys on dedicated telescopes, but the effect of the Large Programmes can already be seen in the literature.

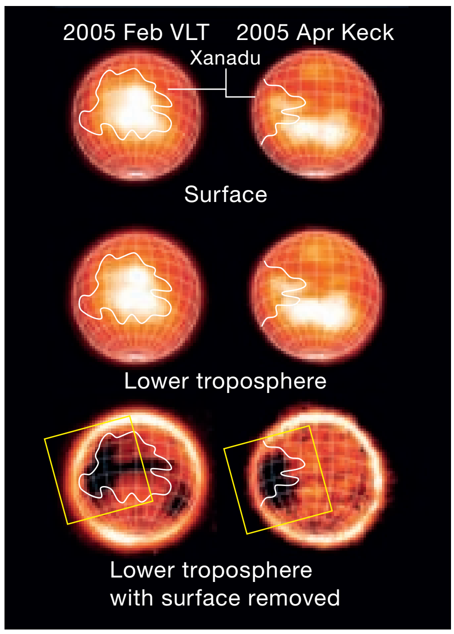
As in previous years, the topics covered range from Solar System objects to the edge of the Universe. The ESO telescopes produce observations for many different projects and the usage of the data is also very varied. In many cases, ESO data are combined with observations from other observatories, in particular space telescopes. The combination of the different strengths of these observatories has transformed many fields in astrophysics.

Planetary weather

Saturn's major moon, Titan, is larger than the planet Mercury. It is the only planetary satellite in the Solar System with a thick atmosphere, which is comprised mostly of nitrogen and resembles Earth's early atmosphere. Because of its extremely cold surface temperature – minus 183 degrees Celsius – trace chemicals such as methane and ethane, which are explosive gases on Earth, exist as liquids or solids on Titan. Some level features on the surface near the poles are thought to be lakes of liquid hydrocarbon analogous to Earth's watery oceans, and presumably these lakes are filled by methane precipitation. ESA's Huygens probe observed features that appear to be controlled by flows down slopes, whether caused by precipitation or springs.

Actual clouds on Titan were first imaged in 2001 by Imke de Pater's group and colleagues at Caltech using the Keck II telescope with adaptive optics. The observations confirmed what had been inferred from spectra of Titan's atmosphere. These frozen methane clouds hovered at an elevation of about 30 kilometres around Titan's south pole. Since then, isolated ethane clouds have been observed at the north pole by NASA's Cassini spacecraft, while both Cassini and Keck photographed methane clouds scattered at mid-southern latitudes. Also in 2005, the ESA Huygens probe, released by Cassini, plummeted through Titan's atmosphere, collecting data on





VLT and Keck near-infrared images of Titan's surface and lower troposphere can be subtracted to reveal widespread cirrus-like clouds of frozen methane (lower images) and a large patch of liquid methane (dark area within box) interpreted as clouds and morning drizzle above the huge continent of Xanadu (outlined in yellow). At left is a chart of Titan's aerosol haze versus altitude, indicating higher density haze over portions of the south pole and the heights of frozen and liquid methane clouds.

methane relative humidity. These data provided evidence for frozen methane clouds between 25 and 30 kilometres in elevation and liquid methane clouds – with possible drizzle – between 15 and 25 kilometres high. The extent of the clouds detected in the descent area was unclear, however, because a single weather station like Huygens cannot characterise the meteorology on a planet-wide scale.

Spatially resolved spectra from a new class of instruments, such as the OH-Suppressing InfraRed Imaging Spectrograph (OSIRIS) at the W. M. Keck Observatory or the Spectrograph for INtegral

Field Observations in the Near Infrared (SINFONI) at the Very Large Telescope (VLT) can be used to create a global picture of Titan's lower atmosphere and surface. Both instruments measure spectra at many points in an image rather than averaging over a small aperture or slit. By subtracting light reflected from the surface from the light reflected by the clouds, it is possible to obtain images of the clouds covering the entire moon.

Observations obtained with these instruments at two different epochs reveal a widespread cloud cover of frozen methane at a height of 25 to 35 kilometres that is consistent with Huygens' measurements, plus liquid methane clouds in the tropopause below 20 kilometres with rain at lower elevations.

The clouds which are seen are like cirrus clouds on Earth. One difference is that the methane droplets are predicted to be at least millimetre-sized on Titan, that is, a thousand times larger than in terrestrial clouds. Since the clouds have about the same moisture content as Earth's clouds, this means the droplets on Titan are much more spread out and have a lower density in the atmosphere, which makes the clouds hard to detect.

The drizzle or mist seems to dissipate after local mid-morning, which, because Titan takes 16 Earth days to rotate once, is about three Earth days after sunrise on Titan. If widespread, such a persistent drizzle may be the dominant mechanism for returning methane to the surface from the atmosphere and closing the methane cycle, analogous to Earth's water cycle.

(Based on M. Ádámkovics et al., 2007, Science, 318, 962)

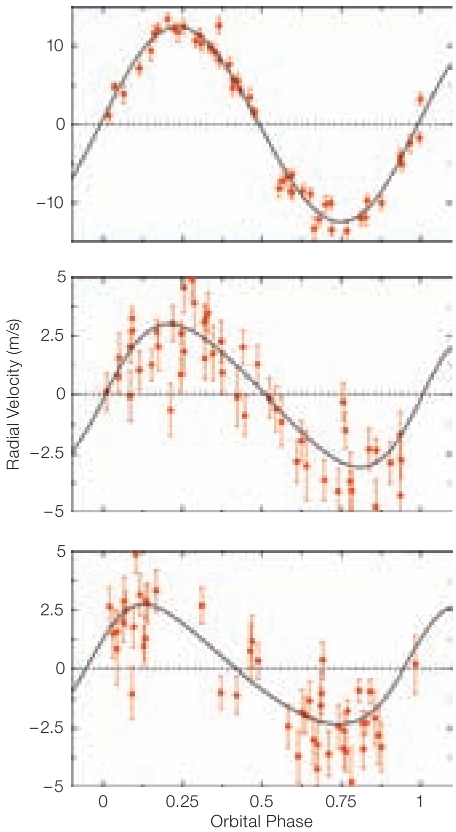
Exoplanets

Finding planets which can harbour life is one of the 'holy grails' of modern astronomy. While finding planets with masses similar to the Earth's, and orbiting stars similar to our Sun at a distance of a few astronomical units (AU), is beyond the reach of current instruments, the High Accuracy Radial-velocity Planet Searcher (HARPS) on the 3.6-m telescope at La Silla, with its long-term radial velocity precision of better than 1 m/s, comes as close as we can get today to that goal.

The habitable zone of a star is defined as the range of orbital distances for which the surface temperature of a planet would be such that water can exist in a liquid state. If the planet were much closer to the star it would be too hot and water would evaporate, whereas if the planet were too far away, water would be permanently frozen. Implicit in this definition is the assumption that liquid water is essential for the development of life, which is a fair assumption given that we only know life on Earth. The mean distance of the habitable zone from the star depends on the intrinsic brightness of the star, and hence on its mass: for stars with masses lower than the Sun (assuming that they are still on the main sequence), the habitable zone will be closer in, and the radial velocity signal of an orbiting planet will be stronger. Thus, Earth-mass planets orbiting low mass M dwarfs are within the reach of HARPS and have been the subject of intensive searches by the HARPS consortium (for M dwarfs the habitable-zone is within 0.1 AU of the star). In the course of that search, which included about 100 stars, the consortium detected the first Neptune-like planet on a 5.4-day orbit around the star Gliese 581 (the 581st entry in the catalogue of nearby stars published by W. Gliese in 1969). Because of its close distance to the star, this Neptune-mass planet is extremely hot. By analogy to the Jupiter-mass objects that are now routinely detected around solar-type stars – the hot-Jupiters – this object is called a 'hot-Neptune'.

Artist's impression of the planetary system around the red dwarf Gliese 581, showing the five Earth-mass planet (seen in foreground: Gliese 581c) and its two sisters, the bluish Neptunian-like planet Gliese 581b, and the most remote one, Gliese 581d.

The hot-Neptune of Gl581 (named Gl581b) imprints a radial velocity (RV) signature of ± 10m/s on its parent star, which is much larger than the accuracy of HARPS. Thus, further monitoring of the star by the HARPS team led them to detect two additional planets, both inducing RV signatures of order ± 3m/s on the parent star. While these values are still well above the accuracy of HARPS, the unique stability of the instrument was required to disentangle the combined signatures of the three planets. Very careful modelling of the observations allowed the team to fit a three-planet solution to the observed orbital periods. The first planet corresponds to the already known hot-Neptune with a period of $P = 5.37$ days, while the other two have periods of 12.9 days (Gl581c) and 83.4 days (Gl581d), respectively. For the M3V star Gl581 these values correspond to minimum masses of 5.0 M_{Earth} and 7.7 M_{Earth}, and orbital distances of 0.07 AU and 0.25 AU, respectively. With only five times the mass of the Earth, Gl581c is the closest 'Earth-twin' yet found. If its composition were similar to the Earth, then its radius would be only 1.5 times the radius of our Earth. As it turns out, Gl581c lies close to the inner (warm) edge of the habitable zone of the M3 dwarf, while Gl581d lies close to the outer (cold) edge. However, in all other respects these two planets are sufficiently different from the Earth that it is highly unlikely that they may harbour life.



The panels display the phase-folded radial-velocity variations for the three planets (Gliese 581b, c, and d, respectively) discovered around Gliese 581. Each point represents the observed radial velocities, after removing the effect of the other planets. The error on one measurement is of the order of 1 m/s.

A very interesting conclusion of the study is that small planets (Neptune mass and below) are more frequent than giant planets (hot-Jupiters) around M dwarfs, and that the Neptune-size planets are much easier to find around M dwarfs than around solar-type stars.

(Based on Udry et al., 2007, A&A, 469, L43)

Low-mass objects

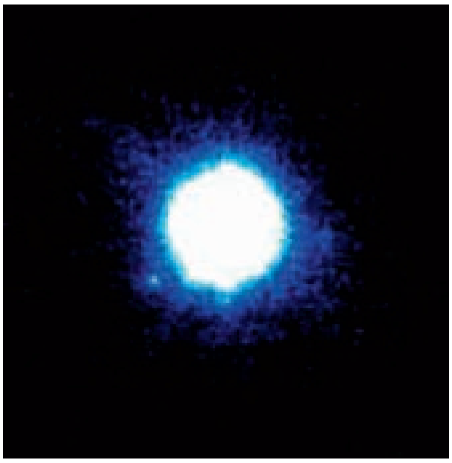
The nature of planets around other stars is of high general interest. The few cases where the planet can be directly investigated and not solely inferred from its effect on the parent star (as above) are of particular importance. The image of the planet around the brown dwarf 2MASS J1207334–393254, discovered a few years ago with the adaptive optics camera NAOS-CONICA on the VLT, has started the process of further characterisation. Further observations with NAOS-CONICA have now shown that the situation might be complicated by additional material in the system. While the colours and temperatures derived for the primary brown dwarf are consistent with previous measurements, the detailed analysis of the planetary-mass companion has shown that there might be a circumstellar disc around the young planet.

The observations were obtained in a follow-up programme by an independent team to check the masses and the temperatures of the objects within the system. The trick is the separation of the light from the primary and the secondary objects. From spectroscopy, the authors infer a low gravity, i.e. small mass, and a dusty atmosphere for the planet. The temperature of the planetary surface is about 1600 Kelvin. To derive the mass of the object, its age and a model of the evolution of young planets are required. Since there is very little observational data, the models have to rely on an accurate interpretation of the physical processes, and as the planets are so cool that they exhibit real weather patterns, one can imagine that there is still quite a degree of uncertainty in the models. Nevertheless, the planet probably has a mass eight times that of Jupiter (with an uncertainty of about 25%). This mass estimate is about twice as much as earlier ones. The reason for this lies in the assumption that the observed brightness is affected by grey dust, i.e. light is absorbed by a disc, which obscures part of the emission from the planet.

The reason for this new interpretation is a discrepancy of the model luminosities, colours and ages with the observed luminosities. The planet simply appears too faint and too blue to assume that it has the same age as the host star. Since the models work very well in all aspects, the authors conclude that there must be an extra source of extinction, a disc seen edge-on, which obscures part of the light and hence explains the apparent faintness of the planet. This is a rather surprising result.

Observing other planetary systems will have further surprises in store. A fundamental requirement for such observations is the ability to observe objects with a large contrast and with a high angular resolution. Adaptive optics observations with large telescopes are a fundamental requirement for such observations.

(Based on Mohanty et al., 2007, ApJ, 657, 1064)



NAOS-CONICA image in the *J*-band of the brown dwarf and its planetary companion 2MASS J1207334-393254b.

The case of Eta Carinae

In the course of their rapid evolution, very massive stars – those with a mass larger than about 100 solar masses – go through a very short phase (perhaps even as short as a few tens of thousands of years) where, due to extremely high mass-loss or other mechanisms, they become variable on several different time scales. These changes can range from micro-variations of 0.1–0.2 magnitude on scales of days, to variations of 1–2 magnitudes on time scales of years to decades, or to huge outbursts of 3 magnitudes or more every few centuries. These luminous blue variables, or LBVs, are a million times more luminous than the Sun, and close to the observed maximum luminosity for any type of stars. LBVs are extremely rare (only about a dozen are known in the Galaxy and the Magellanic Clouds), and are thought to be on their way to becoming Wolf-Rayet stars which will eventually explode as pair-instability supernovae. The masses of LBVs are close to the theoretical upper mass-limit for stars, which is around 120 $M_{\odot}$. The most luminous LBV known is Eta Carinae, which is also the closest and the best-studied example – in fact, Eta Carinae is currently considered to be the most luminous star known in the Galaxy. In 1677, Halley observed Eta Carinae as having magnitude four, but by 1730 it had brightened considerably and was one of the brightest stars towards the Carina constellation. Later it dimmed again, and by 1782 was back to being about fourth magnitude. It started brightening again in 1820, so that by 1827 it was more than ten times brighter than before, reaching its highest peak in April 1843 when it was the second brightest star in the night sky (after Sirius) with a magnitude of −0.8!

After 1843, Eta Carinae faded away, and between about 1900 and 1940 it was only of eighth magnitude. A 'spectroscopic minimum' or 'X-ray eclipse' occurred in June 2003, which was intensely observed with every available ground-based and space observatory, including the VLT, HST, Chandra and Integral. The primary goals of these observations were to determine if Eta Carinae is a binary star and to identify its companion, as well as to determine the physical mechanism behind the 'spectroscopic minima' and to understand their relation (if any) to the large-scale eruptions of the 19th century.

Spectroscopic monitoring of Eta Carinae showed that some emission lines fade every 5.5 years, and that this period has been stable for decades. The radio emission and its X-ray brightness also drops significantly during these 'events'. These variations provide strong indications that Eta Carinae is indeed a binary star with a massive hot primary and a lower mass secondary on a highly eccentric orbit with a period of 5.52 years.

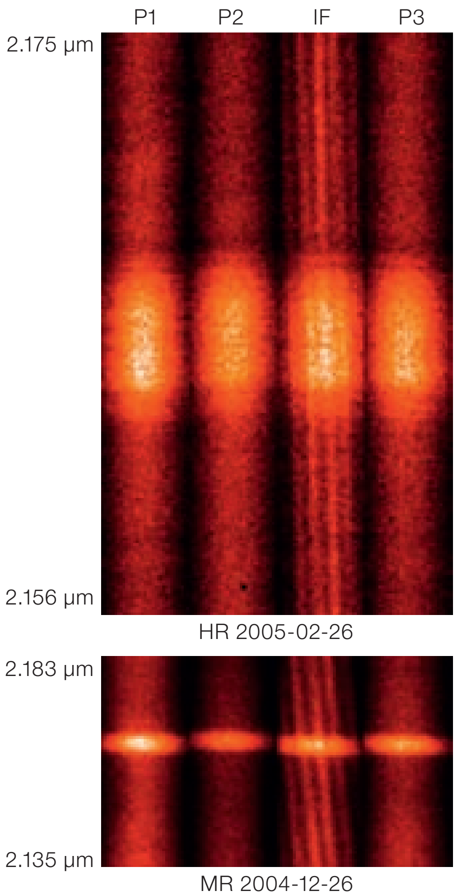
Eta Carinae is surrounded by an expanding bipolar cloud of dust and gas known as the *Homunculus* ('little man' in Latin), believed to have been expelled from the star during the great outburst of 1843 (in fact, since the distance to Eta Carinae is about 2300 parsecs, the eruption must have taken place more than 7000 years before). Spectroscopic observations of the *Homunculus* showed that the wind of Eta Carinae is aspherical and latitude-dependent such that the polar axes of the wind and the *Homunculus* are aligned, and the wind speed increases from the equator (the arms of the little man) to the pole. The central optically thick part of the wind was resolved by VINCI, the precursor instrument on the VLTI, which measured a size of 0.005 arcseconds (5 mas) and a very large mass-loss rate of over 0.001 solar masses per year.

One of the guaranteed time observing (GTO) programmes with AMBER on the VLTI is to obtain the first spectro-interferometric observations of Eta Carinae. AMBER can combine the light of three VLT Unit Telescopes (UTs), thus yielding spectral information with an unprecedented spatial resolution (up to 1 mas), and with spectral resolutions of up to R = 12 000.

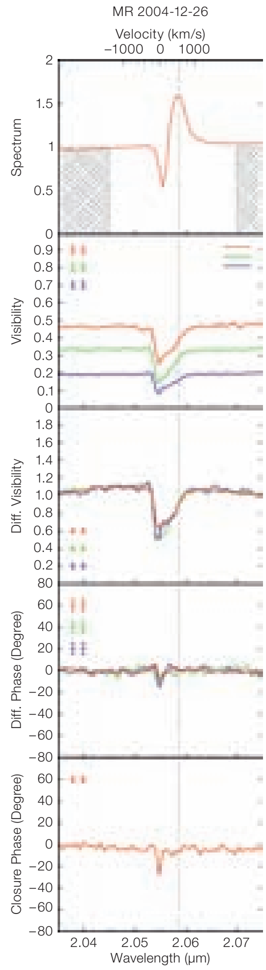
On the basis of the wealth of information provided by AMBER at different spectral resolutions and different baselines (which give different spatial resolutions), the AMBER team was able to construct a detailed model for the wind of Eta Carinae. The (geometrical) model consists of three components: a dense latitude-dependent aspherical stellar wind region of about 6.5 mas embedded in a spherical wind about 10 mas in size, and a compact spherical continuum-emitting region (4 mas), which is indicated by the high-visibilities and low closure phases in the continuum region of the spectra.

The AMBER observations provide invaluable information about the stellar wind of Eta Carinae that can be compared with theoretical models to significantly improve our understanding of the evolution and eventual death of massive stars. The observations are also extremely important to refine models of supernova explosions because, for these massive stars, the explosions take place inside the winds and the subsequent evolution of the remnants depends on the properties of these wind regions. Whilst the observations are consistent with the presence of a binary, as revealed by the asymmetry in the wind-wind collision region, the results are not conclusive. Indeed, if most of the HeI emission is generated in the wind-wind collision zone, the asymmetry indicated by the closure phases (about −30°) is too low compared with what one would predict for a binary. Further observations with AMBER at different orbital phases and better resolution are underway, and astronomers are looking forward to the next spectroscopic eclipse (expected in January 2009) to gain more insight into this fascinating object, which, however, could explode at any time between now and the next hundred thousand years!

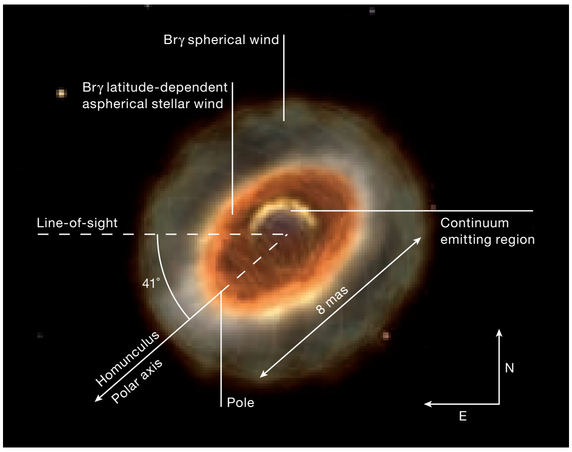
(Based on Weigelt et al., 2007, A&A, 464, 87)



Raw AMBER interferograms of Eta Carinae with medium resolution (MR; R = 1500 – lower panel) and high resolution (HR; R = 12 000). The panels show the spectrally dispersed fringe signals and the photometric calibration signals from the three telescopes in the near-IR *K*-band. The wavelength range is indicated in the left of the images. The strong feature roughly at the centre of these figures is the Brγ line of ionised hydrogen. It is broadened to about 50 spectral channels in the HR spectrum, which allows a very detailed study of the kinematics of the nebula.



The AMBER HeI observations of Eta Carinae (top panel) reveal the well-known P-Cygni profile of the nebular HeI lines, but now observed with milliarcsecond resolution. The second panel shows the fringe contrast or 'visibility' as a function of wavelength. The visibility gives a direct estimate of the size of the source – the lower the visibility, the larger the object – so the observations show that the line-emitting region is significantly larger than the source of the continuum, and that the blue (absorption) wing of the line is larger than the emission side. The differential phases and closure phases measure the asymmetry of the source and again, only the absorption component shows significant asymmetry.



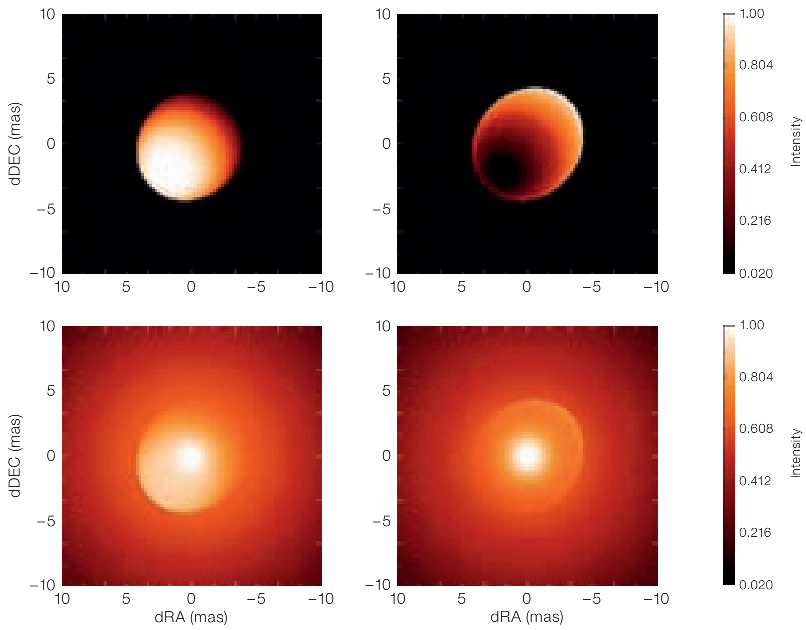
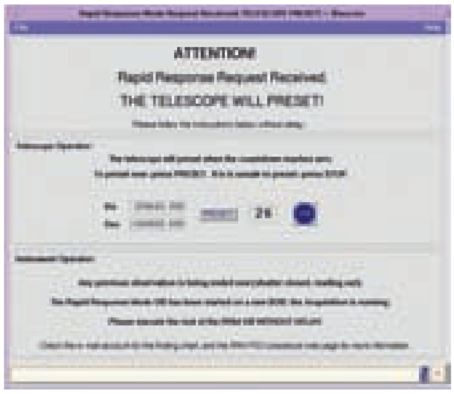


Illustration of the components of the geometric model for an optically thick, latitude-dependent wind of Eta Carinae (for the weak aspherical wind component, we draw the lines of latitudes to illustrate the 3D-orientation of the ellipsoid). Right panels: for two representative wavelengths, the total brightness distribution of the model including the aspherical wind component (upper rows) and the contributions from the two spherical constituents (lower rows).

Gamma-ray bursts

Observations with ESO telescopes – from the first identification of an optical counterpart, to the systematic measurement of the redshifts of the progenitors – have been instrumental in increasing the experimental understanding of the physics of Gamma-Ray Bursts (GRBs). GRBs are short duration bursts of gamma-ray photons lasting anything from a few milliseconds to several minutes. During these short periods of time, GRBs become the most luminous objects in the Universe and, despite being at cosmological distances, some can even be seen with the unaided eye! GRBs appear to come in two flavours: the long duration events, lasting between two seconds and several minutes, and the short duration bursts that last less than two seconds. The progenitors of long bursts are widely thought to be very massive stars (such as Eta Carinae) exploding as supernovae, but there is a very rich debate concerning the physics of short bursts. The VLT is actively contributing to this debate, notably with the discovery in 2006 of a long GRB, with no detected associated supernova, by Fynbo and his colleagues.

Gamma-rays are scattered by particles in the atmosphere of the Earth, so they must be observed by satellites. The NASA/STFC/ASI Swift satellite detects roughly one GRB per day, and X-ray and optical instruments on board enables the positions to be pinpointed with sufficient accuracy to allow the rapid pointing of giant telescopes on the ground. At the VLT, the rapid-response mode (RRM) can slew the UTs to a GRB position within minutes of receiving a satellite alert. An RRM observation is automatically activated when an alert is received, thus minimising the time required by observers and operators to make decisions. Because GRB afterglows fade very rapidly, the RRM enables astronomers to undertake observations which would not be possible even one hour after the explosion. In particular, high dispersion spectra



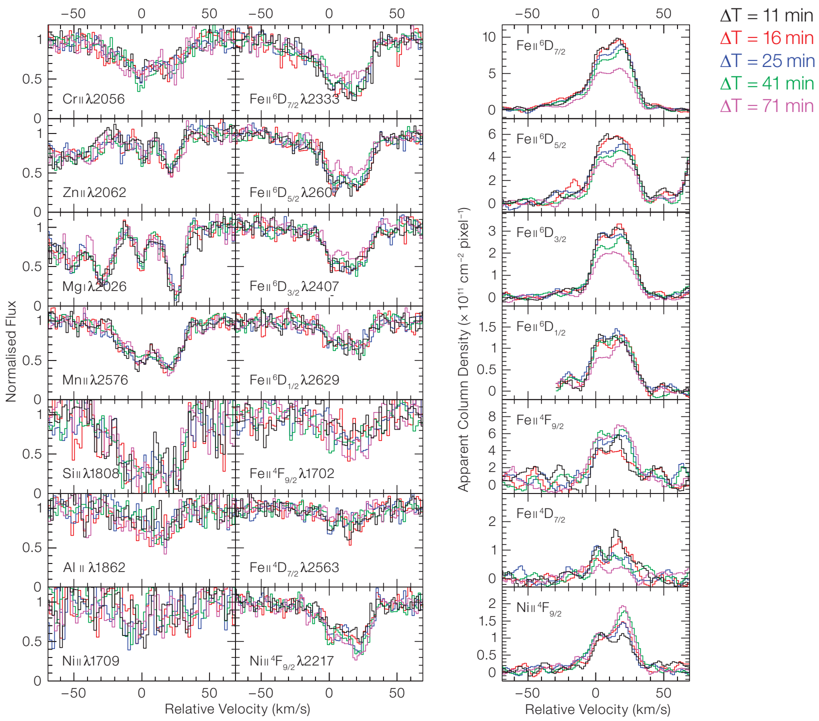
with UVES to study the interstellar material in the parent galaxies of the GRBs are made possible by the RRM.

A team led by Paul Vreeswijk (now at the Dark Cosmology Centre in Copenhagen, Denmark) triggered RRM observations of the bright burst GRB060218 with UVES at the VLT. The first exposure started only

10 minutes after Swift detected the burst, followed by a sequence of spectra taken 11, 16, 25, 41, and 71 minutes after the trigger. This made it possible to detect and follow for the first time the evolution of metastable interstellar absorption lines of Fe II and Ni II in the host galaxy at a redshift $z = 1.490$.

The UVES observations show how the excitation of the interstellar medium surrounding the GRB progenitor responds to the intense flash of radiation produced by the explosion. The high quality of the observations coupled with the unprecedented time resolution allowed the team to perform detailed modelling with three different excitation mechanisms: collisions, excitation by infrared-photons, and fluorescence following excitation by ultraviolet photons. Indeed, the time resolution of the observations proved critical in distinguishing between the three models and allowed the team to reject the first two mechanisms (collisional and IR excitation) with high confidence. On the other hand, UV pumping followed by fluorescence provided a very good fit to the data. The main consequence of the UVES observations is that they showed that the GRB completely ionised the gas within 1.7 kpc of the progenitor. This implies that the very large H I column densities typically observed on GRB sightlines cannot be in the immediate vicinity of the GRB itself, but must correspond to neutral gas clouds located up to several thousands of parsecs away. So they could either be part of a very large star-forming region (so-called 'super-associations'), or foreground material in the GRB host galaxy. This means that parameters derived from absorption line observations on GRB sightlines (such as metallicity for example) may not be representative of the region where the GRB progenitor was born.

(Based on Vreeswijk et al., 2007, A&A, 468, 83)



Time evolution of the most important lines observed by UVES in the host galaxy of the gamma-ray burst GRB060218. In order to make the variations more apparent, the right-hand side of the figure shows the evolution of the column density computed by averaging together several lines from the same atomic levels. The significant decrease in the (column) density of neutral gas with time can be clearly seen in the figure.

Massive stars as chemical tracers of gas

Only about one star in a thousand is as massive as 18 times the Sun or more. These stars are extremely luminous and can be observed to great distances. They are also rather young, as massive stars evolve much faster than low-mass stars such as the Sun. The combination of these facts opens the opportunity to study massive stars not only nearby, but throughout the Milky Way and also in its companion galaxies, the Magellanic Clouds. Since these companion galaxies to the Milky Way have significantly lower metallicity, the study of a large sample of stars provides a way to investigate how stars evolve in different environments.

Of course, massive stars have been the objects of many studies in the past, but only with large-aperture telescopes such as the VLT has it become possible to observe large numbers of these objects fairly quickly. A fibre-optics instrument such as FLAMES further increases the number of observable objects, provided there are many which can be observed simultaneously in a given field.

A FLAMES Large Programme, supplemented by observations with UVES at the VLT and FEROS at La Silla, observed over 800 O and B stars in different galaxies to explore the influence of environment, rotation, and metallicity. The wind properties, the surface chemical composition and the rotation velocities were measured. For all stars, it was possible to determine the surface abundances of carbon, nitrogen, oxygen, magnesium and silicon. The stars studied belong to a cluster in the Milky Way, one in the Small Magellanic Cloud and one in the Large Magellanic Cloud.

Low-metallicity stars are more compact, have a lower mass loss and possibly rotate faster, as less angular momentum is lost in the wind. Hence, studying massive stars in galaxies with different metallicities should reveal significant differences. This is exactly the effect observed in this survey. Stars in the Small Magellanic Cloud – the galaxy with the lowest amount of metals – indeed rotate on average faster than those in the Large Magellanic Cloud and the Milky Way. This means that massive stars in a low metallicity environment will not lose as much matter and possibly explode differently than their counterparts in more metal-rich environments. This could have important implications for the explosions of gamma-ray bursts, which have been predominantly observed in low-metallicity galaxies.

Slowly rotating stars should maintain the chemical composition of their formation cloud on the surface. This means that they can be used to measure the abundance of the interstellar gas in the galaxy. This allowed the astronomers in the project to determine the abundances of various elements in the two Magellanic Clouds. It emerged that there are differences for the individual elements and a simple scaling from the solar composition will not reproduce what has been observed in the Magellanic Clouds. This is an important piece of information, as it means that we cannot simply scale what we know from the Sun to the abundances of distant galaxies.

Another important measurement is the amount of nitrogen at the surface. For rapidly rotating stars one expects that the ashes from the nuclear fusion reactor in the centre of the star are mixed to the surface. One ash material is nitrogen, and more rapidly rotating stars should show an enhancement of this element in their spectra. Although some of this effect has been observed it appears to be not as strong as was expected from the models. This is a puzzle, which will need to be resolved with the help of future observations.

Finally, since the stars had to be observed several times to cover a large spectral range, a velocity offset between different epochs was noticed for several of them. The most straightforward explanation is that these stars are actually not isolated, but are members of binary systems.

This Large Programme has produced several publications over the past two years and represents major progress in our understanding of massive stars and how they evolve.

(Based on Mokiem et al., 2006, A&A, 456, 1131; Mokiem et al., 2007, A&A, 465, 1003, Hunter et al., 2007, A&A, 466, 277; Hunter et al., 2008,A&A, 479, 541; Hunter et al., 2008, ApJ, 676, L29)

Galaxies in the early Universe

It is only a little more than a decade ago that the study of galaxies at large redshifts started in earnest. And it is even more recently that we have been able to start investigating the objects that might have evolved into the Milky Way we live in today. A large sample of distant galaxies is required to infer the way galaxies evolve from the early Universe to the present. Since these objects are very faint and distributed fairly sparsely, large area surveys to faint magnitudes are required. Spectroscopy for the determination of the redshifts, i.e. look-back time towards the objects, is essential. In addition, the complete accessible wavelength range has to be explored to investigate the spectral energy distribution as much as possible. Due to the redshifting caused by the expansion of the universe, the distant galaxies need to be observed at longer wavelengths to sample them in the same light with which we observe the nearby objects.

All this has led to the creation of deep surveys of selected fields. Large teams have been set up to combine the different ground- and space-based observatories. The resulting public data sets have multiple applications and have been used for several independent studies.

One such collaboration is the Great Observatories Optical Deep Survey (GOODS) that combines data from several space telescopes and many major ground-based observatories. ESO contributed the deep near-infrared imaging with ISAAC and FORS spectroscopy of the faint galaxies in the southern GOODS field through several Large Programmes. The data were processed by an ESO team and provided publicly to all interested users, and they have now been used in many publications by independent teams. The large area (125 square arcmin) of the survey and its faint limiting magnitude have been ideal to investigate the Universe from redshifts of about 1 to beyond 5. The data were used in different ways to explore our distant past.

A different approach was followed by the VIMOS VLT Deep Survey (VVDS), which collected redshifts of a complete sample of galaxies to a limiting magnitude of $I < 24$ over a large area on the sky. With such a complete sample, slices through the Universe can be assembled which give snapshots of the galaxies at different look-back times.

To observe the distant galaxies in the optical rest frame, guaranteed time with SINFONI was used. The structure and morphology, together with the emission line characteristics of the galaxies, tells us about their evolutionary state and can give indications on how they may transform into the galaxies we observe today. The results very much depend on which way the galaxies are selected, i.e. at what rest-frame wavelength the selection is done. A sample of about three-dozen galaxies at a redshift of two shows that galaxies selected in the wavelengths in which we observe the local Universe appear very much the same as the local ones. However, galaxies selected for their strong submillimetre emission appear to have higher internal velocities and at the same time seem to be more compact. This also means that these latter galaxies have a much higher stellar density. While the UV- and optically-selected galaxies probably evolve into the spiral galaxies of today, the submillimetre galaxies certainly have a more complicated history and may be the results of recent merging events.

The GOODS data sets enable the combination of data over a very wide range of wavelengths to very faint flux levels. This information was used to test various models of the star formation rate and in particular to explore the evolution of massive galaxies at a redshift of 2. As a surprise, it was found that the most infrared luminous galaxies show excess emission, which most likely comes from additional energy input by an active galactic nucleus. The star formation rate of these galaxies at redshift 2 is about 30 times higher than in the local Universe.

The deep samples can also be used to explore the very high-redshift Universe. Several studies have tried to measure the masses of these most distant observed galaxies at redshifts of 5 and higher. Only the rest-frame UV part of the spectrum can be observed. Objects are selected in a way that they are unobservable below the Lyman-α line, as the hydrogen between the object and us blocks most of the light. This 'drop-out' technique (the objects are unobservable at certain filters, but show up fairly bright at larger wavelengths) has been used very successfully for the past decade. It is now applied to collect fairly large samples of these distant galaxies. Using space infrared data, astronomers have found that a fairly large fraction of these objects have indications of an old stellar population, despite the fact that the age of the Universe at these redshifts corresponds to only about 1 billion years. The implication is that a large fraction of the galaxy mass is already in old stars. Also, the stellar mass density at these redshifts is considerable.

The question of the most massive galaxies at these farthest distances has become rather pressing with the putative discovery of a very massive galaxy at a redshift of 6.5. A detailed investigation of the GOODS-South field checked whether such massive galaxies are present and came to the conclusion that all objects could be explained with highly obscured galaxies at lower redshifts. This is an important result as it indicates that the build-up of mass of the galaxies is more gradual.

All these projects are based on massive data sets from many observing nights (or long integrations with satellites). The distant Universe is just barely accessible with the most advanced facilities and instruments. However, it also shows that the same data sets can be applied for many different studies and can contribute very significantly to our view of the evolution of galaxies and the Universe as a whole.

(Based on Daddi et al., 2007, ApJ, 670, 156; Stark et al., 2007, ApJ, 659, 84; Verma et al., 2007, MNRAS, 377, 1024; Eyles et al., 2007, MNRAS, 374, 910; Dunlop et al., 2007, 376, 1054; Bouché et al., 2007, ApJ, 671, 303)

Lensed galaxies

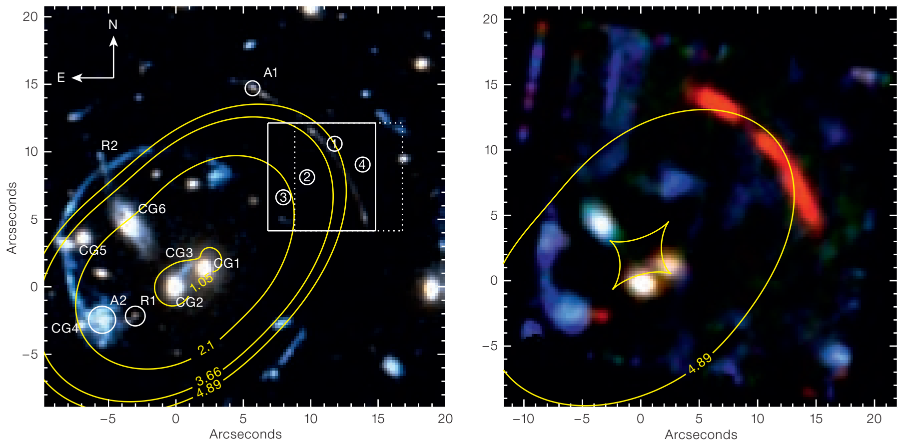
The huge mass concentration of clusters of galaxies can act as a magnifying glass to aid the detection of faint background sources. Galaxies located behind massive clusters can be amplified and distorted by the gravitational lensing effect of the cluster, producing luminous giant arcs that are seen in the central regions of many clusters. Depending on the location of the source relative to the cluster mass distribution, and its redshift, magnifications of several magnitudes can be obtained.

Ever since the lensed nature of these giant arcs was demonstrated through observations at the ESO 3.6-m telescope by a team led by Geneviève Soucail in 1988, astronomers have dreamed of using large clusters of galaxies as gravitational telescopes to explore the high-redshift universe. The advent of powerful telescopes on the ground and in space has finally fulfilled this dream. Systematic searches for high-z galaxies along the critical curves (curves of infinite magnification) of massive clusters at intermediate redshifts ($z \sim 0.3$ to 0.8) have been extremely successful. In fact, the most distant galaxies known to date have been found through this technique, including a galaxy at $z = 6.6$ magnified by Abell 370, the very same cluster which allowed the 3.6-m telescope to confirm the lensed nature of giant gravitational arcs 20 years ago!

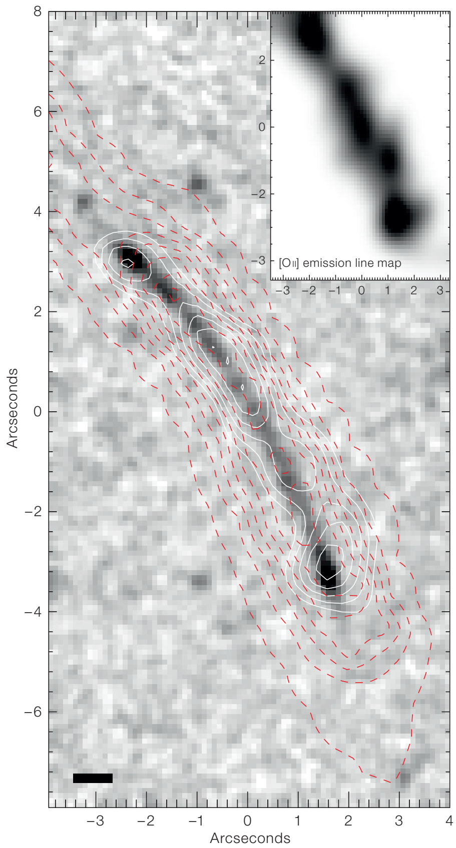
The large magnification of lensed galaxies near critical curves makes it possible not only to find high redshift galaxies and to study their stellar populations spectroscopically, but also to perform detailed studies of their structure and chemical composition that a few years ago were only possible for galaxies in the local Universe. This breakthrough has been possible due to the advent of powerful integral-field (3D) spectrometers on 8-m class telescopes. A team of astronomers led by A. Swinbank used VIMOS in the optical and SINFONI in the near-infrared to perform a detailed study of a galaxy at redshift $z = 4.88$ lensed by a rich cluster at $z = 0.77$.

From the luminosity of the source, the observations indicate that this galaxy is typical of galaxies at this earlier time. Thus, gravitational lensing makes it possible to study a typical $z \sim 5$ galaxy at high signal-to-noise ratio and at spatial scales of 200 pc, which is indeed a remarkable achievement. The radial velocity gradient across the galaxy implies a total mass of about 10^{10} $M_{\odot}$ within a radius of 2 kpc. The total [O II] luminosity indicates a fairly hefty star formation rate of more than 10 $M_{\odot}$/year, and since the [O II] emission extends over most of the observed area, the galaxy is undergoing an extended burst of star formation. The Lyα emission is much more extended than either [O II] or UV-continuum, and the Lyα profiles are asymmetric, indicating the presence of a broad component redshifted by about +400 km/s. Moreover, the weak Si IV absorption features seen in the VIMOS data are blueshifted from the same systemic velocity by about –400 km/s. The observations therefore suggest that the galaxy is surrounded by a galactic-scale bipolar outflow that has recently burst out of the system. The ejected material appears to be travelling at velocities far exceeding the escape velocity, so it may travel for up to 1 Mpc before losing its momentum and stalling. At this point, it will have 'polluted' a volume of nearly 3 Mpc^3 with metal-enriched material. If this phenomenon is typical of galaxies at that epoch (which remains to be demonstrated on a sample of more than one galaxy), it may help us understand the widespread metal enrichment of the early universe, and may explain why only a small fraction of the baryons in the Universe cool to form stars.

(Based on Swinbank et al., 2007, MNRAS, 376, 479)



(Left) HST image of the cluster Abell 370 with the critical curves indicated, and (right) the integrated VIMOS datacube with the central caustic and the $z = 4.89$ critical curve superimposed. The left panel illustrates the power of clusters as gravitational telescopes and integral field spectroscopy: the combined VIMOS and SINFONI data allowed the team to survey all the critical curves from $z = 0$ to 14. This led them to identify at least another 6 high-redshift candidates (labelled A1–A2 and 1–4 in the figure) with redshifts between 1.5 and 5.5. The $z = 4.88$ galaxy is the large arc inside the white square which depicts the SINFONI field. Object R1 is the radial counter-image of the $z = 4.88$ arc, which makes it possible to constrain the gravitational lens model required to interpret the observations.



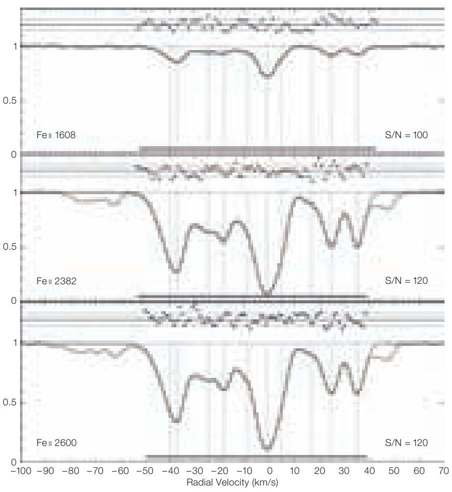
'Image plane' HST observations, that is, the lensed image of the $z = 4.88$ galaxy discovered, in grey scale, with the VIMOS Lyα contours in red and the SINFONI [O II]3727 contours in white. The inlay shows the continuum-subtracted [OII] VIMOS data, showing the structure of the most distorted (central) part of the arc.

Fundamental constants

The standard or 'concordance' cosmological model (referred to as Lambda Cold Dark Matter – ΛCDM) establishes that our Universe formed 13.7 billion years ago in a dramatic explosion. According to the model, the present energy density of the Universe is dominated by two mysterious forms of darkness: dark matter and dark energy. Both are dark because they do not emit electromagnetic radiation, but the concordance model is still based on an impressive body of observations. For example, while dark matter cannot be seen (that is through our gamma-ray to radio telescopes), its gravitational effect on light-emitting matter (baryons and leptons) can be measured. We thus know that the carriers of dark matter must be cold, that is, must move at relatively slow velocities. Otherwise the universe would have much less structure than what we observe because it is very difficult to cluster particles that are moving at relativistic speeds. Particle physicists have coined a name for the cold dark matter particles: weakly interacting massive particles (WIMPS); these particles interact with the rest of the Universe either gravitationally or through the weak nuclear force (responsible for the beta-decay of neutrons). Unfortunately, the standard model of particle physics (which describes three of the four known fundamental interactions between elementary particles – the fourth being gravity), does not predict the existence of any particles that would have the properties of WIMPS. Therefore, even though dark matter is theoretically better understood than dark energy, it still poses a big challenge to our understanding of fundamental physics.

Dark energy is much worse: we simply have no idea what this mysterious repulsive force could be. All we know is that it has a negative pressure, and that during the last billion years or so it has caused an acceleration of the expansion of the Universe. Einstein's 'greatest blunder', the cosmological constant, is currently the form of dark energy that is most consistent with the observations. It poses, however, a formidable challenge to physics because the observed value is several tens of orders of magnitude smaller than theory would predict! Dark energy (or equivalently, cosmic acceleration) requires new physics, and a number of possibilities have emerged in the theoretical particle physics arena: string theory, super-gravity, Grand Unified Theories, and others. While none of these theories has yet offered concrete testable predictions about the nature of dark energy, most require that the fundamental constants of physics (such as the couplings of the fundamental forces for example) should vary with cosmic time.

A particular prediction that could be tested through astronomical observations is the variation of the fine-structure constant (α), which measures the strength of the electromagnetic force. Since electrons are fundamentally bound to atomic nuclei by electrical forces, changes in α have directly observable effects in the spectra of stars and gas. About 10 years ago, a team of astronomers using a telescope in Australia claimed evidence for changes in α with cosmic time (redshift). Their method consisted of observing the interstellar absorption lines of clouds of neutral gas along sightlines to distant quasars, to search for minute shifts in the observed wavelengths of well-characterised spectral features that could be ascribed to changes in α. Such observations are extremely challenging because not only does one need to measure the positions of the lines with very high accuracy, but the intervening gas also has multiple components that can mimic radial velocity shifts. These problems push instruments to their limit, so it is not surprising that different teams find different results. For example, observations with UVES on the VLT of a sample of bright quasars failed to reproduce the variations of α claimed by the Australian observers. However, subsequent observations of a large sample of 143 absorption line systems by the same team, now using the Keck telescope, once again claimed a positive detection of α variations, $\Delta\alpha/\alpha = (-5.7 \pm 1.1) \times 10^{-6}$. Yet again, new observations, using both UVES at the VLT and HARPS on the La Silla 3.6-m telescope, failed to confirm this result. The HARPS observations have higher spectral resolution, but lower signal-to-noise ratio, while UVES gives significantly larger signal, but at a lower resolution. The observations show that a large number of components is required to fit all the bends and wiggles in the spectrum, and that the number of components seems to increase with resolution. Since the interstellar medium is known to have a fractal structure, the number of components used to fit the data will always be a fundamental limitation of the method. Clearly, the weaker the line, the smaller the wavelength shifts they will induce in the neighbouring lines. This fundamental uncertainty becomes even larger if one averages over many absorption systems with different redshifts. Moreover, in order to increase the signal-to-noise, observers not only average over different redshifts, but also over different ions – typically Mg II and Fe II. We know from GRB observations (see above), however, that Mg II and Fe II cannot be formed in the same volume of the intervening absorbers. So averaging different ions is probably not a good idea.



UVES observations of a line of sight to the bright quasar HE 0515-4414 at z = 1.15.

With these considerations in mind, a team of astronomers led by S. Levshakov developed a new method which uses a single ion (Fe II), and applied the method to a single absorption line system at $z_{abs} = 1.15$ toward the bright quasar HE 0515-4414. Both the UVES and the HARPS observations failed to detect any variations in α within an accuracy of $0.8\ 10^{-6}$ for UVES and $2.4\ 10^{-6}$ for HARPS. When applied to archival UVES observations of another quasar, Q1101-264 at $z_{abs} = 1.839$, they also rejected variability albeit with a lower accuracy of $3.8\ 10^{-6}$.

Encouraged by their results with the archival data, Levshakov and collaborators reobserved the same quasar with UVES, but now at a higher spectral resolution and higher signal-to-noise to improve their detection limits. The new observation, with a total exposure time of more than 15 hours and a spectral resolution of R = 80 000, allowed them to reach a signal-to-noise per pixel of better than 100 and a wavelength calibration error of only 20 m/s, quite remarkable for a V = 16 quasar.

A careful statistical analysis led them to detect a statistically significant (2σ barring unknown systematic errors) variation of $\Delta\alpha/\alpha = (5.4 \pm 2.5) \times 10^{-6}$. So the game is not over, and more and better observations are required to confirm these results. Among existing instruments, due to its blue sensitivity and excellent resolution and stability, UVES remains the best-suited instrument for this kind of work. Only future instruments such as ESPRESSO at the combined Coudé focus of the VLT or CODEX at the E-ELT will surpass it.

(Based on Levshakov et al., 2007, A&A, 466, 1077)

Photo: Y. Beletsky

La Silla Paranal Observatory

In 2007, the La Silla Paranal Observatory continued to increase its suite of operational telescopes and instruments. With the start of operation of the fourth 1.8-m Auxiliary Telescope (AT) and of the cryogenic high-resolution infrared echelle spectrograph CRIRES, the Observatory is now routinely operating a total of 11 telescopes with 20 optical, near- and mid-infrared instruments. On Paranal these are the four 8.2-m Unit Telescopes (UT) forming the Very Large Telescope (VLT) with its ten permanently installed instruments, and the VLT Interferometer (VLTI), which coherently combines the light of either the UTs or ATs to feed one of the two interferometric instruments. On La Silla, eight instruments are operated on the New Technology Telescope (NTT), the 3.6-m, and the 2.2-m telescopes.

The Observatory further provides the operations support for the Atacama Pathfinder Experiment (APEX) with its 12-m submillimetre radio antenna and its suite of heterodyne and bolometer instruments located at the high plateau of Chajnantor at an altitude of 5000 m.

The high productivity of the Observatory relies on the high availability of its telescopes and instruments to carry out scientific observations. In 2007, a total of 2245 nights were scheduled for scientific observations with the four UTs at the VLT and with the three major telescopes at La Silla. This is equivalent to about 89 % of the total number of nights theoretically available over the whole year. The remaining 11 % were scheduled for planned engineering and maintenance activities to guarantee the continuous performance of the telescopes and instruments and include time slots for the commissioning of new instruments and facilities. The biggest maintenance operations this year were the recoating with fresh layers of aluminium of the primary and tertiary mirrors of Antu (UT1) and Melipal (UT3), and of the secondary mirrors of Kueyen (UT2) and Melipal. These coating layers measure only a few tens of atomic radii in thickness. For the primary mirrors of the ATs, a regular mirror-washing programme has been established to considerably extend the time between recoating. Out of the available science time for Paranal only 2.6 % was lost due to technical problems and about 9 % due to bad weather conditions. On La Silla bad weather accounted for losses of about 15 %, and technical problems for 1.5 %.

Complementary to regular VLT and La Silla operations, the VLT Interferometer (VLTI) was scheduled for an additional 182 nights to execute scientific observations using baselines with either the UTs or the ATs. The remaining nights of the year were used for technical activities and for further development and commissioning of the interferometer. Of the scheduled VLTI science time, 3.6 % was lost due to technical problems.

The combination of high operational efficiency, system reliability and uptime for scientific observations of the La Silla and Paranal telescopes and instruments has again resulted in high scientific productivity. We have counted 493 peer-reviewed papers published in different scientific journals which are at least partially based on data collected with VLT and VLTI instruments at Paranal, while telescopes at La Silla accounted for 325 refereed papers. Since the majority of astronomical publications are based on contributions from different instruments and observatories, the individual contributions and their relative weight are difficult to measure. However, we estimate that in 2007 the La Silla Paranal Observatory has substantially contributed to about two refereed papers every day of the year.

New instruments and facilities

CRIRES started science operations on the Nasmyth A focus of Antu with the beginning of Period 79 in April 2007. CRIRES is an adaptive-optics supported high-resolution infrared (1 to 5 μm) spectrograph that provides a resolving power of up to 100000 when used with a narrow slit width of 0.2 arcsec. The astronomical community had responded enthusiastically to the call for scientific proposals for this long-awaited new research tool. The high spectral and spatial resolution of CRIRES opens up completely new research fields in the detailed study of spectral lines of chemical elements and molecules in the infrared wavelength regime. The commissioning of this complex instrument continues in parallel to the science operation, to further improve its stability and performance.

The eleventh VLT instrument, HAWK-I (High Acuity Wide field *K*-band Imager) was installed and commissioned on the last free VLT focus station[1], i.e. the Nasmyth A focus of Yepun (UT4). HAWK-I is a cryogenic wide-field imager operating in the near-infrared wavelength range from 0.85 to 2.5 μm with an on-sky field of view of 7.5 arcmin × 7.5 arcmin. This corresponds to a field of view of about

[1] The 12th focus station of the VLT is the Visitor Focus at the Melipal telescope.

The CRIRES instrument.

nine times that of the very successful VLT infrared camera ISAAC, and a field of view comparable to or even larger than that of the optical cameras FORS1 and FORS2. Whenever the atmosphere above Paranal permits, HAWK-I routinely delivers exquisite infrared images with an almost constant full width at half maximum for the stellar point sources of about 0.2 arcsec across the whole field of view. HAWK-I has not only been optimised for best image quality but also for highest sensitivity and allows the deepest views into the infrared sky with the VLT. After its successful commissioning and science verification in 2007, HAWK-I will be offered for the first time to the astronomical community in Period 81 starting in April 2008. To become even more independent from the quality of the atmosphere, and to constantly deliver highest-resolution images, HAWK-I will in the future be supported by the Adaptive Optics Facility (AOF). The AOF is intended to convert Yepun into an adaptive-optics telescope with a large deformable secondary mirror, a four laser guide star facility (4LGSF) and an adaptive optics module named GRAAL, which is specially designed for the needs of HAWK-I and will provide a wide field of view corrected for the effects of the atmosphere.

The ULTRACAM visitor instrument on the VLT.

The single Laser Guide Star Facility (LGSF) achieved its First Light at the Yepun telescope in 2006. Since then the LGSF has provided a bright artificial reference star for the adaptive optics (AO) systems of the SINFONI and NACO instruments. Such a Laser Guide Star is required for the AO systems to work in regions of the sky where no bright natural star can be found close enough to the scientific target. After the basic commissioning of the LGSF the AO instruments SINFONI and NACO were offered with the new LGS mode at the earliest possible stage to the scientific community, in order to allow a timely exploitation of this new exciting capability of the VLT. This early commitment requires a continuous effort of the maintenance and operations teams in Paranal, the Garching LGSF team and the PARSEC laser team from MPE in Garching and MPIA in Heidelberg. As a result of these efforts, the LGS was technically available for science operations with SINFONI and NACO for about half of the 120 nights scheduled with the LGS in 2007. In about half of these nights, actual scientific observations with the LGS could be performed. We consider this a respectable result for the first year of LGSF operation but with room for further improvement. Therefore, the further increase in reliability and performance of the LGSF and the optimisation of the operational procedures remains a continuous effort of the Observatory.

In 2007, the VLT Visitor Focus welcomed again the ULTRACAM and DAZLE visitor instruments. ULTRACAM is an ultra-fast camera capable of capturing some of the most rapid astronomical events in the cosmos. ULTRACAM is the first UK-built instrument to be mounted on the VLT and was designed and built by scientists from the Universities of Sheffield and Warwick, in collaboration with the UK Astronomy Technology Centre in Edinburgh. It can take up to 500 pictures a second in three different colours simultaneously. DAZLE, the Dark Age Z (redshift) Lyman-alpha Explorer, is a narrowband imaging instrument developed by the Institute of Astronomy (Cambridge, UK) and the Anglo-Australian Observatory with the single aim of detecting the most distant objects in the Universe. The Principal Investigators of both visitor instruments reported successful observing runs and returned home with large amounts of data from some 20 observing nights at the VLT.

The visitor instruments had to compete with MAD, the Multi-conjugate Adaptive optics Demonstrator, a test-bench instrument conceived to demonstrate in the laboratory and on-sky the principles of multi-conjugate adaptive optics (MCAO). And indeed, MAD succeeded for the very first time in demonstrating during several test runs on the VLT that it is possible to perform adaptive optics correction in the *K*-band (around 2.2 μm) over a wide field of view of 2 × 2 arcmin by using multiple and relatively bright natural guide stars and multi-layer AO corrections. The spectacular success of this experiment is considered a major milestone for the development of future adaptive telescopes like the AOF at the VLT, and also the E-ELT. In addition, the scientific community has been very excited about the new possibilities provided by MAD and several science demonstration runs were squeezed into the Paranal schedule to allow the community to immediately exploit these new capabilities with the VLT.

Upgrades

To maintain the competitiveness of the VLT and VLTI it is not sufficient to continue to deliver new instruments and facilities: a rigorous upgrade programme for the existing instruments must also be followed. In 2007 several such upgrades were carried out by the Instrumentation Division in Garching in collaboration with the instrument builders and the Observatory.

FORS1, the optical imager and spectrograph on Kueyen, was equipped with a blue-sensitive CCD detector mosaic complementary to the one in FORS2, which is optimised for the red part of the optical spectrum. The overall sensitivity of FORS1 was further increased by the installation of high-transmission broadband filters.

VISIR, the imager and spectrograph in the mid-infrared at Melipal, was upgraded with a new filter set for the imager. The new filters permit spectrophotometric observations with a low resolving power of 10 and quantitative measurements of the most prominent solid-state feature in the 10-micron window, the silicate band.

NACO, the adaptive optics infrared camera on Yepun, received new tools for improved high-contrast imaging. New four-quadrant phase masks (4QPM) and an improved Spectral Differential Imager (SDI+) now allow NACO to better identify close companions such as faint brown dwarfs or even young, giant planets next to bright stars.

An upgrade of a very different nature but of fundamental importance for the Paranal site was started in 2007: the installation of a new Multi-Fuel Power Generator (MFPG) to upgrade the Paranal power station from diesel engine generators to a gas turbine generator. Continuous and reliable on-site power generation at a remote and isolated place such as Paranal, which requires clean and stable electrical power and which cannot be connected to an electrical grid, is absolutely crucial for the smooth operation of the Observatory. The experience of the past years has shown that a power station based on diesel engines is a major challenge and costly to run and maintain.

The multi-fuel power station.

Therefore, a project to purchase a high-reliability, low-maintenance multi-fuel gas turbine generator was initiated. The ability of a MFPG to be supplied with different energy sources, from natural gas to ship diesel, will allow us to react more easily to the fast-changing market of available energy sources. For the time being, the MFPG will run on liquefied propane gas (LPG). The installation and commissioning of the MFPG and the LPG tanks started in the last quarter of 2007 and its handover to the Observatory is planned for the first quarter of 2008.

The VLT Interferometer

In 2007, the VLT Interferometer (VLTI) executed about 182 nights of scientific observations with MIDI and AMBER using UT and AT baselines – this is 30 % more than in the previous year. The remaining time was intensively used for engineering and commissioning activities to complete and improve the interferometer infrastructure and to fully exploit the capabilities of the VLTI Sub Array (VISA).

The VISA feeds the VLTI infrastructure and instruments with the light from the 1.8-m Auxiliary Telescopes (AT) when the individual UTs are used for stand-alone VLT observations. In 2007, the VISA started science operation with four ATs. The additional fourth AT, which was accepted for operation at the beginning of the year, provides the VLTI operations with additional flexibility in the selection of different and complementary AT baselines even in the same observing night without having to physically reconfigure the array of telescopes.

The AMBER instrument, which allows the interferometric combination of up to three beams, was offered to the community for the first time with the FINITO fringe tracker and the ATs. This new mode became available in Period 79 in April 2007 in visitor mode – only four months after it was successfully tested for the first time on 1 December 2006 on the bright star β Ceti. Fringe tracking techniques considerably improve the sensitivity of the interferometer because they enable the instruments to integrate longer on the stabilised fringe patterns and therefore to observe fainter targets or with higher quality. While AMBER so far has been limited by the variability of the earth's atmosphere to integration times of 25 milliseconds, with FINITO it is now possible to integrate for up to 10 seconds, equivalent to a gain of a factor of 400.

After this critical milestone was achieved with the ATs, the VLTI team immediately concentrated its efforts on also providing FINITO fringe tracking with the UTs. Vibrations of the optical surfaces of the UTs transmitted to the VLTI had earlier been identified as the primary cause that prevented fringe tracking with the UTs. In the meantime, active vibration suppression systems had been developed in-house and shown to largely overcome this problem. Consequently, the full deployment and commissioning of the vibration suppression system became the primary tasks of the VLTI team in 2007. This included the installation of accelerometers on all the main vibrating mirrors of the UTs and the commissioning of the active Vibration Tracking (VTK) system. By the end of the year the VLTI team had succeeded in these critical tasks. After an extended characterisation period in early 2008, the team expects to deliver the FINITO fringe tracking with AMBER and the UTs to the science operations team and the community just in time for Period 81 starting in April 2008.

Earthquake

On 14 November at 12:41 LT, an earthquake with Richter magnitude 7.7 and epicentre north of Antofagasta badly affected the north of Chile. The town of Tocopilla was hit hardest, and hundreds of houses were damaged and many people were injured. In Paranal the earthquake was registered with a magnitude of 5.7, a peak ground acceleration of 0.6 m/s^2, and for a duration of approximately two minutes. This was the strongest earthquake since 1997, the first 'high risk' earthquake since the start of operations of the VLT, and the first strong earthquake since the opening of the Paranal hotel, the so-called *Residencia*. Neither injuries to persons nor damage to the installations were registered. After extended checkout procedures, regular night-time operations could be resumed at sunset. All the systems were operated that same night without restrictions, including all four UTs (with their instruments and the LGS) and the ATs with the VLTI.

VST and VISTA survey telescopes

By mid-2007, the 2.4-m optical VLT Survey Telescope (VST) had been shipped to Paranal and its reintegration started inside the VST enclosure next to the UTs on the Paranal observing platform. The integration of the complete telescope structure but with steel dummies for the primary mirror cell and the secondary mirror unit was completed by the end of the year under the responsibility of *Istituto Nazionale di Astrofisica* (INAF) and in collaboration with La Silla Paranal engineers. The manufacturing of the VST primary mirror optics was completed and the mirror was safely delivered to Paranal. It is stored together with the secondary mirror optics, which had already arrived in the previous year. Both mirrors are ready for their integration into the telescope. However, the primary mirror cell and the secondary mirror unit remain in Italy awaiting their completion before being delivered to Paranal to complete the VST.

The construction of the 4.2-m infrared survey telescope VISTA by the VISTA project office continued on its own peak about 1500 m north-east of the Paranal summit. The integration and testing of all the major telescope and support systems has been completed. The manufacturing of the secondary mirror optics was completed and the mirror has arrived at Paranal. The mirror surface was successfully coated in the dedicated VISTA coating plant with a thin layer of silver to provide highest reflectivity of the optical surface in the near-infrared wavelengths where VISTA will survey the sky.

The VST telescope structure.

Also the heart of the VISTA facility, the 64-megapixel infrared camera built from an array of sixteen 2048 × 2048 pixel infrared detectors arrived at Paranal and was successfully integrated in the VISTA telescope. In an extended test phase the camera was successfully operated at its nominal cryogenic temperatures. The instrument mounts to the rotator on the back of the primary mirror cell, and includes a wide-field corrector lens system (three large Infrasil lenses), an autoguider unit and active optics sensors.

The VISTA telescope is now awaiting the arrival of its primary mirror optics. The primary mirror of the VISTA telescope is, with a focal ratio of f/1, the fastest 4.2-m mirror ever manufactured and is still in the phase of final polishing at the manufacturer in Europe. It will be ready to be air-freighted to Paranal in early 2008.

Integrating the VISTA camera into the telescope.

La Silla

At La Silla the operation of the 3.6-m telescope was strongly affected by a severe degradation of the dome rotation mechanism, stalling operations for one full month and subsequently restricting operations for several months in late 2006 and early 2007. Through a combined effort of the engineering and maintenance departments of the La Silla Paranal Observatory the problems identified were corrected. A new system of spring-dampened bogies was developed and installed, reenabling the full-speed rotation of the 300-ton dome by March 2007. Since then, no downtime for the 3.6-m telescope has been reported as being caused by the dome. The telescope itself continues to deliver excellent image quality of better than 0.5 arcsec. This achievement is the result of a long series of upgrades to the telescope, which was concluded this year with the commissioning of the lateral pad control system for the primary mirror. The scientific instruments are taking advantage of the improved image quality as delivered by the telescope: HARPS, the planet search machine at the 3.6-m telescope, reports a sensitivity increase of up to 40 %.

The gamma-ray burst (GRB) follow-up instrument GROND was installed and commissioned by the *Max-Planck-Institut für extraterrestrische Physik* (Garching, Germany) at the 2.2-m telescope. GROND is not a facility instrument for general use by the ESO community but is operated by the La Silla science operations team as part of the 2.2-m telescope. The activation to follow up a new, usually satellite-detected GRB explosion with GROND uses the same rapid-response mode (RRM) mechanism as the VLT. This fully automatic system enables starting the observation of the GRB or other transient phenomena just few minutes after their discovery.

Towards the end of the year the Coudé Echelle Spectrograph (CES) was decommissioned after 25 years of operation. This is part of the plan for a continued streamlining of La Silla operations up to the end of 2009. Starting with Period 81 in April 2008 the three large La Silla telescopes will all operate with a fixed set of instruments. No instrument changes will be performed anymore except to accommodate visitor instruments. The 3.6-m telescope will then operate exclusively with HARPS, the NTT with EFOSC2 and SOFI, and the 2.2-m telescope with FEROS, WFI and GROND.

APEX

In 2007, APEX received its eagerly expected facility bolometer array LABOCA developed by the *Max-Planck-Institut für Radioastronomie* (Bonn, Germany). LABOCA (the LArge BOlometer CAmera) is a detector array with 295 pixels and operates at a wavelength of 870 microns. LABOCA was extensively tested during the beginning of the year at Chajnantor and started regular science operations in mid-2007 after a very successful science verification campaign with strong involvement of the astronomical community. The final facility heterodyne receivers from Onsala Space Observatory, which will cover all atmospheric windows from 200 to 1400 GHz, were ready for shipment to APEX by the end of the year and will be installed during the Bolivian winter break in January and February 2008. In early 2007, the static sub-reflector of the APEX antenna was successfully replaced with a chopping sub-reflector, the so-called ‘wobbler’. The wobbler allows the antenna to switch quickly between two positions on sky. This observing technique increases the quality of the observations by eliminating time-dependent instabilities in the receivers and the atmosphere. The complete suite of new facility instruments will soon allow APEX to exploit fully the exceptional conditions available at its 5100-m altitude site.

User Support

The new interface connecting ESO and its users' community, the ESO User Portal, was successfully launched in mid-November. Within this system, which is the result of a joint effort involving departments of several ESO divisions, account information (username, password, contact information) for all science and observations related web-based applications (e.g. routines for requesting data from the Archive) and standalone software (P2PP, the Phase 2 Proposal Preparation tool) is unified and user-controllable. It is intended to make the use of ESO web applications and other software simpler, and more manageable.

A feedback campaign was launched in early 2007. The questionnaire covered several aspects of the ESO Data Flow System, and it was especially tailored for Service Mode (SM) users. All Principal Investigators with approved SM runs between Periods 69 and 77 (covering the period from April 2002 to September 2006) were asked to provide feedback on different areas, from the Call for Proposal and Phase 1, to Phase 2 activities and their follow-up, to the processing and delivery of the data. The users' satisfaction emerged very clearly: most of the services we offer and support received a majority of "Very Good" and "Excellent" votes.

Service Mode has continued to be the most requested observing mode at the VLT: the demand for SM observing was a factor of 2 and 3 higher than the time requested for Visitor Mode during Period 79 and 80 respectively. The number of SM runs supported at the VLT, VLTI, and ESO/MPI 2.2-m telescope during 2007 has remained above the 1000 threshold. APEX Service Mode operations (started in April 2006) have matured into a stable and organised scheme. The strong demand for SM observing is supported by a constant revision of the preparation and observing tools we offer to the users and by the implementation of new features and improved operational workflow. During 2007, the most notable example of these was the implementation of a new web-based form for Target/Instrument Setup Change Requests that allows ESO to run a thorough semi-automatic duplication check when evaluating this type of request.

The ESO Survey Team (EST) has strengthened its role by coordinating the preparation of the VISTA public survey management plans. Six public surveys were selected and the teams worked on a detailed implementation of their observing strategies with the support of the ESO Survey Team. Based on the submitted Survey Management Plans, final recommendations were prepared.

Data processing and quality control

Ensuring that data taken on Paranal are of certified and predictable quality and continuously monitoring the health state of the instruments are cornerstone concepts in the ESO end-to-end data flow model. The Quality Control and Data Processing (QC) group is responsible primarily for the monitoring and reporting of instrument performance for all VLT/VLTI instruments, as well as the creation of a variety of calibration and science data products for these instruments. QC works closely with the Paranal Science Operations department to assure that VLT/VLTI instruments are always performing within expected and published ranges. Except for a few very specific cases, all the information on instrument performance is available to the community at large from the QC Web pages. Raw calibration data are processed into master calibration products that are used not only to monitor instrument performance but also to process science data. These master calibration products are stored in the ESO archive and are available to the community at large.

Two additional services are provided to Service Mode users. First, Service Mode science data are processed into science products using standard pipelines which, by now, cover virtually 100 % of the Paranal data stream. Second, data packages are created that include all raw data, resultant products, and associated information for each and every Service Mode observing run. These packages are burned onto mass storage devices such as DVDs or USB disks and shipped to users.

During 2007, QC processed more than 7 TB of raw data in 160 000 processing jobs to create 1 100 service mode packages with VLT/VLTI data, which were distributed to their respective Principal Investigators. The QC group also packages data coming from La Silla, but without performing quality checks on them. In the year 2007, 122 such packages were produced and shipped to the corresponding Principal Investigators.

La Silla in the morning.

The Observing Programmes Committee

The Observing Programmes Committee 2007

Danielle Alloin
Omar Almaini (P80)
Svetlana Berdyugina (Vice-chair)
Hermann Böhnhardt (P80)
Jan Brand (P81)
Jarle Brinchmann (P81)
Mike Disney (P80)
Thierry Forveille
Roland Gredel
Rodrigo Ibata
Leopoldo Infante
Mika Juvela (P81)
Donald W. Kurtz (P81)
Claudia Maraston (P81)
Simon Morris (Chair)
Antonella Nota (P80)
Rafael Rebolo Lopez (P80)
Tom Richtler
Sabine Schindler (P81)
Stella Seitz (P80)
Monica Tosi
Sylvie Vauclair

In 2007, the Observing Programmes Committee (OPC) held its two regular annual meetings in May and in November. In addition, a special OPC Panel was convened in August, for evaluation of proposals submitted in response to a “Delta Call” for LABOCA, a new instrument that had been recently commissioned on the APEX telescope. Adding the 51 LABOCA proposals received in response to this Delta Call to the 892 proposals submitted by the regular deadline of end March for the Observing Period 80 (P80 – 1 October 2007 to 31 March 2008), a new all-time record number of 943 proposals were counted in P80. This total was surpassed again in Period 81 (P81 – 1 April to 30 September 2008), which saw the submission of 952 proposals. As already noticed in previous periods, the increase of the demand continues to take place primarily in the ‘Galactic’ scientific areas: interstellar medium, star formation and planetary systems (OPC category C – see page 33), and stellar evolution (OPC category D), while the number of ‘extragalactic’ proposals of categories A (cosmology) and B (galaxies and galactic nuclei) remains approximately constant.

The ratio between the requested and available time has again reached nearly six on the most demanded Unit Telescopes (Antu and Yepun). Following the introduction of LABOCA, this ratio reached an even higher value (6.7 in P80) on APEX, which is run in collaboration with the Max-Planck Institute for Radioastronomy and the Onsala Space Observatory, so that 27 % of the total time is available for ESO programmes. The amount of time requested on the two main La Silla telescopes (3.6-m and NTT) was 10 % higher in 2007 than in 2006. On the 2.2-m telescope, new contractual agreements with the Max-Planck Society and the National Observatory of Brazil decreased the amount of time available for execution of ESO programmes. Taking into account the time already committed to Large Programmes started in 2006, the only new proposals that could be accepted for this telescope in 2007 were those falling within the framework of ESO’s agreement with its host state, Chile. Among VLT instruments, the demand for most instruments is very even, within 10 % of each other. Much less time was requested for HAWK-I, offered for the first time in P81, and VISIR, which is designed for very specific scientific applications, while FORS2, in its eighth year of operation, remains the most popular VLT instrument, with a demand almost twice as high as the average. The visitor instrument DAZLE was also scheduled on Melipal in P80.

Joint telescope time applications for coordinated observations with the VLT and with the XMM-Newton X-ray observatory were invited in P81. These proposals fall within the framework of an agreement between ESO and ESA for a joint telescope time application scheme, which was in its fourth year in 2007. It aims at taking full advantage of the complementarity of ground-based and space-borne observing facilities. ESO did not receive any joint applications in P81, but two of the eleven joint applications evaluated by the XMM Time Allocation Committee were allocated time.

In 2007, the field of gamma-ray bursts (GRBs) continued to account for about half of the successful Target of Opportunity (ToO) proposals. A large fraction of the GRB proposals make use of the Rapid Response Mode (RRM) of the VLT, with which observation of a transient event can be automatically started within minutes of its triggering. The unique performance of the VLT in this mode, combined with ESO’s policy of allowing it to override both Visitor and Service Mode observations, have positioned the VLT and the GRB community of the ESO member states at the forefront of this field of research.

Large Programmes

Large Programmes (LPs) are projects requiring more than 100 hours of observing time per year over no more than two years, and which have the potential to lead to a major advance or breakthrough in the considered field of study. In P80, the OPC evaluated 14 LP proposals, and recommended three of them for implementation. In P81, four of the 24 LP proposals which were submitted were approved. In total, between the start of VLT science operations in 1999 and 2007 (P81), 79 LP proposals which received favourable evaluation from the OPC were allocated time on the La Silla Paranal Observatory telescopes. They cover almost all current astronomical topics, from the Solar System to cosmological studies.

OPC procedures

In an attempt to keep the workload of the OPC to a manageable level despite the ever-increasing number of proposals, a new proposal type, the Short Programme proposals, was introduced in P80. Short Programmes require no more than 10 hours of observing time. Short Programmes need a special proposal form, in which the space available for the scientific justification and the accompanying figures is half of that in Normal Programme proposals. About 20 % of the proposals submitted in P80 and P81 correspond to Short Programmes.

On the other hand, as the fraction of proposals in scientific categories C and D continued to grow, one new sub-panel was added for each of these two categories, for the second time in one year. As a result, the OPC now consists of 12 sub-panels (compared to eight until 2005, and ten in 2006), i.e. two for each of categories A and B, and four for each of categories C and D. For the longer term, alternative solutions are being investigated to face the foreseeable continued increase of the number of proposals.

Summary of Use of Telescopes by Discipline

OPC Categories and Sub-Categories

The scientific categories referred to in the following tables correspond to the OPC classifications given below:

A: Cosmology
A1 Surveys of AGNs and high-z galaxies
A2 Identification studies of extragalactic surveys
A3 Large scale structure and evolution
A4 Distance scale
A5 Groups and clusters of galaxies
A6 Gravitational lensing
A7 Intervening absorption line systems
A8 High redshift galaxies (star formation and ISM)

B: Galaxies and Galactic Nuclei
B1 Morphology and galactic structure
B2 Stellar populations: unresolved and resolved
B3 Chemical evolution
B4 Galaxy dynamics
B5 Peculiar/interacting galaxies
B6 Non-thermal processes in galactic nuclei (incl. QSRs, QSOs, blazars, Seyfert galaxies, BALs, radio galaxies, and LINERS)
B7 Thermal processes in galactic nuclei and starburst galaxies (incl. ultraluminous IR galaxies, outflows, emission lines, and spectral energy distributions)
B8 Central supermassive objects
B9 AGN host galaxies

C: Interstellar Medium, Star Formation and Planetary Systems
C1 Gas and dust, giant molecular clouds, cool and hot gas, diffuse and translucent clouds
C2 Chemical processes in the interstellar medium
C3 Star forming regions, globules, protostars, H II regions
C4 Pre-main-sequence stars (massive PMS stars, Herbig Ae/Be stars and T Tauri stars)
C5 Outflows, stellar jets, HH objects
C6 Main-sequence stars with circumstellar matter, early evolution
C7 Young binaries, brown dwarfs, exosolar planet searches
C8 Solar system (planets, comets, small bodies)

D: Stellar Evolution
D1 Main-sequence stars
D2 Post-main-sequence stars, giants, supergiants, AGB stars, post-AGB stars
D3 Pulsating stars and stellar activity
D4 Mass loss and winds
D5 Supernovae, pulsars
D6 Planetary nebulae, nova remnants and supernova remnants
D7 Pre-white dwarfs and white dwarfs, neutron stars
D8 Evolved binaries, black-hole candidates, novae, X-ray binaries, CVs
D9 Gamma-ray and X-ray bursters
D10 OB associations, open and globular clusters, extragalactic star clusters
D11 Individual stars in external galaxies, resolved stellar populations
D12 Distance scale stars

Percentage of scheduled observing time/telescope/instrument/discipline

		Scientific Categories				
Telescope	Instrument	A	B	C	D	Total
2.2-m	FEROS	0	1	11	61	73
	WFI	13	2	4	8	27
Total		**13**	**3**	**15**	**69**	**100**
3.6-m	CES	0	0	0	1	1
	EFOSC2	9	6	0	8	23
	HARPS	0	0	56	12	68
	Special 3.6	0	0	1	7	8
Total		**9**	**6**	**57**	**28**	**100**
NTT	EMMI	19	6	10	17	52
	SOFI	6	2	16	8	32
	SUSI2	0	8	1	5	14
	Special NTT	0	0	2	0	2
Total		**25**	**16**	**29**	**30**	**100**
APEX	APEX-2A	4	13	31	4	52
	FLASH	0	5	0	0	5
	LABOCA	40	3	0	0	43
Total		**44**	**21**	**31**	**4**	**100**

		Scientific Categories				
Telescope	Instrument	A	B	C	D	Total
UT1	CRIRES	0	3	15	14	32
	FORS2	16	12	4	11	43
	ISAAC	9	3	6	7	25
Total		**25**	**18**	**25**	**32**	**100**
UT2	FLAMES	1	12	8	12	33
	FORS1	7	3	3	17	30
	UVES	8	3	11	15	37
Total		**16**	**18**	**22**	**44**	**100**
UT3	VIMOS	33	14	2	9	58
	VISIR	0	5	22	5	32
	Special UT3	4	0	2	4	10
Total		**37**	**19**	**26**	**18**	**100**
UT4	NACO	2	8	25	12	47
	SINFONI	22	17	10	2	51
	Special UT4	2	0	0	0	2
Total		**26**	**25**	**35**	**14**	**100**
VLTI	AMBER	11	0	27	25	63
	MIDI	0	5	6	26	37
Total		**11**	**5**	**33**	**51**	**100**

The Users' Committee

The Users' Committee 2007	
Belgium	Griet Van de Steene
Denmark	Uffe Gråe Jørgensen
Finland	Merja Tornikoski
France	Pascale Jablonka (Chair)
Germany	Jochen Heidt
Italy	Bianca Maria Poggianti
The Netherlands	Walter Jaffe (Vice-chair)
Portugal	Nuno Cardoso Santos
Spain	Ignacio Negueruela
Sweden	Sofia Feltzing
Switzerland	Frédéric Courbin
United Kingdom	Jacco van Loon
Chile	Wolfgang Gieren

The Users' Committee (UC) held its annual meeting on 16 and 17 April. The acting chair for the meeting was Walter Jaffe.

Representatives from ESO gave presentations to the Committee about the La Silla Paranal Observatory, ALMA, the proposal submission and time allocation processes and the new OPC structure, and the publications based on observations obtained with the ESO telescopes. The UC in turn provided feedback from the users on the usage of ESO facilities, based in part on the outcome of a survey designed and distributed by the Committee. The level of satisfaction of the users with respect to observations carried out at the La Silla Paranal Observatory is in general high. The main issue of concern for the users is the availability of the instrument pipelines, to which the special topic of the meeting was devoted (see below). Users also show great interest in the plans for the future of the La Silla site and telescopes. On the other hand, the degree of user satisfaction with the instrument manuals and online observing documentation, and with the transparency of the OPC and time allocation processes, has improved. More generally, significant progress had been made with respect to the action items and recommendations made by the UC at its 2006 meeting, most of which could be closed. New action items and recommendations were assigned to ESO by the UC, reflecting the areas in which the community perceives the need for further improvements.

As usual, half a day was devoted to a 'special topic', which this time was "Current instrument pipelines and future direction of data processing developments". Two introductory presentations were given by ESO staff, on the current status and the options for future developments of instrument pipelines and of associated tools, and on the generation of science-ready data products with the current instrument pipelines. In the following general discussion, the UC reported the deficiencies perceived by the users in the data processing tools currently made available by ESO and, for the future, expressed its support for the ESO Reflex model developed by Sampo.

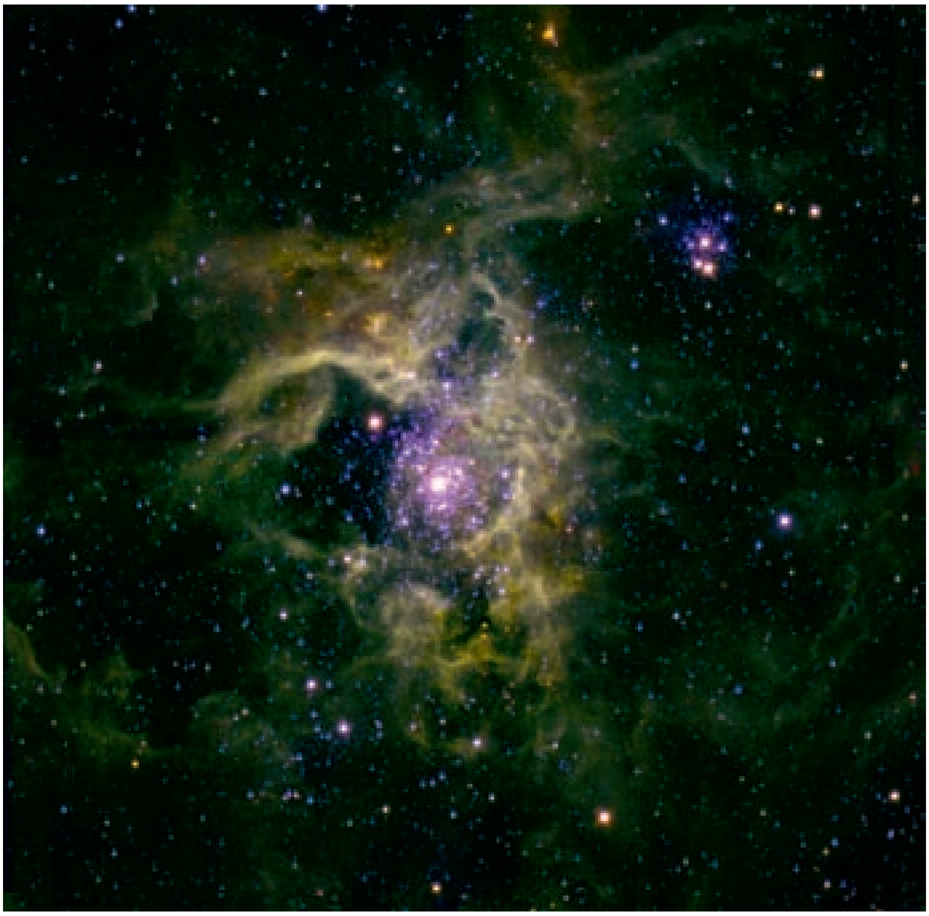
In the VLT control room.

Instrumentation

The first generation of VLT instruments was completed with the final commissioning, science verification and start of operations of the ESO-built high-resolution infrared spectrograph CRIRES on UT1, Antu, in April. The first refereed scientific papers have already appeared in print and an upgrade to incorporate polarimetry is still planned.

A number of other VLT instruments on Paranal were also upgraded, including the first to be offered in 1999, FORS1, which received a new and larger mosaic of CCDs and filters from Garching. Together, these have yielded a sensitivity gain of more than a magnitude in the ultraviolet. Looking to the future, this upgrade also means that the FORS1 detector has the same 4k × 4k format as that in FORS2 and will be interchangeable with it once X-Shooter replaces FORS1. VISIR, the longest wavelength infrared instrument at the VLT was also retrofitted with a new set of filters designed for the optimum study of silicate dust features. Meanwhile, attempts continued to place a development contract for new, larger and better detectors for VISIR.

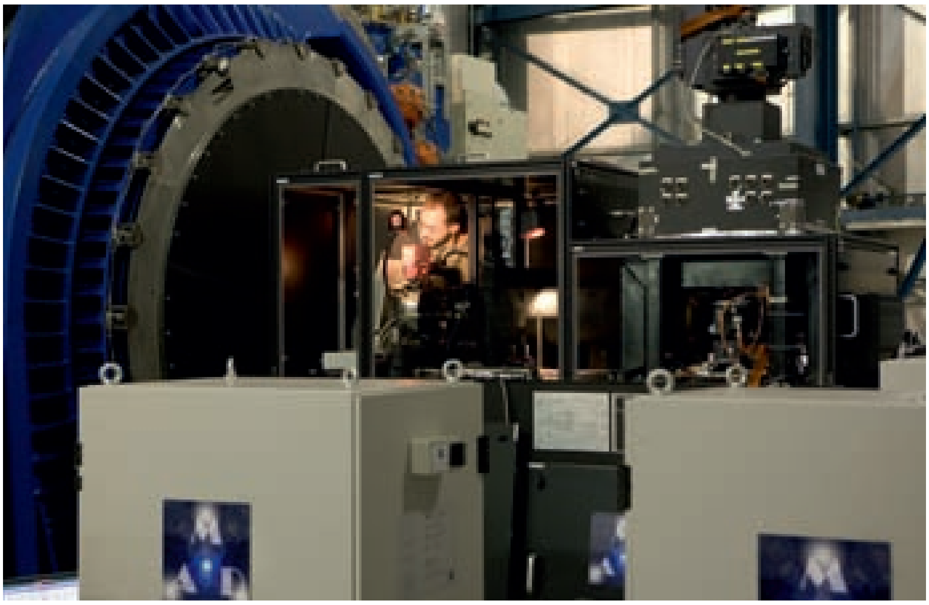
One of the highlights of 2007 was the successful installation and commissioning of the ESO-built HAWK-I infrared imager on Yepun, the fourth Unit Telescope (UT4) of the VLT. In August, the first commissioning run went very smoothly, with the instrument meeting most of its scientific specifications from the start. In particular, the image quality proved to be excellent (seeing-limited down to 0.2 arcsec) over the entire field of view and the total throughput was, as expected, about 50–60 % depending on the waveband. One of the few aspects out of specification was the flexure, but that was solved relatively quickly by adding additional stiffening to the cold structure supports, which has yielded motions of less than two pixels over a full 360-degree rotation. Commissioning and science verification observations were distributed over three runs in 2007 and the start of regular operations is planned for April 2008. Some excellent science verification data on cosmological deep fields, galaxies and star-forming regions have already been obtained and made publicly available. They fully demonstrate the anticipated combination of high resolution and high sensitivity over a field of 7.5 × 7.5 arcmin, which is nearly an order of magnitude larger than provided so far by the workhorse ISAAC instrument. One remaining problem to be solved is the unexpectedly high vibration produced by its closed cycle coolers, which is not a problem for HAWK-I but does disturb the use of the telescope for adaptive optics and interferometric observations.



Full field 7.5 × 7.5 arcmin HAWK-I composite image (*J*, *Brγ*, *K*) of the Tarantula Nebula in the Large Magellanic Cloud, whose location in the southern sky was one of the motivations for the founding of ESO.

Right: The new wide-field infrared imager HAWK-I installed on Yepun, UT4 of the VLT. The image on page 34 was also obtained with HAWK-I.

MAD at the Nasmyth focus of UT3, Melipal.



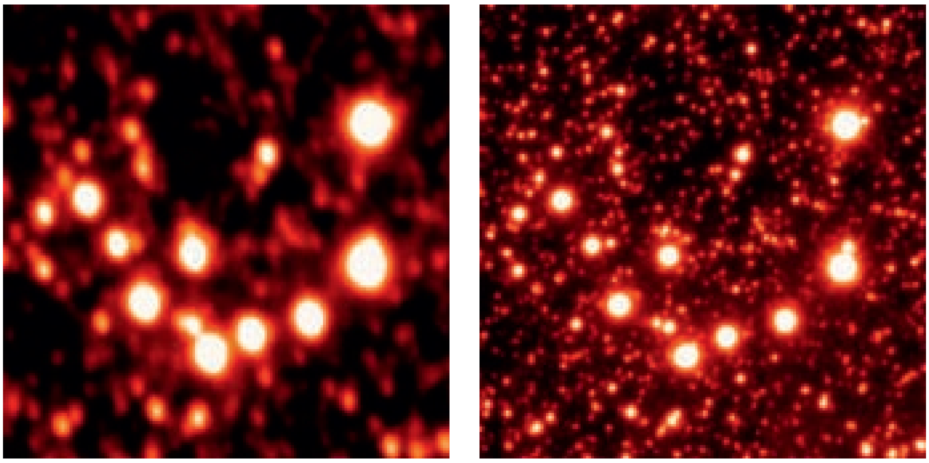
The technique of multi-conjugate adaptive optics (MCAO) has been verified on sky for the first time with MAD, the MCAO Demonstrator. MCAO is used to provide adaptive optics (AO) correction over a much wider field of view than conventional adaptive optics. It achieves this by a tomographic reconstruction and correction of the turbulence profile of the atmosphere above the telescope. MAD uses two different methods of wavefront sensing (one using three reference stars, the other using up to eight) to produce spectacular diffraction limited images with homogeneous image quality distribution. MAD also tested the Ground Layer AO technique, a mode to improve the natural seeing which turned out to provide better correction than expected. MAD has demonstrated the potential of these techniques for the VLT and the E-ELT.

Commissioning was successfully completed of the Laser Guide Star Facility (LGSF), which has started regular operations at Paranal. The LGSF is a collaboration between ESO, MPE (Garching) and MPIA (Heidelberg). Both SINFONI and NACO are now routinely operated in LGS mode and have started producing important astronomical results.

X-Shooter, the wide-band UV-IR spectrograph and first of the second-generation VLT instruments, made excellent progress in 2007. ESO delivered the CCD and infrared array detector systems to the consortium partners for integration in the subsystems under their responsibility. After installation and testing in the respective opto-mechanical subsystems, the French, Danish and Italian contributions have been delivered to ESO, where they will undergo further testing. The near-infrared spectrograph has seen first light in the laboratory in the Netherlands. Beta versions of the observing software, exposure time calculator and physical model have been released and are routinely used within the consortium. Data reduction software routines that take account of the specific instrument characteristics and data format have been defined and were partly coded and tested. First light is expected in September 2008, and it is planned to offer the instrument to the community as soon as possible following commissioning and science verification.

KMOS is another ambitious second-generation instrument for the VLT, containing 24 Integral Field Units (IFUs) each independently deployable over a 7.2 arcmin field of view by means of robotic arms operating in a cryogenic environment. The IFUs feed three spectrographs that cover the infrared *ZJHK* bands with spectral resolving powers of approximately 3 500. On the ESO side this will be the first instrument to be equipped with one of the New General detector Controllers (NGC) developed jointly by the Optical and Infrared Detector Teams. This system already outperforms the old IRACE system in the infrared and NGC controllers are now under development for MUSE and SPHERE and new technology (electron multiplier) CCDs for GALACSI and GRAAL in the Adaptive Optics facility (see below).

With more than 60 cryogenic stepping motors, robotic R-theta arms, and a requirement for precision movements, a critical issue for KMOS is reliability. ESO is therefore interacting more closely than

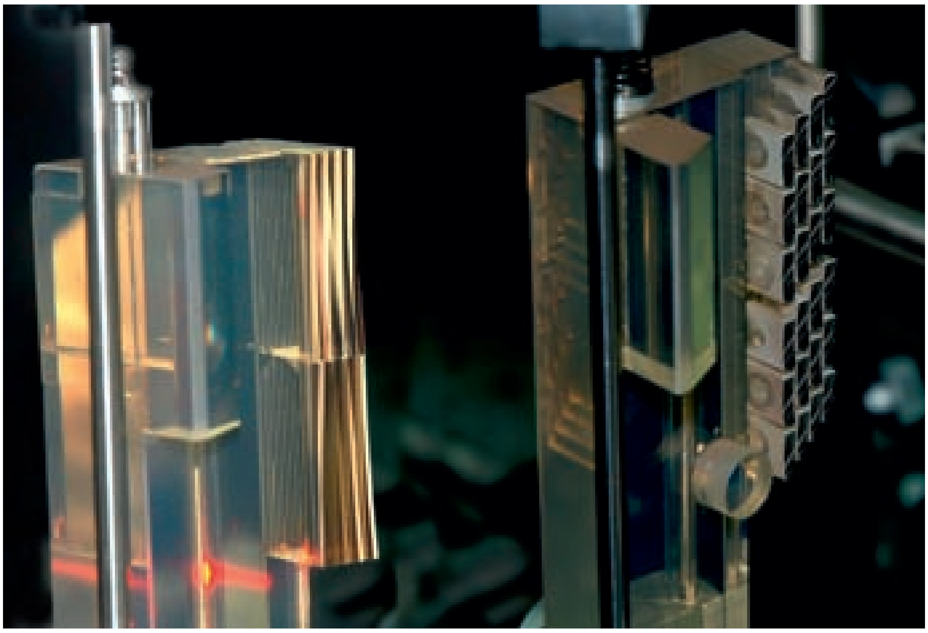


On the left: 20 × 20 arcsec *K*-band seeing-limited image (0.5 arcsec) of ω Centauri obtained with ISAAC. Right: the same field observed with the Multi-Conjugate AO demonstrator (MAD), which achieved a FWHM of 0.090 arcsec.

usual with the consortium to achieve this, including the organisation of a particularly demanding series of sub-assembly reviews which culminated in the formal Final Design Review in September. Despite excellent progress and an apparently solid design, the formal closure has been postponed to the first half of 2008 to allow time to complete some outstanding prototype testing of the robotic arms and IFUs.

2007 was an important year for MUSE, the second-generation VLT optical integral field spectrograph. This instrument, being developed by a French/German/Swiss consortium led by the Observatoire de Lyon, will slice a 1 × 1 arcmin field between 24 spectrographs and will be assisted by the GALACSI adaptive optics module (provided mostly by ESO as part of the Adaptive Optics Facility) to achieve the highest possible throughput. MUSE successfully passed its Preliminary and Optical Final Design Reviews (PDR and OFDR) thus paving the way for the early procurement of a prototype IFU (image slicer plus spectrograph optics). Under direct ESO responsibility, a prototype 4k × 4k detector has been ordered (the first of this size at ESO) and an open tender for procurement of the remaining ones was issued. A fundamental milestone for the project was the production of a prototype of the image slicer. Composed of 24 slices and 24 focusing mirrors, it was produced by Winlight and fulfils the tight MUSE specifications although each final slicer will be twice as large. A parallel study for a metallic slicer is also being pursued as a back-up.

One of the most interesting astronomical results of the last few years has been the discovery of hundreds of planets around other stars (HARPS at the La Silla 3.6-m telescope being one of the most successful instruments for this). The existence of these planets is determined indirectly by observing the radial velocity variations they produce on their parent star. The VLT Planet Finder, SPHERE, will use extreme adaptive optics to obtain images, polarimetry and spectra of planets, allowing direct observations. In 2007, SPHERE passed its preliminary design review. The deformable mirror with the world largest number of actuators (1377) has been delivered by industry.



MUSE prototype image dissector array (IDA; left) and focusing mirror array (FMA; right). The IDA is made of 24 thin (1-mm width) off-axis spherical mirrors and the FMA of 24 rectangular off-axis spherical mirrors. Although this is half of one of the 24 MUSE slicers, it is already the largest slicer of this type ever manufactured.

The Adaptive Optics Facility (AOF) is the upgrade of the UT4 telescope of the VLT to an adaptive telescope. This implies replacing the existing secondary mirror unit with a new deformable mirror and AO modules for HAWK-I and MUSE. These modules will determine the effect of the atmospheric turbulence through the analysis of the light from four artificial laser stars, and correct for it by driving the deformable mirror. The AOF design has progressed in 2007 to the successful Final Designs of the 1.1-m Deformable Secondary Mirror and of the Ground Layer Adaptive Optics system (GRAAL) for HAWK-I.

Work has continued in 2007 on the development of fibre lasers for future LGS systems, in particular towards the 4LGS Facility of the AOF, and in preparation for the E-ELT. As part of this work, a method to achieve high-power Raman amplification maintaining a narrow line width has been developed and is being patented. It will be transferred to industry to foster further research in the area of fibre lasers.

Phase A studies which commenced in 2006 for three proposed second-generation VLTI instruments, namely GRAVITY (high-precision near-infrared astrometry, with the Galactic Centre as prime scientific goal), MATISSE (a mid-infrared imaging and spectroscopy successor to the MIDI instrument) and VSI (near-infrared imaging and spectroscopy using up to six telescopes), were completed in 2007. The results, including the science cases and a summary of the ESO interface and other considerations were provided and presented to the STC at their October 2007 meeting. The three instrument consortia also presented their concepts at the “Science with the VLT in the ELT era” workshop, held just before. The STC recommendation, based on the above but also on the need to phase and coordinate activities with the PRIMA deployment in Paranal, is to proceed immediately with GRAVITY and MATISSE and more slowly with VSI. This also implies some extension of PRIMA to all telescopes, as well as the study and realisation of a 4–6-way

Fringe Tracker. These recommendations were positively endorsed by the ESO Council at its December 2007 meeting and are currently being implemented.

The workshop on "Science with the VLT in the ELT era" held in Garching in October was organised to provide another opportunity for the ESO community to debate the future use of the VLT/I and its instrumentation needs approximately a decade hence when ALMA, JWST and, hopefully, a European Extremely Large Telescope will also be operational. A very large attendance, oversubscription of presentations and several extremely lively discussion sessions testified to the interest in future second-generation VLT/I instrumentation and to the scientific synergies and complementarities anticipated between these major facilities with European participation.

At its meeting shortly afterwards the STC not only recommended proceeding with the VLTI instruments mentioned above (which originated from an earlier workshop in 2005) but also with a high-resolution spectrograph at the incoherent focus of the VLT plus a variety of possible other instruments including (a) new multi-object spectrograph(s).

At ESO, various background technical developments essential for future projects also progressed. In the area of detectors, apart from the systems delivered to specific instruments mentioned above, work continued to test an ASIC (acquisition system on a single chip), prototype AO sensors, such as CALICO and near-infrared HgCdTe electron photo avalanche arrays.

European Extremely Large Telescope

The European Extremely Large Telescope (E-ELT) project is very much based on the heritage of the ESO Very Large Telescope. The VLT started operation in 1999 and, with its arsenal of 11 instruments permanently online at the Unit Telescopes, two at the VLTI combined focus, and a Visitor focus, has proved to be the most powerful facility for ground-based astronomy at optical and infrared wavelengths. In the case of the VLT, an Instrumentation Plan Proposal was distributed to the community as early as 1989 and this approach, with corrections and upgrades introduced on the way, has been very effective in developing a coherent set of very successful instruments in collaboration between ESO, universities and institutes in the ESO member states.

The proposal for the E-ELT Phase B study presented to Council in December 2006 contained an overview of the instruments of highest scientific priority based on the work of the ELT Science and ELT Instrumentation Working Groups, on the parallel Instrument Small Studies carried out under the FP6 ELT Study, on the design work at ESO for the 42-m telescope concept, and on a first assessment of the resources which might be available for the instrument development within the E-ELT Programme. Following approval by Council of the Phase B study, a detailed plan of E-ELT instrument studies was finalised in April 2007 in discussion with the STC. As foreseen in this plan, ESO launched in 2007 six Phase A studies on instruments and one on a complementary post-focal Adaptive Optics system. External consortia are studying a Wide Field, High Angular Resolution Camera; a Single Field, Wide Band Spectrograph; and a Wide Field, Multi IFU, NIR Spectrograph with a distributed AO system (MOAO) and a Multi-Conjugate Adaptive Optics module. Furthermore, ESO is leading institutes in different member states in the studies of a High Resolution, High Stability Visual Spectrograph and of a Planetary Imaging Camera with an associated, very high Strehl, AO module. A call for proposals for a study of a mid-infrared instrument has been also distributed with the goal of selecting a consortium in 2008.

The reports of these studies, due in winter 2009, will include the simulated scientific capabilities, a discussion of the unique advantages with respect to instrumentation at 8-m telescopes and of the synergies with ALMA and the JWST, the cost and the required FTE effort to build the instrument, and a construction schedule. These data will eventually be the basis for the choice of the first-generation instruments and will be used to prepare the technical specifications and the Statement of Work of the construction agreements.

Workers are busy at the ALMA OSF, where several antennas already arrived.

Otto
ALMA


ESO
ALMA
SCHEUERLE
SCHEUERLE
HN RE 20

Atacama Large Millimeter/submillimeter Array

The intersection of the Chilean highway 23 and the ALMA road, with the completed gatehouse.

The Atacama Large Millimeter/submillimeter Array (ALMA) is a highly sensitive, high-resolution array of telescopes. Once completed, the ALMA observatory will operate 54 antennas of 12-metre diameter and 12 antennas of 7-metre diameter in an interferometric mode. All antennas will be equipped with seven receiver bands, with the possibility to install three more receiver bands, thus covering the frequency range from 30 GHz to 950 GHz (or, roughly, 0.3 to 10 mm).

Site construction work

The ALMA Observatory will be operated at two sites. There will be the base camp – the ALMA Operations Support Facilities (OSF) – for the everyday, routine operations of the observatory. Built at an altitude of 2900 metres, it will not only serve as the location for operating the Joint ALMA Observatory (JAO) but also as Assembly, Integration, Verification and Commissioning (AIVC) station for all the high technology equipment before moving it to the Array Operations Site (AOS), located at 5000 metres altitude. Because of the harsh environment, operations at the AOS will be limited to an absolute minimum. The AOS Technical Building will house the antenna data outputs and the Correlator. Digitised signals received from the radio antennas will be processed there and further transmitted to data storage facilities located at the OSF.

The OSF and the AOS are at a remote location and cannot be accessed by public roads. Therefore the ALMA project had to construct an access road. It leads first from the Chilean highway 23 over a distance of 15 kilometres to the OSF. The road then continues another 28 kilometres to the AOS. This access road is up to 14 metres wide since it will be used to move the completely operational antennas from the OSF to the AOS. The gatehouse, at the intersection of the ALMA road with the highway, was completed in 2007.

The OSF is a facility which serves different purposes and which will host a variety of activities over the duration of the project. During 2007 the camp accommodated all ALMA Site contractors and their staff. Personnel lived in the temporary camps and worked either at the OSF or at the AOS. Work was organised in periods of 19 working days, followed by 11 days rest. The camps were laid out, including the necessary infrastructure, to accommodate up to 500 workers at any given time. Most of these workers were involved in the construction of the OSF Technical Facilities.

The OSF facilities.

In August 2006 ESO signed the contract for the construction of the OSF Technical Facilities with a projected completion date of the end of January 2008. During 2006 and 2007 the OSF technical buildings were constructed. No major problems or delays occurred during the construction period and some buildings of the entire OSF complex were already provisionally accepted by ESO before the end of 2007.

During the next years the OSF will become the central point of all antenna assembly and AIVC activities. Antennas will be assembled at the OSF area in three separate zones, one each for the antennas provided by North America (Vertex), Japan (Melco) and Europe (AEM Consortium). AIVC activities will be carried out at the OSF after preliminary acceptance of the antennas, and prior to moving them to the AOS. The corresponding zones for Vertex and Melco have been completed. The AEM zone is, as scheduled, in preparation and will be completed in the first quarter of 2008.

Supplying energy for an isolated observatory at altitudes of 2 900 and 5 000 metres in the Chilean desert of Atacama is not at all trivial. Initially, it was planned to generate power for the OSF and AOS using dual-fuel (natural gas and diesel) generators, installed at the OSF premises. This scheme was expected to be the most cost efficient and reliable for the required power demand of about 8 MW. However, during the last years energy supply and prices have rapidly and drastically changed. Chile proved to be short of natural gas availability. Power generation based on diesel supply only is very costly and, in consideration of an expected operation time of 30 years, not affordable. In view of these developments on the energy market, ALMA decided to change the baseline configuration for the power supply of the observatory and move forward using electricity provided by Northern Chilean electricity suppliers. This scheme requires the erection and operation of an overhead power line from the best-suited electricity generator to the OSF and further on to the AOS. In 2007 ALMA released a call for tender for the construction of an overhead line to provide electrical power to the OSF site. Technical documentation for the power supply within the ALMA premises from the OSF to the AOS is under preparation.

The construction of the AOS Technical Building, a project to be delivered by the North American partner in ALMA, was completed at the end of 2007.

Inside the AOS Technical Building.

The antennas

Activities of this ALMA sub-project focused on the design, manufacture and assembly of antennas and two antenna transporters.

At the end of the year 2005 ESO had signed a contract for the design, manufacture and transport of 25 antennas of 12-metre diameter with the Alcatel Alenia Space, European Industrial Engineering, and MT Aerospace (AEM) Consortium. In the course of 2007 the corporate name of Alcatel Alenia Space was changed to Thales Alenia Space without any contractual consequences regarding technical specifications, schedule, price, contractual terms, etc. During the year 2006 work carried out under this contract was centred on conceptual studies, simulations and detailed designs. This work was carefully and extensively reviewed at the Pre-Production Design Review (PPDR) held in February 2007 in Venice. This review scrutinised the complete design with particular emphasis on the design changes with respect to the prototype, on which the AEM serial antenna design is based, which was extensively tested at the ALMA Test Facility in Socorro (USA) during the first phase of the project. Consequently, any relevant technological choice deviating from the antenna prototype had to be validated by appropriate qualification tests, which were also reviewed at the PPDR. Numerous ALMA experts, either responsible for the antenna manufacture or involved in interfacing with the antennas, participated in the PPDR. The review conclusions on the design were positive and no issue was found preventing the AEM Consortium from proceeding to manufacturing.

In the months following the PPDR, the AEM Consortium finalised the manufacturing drawings and optimised the manufacturing process in view of the serial manufacturing. AEM selected key suppli-

Key suppliers for the major subassemblies of the AEM antennas

Component	Supplier
Steel Structure	Asturfeito (Spain)
Carbon Fibre Receiver Cabin	Multiplast (France) and Jallais (France)
Backup Structure	Duqueine (France)
Reflector Panels	Media Lario Technologies (Italy)
Adjuster Heads	RUAG (Switzerland)
Subreflector Mechanism	Physik Instrumente (Germany)
Quadropod Legs	Xperion (Germany)
Linear Motors	Phase Motion Control (Italy)
Control System	Microgate (Italy)
Pre-Assembly of First Antenna	Asturfeito (Spain)
On-Site Antenna Assembly	DSD (Chile)

ers for the major subassemblies (see box on previous page), and manufacturing activities started in late spring.

In the second half of the year, the ESO antenna group concentrated efforts in following the production closely, monitoring progress and ensuring that the experience gathered with the prototype was fully used. The schedule of the serial production foresees the delivery of three antennas every four months from 2009 onwards. To achieve this production rate various Carbon Fibre Reinforced Plastic moulds and jigs were designed, fabricated and qualified, in particular for the fabrication of the Receiver Cabin and the Backup Structure. By the end of 2007, the construction of the first cabin was approaching completion and the next two cabins were in different stages of production. Assembly of the first Backup Structure has started and a few of the 16 individual slices have been assembled together. The main parts of the steel structure for the first antenna have been manufactured and assembly and integration has started. In spring 2008 the first structure and the first receiver cabin will be assembled at Asturfeito and afterwards shipped to the OSF. The first Backup Structure will be test-assembled elsewhere and shipped separately to the site. Production of the subsequent units is proceeding well. Steel for the first batch of antennas has been cut. Panels and adjusters for three units have already been produced and other parts (quadropod legs, subreflector, motors, etc.) are in serial production.

Preparation at the OSF to support the integration of the antennas is well advanced. The site has been graded flat and five antenna foundations have been prepared. The AEM consortium will start work at the site in the beginning of 2008, starting with the assembling of temporary facilities, in particular the hangar foreseen for mounting the Backup Structure, the panels and the apex structure. Delivery of the first antenna is planned for the end of 2008.

The other major construction activity followed up by the ESO antenna group concerns the design, manufacture, assembly and transport of two special vehicles to be used for transporting antennas at the two ALMA sites, the OSF and AOS.

Assembly of the first Backup Structure.

In January the Final Design Review of the antenna transporters was held at the site of the manufacturer, *Scheuerle Fahrzeugfabrik GmbH* (Germany). This review concluded the design phase during which the concept of the transporters had to be substantially changed. This was necessary in response to the too long delivery time of the special, large size tires, which were foreseen in the original design. The use of smaller and more easily available tires demanded a complete rework of the vehicle architecture.

Further design challenges were imposed by the requirements related to precision driving when approaching the antennas, as well as to the lifting and positioning processes of the antennas on the

Loading the ALMA antenna transporters on a barge for further transport to Chile.

stations. Precision driving is achieved by the implementation of various steering modes, including sideways steering that allows these vehicles of 20 metres length and 10 metres width to move in an extremely compact space. The addition of positioning lasers, an anti-collision system and numerous cameras guarantees a safe approach to the antennas even when they are positioned in the compact array. The lifting and positioning system of the antenna is based on a fail-safe, redundant system where a large X-Y table is fastened to the antenna, then lifts the antenna using the hydraulics suspension of the vehicles, and brings it to the final position using hydraulic-driven lifting ramps.

Manufacturing of the first vehicle was finished in September, while the second unit followed closely thereafter. In October and November a complete programme of testing was performed at the factory. These tests included moving a concrete structure of the same weight and size as an antenna from a foundation specially constructed for these tests at the manufacturer's premises. Tests were also carried out proving the braking power of the transporters, simulating high altitude and slope conditions. The test programme was formally concluded by the 'Factory Acceptance Review', held successfully on 29 November. Afterwards, the transporters were dismantled and transported by trucks to the Heilbronn harbour. There they were loaded on a barge for further transport to Antwerp (Belgium), and loading onto the ship to Chile. The ship left for Chile at Christmas and arrival at the OSF site is foreseen for mid-February 2008.

The Front End

The year 2007 was a landmark for the European Front End tasks under the responsibility of ESO, showing significant progress in the transition from the design phase, including pre-production, to the full series production phase.

ALMA receivers have a major influence on the performance and quality of the ALMA system. In previous years it had already been proven that the demanding performance, especially the sensitivity and bandwidth, could be achieved. In 2007 further evidence was provided that this exceptional performance could also be achieved in a repeatable and controlled way for the larger quantities — more than 70 units — which must be constructed for ALMA.

Most important Front End contracts signed in 2007

- Supply of 45 Cryostats by the Science and Technology Facilities Council/Rutherford Appleton Laboratory (RAL), near Didcot, UK;
- Supply of 48 Band 7 cartridges by the *Institut de Radio Astronomie Millimétrique* in Grenoble, France;
- Supply of 48 Band 9 cartridges by the *Nederlandse Onderzoekschool Voor Astronomie* in Groningen, the Netherlands;
- Detailed design and delivery of 53 Water Vapour Radiometers operating at 183 GHz to be supplied by Omnisys Instruments AB in Gothenburg, Sweden;
- Supply of 198 cryogenic amplifiers operating between 4 and 8 GHz to be supplied by *Tecnologías de Telecomunicaciones y de la Informacíon* in Santander (Cantabria), Spain;
- Supply of 198 cryogenic amplifiers operating between 4 and 12 GHz to be supplied by the *Fundación General de la Universidad de Alcalá/Observatorio Astronómico Nacional* in Alcalá de Henares (Madrid), Spain.

Design activities of major sub-assemblies, e.g. the Band 7 (270–373 GHz) and Band 9 (620–702 GHz) receivers, were finalised by passing the major 'Critical Design Reviews' (CDRs). During these CDRs a thorough and formal assessment was made of the design of a sub-assembly by a review panel composed of internal and external experts. After successful completion of the CDR the design was frozen for series production. The Band 9 cartridge CDR was held on 6 and 7 February and the Band 7 cartridge CDR was held on 8 and 9 August.

During the year, ESO signed several production and integration contracts for the manufacturing and delivery of Front End sub-assemblies, for a total value of approximately 40 M€. All of these contracts were signed after the successful conclusion of the pre-production. At the end of 2007, ESO has accepted eight cryostats, eight Band 7 cartridges, eight Band 9 cartridges, 42 cryogenic amplifiers for Band 7 and 18 cryogenic amplifiers for Band 9.

Substantial progress was made on establishing the European Front End Integration Centre (EU FEIC). Several options, including having an EU FEIC in Garching, were investigated. After a careful assessment and consultation with the ESO and ALMA management, it was decided to set up the EU FEIC at the Rutherford Appleton Laboratory (RAL), near Didcot in the UK. The FEIC activities require a very close involvement of ESO in the EU

Band 9 pre-production cartridges.

FEIC for technical and programmatic matters. Therefore it has been agreed to appoint a dedicated EU FEIC work package manager within the ESO ALMA Division, who will be located permanently at RAL to direct, in close collaboration with the local RAL manager, and oversee the activities at this integration centre. After approval by the ESO Finance Committee, the contract for the set up and integration of 26 Front End assemblies was signed in October. The kick-off meeting for this activity was held on 22 and 23 November at RAL.

In the framework of an EC FP6 project led by ESO, "Enhancement of ALMA Early Science" (E-ALMA), further progress was made in the Band 5 (163–211 GHz) receiver project. Chalmers University's Onsala Space Observatory in Sweden continued with the detailed design of this receiver. Following the earlier discussion with RAL about the Band 5 local oscillator, RAL submitted a formal proposal to ESO. This proposal described the design of a suitable oscillator circuit, compatible with the ALMA Front End concept, and the delivery of six units. Based on this proposal it was decided to include RAL as a participant in the E-ALMA project. A kick-off meeting, with participation of ESO, Chalmers and RAL delegates, for this essential component was held on 18 December at Chalmers University in Gothenburg, Sweden.

In June, ESO and the National Observatory of Japan (NAOJ) signed a Collaborative Agreement in which ESO will extend the quantity of units which ESO is already procuring for its own needs, in order to also cover the needs of NAOJ to outfit their antennas with identical equipment. Subsequently, there has been a close interaction between ESO and NAOJ defining all Front End products, including schedule. By the end of the year, ESO had already ordered the first Front End products for NAOJ.

In November, in close collaboration with the JAO management and institutes involved, ESO started to investigate options to accelerate the series production of Front End components. The aim was to complete all European Front End production tasks, including those additional deliveries for the ALMA Compact Array to NAOJ, by 2011 at the latest. The underlying reason for this acceleration of production is to keep up with the project antenna delivery schedule.

The Back End

The ALMA Back End (BE) system encompasses a wide variety of different electronic modules to be produced in relatively large amounts. Each antenna is equipped with two electronics racks, implementing the 'Antenna Back End', while several racks are installed in the AOS Technical Building to implement the 'Central Back End'.

The Antenna Back End performs the frequency down-conversion of the signals transmitted by the Front End receivers as well as their digitisation and transmission to the AOS Technical Building through fibre optics. The Central Back End provides the timing signals to the whole array, the fibre management and the reception of the signals coming from the antennas. In total there will be 112 Antenna Back End Racks and 20 Central Back End Racks.

During 2007, all the components of the ALMA Back End underwent final design, pre-production and validation tests both in the laboratory and at the Antenna Test Facility (ATF) in New Mexico. Most of the Back End equipment has been successfully prototyped and by the end of 2007 was moving towards the production phase. The status was reviewed at the Back End production workshop held in November. Consequently, all European production contracts, except one, were approved and are progressing as planned. The only outstanding Back End series production contract concerns the procurement of the photomixers, and is, as scheduled, expected to be placed in 2008.

The delivery of Back End components to the ALMA site began in December with the shipment of the 'Test Racks' that will allow testing of incoming components. The shipment of the first pair of 'Antenna Racks' is scheduled for the early months of 2008. Subsequent antenna racks are planned to arrive on a timetable which tracks the delivery of the antennas.

In order to support the activities related to the optical components' manufacturing, assembling and testing, a facility was set-up in the ALMA building at ESO. It is a fully equipped electro-optical laboratory that will enable the thorough testing and quality evaluation of the various optoelectronic components, and in the long term, support the remote maintenance of the ALMA observatory equipment.

The correlator

After extensive tests in the laboratory the first parts of the ALMA correlator are now ready to be shipped and installed on the site. The delivery of the first of four quadrants is planned for the beginning of 2008. The assembly of the second quadrant is almost complete.

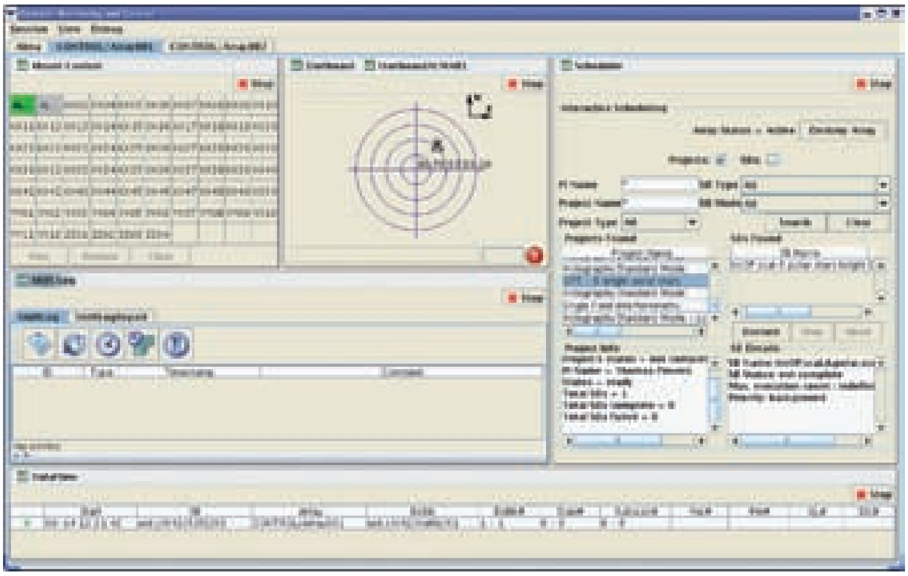
Each quadrant includes 128 Tunable Filter Bank (TFB) electronic modules, developed and manufactured by the Observatory of Bordeaux (France), under an ESO contract.

After an initial period necessary to understand the high complexity of the TFBs and to implement the European Community's directive on the "Restriction Of Hazardous Substances" (ROHS), the production has reached a steady state with yields in excess of 95 %, an extremely high yield taking into account the complexity of the devices.

The Tunable Filter Bank

The Tunable Filter Bank (TFB) is an extremely complex piece of electronics using the latest generation of Field Programmable Gate Array chips to implement thirty-two 125 MHz digital filters. Each chip contains the equivalent of several million logic gates and has more than 700 Ball Grid Array connections; sixteen of such chips are mounted on one 12-layer TFB printed circuit board.

Screenshot of the ALMA operator's console, as used at the ATF with the two prototype antennas and also at the Operations Support Facility for the antenna tests in Chile. The panel shows one of the many that are normally displayed on three operator consoles.



In parallel with the manufacturing of the TFB modules, the optimisation of the firmware continued to identify algorithms and implementations that reduce power dissipation. In fact, due to the low air density at the AOS, the power dissipation is a major concern since the temperature of the devices is directly related to their lifetime. Simulations, analysis and operational testing in the correlator station racks show that, with the latest digital filter implementation, thermal stresses are well within boundaries and guarantee a suitable lifetime of the components at the AOS.

In addition to the main correlator, a downscaled version (referred also as the 'two-antenna correlator', since it can correlate only the signals coming from two antennas) has been developed and two units have been manufactured to support the test activity at the ATF and at the OSF sites, respectively. Due to the modular architecture of the correlator and to the fact that the same boards are used, the two-antenna correlator did not require a significant design effort. The first unit was installed at the ATF in the course of 2007 and is currently in use, while the second one is being shipped to the OSF where it will be installed at the beginning of 2008. There it will be used to test antennas and their equipment on the sky before relocation to the AOS.

Software Development

The ALMA Software has been planned and developed from the beginning as an end-to-end system including proposal preparation, dynamic scheduling, instrument control, data handling and formatting, data archiving and retrieval, automatic and manual data processing, and support for observatory operations.

Work in Europe is organised through ESO, with many software packages being developed by ESO in collaboration with European institutes which have experience and qualified staff to develop and test the required software.

The main achievements made by the Software Development team during 2007 are:
– First delivery of the end-to-end software capable of performing Optical Pointing and Holography, as validated at the ATF and required for the commissioning of antennas at the OSF;
– Support of the achievement of the so-called 'First Fringes' (basic interferometry mode) at the ATF in the spring and achievement of stable dynamic fringes (including automatic delay tracking) in autumn;
– Intensive use of the ATF as a platform to test the software;
– Support of the acceptance tests performed by the Japanese ALMA team for their first antennas at the OSF.

System Engineering

The project-wide requirements and Interface Control Documents are now 95 % and 89 % completed, respectively. Front End and Back End requirements were formally released in line with system and science requirements. The requirements database DOORS is kept up to date and used for verification and acceptance. Support was given to all Integrated Project Teams (IPTs) for their technical activities. ALMA system block diagrams and the sensitivity budget were further refined and used for system design trade-offs and analysis tasks. The ALMA optical detailed analysis for antennas and Front End was finalised and the report issued. The analysis confirmed the design and will be used to predict the science performance and help define the calibration procedures. The ALMA Product Assurance (PA) was specifically analysed at the review meeting and during the different equipment acceptances. Specific PA audits were also done.

The management of the ALMA Test Facility (ATF) was handed over to the computing Integrated Project Team (IPT) in September and it was decided to leave the ATF operational until June 2008 to continue software development, commissioning and system testing.

Activities in AIVC in Chile increased substantially in 2007. More than 20 additional people were hired, including the head of the group, and more than 30 people are now working for AIVC. Training for the newly hired staff is ongoing. Work focused on the AIVC infrastructure needed for equipment acceptance and the integration work. The holography system and the optical pointing telescope were accepted. They are essential tools for antenna acceptance. First holography maps for the antenna procured by NAOJ show promising results.

Science Activities

One of the major highlights in 2007 as far as science activities are concerned has been the support of the software and hardware tests at the ATF in Socorro, which culminated with the achievement of first fringes on planets in spring and dynamical interferometry on quasars in the second half of the year.

The staff of the science IPT is currently ramping up to ensure that a fully functional commissioning team will be available in Chile for the start of the commissioning activities in 2008.

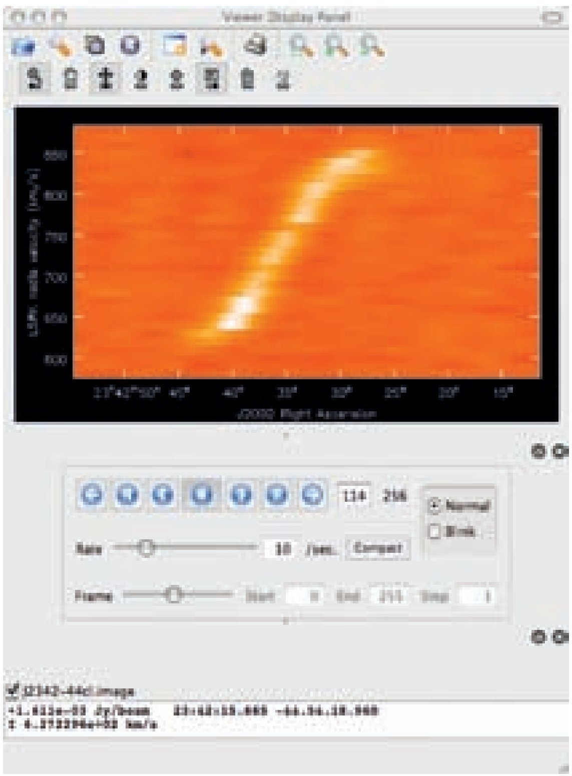
In September two major events were organised at ESO in Garching: the "ALMA Community Days" and the "Surveys for ALMA" workshop. At the ALMA Community Days the European astronomers were informed about the progress of the ALMA construction and the current plans for the organisation of the European ALMA Regional Centre. During the "Surveys for ALMA" workshop the status of plans for large preparatory surveys for ALMA, and in particular the role of Herschel and APEX, were discussed. The community showed a strong interest and is engaged in a vigorous preparatory plan to maximise the scientific potential of the ALMA observatory when it becomes available.

The European ALMA Regional Centre

The mission of the European ALMA Regional Centre (ARC), set up in mid-2006, is to provide the science and technical support services necessary for the European user community to exploit ALMA to its full scientific potential. The ARC will form the interface between the ALMA Observatory in Chile and the European user community. Similar ARCs are currently being established in North America and East Asia, ESO's partners in the trilateral ALMA project. For European users, the ARC is being set up as a cluster of nodes located throughout Europe, with the main coordinating centre at the ESO headquarters in Garching. In this distributed network, user support and operations experience at ESO can be mixed with millimetre-wave astronomy experience that exists in the community, to create optimal science support services.

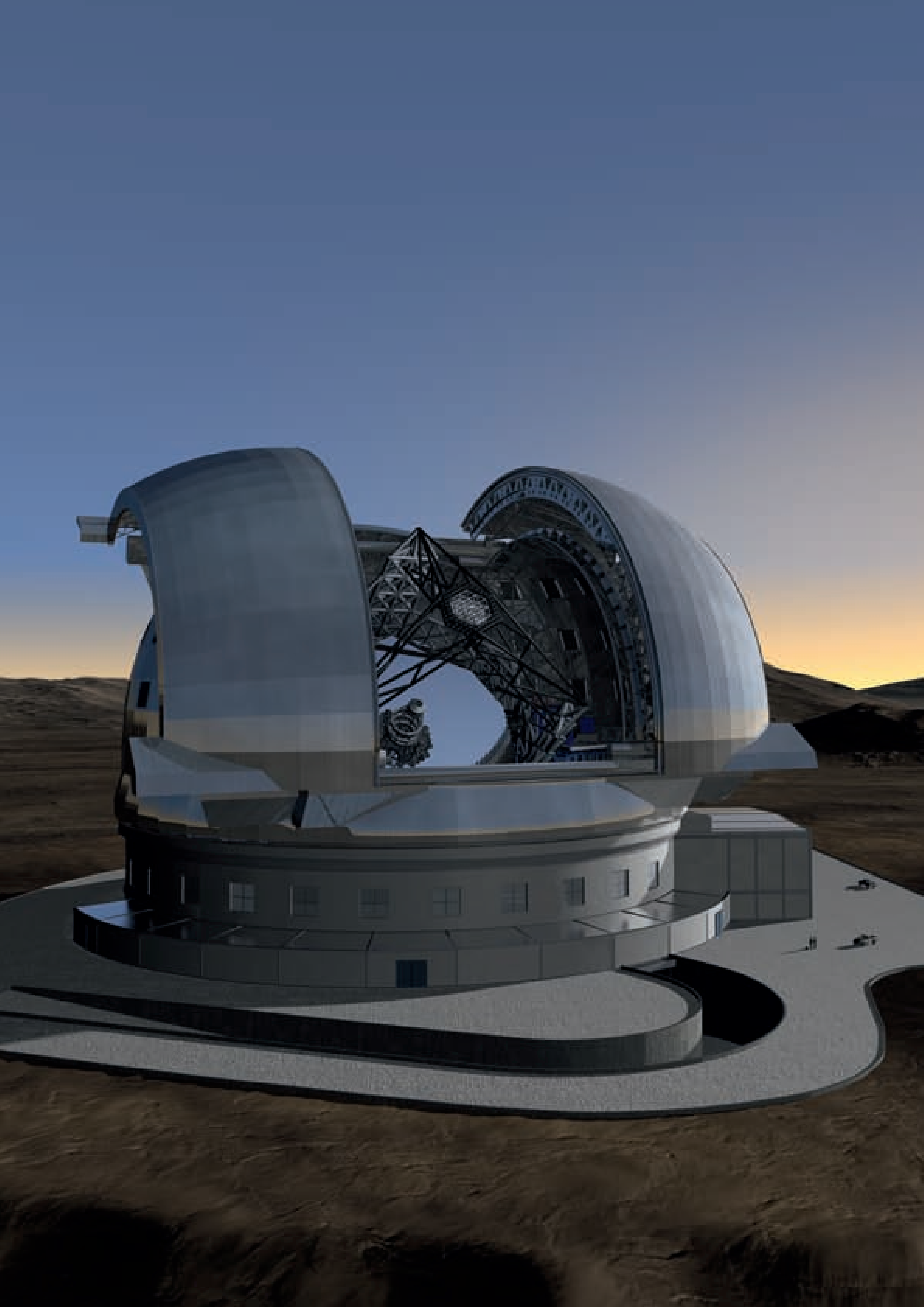
At present, one of the main activities of the ESO ARC is to test the main user-software system. This early involvement is essential in order to make the software available for regular scientific use, at a sufficiently early stage that the pipeline system can be developed. Furthermore, getting acquainted with the software at an early stage will help train the ARC staff who will take part in the commissioning and first astronomer-on-duty shifts in Chile.

During 2007, the ARC staff actively participated in user tests organised by the developers of the offline data reduction system (CASA). The various ARCs form the primary point of contact for the users and testers of the offline software. A main contact astronomer at ESO, together with three additional astronomers consisting of ARC node staff and ESO Fellows, operate as 'user support specialists'. They are the interface between the users and the developers, collecting feedback from the users and organising it in a useful way for the developers. The ARC staff also participated in user tests of the ALMA Observing Tool and the archive interface, and performed in-house testing of the offline system.



An example of the viewer, part of the offline data reduction software CASA currently being developed for the analysis of ALMA data. The viewer is very flexible in showing images and data cubes, as well as raw visibilities, and allows interactive flagging.

Right: View from above the OSF.



The European Extremely Large Telescope

Following the December 2006 Council resolution on the European Extremely Large Telescope (E-ELT) Phase B design, the project was formally launched. A number of major contracts were immediately launched through the tendering phase, and preliminary designs have now been developed for the telescope mount, the dome and the primary mirror cell. In parallel, longer-term contracts have been placed for the preliminary design and prototyping of the adaptive quaternary mirror and the field stabilisation electromechanical unit. Towards the end of the year the tendering and contract award process was concluded for the procurement of prototype primary mirror segments from two potential polishing suppliers.

In parallel, a substantial effort has been undertaken to analyse the performance of the telescope designs, and a contract has been placed with Lund Observatory to further develop their integrated modeling effort. A number of smaller contracts have been placed to evaluate various technological solutions in the area of control and software. Conceptual studies into novel detectors for the Laser Guide Stars have also been undertaken.

The EC-supported FP6 ELT Design Study initiative is a partnership between 28 institutes, led by ESO. It started as a design-independent R&D activity to foster industrial preparedness for the construction of an ELT, but was aligned to the E-ELT specifications once the community converged on a common European ELT concept in 2006.

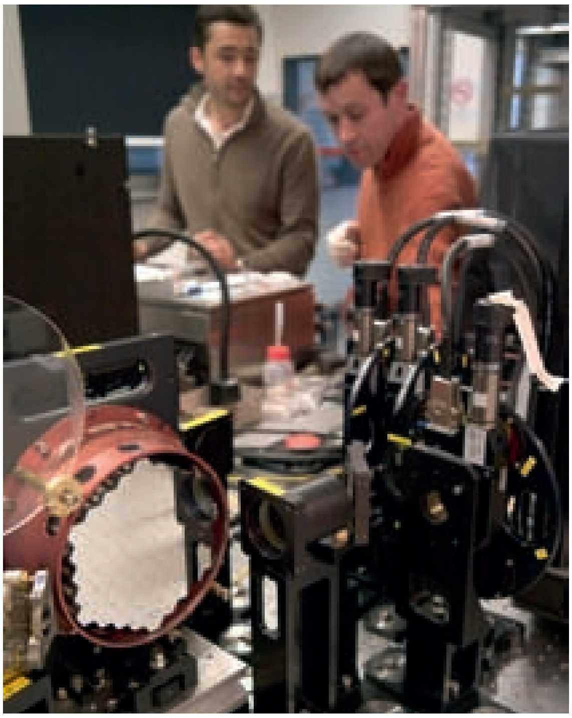
During the first half of 2007, management activities continued to concentrate on improving overall project performance by focusing participant organisations' efforts on meeting-agreed technical milestones. Steady progress was made across all work packages. As of the end of 2007, over 75 % of the EC grant intended for participant organisations had been distributed to them.

The project Mid Term Review (a contractual milestone) was held on 13–14 June 2007. Over 40 participants took part; external attendees included a representative of the European Commission (EC). The EC formally accepted the results of the Mid Term Review on 22 October 2007. In parallel with the Mid Term Review, the progress of the project was subject to a critical review by a panel of external, world-leading experts (Technical Advisory Committee – TAC) in the relevant fields. The TAC Report was received in July 2007 and was fully supportive of the managerial and technical progress that had been achieved.

Work continued on the APE (Active Phasing Experiment), which should achieve 'laboratory first light' early in 2008, with direct measurements of the 61-segment mirror with the internal metrology system, down to nanometre accuracy. Position (edge) sensors, with nanometre-accuracy, were delivered. Civil work for the Wind Evaluation Breadboard also progressed and the Friction Drive Breadboard was being tested. Optical fabrication progressed more slowly than desired, but so far no show-stoppers have emerged. The enclosure concepts selected in 2006 went through a more detailed design phase, and the results were consistent with similar studies undertaken by ESO outside the framework of the ELT Design Study. Enclosure models were tested in wind tunnels, and CFD modeling produced useful results, which may be factored into the eventual design. Adaptive optics work proceeded well, with detailed designs of hardware components (detectors, actuators, mirror technologies), and a potential breakthrough on the issue of wavefront sensing with Laser Guide Stars. Three detailed studies for instruments were in progress. Site characterisation suffered from accumulated delays but the failing software was being fixed, with a view to start synchronised and standardised measurements early in 2008.

The E-ELT is part of the ESFRI roadmap of future facilities. As such it is eligible for FP7 support (Preparatory Phase for Construction). We submitted such a proposal in mid 2007. It was accepted and will start in January 2008. Unlike the FP6 initiative, ESO is a 'mono' partner for this initiative, with 25 third-party institutions in the member countries as collaborators. The aim of this activity is to complement the E-ELT Phase B and help to ESO to be fully prepared for an early 2010 decision on whether to start construction.

Left: Artist's impression of a possible E-ELT design.



The Active Phasing Experiment.

Software Developments

The Software Development Division was created in December 2006 as a merger of three different software departments, with the aim of preparing for the challenges arising from the fact that ESO has become a multi-project organisation. The mission of the new division is to serve the VLT, ALMA and ELT projects and to maintain a high level of quality while ensuring cost-effectiveness. Therefore it is clear that the division has to be more than a simple 'labour shop' and that it must create an environment in which resources are optimised and synergies promoted and encouraged wherever possible. The division is organised around three major development departments and a systems engineering department, which provides services to all development departments.

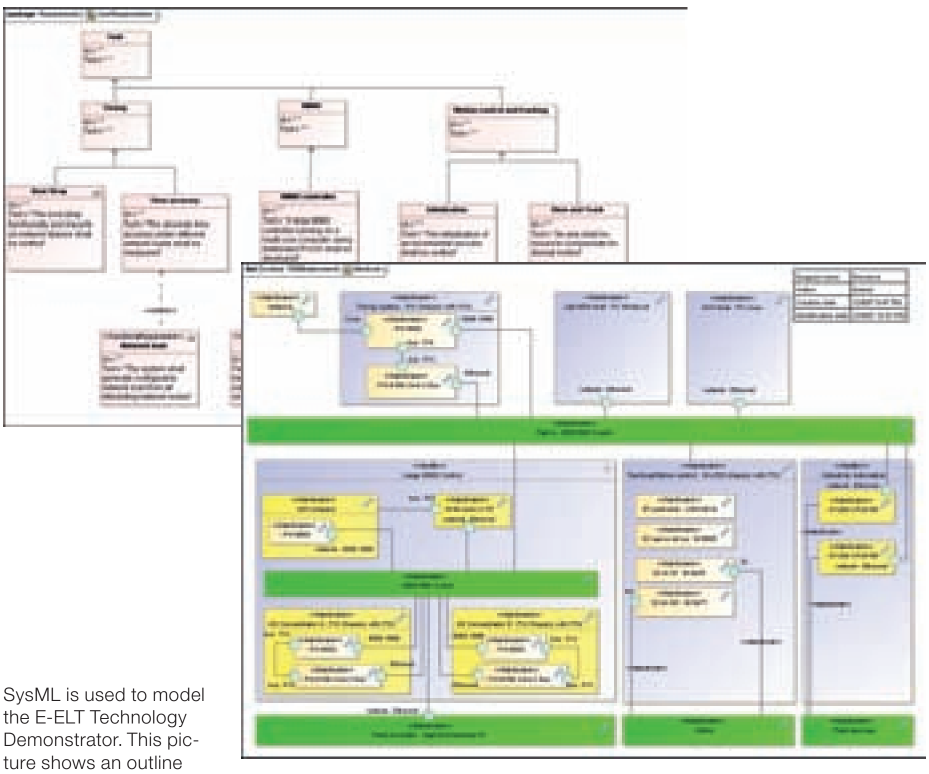
The challenge for 2007 was to build the division while making sure none of our commitments were compromised. A main division objective was to define and optimise the interface to our stakeholders and in particular to the Observatory. With the view of continuing the development and maintenance of the software for VLT/VLTI, ALMA and E-ELT, and with the three projects in very different stages of their life cycle, we have started to work on a roadmap linking the evolution of the projects' software. We want to identify common development paths so that the evolution of the more advanced projects can proceed smoothly alongside the choices made in the newer ones. This is made possible by the matrix structure as it allows the involvement, to a limited extent, of team members from all projects in common activities and job rotation and by a comprehensive personnel training and development plan.

System Engineering

The System Engineering Department (SED) provides the development teams with software engineering services, such as the environment and tools to support the software life cycle, software quality assurance and control. The department is also in charge of integrating software modules and preparing and validating releases before they are delivered to the customer. All planned releases of the VLT (VLTSW FEB2007, DFS FEB2007 and User Portal) and ALMA Software (4.1 and 5.0) have been successfully validated and deployed.

The department is the result of the merging of three groups of software engineers involved in different projects (VLT Control, VLT DFS and ALMA). Because projects have similar needs for their software process, several SED internal tasks started in the course of 2007 to compare the current practices and identify the best one in areas such as version control, building, integration, test, metrics, Problem Reporting System, and software life cycle. A Software Engineering Working Group (SEWG), with representatives from all divisions dealing with software development, has been set up and meets once a month to provide recommendations on the software standards to be used by ESO projects. It has, amongst other results, produced a document defining the basic requirements of the Software Engineering process at ESO.

In order to reduce the impact of new VLTSW releases on Paranal operations and in agreement with the Paranal

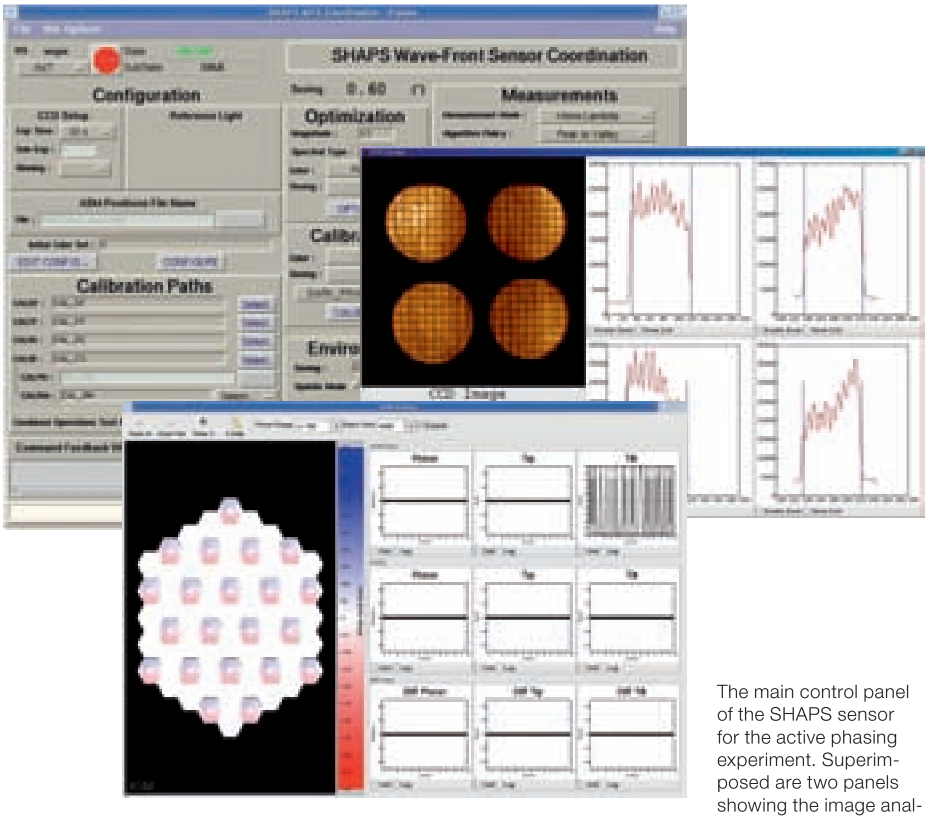


SysML is used to model the E-ELT Technology Demonstrator. This picture shows an outline of the model required and of the physical deployment of the system.

Software Group, the plan and contents of VLTSW annual releases have been changed. Each release containing new functionalities (e.g. 2007) is followed by one containing bug fixes only (e.g. 2008). Only the latter is deployed at Paranal. In this scheme new features are used internally and debugged for at least one year before they actually enter operations.

Control and Instrument Software

The Control and Instrument Software (CIS) Department is responsible for the design, implementation and maintenance of control and common software for the VLT, VLTI and their instruments, as well as for ALMA and E-ELT. Following a matrix organisational model, the members of the team are assigned to the different projects while they also work together to build a common vision and profit from the synergies that emerge from the different activities.

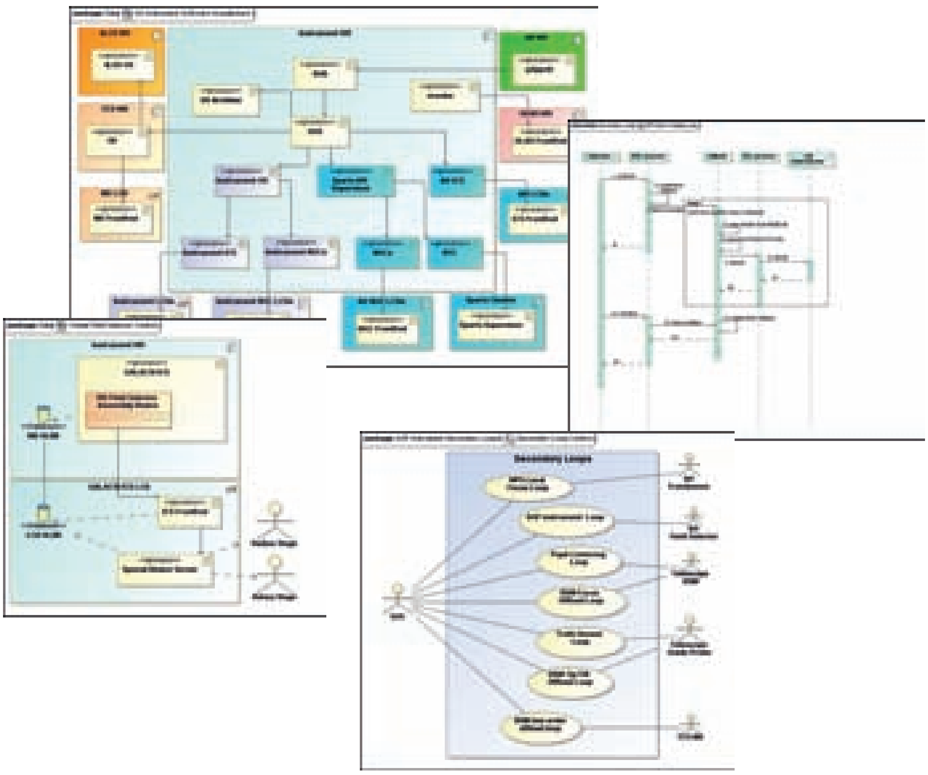


The main control panel of the SHAPS sensor for the active phasing experiment. Superimposed are two panels showing the image analysis of the PYPS sensor and the position of the elements of the active segmented mirror.

The development of control software for the VLT and VLTI is far from being completed, with many new-generation instruments being constructed or designed and with major upgrades in core facilities such as the multiple laser guide star or the adaptive optics facility being undertaken. For this reason, more than half of the team worked during 2007 on the development of control software for the VLT, VLTI and their instruments. Following an annual release cycle to follow up with the evolution of control hardware used in Paranal and by second-generation instruments, the VLTSW FEB2007 version of the VLT common infrastructure and instrumentation software was released at the beginning of the year, followed by the development of the 2008 release now in its final testing phase in Paranal. Standard support for new hardware has been provided, while at the same time new requirements imposed by the increasing complexity of the new facilities have been satisfied. The team has played a major role in the development of the active phasing experiment (APE), PRIMA, HAWK-I and other instruments. Also, following up and consulting external consortia has been extremely valuable in ensuring uniformity between the different developments and in identifying new requirements. Only a small portion of the work done in the VLT area can thus be considered pure maintenance, while the rest constitutes new developments.

The ALMA project relies on a consistent group of software engineers from the CIS Department. They are involved in the Common Software, Control, Executive and Observation Preparation subsystems with coordination, design and development roles in collaboration with software engineers from the partner organisations. More details are provided in the ALMA section of this annual report, where the major milestones achieved this year are described. The team members have been heavily involved in missions at the Antenna Test Facility in Socorro. In particular, the ALMA Common Software (ACS), whose overall coordination is under the responsibility of ESO and CIS team members, is made available outside ALMA as a public domain middleware framework. Several astronomical projects, including APEX, have adopted ACS as the base for their Control Systems. A community of users has developed, and a fruitful collaboration with *Universidad Técnica Federico Santa Maria* in Valparaíso (Chile) is pushing the diffusion of ACS in Chilean universities with the effect of training young software engineers who can be (and have been) hired by ALMA and other ESO projects.

A limited amount of resources has been allocated in 2007 to begin the work on the E-ELT software architecture and infrastructure, in collaboration with the E-ELT office. Software will play a very important role in this project as an integrated part of the system together with mechan-



Elements of the models used in the functional specifications for GALACSI, the Adaptive Optics system for the MUSE second-generation instrument. Together with the high-level architecture, a use-case diagram and a sequence diagram are shown. Sequence diagrams are extremely valuable in the analysis of the flow of actions in a process.

ics, optics and electronics. Therefore we are making a contribution to the overall system engineering and requirement capture activities. At the same time, we are collaborating on the definition of the Telescope Control System architecture and on the selection of the technologies to be used for the overall software infrastructure. The matrix structure of the department enables it to profit from the experience accumulated in the software development for VLT/VLTI and ALMA.

ACS has been evaluated and considered suitable for use in the VLT, although a decision on the middleware to be used for the E-ELT is still premature. An E-ELT technology demonstrator is now being developed to examine promising hardware and software technologies, including ACS, and the ease of integrating them seamlessly.

Data Flow Infrastructure

In 2007 the Data Flow Infrastructure (DFI) Department put a lot of effort into the development and deployment of the VLT/VLTI User Portal (see page 29). The project was challenging both in terms of its technical and organisational impact. Internal and external stakeholders can now use single sign-on to access all their web and desktop applications. For instance, a principal investigator can access the Proposal Submission System, WebLetters and P2PP through a common login. Most existing applications had to be modified to integrate with the new environment and the actual introduction of the system required a switch-over of the complete support infrastructure at the same time. The ‘big-bang’ happened in November and was very successful as it did not generate any disruption in operations. The project was also an excellent team-building opportunity as it involved not only software engineers developing front-end and back-end software but also scientists and engineers belonging to operation groups and departments. A major challenge for the department was to develop those new applications (including support for survey facilities) while providing support, including implementation of new requirements, to Phase I tools and infrastructure for the two observing periods which started in April and in October. The back-end team continued to concentrate on the development of applications that are critical to the execution of data reduction pipelines and quality control procedures. This includes automatic tools for organising, classifying and associating data and executing reduction pipelines on multi-core computers.

The involvement of the department in the development of ALMA data-flow applications is slowly increasing. In 2007, it was limited to the participation in the development of the ALMA archive. The development of ALMA Observatory Operations Support tools will start in 2008 and we hope that ideas and concepts from the VLT can be shared with these new tools.

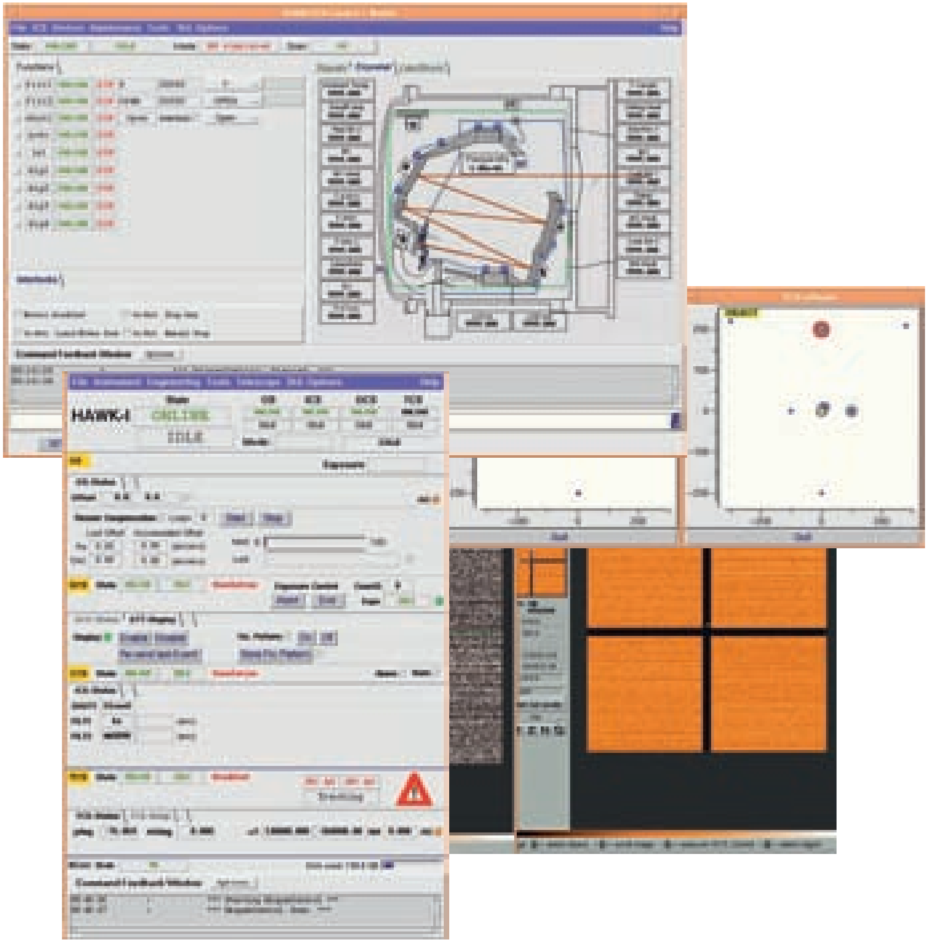
Pipeline systems

All ESO pipelines are now based on the ESO Common Pipeline Library in order to facilitate maintenance and sharing of functionalities, and have been released for public use. Many new algorithm and pipeline developments were presented at the ESO Calibration Workshop. Among the new developments, the CRIRES pipeline was finalised and released for operations for the P79 observing period. The CRIRES pipeline provides recipes for wavelength calibration and sensitivity of the instrument, as well as for the science reduction procedures.

The HAWK-I pipeline was evaluated during the first commissioning run in August 2007. This pipeline was developed in-house and closely follows the data processing scheme of ISAAC software imaging. Development has been accelerated by reusing CPL recipes from the ISAAC pipeline for single-quadrant tasks. Only a few recipes had to be developed explicitly for HAWK-I to support astrometry/distortion correction and to merge the four individual quadrants into one image. The HAWK-I pipeline is foreseen to be released for operations in April 2008.

A new library, CLIP (Common Library for Image Processing), has been developed as a flexible and scaleable framework to provide an interface between CPL-based data processing capabilities and the instrument acquisition process. CLIP is binding software which includes high-level interface libraries with the control software system, support for the VLT Real-Time Display tool, an image-processing library extending the CPL by common instrument-related functions (e.g. for instrument adjustment such as the X-Shooter hardware flexure measurement), and a standard architecture for instrument-specific plug-ins (e.g. CPL-based recipes for KMOS image reconstruction). The CLIP library has been tested by the X-Shooter and KMOS consortia.

Elements of the HAWK-I user interfaces. The main panel is the Instrument Control Software Engineering GUI and is shown together with the OS control panel, a real-time display showing the handling of the gaps between the detectors, and the Telescope Offset Display GUI, used to provide a graphical representation of offset sequences.



Technology Developments

The Technology Division provided engineering support to over 150 different ESO projects and work packages in 2007, maintaining the record levels of 2006. While support for VLT operations and upgrades remains an important background activity, ALMA and second-generation VLT instruments were the main priorities of the division.

As well as contributing to these key projects, the division has also worked on a large number of preparatory studies and developments which have specific relevance for the technological challenges of building and operating an extremely large optical telescope. These E-ELT-related activities have increased rapidly in 2007 and will continue to do so.

Although some of these activities were funded by the ESO E-ELT Phase-B programme, a considerable number of other studies and developments have been partly funded through contributions from the EC Sixth Framework Programme (FP6). The E-ELT Phase-B and FP6 programmes have involved many European institutions and industries, and the division's staff have played an important role in their planning and management, as well as in their execution in some cases. There has deliberately been a clear synergy developed between these activities to allow maximum overall benefit.

Here, we highlight a few examples where inter-disciplinary teams from the Technology Division have been active in the service of ESO's current and future projects.

Electronic standards

Electronic standards were an important issue during the construction of the VLT and were a major contribution to its widely recognised reliability. With equipment provided by dozens of firms and institutions, maintenance would have been extremely troublesome if each supplier selected their own components and standards. Not only would the number of spare parts have had to be greatly increased, but maintenance and upgrades would have been made more difficult and the software would also be much larger and more error-prone. Now that we are starting the E-ELT design, it is equally important to establish the minimum level of technical standards necessary for each phase of the project.

It is obviously still too early to specify all the E-ELT standards; and these will in any case evolve as the project develops. Manufacturers receiving major contracts may also select standards that will thereafter become *de facto* E-ELT standards. But the process of selecting standards is not easy and requires many considerations.

Gas treatment with UV light to improve the quantum efficiency of the FORS1 CCD.

They should not only meet the foreseen performance and environmental requirements, but they should also have development potential, and be based on rising rather than falling technologies as the project will only be completed in the next decade and must be maintained throughout its whole operational life. Standards should also have a broad industrial acceptance to allow multi-vendor procurement. Even if all these factors are positive, extensive testing and evaluation of components under the expected environmental and operational conditions at a high-altitude observatory are necessary to provide assurance of long-term serviceability.

E-ELT Technology Demonstrator

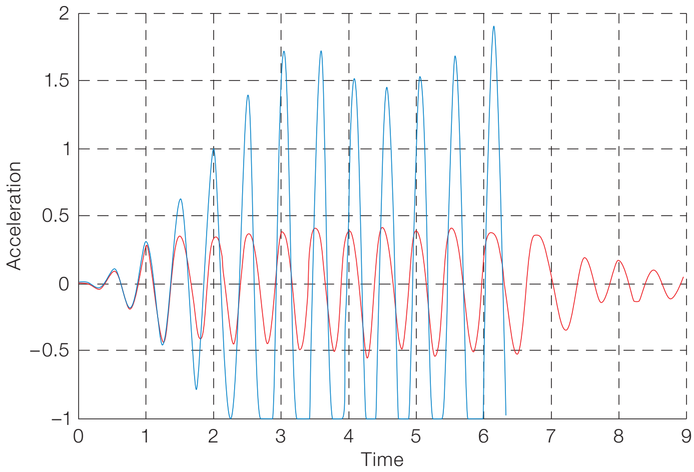
The E-ELT Technology Demonstrator project, which was started in 2007, is intended to test and benchmark key technologies available on the market today, and provide an indication as to their suitability for an extremely large optical telescope and assess the development potential.

The E-ELT, being an adaptive telescope, requires a control system that is far more complex than those of previous generations of telescopes. The initial analyses of the control system requirements indicate the need for a substantial increase in the number of I/O channels, much faster computers and higher communication bandwidths. In addition, there will be a stronger coupling between subsystems than with previous projects. The advances in technologies that have occurred during the last decade make it reasonable to expect that these goals can be achieved in a cost effective way, with much reduced cost per I/O channel.

Tests will not only be carried out under laboratory conditions, but also under the conditions expected at the future E-ELT observatory. For this, the recently acquired climatic chamber will allow equipment to be tested over the full range of temperatures and humidities that it will eventually be exposed to in operation.

Cryo-testing

Electro-mechanical functions that operate reliably under vacuum and at cryogenic temperatures are another field where development and testing has been carried out by the Mechanical Systems and Electronics departments. The reliability of vacuum-cryogenic functions is extremely critical, as any failure in an operational cryogenic instrument typically means a week of lost observation time due to the need to warm up the instrument, repair the function, pump down the vacuum and re-cool. Not only must cryogenic functions work reliably, they should also produce very little heat. Some of the proposed E-ELT instruments will require very complex cryogenic functions. As most commercial components are not designed to operate at cryogenic temperatures, a test programme was started to evaluate a number of components such as motors and encoders to validate them under these conditions. Even if a product works mechanically when cold, the associated drive or interface electronics may not. These problems and limitations need to be well understood before the components can be accepted for use in cryogenic instruments. A vacuum cryogenic test facility has been developed to facilitate the evaluation of new devices. One particularly interesting product currently being tested is the *Squiggle* motor. These can provide linear movements of up to 50 mm with a resolution as small as 20 nm. They are not only vacuum compatible and require no holding power, but are very compact – down to 6 mm in length – and could be of potential interest for moving slitlet jaws, for example.



Antenna accelerations without (blue) and with (red) additional damping system.

ALMA transporter damping system

During the development of the ALMA Transporters, it became apparent that there was a potential danger to the ALMA telescopes if they were transported at critical speeds over 'washboard' road surfaces. These surfaces can develop rather rapidly on non-metalled roads such as that connecting the ALMA OSF to the high site. Analysis showed that, in the worst case, the accelerations felt by the telescope could considerably exceed the seismic accelerations for which the vehicles were designed. Engineers from the division created a task force to find a method of damping such vibrations that could be easily retrofitted to the transporters, which were almost complete, without delaying the critical delivery schedule for these vehicles.

Taking the vehicle characteristics calculated by the manufacturer, dynamic simulations were carried out and analysed by ESO experts and a solution was found to limit the accelerations to acceptable values. The hydraulic support systems of each of the 14 transporter wheels were fitted with a nitrogen-charged accumulator and a throttle/check valve. Both these components were carefully selected and adjusted so that they change the resonance frequency in case of an overload situation and detune the system in order to avoid critical resonance amplifications. Additionally, electronic sensors have been installed to bring the vehicle automatically to a safe stop in such a situation.

Looking at the transporter damping system.

Wind characterisation

Wind disturbance is a major concern for the performance of any telescope, but particularly so for the E-ELT because of the enormous optical surfaces. In open space, the wind forces can be very high, although with a relatively small turbulent component. Protecting the telescope by placing it inside an enclosure can reduce the absolute wind forces, but create turbulence that can give problems for controlling the mirror surface. Although wind tunnel testing and computational fluid dynamics (CFD) modelling are both valuable techniques, there always remains a problem of validating these models, both in terms of scaling and understanding the correct disturbance spectra to apply. The Jodrell-Bank wind experiment that was initiated in 2006 and is now in operation is intended to obtain direct measurements on a large telescope structure standing in a relatively unhindered airflow. Of interest are not only the absolute pressure variations but also the pressure correlations across the reflector surface. Another related experiment is the FP6 Wind Evaluation Breadboard project that is now being installed on Tenerife. It consists of a representative subset of a segmented aperture mirror with seven E-ELT-sized mirror segments equipped with active mirror supports and edge sensors. It will investigate optimum Servo Control Architectures for mirror control under varying wind exposures and orientations.

Another wind study, carried out in July 2007 under the division's leadership, has been to investigate the turbulent flow characteristics inside a real telescope enclosure. Due to the large scale factors in the wind tunnel and CFD models, it is difficult to characterise the flow characteristics behind special structures like the wind screen. For this campaign, four high frequency (32 Hz) ultrasonic anemometers were installed in the vacant VST enclosure on Paranal. A row of four anemometers were placed at different locations within the enclosure volume. In each configuration, the wind speed versus time histories were recorded, from which the PSD of wind speed turbulence and all the parameters which characterise the turbulent flow, like the mean speed turbulence intensity and integral length, were calculated. This was carried out for various windscreen positions and enclosure orientations.

Right: The summit of Cerro Paranal with VISTA in the foreground.

Anemometers arranged in a vertical line behind the windscreen of the VST enclosure. In the configuration shown, one anemometer is located in front of the enclosure to have a reference of the outside flow velocity.

The Science Archive Facility

The ESO Science Archive Facility (SAF) stores all raw data taken at the ESO sites in Chile, as well as processed products for selected datasets. The facility also contains a copy of the HST archive, managed in cooperation with the Space Telescope European Coordinating Facility (ST-ECF) and the raw data from the UKIRT Infrared Deep Sky Survey (UKIDSS) taken with the Wide Field Infrared Camera (WFCAM).

Users around the world can access the ESO archive via a Web-based data request submission system. In addition to the general archive Web interface, all current VLT instruments, the VLTI MIDI instrument, the HARPS instrument on La Silla, and APEX on Chajnantor have dedicated instrument-specific forms to query the data. Dedicated query forms are also available to browse and retrieve reduced data products. In 2007, work on the ESO Science Archive Facility progressed towards setting up the infrastructure necessary to build a Virtual Observatory-compliant archive.

A visual browser to the SAF was released in 2007. VirGO, a plug-in to the open source tool *Stellarium*, provides a new way to access ESO data by displaying on the sky the field of view of imaging detectors and slits of spectrographs, with the actual orientation. As such, it allows a global and intuitive view of the areas of the sky observed by ESO telescopes, which is fundamental especially in the case of highly studied regions. The visual presentation is unprecedented in the field of archive browsers. The real strength of VirGO, however, is that it can filter out and select relevant observations in a simple way, and its Virtual Observatory compliancy allows it to interact with other Virtual Observatory (VO) tools. Among many other features, VirGO includes a 'shopping basket', as used by many commercial Web sites, which can be used to store a group of observations for further retrieval from the ESO archive.

New archive web pages were deployed. They are now served through a content management system with ESO's new corporate design. In the process, their content was updated and their structure streamlined. A significant fraction of the new web pages was implemented as part of the in-kind contribution provided by Spain.

Archive holdings and data handling

The ESO archive currently contains 74 TB of data in 14 million files. Except for a few special cases, all science observations have a proprietary period of one year. After this period the archival datasets are available worldwide to the general astronomical community for further scientific exploitation. More than 15 TB of new data were archived during 2007, a 15 % increase over the previous year. While the volume of HST data is smaller than that of ESO data by a factor of 37 to 1, the difference in the number of files archived for the two observatories is much less pronounced: 10 million ESO files and 4 million files from HST.

More than 11 000 unique archive requests were served in 2007, totalling 16.1 TB of data. Of those requests, 8 800 were for ESO data (12.3 TB in nearly three quarters of a million files), while the remaining 2 500 were for HST data (3.8 TB in nearly a quarter of a million files). We prepared and delivered to Principal Investigators data packages containing proprietary data for more than 1100 VLT/VLTI and 120 La Silla observing programmes. In addition, 170 calibrated pre-imaging datasets were delivered automatically to Principal Investigators within 48 hours of acquisition at the telescope to allow them to prepare follow-up spectroscopic observations with the following instruments: FORS1, FORS2, VIMOS, VISIR, ISAAC, NACO and SINFONI.

Raw data from the UKIRT Infrared Deep Sky Survey (UKIDSS) executed with the WFCAM instrument at the UK Infrared Telescope (UKIRT) have kept flowing into the ESO archive. During 2007 the ESO archive received 4.6 TB worth of UKIDSS data (260 000 files), which brought the total holdings to 13.1 TB (737 000 files).

As of 2006, the APEX submillimetre antenna on the Llano de Chajnantor has been routinely producing science data. The data belonging to two of the three APEX partners[1], ESO itself and the Onsala Space Observatory in Sweden, are stored in the ESO archive. As with any other ESO data, APEX files are also available to the community at large, once the usual proprietary period has expired. The ESO archive currently holds 376 GB from just over 62 000 files of APEX data, 253 GB of which were produced and processed in 2007.

In the course of 2007 a dedicated keyword repository based on Sybase IQ database technology was deployed to store the complete and updated description of the science data contained in the archive, e.g. what objects were observed, when they were observed, and how they were observed. The database currently stores information on 7.9 million files and is being backfilled to include all science files in the archive.

Also, the ESO archive stores all kinds of data to monitor the status of virtually every single function of the VLT/VLTI machinery. This database currently holds 2.3 billion entries and grew in the past year by a quarter of a billion entries.

VISTA/VIRCAM is the new wide-field infrared imager on Cerro Paranal, scheduled to start operations soon. With an expected data rate of 150 TB a year, this instrument alone will produce a ten-fold increase of data volume compared to all other instruments combined! Handling this massive amount of data will pose new challenges for archive operations and will also serve to pave the way for future high throughput instruments like MUSE, a second-generation VLT instrument which is foreseen to be composed of 24 integral field units.

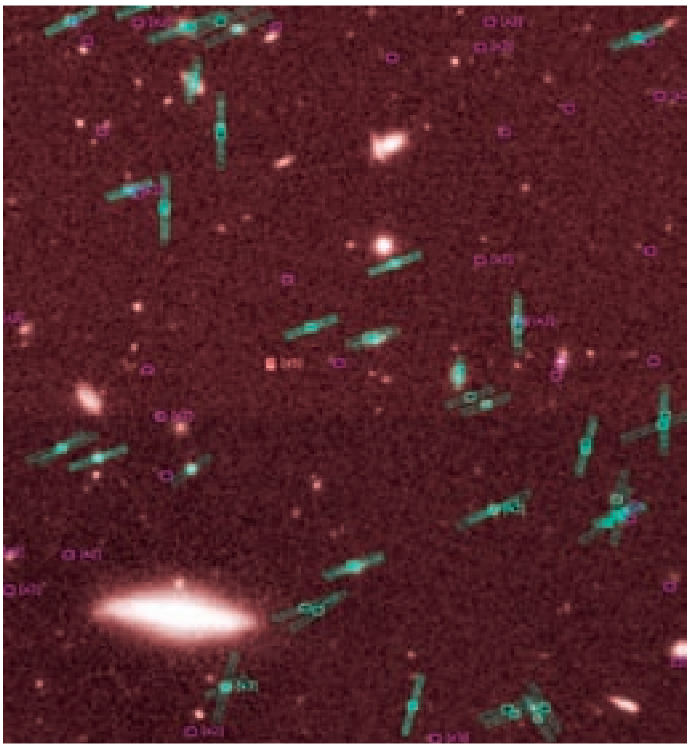
[1] The third partner being the Max Planck Institute for Radio Astronomy in Bonn, Germany.

Processed data products

A number of processed data products, which astronomers can directly use for most scientific purposes, were made available during 2007:

- All non-Guaranteed Time Observation High Accuracy Radial velocity Planet Searcher (HARPS) spectra taken between the start of science operations and the end of 2006 were reprocessed with the latest HARPS consortium pipeline and made accessible. HARPS is mainly dedicated to the detection of extra-solar planets and has discovered many such objects;
- All the spectra obtained with the UV-Visual Echelle Spectrograph (UVES) since the beginning of its operations in February 2000 – nearly 60 000 raw frames of point-like observations – were processed at ESO with the latest version of the instrument pipeline (v3.2). This new pipeline implements an adaptive scheme to consistently and efficiently perform optimal spectral extraction over a wide range of signal-to-noise ratios, up to the maximum Poisson limit of several hundred dictated by pixel saturation. Only quality-controlled master calibration frames were used for the processing and all science products have undergone a certification procedure. This approach results in a large data set processed in a homogeneous, controlled and well understood way. This massive data processing was made possible by applying to the UVES catalogue the new tools and concepts developed to cope with the large amount of data that is expected to be produced by the upcoming survey instruments. UVES data were processed in a VO-compliant manner and are accessible through an interface which includes target information obtained via cross-identification with astronomical objects in the SIMBAD and NED databases. Archive users can search by target name, object class, redshift or radial velocity and look, for example, for all quasars at redshift larger than 3 observed by UVES;
- The final (v2.0) release of the Great Observatories Origins Deep Survey (GOODS)/ISAAC data went online on 10 September. GOODS unites extremely deep observations from many space observatories and from the most powerful ground-based facilities, to survey the distant Universe to the faintest flux limits across the broadest range of wavelengths. This release includes fully calibrated mosaics (26 fields in the infrared *J*- and *Ks*-bands, 24 in the infrared *H*-band) and accumulates data acquired in 12 814 science exposures between October 1999 and January 2007 totalling 1.3 Msec of integration time. The fully automated processing of the entire data set consists of 13 964 raw science images, 20 699 calibration frames, and 6 290 photometric standard stars;
- The final (v3.0) release of the GOODS/FORS2 spectra went online on 31 October. This includes 1715 spectra of 1225 unique targets, providing in total 1165 redshift measurements;
- Advanced data products for the Large Programme zCosmos (The evolutionary links between galaxies, their nuclei, their morphologies and their environments) were released on 30 October. They include 1264 one- and two-dimensional VIMOS spectra. This is the first release of reduced data from an external ESO Large Programme. Proposers of Large Programmes are in fact requested to deliver to ESO final data products at the time of publication of their results. This enhances the legacy value of ESO data, facilitating further scientific exploitation, assures uniform distribution of data products through the Science Archive Facility, and gives them higher visibility.

Finally, preview images (re-binned JPG and FITS) with accurate astrometry from Wide Field Imager (WFI) archival data have been produced. These allow a ‘quick look’ at the data before submitting a request.



ESO VLT/FORS2 spectra slits overlaid with VirGO on a VLT/ISAAC preview image in the GOODS south area.

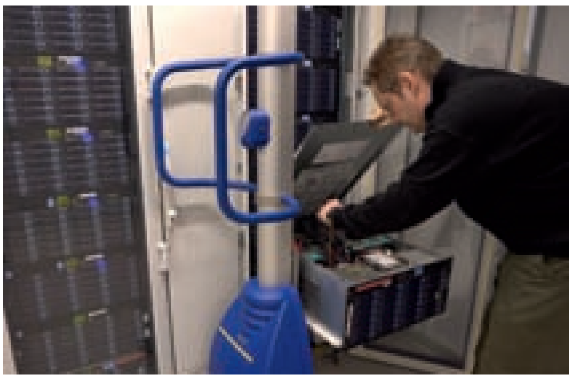
The ESO Data Centre

The ESO Data Centre was completed in June 2007. It is a state-of-the-art computer room, currently equipped with eight actively cooled racks, seven standard racks, three network racks and one Blade Centre. The technical equipment in this Data Centre comprises redundant Liquid Cooling Packages (LCPs), a leakage detection system, and smoke and particle detectors in a controlled and air-conditioned environment. The entire ESO Data Centre is powered through a centralised Uninterruptible Power Supply (UPS), which is located directly underneath the Data Centre.

The construction of the ESO Data Centre has enabled the consolidation of the majority of the mission-critical operations computer systems into one location. The relocation of the operational computer systems took meticulous planning and was executed within three weeks. A downtime for the entire Archive was not required, because the Primary Archive consists of twenty-four individual systems, which could be relocated individually one at a time. In addition, most mission-critical database servers were moved on short notice.

During a power outage from 1 to 2 December 2007, the Uninterruptible Power Supply proved its worth, which enabled all mission-critical computer systems and services to continue without interruption.

Database replacement servers for the remote observatory sites have also been procured. These servers are situated in the ESO Data Centre and are being installed, configured and tested prior to handover to the La Silla Paranal Observatory.



The ESO Data Centre in Garching.

The European Virtual Observatory

The EURO-VO project aims at deploying an operational Virtual Observatory (VO) in Europe, allowing users easy and seamless access to the huge amount of astronomical data currently available, to facilitate their exploitation and foster new science. ESO is a founding member of EURO-VO, which is partly funded by the European Community.

The EURO-VO project, through its Science Advisory Committee (SAC) and the ESO/ESA managed Facility Centre, selected three projects (two of which are being supported by ESO staff) making use of VO tools and applications to carry out astronomical research. The projects have received scientific support and technical contact points and should soon complete their work.

The ESO/EURO-VO project was present at the European Astronomical Society Symposium on “Science with Virtual Observatories” (JENAM, Yerevan, Armenia, 20–25 August), at the workshop “Astronomy with Virtual Observatories” held in Pune, India, on 15–19 October, and at the Lithuanian Summer School “Virtual Observatories”, held in the Moletai Observatory, Lithuania, on 23–26 October.

The EURO-VO SAC met for the third time on 18 June at ESTEC, Noordwijk, the Netherlands. SAC members were updated on the latest EURO-VO developments.

A EURO-VO workshop on how to publish data to the Virtual Observatory, organised by ESO and ESA in collaboration with the other EURO-VO partners, took place at ESAC, Madrid, in June. It attracted about 60 participants (many astronomers) and 20 advisers/organisers. It was geared towards data centres and large projects in order for them to acquire the knowledge and experience necessary to allow them to become ‘publishers’ in the VO. In hands-on sessions, participants were introduced to VO protocols in the view of publishing their data holdings through the VO. Implementation feedback was collected on the VO protocols and tools.

The second meeting of the EURO-VO Data Centre Alliance board took place on 1–2 February at ESO. The main topic of discussion was the EURO-VO proposal in response to the first Framework Programme 7 (FP7) Infrastructure call, published on 22 December 2006. The third meeting of the EURO-VO Data Centre was held in Trieste, Italy, on 4–5 October. Topics of discussion included the assessment of Cycle 1 activity, preparation of the revised Project Plan for Cycle 2, preparation of the first periodic report to the EC, and discussion of the Data Centre census information collection and collation.

The fourth cycle of the VOTech project, which works by six months cycles, was completed in March 2007. Project members met at ESO, on 12–15 March, to assess the work done and present plans for the next cycle. The project mid-term review and Cycle 6 planning was held on 8–11 October in Edinburgh, UK.

The ESO-led design study group on new user tools released its report. Many of the new prototype components made it into production software such as archival access to spectra or display of instrumental footprints and filter transmission curves.

ESO was instrumental in developing a query protocol for standardised access to spectroscopic data. The technical specifications of the Simple Spectral Access (SSA) Protocol were approved and adopted by all 16 IVOA members. SSA constitutes the most significant technical contribution of ESO in the VO era.

The EURO-VO proposal “Astronomical Infrastructure for Data Access (AIDA)” submitted to the first FP7 Infrastructure call INFRA-2007-1.2.1 “Scientific Digital Repositories” was selected for funding at the 2.7 M€ level. The project starting date is 1 February 2008. This ensures the continuation of European-wide VO activities at least until 2010.

ESO maintains the EURO-VO project web site, which in 2007 served 112 GB of content resulting from 230 000 user sessions. ESO is also in charge of the IVOA project web site, which served 116 GB of web content resulting from 500 000 user sessions.

ST-ECF

ESO and the European Space Agency continued their successful collaboration through the Space Telescope European Coordinating Facility (ST-ECF). The Hubble Space Telescope (HST) is currently in observing cycle 16, routinely achieving observing efficiencies between 45 and 50 per cent. It is performing nominally in two-gyro mode, with the possibility to operate in one-gyro mode, should this be required. Science highlights include the observation of 'Lego-block' galaxies, from which today's galaxies are assumed to have evolved. The dark matter scaffolding of the universe was mapped. 2007 also marked the 20th anniversary of Supernova 1987a; it has now been monitored by the HST for 17 years, completely revolutionising our knowledge of supernovae.European observing time allocation continued to be well above the nominal 15 %.

Currently the ST-ECF is operating under the terms of the original MoU between NASA and ESA, which foresees a staffing level of seven ESA and ESO funded positions. The MoU will expire at the end of 2010. The focus of the ST-ECF efforts was on the generation of Advanced Science Data Products: both the ACS and the NICMOS instruments on HST have integral-field spectroscopic capabilities. The data produced in these modes are complex to analyse and require techniques unfamiliar to most astronomers. ST-ECF has therefore developed software that is able to extract spectra from the data frames and to calibrate them, with the aim of making them directly available to the community. This capability is also applicable to Wide Field Camera 3 (WFC3), one of the two new scientific instruments that will be installed on the HST during Servicing Mission 4 (SM4).

Intense preparations for SM4 continued throughout the reporting period. The mission is currently scheduled to launch in August or September 2008. It will restore the HST to 3-gyro configuration. In addition to the installation of the Cosmic Origins Spectrograph (COS) and the WFC3, the mission will attempt to bring STIS and ACS back to full functionality. ST-ECF staff are supporting these activities by generating technical documentation and by participating in the reviewing process.

The European HST Archive is now operating within the new ESO Archive infrastructure. The total Hubble data holdings are now about 2 Terabytes in unprocessed and compressed form. During 2007, 2512 requests for data (3.1 TB) were served and distributed to 405 users. In collaboration with the STScI and the CADC, work on the Hubble Legacy Archive continued. The goal is to collect and generate selected High Level Science Data Products and make them available to the community through a science-oriented user interface. User support continued through the Newsletter, the HST email hotline, and the production of technical documents. ST-ECF staff also monitored the TAC process and continued to support the ESO SAMPO Project. Moreover, ST-ECF staff takes care of the editorship of the ESO Messenger.

The ST-ECF has been active in the dissemination of the discoveries from Hubble to the public during 2007. Twenty news and photo releases and sixteen smaller 'Hubble Updates' were produced. The European Hubble website had 7.5 million visits (up 160 %) and distributed 110 TB of multimedia materials (up 200 %). 150 new Full High Definition (1080 p) video clips were produced. One of the highlights of the year was the start of the production of the Hubblecasts in Full HD, which prompted an enormous increase in the number of web downloads. In total, 1.8 million Hubblecasts (12 episodes) were distributed during the last nine months of 2007. These Hubblecasts continue to rank among the most successful science-related materials in, for instance, *iTunes*. It was voted among the Top-25 video podcasts of 2007 (one of two science vodcasts in Top-25), and even used in a demo by Apple CEO Steve Jobs at the keynote address at MacWorld 2007.

In collaboration with IAU Commission 55, the journal "Communicating Astronomy with the Public" (CAP) was created. It is to appear on a quarterly basis and is designed to meet the clear need for a publication addressing the specific needs of the public astronomy communication community. This is particularly important as 2009 has been declared the International Year of Astronomy (IYA2009) by the United Nations. In collaboration with the IAU the IYA2009 Secretariat was set up at ST-ECF's outreach group in August 2007. Two conferences were organised: The International Year of Astronomy 2009 Meeting at ESO and Communicating Astronomy with the Public 2007 in Athens. Five new websites were created – the one for the International Year of Astronomy 2009 was the most popular of these.

As part of the continuing ESA-ESO science strategy coordination, a fourth topical working group, chaired by Catherine Turon, is preparing a report on Galactic Structure with particular reference to the forthcoming GAIA mission. This will be the latest addition to the existing set of reports: Extrasolar Planets (M. Perryman, chair); The Herschel-ALMA Synergies (T. Wilson) and Fundamental Cosmology (J. Peacock); and will be published in mid-2008.

The Organisation

Office of the Director General[1]

Tim de Zeeuw

Fatme Allouche
Catarina Alves de Oliveira
Gonzalo Argandoña
Mustafa Basbilir
Giuseppina Battaglia
Mary Bauerle
Yuri Beletsky
Angelika Beller
Thomas Lennart Bensby
Michael Böcker
Henri Boffin
Konstantina Boutsia
Jutta Boxheimer
Pamela Bristow
Karsten Brogaard
Benoît Carry
Catherine Cesarsky
Mary Cesetti
Lise Bech Christensen
Blair Campbell Conn
Silvia Cristiani
Itziar De Gregorio Monsalvo
Gayandhi Manomala De Silva
Antonio De Ugarte Postigo
Jörg Dietrich
Michelle Doherty
Michaela Döllinger
Brigitta Eder
Christopher Erdmann
Robert Fischer
Andrew Fox
Diego Alex Garcia-Appadoo
Mark Gieles
Carla Gil
Rachel Emily Gilmour
Raphael Gobat
María Eugenia Gómez
Luis Calçada
Claudio Grillo
Uta Grothkopf
Karin Hansen
Camilla Juul Hansen
Hans Hermann Heyer
Renate Hoppe-Lentner
Gaitee Hussain
Gaël James
Edmund Janssen
Paulina Jiron
Eric Jullo
Georg Junker
Katarina Kiupel
Heidi Helena Korhonen
Isolde Kreutle
Daniel Kubas
Milla Laaksonen
Jean Baptiste Le Bouquin
Bruno Leibundgut
Silvia Leurini
Karin Lind
Luis Felipe Lira
Cristian Lopez
Paul Lynam
Mariya Lyubenova

[1] Including all the Fellows and Students under the Studentship Programme.

Claus Madsen
Vincenzo Mainieri
Gautier Mathys
Jorge Melnick
Steffen Mieske
Igor-Félix Mirabel
Ingo Misgeld
Lorenzo Monaco
Dominique Naef
Thomas Naets
Nadine Neumayer
Pasquier Noterdaeme
Enikő Patkós
Silvia Pedicelli
Douglas Pierce-Price
Olga Pinto Moreira
Farid Rahoui
Anna Raiter
Suzanna Randall
Paula Valentina Rodriguez
Francesco Saitta
Hugues Sana
Julia Scharwächter
Zhixia Shen
Colin Snodgrass
Veronica Sommariva
Thomas Stanke
Christina Stoffer
Masayuki Tanaka
Leonardo Testi
Svea Teupke
Sune Toft
Ezequiel Treister
Elena Valenti
Gerrit van der Plas
Stefan Vehoff
Giulia Ventimiglia
Elisabeth Völk
Rein Warmels
Michael Weigand
Michael West
Thomas Wilson
Gabriele Zech
Herbert Zodet

Administration Division

Hans Jahreiss

Patricia Adriazola
Eduardo Arenas
Andres Arias
Angela Arndt
Samantha Austin-May
Juan Carlo Avanti
Roland Block
Jean-Michel Bonneau
Renate Brunner
Cecilia Carrasco
Karina Celedon
Claudia Silvina Cerda
Laura Comendador Frutos
Tommaso Di Dio
Andrea Dinkel
Günther Dremel
Willem Arie Dirk Eng
Sonia Garnica
Rebonto Guha
Adriana Gutierrez
Priya Nirmala Hein
Charlotte Hermant
Nathalie Kastelyn
Elizabeth Kerk
Hans-Jürgen Kraus
Katjuscha Lockhart
Ignacio Lopez Gil
Maria Madrazo
Silvia Madrid Pariente
Jorge Moreno
Maria Angelica Moya
Hélène Neuville
Christine Nieuwenkamp
Thomas Penker
Rolando Quintana
Mauricio Quintana
Andre Ritz
Rosa Ivonne Riveros
Francky Rombout
Marcia Saavedra
Nadja Sababa
Maria Soledad Silva
Erich Siml
Beatrice Sivertsen
Roswitha Slater
Albert Triat
Lone Vedsø Marschollek
Sabine Weiser
Yves Wesse
Gerd Wieland

La Silla Paranal Observatory

Andreas Kaufer

Nancy Ageorges
Luis Aguila
Claudio Agurto
Bernardo Ahumada
Mario Alfaro
Jaime Alonso
Nilso Alquinta
Jose Luis Alvarez
Paola Amico
Andreas Andersson Lundgren
Gaetano Andreoni
Ernesto Araya
Juan Carlos Arcos
Javier Argomedo
Karla Aubel
Francisco Azagra
Jose Baez
Pedro Baksai
Emilio Barrios
Rogelio Bascunan
Juan Beltran
Eduardo Bendek
Per Mikael Bergman
Guillaume Blanchard
Carlos Bolados
Stéphane Brillant
Armando Bruna
Erich Bugueno
Blanca Camucet
Massimiliano Camuri
Luis Alejandro Caniguante
Michael Cantzler
Ruben Carcamo
Cesar Cardenas
Giovanni Carraro
Duncan Castex
Roberto Castillo
Monica Castillo
Jorge Castizaga
Susana Cerda
Cecilia Ceron
Claudia Cid
Alex Correa
Jose Ignacio Cortes
Angela Cortes
Jaime Costa
Claudio De Figueiredo Melo
Reinaldo Donoso
Javier Duk
Christophe Dumas
Michael Dumke
Domingo Duran
Carlos Durán
Yves Durand
Carlos Ebensperger
Alessandro Ederoclite
Cristian Esparza
Lorena Faundez
José Figueroa
Erito Flores
Juan Carlos Fluxa
Sergio Gaete
Jose Gardiazabal
Gordon Gillet
Alain Gilliotte
Philippe Gitton
Percy Glaves
Leonardo González
Domingo González
Andrés González
Sergio González

Victor González
Charlotte Groothuis
Patricia Guajardo
Carlos Guerra
Stéphane Guisard
Serge Guniat
Flavio Gutiérrez
Fernando Gutiérrez
Nicolas Haddad
Juan Pablo Haddad
Pierre Haguenauer
Olivier Hainaut
George Harding
Volker Heinz
Juan Pablo Henriquez
Cristian Herrera
Leonardo Herrera
Swetlana Hubrig
Gerhard Hüdepohl
Rodrigo Huerta
Ramon Huidobro
Gerardo Ihle
Valentin Ivanov
Jorge Jimenez
Nestor Jimenez
Ismo Kastinen
Nicholas Charles Kornweibel
Carlos La Fuente
Francisco Labraña
Octavio Lavin
Paul Le Saux
Cedric Ledoux
Alfredo Leiva
Ramon Leyton
Christopher Lidman
Gaspare Lo Curto
Gianluca Lombardi
Ignacio Lopez
Ariel Lopez
Fernando Luco
Felipe Mac-Auliffe
Agustin Macchino
Gianni Marconi
Pedro Mardones
Pedro Marin
Kiriako Markar
Mauricio Martinez
Elena Mason
Eduardo Matamoros
Rolando Medina
Angel Mellado
Alejandra Mena
Jorge Miranda
Juan Molina
Nelson Montano
Alex Morales
Sebastien Morel
Merilio Morell
Ivan Muñoz
Julio Navarrete
Hernan Nievas
Dieter Nürnberger
Herman Nuñez
Kieran O'Brien
Rodrigo Olivares
Francisco Olivares

Ernesto Orrego
Oscar Orrego
Juan Osorio
Juan Carlos Palacio
Ricardo Parra
Jose Parra
Andres Parraguez
Marcus Pavez
Eduardo Peña
Jorge Pilquinao
Juan Pineda
Andres Pino
Manuel Pizarro
Aldo Pizarro
Andres Pizarro
Emanuela Pompei
Hugo Quijón
David Rabanus
Andrés Ramírez
Fredrik Rantakyrö
Johnny Reveco
Vincent Reveret
Miguel Riquelme
Christophe Risacher
Thomas Rivinius
Pascal Robert
William Robinson
Chester Rojas
Gorky Roman
Jose Rosas
Felix Alberto Rozas
Francisco G. Ruseler
Claudio Saguez
Daniel Salazar
Antonio Saldias
Fernando Salgado
Alejandro Salinas
Ariel Sanchez
Stefan Sandrock
Roberto Sanhueza
Pierre Sansgasset
Jorge Santana
Lilian Sanzana
Ivo Saviane
Linda Schmidtobreick
Ricardo Schmutzer
Markus Schöller
Oliver Schuetz
Alex Segovia
Fernando Selman
Waldo Siclari
Peter Sinclaire
Alain Smette
Fabio Somboli
Stanislav Stefl
Michael Fritz Sterzik
Sandra Strunk
Thomas Szeifert
Roberto Tamai
Mario Tapia
Manuel Torres
Soraya Torres
Josefina Urrutia
Guillermo Valdes
Jose Javier Valenzuela
Karen Vallejo
Leonardo Vanzi
Oscar Varas
Enrique Vera
Jorge Vilaza
Stefan Wehner
Ueli Weilenmann
Luis Wendegass
Andrew Wright

Telescope System Division

Roberto Gilmozzi

Constanza Araujo Hauck
Dina Arbogast
Robin Arsenault
Domenico Bonaccini Calia
Marc Cayrel
Richard Clare
Jeroen de Jong
Françoise Delplancke
Frédéric Derie
Philippe Dierickx
Robert Donaldson
Enrico Fedrigo
Yan Feng
Wolfgang Hackenberg
Ronald Holzlöhner
Norbert Hubin
Lieselotte Jochum
Markus Kasper
Bertrand Koehler
Johann Kolb
Visa Korkiakoski
Paolo La Penna
Miska Kristian Le Louarn
Samuel Lévêque
Jochen Liske
Pierre-Yves Madec
Enrico Marchetti
Patrice Martinez
Serge Menardi
Samantha Milligan
Guy Monnet
Riccardo Muradore
Sylvain Oberti
Jérôme Paufique
Duc Thanh Phan
Florence Puech
Mark Robinson
Johannes Sahlmann
Marc Sarazin
Nicolas Schuhler
Christian Soenke
Jason Spyromilio
Josef Strasser
Stefan Ströbele
Isabelle Surdej
Arkadiusz Swat
Luke Taylor
Gerard van Belle
Elise Vernet
Anders Wallander
Nataliya Yaitskova

Data Management and Operations Division

Fernando Comerón

Paola Andreani
Andrew Burrows
Fabien Chereau
Carlos De Breuck
Nausicaa Delmotte
Danuta Dobrzycka
Adam Dobrzycki
Markus Dolensky
Nina Felber
Nathalie Fourniol
Monika Gotzens
Reinhard Hanuschik
Evanthia Hatziminaoglou
Michael Hilker
Wolfgang Hummel
Christian Hummel
John Lockhart
Jean-Christophe Malapert
Stephane Marteau
Sabine Mengel
Sabine Moehler
Palle Møller
Petra Nass
Mark Neeser
Paolo Padovani
Ferdinando Patat
Isabelle Percheron
Francesca Primas
John Pritchard
Marina Rejkuba
Jörg Retzlaff
Bruno Rino
Charles Rite
Jesus Rodriguez Ulloa
Martino Romaniello
Piero Rosati
María del Mar Sierra González
Remco Slijkhuis
Dieter Suchar
Lowell Tacconi-Garman
Mario Van Den Ancker
Ignacio Vera Sequeiros
Andreas Wicenec
Markus Wittkowski
Burkhard Wolff
Bodo Ziegler
Martin A. Zwaan

Software Development Division

Michèle Péron

Roberto Abuter
Eric Allaert
Luigi Andolfato
Pascal Ballester
Klaus Banse
Peter Biereichel
Thomas Bierwirth
Reynald Bourtembourg
Alessandro Caproni
Sandra Maria Castro
Maurizio Chavan
Gianluca Chiozzi
Mauro Comin
Livio Condorelli
Paulo Correia Nunes
Stéphane Di Cesare
Dario Dorigo
Philippe Duhoux
Sylvie Feyrin
Robert Frahm
Bruno Gilli
Carlos Guirao Sanchez
Birger Gustafsson
Karim Haggouchi
Carlo Izzo
Bogdan Jeram
Yves Jung
Robert Karban
Maurice klein Gebbinck
Jens Knudstrup
Antonio Longinotti
Henning Lorch
Lars Kristian Lundin
Holger Meuss
Andrea Modigliani
Christophe Moins
Ralf Palsa
Moreno Pasquato
Martine Peltzer
Werther Pirani
Dan Popovic
Eszter Pozna
Marcus Schilling
Diego Sforna
Paola Sivera
Fabio Sogni
Heiko Andreas Sommer
Stefano Turolla
Jakob Vinther
Michele Zamparelli
Stefano Zampieri

Instrumentation Division

Alan Moorwood

Matteo Accardo
Gerardo Avila
Dietrich Baade
Andrea Balestra
Paul Bristow
Iris Bronnert
Mark Casali
Claudio Cumani
Sebastian Deiries
Klaas Johannes Dekker
Sandro D'Odorico
Reinhold Dorn
Mark Desmond Downing
Christophe Dupuy
Siegfried Eschbaumer
Gert Finger
Christoph Geimer
Andreas Glindemann
Juan Carlos Gonzalez
Stefan Hötzl
Olaf Iwert
Gerd Jakob
Hans-Ulrich Käufl
Florian Kerber
Jean Paul Kirchbauer
Jean-Louis Lizon à L'Allemand
Antonio Ramon Manescau Hernandez
Leander H. Mehrgan
Manfred Meyer
Luca Pasquini
Markus Patig
Jean-François Pirard
Suzanne Ramsay
Roland Reiss
Javier Reyes
Andrea Richichi
Gero Rupprecht
Ralf Siebenmorgen
Jörg Stegmeier
Sebastien Tordo
Joël Daniel Roger Vernet

Technology Division

Martin Cullum

Bertrand Bauvir
Henri Bonnet
Roland Brast
Enzo Brunetto
Bernard Buzzoni
Ralf Dieter Conzelmann
Bernard-Alexis Delabre
Nicola Di Lieto
Canio Dichirico
Martin Dimmler
Michel Duchateau
Toomas Erm
Raul Esteves
Giorgio Filippi
Gerhard Fischer
Christoph Frank
Domingo Gojak
Frederic Yves Joseph Gonté
Ivan Maria Guidolin
Andreas Haimerl
Florian Heissenhuber
Guy Hess
Renate Hinterschuster
Georgette Hubert
Georg Igl
Paul Jolley
Andreas Jost
Barbara Klein
Franz Koch
Heinz E. Kotzlowski
Maximilian Kraus
Simon Lowery
Christian Lucuix
Ruben Mazzoleni
Jean-Michel Moresmau
Michael Müller
Michael Naumann
Frank Nittel
Lothar Noethe
Edouard Pomaroli
Marco Quattri
Jutta Quentin
Michael Schneermann
Babak Sedghi
Armin Silber
Jesper Thillerup
Arno Van Kesteren
Véronique Ziegler

ALMA Division

Hans Rykaczewski

Gareth Aspinall
Fabio Biancat Marchet
Claus Dierksmeier
Preben Grosbøl
Christoph Haupt
Jennifer Hewitson
Andreas Kempf
Hervé Kurlandczyk
Robert Alexander Laing
Massimiliano Marchesi
Pascal Martinez
Beate Marx
Eric Pangole
Ferdinand Patt
Gianni Raffi
Silvio Rossi
Hans Rudolf
Joseph Schwarz
Stefano Stanghellini
Donald Tait
Gie Han Tan
Eugenio Ureta
Elena Zuffanelli

Space Telescope – European Coordination Facility

Lars Lindberg Christensen
Wolfram Freudling
Jonas Haase
Richard Hook
Martin Kornmesser
Martin Kümmel
Harald Kuntschner
Marco Lombardi
Pedro Miguel Russo
Britt Sjöberg
Felix Stoehr
Jeremy Walsh

Seconded Staff Members

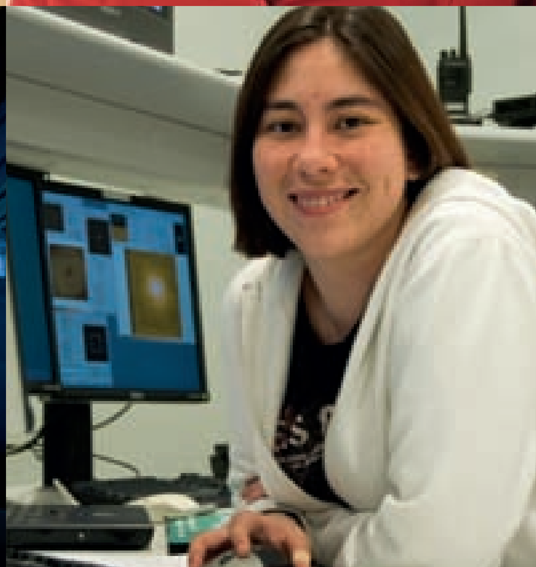
ALMA Joint Office

Massimo Tarenghi

Paulina Bocaz
Richard Hills
Jacques Lassalle
Lars Å. Nyman
Russell Smeback

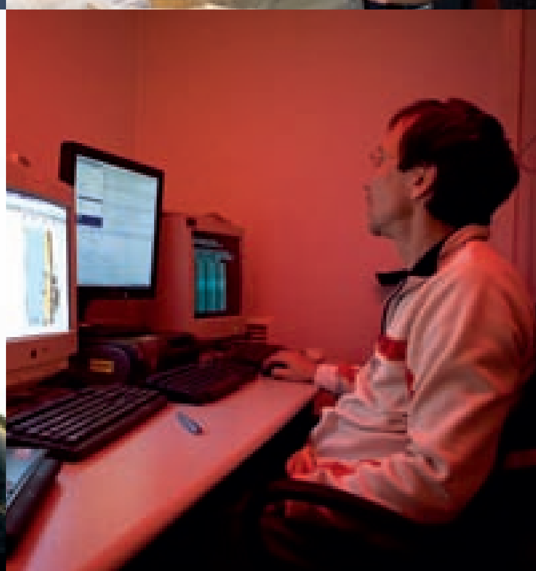










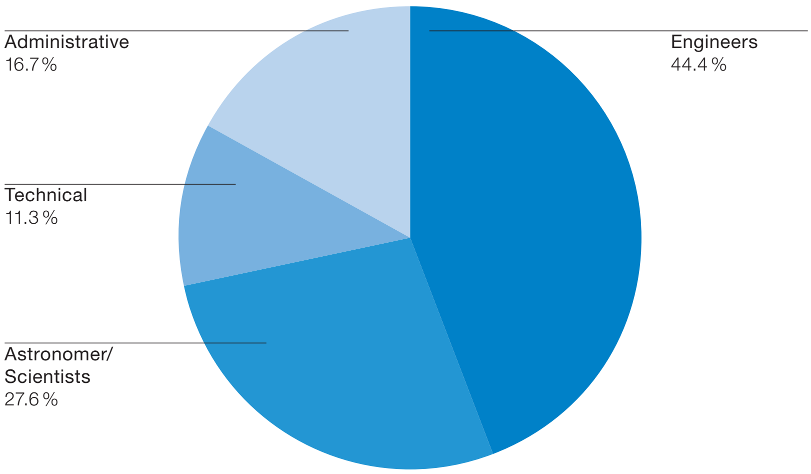
Personnel

As defined in its Rules and Regulations, ESO has five categories of staff members, whose distribution at the end of 2007 was the following:
- International Staff Members (371 staff; 56.1 %)
- Local Staff (176; 26.6 %)
- Fellows (36; 5.4 %)
- Paid Associates (46; 7 %)
- Students (32; 4.8 %).

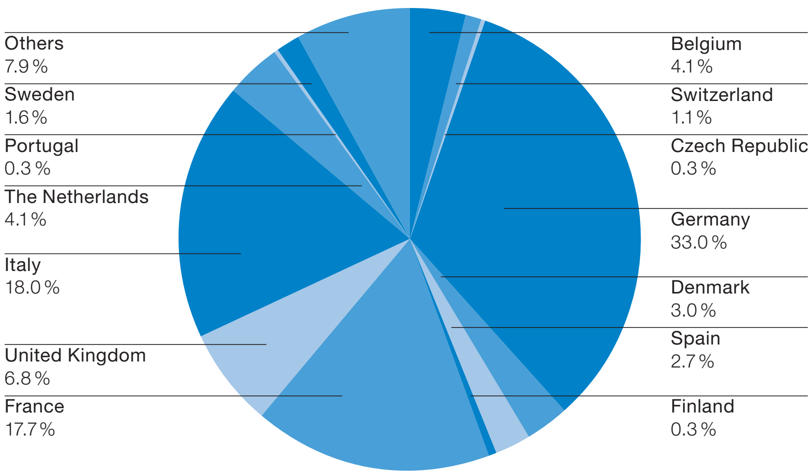
Their purpose is to reflect the variety of circumstances and diverse work at ESO, and to provide flexibility. ESO has seen a steady increase in staff numbers over the last 3 years, and it is positive to note that the number of female staff has increased by a higher percentage than male staff (17 % and 4 %, respectively).

During 2007 we introduced *e-Recruitment* to facilitate the recruitment process for applicants and the management of human resources (HR) activities, enabling internal and external applicants to apply for vacancies online. Applicants get automatic confirmation that their application has been received, and HR can request additional information electronically, thus reducing the administration activities, and speeding up the recruitment process.

Throughout 2007, ESO advertised 88 vacancy notices and 1744 applications were received. In 2007, 54 International Staff Members and 23 Local Staff Members were recruited. In addition, 11 Students, Fellows, Paid and Unpaid Associates joined ESO.



ESO staff are distributed across four main job categories: administrative and technical staff, astronomers, and engineers. Given the technical and scientific nature of the work, engineers and astronomers make up 44 % and 28 %, respectively, of the organisation.



Distribution of International Staff Members by Nationality as of 31 December 2007.

HR development

Throughout 2007 we have been working to further develop the terms and conditions of employment at ESO. Working with the International Staff Committee in Chile, a revision of the terms of employment for astronomers working in Chile was agreed, with particular note taken of the annual review of scientific activity, the assignment and career development, and the working schedules for astronomers.

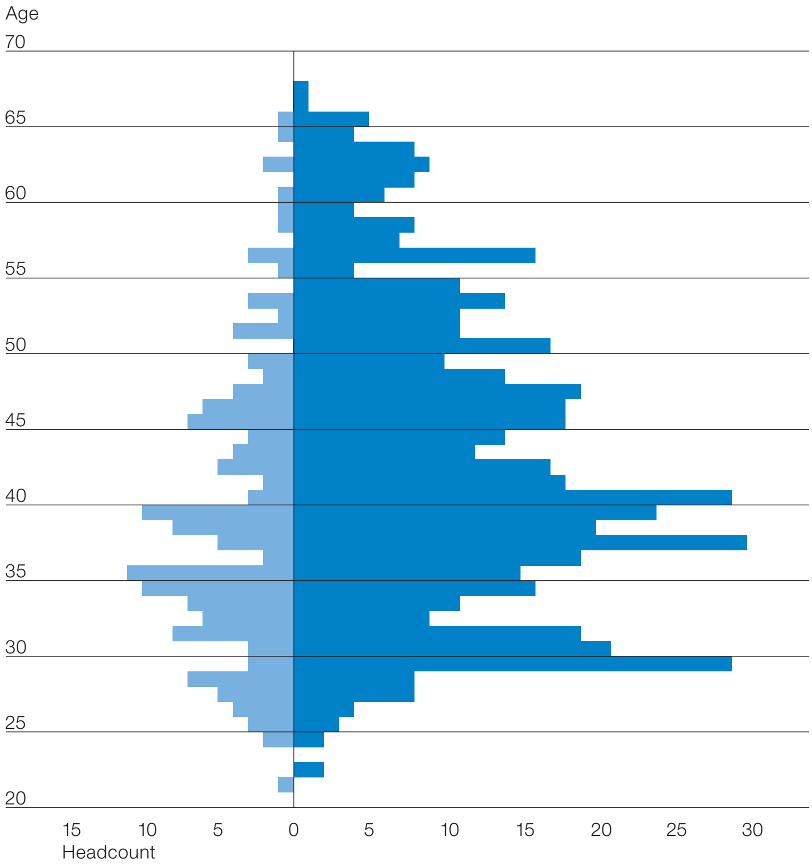
Another important activity concerns equal opportunity issues. This work commenced in 2006 with the purpose of ascertaining if we are providing an environment conducive to attracting women to, and allowing them to develop in, science. This was an active working group, which compared ESO to other scientific organisations. The group produced a number of recommendations that do not only focus on women-related matters but also affect organisation-wide issues. Some of the key areas for development have included: a review of maternity and adoption leave; the participation in a common ‘Kinderkrippe’ and ‘Kindergarten’ with neighbouring institutions; management and leadership training; a proposal to introduce a ‘Harassment and Bullying’ policy; and a review of the approach to flexible working at ESO. This work will continue in 2008 with the working group.

During 2007, Human Resources made and implemented the following improvements/changes as far as Rules and Regulation developments are concerned:
- Recognition of same sex marriages;
- Recognition of same sex and opposite sex partnerships;
- Paid paternity leave increased;
- Paid maternity leave increased for the second and the following children;
- Special leave in the event of illness of a close relative was introduced;
- Unpaid special leave to care for members of the family or close relatives;
- Amendment in the application of official holidays in Chile and Garching;
- Amendment in the application of the Cost of Living differential to the Expatriation Allowance;
- Amendment of the Education Grant and its related Circular;
- Contract Policy for International Staff Members;
- Guidelines for commuting of Staff Members in Chile;
- Recruitment and Selection Procedures.

Moreover, the Human Resources department has led a working group to look at the impact of the recommendations from the 'Future of La Silla' working group. This has focused on matters relating to resources including; internal reassignments; future early retirement schemes, and the selection of skilled staff for the core positions for the future operation of La Silla.

Throughout the year, considerable advice and guidance has been provided to the ALMA Human Resources Advisory Group, specifically in the areas of internal regulations; compensation and benefit programmes; review and definition of the recruitment processes for Local Staff and International Staff; clarification on process of performance and advancement reviews; and resource requirements for the JAO HR Department.

Further activities included the organisation of two meetings of the ESO Tripartite Group; the participation in the HR working group of EIROforum; the implementation of two new Collective Contracts for Santiago and the sites; the implementation of the Leave Module of the Navision system in Garching and Vitacura.



Age distribution of ESO staff on 31 December 2007. The average age is 42 years, and within the age range of 35 to 45 years, the spread is fairly homogenous, for both male (dark blue) and female (light blue).

Council

The Council is ESO's ruling body, which delegates the day-to-day responsibility to the Executive under ESO's Director General. In 2007, Council held two ordinary meetings, in Barcelona in June and in Garching in December. The Committee of Council met twice, in Potsdam in March, and in Oxfordshire in October. The President of Council, Prof. Richard Wade, chaired all the meetings.

In June, Council approved a Collaborative Agreement concerning the construction of the Atacama Large Millimeter/submillimeter Array with the National Astronomical Observatory of Japan (NAOJ). This Agreement governs the financial and procedural aspects related to goods purchased and services performed by ESO in the interests of NAOJ.

Having spent time at the sites in Chile in January and in Garching in February, the Visiting Committee delivered its report to Council in June. The then Director General, Catherine Cesarsky, presented an initial response to the report but it was left to the new Director General, Tim de Zeeuw, to provide an action plan to Council on how to respond to the individual points. This was done later in 2007.

In June, Council also approved a resolution stating that the La Silla 2010+ scenario would allow ESO to maintain the availability of the La Silla site for the ESO community at a reduced level.

Council received the usual VLT/VLTI, Instrumentation and ALMA biannual reports, and the reports from the Chairs of the Finance Committee, the Scientific Technical Committee and the Observing Programmes Committee. In addition a biannual E-ELT Design Phase Status Report was introduced. Council approved an agreement with NOVA regarding ASSIST – a test bench used to test the Adaptive Optics Facility.

In June, Council reaffirmed its approval of the Phase B Work Plan for the E-ELT. In December, Council approved the Terms of Reference and the membership of an FP7 E-ELT Preparation Steering Committee. This oversight committee would take up work on 25 January 2008.

In March, an In-Kind Negotiation Team for the accession of Austria was appointed, chaired by Prof. Jens Viggo Clausen. The Team reported to Council in June and Council agreed by consensus that the negotiations should continue along the lines drawn up by the team with the objective of presenting a draft agreement to Council for approval at a later stage.

ESO is still in dire need of an extension to the Headquarters' Building in Garching and an agreement about lease and subsequent purchase of the necessary land was signed by the landowners and ESO. An architects' competition was initiated and an international jury met in October and awarded two first prizes, a third and a fourth prize, and recognised (with a 'purchase prize') one additional design which, although innovative, did not meet local building regulations. Council approved that a revised call for tenders would be issued to the top three prize winners in the course of spring 2008.

At the meeting in December, Prof. Richard Wade was re-elected President of Council for 2008 and Prof. Thomas Henning was elected Vice-President. Mr Alain Heynen was appointed Chair of the Finance Committee for 2008. Dr Monica Tosi was appointed Chair of the Observing Programmes Committee for 2008 and Dr Svetlana Berdyugina was re-appointed Vice-Chair.

Membership of the ALMA Board was confirmed for a year or until the possible restructuring of the Board had taken place.

The ELT Standing Review Committee chaired by Prof. Roger Davies met twice in 2007 and subsequently reported to Council.

The Scientific Strategy Working Group, chaired by Prof. Bruno Marano, met three times in 2007. In February and in May it elaborated on scenarios for ESO's future direction within astronomy in Europe. In September, it convened, together with a number of renowned experts, to discuss surveys. Reports on the outcome were presented to Council.

Council and Committee of Council 2007

President	Richard Wade
Belgium	Monnik Desmeth Christoffel Waelkens
Czech Republic	Jan Marek Jan Palouš
Denmark	Jens Viggo Clausen Henrik Grage
Finland	Kalevi Mattila Pentti Pulkkinen
France	Julien Galabru Laurent Vigroux
Germany	Andreas Drechsler Thomas Henning
Italy	Vicenzo Dovì Bruno Marano
The Netherlands	Jan A. C. van de Donk Piet C. van der Kruit (until 30 June 2007) Konrad H. Kuijken (as of 1 July 2007)
Portugal	Fernando Bello Teresa Lago
Spain	Xavier Barcons Jordi Torra
Sweden	Claes Fransson Finn Karlsson
Switzerland	Michel Mayor Martin Steinacher
United Kingdom	Gerry Gilmore (until 30 June 2007) Patrick Roche (as of 1 July 2007) Rowena Sirey

The ESO Tripartite Group met twice in 2007. The meeting in March was chaired by Dr Ugo Sessi and the meeting in September by the new Chair, Dr Patricia Laplaud. The Group received updates regarding the CERN Pension Fund and was kept informed about the measures taken for personnel regarding the reduction of operations at La Silla. Changes to the Staff Rules and Regulations concerning the education grant were discussed as well as changes to the calculation of the cost-of-living adjustment. The Tripartite Group received information regarding the collective bargaining for local staff in Chile and the advancement review and salary adjustments for international staff.

Finance Committee

In 2007 the Finance Committee held two ordinary meetings and two extraordinary sessions, which were all chaired by Ms. Rowena Sirey. They all took place at ESO Garching, except for the regular meeting in November 2007 which was held in Paranal. On this occasion, members of the committee had the chance to see the offices in Santiago, the observatories in Paranal and La Silla, and discover the latest developments at the ALMA site.

The committee dealt with various financial issues (annual accounts, budget, cash-flow situation, financial projections, member state contributions) and with personnel issues concerning International as well as Local Staff. These subjects were discussed in detail and recommendations were made to Council.

The Finance Committee approved the awarding of 16 contracts exceeding 300 000 € and 24 single-source procurements exceeding 150 000 €. The Collaborative Agreement between the National Astronomical Observatory of Japan and ESO was approved, and information was received concerning procurement statistics, forthcoming calls for tenders and price enquiries. The New Headquarters' Agreement on the lease and subsequent purchase of the land has also been approved, thereby enabling ESO to advance the planning for the extension of the headquarters building in Garching.

Some contracts for the design phase of the E-ELT could also be presented and approved by the Committee.

Finance Committee 2007

Chair	Rowena Sirey
Belgium	Alain Heynen
Czech Republic	Jaroslava Jeslínková
Denmark	Cecilie Tornøe
Finland	Jaana Aalto
France	Patricia Laplaud
Germany	Marlene Lohkamp-Himmighofen
Italy	Ugo Sessi Emanuela De Lauretis
The Netherlands	Coen J. van Riel
Portugal	Fernando Bello
Spain	Luis E. Ruiz López de la Torre Ayllón
Sweden	Sofie Björling Johan Holmberg
Switzerland	Jean-Pierre Ruder
United Kingdom	Colin Vincent

Finance

As in the last four years, the ESO financial statements showed a positive annual cash flow in 2007. The 2007 figure of +55.3 M€ included the one-time receipt of Spain's entrance fee, following the country's accession in 2006. During 2007, ESO also received the first regular contribution from the Czech Republic, the ESO thirteenth member state. The cash and short term deposits as of 31 December 2007 amounted to 144.5 M€.

The statement of income and expenditure for 2007 showed a slight excess of expenditure over income of 0.17 M€.

The budget for 2008 was approved by the ESO Council in December 2007. The budget comprises three sections: the income budget, the payment budget and the commitment budget.

With 189.7 M€, the payment budget covers in particular the 2008 requirements for the ALMA construction and for the European ELT detail design phase. In total, it is expected to be significantly higher than the 2008 income budget, which amounts to 164.0 M€. The commitment budget for 2008 is 232.7 M€.

A meeting of the Finance Department.

Financial Statements 2007
(in € 1000)

Balance Sheet	31.12.2007	31.12.2006
Assets		
Cash and short-term deposits	144 544	89 222
Claims, advances, refundable taxes and other assets	4 488	60 402
Total assets	149 032	149 624
Liabilities and equity		
Dues	12 371	6 803
Advance payments received and other liabilities	14 627	20 616
Total liabilities	26 998	27 419
Cumulated result previous years	122 205	46 675
Annual result	−171	75 530
Total equity	122 034	122 205
Total liabilities and equity	149 032	149 624

Statement of Income and Expenditure	01.01.2007–31.12.2007
Income	
Contributions from member states	134 649
Contributions from third parties and partners	5 227
Income from sales and other income	7 643
Total income	147 519
Expenditure	
Expenditure for staff	51 893
Operating and other expenditure	95 797
Total expenditure	147 690
Annual Result	−171

Statement of Cash flow	01.01.2007–31.12.2007
Cash flow from operating activities	
Receipts	
Income	147 519
Net movements on accounts receivable	55 913
Total	203 432
Payments	
Expenditure	−147 690
Net movements on accounts payable	7 449
Total	−140 241
Net cash flow from operating activities	63 191
Net cash flow from financing activities	−7 870
Net cash flow = Net increase/decrease in cash and short-term deposits	55 321

Budget for 2008
(in € 1000)

Income budget	2008
Contributions from member states	123 364
Other income from member states	7 736
Income from third parties	27 628
Various income	5 300
Total income budget	164 028

Payment budget	2008
Personnel cost	57 423
Other cost	132 316
Total payment budget	189 739

Commitment budget	2008
Personnel cost	57 423
Projects commitments w/o personnel	123 099
Operations commitments w/o personnel	52 220
Total commitment budget	232 742

The Scientific Technical Committee

The Scientific Technical Committee 2007

José Afonso (P) (Chair ALMA/APEX sub-panel)
Rafael Bachiller (E)
Willy Benz (CH)
Joris Blommaert (B)
Jean-Gabriel Cuby (F)
Raffaele Gratton (I)
Lauri Haikala (FIN)
Thomas Michael Herbst (D) (Co-chair E-ELT sub-panel)
Richard Hills (UK) (until first meeting in 2007)
Hans Kjeldsen (DK)
Yannick Mellier (F)
Dante Minniti (RCH)
Goran Olofsson (SE)
Michael Prouza (CZ)
Patrick Roche (UK) (Vice-chair, chair VLTI sub-panel)
Linda Tacconi (D) (Chair)
Leonardo Testi (I) (until first meeting in 2007)
Huib Jan van Langevelde (NL)

STC 66th Meeting

At its 66th meeting, held on 18–19 April, the Scientific Technical Committee (STC) endorsed the recommendation of the Science Working Group (SWG) that the ELT project office continues to study the design of a 42-m telescope because the superior spatial resolution and speed are required by two of the three primary science cases. The choice of a 42-m diameter will give ESO the best telescope in the world.

STC endorsed the plan presented by the ELT Project Office for launching the instrument and adaptive optics studies during Phase B. The plan foresees that the selection of instrument studies should be based on a mixture of single source procurements (SSP) and open calls. STC recommended not to initiate any further SSP for the new instrument concepts, but rather to issue well advertised open calls for instrument concept studies. Depending on the outcome of these open calls, STC considered that it could be necessary to support more than the two new instrument concept slots currently envisaged by the plan. STC also urged ESO to request proposals from the SSP teams, since all concepts will ultimately need evaluation.

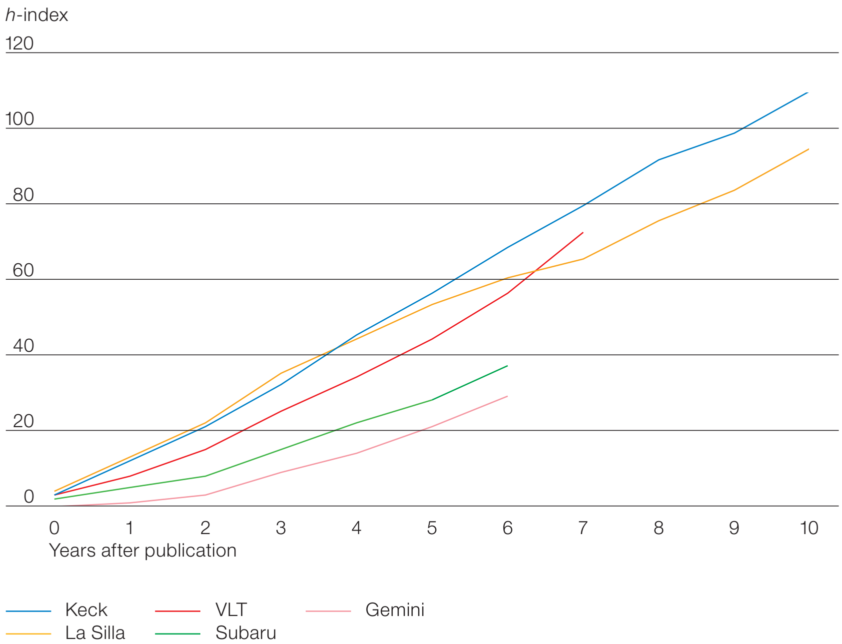
STC expressed their concern about the tight schedule for the E-ELT site selection and encouraged ESO to study aggressively and thoroughly more sites. In addition, STC proposed that the ELT project office assesses the validity of the current models used in testing the proposed ELT sites by applying these models to the La Silla and Paranal sites and compare the results with the real data.

STC recognised the continuing vitality of La Silla and the excellence of the science it delivers. The STC was convinced that the La Silla facilities remain unique for a large community of European astronomers, and that they will continue to deliver excellent science for many years to come. Thus, STC recommended that every effort be made to ensure that La Silla is preserved beyond 2010. ESO presented a plan to refocus and streamline operations on La Silla, which includes dedicating the 3.6-m to HARPS, restricting the NTT to EFOSC2 and a visitor focus, and not offering the 2.2-m on ESO time beyond 2009. The plan, that foresees starting preparations in Period 81 by moving EFOSC2 to the NTT and stopping service mode observations, was endorsed by STC that also anticipated that the La Silla facility will evolve towards observing runs of one week or longer in order to gain additional savings in operations costs.

In discussing the 2010+ outlook for La Silla, STC encouraged ESO to continue monitoring the scientific productivity as the operations model and instrument plan for La Silla 2010+ converge. Since the plan foresees no travel and scientific support beyond 2009, STC recommended to leave open the possibility of limited financial support for some programmes from the ESO community requesting the La Silla facilities beyond 2010. This would enable groups from smaller institutions to continue to exploit the scientific potential of La Silla.

STC was concerned that the continuing delay of the VLT Survey Telescope (VST) is impacting key components of ESO's scientific programme and indicated that the completion of the project is very urgent. Moreover, STC was seriously concerned about the potential absence of competitive optical wide field facilities at ESO on the short time scale, and urged ESO to start immediately a study of alternative plans or possible backup solu-

Scientific productivity of La Silla compared to the major ground-based optical observatories in the world. Since the *h*-index increases with time and La Silla is significantly older than the other observatories included, only the rate of change of *h* with time is relevant in this comparison. The slopes are seen to be comparable for La Silla, Keck, Gemini, and Subaru, but the growth rate is clearly steeper for the VLT.



Planet Jupiter is seen between the 3.6-m and the CAT at La Silla, while the Milky Way is seen in its full splendour.

Photo: S. Brunier

tions, such as technical studies to enable optical wide-field capability at the NTT or at the VLT. On the longer term, STC asked ESO to look for cost effective ways to enable and maintain wide-field imaging and spectroscopic facilities for the ESO community without jeopardising the other major approved ESO projects. In particular, and although full participation in the Large Synoptic Survey Telescope (LSST) may require an unrealistically large financial commitment from ESO, STC recommended that ESO continues the dialogue with the LSST consortium. Along the same lines, STC recommended to investigate optimum ways to realise leadership and/or major participation in competitive wide-field facilities in the ELT era.

STC 67th meeting

The 67th meeting of the STC took place on 23 and 24 October. The main items considered were the sub-committees, the next generation instruments for the VLT and VLTI, ESO's short term wide-field survey capabilities, and multi-conjugated adaptive optics.

Because of the increasing diversity and complexity of the ESO programmes, three expert committees on, respectively, ALMA, the E-ELT, and the VLTI, now advise STC. For historical reasons, these committees, which evolved from the ESAC in the case of ALMA, and the ESE in the case of the E-ELT, have different terms of reference. STC recommended that the terms of reference for the three sub-panels be reassessed and updated to reflect the evolving situations of the projects, and that more than one STC member be present on each of these committees. This would be crucial to optimise the effectiveness of the communication between the sub-committees and the STC, to provide redundancy of STC presence at the sub-committee meetings, and to expedite the discussion of the varied individual topics at the STC meetings.

STC noted that with the imminent PRIMA commissioning, the VLTI is about to gain new capabilities in high precision astrometry, while enhanced capabilities from second generation instruments will consolidate its position as the world-leading infrared interferometer over the next decade. Therefore, STC recommended that ESO follows a phased development aimed at bringing these instruments to the VLTI in the period 2012 to 2015. Since the ultimate performance of the instruments is tied to the performance of the VLTI infrastructure, which will need to be improved to allow them to realise their full scientific potential, STC recommend that continuing improvements in the infrastructure should be pursued vigorously, integrated with the PRIMA commissioning programme so that PRIMA reaches its design goals at the end of the commissioning period. The commissioning of PRIMA should be the highest priority for the VLTI, in addition, of course, to continuing to obtain high profile science results with the current VLTI system.

STC recognised that all three second-generation VLTI instruments presented at the meeting have high scientific potential, but considered that GRAVITY and MATISSE should be given the highest priorities and should now proceed to the next design phase. The third, VSI, which will make it possible to combine up to six telescopes simultaneously and will be a unique capability in the southern hemisphere, could proceed more slowly than the other two. However, STC stressed their wish to see a global and phased VLTI development plan considering the three instruments and optimising the common requirements on infrastructure, such as the physical space in the VLTI laboratory, adaptive optics, and fringe tracking.

STC stressed the importance of developing and maintaining a broad and innovative instrumentation suite for preserving the long-term competitiveness of the VLT into the ELT era. The initial set of VLT instruments will be old at that time and would have accomplished most of its goals. Noting that adequate funding has been reserved for new instrumentation in the mid- and long-terms plans, STC warmly thanked ESO for the efforts in collecting new ideas for future plans from the community by means of the "VLT in the ELT era" workshop, held in Garching the week prior to the STC meeting.

Following this workshop and their own ensuing discussions, STC recommended that a new long-term instrumentation plan be devised, commencing nearer to completion of the current second-generation VLT instrument suite. This plan should include at least the following instrument concepts:
– A very stable, high resolution spectrograph, able to measure radial velocities with very high precision in order to search for rocky planets, measure possible variations of physical constants, and make detailed analysis of the chemical composition of stars in nearby galaxies;
– A wide field, very high multiplex spectroscopic facility to exploit the wide field imaging capabilities that will be available in the near future;
– Upgrades and/or replacements of the VLT 'work-horse' instrument capabilities. In particular, these would include a multiplex near-infrared (NIR) spectroscopic capability, intermediate to high spectral resolution optical and NIR spectroscopy, and NIR diffraction limited imaging.

The STC strongly advocated that any new instrument concepts should not include changing the fundamental design of any of the VLT's Unit Telescopes, nor compromise the VLTI capabilities or put severe stress on ESO's resources. STC recommended that an open plan including these instruments, as well as at least one open slot for new concepts, be established following procedures similar to those followed for second-generation VLT instruments.

STC welcomed the positive news, presented at the meeting, about the progress and recovery plans for the VST and the foreseen start of operations in 2009. Stressing that the successful operations of both VISTA and VST are of very high priority for the study of dark energy, STC stressed that it continues to be important for ESO to look for cost effective ways to enable and maintain wide-field imaging and spectroscopic facilities for the ESO community without jeopardising the other major approved ESO projects. As an example, STC recommended that, together with the OPC, ESO investigates ways to begin soon spectroscopic public surveys with VIMOS, urging ESO to upgrade VIMOS with CCDs with higher quantum efficiency in the red for this purpose.
In the vision of STC, such surveys would provide an essential complement to the VISTA and VST imaging surveys in the short term, while new next generation instrumentation for the VLT would ensure ESO competitiveness in this field in the longer term.

The STC continued to be impressed with the performance of the Multi-Conjugate Adaptive Optics Demonstrator (MAD), and applauded ESO and the MAD team for this remarkable demonstrator. Noting that an instrument able to further exploit multi-conjugate adaptive optics on a short timescale would be highly welcome, STC encouraged ESO to investigate ways to continue to make MAD available to the community for additional observing runs to exhaust the potential observing opportunities available with this system.

Photo: S. Guisard

Sunset over Paranal and the VLT.

Public Outreach

ESO's outreach and education programme includes a wide range of activities, encompassing, for example, press releases, videos, printed matter, exhibitions, open houses, high-level events, contests, education material and summer schools.

In 2007, ESO issued a record 55 press releases: 23 presented outstanding science results made possible with ESO telescopes, 10 were press photos, 7 concerned new instruments, 9 dealt with ESO as an organisation, and 6 were ALMA releases. Among the very successful press releases was the discovery of Gliese 581c with the HARPS instrument in La Silla. This is the most Earth-like planet ever found around another star, where water possibly flows on the surface, although this has recently become subject to further debate. Thanks to its intrinsic news value, but also to dedicated effort involving the distribution of custom broadcast-quality video and background material, the news received worldwide coverage. The story reached several hundred million viewers on TV, including during prime time, and millions of readers through the written press. It goes without saying that the equivalent advertisement value is tremendous. The interest in this story did not fade throughout the year, with many requests coming from producers, magazines and authors of books. Other highlights were the images of the Great Comet McNaught, the anniversary of supernova SN 1987A, the ALMA transporters, the superb image of the galaxy taken in the presence of European Commissioner Potočnik, and the UN Resolution on the International Year of Astronomy, in which ESO played an important role.

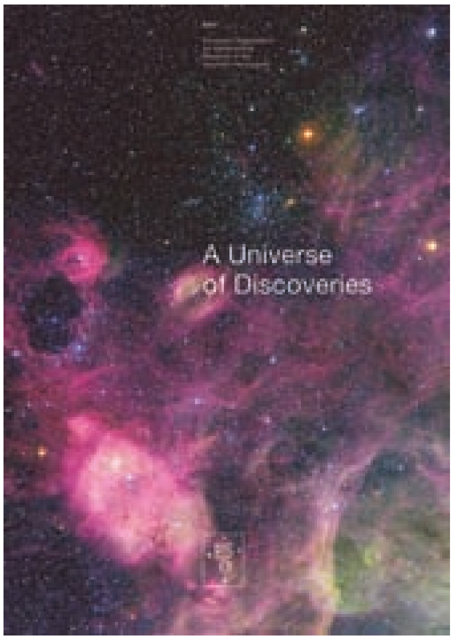
For the ALMA transporters, a dedicated press and industry event was arranged in collaboration with the company that built them, Scheuerle GmbH. This also ensured that ESO was visible in a very different section of the press than usual, i.e. the truck and special vehicle press.

In the area of printed matter, a completely new 48-page ESO brochure was published in English and German. This brochure will also be made available in most of the other languages spoken in ESO member states, and translation work was in progress in 2007. A total of eight languages will be ready for distribution in early 2008, while the remaining three will be completed by mid-2008.

Videos

As already alluded to above, a special effort is made as regards to providing video material (footage, interviews, animations) to broadcasters. This is distributed via video newsreel on the occasion of important press releases, or as regular updates to the 'collection tapes' on La Silla, Paranal, and ALMA. A list of broadcasters is maintained for this purpose. This effort led to many broadcasts, reaching a very wide audience that is otherwise very difficult to address. In addition, we provide support to journalists, including TV crews, coming to the various ESO sites. The video material is also distributed through the ESO website, as well as on sites such as *YouTube*. On these sites, users also contribute new material based on ESO-made videos. This shows how well ESO is entering into the public sphere and adding hundreds of thousands of young viewers to the ESO audience.

In September 2007, on the occasion of the first visit of Tim de Zeeuw as ESO Director General to the Chilean sites, a group of Dutch journalists paid a visit to ESO's Vitacura Centre, and the Paranal and Chajnantor sites. This resulted in very wide coverage of ESO in Dutch media, including on TV. In November a group of ten journalists – including two TV crews – from French-speaking Belgium visited Paranal, together with the Walloon Minister for Research, Marie-Dominique Simonet. This also resulted in very extensive media coverage. These are but two examples of activities were ESO collaborate actively with institutes or funding agencies in member states. Other examples include the participation of ESO to the STFC Town Hall meeting on outreach and education and to the ISSI Forum on Space Science and Education.



Cover of the 48-page ESO brochure.

Because the importance of television as a distribution channel for science cannot be overstated, the ESO Public Affairs Department also participated in the World Congress of Science and Factual producers that took place in New York in November. This annual event brought together more than 550 international broadcasters, producers and distributors from more than 20 countries, providing a unique chance to meet the key actors in this field and promote ESO.

As far as video is concerned, it is worth noting that a new movie was made, presenting ESO and its various activities and sites. The movie was made available on DVD, as well as on the ESO website, and in five languages.

The ESO Web

Another major milestone in 2007 was the complete overhaul of the ESO website, which received 2.5 million visits over the year. This revamping was clearly needed to reflect the changes in its usage since its conception in 1994. Since then the ESO Web has expanded rapidly, both in the amount of information and services that are provided as well as in terms of access rates. In spite of the information and services that have been continuously added to the ESO Web over the past years, its structure had not been adapted; the 'Look and Feel' still reflected the predominantly science-oriented approach and usage of the ESO Web in the mid-nineties. New information and services were added arbitrarily to the old structure and could not easily be integrated into the existing navigation. Consequently, the ESO Web became increasingly complex, barely maintainable and it became increasingly difficult to store new information and services that would be easy to find and use.

The new ESO Web addresses these issues. It is now divided in three major user areas:
1. Public. This area is intended for the general public, press and media, (potential) industrial partners and people interested in working at ESO. The area is partially based on existing information, but also with new content.
2. Science Users. The area is intended for professional astronomers who are doing, or are planning to do, research using ESO facilities.
3. Intranet. This area is for ESO Staff only.

In its current implementation the ESO Web still consists of many single web pages that use a common style and navigation. In the near future it is planned to move to a database-backed Content Management System. This will substantially improve maintainability of the site and will serve all web users with the most current information and a common Look and Feel.

A string of exhibitions

As part of our aim to be known to as many people as possible and to share our passion and efforts to understand the Universe, we try to engage with the public as often as possible. For many years now, ESO has therefore participated in exhibitions aimed either at the general public or specific groups. The year 2007 was no exception and ESO participated in a string of exhibitions in many countries.

For the first time, ESO was present at the Winter Meeting of the American Astronomical Society (AAS) which took place in early January in Seattle, USA. The meeting, which was held jointly with the Annual Meeting of the American Association of Physics Teachers, gathered over five days about 3000 astronomers and hundreds of teachers, and also attracted many journalists. On account of its shear size, the AAS Winter Meeting is one of the astronomical events of the year, especially for years in which there is no IAU General Assembly, and it is thus no surprise that ESO decided to be present with an exhibition stand, featuring a VLT model. ESO's presence was very much appreciated and many astronomers and teachers came by to get the latest information on the most recent developments. In particular interest was high in the Laser Guide Star project, ALMA and, of course, the E-ELT. ALMA was also represented at the AAS meeting on the NRAO stand, our colleagues in this global project. In addition to the exhibition, ESO was present at some of the press briefings, including the one on the discovery of the first triple quasar and on results from the COSMOS survey. This, in turn, resulted in an enhanced presence of ESO in the media, ironically also on the European scene. ESO's first participation in the Winter Meeting of the AAS appeared therefore well justified and we look forward to attending next year's event in Austin, Texas. From Seattle, the exhibition stand of ESO was then transferred a little bit further south, to San Francisco, where from 15 to 19 February, the Annual Meeting of the American Association for the Advancement of Science took place. With an estimated 10000 participants and visitors, it is a privileged place for exchanges between American and European scientists and science policy makers, as well as an opportunity to get in touch with a large number of science journalists in a very short time-span. With its 30 m^2 information stand at these two major events, ESO and its ambitious projects have been well represented across the Atlantic.

In Europe, an important event was JENAM, the Joint European and National Astronomy Meeting, organised annually in one of the European countries jointly by the European Astronomical Society and one of the national astronomical societies. In 2007, JENAM took place in Yerevan, Armenia, allowing many visitors, especially from the West, to discover a unique culture and country. ESO was of course present at this European astronomical event with, among others, an exhibition, providing thereby an occasion for the young astronomers from Eastern Europe to become acquainted with ESO.

A French version of the ESO exhibition went on a real *tour de France*, travelling from Meursault to Paris, and then to Meudon. At the end of May, the city of Meursault in Burgundy was renamed 'Meursault les Etoiles' for five days, as it featured many astronomical activities for schools and the general public. In June, ESO participated for the third time in the European Research and Innovation Exhibition in Paris, an event that attracted about 25000 visitors. In 2007, ESO formed a partnership for this exhibition with three astronomical institutes from Paris that develop instruments together with ESO, or make use of ESO telescopes: the Paris Observatory, the *Institut d'Astrophysique* and the CEA/Saclay

Senior high school students, crowding the ESO stand at the International Festival for Astronomy, were particularly interested in the ALMA project.

Service d'Astrophysique. Staff from these institutes manned the ESO stand and interacted with the public. Most were former ESO staff and they greatly enjoyed sharing their knowledge of the organisation. They also helped present the videoconferences that took place daily from Paranal, with Olivier Hainaut at the other end of the line. Later, in October, the ESO exhibition was featured at the Meudon site of the Paris Observatory during the Science Week. About 1000 kids came along to see it with their schools, while on the Sunday, 1600 people visited.

France was not the only country visited of course, and ESO was also present in Switzerland, Germany and the Netherlands. In Switzerland, ESO participated in the first Swiss Astronomy day, which took place on 20 September on the Üetliberg near Zurich. One of the organisers, Ms Barbara Burtscher, had won ESO's special donated prize of a trip to Paranal, at the 16th European Union Contest for Young Scientists in 2004. The September event in Zurich featured Bruno Leibundgut as one of the speakers. Bruno also moderated several videoconferences from Paranal, this time with Thomas Szeifert on the other side. The event attracted some 1500 visitors.

In Germany, ESO had a stand during the 80th Annual Scientific Meeting of the *Astronomische Gesellschaft*, which also hosted the 5th biennial Workshop on Astroparticle Physics. The event, where ESO's Director General presented the ASTRONET Science Vision book, took place on 24–28 September and was attended by some 300 participants.

Finally, in the Netherlands, ESO was present with an information stand at the International Festival for Astronomy (IFA) that took place near Utrecht. This three-day event, which focuses on senior high school students and beyond, was organised by the Dutch Youth Working Group for Astronomy and The Royal Netherlands Society for Meteorology and Astronomy. Amongst many other interesting sessions, the winners of the Catch a Star 2007 competition (see below), Jan Měšťan and Jan Kotek from the Czech Republic, showed a presentation of their trip to the Paranal Observatory.

Long Night of Science, October 2007.

In October, ESO also participated to the golden anniversary of the Garching Campus, home to the ESO headquarters in Germany. The campus has indeed existed since 1957, when the 'Garching Atom-egg' was inaugurated. Since then, the Garching Campus has developed extensively. There are now about 4000 people who work on the campus, in addition to the 8500 students, making the campus almost as populous as the town of Garching itself. Albeit ESO only joined the Campus in 1980, it participated fully in the activities for the 50th Anniversary, organising or taking part in several public events. The set of activities started on 26 September, with a gala evening, featuring high-level politicians, including the then Prime Minister of Bavaria, Dr Edmund Stoiber, and the German Federal Secretary of State for Research, Dr Thomas Rachel. On 2 October, ESO organised a round-table discussion on the topic of "Arts and Science". The discussion was moderated by a well-known space-science journalist, Dirk Lorenzen. Hans-Ulrich Käufl from ESO responded to Ernst-Peter Fischer, Dieter Ronte, and Elmar Zorn, on the interplay between the two very different sensitivities and how they can apprehend the world. The event, which was broadcast on Bavarian TV, was very successful, drawing participants from all over Germany and abroad, and allowed people to see the ESO Headquarters building in a new and unique setting: on this occasion, paintings by Rita Adolff-Wollfarth, a German painter who also participated in the discussion, were on display in the building.

On 13 October, the campus organised a 'Long Night of Science', running from 18:00 till midnight. As usual, ESO, with the participation of staff from all the divisions, set up a wide range of activities. The visitors could watch the latest ESO movie or attend short scientific talks on many subjects – from the history of the telescope to the principles of interferometry, from the study of exoplanets to the interaction of galaxies. They could also glance at the exhibition, featuring panels and models, or talk with the many staff present. They could address their questions to Nancy Ageorges in Paranal over the video link, with Christian Hummel in Garching taking the role of moderator. Activities were also organised for the young, such as puzzles, a stamp quest, a quiz and a planetarium show. As the weather was fine and the skies clear, the members of the AGAPE hobby astronomy group were able to share their enthusiasm with visitors. The Charity group also set up a very successful stand, selling a variety of food from different European countries that had been generously prepared by many ESO staff and their families. Particularly popular were the Belgian waffles, whose mouth-watering smell attracted many people. By the end of the night, about 1800 people had visited ESO's headquarters during the six-hour period. A remarkable achievement, since at the same time, the national soccer team was playing a qualifying match for the European Championship!

ALMA EPO

ALMA is a project involving several partners split over different continents, who are working together to build the largest and highest astronomical observatory in the world. It is important that these partners also work together on outreach activities, avoiding duplicate work and instead enhancing and coordinating their work. At the General Assembly of the International Astronomical Union in the summer of 2006 an Education and Public Outreach Working Group (EPO WG) was formally set up, composed of members from the outreach groups of the three partners (ESO, NRAO and NAOJ), as well as the respective ALMA scientists in the Executives and at the Joint ALMA Observatory (JAO). In 2007, the JAO also recruited a Press Officer, who now chairs this working group and coordinates activities in Chile where all three partners are present. One or two face-to-face meetings will take place annually, and the one in 2007 took place at the JAO headquarters in Santiago, Chile. Regular phone conferences, as well as a dedicated mailing list, allow the members of the working groups to share information.

Apart from promoting ALMA in several events or with dedicated news releases, press conferences, and production of material, the EPO WG also started the complete process of defining a strategic, short-, and long-range plan, a budget, and guidelines and procedures for working together. These were submitted for approval to the ALMA board. The next steps to be taken in the first part of 2008 are to define the ALMA Corporate Identity and develop a completely new, centralised ALMA web site.

Education activities

"Catch a Star" is ESO's flagship education activity for school students, and in 2007 this international competition took place for the fifth time. It was named "Catch a Star 2007" as the deadline occurred in this year, although the competition opened in late 2006. The competition is organised in collaboration with the European Association for Astronomy Education (EAAE), and is open to school students worldwide (although certain prizes are restricted to entrants from Europe and Chile).

"Catch a Star" has now evolved to include three different categories, to ensure that all students are able to take part, no matter what their level. In the *Researchers* category, written projects with an astronomical theme are judged by an international jury, with the top prize being a trip to visit the VLT on Paranal. In the *Adventurers* category, prizes are awarded by lottery, to avoid a sense of elitism. In the Artists category, students enter astronomically-themed artwork which is displayed in a public gallery, and prizes are awarded with the help of a web-based vote.

Over 100 written projects were submitted from 22 countries, and the top prize was won by Jan Měšťan, Jan Kotek and their teacher Marek Tyle, from the Czech Republic. Their project on "Research and Observation of the Solar Eclipse" told how they had studied solar eclipses, and involved their fellow students in observations of an eclipse from their school in 2006. The winners were announced at the EIROforum "Science on Stage 2" festival in Grenoble.

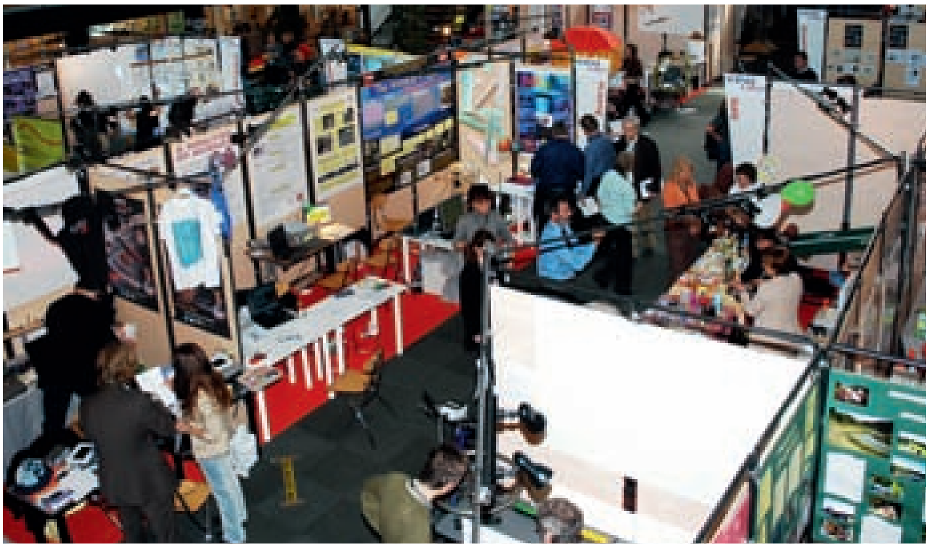
The *Artists* competition also proved to be extremely popular, with 395 artworks submitted – a large increase over the previous year's figure of 60. Efficient handling of the larger number of registrations, as well as the public *Artists* gallery, was made possible by a complete overhaul of the competition's web-based infrastructure, with the implementation of dynamically-generated pages, a database backend, and an interface for students to submit their work and edit their registration details themselves. This technical development put the competition on a robust footing for the launch of "Catch a Star 2008", which opened in late 2007.

In April 2007, the second EIROforum "Science on Stage" European science teaching festival took place in Grenoble, France. This international festival was attended by about 500 educators, who had been selected from national events in 28 countries. As with the first "Science on Stage" festival, the aim was to stimulate original and high-quality science

Report from Catch a Star winners in the Winter 2007 issue of *Science in School*.

teaching in Europe, and to expose teachers to cutting-edge scientific research, as part of the EIROforum "European Science Teaching Initiative" (ESTI). Over the course of "Science on Stage" 1 and 2, and the earlier three "Physics on Stage" events, it is estimated that approximately 2000 teachers participated in the international festivals and 30000 in the national events.

The other pillar of the ESTI project is the European science education journal, "Science in School". This journal was launched in March 2006, and offers a mix of teaching materials, articles on cutting-edge science, interviews with scientists, and more. It is published quarterly by the EIROforum, with a print run of 30000 copies, and is also freely available on the web, where translated articles are also present. ESO has participated in the journal's editorial board, and has also used it as a powerful way to communicate about our activities to teachers and other educators. During 2007, the journal regularly featured ESO- and astronomy-related stories, and these have been among the most popular according to reader feedback. Science in School as a whole is very popular among readers; in evaluation activities, readers reported that it was "a useful teaching tool which effectively inspires teachers and provides creative ideas for teaching science".



The fair at the Science on Stage 2 festival.

The first joint ESO-EAAE Summer School, for teachers with an interest in astronomy, took place in July 2007 at the ESO headquarters in Garching. ESO had supported the previous EAAE summer schools, by providing speakers and taking care of the printing of proceedings. Building on a decade of success with these EAAE schools, the idea behind a joint ESO-EAAE summer school was to encourage a stronger interaction between teachers and active scientists, and to introduce the teachers to the latest news and results from ESO.

The first joint school had the topic "Strategies for Effective Teaching of Astronomy", and brought together 50 educators from 16 European countries plus Chile, who took part in astronomy-teaching workshops, sharing ideas and best practice. Claus Madsen gave a presentation on science education in a European context, and Douglas Pierce-Price spoke about ESO's educational programmes. There was also a series of talks by ESO astronomers on the latest work of the organisation. These comprised talks by Roberto Gilmozzi (on the E-ELT), Paola Andreani (on ALMA), and Ferdinando Patat (on supernovae), which were all very well received by the teachers. In addition, there were amateur observing sessions kindly arranged by AGAPE, the group of hobby astronomers at ESO, and a live video link to the VLT on Paranal. This school was part of the EC Comenius Programme, meaning that participants could apply for funding from the EC to attend. At the end of 2007, the second joint ESO-EAAE summer school was being organised, and it is planned to take place in Granada, Spain, in July 2008.

ESO Press Releases

ESO Press Photo 01/07 (3 January): ESO PR Highlights in 2006
ESO Science Release 02/07 (8 January): It Is No Mirage!
ESO Organisation Release 03/07 (11 January): Tim de Zeeuw to Become the Next Director General of ESO
ESO Instrument Release 04/07 (17 January): Big Red Eye is Ready
ESO Press Photo 05/07 (19 January): The Great Cometary Show
ESO Instrument Release 06/07 (21 February): The Sky Through Three Giant Eyes
ESO Press Photo 07/07 (23 February): The Celestial Whirligig
ESO Science Release 08/07 (24 February): SN 1987A's Twentieth Anniversary
ESO Press Photo 09/07 (7 March): The Giant that Turned Out to be a Dwarf
ESO ALMA Release 10/07 (7 March): The Antenna Bride and Bridegroom
ESO Science Release 11/07 (7 March): Solar Power at Play
ESO Science Release 12/07 (13 March): Star Family Seen Through Dusty Fog
ESO ALMA Release 13/07 (14 March): A Roof for ALMA
ESO EIROforum Release 14/07 (15 March): Waking-up to Science!
ESO Science Release 15/07 (22 March): Fingerprinting the Milky Way
ESO Press Photo 16/07 (27 March): The Purple Rose of Virgo
ESO Science Release 17/07 (28 March): Controlled by Distant Explosions
ESO Science Release 18/07 (29 March): The Impossible Siblings
ESO Instrument Release 19/07 (30 March): New Adaptive Optics Technique Demonstrated
ESO ALMA Release 20/07 (3 April): ALMA to Help Solving Acute Mountain Sickness Mystery
ESO Organisation News 21/07 (13 April): School students "Catch a Star"!
ESO Science Release 22/07 (25 April): Astronomers Find First Earth-like Planet in Habitable Zone
ESO Science Release 23/07 (10 May): A Galactic Fossil
ESO Science Release 24/07 (23 May): A Brown Dwarf Joins the Jet-Set
ESO Science Release 25/07 (31 May): Chronicle of a Death Foretold
ESO Science Release 26/07 (12 June): Matter Flashed at Ultra Speed
ESO Instrument Release 27/07 (13 June): Free from the Atmosphere
ESO Science Release 28/07 (19 June): Back on Track
ESO Science Release 29/07 (6 July): Star Surface Polluted by Planetary Debris
ESO Instrument Release 30/07 (6 July): GROND Takes Off
ESO Science Release 31/07 (12 July): The Gobbling Dwarf that Exploded
ESO ALMA Release 32/07 (30 July): Birth of a Colossus on Wheels
ESO Press Photo 33/07 (2 August): The Planet, the Galaxy and the Laser
ESO Science Release 34/07 (3 August): Star Caught Smoking
ESO Instrument Release 35/07 (4 August): First Light for World's Largest 'Thermometer Camera'


La saga des trous noirs

ESO Instrument Release 36/07 (22 August): HAWK-I Takes Off
ESO Press Photo 37/07 (23 August): Edge-on!
ESO Web Release 38/07 (3 September): Professor Tim de Zeeuw Takes Up Duty as New ESO Director General
ESO Press Photo 39/07 (3 September): Stellar Firework in a Whirlwind
ESO Science Release 40/07 (14 September): Galaxy 'Hunting' Made Easy
ESO Science Release 41/07 (18 September): A Warm South Pole? Yes, on Neptune!
ESO Science Release 42/07 (27 September): The Frugal Cosmic Ant
ESO Science Release 43/07 (27 September): Into the Chrysalis
ESO ASTRONET Release 44/07 (28 September): A Grand Vision for European Astronomy
ESO ALMA Release 45/07 (5 October): A Colossus Gets its Name
ESO Organisation Release 46/07 (5 October): Catch a Star 2008!
ESO Science Release 47/07 (11 October): Drizzly Mornings on Xanadu
ESO Organisation Release 48/07 (29 October): Commissioner Potočnik at Paranal Observatory
ESO Press Photo 49/07 (9 November): A Galaxy for Science and Research
ESO ALMA Release 50/07 (22 November): Close to the Sky
ESO Organisation Release 51/07 (23 November): ESO Helps Antofagasta Region after the Earthquake
ESO Science Release 52/07 (28 November): Discovering Teenage Galaxies
ESO Science Release 53/07 (19 December): Speedy Mic's Photograph
ESO Organisation Release 54/07 (20 December): 2009 to be the International Year of Astronomy
ESO Press Photo 55/07 (21 December): Anatomy of a Bird


Äntligen! Ett nytt jordklot funnet!

The discovery of Gliese 581c got worldwide attention.

European and International Relations

Even to the casual observer of how international science is conducted and managed, it is clear that complexity has increased during the recent years. This development is at least technology-*enabled*, as is manifest in the emergence of *e-science* (including AVO and grid technologies), but probably at a deeper level even technology-*driven*. This happens, so to speak, as collateral of the wider issue of globalisation. This is also the case for the European Research Area (ERA), which has been conceived in the light of Europe's so-called Lisbon Strategy. With the ERA, new networks and modes of collaboration in science have surfaced, impacting the way that ESO interacts with the scientific community as well as with funding agencies and science policy-making bodies. Simply put, in the past our relations with the outside world were predominantly bilateral, whereas today we see a multilayered web of relations both within Europe and beyond our shores.

Aside from ALMA, where ESO represents its member states in a quasi-global project, other examples include ASTRONET, a so-called ERA-net under the European Community Framework Programme, whose aim is to establish a comprehensive long-term plan for the development of European astronomy. ESO is a full participant in ASTRONET.

At the same time, the EIROforum partnership, of which ESO is an active member, is now widely recognised as a key actor in the European Research Area. Since July 2007, CERN has held the rotating Chairmanship. In July 2008, ESO will follow.

Even what appears to be straightforward bilateral cooperation projects may occasionally involve European Union funding with related policy aspects.

At the other end of the 'geographical scale', ESO was granted observer status at the United Nations Committee for Peaceful Uses of Outer Space (UNCOPUOS), both to raise support for the International Year of Astronomy and also with a view to wider issues such as the protection of the skies.

EU-matters

In the frame of the EIROforum partnership, in February we participated in the MIT European Career Fair and Science Policy Meeting in Boston, which was organised jointly by the European Commission and the MIT European Club, with support from several ESO member state embassies and the MIT International Science and Technology Initiatives (MISTI). The purpose of this recurrent event is to raise awareness among young researchers of the European Research Area as an attractive place to work and live in.

In April 2007 the European Commission published for public consultation its Green Paper entitled "The European Research Area: New Perspectives" (COM(2007) 161 final). The paper basically constituted a catalogue of 35 concrete questions covering a wide spectrum of possible actions to support the further development of the ERA. Among these questions was also the possibility of EC membership of the intergovernmental organisations "to increase the coherence, quality and delivery of European efforts in a number of research fields." In its joint response published in September, EIROforum acknowledged the suggestion of closer cooperation between the EC and the intergovernmental organisations, based on the principle of reciprocity and underpinned by targeted practical agreements, subject to negotiations between the individual organisations and the EC.

The Green Paper and the many reactions were discussed at a high-level Conference on "The Future of Science and Technology in Europe" in Lisbon, between 8 and 10 October 2007 under the auspices of the Portuguese EU Presidency. Among the conclusions were a confirmation of the important role that the intergovernmental organisations play in the context of the ERA, but also the need for enhanced cooperation between them, e.g. as expressed in the EIROforum partnership, as well as with the European Commission.

The FP6 funded ASTRONET programme is pursued by 18 funding agencies across Europe, in addition to ESA and ESO. One fundamental goal is to set up an overall European astrophysical strategic plan, covering all branches of astronomy and all nations of the enlarged European Research Area, for the next 20 years, using a two-step procedure. The first step was to produce an integrated Science Vision from thematic panels and a Science Vision Working Group, both drawn from the scientific community. Detailed mid-term feedback from the community was secured through a web forum and an open symposium that took place in January in Poitiers, France, with participation from 31 countries. The Science Vision effort, led by Prof. Tim de Zeeuw (then at Leiden University) and managed by ESO, was completed this year, with the Science Vision document aired and widely distributed by the end of September. The subsequent task of drawing up by the autumn of 2008 a prioritised infrastructure roadmap to implement the Vision began in May under STFC leadership and with significant ESO staff involvement.

Participation in the 7th Framework Programme

In 2007 ESO submitted three proposals to the 7th Research and Development Framework Programme (FP7): EVALSO, EuroVO-AIDA, and E-ELT Prep. All three were accepted by the European Commission for funding.

The EVALSO project (Enabling Virtual Access to Latin-American Southern Observatories) aims to connect ESO's La Silla Paranal Observatory to the Chilean data network and to develop new ways of doing astronomy using ICT and large capacity networks. It complements the international infrastructures created in the last years with the EC support (GÉANT, ALICE/RedCLARA) and will be another step in the creation of an advanced instrumentation data Grid in Latin America. In the context of European and international relations, it is yet another example of how R&D projects, international co-operation, EU funded actions and ESO's own activities are intertwined. EVALSO has an overall budget of 3.6 M€, of which 1.6 M€ will be covered by European Commission (EC) funding. ESO's share of the cost is 0.5 M€, with the rest covered by eight partners, including *Cooperación Latino Americana de Redes Avanzadas* (CLARA) and *Red Universitaria Nacional* (REUNA). The project is led by INAF.

The EuroVO-AIDA project will lead the transition of Euro-VO into an operational phase. The aim is to integrate the technology, networking and service activities of Euro-VO into a fully functioning *e-infrastructure*. This project brings together eight partners, with CRNS/INSU as coordinator. The overall budget is 3.4 M€ including a 2.9 M€ EC contribution.

The E-ELT Prep project complements the 2007–2009 Phase B (final design) of the European Extremely Large Telescope (E-ELT), presently conducted by ESO. E-ELT Prep has a total budget of 6.1 M€, including a 5.0 M€ contribution from the European Commission and will run for two years, in 2008–2009. ESO acts as a mono-partner in this project on behalf of all its member states, coordinating contributions from 25 institutes in eight member states. The EC involvement became possible as the E-ELT is included in the Roadmap established in 2006 by the European Strategy Forum for Research Infrastructures (ESFRI).

Besides the new contracts, ESO participates in 11 FP6 contracts running for some more years.

Visit of European Research Commissioner Janez Potočnik.

Visit of Marie-Dominique Simonet, Minister of Research in the Walloon Regional Government.

High-level visits

During the year, several science policy makers took the opportunity to visit ESO's facilities in Chile. The visits included ESFRI Chairman John Wood (in March), European Research Commissioner Janez Potočnik with key Commission officials (in October), Minister of Research in the Walloon Regional Government Marie-Dominique Simonet (in November) as well as a high-level delegation from France, led by CNRS President Catherine Bréchignac (in December). Furthermore, members of the Budget Committee of the German Federal Parliament visited Paranal in August.

Bilateral relations

In the course of the year, informal exchanges took place with several countries potentially interested in joining ESO. The formal negotiations with Austria that had been initiated in 2006 at the request of the Austrian government continued.

With respect to current member states, ESO organised an Information Day for Czech Industry on 8 June in Prague, with same-day participation in a side-event for Czech students taking part in an 'Astronomy Olympiad' at the Czech Academy of Sciences. Earlier in the year, we had organised an event for Finnish Industry in collaboration with *Finpro*, an association to support Finnish industry in the international marketplace. This event took place at the ESO Headquarters, as did a similar meeting with potential Austrian companies and institutes as part of the process to identify possible in-kind contributions from Austria in case of Austria joining ESO.

Furthermore, a joint ESO-Czech working group was convened in the autumn to consider the creation of a "Centre for Cooperation with ESO and ESA", or – for short – the "E2S Centre", to be placed on the site of the Ondřejov Observatory. The planned centre, which would be largely funded by means from the European Union Structural Funds might serve as a
- Regional Training Centre (RTC),
- ALMA Regional Centre (ARC*let*),
- VLT/VLTI and E-ELT involvements coordinator,
- Technology Information Centre (TIC), and
- Public Outreach Centre (POC)

for the Czech Republic and possibly for neighbouring Eastern European countries.

The International Year of Astronomy

With IAU as its main partner, but also in cooperation with UNESCO, INAF and others, ESO has provided significant support for the International Year of Astronomy (IYA 2009). The support includes hosting of the IAU IYA Secretariat at the ESO Headquarters but also help and assistance in the year-long diplomatic effort to win adoption by the United Nations' General Assembly of the necessary resolution for the formal declaration of the Year. The support has been warranted as ESO and its member state astronomers have a strong interest in raising public awareness of our science and the IYA 2009 promises to become an excellent and unique vehicle for this. It is therefore with satisfaction that we note the approval of the IYA 2009 Resolution through the UN General Assembly on 19 December. The resolution "[…] designates the United Nations Educational, Scientific and Cultural Organization (UNESCO) as the lead agency and focal point for the Year, to organise activities to be realised during the Year, in collaboration with other relevant entities of the United Nations system, the International Astronomical Union, the European Southern Observatory and Astronomical societies and groups throughout the world." It is the first time in ESO's history that our organisation has been named in a formal UN Resolution.

The Czech Industry Day.

The United Nations delegation.

Right: Twisted Spiral Galaxy NGC 134 observed during the visit of European Commissioner for Science and Research, Janez Potočnik.

Relations with Chile

For the very first time, the Chilean Ministry of Foreign Affairs hosted an international workshop on Astronomy. The event, held on 4 and 5 December 2007 and called "Chile: A Window into the Universe", was jointly organised by the Ministry and all international observatories currently operating in Chile, including ESO, as well as the Chilean Astronomical Society and the National Commission for Science and Technology.

The workshop provided the opportunity of bringing together a wide range of institutions, including local universities, representatives of local governments, members of industry, officers dealing with legal affairs, and Chilean national agencies in charge of key issues, such as the environment, light pollution control, mining and the administration of the electromagnetic spectrum. This event produced a rich, lively discussion on future challenges for astronomical activities in the country, including the protection of the sky and the possible installation of new international facilities in the next decades.

The year 2007 also marked the continuation and systematisation of a wide range of educational and public outreach activities in the country, as part of ESO's programme of engagement with Chilean society.

In collaboration with the Education Department of San Pedro de Atacama and the EXPLORA Programme, an interactive exhibition on Physics was offered to the local community in October. More than 90 % of the primary schools in the area participated, enjoying the lively displays and demonstrations. Also with EXPLORA, ESO contributed to the Chilean National Science Week, with the organisation of an exhibition in Santiago on the VLT, ALMA and the ELT, attended by more than 30 000 people. In addition, secondary students from Antofagasta, La Serena and San Pedro de Atacama had the opportunity of visiting Paranal, La Silla and APEX during their regular classes, as ESO participated for the first time to the "Open Labs and Observatories" programme.

ESO's collaboration with the town of Taltal, the nearest town to Paranal, continued. ESO provides a scholarship programme for schoolchildren and university students. This year, an educational astronomy exhibit was inaugurated at the city's museum, presenting the VLT in a visual way, and highlighting the importance for astronomical observations of protecting the night sky against light pollution.

ALMA-related activities

In November, a new ALMA outreach and educational book was publicly presented to officials of San Pedro de Atacama, in the context of the celebrations of the anniversary of the Andean village. Entitled "Close to the sky: Biological heritage in the ALMA area", and published in English and Spanish by ESO in Chile, the book is a collection by experts of unique on-site observations of the flora and fauna of the ALMA region. Copies of the book were distributed to all schools in the area, as a contribution to the education of students and young people in northern Chile.

In March, an official 'topping out' ceremony took place on the 2 900 m site of the ALMA Operations Support Facility. The ceremony marked the completion of the structural works and was attended by Region II Senator C. Cantero and representatives of the local community, including the Mayor of San Pedro, who joined more than 40 representatives of ESO, NRAO and NAOJ.

The programme to prevent environmental damage to the ALMA site continued in 2007. One highlight was the introduction of film cameras to monitor *vizcachas* and *abrocoma* species. This is the first time that this kind of surveillance has been done in Chile, representing a tech-

Students from a school in San Pedro de Atacama, Chile, read the new ALMA book on the fauna and flora in the region.

ALMA has started a programme to help solving acute mountain sickness mystery.

nological milestone in the country. The films spotted the presence of *Chinchilla Andina*, a highly endangered species, not found in the area before.

During a ceremony held in April in Antofagasta, representatives from ESO and the University of Antofagasta officially launched a collaborative agreement that also involves the University of Chile and the University of Copenhagen. The newly established cooperation will promote teaching and research on work at high altitudes. The valuable data collected will enhance our knowledge of human physiology in extreme environments, generating recommendations that will improve well-being and health not only in high-altitude observatories, but also for personnel in the mining industry and in the Antarctic.

Moreover, the Representative's Office has been involved in negotiations to provide permanent power supply for the ALMA site. This was done together with the local communities who would greatly benefit by a connection to the Chilean electricity grid. The arrival of the first antennas at the site also called for negotiations with local authorities, Police Corps, and others, in order to obtain permits and collaboration to clear the roads and highways during the long journey from the port of Mejillones to San Pedro de Atacama and the ALMA site.

Public Affairs

Due to the increase in the price of copper, ESO has had to face efforts from mining companies trying to establish mining rights within the zones declared as "area of scientific interest", mostly in La Silla. For the first time, we had to oppose requests submitted by mining companies to the President of the Republic, seeking permission to carry out mining works within protected areas.

A possible site in Region II for the future E-ELT project has been found and various negotiations and administrative procedures have taken place, to obtain leasing and to proceed with the protection of the site.

The ESO/Government of Chile Joint Committee for the Development of Astronomy in Chile received 24 proposals for funding from Chilean institutions this year. This Committee was established according to the Supplementary Agreement with the Government a decade ago, and has played a crucial role in the establishment and strengthening of Astronomy Departments in Chilean Universities. This year, funds were allocated to several post-doctoral programmes, support to research groups, and outreach, in a selection process that involved representatives from the Chilean Government and ESO.

Vitacura was the focus of several talks on astronomy for the general public, drawing large enthusiastic audiences. Lectures and courses on subjects at the frontiers of astronomy were delivered by outstanding astronomers who visited Vitacura for periods of one or two months.

Finally, an official farewell from Chile was organised for former ESO Director General, Catherine Cesarsky, at the ESO Guesthouse. It was attended by representatives of the Ministry of Foreign Affairs, regional authorities and the Ambassadors from member states in Chile, as well as the Chilean astronomical community.

Four Seasons at a Glance

January

The fourth Auxiliary Telescope (AT) is commissioned and accepted for operations.

The first commissioning of NACO with the Laser Guide System is completed.

The VISTA Infrared Camera arrives at Paranal.

Comet McNaught, the Great Comet of 2007, puts on an amazing show at Paranal.

The ESO Council appoints Tim de Zeeuw as the next Director General of ESO.

Final Design Review of the ALMA antenna transporters.

The ESO co-sponsored Third Chilean Advanced School of Astrophysics, “Insights into the Galaxy Evolution from Resolved Stellar Populations”, takes place at the Universidad de Concepción, Chile.

The 2007 ESO Instrument Calibration Workshop takes place at ESO Garching.

The Astronet Symposium, “A Science Vision for European Astronomy in the Next 20 Years”, brings together the European astronomical community in Poitiers, France.

ESO is present at the winter AAS meeting in Seattle, USA.

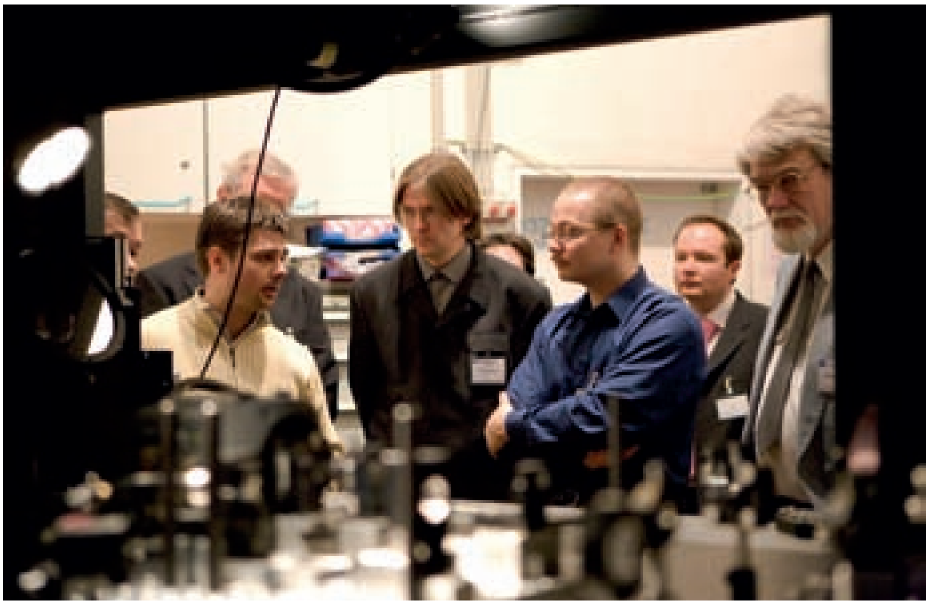
February

A special section on AMBER scientific results appears in Astronomy & Astrophysics.

The astronomical community celebrates the twentieth anniversary of Supernova 1987A.

Pre-Production Design Review of the European ALMA antennas, built by the AEM consortium.

Critical Design Review of ALMA Band 9 cartrige.



During the Finnish Industry Day.

ESO is present at the annual AAAS meeting in San Francisco, USA.

EIROforum participates in the MIT European Career Fair and Science Policy Meeting in Boston, USA.

March

The VLT automatically takes detailed spectra of gamma-ray burst afterglows only minutes after the burst’s discovery.

‘First Fringes’ at the ALMA Test Facility with two prototype antennas.

The Multi-Conjugate Adaptive Optics Demonstrator (MAD) achieves First Light on the VLT.

The first commissioning of SINFONI with the Laser Guide System is completed.

The recoating of the secondary mirror of UT2 is successfully completed.

The dome of the 3.6-m telescope at La Silla is fully restored, and moves with nominal speed.

A Roof-Topping ceremony is held for the ALMA Operations Support Facility.

An ESO workshop, “Observing Planetary Systems”, takes place at ESO Santiago.

A Finnish Industry Day takes place at ESO Garching.

The ESFRI Chairman John Wood visits ESO’s facilities in Chile.

The Committee of Council meets in Potsdam, Germany.

The ALMA Board meets in Tokyo, Japan.

April

Astronomers discover with HARPS the most Earth-like planet outside our Solar System to date, Gliese 581c.

CRIRES, the ESO-built high-resolution infrared spectrograph on UT1, starts operations.

Science Operation of AMBER with three ATs starts. Fringe tracking with FINITO is available in visitor mode.

The FORS1 CCD upgrade is completed.

A detailed plan of E-ELT instrument studies is finalised.

Representatives from ALMA, ESO and the University of Antofagasta officially launch a collaborative agreement to help improve the understanding of acute mountain sickness.

The EIROforum Science on Stage 2 festival, held in Grenoble, France, brings together some 500 science educators from 27 European countries. The winners of ESO's flagship educational competition 'Catch a Star' are announced.

The Scientific Technical Committee meets.

The 31st Meeting of the ESO Users' Committee takes place.

May

Using the VLT, astronomers measure the age of a star located in our Galaxy as 13.2 billion years. It was formed just 500 million years after the Big Bang.

The VISTA secondary mirror arrives at Paranal.

A VLTI Summer School, "Circumstellar discs and planets at very high angular resolution", takes place in Ofir, Portugal.

The newly revamped ESO web site goes live.

ESO is present with an exhibition stand at "Meursault les Etoiles", France.

Finance Committee meets.

The Observing Programmes Committee meets for P80.

The ALMA Science Advisory Committee meets face-to-face in Tokyo, Japan.

An ALMA Front End optics Concept Design Review is held at IRAM, France.

Claudie Haigneré, former French Minister for European Affairs and former astronaut, visits the ESO stand in Meursault.

June

The ESO Data Centre is completed. It is a state-of-the-art computer room, currently equipped with eight actively cooled racks, seven standard racks, three network racks and one Blade Centre.

The UVES and spectroscopic FORS pipelines are publicly released.

An Information Day for Czech Industry is held in Prague.

The ESO workshop "Obscured AGN Across Cosmic Time" is held in Seeon, Bavaria, Germany.

The ESO Council meets in Barcelona, Spain.

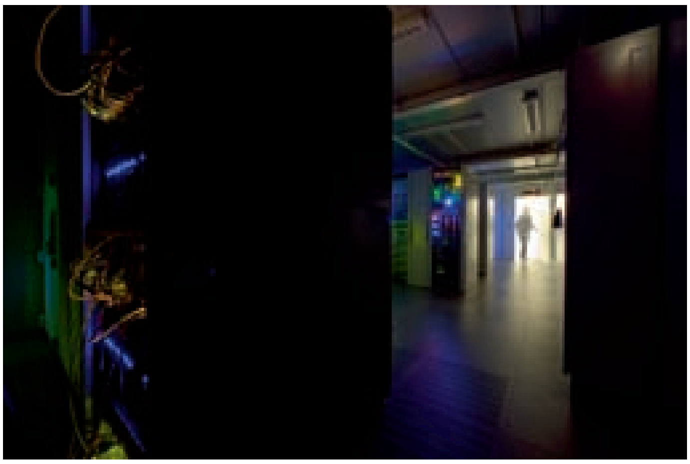
The ALMA Board meets in Santiago, Chile.

ESO participates for the third time in the European Research and Innovation Exhibition in Paris, France.

ESO participates in the ISSI Forum on Space Science and Education.

July

The first of two ALMA antenna transporters rolls out of its hangar and successfully passes a series of tests.



The ESO Data Centre.

First Light for GROND, the gamma-ray burst chaser, on the 2.2-m telescope at La Silla.

The recoating of the primary mirror of UT1 is successfully completed.

MUSE successfully passes its Preliminary Design Review.

The ESO workshop “12 Questions on Star and Massive Star Cluster Formation” is held.

The first ESO-EAAE Astronomy Summer School for Teachers is held at ESO Garching.

The EAAE summer school.

August

First Light for HAWK-I on the VLT. Working in the near-infrared, HAWK-I covers about one tenth of the area of the Full Moon in a single exposure.

The world’s largest bolometer camera for submillimetre astronomy, LABOCA, enters service at the 12-m APEX telescope on Chajnantor.

Critical Design Review of the ALMA Band 7 cartrige.

The Joint European and National Astronomy Meeting is organised in Yerevan, Armenia, with ESO presence.

A VLTI Summer School, “Active Galactic Nuclei at the highest angular resolution: theory and observations”, takes place in Torun, Poland.

The LABOCA Panel of the Observing Programmes Committee meets.

September

Using the VLT, astronomers discover that the south pole of Neptune is much hotter than the rest of the planet.

Professor Tim de Zeeuw takes up duty as the new ESO Director General.

KMOS passes its Final Design Review and SPHERE its Preliminary Design Review.

The “ALMA Community Days” and the “Surveys for ALMA” workshop take place at ESO.

The MPA/ESO/MPE/USM 2007 Joint Astronomy Conference on Gas Accretion and Star Formation in Galaxies takes place in Garching.

The 6th NEON Observing School is organised at the Asiago Observatory, Italy.

ESO is present at the 80th Annual Scientific Meeting of the *Astronomische Gesellschaft*.

ESO participates in the first Swiss Astronomy day.

The ASTRONET Science Vision for European Astronomy is published.

Finance Committee meets.

October

New near-infrared images from the VLT and Keck show for the first time a nearly global cloud cover at high elevations in the atmosphere of Saturn's largest moon, Titan.

The European Science and Research Commissioner, Janez Potočnik, visits Paranal, together with key European Commission officials.

ESO organises a round-table discussion on the topic of "Arts and Science", broadcast on Bavarian TV.

The 'Long Night of Science' Open House event at ESO Garching draws 1800 visitors.

At a ceremony at their manufacturer, the ALMA antenna transporters get their names: Otto and Lore.

The Catch a Star 2008 international astronomy education competition is launched.

The "Science with the VLT in the ELT era" workshop takes place at ESO, Garching.

The Committee of Council meeting is held in the UK.

The ALMA Board meets in Santiago, Chile.

The Scientific Technical Committee meets.

ESO participates in the EC high-level Conference on "The Future of Science and Technology in Europe", in Lisbon, Portugal.

The "Arts and Science" event at ESO Garching.

Long Night of Science, ESO Open House.

November

A major earthquake with magnitude 7.7 on the Richter scale affects the north of Chile.

The two ALMA antenna transporters pass their 'Factory Acceptance Review'.

A new ALMA outreach and educational book, 'Close to the Sky: Biological heritage in the ALMA area', is publicly presented to city officials of San Pedro de Atacama in Chile.

The ESO User Portal is launched.

The CRIRES pipeline 1.5.0 is publicly released.

The Minister of Research in the Walloon Regional Government, Marie-Dominique Simonet, visits Paranal.

The ESO Fellowship Symposium is held at ESO Santiago.

ESO is present with an information stand at the 'International Festival for Astronomy', in Utrecht, the Netherlands.

The ESO exhibition is featured at the Paris Observatory Meudon site of the Paris Observatory during the French Science Week, drawing 1600 pupils and more than 1000 other people.

The 81st Meeting of the Scientific Technical Committee takes place at ESO, Garching.

Finance Committee meets.

December

The 62nd General Assembly of the United Nations proclaims 2009 the International Year of Astronomy.

The Workshop "Science from UKIDSS" takes place at ESO Garching.

MUSE successfully passes its Optical Final Design Review.

ESO Council meets at ESO, Garching.

A high-level delegation from France, led by CNRS President Catherine Bréchignac, visits ESO in Chile.

Glossary of Acronyms

4LGSF	Four-Laser Guide Star Facility
4QPM	Four-quadrant phase masks
AAAS	American Association for the Advancement of Science
A&A	Journal *Astronomy & Astrophysics*
AAS	American Astronomical Society
ACS	ALMA Common Software
AEM	Alcatel Alenia Space France, Alcatel Alenia Space Italy, European Industrial Engineering s.r.L., MT Aerospace Consortium (ALMA)
AIDA	Astronomical Infrastructure for Data Access
AIVC	Assembly, Integration, Verification and Commissioning
AGAPE	Amateur Group for Astronomy Projects at ESO
ALMA	Atacama Large Millimeter/submillimeter Array
ARC*let*	ALMA Regional Centre node
ALICE	*America Latina Interconectada Con Europa*
AMBER	Astronomical Multi-BEam combineR (VLTI Instrument)
AO	Adaptive Optics
AOF	Adaptive Optics Facility
AOS	Array Operations Site (ALMA)
APE	Active Phasing Experiment (E-ELT)
APEX	Atacama Pathfinder Experiment
ASAC	ALMA Science Advisory Committee
ASI	Italian Space Agency (*Agenzia Spaziale Italiana*)
ASIC	Acquisition System on a single chip
ASSIST	Adaptive Secondary Setup and Instrument Simulator
ASTRONET	Astronomy ERA-net
AT	Auxiliary Telescope for the VLTI
ATF	Antenna Test Facility (ALMA)
AU	Astronomical Unit
AVO	Astrophysical Virtual Observatory
BE	Back End
CADC	Canadian Astronomy Data Centre
CAP	Journal "Communicating Astronomy with the Public"
CASA	Offline data reduction software for ALMA data
CAT	Coudé Auxiliary Telescope
CCD	Charge-Coupled Device
CEA	*Commissariat à l'énergie atomique*
CES	Coudé Echelle Spectrograph (3.6-m)
CERN	European Organisation for Nuclear Research (*Conseil Européen pour la Recherche Nucléaire*, Switzerland)
CDR	Critical Design Review
CFD	Computational Fluid Dynamics
CIS	Control and Instrument Software
CLARA	*Cooperación Latino Americana de Redes Avanzadas*
CLIP	Common Library for Image Processing
CNRS	*Centre National de la Recherche Scientifique* (France)
CODEX	Cosmic Dynamics Experiment (E-ELT)
CONICA	COudé Near-Infrared CAmera (VLT)
COS	Cosmic Origins Spectrograph (HST)
COSMOS	Cosmological Evolution Survey
CPL	Common Pipeline Library
CRIRES	Cryogenic InfraRed Echelle Spectrometer (VLT)
DAZLE	Dark Age 'Z' Lyman-alpha Explorer
DFI	Data Flow Infrastructure
DFS	Data Flow System
DOORS	Requirement management software
EAAE	European Association for Astronomy Education
E-ALMA	Enhancement of ALMA Early Science
EC	European Commission
EFOSC	ESO Faint Object Spectrograph and Camera (3.6-m)
EIS	ESO Imaging Survey
ELT	Extremely Large Telescope
E-ELT	European Extremely Large Telescope
EMMI	ESO Multi-Mode Instrument (NTT)
EPO	Education and Public Outreach
ERA	European Research Area
ERA-net	European Research Area Network
ESA	European Space Agency
ESAC	European Science Advisory Committee (for ALMA)
EST	ESO Survey Team
ESE	ELT Science and Engineering
ESFRI	European Strategy Forum on Research Infrastructures
ESPRESSO	Super stable high resolution optical spectrograph for the VLT
ESTEC	European Space Research and Technology Centre (ESA)
ESTI	EIROforum European Science Teaching Initiative
EU FEIC	European Front End Integration Centre
EURO-VO	European Virtual Observatory
EVALSO	Enabling Virtual Access to Latin-American Southern Observatories
EXPLORA	Chilean Programme for non formal education in Science and Technology
FDR	Final Design Review
FE	Front End
FEIC	Front End Integration Centres
FEROS	Fibre-fed, Extended Range, Échelle Spectrograph (2.2-m)
FINITO	Fringe Tracking Instrument Nice Torino (VLTI)
FITS	Flexible Image Transport System
FLAMES	Fibre Large Array Multi Element Spectrograph (VLT)
FMA	Focusing Mirror Array
FORS	FOcal Reducer/low dispersion Spectrograph (VLT)
FP6	Sixth EC Framework Programme
FP7	Seventh EC Framework Programme
FTE	Full-time equivalent
FWHM	Full width half maximum
GALACSI	Ground Atmospheric Layer Adaptive Optics for Spectroscopic Imaging
GB	GigaBytes
GÉANT	Multi-gigabit Pan-European Data Communications Network
GENIE	Ground based European Nulling Interferometer Experiment (VLTI)
GHz	Gigahertz
GOODS	Great Observatories Optical Deep Survey
GRAAL	GRound-layer Adaptive optics Assisted by Lasers
GRAVITY	AO assisted, two-object, multiple-beam-combiner (VLTI)
GRB	Gamma-Ray Burst
GROND	Gamma-Ray burst Optical/Near-infrared Detector
GUI	Graphical User Interface
HARPS	High Accuracy Radial Velocity Planetary Searcher (3.6-m)
HAWK-I	High Acuity Wide field *K*-band Imager (VLT)
HD	High Definition
HR	High Resolution
HST	Hubble Space Telescope
IAU	International Astronomical Union
ICD	Interface Control Document
ICT	Information and Communication Technology
IDA	Image Dissector Array
IQ	Image Quality
IFA	International Festival for Astronomy
IFU	Integral Field Units
INAF	*Istituto Nazionale di Astrofisica* (Italy)
INSU	*Institut National des Sciences de l'Univers* (France)
INTA	*Instituto Nacional de Técnica Aeroespacial* (Spain)
I/O	Input/Output
IPP	*Max-Planck-Institut für Plasmaphysik*
IPT	Integrated Project Team (ALMA)
IR	InfraRed
IRACE	InfraRed detector high speed Array Control and processing Electronics
IRAM	*Institut de Radioastronomie Millimétrique* (France)
ISAAC	Infrared Spectrometer And Array Camera (VLT)
ISSI	International Space Science Institute
IT	Information Technology
ITF	Interferometry Task Force
IVOA	International Virtual Observatory Alliance
IYA	International Year of Astronomy
JAO	Joint ALMA Observatory
JENAM	Joint European and National Astronomy Meeting
JPG	Joint Photographic Experts Group (standard for images)
JWST	James Webb Space Telescope
KMOS	*K*-band multi-object spectrograph (VLT)
LABOCA	Large APEX Bolometer CAmera
LBV	Luminous Blue Variables
LCP	Liquid Cooling Packages
LGS	Laser Guide Star
LGSF	Laser Guide Star Facility
LP	Large Programme
LPG	Liquefied Propane Gas
LSST	Large Synoptic Survey Telescope
LZOS	Lytkarino Optical Glass Factory, Moscow

MACAO	Multi-Application Curvature Adaptive Optics (VLT/VLTI)
MAD	Multi-Conjugate Adaptive Optics Demonstrator
MATISSE	Multi AperTure mid-Infrared Spectro-Scopic Experiment (VLTI)
MCAO	Multi-Conjugate Adaptive Optics
MFPG	Multi-Fuel Power Generator
MIDI	Mid-Infrared Interferometric Instrument (VLTI)
MISTI	MIT International Science and Technology Initiatives
MIT	Massachusetts Institute of Technology
MOAO	Multi-Objects Adaptive Optics
MoU	Memorandum of Understanding
MPE	Max Planck Institute for Extraterrestrial Physics (Germany)
MPI	Max Planck Institute
MPIA	Max Planck Institute for Astronomy (Germany)
MPIfR	Max Planck Institute for Radioastronomy (Germany)
MR	Medium Resolution
MRIP	Medium Range Implementation Plan
MUSE	Multi Unit Spectroscopic Explorer (VLT)
MW	Milky Way
NACO	NAOS-CONICA (VLT)
NAOJ	National Astronomical Observatory of Japan
NAOS	Nasmyth Adaptive Optics System (VLT)
NASA	National Air and Space Administration (US)
NED	NASA/IPAC Extragalactic Database
NGAS	Next Generation Archiving System
NGC	New General detector Controller
NIR	Near-InfraRed
NOVA	Dutch Research School for Astronomy (*Nederlandse Onderzoekschool voor Astronomie*)
NRAO	National Radio Astronomy Observatory
NSF	National Science Foundation
NTT	New Technology Telescope
OFDR	Optical Final Design Review
OmegaCAM	Optical Camera for the VST
OPC	Observing Programmes Committee
OPD	Optical Path Differences
OPTICON	Optical Infrared Coordination Network for Astronomy
OSF	ALMA Operations Support Facilities
OSIRIS	OH-Suppressing InfraRed Imaging Spectrograph
OSO	Onsala Space Observatory
P2PP	Phase 2 Preparation Tool
P79	Observing Period 79
P80	Observing Period 80
P81	Observing Period 81
PA	Product Assurance
PAD	Public Affairs Department
PAE	Preliminary Acceptance Europe
PARSEC	Sodium line laser for VLT AO
PDR	Preliminary Design Review
PI	Principal Investigator
PPDR	Pre-Production Design Review
PRIMA	Phase-Referenced Imaging and Micro-arcsecond Astrometry facility (VLTI)
POC	Public Outreach Centre
PSD	Power Spectral Density
PYPS	PYramid Phasing Sensor
QC	Quality Control and Data Processing
RAL	Rutherford Appleton Laboratory
R&D	Research and Development
RADIONET	Radio Astronomy Network in Europe
REUNA	*Red Universitaria Nacional*
ROHS	Restriction Of Hazardous Substances
RRM	Rapid-Response Mode
RTC	Regional Training Centre
RV	Radial Velocity
SAC	EURO-VO Science Advisory Committee
SAF	Science Archive Facility
SDI+	Spectral Differential Imager
SED	System Engineering Department
SEI	System Engineering and Integration
SEWG	Software Engineering Working Group
SHAPS	Shack-Hartmann sensor
SINFONI	Spectrograph for INtegral Field Observations in the Near Infrared (VLT)
SIMBAD	Astronomical database
SM	Service Mode
SM4	Servicing Mission 4 (HST)
SOCHIAS	Chilean Astronomical Society
SOFI	SOn oF Isaac (NTT)
SPHERE	Spectro-Polarimetric High-contrast Exoplanet Research instrument
SPIE	International Society for Optical Engineering
SSA	Simple Spectral Access
SSP	Single Source Procurement
SSWG	Scientific Strategy Planning Working Group
STC	Scientific Technical Committee
ST-ECF	Space Telescope European Coordination Facility
STFC	Science and Technology Facilities Council (UK)
STIS	Slit spectrograph (HST)
STScI	Space Telescope Science Institute (USA)
SUSI	SUperb Seeing Imager (NTT)
SWG	Science Working Group
SysML	System Modeling Language
TAC	Time Allocation Committee
TAC	Technical Advisory Committee
TB	TeraBytes
TFB	Tunable Filter Bank
TIC	Technology Information Centre
TIMMI	Thermal Infrared MultiMode Instrument (3.6-m)
TMT	Thirty Meter Telescope
ToO	Target of Opportunity
UC	Users' Committee
UK	United Kingdom
UKIDSS	UKIRT Infrared Deep Sky Survey
UKIRT	UK Infrared Telescope
ULTRACAM	ULTRA-fast, triple-beam CCD CAMera (visitors, VLT)
UN	United Nations
UNCOPUOS	United Nations Committee for Peaceful Uses of Outer Space
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPS	Uninterruptible Power Supply
US	United States
USB	Universal Serial Bus
UT	Unit Telescope of the VLT
UT1–4	VLT Unit Telescope 1–4: Antu, Kueyen, Melipal and Yepun
UV	UltraViolet
UVES	UV-Visual Echelle Spectrograph (VLT)
VIMOS	VIsible MultiObject Spectrograph (VLT)
VINCI	VLT INterferometer Commissionning Instrument
VIRCAM	VISTA IR Camera
VirGO	Visual Archive Browser
VISA	VLTI Sub-Array
VISIR	VLT Mid-Infrared Imager Spectrometer
VISTA	Visible and Infrared Survey Telescope for Astronomy
VITRUV	Near-IR spectro-imager using fibre (VLTI)
VLT	Very Large Telescope
VLTI	Very Large Telescope Interferometer
VLTSW	VLT Software
VO	Virtual Observatory
VSI	VLTI Spectro Imager
VST	VLT Survey Telescope
VTK	Vibration Tracking
VVDS	VIMOS VLT Deep Survey
WFCAM	Wide-Field Infrared Camera (UKIDSS)
WFI	Wide Field Imager (2.2-m)
WG	Working Group
WIMPS	Weakly Interacting Massive Particles
X-Shooter	Wideband UV-IR single target spectrograph (VLT)
XMM-Newton	X-ray Multi-Mirror satellite (ESA)

Publications

Publications in refereed journals based on ESO data

Adami, C.; Ulmer, M. P.; Durret, F.; Covone, G.; Cypriano, E.; Holden, B. P.; Kron, R.; Lima Neto, G. B.; Romer, A. K.; Russeil, D.; Wilhite, B.; An extension of the SHARC survey; A&A 472, 373–381

Ádámkovics, M.; Wong, M. H.; Laver, C.; de Pater, I.; Widespread Morning Drizzle on Titan; Sci 318, 962

Agafonova, I. I.; Levshakov, S. A.; Reimers, D.; Fechner, C.; Tytler, D.; Simcoe, R. A.; Songaila, A.; Spectral shape of the UV ionizing background and He II absorption at redshifts $1.8 < z < 2.9$; A&A 461, 893–909

Ahmic, M.; Jayawardhana, R.; Brandeker, A.; Scholz, A.; van Kerkwijk, M. H.; Delgado-Donate, E.; Froebrich, D.; Multiplicity among Young Brown Dwarfs and Very Low Mass Stars; ApJ 671, 2074–2081

Aigrain, S.; Hodgkin, S.; Irwin, J.; Hebb, L.; Irwin, M.; Favata, F.; Moraux, E.; Pont, F.; The Monitor project: searching for occultations in young open clusters; MNRAS 375, 29–52

Albrecht, M.; Krügel, E.; Chini, R.; Dust and CO emission towards the centers of normal galaxies, starburst galaxies and active galactic nuclei. – I. New data and updated catalogue; A&A 462, 575–579

Allard, F.; Allard, N. F.; Homeier, D.; Kielkopf, J.; McCaughrean, M. J.; Spiegelman, F.; K-H_2 quasi-molecular absorption detected in the T-dwarf ϵ Indi Ba; A&A 474, L21–L24

Allen, D. M.; Porto de Mello, G. F.; Ruthenium and hafnium abundances in giant and dwarf barium stars; A&A 474, 221–228

Altavilla, G.; Stehle, M.; Ruiz-Lapuente, P.; Mazzali, P.; Pignata, G.; Balastegui, A.; Benetti, S.; Blanc, G.; Canal, R.; Elias-Rosa, N.; Goobar, A.; Harutyunyan, A.; Pastorello, A.; Patat, F.; Rich, J.; Salvo, M.; Schmidt, B. P.; Stanishev, V.; Taubenberger, S.; Turatto, M.; Hillebrandt, W.; The early spectral evolution of SN 2004dt; A&A 475, 585–595

Alvarez-Candal, A.; Barucci, M. A.; Merlin, F.; Guilbert, A.; de Bergh, C.; A search for rotational variations on trans-Neptunian objects; A&A 475, 369–374

Amram, P.; Mendes de Oliveira, C.; Plana, H.; Balkowski, C.; Hernandez, O.; HCG 31: a multiple merger in progress; A&A 471, 753–764

Andrievsky, S. M.; Spite, M.; Korotin, S. A.; Spite, F.; Bonifacio, P.; Cayrel, R.; Hill, V.; François, P.; NLTE determination of the sodium abundance in a homogeneous sample of extremely metal-poor stars; A&A 464, 1081–1087

Apai, D.; Bik, A.; Kaper, L.; Henning, T.; Zinnecker, H.; Massive Binaries in High-Mass Star-forming Regions: A Multiepoch Radial Velocity Survey of Embedded O Stars; ApJ 655, 484–491

Arentoft, T.; de Ridder, J.; Grundahl, F.; Glowienka, L.; Waelkens, C.; Dupret, M.-A.; Grigahcène, A.; Lefever, K.; Jensen, H. R.; Reyniers, M.; Frandsen, S.; Kjeldsen, H.; Oscillating blue stragglers, γ Doradus stars and eclipsing binaries in the open cluster NGC 2506; A&A 465, 965–979

Arias, J. I.; Barbá, R. H.; Morrell, N. I.; Pre-main-sequence stars in the Lagoon Nebula (M8); MNRAS 374, 1253–1263

Arnouts, S.; Walcher, C. J.; Le Fèvre, O.; Zamorani, G.; Ilbert, O.; Le Brun, V.; Pozzetti, L.; Bardelli, S.; Tresse, L.; Zucca, E.; Charlot, S.; Lamareille, F.; McCracken, H. J.; Bolzonella, M.; Iovino, A.; Lonsdale, C.; Polletta, M.; Surace, J.; Bottini, D.; Garilli, B.; Maccagni, D.; Picat, J. P.; Scaramella, R.; Scodeggio, M.; Vettolani, G.; Zanichelli, A.; Adami, C.; Cappi, A.; Ciliegi, P.; Contini, T.; de La Torre, S.; Foucaud, S.; Franzetti, P.; Gavignaud, I.; Guzzo, L.; Marano, B.; Marinoni, C.; Mazure, A.; Meneux, B.; Merighi, R.; Paltani, S.; Pellò, R.; Pollo, A.; Radovich, M.; Temporin, S.; Vergani, D.; The SWIRE-VVDS-CFHTLS surveys: stellar mass assembly over the last 10 Gyr. Evidence for a major build up of the red sequence between $z = 2$ and $z = 1$; A&A 476, 137–150

Ascenso, J.; Alves, J.; Beletsky, Y.; Lago, M. T. V. T.; Near-IR imaging of Galactic massive clusters: Westerlund 2; A&A 466, 137–149

Ascenso, J.; Alves, J.; Vicente, S.; Lago, M. T. V. T.; NTT and VLT diffraction limited imaging of Trumpler 14: revealing a massive core-halo cluster; A&A 476, 199–215

Azevedo, R.; Folha, D. F. M.; Gameiro, J. F.; Calvet, N.; Extended Wind in Jetless Classical T Tauri Star TW Hya; ApJ 670, 1234–1239

Ballero, S. K.; Matteucci, F.; Origlia, L.; Rich, R. M.; Formation and evolution of the Galactic bulge: constraints from stellar abundances; A&A 467, 123–136

Ballo, L.; Cristiani, S.; Fasano, G.; Fontanot, F.; Monaco, P.; Nonino, M.; Pignatelli, E.; Tozzi, P.; Vanzella, E.; Fontana, A.; Giallongo, E.; Grazian, A.; Danese, L.; Black Hole Masses and Eddington Ratios of AGNs at $z < 1$: Evidence of Retriggering for a Representative Sample of X-Ray-selected AGNs; ApJ 667, 97–116

Bamford, S. P.; Milvang-Jensen, B.; Aragón-Salamanca, A.; The sizes of disc galaxies in intermediate-redshift clusters; MNRAS 378, L6–L10

Barbá, R. H.; Arias, J. I.; Geysers in the Lagoon: new Herbig-Haro objects in M8; A&A 471, 841–847

Barbuy, B.; Zoccali, M.; Ortolani, S.; Minniti, D.; Hill, V.; Renzini, A.; Bica, E.; Gómez, A.; NGC 6558: A Blue Horizontal Branch Moderately Metal-Poor Globular Cluster in the Bulge; AJ 134, 1613–1625

Barcons, X.; Carrera, F. J.; Ceballos, M. T.; Page, M. J.; Bussons-Gordo, J.; Corral, A.; Ebrero, J.; Mateos, S.; Tedds, J. A.; Watson, M. G.; Baskill, D.; Birkinshaw, M.; Boller, T.; Borisov, N.; Bremer, M.; Bromage, G. E.; Brunner, H.; Caccianiga, A.; Crawford, C. S.; Cropper, M. S.; Della Ceca, R.; Derry, P.; Fabian, A. C.; Guillout, P.; Hashimoto, Y.; Hasinger, G.; Hassall, B. J. M.; Lamer, G.; Loaring, N. S.; Maccacaro, T.; Mason, K. O.; McMahon, R. G.; Mirioni, L.; Mittaz, J. P. D.; Motch, C.; Negueruela, I.; Osborne, J. P.; Panessa, F.; Pérez-Fournon, I.; Pye, J. P.; Roberts, T. P.; Rosen, S.; Schartel, N.; Schurch, N.; Schwope, A.; Severgnini, P.; Sharp, R.; Stewart, G. C.; Szokoly, G.; Ullán, A.; Ward, M. J.; Warwick, R. S.; Wheatley, P. J.; Webb, N. A.; Worrall, D.; Yuan, W.; Ziaeepour, H.; The XMM-Newton serendipitous survey. – IV. Optical identification of the XMM-Newton medium sensitivity survey (XMS); A&A 476, 1191–1203

Barnes, A. D.; Casares, J.; Cornelisse, R.; Charles, P. A.; Steeghs, D.; Hynes, R. I.; O'Brien, K.; Kinematical studies of the low-mass X-ray binary GRMus (XB 1254–690); MNRAS 380, 1182–1190

Barros, S. C. C.; Marsh, T. R.; Dhillon, V. S.; Groot, P. J.; Littlefair, S.; Nelemans, G.; Roelofs, G.; Steeghs, D.; Wheatley, P. J.; ULTRACAM photometry of the ultracompact binaries V407 Vul and HM Cnc; MNRAS 374, 1334–1346

Barr, J. M.; Bedregal, A. G.; Aragón-Salamanca, A.; Merrifield, M. R.; Bamford, S. P.; The formation of S0 galaxies: evidence from globular clusters; A&A 470, 173–178

Bazot, M.; Bouchy, F.; Kjeldsen, H.; Charpinet, S.; Laymand, M.; Vauclair, S.; Asteroseismology of α Centauri A. Evidence of rotational splitting; A&A 470, 295–302

Bedding, T. R.; Kjeldsen, H.; Arentoft, T.; Bouchy, F.; Brandbyge, J.; Brewer, B. J.; Butler, R. P.; Christensen-Dalsgaard, J.; Dall, T.; Frandsen, S.; Karoff, C.; Kiss, L. L.; Monteiro, M. J. P. F. G.; Pijpers, F. P.; Teixeira, T. C.; Tinney, C. G.; Baldry, I. K.; Carrier, F.; O'Toole, S. J.; Solar-like Oscillations in the G2 Subgiant ß Hydri from Dual-Site Observations; ApJ 663, 1315–1324

Beers, T. C.; Flynn, C.; Rossi, S.; Sommer-Larsen, J.; Wilhelm, R.; Marsteller, B.; Lee, Y. S.; De Lee, N.; Krugler, J.; Deliyannis, C. P.; Simmons, A. T.; Mills, E.; Zickgraf, F.-J.; Holmberg, J.; Önehag, A.; Eriksson, A.; Terndrup, D. M.; Salim, S.; Andersen, J.; Nordström, B.; Christlieb, N.; Frebel, A.; Rhee, J.; Broadband $UBVR_CI_C$ Photometry of Horizontal-Branch and Metal-poor Candidates from the HK and Hamburg/ESO Surveys. I.; ApJS 168, 128–139

Benaglia, P.; Vink, J. S.; Martí, J.; Maíz Apellániz, J.; Koribalski, B.; Crowther, P. A.; Testing the predicted mass-loss bi-stability jump at radio wavelengths; A&A 467, 1265–1274

Benjamin, J.; Heymans, C.; Semboloni, E.; van Waerbeke, L.; Hoekstra, H.; Erben, T.; Gladders, M. D.; Hetterscheidt, M.; Mellier, Y.; Yee, H. K. C.; Cosmological constraints from the 100-deg^2 weak-lensing survey; MNRAS 381, 702–712

Bensby, T.; Zenn, A. R.; Oey, M. S.; Feltzing, S.; Tracing the Galactic Thick Disk to Solar Metallicities; ApJ 663, L13–L16

Bergond, G.; Athanassoula, E.; Leon, S.; Balkowski, C.; Cayatte, V.; Chemin, L.; Guzmán, R.; Meylan, G.; Prugniel, P.; Globular clusters and dwarf galaxies in Fornax. – I. Kinematics in the cluster core from multi-object spectroscopy; A&A 464, L21–L24

Berger, E.; Fox, D. B.; Price, P. A.; Nakar, E.; Gal-Yam, A.; Holz, D. E.; Schmidt, B. P.; Cucchiara, A.; Cenko, S. B.; Kulkarni, S. R.; Soderberg, A. M.; Frail, D. A.; Penprase, B. E.; Rau, A.; Ofek, E.; Burnell, S. J. Bell; Cameron, P. B.; Cowie, L. L.; Dopita, M. A.; Hook, I.; Peterson, B. A.; Podsiadlowski, P.; Roth, K. C.; Rutledge, R. E.; Sheppard, S. S.; Songaila, A.; A New Population of High-Redshift Short-Duration Gamma-Ray Bursts; ApJ 664, 1000–1010

Bertram, T.; Eckart, A.; Fischer, S.; Zuther, J.; Straubmeier, C.; Wisotzki, L.; Krips, M.; Molecular gas in nearby low-luminosity QSO host galaxies; A&A 470, 571–583

Bertoldi, F.; Carilli, C.; Aravena, M.; Schinnerer, E.; Voss, H.; Smolcic, V.; Jahnke, K.; Scoville, N.; Blain, A.; Menten, K. M.; Lutz, D.; Brusa, M.; Taniguchi, Y.; Capak, P.; Mobasher, B.; Lilly, S.; Thompson, D.; Aussel, H.; Kreysa, E.; Hasinger, G.; Aguirre, J.; Schlaerth, J.; Koekemoer, A.; COSBO: The MAMBO 1.2 Millimeter Imaging Survey of the COSMOS Field; ApJS 172, 132–149

Berta, S.; Lonsdale, C. J.; Polletta, M.; Savage, R. S.; Franceschini, A.; Buttery, H.; Cimatti, A.; Dias, J.; Feruglio, C.; Fiore, F.; Held, E. V.; La Franca, F.; Maiolino, R.; Marconi, A.; Matute, I.; Oliver, S. J.; Ricciardelli, E.; Rubele, S.; Sacchi, N.; Shupe, D.; Surace, J.; The contribution of very massive high-redshift SWIRE galaxies to the stellar mass function; A&A 476, 151–175

Beuermann, K.; Euchner, F.; Reinsch, K.; Jordan, S.; Gänsicke, B. T.; Zeeman tomography of magnetic white dwarfs. – IV. The complex field structure of the polars EF Eridani, BL Hydri and CP Tucanae; A&A 463, 647–655

Biazzo, K.; Pasquini, L.; Girardi, L.; Frasca, A.; da Silva, L.; Setiawan, J.; Marilli, E.; Hatzes, A. P.; Catalano, S.; Deriving temperature, mass, and age of evolved stars from high-resolution spectra. Application to field stars and the open cluster IC 4651; A&A 475, 981–989

Biller, B. A.; Close, L. M.; Masciadri, E.; Nielsen, E.; Lenzen, R.; Brandner, W.; McCarthy, D.; Hartung, M.; Kellner, S.; Mamajek, E.; Henning, T.; Miller, D.; Kenworthy, M.; Kulesa, C.; An Imaging Survey for Extrasolar Planets around 45 Close, Young Stars with the Simultaneous Differential Imager at the Very Large Telescope and MMT; ApJS 173, 143–165

Blundell, K. M.; Bowler, M. G.; Schmidtobreick, L.; Fluctuations and symmetry in the speed and direction of the jets of SS 433 on different timescales; A&A 474, 903–910

Boehnhardt, H.; Pompei, E.; Tozzi, G. P.; Hainaut, O.; Ageorges, N.; Bagnulo, S.; Barrera, L.; Bonev, T.; Käufl, H. U.; Kerber, F.; Locurto, G.; Marco, O.; Pantin, E.; Rauer, H.; Saviane, I.; Selman, F.; Sterken, C.; Weiler, M.; Broad- and narrowband visible imaging of comet 9P/Tempel 1 at ESO around the time of the Deep Impact event; A&A 470, 1175–1183

Böhm, A.; Ziegler, B. L.; Evolution of Field Spiral Galaxies up to Redshifts z = 1; ApJ 668, 846–852

Bondar, A.; Kozak, M.; Gnaciński, P.; Galazutdinov, G. A.; Beletsky, Y.; Krełowski, J.; CaFe interstellar clouds; MNRAS 378, 893–900

Bonfils, X.; Mayor, M.; Delfosse, X.; Forveille, T.; Gillon, M.; Perrier, C.; Udry, S.; Bouchy, F.; Lovis, C.; Pepe, F.; Queloz, D.; Santos, N. C.; Bertaux, J.-L.; The HARPS search for southern extra-solar planets. – X. A $m \sin i = 11\ M_\oplus$ planet around the nearby spotted M dwarf GJ 674; A&A 474, 293–299

Bongiorno, A.; Zamorani, G.; Gavignaud, I.; Marano, B.; Paltani, S.; Mathez, G.; Møller, P.; Picat, J. P.; Cirasuolo, M.; Lamareille, F.; Bottini, D.; Garilli, B.; Le Brun, V.; Le Fèvre, O.; Maccagni, D.; Scaramella, R.; Scodeggio, M.; Tresse, L.; Vettolani, G.; Zanichelli, A.; Adami, C.; Arnouts, S.; Bardelli, S.; Bolzonella, M.; Cappi, A.; Charlot, S.; Ciliegi, P.; Contini, T.; Foucaud, S.; Franzetti, P.; Guzzo, L.; Ilbert, O.; Iovino, A.; McCracken, H. J.; Marinoni, C.; Mazure, A.; Meneux, B.; Merighi, R.; Pellò, R.; Pollo, A.; Pozzetti, L.; Radovich, M.; Zucca, E.; Hatziminaoglou, E.; Polletta, M.; Bondi, M.; Brinchmann, J.; Cucciati, O.; de La Torre, S.; Gregorini, L.; Mellier, Y.; Merluzzi, P.; Temporin, S.; Vergani, D.; Walcher, C. J.; The VVDS type-1 AGN sample: the faint end of the luminosity function; A&A 472, 443–454

Bonifacio, P.; Molaro, P.; Sivarani, T.; Cayrel, R.; Spite, M.; Spite, F.; Plez, B.; Andersen, J.; Barbuy, B.; Beers, T. C.; Depagne, E.; Hill, V.; François, P.; Nordström, B.; Primas, F.; First stars VII – Lithium in extremely metal poor dwarfs; A&A 462, 851–864

Bonifacio, P.; Pasquini, L.; Molaro, P.; Carretta, E.; François, P.; Gratton, R. G.; James, G.; Sbordone, L.; Spite, F.; Zoccali, M.; Variations in the lithium abundances of turn off stars in the globular cluster 47 Tucanae; A&A 470, 153–159

Borges Fernandes, M.; Kraus, M.; Lorenz Martins, S.; de Araújo, F. X.; On the evolutionary stage of the unclassified B[e] star CD-42°11721; MNRAS 377, 1343–1362

Borissova, J.; Ivanov, V. D.; Stephens, A. W.; Catelan, M.; Minniti, D.; Prieto, G.; A deep near-infrared view of the Galactic globular cluster 2 MASS GC 02; A&A 474, 121–127

Bornancini, C. G.; De Breuck, C.; de Vries, W.; Croft, S.; van Breugel, W.; Röttgering, H.; Minniti, D.; Imaging and spectroscopy of ultrasteep spectrum radio sources; MNRAS 378, 551–562

Bosch-Ramon, V.; Motch, C.; Ribó, M.; Lopes de Oliveira, R.; Janot-Pacheco, E.; Negueruela, I.; Paredes, J. M.; Martocchia, A.; Exploring the connection between the stellar wind and the non-thermal emission in LS 5039; A&A 473, 545–550

Bot, C.; Boulanger, F.; Rubio, M.; Rantakyro, F.; Millimeter dust continuum emission revealing the true mass of giant molecular clouds in the Small Magellanic Cloud; A&A 471, 103–112

Bouché, N.; Murphy, M. T.; Péroux, C.; Davies, R.; Eisenhauer, F.; Förster Schreiber, N. M.; Tacconi, L.; The SINFONI Mg II Program for Line Emitters (SIMPLE): Discovering Starbursts near QSO Sight Lines; ApJ 669, L5–L8

Bouché, N.; Cresci, G.; Davies, R.; Eisenhauer, F.; Förster Schreiber, N. M.; Genzel, R.; Gillessen, S.; Lehnert, M.; Lutz, D.; Nesvadba, N.; Shapiro, K. L.; Sternberg, A.; Tacconi, L. J.; Verma, A.; Cimatti, A.; Daddi, E.; Renzini, A.; Erb, D. K.; Shapley, A.; Steidel, C. C.; Dynamical Properties of $z \sim 2$ Star-forming Galaxies and a Universal Star Formation Relation; ApJ 671, 303–309

Bouvier, J.; Alencar, S. H. P.; Boutelier, T.; Dougados, C.; Balog, Z.; Grankin, K.; Hodgkin, S. T.; Ibrahimov, M. A.; Kun, M.; Magakian, T. Y.; Pinte, C.; Magnetospheric accretion-ejection processes in the classical T Tauri star AA Tauri; A&A 463, 1017–1028

Bouy, H.; Huélamo, N.; Martín, E. L.; Barrado Y Navascués, D.; Sterzik, M.; Pantin, E.; A mid-infrared study of very low mass stars and brown dwarfs in Upper Scorpius; A&A 463, 641–646

Braglia, F.; Pierini, D.; Böhringer, H.; Flaming, bright galaxies along the filaments of A 2744; A&A 470, 425–429

Brand, J.; Wouterloot, J. G. A.; A star cluster at the edge of the Galaxy; A&A 464, 909–920

Bresolin, F.; Urbaneja, M. A.; Gieren, W.; Pietrzyński, G.; Kudritzki, R.-P.; VLT Spectroscopy of Blue Supergiants in IC 1613; ApJ 671, 2028–2039

Briquet, M.; Hubrig, S.; Schöller, M.; De Cat, P.; Discovery of magnetic fields in three He variable Bp stars with He and Si spots; AN 328, 41–45

Broderick, J. W.; De Breuck, C.; Hunstead, R. W.; Seymour, N.; An extreme rotation measure in the high-redshift radio galaxy PKS B0529–549; MNRAS 375, 1059–1069

Broeg, C.; Schmidt, T. O. B.; Guenther, E.; Gaedke, A.; Bedalov, A.; Neuhäuser, R.; Walter, F. M.; Rotational period of GQ Lupi; A&A 468, 1039–1044

Bruntt, H.; Stello, D.; Suárez, J. C.; Arentoft, T.; Bedding, T. R.; Bouzid, M. Y.; Csubry, Z.; Dall, T. H.; Dind, Z. E.; Frandsen, S.; Gilliland, R. L.; Jacob, A. P.; Jensen, H. R.; Kang, Y. B.; Kim, S.-L.; Kiss, L. L.; Kjeldsen, H.; Koo, J.-R.; Lee, J.-A.; Lee, C.-U.; Nuspl, J.; Sterken, C.; Szabó, R.; Multisite campaign on the open cluster M67 – III. δ Scuti pulsations in the blue stragglers; MNRAS 378, 1371–1384

Brusa, M.; Zamorani, G.; Comastri, A.; Hasinger, G.; Cappelluti, N.; Civano, F.; Finoguenov, A.; Mainieri, V.; Salvato, M.; Vignali, C.; Elvis, M.; Fiore, F.; Gilli, R.; Impey, C. D.; Lilly, S. J.; Mignoli, M.; Silverman, J.; Trump, J.; Urry, C. M.; Bender, R.; Capak, P.; Huchra, J. P.; Kneib, J. P.; Koekemoer, A.; Leauthaud, A.; Lehmann, I.; Massey, R.; Matute, I.; McCarthy, P. J.; McCracken, H. J.; Rhodes, J.; Scoville, N. Z.; Taniguchi, Y.; Thompson, D.; The XMM-Newton Wide-Field Survey in the COSMOS Field. – III. Optical Identification and Multiwavelength Properties of a Large Sample of X-Ray-Selected Sources; ApJS 172, 353–367

Bujarrabal, V.; van Winckel, H.; Neri, R.; Alcolea, J.; Castro-Carrizo, A.; Deroo, P.; The nebula around the post-AGB star 89 Herculis; A&A 468, L45–L48

Burenin, R. A.; Vikhlinin, A.; Hornstrup, A.; Ebeling, H.; Quintana, H.; Mescheryakov, A.; The 400 Square Degree ROSAT PSPC Galaxy Cluster Survey: Catalog and Statistical Calibration; ApJS 172, 561–582

Butler, D. J.; Martínez-Delgado, D.; Rix, H.-W.; Peñarrubia, J.; de Jong, J. T. A.; A Canis Major Overdensity Imaging Survey. – I. Stellar Content and Star-Count Maps: A Distinctly Elongated Body of Main-Sequence Stars; AJ 133, 2274–2290

Caballero, J. A.; Béjar, V. J. S.; Rebolo, R.; Eislöffel, J.; Zapatero Osorio, M. R.; Mundt, R.; Barrado Y Navascués, D.; Bihain, G.; Bailer-Jones, C. A. L.; Forveille, T.; Martín, E. L.; The substellar mass function in σ Orionis. – II. Optical, near-infrared and IRAC/Spitzer photometry of young cluster brown dwarfs and planetary-mass objects; A&A 470, 903–918

Caccianiga, A.; Severgnini, P.; Della Ceca, R.; Maccacaro, T.; Carrera, F. J.; Page, M. J.; Elusive AGN in the XMM-Newton bright serendipitous survey; A&A 470, 557–570

Cadolle Bel, M.; Ribó, M.; Rodriguez, J.; Chaty, S.; Corbel, S.; Goldwurm, A.; Frontera, F.; Farinelli, R.; D'Avanzo, P.; Tarana, A.; Ubertini, P.; Laurent, P.; Goldoni, P.; Mirabel, I. F.; Simultaneous Multiwavelength Observations of the Low/Hard State of the X-Ray Transient Source SWIFT J1753.5–0127; ApJ 659, 549–560

Caffau, E.; Faraggiana, R.; Bonifacio, P.; Ludwig, H.-G.; Steffen, M.; Sulphur abundances from the S I near-infrared triplet at 1045 nm; A&A 470, 699–708

Calamida, A.; Bono, G.; Stetson, P. B.; Freyhammer, L. M.; Cassisi, S.; Grundahl, F.; Pietrinferni, A.; Hilker, M.; Primas, F.; Richtler, T.; Romaniello, M.; Buonanno, R.; Caputo, F.; Castellani, M.; Corsi, C. E.; Ferraro, I.; Iannicola, G.; Pulone, L.; Strömgren Photometry of Galactic Globular Clusters. – I. New Calibrations of the Metallicity Index; ApJ 670, 400–422

Cameron, E.; Driver, S. P.; The galaxy luminosity-size relation and selection biases in the Hubble Ultra Deep Field; MNRAS 377, 523–534

Camilo, F.; Ransom, S. M.; Peñalver, J.; Karastergiou, A.; van Kerkwijk, M. H.; Durant, M.; Halpern, J. P.; Reynolds, J.; Thum, C.; Helfand, D. J.; Zimmerman, N.; Cognard, I.; The Variable Radio-to-X-Ray Spectrum of the Magnetar XTE J1810–197; ApJ 669, 561–569
Campeggio, L.; Strafella, F.; Maiolo, B.; Elia, D.; Aiello, S.; Total to Selective Extinction in the Dark Globule CB 107; ApJ 668, 316–330
Cantalupo, S.; Lilly, S. J.; Porciani, C.; Plausible Fluorescent Lyα Emitters around the $z = 3.1$ QSO 0420–388; ApJ 657, 135–144
Caputi, K. I.; Lagache, G.; Yan, L.; Dole, H.; Bavouzet, N.; Le Floc'h, E.; Choi, P. I.; Helou, G.; Reddy, N.; The Infrared Luminosity Function of Galaxies at Redshifts $z = 1$ and $z \sim 2$ in the GOODS Fields; ApJ 660, 97–116
Carmona, A.; van den Ancker, M. E.; Henning, T.; Optical spectroscopy of close companions to nearby Herbig Ae/Be and T Tauri stars; A&A 464, 687–695
Carmona, A.; van den Ancker, M. E.; Henning, T.; Goto, M.; Fedele, D.; Stecklum, B.; A search for near-infrared molecular hydrogen emission in the CTTS LkHα 264 and the debris disk 49 Ceti; A&A 476, 853–862
Carpano, S.; Pollock, A. M. T.; Wilms, J.; Ehle, M.; Schirmer, M.; A Wolf-Rayet/black-hole X-ray binary candidate in NGC 300; A&A 461, L9–L12
Carquillat, J.-M.; Prieur, J.-L.; Contribution to the study of composite spectra: XI. Orbital elements of some faint systems; AN 328, 46–54
Carretta, E.; Bragaglia, A.; Gratton, R. G.; Momany, Y.; Recio-Blanco, A.; Cassisi, S.; François, P.; James, G.; Lucatello, S.; Moehler, S.; Na-O anticorrelation and horizontal branches. – VI. The chemical composition of the peculiar bulge globular cluster NGC 6388; A&A 464, 967–981
Carretta, E.; Bragaglia, A.; Gratton, R. G.; Catanzaro, G.; Leone, F.; Sabbi, E.; Cassisi, S.; Claudi, R.; D'Antona, F.; François, P.; James, G.; Piotto, G.; Na-O anticorrelation and horizontal branches. – IV. Detection of He-rich and He-poor stellar populations in the globular cluster NGC 6218; A&A 464, 939–951
Carretta, E.; Bragaglia, A.; Gratton, R. G.; Lucatello, S.; Momany, Y.; Na-O anticorrelation and horizontal branches. – II. The Na-O anticorrelation in the globular cluster NGC 6752; A&A 464, 927–937
Carraro, G.; Zinn, R.; Moni Bidin, C.; Whiting 1: the youngest globular cluster associated with the Sagittarius dwarf spheroidal galaxy; A&A 466, 181–189
Carraro, G.; de La Fuente Marcos, R.; Villanova, S.; Moni Bidin, C.; de La Fuente Marcos, C.; Baumgardt, H.; Solivella, G.; Observational templates of star cluster disruption. The stellar group NGC 1901 in front of the Large Magellanic Cloud; A&A 466, 931–941
Carrier, F.; Kjeldsen, H.; Bedding, T. R.; Brewer, B. J.; Butler, R. P.; Eggenberger, P.; Grundahl, F.; McCarthy, C.; Retter, A.; Tinney, C. G.; Solar-like oscillations in the metal-poor subgiant ν Indi. – II. Acoustic spectrum and mode lifetime; A&A 470, 1059–1063
Carrier, F.; Eggenberger, P.; Leyder, J.-C.; Debernardi, Y.; Royer, F.; A search for solar-like oscillations in the Am star HD 209625; A&A 470, 1009–1012
Carrera, R.; Gallart, C.; Pancino, E.; Zinn, R.; The Infrared Ca II Triplet as Metallicity Indicator; AJ 134, 1298–1314
Carretta, E.; Bragaglia, A.; Gratton, R. G.; The chemical abundance of the very metal-rich old open clusters NGC 6253 and NGC 6791; A&A 473, 129–141
Carraro, G.; Geisler, D.; Villanova, S.; Frinchaboy, P. M.; Majewski, S. R.; Old open clusters in the outer Galactic disk; A&A 476, 217–227
Carretta, E.; Recio-Blanco, A.; Gratton, R. G.; Piotto, G.; Bragaglia, A.; The Link between Chemical Anomalies along the Red Giant Branch and the Horizontal Branch Extension in Globular Clusters; ApJ 671, L125–L128
Casares, J.; Bonifacio, P.; González Hernández, J. I.; Molaro, P.; Zoccali, M.; The isotopic ^{6}Li/^{7}Li ratio in Centaurus X-4 and the origin of Li in X-ray binaries; A&A 470, 1033–1041
Casassus, S.; Nyman, L.-Å.; Dickinson, C.; Pearson, T. J.; A centimetre-wave excess over free-free emission in planetary nebulae; MNRAS 382, 1607–1622
Cassata, P.; Guzzo, L.; Franceschini, A.; Scoville, N.; Capak, P.; Ellis, R. S.; Koekemoer, A.; McCracken, H. J.; Mobasher, B.; Renzini, A.; Ricciardelli, E.; Scodeggio, M.; Taniguchi, Y.; Thompson, D.; The Cosmic Evolution Survey (COSMOS): The Morphological Content and Environmental Dependence of the Galaxy Color-Magnitude Relation at $z \sim 0.7$; ApJS 172, 270–283
Castellani, V.; Calamida, A.; Bono, G.; Stetson, P. B.; Freyhammer, L. M.; Degl'Innocenti, S.; Moroni, P. Prada; Monelli, M.; Corsi, C. E.; Nonino, M.; Buonanno, R.; Caputo, F.; Castellani, M.; Dall'Ora, M.; Del Principe, M.; Ferraro, I.; Iannicola, G.; Piersimoni, A. M.; Pulone, L.; Vuerli, C.; Star Counts in the Globular Cluster ω Centauri. – I. Bright Stellar Components; ApJ 663, 1021–1039
Castelli, F.; Hubrig, S.; A refined analysis of the remarkable Bp star HR 6000; A&A 475, 1041–1052
Castellano, M.; Salimbeni, S.; Trevese, D.; Grazian, A.; Pentericci, L.; Fiore, F.; Fontana, A.; Giallongo, E.; Santini, P.; Cristiani, S.; Nonino, M.; Vanzella, E.; A Photometrically Detected Forming Cluster of Galaxies at Redshift 1.6 in the GOODS Field; ApJ 671, 1497–1502
Cayrel, R.; Steffen, M.; Chand, H.; Bonifacio, P.; Spite, M.; Spite, F.; Petitjean, P.; Ludwig, H.-G.; Caffau, E.; Line shift, line asymmetry, and the ^{6}Li/^{7}Li isotopic ratio determination; A&A 473, L37–L40
Chauvin, G.; Lagrange, A.-M.; Udry, S.; Mayor, M.; Characterization of the long-period companions of the exoplanet host stars: HD 196885, HD 1237 and HD 27442. VLT/NACO and SINFONI near-infrared, follow-up imaging and spectroscopy; A&A 475, 723–727
Chen, H.-W.; Prochaska, J. X.; Ramirez-Ruiz, E.; Bloom, J. S.; Dessauges-Zavadsky, M.; Foley, R. J.; On the Absence of Wind Signatures in GRB Afterglow Spectra: Constraints on the Wolf-Rayet Winds of GRB Progenitors; ApJ 663, 420–436
Chen, X. P.; Launhardt, R.; Henning, T.; VLT/NACO adaptive optics imaging of GSS 30 IRS1: a protostellar binary system?; A&A 475, 277–280
Chesneau, O.; Nardetto, N.; Millour, F.; Hummel, C.; Domiciano de Souza, A.; Bonneau, D.; Vannier, M.; Rantakyrö, F.; Spang, A.; Malbet, F.; Mourard, D.; Bode, M. F.; O'Brien, T. J.; Skinner, G.; Petrov, R. G.; Stee, P.; Tatulli, E.; Vakili, F.; AMBER/VLTI interferometric observations of the recurrent Nova RS Ophiuchii 5.5 days after outburst; A&A 464, 119–126
Chesneau, O.; Lykou, F.; Balick, B.; Lagadec, E.; Matsuura, M.; Smith, N.; Spang, A.; Wolf, S.; Zijlstra, A. A.; A silicate disk in the heart of the Ant; A&A 473, L29–L32
Chieregato, M.; Miranda, M.; Jetzer, P.; Q0045-3337: models including strong lensing by a spiral galaxy; A&A 474, 777–782
Chilingarian, I.; Cayatte, V.; Chemin, L.; Durret, F.; Laganá, T. F.; Adami, C.; Slezak, E.; Discovery of a new M32-like "Compact Elliptical" galaxy in the halo of the Abell 496 cD galaxy; A&A 466, L21–L24
Civano, F.; Mignoli, M.; Comastri, A.; Vignali, C.; Fiore, F.; Pozzetti, L.; Brusa, M.; La Franca, F.; Matt, G.; Puccetti, S.; Cocchia, F.; The HELLAS2XMM survey. – XI. Unveiling the nature of X-ray bright optically normal galaxies; A&A 476, 1223–1233
Clausen, J. V.; Helt, B. E.; Giménez, A.; Vaz, L. P. R.; García, J. M.; Olsen, E. H.; Southworth, J.; Four-colour photometry of eclipsing binaries. – XL. uvby light curves for the B-type systems DW Carinae, BF Centauri, AC Velorum, and NSV 5783; A&A 461, 1065–1075
Close, L. M.; Thatte, N.; Nielsen, E. L.; Abuter, R.; Clarke, F.; Tecza, M.; New Photometry and Spectra of AB Doradus C: An Accurate Mass Determination of a Young Low-Mass Object with Theoretical Evolutionary Tracks; ApJ 665, 736–743
Cocchia, F.; Fiore, F.; Vignali, C.; Mignoli, M.; Brusa, M.; Comastri, A.; Feruglio, C.; Baldi, A.; Carangelo, N.; Ciliegi, P.; D'Elia, V.; La Franca, F.; Maiolino, R.; Matt, G.; Molendi, S.; Perola, G. C.; Puccetti, S.; The HELLAS2XMM survey. – VIII. Optical identifications of the extended sample; A&A 466, 31–40
Coccato, L.; Corsini, E. M.; Pizzella, A.; Bertola, F.; The search for inner polar disks with integral field spectroscopy: the case of NGC 2855 and NGC 7049; A&A 465, 777–786
Codella, C.; Cabrit, S.; Gueth, F.; Cesaroni, R.; Bacciotti, F.; Lefloch, B.; McCaughrean, M. J.; A highly-collimated SiO jet in the HH212 protostellar outflow; A&A 462, L53–L56
Comerón, F.; Schneider, N.; A close look at the heart of RCW 108; A&A 473, 149–162
Cooke, R.; Kuncic, Z.; Sharp, R.; Bland-Hawthorn, J.; Spectacular Trailing Streamers near LMC X-1: The First Evidence of a Jet?; ApJ 667, L163–L166
Copetti, M. V. F.; Oliveira, V. A.; Riffel, R.; Castañeda, H. O.; Sanmartim, D.; A study of the neglected Galactic H II region NGC 2579 and its companion ESO 370–9; A&A 472, 847–854
Cornelisse, R.; Casares, J.; Steeghs, D.; Barnes, A. D.; Charles, P. A.; Hynes, R. I.; O'Brien, K.; A detection of the donor star of Aquila X-1 during its 2004 outburst?; MNRAS 375, 1463–1470
Cornelisse, R.; Steeghs, D.; Casares, J.; Charles, P. A.; Barnes, A. D.; Hynes, R. I.; O'Brien, K.; Optical spectroscopy of the low-mass X-ray binary GX9+9; MNRAS 380, 1219–1229
Cornelisse, R.; Steeghs, D.; Casares, J.; Charles, P. A.; Shih, I. C.; Hynes, R. I.; O'Brien, K.; A signature of the donor star in the extra-galactic X-ray binary LMCX-2; MNRAS 381, 194–200
Corradi, R. L. M.; Steffen, M.; Schönberner, D.; Jacob, R.; A hydrodynamical study of multiple-shell planetary nebulae. – II. Measuring the post-shock velocities in the shells; A&A 474, 529–539
Corsini, E. M.; Aguerri, J. A. L.; Debattista, Victor P.; Pizzella, A.; Barazza, F. D.; Jerjen, H.; The Bar Pattern Speed of Dwarf Galaxy NGC 4431; ApJ 659, L121–L124

Cortese, L.; Marcillac, D.; Richard, J.; Bravo-Alfaro, H.; Kneib, J.-P.; Rieke, G.; Covone, G.; Egami, E.; Rigby, J.; Czoske, O.; Davies, J.; The strong transformation of spiral galaxies infalling into massive clusters at $z \sim 0.2$; MNRAS 376, 157–172
Cowley, C. R.; Hubrig, S.; Castelli, F.; González, J. F.; Wolff, B.; Heavy calcium in CP stars; MNRAS 377, 1579–1587
Cox, N. L. J.; Cordiner, M. A.; Ehrenfreund, P.; Kaper, L.; Sarre, P. J.; Foing, B. H.; Spaans, M.; Cami, J.; Sofia, U. J.; Clayton, G. C.; Gordon, K. D.; Salama, F.; Interstellar gas, dust and diffuse bands in the SMC; A&A 470, 941–955
Cresci, G.; Mannucci, F.; Della Valle, M.; Maiolino, R.; A NICMOS search for obscured supernovae in starburst galaxies; A&A 462, 927–931
Crowther, P. A.; Carpano, S.; Hadfield, L. J.; Pollock, A. M. T.; On the optical counterpart of NGC 300 X-1 and the global Wolf-Rayet content of NGC 300; A&A 469, L31–L34
Cuby, J.-G.; Hibon, P.; Lidman, C.; Le Fèvre, O.; Gilmozzi, R.; Moorwood, A.; van der Werf, P.; A narrow-band search for Lyα emitting galaxies at $z = 8.8$; A&A 461, 911–916
Curran, S. J.; Tzanavaris, P.; Murphy, M. T.; Webb, J. K.; Pihlström, Y. M.; Detection of broad 21-cm absorption at zabs = 0.656 in the complex sight-line towards 3C336; MNRAS 381, L6–L10
D'Elia, V.; Fiore, F.; Meurs, E. J. A.; Chincarini, G.; Melandri, A.; Norci, L.; Pellizza, L.; Perna, R.; Piranomonte, S.; Sbordone, L.; Stella, L.; Tagliaferri, G.; Vergani, S. D.; Ward, P.; Angelini, L.; Antonelli, L. A.; Burrows, D. N.; Campana, S.; Capalbi, M.; Cimatti, A.; Costa, E.; Cusumano, G.; Della Valle, M.; Filliatre, P.; Fontana, A.; Frontera, F.; Fugazza, D.; Gehrels, N.; Giannini, T.; Giommi, P.; Goldoni, P.; Guetta, D.; Israel, G.; Lazzati, D.; Malesani, D.; Marconi, G.; Mason, K.; Mereghetti, S.; Mirabel, F.; Molinari, E.; Moretti, A.; Nousek, J.; Perri, M.; Piro, L.; Stratta, G.; Testa, V.; Vietri, M.; UVES/VLT high resolution spectroscopy of GRB 050730 afterglow: probing the features of the GRB environment; A&A 467, 629–639
D'Odorico, V.; A cold metal-poor cloud traced by a weak Mg II absorption at $z \simeq 0.45$. First detection of Si I, Ca I, and Fe I in a QSO absorber; A&A 470, 523–529
Daddi, E.; Dickinson, M.; Morrison, G.; Chary, R.; Cimatti, A.; Elbaz, D.; Frayer, D.; Renzini, A.; Pope, A.; Alexander, D. M.; Bauer, F. E.; Giavalisco, M.; Huynh, M.; Kurk, J.; Mignoli, M.; Multiwavelength Study of Massive Galaxies at $z \sim 2$. – I. Star Formation and Galaxy Growth; ApJ 670, 156–172
Daflon, S.; Cunha, K.; de Araújo, F. X.; Wolff, S.; Przybilla, N.; The Projected Rotational Velocity Distribution of a Sample of OB stars from a Calibration Based on Synthetic He I Lines; AJ 134, 1570–1578
Dahlen, T.; Mobasher, B.; Dickinson, M.; Ferguson, H. C.; Giavalisco, M.; Kretchmer, C.; Ravindranath, S.; Evolution of the Luminosity Function, Star Formation Rate, Morphology, and Size of Star-forming Galaxies Selected at Rest-Frame 1500 and 2800 Å; ApJ 654, 172–185
Dall, T. H.; Foellmi, C.; Pritchard, J.; Lo Curto, G.; Allende Prieto, C.; Bruntt, H.; Amado, P. J.; Arentoft, T.; Baes, M.; Depagne, E.; Fernandez, M.; Ivanov, V.; Koesterke, L.; Monaco, L.; O'Brien, K.; Sarro, L. M.; Saviane, I.; Scharwächter, J.; Schmidtobreick, L.; Schütz, O.; Seifahrt, A.; Selman, F.; Stefanon, M.; Sterzik, M.; VSOP: the variable star one-shot project. – I. Project presentation and first data release; A&A 470, 1201–1214
Dasyra, K. M.; Tacconi, L. J.; Davies, R. I.; Genzel, R.; Lutz, D.; Peterson, B. M.; Veilleux, S.; Baker, A. J.; Schweitzer, M.; Sturm, E.; Host Dynamics and Origin of Palomar-Green QSOs; ApJ 657, 102–115
Davies, R. I.; Mueller Sánchez, F.; Genzel, R.; Tacconi, L. J.; Hicks, E. K. S.; Friedrich, S.; Sternberg, A.; A Close Look at Star Formation around Active Galactic Nuclei; ApJ 671, 1388–1412
de Jong, J. T. A.; Butler, D. J.; Rix, H. W.; Dolphin, A. E.; Martínez-Delgado, D.; Modeling the Stellar Populations in the Canis Major Overdensity: The Relation between the Old and Young Populations; ApJ 662, 259–271
De Lucia, G.; Poggianti, B. M.; Aragón-Salamanca, A.; White, S.D. M.; Zaritsky, D.; Clowe, D.; Halliday, C.; Jablonka, P.; von der Linden, A.; Milvang-Jensen, B.; Pelló, R.; Rudnick, G.; Saglia, R. P.; Simard, L.; The build-up of the colour-magnitude relation in galaxy clusters since $z \sim 0.8$; MNRAS 374, 809–822
de Lapparent, V.; Slezak, E.; Spatial clustering in the ESO-Sculptor survey: two-point correlation functions by galaxy type at redshifts 0.1–0.5; A&A 472, 29–49
de Luca, M.; Giannini, T.; Lorenzetti, D.; Massi, F.; Elia, D.; Nisini, B.; Near- and far-infrared counterparts of millimeter dust cores in the Vela molecular ridge cloud D; A&A 474, 863–872
de La Torre, S.; Le Fèvre, O.; Arnouts, S.; Guzzo, L.; Farrah, D.; Iovino, A.; Lonsdale, C. J.; Meneux, B.; Oliver, S. J.; Pollo, A.; Waddington, I.; Bottini, D.; Fang, F.; Garilli, B.; Le Brun, V.; Maccagni, D.; Picat, J. P.; Scaramella, R.; Scodeggio, M.; Shupe, D.; Surace, J.; Tresse, L.; Vettolani, G.; Zanichelli, A.; Adami, C.; Bardelli, S.; Bolzonella, M.; Cappi, A.; Charlot, S.; Ciliegi, P.; Contini, T.; Foucaud, S.; Franzetti, P.; Gavignaud, I.; Ilbert, O.; Lamareille, F.; McCracken, H. J.; Marano, B.; Marinoni, C.; Mazure, A.; Merighi, R.; Paltani, S.; Pellò, R.; Pozzetti, L.; Radovich, M.; Zamorani, G.; Zucca, E.; Bondi, M.; Bongiorno, A.; Brinchmann, J.; Cucciati, O.; Mellier, Y.; Merluzzi, P.; Temporin, S.; Vergani, D.; Walcher, C. J.; VVDS-SWIRE. Clustering evolution from a spectroscopic sample of galaxies with redshift $0.2 < z < 2.1$ selected from Spitzer IRAC 3.6 µm and 4.5 µm photometry; A&A 475, 443–451
de Luise, F.; Perna, D.; Dotto, E.; Fornasier, S.; Belskaya, I. N.; Boattini, A.; Valsecchi, G. B.; Milani, A.; Rossi, A.; Lazzarin, M.; Paolicchi, P.; Fulchignoni, M.; Physical investigation of the potentially hazardous Asteroid (144898) 2004 VD17; Icar 191, 628–635
De Rijcke, S.; Zeilinger, W. W.; Hau, G. K. T.; Prugniel, P.; Dejonghe, H.; Generalizations of the Tully-Fisher Relation for Early- and Late-Type Galaxies; ApJ 659, 1172–1175
De Silva, G. M.; Freeman, K. C.; Asplund, M.; Bland-Hawthorn, J.; Bessell, M. S.; Collet, R.; Chemical Homogeneity in Collinder 261 and Implications for Chemical Tagging; AJ 133, 1161–1175
de Ugarte Postigo, A.; Fatkhullin, T. A.; Jóhannesson, G.; Gorosabel, J.; Sokolov, V. V.; Castro-Tirado, A. J.; Balega, Y. Y.; Spiridonova, O. I.; Jelínek, M.; Guziy, S.; Pérez-Ramírez, D.; Hjorth, J.; Laursen, P.; Bersier, D.; Pandey, S. B.; Bremer, M.; Monfardini, A.; Huang, K. Y.; Urata, Y.; Ip, W. H.; Tamagawa, T.; Kinoshita, D.; Mizuno, T.; Arai, Y.; Yamagishi, H.; Soyano, T.; Usui, F.; Tashiro, M.; Abe, K.; Onda, K.; Aslan, Z.; Khamitov, I.; Ozisik, T.; Kiziloglu, U.; Bikmaev, I.; Sakhibullin, N.; Burenin, R.; Pavlinsky, M.; Sunyaev, R.; Bhattacharya, D.; Kamble, A. P.; Ishwara Chandra, C. H.; Trushkin, S. A.; Extensive multiband study of the X-ray rich GRB 050408. A likely off-axis event with an intense energy injection; A&A 462, L57–L60
de Vries, N.; Snellen, I. A. G.; Schilizzi, R. T.; Lehnert, M. D.; Bremer, M. N.; Complete identification of the Parkes half-Jansky sample of GHz peaked spectrum radio galaxies; A&A 464, 879–883
de Wit, W. J.; Hoare, M. G.; Oudmaijer, R. D.; Mottram, J. C.; VLTI/MIDI 10 µm Interferometry of the Forming Massive Star W33A; ApJ 671, L–69–L172
Dehaes, S.; Groenewegen, M. A. T.; Decin, L.; Hony, S.; Raskin, G.; Blommaert, J. A. D. L.; Continuum emission around AGB stars at 1.2 mm; MNRAS 377, 931–944
Delbò, M.; Cellino, A.; Tedesco, E. F.; Albedo and size determination of potentially hazardous asteroids: (99942) Apophis; Icar 188, 266–269
Demarco, R.; Rosati, P.; Lidman, C.; Girardi, M.; Nonino, M.; Rettura, A.; Strazzullo, V.; van der Wel, A.; Ford, H. C.; Mainieri, V.; Holden, B. P.; Stanford, S. A.; Blakeslee, J. P.; Gobat, R.; Postman, M.; Tozzi, P.; Overzier, R. A.; Zirm, A. W.; Benítez, N.; Homeier, N. L.; Illingworth, G. D.; Infante, L.; Jee, M. J.; Mei, S.; Menanteau, F.; Motta, V.; Zheng, W.; Clampin, M.; Hartig, G.; VLT and ACS Observations of RDCS J1252.9–2927: Dynamical Structure and Galaxy Populations in a Massive Cluster at $z = 1.237$; ApJ 663, 164–182
Demory, B.-O.; Gillon, M.; Barman, T.; Bonfils, X.; Mayor, M.; Mazeh, T.; Queloz, D.; Udry, S.; Bouchy, F.; Delfosse, X.; Forveille, T.; Mallmann, F.; Pepe, F.; Perrier, C.; Characterization of the hot Neptune GJ 436 b with Spitzer and ground-based observations; A&A 475, 1125–1129
Deroo, P.; van Winckel, H.; Verhoelst, T.; Min, M.; Reyniers, M.; Waters, L. B. F. M.; The circumbinary disc around the J-type C-star IRAS 18006-3213; A&A 467, 1093–1101
Deroo, P.; Acke, B.; Verhoelst, T.; Dominik, C.; Tatulli, E.; van Winckel, H.; AMBER and MIDI interferometric observations of the post-AGB binary IRAS 08544-4431: the circumbinary disc resolved; A&A 474, L45–L48
Desai, V.; Dalcanton, J. J.; Aragón-Salamanca, A.; Jablonka, P.; Poggianti, B.; Gogarten, S. M.; Simard, L.; Milvang-Jensen, B.; Rudnick, G.; Zaritsky, D.; Clowe, D.; Halliday, C.; Pelló, R.; Saglia, R.; White, S.; The Morphological Content of 10 EDisCS Clusters at $0.5 < z < 0.8$; ApJ 660, 1151–1164
Descamps, P.; Marchis, F.; Michalowski, T.; Vachier, F.; Colas, F.; Berthier, J.; Assafin, M.; Dunckel, P. B.; Polinska, M.; Pych, W.; Hestroffer, D.; Miller, K. P. M.; Vieira-Martins, R.; Birlan, M.; Teng-Chuen-Yu, J.-P.; Peyrot, A.; Payet, B.; Dorseuil, J.; Léonie, Y.; Dijoux, T.; Figure of the double Asteroid 90 Antiope from adaptive optics and lightcurve observations; Icar 187, 482–499

Desidera, S.; Gratton, R. G.; Lucatello, S.; Endl, M.; Udry, S.; Accretion of chemically fractionated material on a wide binary with a blue straggler; A&A 462, 1039–1049
Desort, M.; Lagrange, A.-M.; Galland, F.; Udry, S.; Mayor, M.; Search for exoplanets with the radial-velocity technique: quantitative diagnostics of stellar activity; A&A 473, 983–993
Dessauges-Zavadsky, M.; Calura, F.; Prochaska, J. X.; D'Odorico, S.; Matteucci, F.; A new comprehensive set of elemental abundances in DLAs. – III. Star formation histories; A&A 470, 431–448
Díaz-Sánchez, A.; Villo-Pérez, I.; Pérez-Garrido, A.; Rebolo, R.; A low mass cluster of extremely red galaxies at z = 1.10 in the GOODS Southern Field; MNRAS 377, 516–522
Díaz, R. F.; Ramírez, S.; Fernández, J. M.; Gallardo, J.; Gieren, W.; Ivanov, V. D.; Mauas, P.; Minniti, D.; Pietrzynski, G.; Pérez, F.; Ruíz, M. T.; Udalski, A.; Zoccali, M.; Millimagnitude Photometry for Transiting Extrasolar Planetary Candidates. – II. Transits of OGLE-TR-113-b in the Optical and Near-IR; ApJ 660, 850–857
Dietrich, J. P.; Erben, T.; Lamer, G.; Schneider, P.; Schwope, A.; Hartlap, J.; Maturi, M.; BLOX: the Bonn lensing, optical, and X-ray selected galaxy clusters. – I. Cluster catalog construction; A&A 470, 821–834
Dimitrijević, M. S.; Ryabchikova, T.; Simić, Z.; Popović, L. Č.; Dačić, M.; The influence of Stark broadening on Cr II spectral line shapes in stellar atmospheres; A&A 469, 681–686
Djorgovski, S. G.; Courbin, F.; Meylan, G.; Sluse, D.; Thompson, D.; Mahabal, A.; Glikman, E.; Discovery of a Probable Physical Triple Quasar; ApJ 662, L1–L5
Domiciano de Souza, A.; Driebe, T.; Chesneau, O.; Hofmann, K.-H.; Kraus, S.; Miroshnichenko, A. S.; Ohnaka, K.; Petrov, R. G.; Preisbisch, T.; Stee, P.; Weigelt, G.; Lisi, F.; Malbet, F.; Richichi, A.; AMBER/VLTI and MIDI/VLTI spectro-interferometric observations of the B[e] supergiant CPD-57°2874. Size and geometry of the circumstellar envelope in the near- and mid-IR; A&A 464, 81–86
Doucet, C.; Habart, E.; Pantin, E.; Dullemond, C.; Lagage, P. O.; Pinte, C.; Duchêne, G.; Ménard, F.; HD 97048: a closer look at the disk; A&A 470, 625–631
Douglas, L. S.; Bremer, M. N.; Stanway, E. R.; Lehnert, M. D.; Discovery of a single faint AGN in a large sample of z > 5 Lyman break galaxies; MNRAS 376, 1393–1398
Dow-Hygelund, C. C.; Holden, B. P.; Bouwens, R. J.; Illingworth, G. D.; van der Wel, A.; Franx, M.; van Dokkum, P. G.; Ford, H.; Rosati, P.; Magee, D.; Zirm, A.; Spectroscopy of z ~ 6 i-Dropout Galaxies: Frequency of Lyα Emission and the Sizes of Lyα-emitting Galaxies; ApJ 660, 47–61
Driver, S. P.; Popescu, C. C.; Tuffs, R. J.; Liske, J.; Graham, A. W.; Allen, P. D.; de Propris, R.; The Millennium Galaxy Catalogue: the B-band attenuation of bulge and disc light and the implied cosmic dust and stellar mass densities; MNRAS 379, 1022–1036
Duc, P.-A.; Braine, J.; Lisenfeld, U.; Brinks, E.; Boquien, M.; VCC 2062: an old tidal dwarf galaxy in the Virgo cluster?; A&A 475, 187–197
Duchêne, G.; Bontemps, S.; Bouvier, J.; André, P.; Djupvik, A. A.; Ghez, A. M.; Multiple protostellar systems. – II. A high resolution near-infrared imaging survey in nearby star-forming regions; A&A 476, 229–242
Ducourant, C.; Teixeira, R.; Hambly, N. C.; Oppenheimer, B. R.; Hawkins, M. R. S.; Rapaport, M.; Modolo, J.; Lecampion, J. F.; Trigonometric parallaxes of high velocity halo white dwarf candidates; A&A 470, 387–394
Duerbeck, H. W.; Rucinski, S. M.; Radial Velocity Studies of Southern Close Binary Stars. – II. Spring/Summer Systems; AJ 133, 169–176
Dumas, C.; Merlin, F.; Barucci, M. A.; de Bergh, C.; Hainault, O.; Guilbert, A.; Vernazza, P.; Doressoundiram, A.; Surface composition of the largest dwarf planet 136199 Eris (2003 UB_{313}); A&A 471, 331–334
Dunlop, J. S.; Cirasuolo, M.; McLure, R. J.; A systematic search for very massive galaxies at z > 4; MNRAS 376, 1054–1064
Eggenberger, A.; Udry, S.; Chauvin, G.; Beuzit, J.-L.; Lagrange, A.-M.; Ségransan, D.; Mayor, M.; The impact of stellar duplicity on planet occurrence and properties. – I. Observational results of a VLT/NACO search for stellar companions to 130 nearby stars with and without planets; A&A 474, 273–291
Eigenbrod, A.; Courbin, F.; Meylan, G.; COSMOGRAIL: the COSmological MOnitoring of GRAvItational Lenses. VI. Redshift of the lensing galaxy in seven gravitationally lensed quasars; A&A 465, 51–56
Eisenbeiss, T.; Seifahrt, A.; Mugrauer, M.; Schmidt, T. O. B.; Neuhäuser, R.; Roell, T.; Low-mass visual binaries in the solar neighbourhood: The case of HD 141272; AN 328, 521
Elia, D.; Massi, F.; Strafella, F.; De Luca, M.; Giannini, T.; Lorenzetti, D.; Nisini, B.; Campeggio, L.; Maiolo, B. M. T.; Mapping Molecular Emission in Vela Molecular Ridge Cloud D; ApJ 655, 316–331
Ellison, S. L.; Prochaska, J. X.; Lopez, S.; The Galactic deuterium abundance and dust depletion: insights from an expanded Ti/H sample; MNRAS 380, 1245–1254
Esposito, M.; Covino, E.; Alcalá, J. M.; Guenther, E. W.; Schisano, E.; MO Lup: a hierarchical triple T Tauri system; MNRAS 376, 1805–1813
Evans, C. J.; Bresolin, F.; Urbaneja, M. A.; Pietrzyński, G.; Gieren, W.; Kudritzki, R.-P.; The ARAUCARIA Project: VLT-FORS Spectroscopy of Blue Supergiants in NGC 3109-Classifications, First Abundances, and Kinematics; ApJ 659, 1198–1211
Eyles, L. P.; Bunker, A. J.; Ellis, R. S.; Lacy, M.; Stanway, E. R.; Stark, D. P.; Chiu, K.; The stellar mass density at z ~ 6 from Spitzer imaging of i'-drop galaxies; MNRAS 374, 910–930
Fangano, A. P. M.; Ferrara, A.; Richter, P.; Absorption features of high-redshift galactic winds; MNRAS 381, 469–488
Faure, C.; Giraud, E.; Melnick, J.; Quintana, H.; Selman, F.; Wambsganss, J.; An S-shaped arc in the galaxy cluster RX J0054.0-2823; A&A 463, 833–837
Feain, I. J.; Papadopoulos, P. P.; Ekers, R. D.; Middelberg, E.; Dressing a Naked Quasar: Star Formation and Active Galactic Nucleus Feedback in HE 0450–2958; ApJ 662, 872–877
Fechner, C.; Reimers, D.; Fluctuations of the intergalactic UV background towards two lines of sight; A&A 461, 847–859
Fedele, D.; van den Ancker, M. E.; Petr-Gotzens, M. G.; Rafanelli, P.; Optical and infrared properties of V1647 Orionis during the 2003–2006 outburst. – II. Temporal evolution of the eruptive source; A&A 472, 207–217
Fedele, D.; van den Ancker, M. E.; Petr-Gotzens, M. G.; Ageorges, N.; Rafanelli, P.; Optical and infrared properties of V1647 Orionis during the 2003–2006 outburst. – I. The reflection nebula; A&A 472, 199–205
Feltzing, S.; Fohlman, M.; Bensby, T.; Manganese trends in a sample of thin and thick disk stars. The origin of Mn; A&A 467, 665–677
Ferrero, P.; Sanchez, S. F.; Kann, D. A.; Klose, S.; Greiner, J.; Gorosabel, J.; Hartmann, D. H.; Henden, A. A.; Møller, P.; Palazzi, E.; Rau, A.; Stecklum, B.; Castro-Tirado, A. J.; Fynbo, J. P. U.; Hjorth, J.; Jakobsson, P.; Kouveliotou, C.; Masetti, N.; Pian, E.; Tanvir, N. R.; Wijers, R. A. M. J.; Constraints on an Optical Afterglow and on Supernova Light Following the Short Burst GRB 050813; AJ 134, 2118–2123
Feulner, G.; Goranova, Y.; Hopp, U.; Gabasch, A.; Bender, R.; Botzler, C. S.; Drory, N.; The Munich Near-Infrared Cluster Survey – IX. Galaxy evolution to z ~ 2 from optically selected catalogues; MNRAS 378, 429–448
Firth, P.; Drinkwater, M. J.; Evstigneeva, E. A.; Gregg, M. D.; Karick, A. M.; Jones, J. B.; Phillipps, S.; Compact stellar systems around NGC 1399; MNRAS 382, 1342–1352
Fivet, V.; Quinet, P.; Biémont, É.; Jorissen, A.; Yushchenko, A. V.; van Eck, S.; Transition probabilities in singly ionized promethium and the identification of Pm II lines in Przybylski's star and HR 465; MNRAS 380, 771–780
Foellmi, C.; Dall, T. H.; Depagne, E.; On the abundances of GRO J1655-40; A&A 464, L61–L64
Folkes, S. L.; Pinfield, D. J.; Kendall, T. R.; Jones, H. R. A.; Discovery of a nearby L-T transition object in the Southern Galactic plane; MNRAS 378, 901–909
Folsom, C. P.; Wade, G. A.; Bagnulo, S.; Landstreet, J. D.; Rotation and chemical abundances of Ap/Bp stars in the open cluster NGC 6475; MNRAS 376, 361–370
Forbrich, J.; Preibisch, T.; Menten, K. M.; Neuhäuser, R.; Walter, F. M.; Tamura, M.; Matsunaga, N.; Kusakabe, N.; Nakajima, Y.; Brandeker, A.; Fornasier, S.; Posselt, B.; Tachihara, K.; Broeg, C.; Simultaneous X-ray, radio, near-infrared, and optical monitoring of young stellar objects in the Coronet cluster; A&A 464, 1003–1013
Forbrich, J.; Massi, M.; Ros, E.; Brunthaler, A.; Menten, K. M.; Searching for coronal radio emission from protostars using very-long-baseline interferometry; A&A 469, 985–992
Fornasier, S.; Dotto, E.; Hainaut, O.; Marzari, F.; Boehnhardt, H.; de Luise, F.; Barucci, M. A.; Visible spectroscopic and photometric survey of Jupiter Trojans: Final results on dynamical families; Icar 190, 622–642
Fornasier, S.; Marzari, F.; Dotto, E.; Barucci, M. A.; Migliorini, A.; Are the E-type asteroids (2867) Steins, a target of the Rosetta mission, and NEA (3103) Eger remnants of an old asteroid family?; A&A 474, L29–L32

Fox, A. J.; Petitjean, P.; Ledoux, C.; Srianand, R.; Hot halos around high redshift protogalaxies. Observations of O VI and N V absorption in damped Lyman-α systems; A&A 465, 171–184
Fox, A. J.; Ledoux, C.; Petitjean, P.; Srianand, R.; C IV absorption in damped and sub-damped Lyman-α systems. Correlations with metallicity and implications for galactic winds at $z \approx 2$–3; A&A 473, 791–803
Fox, A. J.; Petitjean, P.; Ledoux, C.; Srianand, R.; Multiphase Plasma in Sub-Damped Lyα Systems: A Hidden Metal Reservoir; ApJ 668, L15–L18
Franzetti, P.; Scodeggio, M.; Garilli, B.; Vergani, D.; Maccagni, D.; Guzzo, L.; Tresse, L.; Ilbert, O.; Lamareille, F.; Contini, T.; Le Fèvre, O.; Zamorani, G.; Brinchmann, J.; Charlot, S.; Bottini, D.; Le Brun, V.; Picat, J. P.; Scaramella, R.; Vettolani, G.; Zanichelli, A.; Adami, C.; Arnouts, S.; Bardelli, S.; Bolzonella, M.; Cappi, A.; Ciliegi, P.; Foucaud, S.; Gavignaud, I.; Iovino, A.; McCracken, H. J.; Marano, B.; Marinoni, C.; Mazure, A.; Meneux, B.; Merighi, R.; Paltani, S.; Pellò, R.; Pollo, A.; Pozzetti, L.; Radovich, M.; Zucca, E.; Cucciati, O.; Walcher, C. J.; The VIMOS-VLT deep survey. Color bimodality and the mix of galaxy populations up to $z \sim 2$; A&A 465, 711–723
Frandsen, S.; Bruntt, H.; Grundahl, F.; Kopacki, G.; Kjeldsen, H.; Arentoft, T.; Stello, D.; Bedding, T. R.; Jacob, A. P.; Gilliland, R. L.; Edmonds, P. D.; Michel, E.; Matthiesen, J.; A search for solar-like oscillations in K giants in the globular cluster M4; A&A 475, 991–1002
François, P.; Depagne, E.; Hill, V.; Spite, M.; Spite, F.; Plez, B.; Beers, T. C.; Andersen, J.; James, G.; Barbuy, B.; Cayrel, R.; Bonifacio, P.; Molaro, P.; Nordström, B.; Primas, F.; First stars. – VIII. Enrichment of the neutron-capture elements in the early Galaxy; A&A 476, 935–950
Frebel, A.; Christlieb, N.; Norris, J. E.; Thom, C.; Beers, T. C.; Rhee, J.; Discovery of HE 1523–0901, a Strongly *r*-Process-enhanced Metal-poor Star with Detected Uranium; ApJ 660, L117–L120
Froebrich, D.; Meusinger, H.; Scholz, A.; FSR1735 – a new globular cluster candidate in the inner Galaxy; MNRAS 377, L54–L58
Frye, B. L.; Coe, D.; Bowen, D. V.; Benítez, N.; Broadhurst, T.; Guhathakurta, P.; Illingworth, G.; Menanteau, F.; Sharon, K.; Lupton, R.; Meylan, G.; Zekser, K.; Meurer, G.; Hurley, M.; The Sextet Arcs: A Strongly Lensed Lyman Break Galaxy in the ACS Spectroscopic Galaxy Survey toward Abell 1689; ApJ 665, 921–935
Fuhrmeister, B.; Liefke, C.; Schmitt, J. H. M. M.; Simultaneous XMM-Newton and VLT/UVES observations of the flare star CN Leonis; A&A 468, 221–231
Gâlfalk, M.; Olofsson, G.; Herbig-Haro flows in B335; A&A 475, 281–300
Garay, G.; Mardones, D.; Bronfman, L.; Brooks, K. J.; Rodríguez, L. F.; Güsten, R.; Nyman, L.-Å.; Franco-Hernández, R.; Moran, J. M.; Discovery of an energetic bipolar molecular outflow towards IRAS 16547–4247; A&A 463, 217–224
Garavini, G.; Folatelli, G.; Nobili, S.; Aldering, G.; Amanullah, R.; Antilogus, P.; Astier, P.; Blanc, G.; Bronder, T.; Burns, M. S.; Conley, A.; Deustua, S. E.; Doi, M.; Fabbro, S.; Fadeyev, V.; Gibbons, R.; Goldhaber, G.; Goobar, A.; Groom, D. E.; Hook, I.; Howell, D. A.; Kashikawa, N.; Kim, A. G.; Kowalski, M.; Kuznetsova, N.; Lee, B. C.; Lidman, C.; Mendez, J.; Morokuma, T.; Motohara, K.; Nugent, P. E.; Pain, R.; Perlmutter, S.; Quimby, R.; Raux, J.; Regnault, N.; Ruiz-Lapuente, P.; Sainton, G.; Schahmaneche, K.; Smith, E.; Spadafora, A. L.; Stanishev, V.; Thomas, R. C.; Walton, N. A.; Wang, L.; Wood-Vasey, W. M.; Yasuda, N.; Quantitative comparison between type Ia supernova spectra at low and high redshifts: a case study; A&A 470, 411–424
Garavini, G.; Nobili, S.; Taubenberger, S.; Pastorello, A.; Elias-Rosa, N.; Stanishev, V.; Blanc, G.; Benetti, S.; Goobar, A.; Mazzali, P. A.; Sanchez, S. F.; Salvo, M.; Schmidt, B. P.; Hillebrandt, W.; ESC observations of SN 2005cf. – II. Optical spectroscopy and the high-velocity features; A&A 471, 527–535
Garay, G.; Mardones, D.; Brooks, K. J.; Videla, L.; Contreras, Y.; A Multiwavelength Study of Young Massive Star Forming Regions. – II. The Dust Environment; ApJ 666, 309–320
García-Hernández, D. A.; García-Lario, P.; Plez, B.; Manchado, A.; D'Antona, F.; Lub, J.; Habing, H.; Lithium and zirconium abundances in massive Galactic O-rich AGB stars; A&A 462, 711–730
Garcet, O.; Gandhi, P.; Gosset, E.; Sprimont, P. G.; Surdej, J.; Borkowski, V.; Tajer, M.; Pacaud, F.; Pierre, M.; Chiappetti, L.; Maccagni, D.; Page, M. J.; Carrera, F. J.; Tedds, J. A.; Mateos, S.; Krumpe, M.; Contini, T.; Corral, A.; Ebrero, J.; Gavignaud, I.; Schwope, A.; Le Fèvre, O.; Polletta, M.; Rosen, S.; Lonsdale, C.; Watson, M.; Borczyk, W.; Vaisanen, P.; The XMM large scale structure survey: optical vs. X-ray classifications of active galactic nuclei and the unified scheme; A&A 474, 473–489
García-Rojas, J.; Esteban, C.; On the Abundance Discrepancy Problem in H II Regions; ApJ 670, 457–470
Geers, V. C.; Pontoppidan, K. M.; van Dishoeck, E. F.; Dullemond, C. P.; Augereau, J.-C.; Merín, B.; Oliveira, I.; Pel, J. W.; Spatial separation of small and large grains in the transitional disk around the young star IRS 48; A&A 469, L35–L38
Geers, V. C.; van Dishoeck, E. F.; Visser, R.; Pontoppidan, K. M.; Augereau, J.-C.; Habart, E.; Lagrange, A. M.; Spatially extended polycyclic aromatic hydrocarbons in circumstellar disks around T Tauri and Herbig Ae stars; A&A 476, 279–289
Geißler, K.; Kellner, S.; Brandner, W.; Masciadri, E.; Hartung, M.; Henning, T.; Lenzen, R.; Close, L.; Endl, M.; Kürster, M.; A direct and differential imaging search for sub-stellar companions to ε Indi A; A&A 461, 665–668
Geier, S.; Nesslinger, S.; Heber, U.; Przybilla, N.; Napiwotzki, R.; Kudritzki, R.-P.; The hot subdwarf B + white dwarf binary KPD 1930+2752. A supernova type Ia progenitor candidate; A&A 464, 299–307
Georgantopoulos, I.; Georgakakis, A.; Akylas, A.; Chandra and Spitzer observations of CDFS X-ray obscured QSOs; A&A 466, 823–830
Gielen, C.; van Winckel, H.; Waters, L. B. F. M.; Min, M.; Dominik, C.; Dust-grain processing in circumbinary discs around evolved binaries. The RV Tauri spectral twins RU Centauri and AC Herculis; A&A 475, 629–637
Gilbert, A. M.; Graham, J. R.; Feedback in the Antennae Galaxies (NGC 4038/9). – I. High-Resolution Infrared Spectroscopy of Winds from Super Star Clusters; ApJ 668, 168–181
Gillon, M.; Pont, F.; Moutou, C.; Santos, N. C.; Bouchy, F.; Hartman, J. D.; Mayor, M.; Melo, C.; Queloz, D.; Udry, S.; Magain, P.; The transiting planet OGLE-TR-132b revisited with new spectroscopy and deconvolution photometry,; A&A 466, 743–748
Gillon, M.; Pont, F.; Demory, B.-O.; Mallmann, F.; Mayor, M.; Mazeh, T.; Queloz, D.; Shporer, A.; Udry, S.; Vuissoz, C.; Detection of transits of the nearby hot Neptune GJ 436 b; A&A 472, L13–L16
Girard, P.; Köppen, J.; Acker, A.; Chemical compositions and plasma parameters of planetary nebulae with Wolf-Rayet and wels type central stars; A&A 463, 265–274
Girart, J. M.; Viti, S.; The origin of the molecular emission around the southern hemisphere Re 4 IRS – HH 188 region; A&A 470, 633–638
Gorgas, J.; Jablonka, P.; Goudfrooij, P.; Stellar population gradients in bulges along the Hubble sequence. – I. The data; A&A 474, 1081–1092
Gorlova, N.; Balog, Z.; Rieke, G. H.; Muzerolle, J.; Su, K. Y. L.; Ivanov, V. D.; Young, E. T.; Debris Disks in NGC 2547; ApJ 670, 516–535
Gosling, A. J.; Bandyopadhyay, R. M.; Miller-Jones, J. C. A.; Farrell, S. A.; GRO J1744–28, search for the counterpart: infrared photometry and spectroscopy; MNRAS 380, 1511–1520
Graham, A. W.; Driver, S. P.; Allen, P. D.; Liske, J.; The Millennium Galaxy Catalogue: the local supermassive black hole mass function in early- and late-type galaxies; MNRAS 378, 198–210
Granvik, M.; Muinonen, K.; Jones, L.; Bhattacharya, B.; Delbo, M.; Saba, L.; Cellino, A.; Tedesco, E.; Davis, D.; Meadows, V.; Linking large-parallax Spitzer–CFHT–VLT astrometry of asteroids; Icar 192, 475–490
Gratton, R. G.; Lucatello, S.; Bragaglia, A.; Carretta, E.; Cassisi, S.; Momany, Y.; Pancino, E.; Valenti, E.; Caloi, V.; Claudi, R.; D'Antona, F.; Desidera, S.; François, P.; James, G.; Moehler, S.; Ortolani, S.; Pasquini, L.; Piotto, G.; Recio-Blanco, A.; Na-O anticorrelation and horizontal branches. – V. The Na-O anticorrelation in NGC 6441 from Giraffe spectra; A&A 464, 953–965
Grave, J. M. C.; Kumar, M. S. N.; Probing the close environment of massive young stars with spectro-astrometry; A&A 462, L37–L40
Grazian, A.; Salimbeni, S.; Pentericci, L.; Fontana, A.; Nonino, M.; Vanzella, E.; Cristiani, S.; de Santis, C.; Gallozzi, S.; Giallongo, E.; Santini, P.; A comparison of LBGs, DRGs, and BzK galaxies: their contribution to the stellar mass density in the GOODS-MUSIC sample; A&A 465, 393–404
Gredel, R.; Quantitative optical and near-infrared spectroscopy of H_2 towards HH91A; A&A 474, 941–950
Grin, D.; Covone, G.; Kneib, J.-P.; Kamionkowski, M.; Blain, A.; Jullo, E.; Telescope search for decaying relic axions; PhRvD 75, 105018–
Grocholski, A. J.; Sarajedini, A.; Olsen, K. A. G.; Tiede, G. P.; Mancone, C. L.; Distances to Populous Clusters in the Large Magellanic Cloud via the *K*-band Luminosity of the Red Clump; AJ 134, 680–693
Groenewegen, M. A. T.; Decin, L.; Salaris, M.; De Cat, P.; The Pleiades eclipsing binary HD 23642 revisited; A&A 463, 579–587

Grundstrom, E. D.; Gies, D. R.; Hillwig, T. C.; McSwain, M. V.; Smith, N.; Gehrz, R. D.; Stahl, O.; Kaufer, A.; A Spectroscopic Study of Mass Outflows in the Interacting Binary RY Scuti; ApJ 667, 505–519
Grützbauch, R.; Trinchieri, G.; Rampazzo, R.; Held, E. V.; Rizzi, L.; Sulentic, J. W.; Zeilinger, W. W.; Small-Scale Systems of Galaxies. – III. X-Ray-detected Elliptical + Spiral Galaxy Pairs in Low-Density Environments; AJ 133, 220–254
Guarcello, M. G.; Prisinzano, L.; Micela, G.; Damiani, F.; Peres, G.; Sciortino, S.; Correlation between the spatial distribution of circumstellar disks and massive stars in the open cluster NGC 6611. Compiled catalog and cluster parameters; A&A 462, 245–255
Guenther, E. W.; Esposito, M.; Mundt, R.; Covino, E.; Alcalá, J. M.; Cusano, F.; Stecklum, B.; Pre-main sequence spectroscopic binaries suitable for VLTI observations; A&A 467, 1147–1155
Gullieuszik, M.; Held, E. V.; Rizzi, L.; Saviane, I.; Momany, Y.; Ortolani, S.; Near-infrared observations of the Fornax dwarf galaxy. – I. The red giant branch; A&A 467, 1025–1036
Gullieuszik, M.; Rejkuba, M.; Cioni, M. R.; Habing, H. J.; Held, E. V.; Near-infrared photometry of carbon stars in the Sagittarius dwarf irregular galaxy and DDO 210; A&A 475, 467–477
Guseva, N. G.; Izotov, Y. I.; Papaderos, P.; Fricke, K. J.; Balmer jump temperature determination in a large sample of low-metallicity H II regions; A&A 464, 885–893
Guy, J.; Astier, P.; Baumont, S.; Hardin, D.; Pain, R.; Regnault, N.; Basa, S.; Carlberg, R. G.; Conley, A.; Fabbro, S.; Fouchez, D.; Hook, I. M.; Howell, D. A.; Perrett, K.; Pritchet, C. J.; Rich, J.; Sullivan, M.; Antilogus, P.; Aubourg, E.; Bazin, G.; Bronder, J.; Filiol, M.; Palanque-Delabrouille, N.; Ripoche, P.; Ruhlmann-Kleider, V.; SALT2: using distant supernovae to improve the use of type Ia supernovae as distance indicators; A&A 466, 11–21
Guzzo, L.; Cassata, P.; Finoguenov, A.; Massey, R.; Scoville, N. Z.; Capak, P.; Ellis, R. S.; Mobasher, B.; Taniguchi, Y.; Thompson, D.; Ajiki, M.; Aussel, H.; Böhringer, H.; Brusa, M.; Calzetti, D.; Comastri, A.; Franceschini, A.; Hasinger, G.; Kasliwal, M. M.; Kitzbichler, M. G.; Kneib, J.-P.; Koekemoer, A.; Leauthaud, A.; McCracken, H. J.; Murayama, T.; Nagao, T.; Rhodes, J.; Sanders, D. B.; Sasaki, S.; Shioya, Y.; Tasca, L.; Taylor, J. E.; The Cosmic Evolution Survey (COSMOS): A Large-Scale Structure at z = 0.73 and the Relation of Galaxy Morphologies to Local Environment; ApJS 172, 254–269
Haas, M.; Siebenmorgen, R.; Pantin, E.; Horst, H.; Smette, A.; Käufl, H.-U.; Lagage, P.-O.; Chini, R.; VISIR/VLT mid-infrared imaging of Seyfert nuclei: nuclear dust emission and the Seyfert-2 dichotomy; A&A 473, 369–376
Haberzettl, L.; Bomans, D. J.; Dettmar, R.-J.; Low surface brightness galaxies around the HDF-S. – II. Distances and volume densities; A&A 471, 787–794
Hadfield, L. J.; Crowther, P. A.; A survey of the Wolf-Rayet population of the barred, spiral galaxy NGC 1313; MNRAS 381, 418–432
Haikala, L. K.; Olberg, M.; The structure of the cometary globule CG 12: a high-latitude star-forming region; A&A 466, 191–200
Hall, P. B.; Sadavoy, S. I.; Hutsemekers, D.; Everett, J. E.; Rafiee, A.; Acceleration and Substructure Constraints in a Quasar Outflow; ApJ 665, 174–186
Harris, A. W.; Mueller, M.; Delbó, M.; Bus, S. J.; Physical characterization of the potentially hazardous high-albedo Asteroid (33342) 1998 WT24 from thermal-infrared observations; Icar 188, 414–424
Hayashi, M.; Shimasaku, K.; Motohara, K.; Yoshida, M.; Okamura, S.; Kashikawa, N.; Luminosity-Dependent Clustering of Star-forming BzK Galaxies at Redshift 2; ApJ 660, 72–80
Hayes, M.; Östlin, G.; Atek, H.; Kunth, D.; Mas-Hesse, J. M.; Leitherer, C.; Jiménez-Bailón, E.; Adamo, A.; The escape of Lyman photons from a young starburst: the case of Haro11; MNRAS 382, 1465–1480
Helfand, D. J.; Chatterjee, S.; Brisken, W. F.; Camilo, F.; Reynolds, J.; van Kerkwijk, M. H.; Halpern, J. P.; Ransom, S. M.; VLBA Measurement of the Transverse Velocity of the Magnetar XTE J1810–197; ApJ 662, 1198–1203
Hempel, M.; Kissler-Patig, M.; Puzia, T. H.; Hilker, M.; The age structure of globular cluster systems in early-type galaxies and its dependence on host galaxy properties; A&A 463, 493–502
Hempel, M.; Zepf, S.; Kundu, A.; Geisler, D.; Maccarone, T. J.; Near-Infrared Observations of Globular Clusters in NGC 4472, NGC 4594, NGC 3585, and NGC 5813 and Implications for Their Ages and Metallicities; ApJ 661, 768–778
Hensberge, H.; Nitschelm, C.; Olsen, E. H.; Sterken, C.; David, M.; Freyhammer, L. M.; Landin, N. R.; Bouzid, M. Y.; Papadaki, C.; Pritchard, J. D.; Clausen, J. V.; Vaz, L. P. R.; The eclipsing double-lined binaries V883Cen and η Mus; MNRAS 379, 349–356
Herbst, T. M.; Hartung, M.; Kasper, M. E.; Leinert, C.; Ratzka, T.; Molecular Hydrogen Outflows in the Central Arcseconds of the T Tauri System; AJ 134, 359–366
Hetterscheidt, M.; Simon, P.; Schirmer, M.; Hildebrandt, H.; Schrabback, T.; Erben, T.; Schneider, P.; GaBoDS: The Garching-Bonn deep survey. – VII. Cosmic shear analysis; A&A 468, 859–876
Hicks, A. K.; Ellingson, E.; Hoekstra, H.; Gladders, M.; Yee, H. K. C.; Bautz, M.; Gilbank, D.; Webb, T.; Ivison, R.; A Multiwavelength Analysis of the Strong Lensing Cluster RCS 022434-0002.5 at z = 0.778; ApJ 671, 1446–1455
Hidalgo-Gámez, A. M.; Peimbert, A.; Diffuse Ionized Gas inside the Dwarf Irregular Galaxy NGC 6822; AJ 133, 1874–1882
Hildebrandt, H.; Pielorz, J.; Erben, T.; Schneider, P.; Eifler, T.; Simon, P.; Dietrich, J. P.; GaBoDS: the Garching-Bonn deep survey. – VIII. Lyman-break galaxies in the ESO deep public survey; A&A 462, 865–873
Hilker, M.; Baumgardt, H.; Infante, L.; Drinkwater, M.; Evstigneeva, E.; Gregg, M.; Dynamical masses of ultra-compact dwarf galaxies in Fornax; A&A 463, 119–130
Hilton, M.; Collins, C. A.; Stanford, S. A.; Lidman, C.; Dawson, K. S.; Davidson, M.; Kay, S. T.; Liddle, A. R.; Mann, R. G.; Miller, C. J.; Nichol, R. C.; Romer, A. K.; Sabirli, K.; Viana, P. T. P.; West, M. J.; The XMM Cluster Survey: The Dynamical State of XMMXCS J2215.9–1738 at z = 1.457; ApJ 670, 1000–1009
Hintz, E. G.; Brown, P. J.; Revised Periods for QS Geminorum and V367 Geminorum; PASP 119, 274–283
Hirtzig, M.; Coustenis, A.; Gendron, E.; Drossart, P.; Hartung, M.; Negrão, A.; Rannou, P.; Combes, M.; Titan: Atmospheric and surface features as observed with Nasmyth Adaptive Optics System Near-Infrared Imager and Spectrograph at the time of the Huygens mission; JGRE 112
Holden, B. P.; Illingworth, G. D.; Franx, M.; Blakeslee, J. P.; Postman, M.; Kelson, D. D.; van der Wel, A.; Demarco, R.; Magee, D. K.; Tran, K.-V.; Zirm, A.; Ford, H.; Rosati, P.; Homeier, N.; Mass Selection and the Evolution of the Morphology-Density Relation from z = 0.8 to 0; ApJ 670, 190–205
Holland, S. T.; Boyd, P. T.; Gorosabel, J.; Hjorth, J.; Schady, P.; Thomsen, B.; Augusteijn, T.; Blustin, A. J.; Breeveld, A.; De Pasquale, M.; Fynbo, J. P. U.; Gehrels, N.; Gronwall, C.; Hunsberger, S.; Ivanushkina, M.; Landsman, W.; Laursen, P.; McGowan, K.; Mangano, V.; Markwardt, C. B.; Marshall, F.; Mason, K. O.; Moretti, A.; Page, M. J.; Poole, T.; Roming, P.; Rosen, S.; Still, M.; Optical, Infrared, and Ultraviolet Observations of the X-Ray Flash XRF 050416A; AJ 133, 122–129
Holmberg, J.; Nordström, B.; Andersen, J.; The Geneva-Copenhagen survey of the Solar neighbourhood II. New uvby calibrations and rediscussion of stellar ages, the G dwarf problem, age-metallicity diagram, and heating mechanisms of the disk; A&A 475, 519–537
Holt, J.; Tadhunter, C. N.; González Delgado, R. M.; Inskip, K. J.; Rodriguez, J.; Emonts, B. H. C.; Morganti, R.; Wills, K. A.; The properties of the young stellar populations in powerful radio galaxies at low and intermediate redshifts; MNRAS 381, 611–639
Hopp, U.; Schulte-Ladbeck, R. E.; Kerp, J.; Searching for stars in compact high-velocity clouds – II; MNRAS 374, 1164–1168
Hovatta, T.; Tornikoski, M.; Lainela, M.; Lehto, H. J.; Valtaoja, E.; Torniainen, I.; Aller, M. F.; Aller, H. D.; Statistical analyses of long-term variability of AGN at high radio frequencies; A&A 469, 899–912
Hoyer, S.; Ramírez Alegría, S.; Ivanov, V. D.; Minniti, D.; Pietrzyński, G.; Ruíz, M. T.; Gieren, W.; Udalski, A.; Zoccali, M.; Carrasco, E. R.; Díaz, R. F.; Fernández, J. M.; Gallardo, J.; Rejkuba, M.; Pérez, F.; Millimagnitude Photometry for Transiting Extrasolar Planetary Candidates. – IV. Solution to the Puzzle of the Extremely Red OGLE-TR-82 Primary; ApJ 669, 1345–1353
Hubrig, S.; Pogodin, M. A.; Yudin, R. V.; Schöller, M.; Schnerr, R. S.; The magnetic field in the photospheric and circumstellar components of Herbig Ae stars; A&A 463, 1039–1046
Hubrig, S.; González, J. F.; Detection of variable Si II, Mn II, and Fe II emission lines in the magnetic Bp star a Centauri; A&A 466, 1083–1087
Hubrig, S.; Nesvacil, N.; Two new chemically peculiar stars with resolved, magnetically split lines; MNRAS 378, L16–L19
Hubrig, S.; Marco, O.; Stelzer, B.; Schöller, M.; Huélamo, N.; Establishing the nature of companion candidates to X-ray-emitting late *B*-type stars; MNRAS 381, 1569–1574
Hubrig, S.; Yudin, R. V.; Pogodin, M.; Schöller, M.; Peters, G. J.; Evidence for weak magnetic fields in early-type emission stars; AN 328, 1133
Huélamo, N.; Melo, C.; Sterzik, M. F.; Santos, N. C.; Mardones, D.; Looking into the cradle: new mid-IR observations of multiple proto-stars; A&A 464, 625–629

Huertas-Company, M.; Rouan, D.; Soucail, G.; Le Fèvre, O.; Tasca, L.; Contini, T.; Morphological evolution of $z \sim 1$ galaxies from deep K-band AO imaging in the COSMOS deep field; A&A 468, 937–950
Hügelmeyer, S. D.; Dreizler, S.; Homeier, D.; Reiners, A.; Investigation of transit-selected exoplanet candidates from the MACHO survey; A&A 469, 1163–1168
Hultzsch, P. J. N.; Puls, J.; Méndez, R. H.; Pauldrach, A. W. A.; Kudritzki, R.-P.; Hoffmann, T. L.; McCarthy, J. K.; Central stars of planetary nebulae in the Galactic bulge; A&A 467, 1253–1264
Humphrey, A.; Villar-Martín, M.; Fosbury, R.; Binette, L.; Vernet, J.; De Breuck, C.; di Serego Alighieri, S.; Giant Lyα nebulae around $z > 2$ radio galaxies: evidence for infall; MNRAS 375, 705–714
Hunter, I.; Dufton, P. L.; Smartt, S. J.; Ryans, R. S. I.; Evans, C. J.; Lennon, D. J.; Trundle, C.; Hubeny, I.; Lanz, T.; The VLT-FLAMES survey of massive stars: surface chemical compositions of B-type stars in the Magellanic Clouds; A&A 466, 277–300
Hyvönen, T.; Kotilainen, J. K.; Falomo, R.; Örndahl, E.; Pursimo, T.; The stellar content of low redshift BL Lacertae host galaxies from multicolour imaging; A&A 476, 723–734
Idiart, T. P.; Maciel, W. J.; Costa, R. D. D.; Chemical evolution of the Small Magellanic Cloud based on planetary nebulae; A&A 472, 101–110
Inskip, K. J.; Tadhunter, C. N.; Dicken, D.; Holt, J.; Villar-Martín, M.; Morganti, R.; PKS1932–46: a radio source in an interacting group?; MNRAS 382, 95–108
Irwin, J.; Aigrain, S.; Hodgkin, S.; Stassun, K. G.; Hebb, L.; Irwin, M.; Moraux, E.; Bouvier, J.; Alapini, A.; Alexander, R.; Bramich, D. M.; Holtzman, J.; Martín, E. L.; McCaughrean, M. J.; Pont, F.; Verrier, P. E.; Zapatero Osorio, M. R.; The Monitor project: JW 380 – a 0.26-, 0.15-Msolar, pre-main-sequence eclipsing binary in the Orion nebula cluster; MNRAS 380, 541–550
Irwin, J.; Irwin, M.; Aigrain, S.; Hodgkin, S.; Hebb, L.; Moraux, E.; The Monitor project: data processing and light curve production; MNRAS 375, 1449–1462
Hultzsch, P. J. N.; Puls, J.; Méndez, R. H.; Pauldrach, A. W. A.; Kudritzki, R.-P.; Hoffmann, T. L.; McCarthy, J. K.; Central stars of planetary nebulae in the Galactic bulge; A&A 467, 1253–1264
Jablonka, P.; Gorgas, J.; Goudfrooij, P.; Stellar population gradients in bulges along the Hubble sequence. – II. Relations with galaxy properties; A&A 474, 763–776
Jahnke, K.; Wisotzki, L.; Courbin, F.; Letawe, G.; Spatial decomposition of on-nucleus spectra of quasar host galaxies; MNRAS 378, 23–40
Janson, M.; Brandner, W.; Lenzen, R.; Close, L.; Nielsen, E.; Hartung, M.; Henning, T.; Bouy, H.; Improved age constraints for the AB Doradus quadruple system. The binary nature of AB Doradus B; A&A 462, 615–620
Janson, M.; Brandner, W.; Henning, T.; Lenzen, R.; McArthur, B.; Benedict, G. F.; Reffert, S.; Nielsen, E.; Close, L.; Biller, B.; Kellner, S.; Günther, E.; Hatzes, A.; Masciadri, E.; Geissler, K.; Hartung, M.; NACO-SDI Direct Imaging Search for the Exoplanet ε Eri b; AJ 133, 2442–2456
Jeffers, S. V.; Donati, J.-F.; Collier Cameron, A.; Magnetic activity on AB Doradus: temporal evolution of star-spots and differential rotation from 1988 to 1994; MNRAS 375, 567–583
Joergens, V.; Müller, A.; 16–20 M_{Jup} Radial Velocity Companion Orbiting the Brown Dwarf Candidate Cha Hα 8; ApJ 666, L113–L116
Johnas, C. M. S.; Guenther, E. W.; Joergens, V.; Schweitzer, A.; Hauschildt, P. H.; Lithium abundances of very low mass members of Chamaeleon I; A&A 475, 667–675
Jonker, P. G.; Nelemans, G.; Bassa, C. G.; Detection of the radial velocity curve of the B5–A0 supergiant companion star of Cir X-1?; MNRAS 374, 999–1005
Joos, F.; Schmid, H. M.; Limb polarization of Uranus and Neptune. – II. Spectropolarimetric observations; A&A 463, 1201–1210
Jordan, S.; Aznar Cuadrado, R.; Napiwotzki, R.; Schmid, H. M.; Solanki, S. K.; The fraction of DA white dwarfs with kilo-Gauss magnetic fields; A&A 462, 1097–1101
Kacprzak, G. G.; Churchill, C. W.; Steidel, C. C.; Murphy, M. T.; Evans, J. L.; A Correlation between Galaxy Morphology and Mg II Halo Absorption Strength; ApJ 662, 909–922
Kainulainen, J.; Lehtinen, K.; Väisänen, P.; Bronfman, L.; Knude, J.; A comparison of density structures of a star forming and a non-star-forming globule. DCld303.8-14.2 and Thumbprint nebula; A&A 463, 1029–1037
Kampczyk, P.; Lilly, S. J.; Carollo, C. M.; Scarlata, C.; Feldmann, R.; Koekemoer, A.; Leauthaud, A.; Sargent, M. T.; Taniguchi, Y.; Capak, P.; Simulating the Cosmos: The Fraction of Merging Galaxies at High Redshift; ApJS 172, 329–340
Kaplan, D. L.; van Kerkwijk, M. H.; Anderson, J.; The Distance to the Isolated Neutron Star RX J0720.4–3125; ApJ 660, 1428–1443
Karoff, C.; High-frequency modes in solar-like stars; MNRAS 381, 1001–1008
Kasper, M.; Biller, B. A.; Burrows, A.; Brandner, W.; Budaj, J.; Close, L. M.; The very nearby M/T dwarf binary SCR 1845-6357; A&A 471, 655–659
Kasper, M.; Apai, D.; Janson, M.; Brandner, W.; A novel L-band imaging search for giant planets in the Tucana and ß Pictoris moving groups; A&A 472, 321–327
Kausch, W.; Gitti, M.; Erben, T.; Schindler, S.; ARCRAIDER. – I. Detailed optical and X-ray analysis of the cooling flow cluster Z3146; A&A 471, 31–50
Kawakita, H.; Jehin, E.; Manfroid, J.; Hutsemékers, D.; Nuclear spin temperature of ammonia in Comet 9P/Tempel 1 before and after the Deep Impact event; Icar 187, 272–275
Kellerer, A.; Petr-Gotzens, M. G.; Kervella, P.; Coudé Du Foresto, V.; Interferometric observations of the multiple stellar system δ Velorum; A&A 469, 633–637
Kendall, T. R.; Jones, H. R. A.; Pinfield, D. J.; Pokorny, R. S.; Folkes, S.; Weights, D.; Jenkins, J. S.; Mauron, N.; New nearby, bright southern ultracool dwarfs; MNRAS 374, 445–454
Kervella, P.; Interferometric observations of η Carinae with VINCI/VLTI; A&A 464, 1045–1047
Kervella, P.; Thévenin, F.; Deep imaging survey of the environment of α Centauri. – II. CCD imaging with the NTT-SUSI2 camera; A&A 464, 373–375
Kervella, P.; Domiciano de Souza, A.; The environment of the fast rotating star Achernar. High-resolution thermal infrared imaging with VISIR in BURST mode; A&A 474, L49–L52
Kim, T.-S.; Bolton, J. S.; Viel, M.; Haehnelt, M. G.; Carswell, R. F.; An improved measurement of the flux distribution of the Lyα forest in QSO absorption spectra: the effect of continuum fitting, metal contamination and noise properties; MNRAS 382, 1657–1674
Kjær, K.; Leibundgut, B.; Fransson, C.; Gröningsson, P.; Spyromilio, J.; Kissler-Patig, M.; Infrared integral field spectroscopy of SN 1987A; A&A 471, 617–624
Kniazev, A. Y.; Grebel, E. K.; Pustilnik, S. A.; Pramskij, A. G.; High-quality spectrophotometry of the planetary nebula in the Fornax dSph; A&A 468, 121–128
Knudsen, K. K.; Walter, F.; Weiss, A.; Bolatto, A.; Riechers, D. A.; Menten, K.; New Insights on the Dense Molecular Gas in NGC 253 as Traced by HCN and HCO^+; ApJ 666, 156–164
Kocevski, D. D.; Ebeling, H.; Mullis, C. R.; Tully, R. B.; A Systematic X-Ray Search for Clusters of Galaxies behind the Milky Way. – II. The Second CIZA Subsample; ApJ 662, 224–235
Koch, A.; Grebel, E. K.; Kleyna, J. T.; Wilkinson, M. I.; Harbeck, D. R.; Gilmore, G. F.; Wyse, R. F. G.; Evans, N. W.; Complexity on Small Scales. – II. Metallicities and Ages in the Leo II Dwarf Spheroidal Galaxy; AJ 133, 270–283
Kochukhov, O.; Ryabchikova, T.; Weiss, W. W.; Landstreet, J. D.; Lyashko, D.; Line profile variations in rapidly oscillating Ap stars: resolution of the enigma; MNRAS 376, 651–672
Koch, A.; Kleyna, J. T.; Wilkinson, M. I.; Grebel, E. K.; Gilmore, G. F.; Evans, N. W.; Wyse, R. F. G.; Harbeck, Daniel R.; Stellar Kinematics in the Remote Leo II Dwarf Spheroidal Galaxy-Another Brick in the Wall; AJ 134, 566–578
Kodama, T.; Tanaka, I.; Kajisawa, M.; Kurk, J.; Venemans, B.; De Breuck, C.; Vernet, J.; Lidman, C.; The first appearance of the red sequence of galaxies in proto-clusters at $2 \lesssim z \lesssim 3$; MNRAS 377, 1717–1725
Koekemoer, A. M.; Aussel, H.; Calzetti, D.; Capak, P.; Giavalisco, M.; Kneib, J.-P.; Leauthaud, A.; Le Fèvre, O.; McCracken, H. J.; Massey, R.; Mobasher, B.; Rhodes, J.; Scoville, N.; Shopbell, P. L.; The COSMOS Survey: Hubble Space Telescope Advanced Camera for Surveys Observations and Data Processing; ApJS 172, 196–202
Korn, A. J.; Grundahl, F.; Richard, O.; Mashonkina, L.; Barklem, P. S.; Collet, R.; Gustafsson, B.; Piskunov, N.; Atomic Diffusion and Mixing in Old Stars. – I. Very Large Telescope FLAMES-UVES Observations of Stars in NGC 6397; ApJ 671, 402–419
Kóspál, Á.; Ábrahám, P.; Prusti, T.; Acosta-Pulido, J.; Hony, S.; Moór, A.; Siebenmorgen, R.; The outburst of the eruptive young star OO Serpentis between 1995 and 2006; A&A 470, 211–219
Kotilainen, J. K.; Falomo, R.; Labita, M.; Treves, A.; Uslenghi, M.; The Nuclear to Host Galaxy Relation of High-Redshift Quasars; ApJ 660, 1039–1050
Kouwenhoven, M. B. N.; Brown, A. G. A.; Kaper, L.; A brown dwarf desert for intermediate mass stars in Scorpius OB2?; A&A 464, 581–599
Kouwenhoven, M. B. N.; Brown, A. G. A.; Portegies Zwart, S. F.; Kaper, L.; The primordial binary population. – II. Recovering the binary population for intermediate mass stars in Scorpius OB2; A&A 474, 77–104
Kovtyukh, V. V.; High-precision effective temperatures of 161 FGK supergiants from line-depth ratios; MNRAS 378, 617–624

Kraus, M.; Borges Fernandes, M.; de Araújo, F. X.; On the hydrogen neutral outflowing disks of B[e] supergiants; A&A 463, 627–634
Kravtsov, V.; Alcaíno, G.; Marconi, G.; Alvarado, F.; Multi-color photometry of the Galactic globular cluster M75 = NGC 6864. A new sensitive metallicity indicator and the position of the horizontal branch in UV; A&A 469, 529–537
Kriek, M.; van Dokkum, P. G.; Franx, M.; Illingworth, G. D.; Coppi, P.; Förster Schreiber, N. M.; Gawiser, E.; Labbé, I.; Lira, P.; Marchesini, D.; Quadri, R.; Rudnick, G.; Taylor, E. N.; Urry, C. M.; van der Werf, P. P.; The Origin of Line Emission in Massive $z \sim 2.3$ Galaxies: Evidence for Cosmic Downsizing of AGN Host Galaxies; ApJ 669, 776–790
Krisciunas, K.; Garnavich, P. M.; Stanishev, V.; Suntzeff, N. B.; Prieto, J. L.; Espinoza, J.; Gonzalez, D.; Salvo, M. E.; Elias de la Rosa, N.; Smartt, S. J.; Maund, J. R.; Kudritzki, R.-P.; The Type Ia Supernova 2004S, a Clone of SN 2001el, and the Optimal Photometric Bands for Extinction Estimation; AJ 133, 58–72
Krumpe, M.; Lamer, G.; Schwope, A. D.; Wagner, S.; Zamorani, G.; Mignoli, M.; Staubert, R.; Wisotzki, L.; Hasinger, G.; The XMM-Newton survey in the Marano field. I. The X-ray data and optical follow-up; A&A 466, 41–61
Küpcü Yoldaş, A.; Salvato, M.; Greiner, J.; Pierini, D.; Pian, E.; Rau, A.; The host galaxy of GRB 011121: morphology and spectral energy distribution; A&A 463, 893–902
Kurk, J. D.; Walter, F.; Fan, X.; Jiang, L.; Riechers, D. A.; Rix, H.-W.; Pentericci, L.; Strauss, M. A.; Carilli, C.; Wagner, S.; Black Hole Masses and Enrichment of $z \sim 6$ SDSS Quasars; ApJ 669, 32–44
Kurtz, D. W.; Elkin, V. G.; Mathys, G.; The detection of the very low amplitude 16.2-min pulsation in individual lines of first ionization stage of rare earth elements in the roAp star ßCrB; MNRAS 380, 741–748
Kurtev, R.; Borissova, J.; Georgiev, L.; Ortolani, S.; Ivanov, V. D.; Obscured clusters. – I. GLIMPSE 30 – A young Milky Way star cluster hosting Wolf-Rayet stars; A&A 475, 209–216
Kurtz, D. W.; Elkin, V. G.; Mathys, G.; van Wyk, F.; On the nature of the upper atmospheric variability in the rapidly oscillating Ap star HD 134214; MNRAS 381, 1301–1312
Labbé, I.; Franx, M.; Rudnick, G.; Schreiber, N. M. F.; van Dokkum, P. G.; Moorwood, A.; Rix, H.-W.; Röttgering, H.; Trujillo, I.; van der Werf, P.; The Color-Magnitude Distribution of Field Galaxies to $z \sim 3$: The Evolution and Modeling of the Blue Sequence; ApJ 665, 944–972
Labiano, A.; Barthel, P. D.; O'Dea, C. P.; de Vries, W. H.; Pérez, I.; Baum, S. A.; GPS radio sources: new optical observations and an updated master list; A&A 463, 97–104
Lachaume, R.; Preibisch, T.; Driebe, T.; Weigelt, G.; Resolving the B[e] star Hen 3-1191 at 10 µm with VLTI/MIDI; A&A 469, 587–593
Lacy, J. H.; Jaffe, D. T.; Zhu, Q.; Richter, M. J.; Bitner, M. A.; Greathouse, T. K.; Volk, K.; Geballe, T. R.; Mehringer, D. M.; W51 IRS 2: A Massive Jet Emerging from a Molecular Cloud into an H II Region; ApJ 658, L45–L49
Lagos, P.; Telles, E.; Melnick, J.; Narrow-band Hß images of star-formation regions in H II galaxies; A&A 476, 89–96
Landstreet, J. D.; Bagnulo, S.; Andretta, V.; Fossati, L.; Mason, E.; Silaj, J.; Wade, G. A.; Searching for links between magnetic fields and stellar evolution: II. The evolution of magnetic fields as revealed by observations of Ap stars in open clusters and associations; A&A 470, 685–698
Lanzoni, B.; Dalessandro, E.; Ferraro, F. R.; Mancini, C.; Beccari, G.; Rood, R. T.; Mapelli, M.; Sigurdsson, S.; The Blue Straggler Population of the Globular Cluster M5; ApJ 663, 267–276
Lanzoni, B.; Sanna, N.; Ferraro, F. R.; Valenti, E.; Beccari, G.; Schiavon, R. P.; Rood, R. T.; Mapelli, M.; Sigurdsson, S.; A Panchromatic Study of the Globular Cluster NGC 1904. – I. The Blue Straggler Population; ApJ 663, 1040–1048
Lanzoni, B.; Dalessandro, E.; Ferraro, F. R.; Miocchi, P.; Valenti, E.; Rood, R. T.; The Surface Density Profile of NGC 6388: A Good Candidate for Harboring an Intermediate-Mass Black Hole; ApJ 668, L139–L142
Lanzoni, B.; Dalessandro, E.; Perina, S.; Ferraro, F. R.; Rood, R. T.; Sollima, A.; The Surprising External Upturn of the Blue Straggler Radial Distribution in M55; ApJ 670, 1065–1073
Lazorenko, P. F.; Mayor, M.; Dominik, M.; Pepe, F.; Segransan, D.; Udry, S.; High-precision astrometry on the VLT/FORS1 at time scales of few days; A&A 471, 1057–1067
Leão, I. C.; de Laverny, P.; Chesneau, O.; Mékarnia, D.; de Medeiros, J. R.; A snapshot of the inner dusty regions of a R CrB-type variable; A&A 466, L1–L4
Leauthaud, A.; Massey, R.; Kneib, J.-P.; Rhodes, J.; Johnston, D. E.; Capak, P.; Heymans, C.; Ellis, R. S.; Koekemoer, A. M.; Le Fèvre, O.; Mellier, Y.; Réfrégier, A.; Robin, A. C.; Scoville, N.; Tasca, L.; Taylor, J. E.; Van Waerbeke, L.; Weak Gravitational Lensing with COSMOS: Galaxy Selection and Shape Measurements; ApJS 172, 219–238
Lecureur, A.; Hill, V.; Zoccali, M.; Barbuy, B.; Gómez, A.; Minniti, D.; Ortolani, S.; Renzini, A.; Oxygen, sodium, magnesium, and aluminium as tracers of the galactic bulge formation; A&A 465, 799–814
Lee, T.-H.; Stanghellini, L.; Ferrario, L.; Wickramasinghe, D.; High-Resolution Spectra of Bright Central Stars of Bipolar Planetary Nebulae and the Question of Magnetic Shaping; AJ 133, 987–999
Lee, H.; Zucker, D. B.; Grebel, E. K.; Interstellar medium oxygen abundances of dwarf irregular galaxies in Centaurus A and nearby groups; MNRAS 376, 820–840
Lefever, K.; Puls, J.; Aerts, C.; Statistical properties of a sample of periodically variable B-type supergiants. Evidence for opacity-driven gravity-mode oscillations; A&A 463, 1093–1109
Leipski, C.; Haas, M.; Meusinger, H.; Siebenmorgen, R.; Chini, R.; Drass, H.; Albrecht, M.; Wilkes, B. J.; Huchra, J. P.; Ott, S.; Cesarsky, C.; Cutri, R.; Narrow-line AGN in the ISO-2MASS survey; A&A 464, 895–901
Leipski, C.; Haas, M.; Siebenmorgen, R.; Meusinger, H.; Albrecht, M.; Cesarsky, C.; Chini, R.; Cutri, R.; Drass, H.; Huchra, J. P.; Ott, S.; Wilkes, B. J.; The reddest ISO-2MASS quasar; A&A 473, 121–128
Lemasle, B.; François, P.; Bono, G.; Mottini, M.; Primas, F.; Romaniello, M.; Detailed chemical composition of Galactic Cepheids. A determination of the Galactic abundance gradient in the 8–12 kpc region; A&A 467, 283–294
Letawe, G.; Magain, P.; Courbin, F.; Jablonka, P.; Jahnke, K.; Meylan, G.; Wisotzki, L.; On-axis spectroscopy of the host galaxies of 20 optically luminous quasars at $z \sim 0.3$; MNRAS 378, 83–108
Levan, A. J.; Jakobsson, P.; Hurkett, C.; Tanvir, N. R.; Gorosabel, J.; Vreeswijk, P.; Rol, E.; Chapman, R.; Gehrels, N.; O'Brien, P. T.; Osborne, J. P.; Priddey, R. S.; Kouveliotou, C.; Starling, R.; vanden Berk, D.; Wiersema, K.; A case of mistaken identity? GRB 060912A and the nature of the long-short GRB divide; MNRAS 378, 1439–1446
Levshakov, S. A.; Molaro, P.; Lopez, S.; D'Odorico, S.; Centurión, M.; Bonifacio, P.; Agafonova, I. I.; Reimers, D.; A new measure of $\Delta\alpha/\alpha$ at redshift $z = 1.84$ from very high resolution spectra of Q 1101–264; A&A 466, 1077–1082
Leyder, J.-C.; Walter, R.; Lazos, M.; Masetti, N.; Produit, N.; Hard X-ray flares in IGR J08408–4503 unveil clumpy stellar winds; A&A 465, L35–L38
Lilly, S. J.; Le Fèvre, O.; Renzini, A.; Zamorani, G.; Scodeggio, M.; Contini, T.; Carollo, C. M.; Hasinger, G.; Kneib, J.-P.; Iovino, A.; Le Brun, V.; Maier, C.; Mainieri, V.; Mignoli, M.; Silverman, J.; Tasca, L. A. M.; Bolzonella, M.; Bongiorno, A.; Bottini, D.; Capak, P.; Caputi, K.; Cimatti, A.; Cucciati, O.; Daddi, E.; Feldmann, R.; Franzetti, P.; Garilli, B.; Guzzo, L.; Ilbert, O.; Kampczyk, P.; Kovac, K.,; Lamareille, F.; Leauthaud, A.; Borgne, J.-F. Le; McCracken, H. J.; Marinoni, C.; Pello, R.; Ricciardelli, E.; Scarlata, C.; Vergani, D.; Sanders, D. B.; Schinnerer, E.; Scoville, N.; Taniguchi, Y.; Arnouts, S.; Aussel, H.; Bardelli, S.; Brusa, M.; Cappi, A.; Ciliegi, P.; Finoguenov, A.; Foucaud, S.; Franceschini, R.; Halliday, C.; Impey, C.; Knobel, C.; Koekemoer, A.; Kurk, J.; Maccagni, D.; Maddox, S.; Marano, B.; Marconi, G.; Meneux, B.; Mobasher, B.; Moreau, C.; Peacock, J. A.; Porciani, C.; Pozzetti, L.; Scaramella, R.; Schiminovich, D.; Shopbell, P.; Smail, I.; Thompson, D.; Tresse, L.; Vettolani, G.; Zanichelli, A.; Zucca, E.; zCOSMOS: A Large VLT/VIMOS Redshift Survey Covering $0 < z < 3$ in the COSMOS Field; ApJS 172, 70–85
Limousin, M.; Richard, J.; Jullo, E.; Kneib, J.-P.; Fort, B.; Soucail, G.; Elíasdóttir, Á.; Natarajan, P.; Ellis, R. S.; Smail, I.; Czoske, O.; Smith, G. P.; Hudelot, P.; Bardeau, S.; Ebeling, H.; Egami, E.; Knudsen, K. K.; Combining Strong and Weak Gravitational Lensing in Abell 1689; ApJ 668, 643–666
Lin, Z. Y.; Weiler, M.; Rauer, H.; Ip, W. H.; Photometry and imaging of comet C/2004 Q2 (Machholz) at Lulin and La Silla; A&A 469, 771–776
Linder, N.; Rauw, G.; Sana, H.; De Becker, M.; Gosset, E.; The Struve-Sahade effect in the optical spectra of O-type binaries. – I. Main-sequence systems; A&A 474, 193–204
Driver, S. P.; Allen, P. D.; Liske, J.; Graham, A. W.; The Millennium Galaxy Catalogue: The Luminosity Functions of Bulges and Disks and Their Implied Stellar Mass Densities; ApJ 657, L85–L88
De Propris, R.; Conselice, C. J.; Liske, J.; Driver, S. P.; Patton, D. R.; Graham, A. W.; Allen, P. D.; The Millennium Galaxy Catalogue: The Connection between Close Pairs and Asymmetry; Implications for the Galaxy Merger Rate; ApJ 666, 212–221
Liu, Y. J.; Zhao, G.; Shi, J. R.; Pietrzyński, G.; Gieren, W.; The abundances of nearby red clump giants; MNRAS 382, 553–566
Lo Curto, G.; Mignani, R. P.; Perna, R.; Israel, G. L.; Deep VLT infrared observations of X-ray dim isolated neutron stars; A&A 473, 539–543

Lodieu, N.; Pinfield, D. J.; Leggett, S. K.; Jameson, R. F.; Mortlock, D. J.; Warren, S. J.; Burningham, B.; Lucas, P. W.; Chiu, K.; Liu, M. C.; Venemans, B. P.; McMahon, R. G.; Allard, F.; Baraffe, I.; Y Navascués, D. B.; Carraro, G.; Casewell, S. L.; Chabrier, G.; Chappelle, R. J.; Clarke, F.; Day-Jones, A. C.; Deacon, N. R.; Dobbie, P. D.; Folkes, S. L.; Hambly, N. C.; Hewett, P. C.; Hodgkin, S. T.; Jones, H. R. A.; Kendall, T. R.; Magazzù, A.; Martín, E. L.; McCaughrean, M. J.; Nakajima, T.; Pavlenko, Y.; Tamura, M.; Tinney, C. G.; Zapatero Osorio, M. R.; Eight new T4.5–T7.5 dwarfs discovered in the UKIDSS Large Area Survey Data Release 1; MNRAS 379, 1423–1430

Londish, D.; Croom, S. M.; Heidt, J.; Boyle, B. J.; Sadler, E. M.; Whiting, M.; Rector, T. A.; Pursimo, T.; Chynoweth, K.; The 2QZ BL Lac survey – II; MNRAS 374, 556–578

López-Sánchez, Á. R.; Esteban, C.; García-Rojas, J.; Peimbert, M.; Rodríguez, M.; The Localized Chemical Pollution in NGC 5253 Revisited: Results from Deep Echelle Spectrophotometry; ApJ 656, 168–185

Lopez, S.; Ellison, S.; D'Odorico, S.; Kim, T.-S.; Clues to the nature of high-redshift O VI absorption systems from their lack of small-scale structure; A&A 469, 61–74

Lopes de Oliveira, R.; Motch, C.; Smith, M. A.; Negueruela, I.; Torrejón, J. M.; On the X-ray and optical properties of the Be star HD 110432: a very hard-thermal X-ray emitter; A&A 474, 983–996

Lorin, O.; Rousselot, P.; Search for cometary activity in three Centaurs [(60558) Echeclus, 2000 FZ_{53} and 2000 GM_{137}] and two trans-Neptunian objects [(29981) 1999 TD_{10} and (28978) Ixion]; MNRAS 376, 881–889

Lovis, C.; Pepe, F.; A new list of thorium and argon spectral lines in the visible; A&A 468, 1115–1121

Lovis, C.; Mayor, M.; Planets around evolved intermediate-mass stars. – I. Two substellar companions in the open clusters NGC 2423 and NGC 4349; A&A 472, 657–664

Lowry, S. C.; Fitzsimmons, A.; Pravec, P.; Vokrouhlický, D.; Boehnhardt, H.; Taylor, P. A.; Margot, J.-L.; Galád, A.; Irwin, M.; Irwin, J.; Kusnirák, P.; Direct Detection of the Asteroidal YORP Effect; Sci 316, 272

Lynch, R. S.; Charlton, J. C.; Physical Properties of Weak Mg II Absorbers at $z \sim 2$; ApJ 666, 64–78

Mainieri, V.; Hasinger, G.; Cappelluti, N.; Brusa, M.; Brunner, H.; Civano, F.; Comastri, A.; Elvis, M.; Finoguenov, A.; Fiore, F.; Gilli, R.; Lehmann, I.; Silverman, J.; Tasca, L.; Vignali, C.; Zamorani, G.; Schinnerer, E.; Impey, C.; Trump, J.; Lilly, S.; Maier, C.; Griffiths, R. E.; Miyaji, T.; Capak, P.; Koekemoer, A.; Scoville, N.; Shopbell, P.; Taniguchi, Y.; The XMM-Newton Wide-Field Survey in the COSMOS Field. – IV. X-Ray Spectral Properties of Active Galactic Nuclei; ApJS 172, 368–382

Maiolo, B.; Strafella, F.; Campeggio, L.; Elia, D.; Aiello, S.; Optical and Near-IR Imaging of the Dark Globule CB 52; ApJ 661, 926–937

Malbet, F.; Benisty, M.; de Wit, W.-J.; Kraus, S.; Meilland, A.; Millour, F.; Tatulli, E.; Berger, J.-P.; Chesneau, O.; Hofmann, K.-H.; Isella, A.; Natta, A.; Petrov, R. G.; Preibisch, T.; Stee, P.; Testi, L.; Weigelt, G.; Antonelli, P.; Beckmann, U.; Bresson, Y.; Chelli, A.; Dugué, M.; Duvert, G.; Gennari, S.; Glück, L.; Kern, P.; Lagarde, S.; Le Coarer, E.; Lisi, F.; Perraut, K.; Puget, P.; Rantakyrö, F.; Robbe-Dubois, S.; Roussel, A.; Zins, G.; Accardo, M.; Acke, B.; Agabi, K.; Altariba, E.; Arezki, B.; Aristidi, E.; Baffa, C.; Behrend, J.; Blöcker, T.; Bonhomme, S.; Busoni, S.; Cassaing, F.; Clausse, J.-M.; Colin, J.; Connot, C.; Delboulbé, A.; Domiciano de Souza, A.; Driebe, T.; Feautrier, P.; Ferruzzi, D.; Forveille, T.; Fossat, E.; Foy, R.; Fraix-Burnet, D.; Gallardo, A.; Giani, E.; Gil, C.; Glentzlin, A.; Heiden, M.; Heininger, M.; Hernandez Utrera, O.; Kamm, D.; Kiekebusch, M.; Le Contel, D.; Le Contel, J.-M.; Lesourd, T.; Lopez, B.; Lopez, M.; Magnard, Y.; Marconi, A.; Mars, G.; Martinot-Lagarde, G.; Mathias, P.; Mège, P.; Monin, J.-L.; Mouillet, D.; Mourard, D.; Nussbaum, E.; Ohnaka, K.; Pacheco, J.; Perrier, C.; Rabbia, Y.; Rebattu, S.; Reynaud, F.; Richichi, A.; Robini, A.; Sacchettini, M.; Schertl, D.; Schöller, M.; Solscheid, W.; Spang, A.; Stefanini, P.; Tallon, M.; Tallon-Bosc, I.; Tasso, D.; Vakili, F.; von der Lühe, O.; Valtier, J.-C.; Vannier, M.; Ventura, N.; Disk and wind interaction in the young stellar object MWC 297 spatially resolved with AMBER/VLTI; A&A 464, 43–53

Malesani, D.; Covino, S.; D'Avanzo, P.; D'Elia, V.; Fugazza, D.; Piranomonte, S.; Ballo, L.; Campana, S.; Stella, L.; Tagliaferri, G.; Antonelli, L. A.; Chincarini, G.; Della Valle, M.; Goldoni, P.; Guidorzi, C.; Israel, G. L.; Lazzati, D.; Melandri, A.; Pellizza, L. J.; Romano, P.; Stratta, G.; Vergani, S. D.; Multicolor observations of the afterglow of the short/hard GRB 050724; A&A 473, 77–84

Maness, H.; Martins, F.; Trippe, S.; Genzel, R.; Graham, J. R.; Sheehy, C.; Salaris, M.; Gillessen, S.; Alexander, T.; Paumard, T.; Ott, T.; Abuter, R.; Eisenhauer, F.; Evidence for a Long-standing Top-heavy Initial Mass Function in the Central Parsec of the Galaxy; ApJ 669, 1024–1041

Manfroid, J.; Hutsemékers, D.; Jehin, E.; Cochran, A. L.; Arpigny, C.; Jackson, W. M.; Meech, K. J.; Schulz, R.; Zucconi, J.-M.; The impact and rotational light curves of Comet 9P/Tempel 1; Icar 187, 144–155

Mannucci, F.; Buttery, H.; Maiolino, R.; Marconi, A.; Pozzetti, L.; Evidence for strong evolution of the cosmic star formation density at high redshifts; A&A 461, 423–431

Marchesini, D.; van Dokkum, P.; Quadri, R.; Rudnick, G.; Franx, M.; Lira, P.; Wuyts, S.; Gawiser, E.; Christlein, D.; Toft, S.; The Rest-Frame Optical Luminosity Functions of Galaxies at $2 \leqq z \leqq 3.5$; ApJ 656, 42–65

Marcolino, W. L. F.; Hillier, D. J.; de Araujo, F. X.; Pereira, C. B.; Detailed Far-Ultraviolet to Optical Analysis of Four [WR] Stars; ApJ 654, 1068–1086

Marchenko, S. V.; Foellmi, C.; Moffat, A. F. J.; Martins, F.; Bouret, J.-C.; Depagne, E.; Spectroscopy of SMC Wolf-Rayet Stars Suggests that Wind Clumping Does Not Depend on Ambient Metallicity; ApJ 656, L77–L80

Maret, S.; Bergin, E. A.; Lada, C. J.; Using Chemistry to Unveil the Kinematics of Starless Cores: Complex Radial Motions in Barnard 68; ApJ 670, L25–L28

Margutti, R.; Chincarini, G.; Covino, S.; Tagliaferri, G.; Campana, S.; Della Valle, M.; Filippenko, A. V.; Fiore, F.; Foley, R.; Fugazza, D.; Giommi, P.; Malesani, D.; Moretti, A.; Stella, L.; The host galaxy of GRB 031203: a new spectroscopic study; A&A 474, 815–826

Marilli, E.; Frasca, A.; Covino, E.; Alcalá, J. M.; Catalano, S.; Fernández, M.; Arellano Ferro, A.; Rubio-Herrera, E.; Spezzi, L.; Rotational periods of solar-mass young stars in Orion; A&A 463, 1081–1091

Maris, M.; Carraro, G.; Parisi, M. G.; Light curves and colours of the faint Uranian irregular satellites Sycorax, Prospero, Stephano, Setebos, and Trinculo; A&A 472, 311–319

Marquart, T.; Fathi, K.; Ã-Stlin, G.; Bergvall, N.; Cumming, R. J.; Amram, P.; Star-gas decoupling and a non-rotating stellar core in He 2–10. Integral field spectroscopy with FLAMES/ARGUS; A&A 474, L9–L12

Martayan, C.; Frémat, Y.; Hubert, A.-M.; Floquet, M.; Zorec, J.; Neiner, C.; Effects of metallicity, star-formation conditions, and evolution in B and Be stars. – II. Small Magellanic Cloud, field of NGC 330; A&A 462, 683–694

Martins, F.; Genzel, R.; Hillier, D. J.; Eisenhauer, F.; Paumard, T.; Gillessen, S.; Ott, T.; Trippe, S.; Stellar and wind properties of massive stars in the central parsec of the Galaxy; A&A 468, 233–254

Martin-Zaïdi, C.; Lagage, P.-O.; Pantin, E.; Habart, E.; Detection of Warm Molecular Hydrogen in the Circumstellar Disk around the Herbig Ae Star HD 97048; ApJ 666, L117–L120

Martayan, C.; Floquet, M.; Hubert, A. M.; Gutiérrez-Soto, J.; Fabregat, J.; Neiner, C.; Mekkas, M.; Be stars and binaries in the field of the SMC open cluster NGC 330 with VLT-FLAMES; A&A 472, 577–586

Mashonkina, L.; Korn, A. J.; Przybilla, N.; A non-LTE study of neutral and singly-ionized calcium in late-type stars; A&A 461, 261–275

Mason, E.; Wickramasinghe, D.; Howell, S. B.; Szkody, P.; First detection of Zeeman absorption lines in the polar VV Puppis. Observations of low activity states; A&A 467, 277–281

Massey, R.; Rhodes, J.; Ellis, R.; Scoville, N.; Leauthaud, A.; Finoguenov, A.; Capak, P.; Bacon, D.; Aussel, H.; Kneib, J.-P.; Koekemoer, A.; McCracken, H.; Mobasher, B.; Pires, S.; Refregier, A.; Sasaki, S.; Starck, J.-L.; Taniguchi, Y.; Taylor, A.; Taylor, J.; Dark matter maps reveal cosmic scaffolding; Natur 445, 286–290

Massi, F.; de Luca, M.; Elia, D.; Giannini, T.; Lorenzetti, D.; Nisini, B.; Star formation in the Vela molecular ridge. Large scale mapping of cloud D in the mm continuum; A&A 466, 1013–1023

Massey, P.; Levesque, E. M.; Olsen, K. A. G.; Plez, B.; Skiff, B. A.; HV 11423: The Coolest Supergiant in the SMC; ApJ 660, 301–310

Massey, R.; Rhodes, J.; Leauthaud, A.; Capak, P.; Ellis, R.; Koekemoer, A.; Réfrégier, A.; Scoville, N.; Taylor, J. E.; Albert, J.; Bergé, J.; Heymans, C.; Johnston, D.; Kneib, J.-P.; Mellier, Y.; Mobasher, B.; Semboloni, E.; Shopbell, P.; Tasca, L.; Van Waerbeke, L.; COSMOS: Three-dimensional Weak Lensing and the Growth of Structure; ApJS 172, 239–253

Mathys, G.; Kurtz, D. W.; Elkin, V. G.; Pulsation in the presence of a strong magnetic field: the roAp star HD 166473; MNRAS 380, 181–198

Matsuura, M.; Speck, A. K.; Smith, M. D.; Zijlstra, A. A.; Viti, S.; Lowe, K. T. E.; Redman, M.; Wareing, C. J.; Lagadec, E.; VLT/near-infrared integral field spectrometer observations of molecular hydrogen lines in the knots of the planetary nebula NGC 7293 (the Helix Nebula); MNRAS 382, 1447–1459

Mattila, S.; Väisänen, P.; Farrah, D.; Efstathiou, A.; Meikle, W. P. S.; Dahlen, T.; Fransson, C.; Lira, P.; Lundqvist, P.; Östlin, G.; Ryder, S.; Sollerman, J.; Adaptive Optics Discovery of Supernova 2004ip in the Nuclear Regions of the Luminous Infrared Galaxy IRAS 18293–3413; ApJ 659, L9–L12

Maturi, M.; Schirmer, M.; Meneghetti, M.; Bartelmann, M.; Moscardini, L.; Searching dark-matter halos in the GaBoDS survey; A&A 462, 473–479

Maund, J. R.; Wheeler, J. C.; Patat, F.; Baade, D.; Wang, L.; Höflich, P.; Spectropolarimetry of the Type Ib/c SN 2005bf; MNRAS 381, 201–210

Maund, J. R.; Wheeler, J. C.; Patat, F.; Baade, D.; Wang, L.; Höflich, P.; Spectropolarimetry of SN 2006aj at 9.6 days; A&A 475, L1–L4

Maund, J. R.; Wheeler, J. C.; Patat, F.; Wang, L.; Baade, D.; Höflich, P. A.; Spectropolarimetry of the Type IIb Supernova 2001ig; ApJ 671, 1944–1958

Mauron, N.; Gigoyan, K. S.; Kendall, T. R.; The properties of carbon stars found in the Byurakan and the Hamburg/ESO surveys; A&A 463, 969–974

Maxted, P. F. L.; O'Donoghue, D.; Morales-Rueda, L.; Napiwotzki, R.; Smalley, B.; The mass and radius of the M-dwarf in the short-period eclipsing binary RR Caeli; MNRAS 376, 919–928

Mazure, A.; Adami, C.; Pierre, M.; Le Fèvre, O.; Arnouts, S.; Duc, P. A.; Ilbert, O.; Lebrun, V.; Meneux, B.; Pacaud, F.; Surdej, J.; Valtchanov, I.; Structure detection in the D1 CFHTLS deep field using accurate photometric redshifts: a benchmark; A&A 467, 49–62

Mazzali, P. A.; Foley, R. J.; Deng, J.; Patat, F.; Pian, E.; Baade, D.; Bloom, J. S.; Filippenko, A. V.; Perley, D. A.; Valenti, S.; Wang, L.; Kawabata, K.; Maeda, K.; Nomoto, K.; Keck and European Southern Observatory Very Large Telescope View of the Symmetry of the Ejecta of the XRF/SN 2006aj; ApJ 661, 892–898

McCracken, H. J.; Peacock, J. A.; Guzzo, L.; Capak, P.; Porciani, C.; Scoville, N.; Aussel, H.; Finoguenov, A.; James, J. B.; Kitzbichler, M. G.; Koekemoer, A.; Leauthaud, A.; Le Fèvre, O.; Massey, R.; Mellier, Y.; Mobasher, B.; Norberg, P.; Rhodes, J.; Sanders, D. B.; Sasaki, S. S.; Taniguchi, Y.; Thompson, D. J.; White, S. D. M.; El-Zant, A.; The Angular Correlations of Galaxies in the COSMOS Field; ApJS 172, 314–319

McDonald, I.; van Loon, J. T.; Dust, pulsation, chromospheres and their rôle in driving mass loss from red giants in Galactic globular clusters; A&A 476, 1261–1282

McNamara, D. H.; Clementini, G.; Marconi, M.; A δ Scuti Distance to the Large Magellanic Cloud; AJ 133, 2752–2763

Meilland, A.; Stee, P.; Vannier, M.; Millour, F.; Domiciano de Souza, A.; Malbet, F.; Martayan, C.; Paresce, F.; Petrov, R. G.; Richichi, A.; Spang, A.; First direct detection of a Keplerian rotating disk around the Be star α Arae using AMBER/VLTI; A&A 464, 59–71

Meilland, A.; Millour, F.; Stee, P.; Domiciano de Souza, A.; Petrov, R. G.; Mourard, D.; Jankov, S.; Robbe-Dubois, S.; Spang, A.; Aristidi, E.; Antonelli, P.; Beckmann, U.; Bresson, Y.; Chelli, A.; Dugué, M.; Duvert, G.; Gennari, S.; Glück, L.; Kern, P.; Lagarde, S.; Le Coarer, E.; Lisi, F.; Malbet, F.; Perraut, K.; Puget, P.; Rantakyrö, F.; Roussel, A.; Tatulli, E.; Weigelt, G.; Zins, G.; Accardo, M.; Acke, B.; Agabi, K.; Altariba, E.; Arezki, B.; Baffa, C.; Behrend, J.; Blöcker, T.; Bonhomme, S.; Busoni, S.; Cassaing, F.; Clausse, J.-M.; Colin, J.; Connot, C.; Delboulbé, A.; Driebe, T.; Feautrier, P.; Ferruzzi, D.; Forveille, T.; Fossat, E.; Foy, R.; Fraix-Burnet, D.; Gallardo, A.; Giani, E.; Gil, C.; Glentzlin, A.; Heiden, M.; Heininger, M.; Hernandez Utrera, O.; Hofmann, K.-H.; Kamm, D.; Kiekebusch, M.; Kraus, S.; Le Contel, D.; Le Contel, J.-M.; Lesourd, T.; Lopez, B.; Lopez, M.; Magnard, Y.; Marconi, A.; Mars, G.; Martinot-Lagarde, G.; Mathias, P.; Mège, P.; Monin, J.-L.; Mouillet, D.; Nussbaum, E.; Ohnaka, K.; Pacheco, J.; Perrier, C.; Rabbia, Y.; Rebattu, S.; Reynaud, F.; Richichi, A.; Robini, A.; Sacchettini, M.; Schertl, D.; Schöller, M.; Solscheid, W.; Stefanini, P.; Tallon, M.; Tallon-Bosc, I.; Tasso, D.; Testi, L.; Vakili, F.; von der Lühe, O.; Valtier, J.-C.; Vannier, M.; Ventura, N.; An asymmetry detected in the disk of κ Canis Majoris with AMBER/VLTI; A&A 464, 73–79

Meisenheimer, K.; Tristram, K. R. W.; Jaffe, W.; Israel, F.; Neumayer, N.; Raban, D.; Röttgering, H.; Cotton, W. D.; Graser, U.; Henning, T.; Leinert, C.; Lopez, B.; Perrin, G.; Prieto, A.; Resolving the innermost parsec of Centaurus A at mid-infrared wavelengths; A&A 471, 453–465

Mekkaden, M. V.; Muneer, S.; Raveendran, A. V.; Photometric, spectroscopic and polarimetric variability of the weak-emission T Tauri star HD 288313; MNRAS 378, 1079–1088

Melo, C.; Santos, N. C.; Gieren, W.; Pietrzynski, G.; Ruiz, M. T.; Sousa, S. G.; Bouchy, F.; Lovis, C.; Mayor, M.; Pepe, F.; Queloz, D.; da Silva, R.; Udry, S.; A new Neptune-mass planet orbiting HD 219828; A&A 467, 721–727

Memola, E.; Caccianiga, A.; Cocchia, F.; Della Ceca, R.; Maccacaro, T.; Severgnini, P.; Fyfe, D. J.; Mateos, S.; Watson, M. G.; Lamer, G.; Searching for absorbed AGN in the 2XMM-Newton pre-release EPIC Serendipitous Source Catalogue; A&A 465, 759–764

Mengel, S.; Tacconi-Garman, L. E.; Medium resolution 2.3 µm spectroscopy of the massive Galactic open cluster Westerlund 1; A&A 466, 151–155

Menut, J.-L.; Gendron, E.; Schartmann, M.; Tuthill, P.; Lopez, B.; Danchi, W. C.; Wolf, S.; Lagrange, A.-M.; Flament, S.; Rouan, D.; Clénet, Y.; Berruyer, N.; The carbon star IRC+10216: linking the complex inner region with its spherical large-scale structures; MNRAS 376, L6–L10

Mérand, A.; Aufdenberg, J. P.; Kervella, P.; du Foresto, V. C.; ten Brummelaar, T. A.; McAlister, H. A.; Sturmann, L.; Sturmann, J.; Turner, N. H.; Extended Envelopes around Galactic Cepheids. – III. Y Ophiuchi and α Persei from Near-Infrared Interferometry with CHARA/FLUOR; ApJ 664, 1093–1101

Merín, B.; Augereau, J.-C.; van Dishoeck, E. F.; Kessler-Silacci, J.; Dullemond, C. P.; Blake, G. A.; Lahuis, F.; Brown, J. M.; Geers, V. C.; Pontoppidan, K. M.; Comerón, F.; Frasca, A.; Guieu, S.; Alcalá, J. M.; Boogert, A. C. A.; Evans II, N. J.; D'Alessio, P.; Mundy, L. G.; Chapman, N.; Abundant Crystalline Silicates in the Disk of a Very Low Mass Star; ApJ 661, 361–367

Merlin, F.; Guilbert, A.; Dumas, C.; Barucci, M. A.; de Bergh, C.; Vernazza, P.; Properties of the icy surface of the TNO 136108 (2003 EL_{61}); A&A 466, 1185–1188

Mermilliod, J.-C.; Mayor, M.; Red giants in open clusters. – XII. Six old open clusters NGC 2112, 2204, 2243, 2420, 2506, 2682; A&A 470, 919–926

Mermilliod, J.-C.; Andersen, J.; Latham, D. W.; Mayor, M.; Red giants in open clusters. – XIII. Orbital elements of 156 spectroscopic binaries; A&A 473, 829–845

Messineo, M.; Petr-Gotzens, M. G.; Schuller, F.; Menten, K. M.; Habing, H. J.; Kissler-Patig, M.; Modigliani, A.; Reunanen, J.; Integral-field spectroscopy of the Galactic cluster [DBS2003]8. Discovery of an ultra-compact H II region and its ionizing star in the bright rimmed cloud SFO49; A&A 472, 471–482

Meyer, L.; Schödel, R.; Eckart, A.; Duschl, W. J.; Karas, V.; Dovčiak, M.; On the orientation of the Sagittarius A system; A&A 473, 707–710

Meynadier, F.; Heydari-Malayeri, M.; Low-excitation blobs in the Magellanic Clouds; A&A 461, 565–569

Michielsen, D.; Koleva, M.; Prugniel, P.; Zeilinger, W. W.; De Rijcke, S.; Dejonghe, H.; Pasquali, A.; Ferreras, I.; Debattista, V. P.; Toward a Solution for the Ca II Triplet Puzzle: Results from Dwarf Elliptical Galaxies; ApJ 670, L101–L104

Mieske, S.; Hilker, M.; Jordán, A.; Infante, L.; Kissler-Patig, M.; A search for ultra-compact dwarf galaxies in the Centaurus galaxy cluster; A&A 472, 111–119

Mignano, A.; Miralles, J.-M.; da Costa, L.; Olsen, L. F.; Prandoni, I.; Arnouts, S.; Benoist, C.; Madejsky, R.; Slijkhuis, R.; Zaggia, S.; ESO imaging survey: optical deep public survey; A&A 462, 553–563

Mignani, R. P.; Bagnulo, S.; Dyks, J.; Lo Curto, G.; Słowikowska, A.; The optical polarisation of the Vela pulsar revisited; A&A 467, 1157–1162

Mignani, R. P.; Perna, R.; Rea, N.; Israel, G. L.; Mereghetti, S.; Curto, G. Lo.; VLT/NACO observations of the high-magnetic field radio pulsar PSR J1119-6127; A&A 471, 265–270

Mignani, R. P.; Zharikov, S.; Caraveo, P. A.; The optical spectrum of the Vela pulsar; A&A 473, 891–896

Mignani, R. P.; de Luca, A.; Zaggia, S.; Sester, D.; Pellizzoni, A.; Mereghetti, S.; Caraveo, P. A.; VLT observations of the central compact object in the Vela Jr. supernova remnant; A&A 473, 883–889

Miknaitis, G.; Pignata, G.; Rest, A.; Wood-Vasey, W. M.; Blondin, S.; Challis, P.; Smith, R. C.; Stubbs, C. W.; Suntzeff, N. B.; Foley, R. J.; Matheson, T.; Tonry, J. L.; Aguilera, C.; Blackman, J. W.; Becker, A. C.; Clocchiatti, A.; Covarrubias, R.; Davis, T. M.; Filippenko, A. V.; Garg, A.; Garnavich, P. M.; Hicken, M.; Jha, S.; Krisciunas, K.; Kirshner, R. P.; Leibundgut, B.; Li, W.; Miceli, A.; Narayan, G.; Prieto, J. L.; Riess, A. G.; Salvo, M. E.; Schmidt, B. P.; Sollerman, J.; Spyromilio, J.; Zenteno, A.; The ESSENCE Supernova Survey: Survey Optimization, Observations, and Supernova Photometry; ApJ 666, 674–693

Millour, F.; Petrov, R. G.; Chesneau, O.; Bonneau, D.; Dessart, L.; Bechet, C.; Tallon-Bosc, I.; Tallon, M.; Thiébaut, E.; Vakili, F.; Malbet, F.; Mourard, D.; Antonelli, P.; Beckmann, U.; Bresson, Y.; Chelli, A.; Dugué, M.; Duvert, G.; Gennari, S.; Glück, L.; Kern, P.; Lagarde, S.; Le Coarer, E.; Lisi, F.; Perraut, K.; Puget, P.; Rantakyrö, F.; Robbe-Dubois, S.; Roussel, A.; Tatulli, E.; Weigelt, G.; Zins, G.; Accardo, M.; Acke, B.; Agabi, K.; Altariba, E.; Arezki, B.; Aristidi, E.; Baffa, C.; Behrend, J.; Blöcker, T.; Bonhomme, S.; Busoni, S.; Cassaing, F.; Clausse, J.-M.; Colin, J.; Connot, C.; Delboulbé, A.; Domiciano de Souza, A.; Driebe, T.; Feautrier, P.; Ferruzzi, D.; Forveille, T.; Fossat, E.; Foy, R.; Fraix-Burnet, D.; Gallardo, A.; Giani, E.; Gil, C.; Glentzlin, A.; Heiden, M.; Heininger, M.; Hernandez Utrera, O.; Hofmann, K.-H.; Kamm, D.; Kiekebusch, M.; Kraus, S.; Le Contel, D.; Le Contel, J.-M.; Lesourd, T.; Lopez, B.; Lopez, M.; Magnard, Y.; Marconi, A.; Mars, G.; Martinot-Lagarde, G.; Mathias, P.; Mège, P.; Monin, J.-L.; Mouillet, D.; Nussbaum, E.; Ohnaka, K.; Pacheco, J.; Perrier, C.; Rabbia, Y.; Rebattu, S.; Reynaud, F.; Richichi, A.; Robini, A.; Sacchettini, M.; Schertl, D.; Schöller, M.; Solscheid, W.; Spang, A.; Stee, P.; Stefanini, P.; Tasso, D.; Testi, L.; von der Lühe, O.; Valtier, J.-C.; Vannier, M.; Ventura, N.; Direct constraint on the distance of γ2 Velorum from AMBER/VLTI observations; A&A 464, 107–118

Minniti, D.; Fernández, J. M.; Díaz, R. F.; Udalski, A.; Pietrzynski, G.; Gieren, W.; Rojo, P.; Ruíz, M. T.; Zoccali, M.; Millimagnitude Photometry for Transiting Extrasolar Planetary Candidates. – III. Accurate Radius and Period for OGLE-TR-111-b; ApJ 660, 858–862

Mobasher, B.; Capak, P.; Scoville, N. Z.; Dahlen, T.; Salvato, M.; Aussel, H.; Thompson, D. J.; Feldmann, R.; Tasca, L.; Lefevre, O.; Lilly, S.; Carollo, C. M.; Kartaltepe, J. S.; McCracken, H.; Mould, J.; Renzini, A.; Sanders, D. B.; Shopbell, P. L.; Taniguchi, Y.; Ajiki, M.; Shioya, Y.; Contini, T.; Giavalisco, M.; Ilbert, O.; Iovino, A.; Le Brun, V.; Mainieri, V.; Mignoli, M.; Scodeggio, M.; Photometric Redshifts of Galaxies in COSMOS; ApJS 172, 117–131

Moehler, S.; Dreizler, S.; Lanz, T.; Bono, G.; Sweigart, A. V.; Calamida, A.; Monelli, M.; Nonino, M.; The hottest horizontal-branch stars in ω Centauri. Late hot flasher vs. helium enrichment; A&A 475, L5–L8

Mohanty, S.; Jayawardhana, R.; Huélamo, N.; Mamajek, E.; The Planetary Mass Companion 2MASS 1207–3932B: Temperature, Mass, and Evidence for an Edge-on Disk; ApJ 657, 1064–1091

Mokiem, M. R.; de Koter, A.; Evans, C. J.; Puls, J.; Smartt, S. J.; Crowther, P. A.; Herrero, A.; Langer, N.; Lennon, D. J.; Najarro, F.; Villamariz, M. R.; Vink, J. S.; The VLT-FLAMES survey of massive stars: wind properties and evolution of hot massive stars in the Large Magellanic Cloud; A&A 465, 1003–1019

Moll, S. L.; Mengel, S.; de Grijs, R.; Smith, L. J.; Crowther, P. A.; Cluster and nebular properties of the central star-forming region of NGC 1140; MNRAS 382, 1877–1888

Momany, Y.; Held, E. V.; Saviane, I.; Zaggia, S.; Rizzi, L.; Gullieuszik, M.; The blue plume population in dwarf spheroidal galaxies. Genuine blue stragglers or young stellar population?; A&A 468, 973–978

Monaco, L.; Bellazzini, M.; Bonifacio, P.; Buzzoni, A.; Ferraro, F. R.; Marconi, G.; Sbordone, L.; Zaggia, S.; High-resolution spectroscopy of RGB stars in the Sagittarius streams. – I. Radial velocities and chemical abundances; A&A 464, 201–209

Moni Bidin, C.; Moehler, S.; Piotto, G.; Momany, Y.; Recio-Blanco, A.; Spectroscopy of horizontal branch stars in NGC 6752. Anomalous results on atmospheric parameters and masses; A&A 474, 505–514

Moraux, E.; Bouvier, J.; Stauffer, J. R.; Navascués, D. Barrado Y.; Cuillandre, J.-C.; The lower mass function of the young open cluster Blanco 1: from 30 M_{Jup} to 3 $M_{\odot}$; A&A 471, 499–513

Morganti, R.; Holt, J.; Saripalli, L.; Oosterloo, T. A.; Tadhunter, C. N.; IC 5063: AGN driven outflow of warm and cold gas; A&A 476, 735–743

Mottram, J. C.; Hoare, M. G.; Lumsden, S. L.; Oudmaijer, R. D.; Urquhart, J. S.; Sheret, T. L.; Clarke, A. J.; Allsopp, J.; The RMS survey: mid-infrared observations of candidate massive YSOs in the southern hemisphere; A&A 476, 1019–1111

Mshar, A. C.; Charlton, J. C.; Lynch, R. S.; Churchill, C.; Kim, T.-S.; The Kinematic Evolution of Strong Mg II Absorbers; ApJ 669, 135–157

Mucciarelli, P.; Zampieri, L.; Treves, A.; Turolla, R.; Falomo, R.; X-Ray and Optical Variability of the Ultraluminous X-Ray Source NGC 1313 X-2; ApJ 658, 999–1005

Mugrauer, M.; Neuhäuser, R.; Mazeh, T.; The multiplicity of exoplanet host stars. Spectroscopic confirmation of the companions GJ 3021 B and HD 27442 B, one new planet host triple-star system, and global statistics; A&A 469, 755–770

Mugrauer, M.; Seifahrt, A.; Neuhäuser, R.; The multiplicity of planet host stars – new low-mass companions to planet host stars; MNRAS 378, 1328–1334

Mundell, C. G.; Melandri, A.; Guidorzi, C.; Kobayashi, S.; Steele, I. A.; Malesani, D.; Amati, L.; D'Avanzo, P.; Bersier, D. F.; Gomboc, A.; Rol, E.; Bode, M. F.; Carter, D.; Mottram, C. J.; Monfardini, A.; Smith, R. J.; Malhotra, S.; Wang, J.; Bannister, N.; O'Brien, P. T.; Tanvir, N. R.; The Remarkable Afterglow of GRB 061007: Implications for Optical Flashes and GRB Fireballs; ApJ 660, 489–495

Muñoz, D. J.; Mardones, D.; Garay, G.; Rebolledo, D.; Brooks, K.; Bontemps, S.; Massive Clumps in the NGC 6334 Star-forming Region; ApJ 668, 906–917

Murphy, M. T.; Curran, S. J.; Webb, J. K.; Ménager, H.; Zych, B. J.; The connection between metallicity and metal-line kinematics in (sub-)damped Lyα systems; MNRAS 376, 673–681

Murphy, M. T.; Tzanavaris, P.; Webb, J. K.; Lovis, C.; Selection of ThAr lines for wavelength calibration of echelle spectra and implications for variations in the fine-structure constant; MNRAS 378, 221–230

Mužić, K.; Eckart, A.; Schödel, R.; Meyer, L.; Zensus, A.; First proper motions of thin dust filaments at the Galactic center; A&A 469, 993–1002

Naef, D.; Mayor, M.; Benz, W.; Bouchy, F.; Lo Curto, G.; Lovis, C.; Moutou, C.; Pepe, F.; Queloz, D.; Santos, N. C.; Udry, S.; The HARPS search for southern extra-solar planets. – IX. Exoplanets orbiting HD 100777, HD 190647, and HD 221287; A&A 470, 721–726

Narayanan, A.; Misawa, T.; Charlton, J. C.; Kim, T.-S.; A Survey of Weak Mg II Absorbers at $0.4 < z < 2.4$; ApJ 660, 1093–1105

Nardetto, N.; Mourard, D.; Mathias, P.; Fokin, A.; Gillet, D.; High-resolution spectroscopy for Cepheids distance determination. – II. A period-projection factor relation; A&A 471, 661–669

Negrão, A.; Hirtzig, M.; Coustenis, A.; Gendron, E.; Drossart, P.; Rannou, P.; Combes, M.; Boudon, V.; The 2-μm spectroscopy of Huygens probe landing site on Titan with Very Large Telescope/Nasmyth Adaptive Optics System Near-Infrared Imager and Spectrograph; JGRE 112

Negueruela, I.; Schurch, M. P. E.; A search for counterparts to massive X-ray binaries using photometric catalogues; A&A 461, 631–639

Nesvadba, N. P. H.; Lehnert, M. D.; Genzel, R.; Eisenhauer, F.; Baker, A. J.; Seitz, S.; Davies, R.; Lutz, D.; Tacconi, L.; Tecza, M.; Bender, R.; Abuter, R.; Intense Star Formation and Feedback at High Redshift: Spatially Resolved Properties of the $z = 2.6$ Submillimeter Galaxy SMM J14011+0252; ApJ 657, 725–737

Nesvadba, N. P. H.; Lehnert, M. D.; De Breuck, C.; Gilbert, A.; van Breugel, W.; Compact radio sources and jet-driven AGN feedback in the early universe: constraints from integral-field spectroscopy; A&A 475, 145–153

Neumayer, N.; Cappellari, M.; Reunanen, J.; Rix, H.-W.; van der Werf, P. P.; de Zeeuw, P. T.; Davies, R. I.; The Central Parsecs of Centaurus A: High-excitation Gas, a Molecular Disk, and the Mass of the Black Hole; ApJ 671, 1329–1344

Nielbock, M.; Chini, R.; Hoffmeister, V. H.; Scheyda, C. M.; Steinacker, J.; Nürnberger, D.; Siebenmorgen, R.; The Morphology of M17-UC1: A Disk Candidate Surrounding a Hypercompact H II Region; ApJ 656, L81–L84

Nieppola, E.; Tornikoski, M.; Lähteenmäki, A.; Valtaoja, E.; Hakala, T.; Hovatta, T.; Kotiranta, M.; Nummila, S.; Ojala, T.; Parviainen, M.; Ranta, M.; Saloranta, P.-M.; Torniainen, I.; Tröller, M.; 37 GHz Observations of a Large Sample of BL Lacertae Objects; AJ 133, 1947–1953

Nieva, M. F.; Przybilla, N.; Hydrogen and helium line formation in OB dwarfs and giants. A hybrid non-LTE approach; A&A 467, 295–309

Nigoche-Netro, A.; Moles, M.; Ruelas-Mayorga, A.; Franco-Balderas, A.; Kjørgaard, P.; Structural properties of isolated early-type galaxies. The dependence of scaling relations on environment; A&A 472, 773–784

Nikolić, S.; Garay, G.; Rubio, M.; Johansson, L. E. B.; CO and CS in the Magellanic Clouds: a χ^2-analysis of multitransitional data based on the MEP radiative transfer model; A&A 471, 561–571

Nilsson, K. K.; Møller, P.; Möller, O.; Fynbo, J. P. U.; Michałowski, M. J.; Watson, D.; Ledoux, C.; Rosati, P.; Pedersen, K.; Grove, L. F.; A multi-wavelength study of $z = 3.15$ Lyman-α emitters in the GOODS South Field; A&A 471, 71–82

Nissen, H. D.; Gustafsson, M.; Lemaire, J. L.; Clénet, Y.; Rouan, D.; Field, D.; Observations of spatial and velocity structure in the Orion molecular cloud; A&A 466, 949–968

Nissen, P. E.; Akerman, C.; Asplund, M.; Fabbian, D.; Kerber, F.; Kaufl, H. U.; Pettini, M.; Sulphur and zinc abundances in Galactic halo stars revisited; A&A 469, 319–330

Noël, N. E. D.; Gallart, C.; Stellar Populations in the Outskirts of the Small Magellanic Cloud: No Outer Edge Yet; ApJ 665, L23–L26

Noll, S.; Pierini, D.; Pannella, M.; Savaglio, S.; Presence of dust with a UV bump in massive, star-forming galaxies at $1 < z < 2.5$; A&A 472, 455–469

Norris, J. E.; Christlieb, N.; Korn, A. J.; Eriksson, K.; Bessell, M. S.; Beers, T. C.; Wisotzki, L.; Reimers, D.; HE 0557–4840: Ultra-Metal-Poor and Carbon-Rich; ApJ 670, 774–788

Noterdaeme, P.; Petitjean, P.; Srianand, R.; Ledoux, C.; Le Petit, F.; Physical conditions in the neutral interstellar medium at $z = 2.43$ toward Q 2348–011; A&A 469, 425–436

Noterdaeme, P.; Ledoux, C.; Petitjean, P.; Le Petit, F.; Srianand, R.; Smette, A.; Excitation mechanisms in newly discovered H_2-bearing damped Lyman-α clouds: systems with low molecular fractions; A&A 474, 393–407

Nowak, N.; Saglia, R. P.; Thomas, J.; Bender, R.; Pannella, M.; Gebhardt, K.; Davies, R. I.; The supermassive black hole in NGC 4486a detected with SINFONI at the Very Large Telescope; MNRAS 379, 909–914

Nürnberger, D. E. A.; Chini, R.; Eisenhauer, F.; Kissler-Patig, M.; Modigliani, A.; Siebenmorgen, R.; Sterzik, M. F.; Szeifert, T.; Formation of a massive protostar through disk accretion. – II. SINFONI integral field spectroscopy of the M17 silhouette disk and discovery of the associated H_2 jet; A&A 465, 931–936

Ohnaka, K.; Driebe, T.; Weigelt, G.; Wittkowski, M.; Temporal variations of the outer atmosphere and the dust shell of the carbon-rich Mira variable V Ophiuchi probed with VLTI/MIDI; A&A 466, 1099–1110

Origlia, L.; Rood, R. T.; Fabbri, S.; Ferraro, F. R.; Fusi Pecci, F.; Rich, R. M.; The First Empirical Mass-Loss Law for Population II Giants; ApJ 667, L85–L88

Orio, M.; Zezas, A.; Munari, U.; Siviero, A.; Tepedelenlioglu, E.; Two SMC Symbiotic Stars Undergoing Steady Hydrogen Burning; ApJ 661, 1105–1111

Orton, G. S.; Encrenaz, T.; Leyrat, C.; Puetter, R.; Friedson, A. J.; Evidence for methane escape and strong seasonal and dynamical perturbations of Neptune's atmospheric temperatures; A&A 473, L5–L8

Östlin, G.; Cumming, R. J.; Bergvall, N.; Dynamical masses of two young globular clusters in the blue compact galaxy ESO 338–IG04; A&A 461, 471–483

Ovaldsen, J.-E.; Jaunsen, A. O.; Fynbo, J. P. U.; Hjorth, J.; Thöne, C. C.; Féron, C.; Xu, D.; Selj, J. H.; Teuber, J.; A Search for Host Galaxies of 24 Gamma-Ray Bursts; ApJ 662, 294–303

Pacaud, F.; Pierre, M.; Adami, C.; Altieri, B.; Andreon, S.; Chiappetti, L.; Detal, A.; Duc, P.-A.; Galaz, G.; Gueguen, A.; Le Fèvre, J.-P.; Hertling, G.; Libbrecht, C.; Melin, J.-B.; Ponman, T. J.; Quintana, H.; Refregier, A.; Sprimont, P.-G.; Surdej, J.; Valtchanov, I.; Willis, J. P.; Alloin, D.; Birkinshaw, M.; Bremer, M. N.; Garcet, O.; Jean, C.; Jones, L. R.; Le Fèvre, O.; Maccagni, D.; Mazure, A.; Proust, D.; Röttgering, H. J. A.; Trinchieri, G.; The XMM-LSS survey: the Class 1 cluster sample over the initial 5 deg^2 and its cosmological modelling; MNRAS 382, 1289–1308

Padovani, P.; Giommi, P.; Landt, H.; Perlman, E. S.; The Deep X-Ray Radio Blazar Survey. – III. Radio Number Counts, Evolutionary Properties, and Luminosity Function of Blazars; ApJ 662, 182–198

Page, M. J.; Lehmann, I.; Boller, T.; Watson, M. G.; Dwelly, T.; Hess, S.; Matute, I.; Loaring, N. S.; Rosen, S.; Ziaeepour, H.; Schwope, A.; Lamer, G.; Carrera, F. J.; Tedds, J.; Della Ceca, R.; Severgnini, P.; McMahon, R. G.; Yuan, W.; The XMM-SSC survey of hard-spectrum XMM-Newton sources – I. Optically bright sources; MNRAS 378, 1335–1355

Paizis, A.; Nowak, M. A.; Chaty, S.; Rodriguez, J.; Courvoisier, T. J.-L.; Del Santo, M.; Ebisawa, K.; Farinelli, R.; Ubertini, P.; Wilms, J.; Unveiling the Nature of IGR J17497–2821 Using X-Ray and Near-Infrared Observations; ApJ 657, L109–L112

Palla, F.; Randich, S.; Pavlenko, Y. V.; Flaccomio, E.; Pallavicini, R.; Old Stars in Young Clusters: Lithium-depleted Low-Mass Stars of the Orion Nebula Cluster; ApJ 659, L41–L44

Palmeri, P.; Quinet, P.; Biémont, É.; Yushchenko, A. V.; Jorissen, A.; van Eck, S.; Radiative decay of the $4d^5(^6S)5p\ z^{5,7}P^o$ states in Tc II: comparison along the homologous and isoelectronic sequences. Application to astrophysics; MNRAS 374, 63–71

Paltani, S.; Le Fèvre, O.; Ilbert, O.; Arnouts, S.; Bardelli, S.; Tresse, L.; Zamorani, G.; Zucca, E.; Bottini, D.; Garilli, B.; Le Brun, V.; Maccagni, D.; Picat, J.-P.; Scaramella, R.; Scodeggio, M.; Vettolani, G.; Zanichelli, A.; Adami, C.; Bolzonella, M.; Cappi, A.; Charlot, S.; Ciliegi, P.; Contini, T.; Foucaud, S.; Franzetti, P.; Gavignaud, I.; Guzzo, L.; Iovino, A.; McCracken, H. J.; Marano, B.; Marinoni, C.; Mazure, A.; Meneux, B.; Merighi, R.; Pellò, R.; Pollo, A.; Pozzetti, L.; Radovich, M.; Bondi, M.; Bongiorno, A.; Brinchmann, J.; Cucciati, O.; de La Torre, S.; Lamareille, F.; Mellier, Y.; Merluzzi, P.; Temporin, S.; Vergani, D.; Walcher, C. J.; The VIMOS VLT deep survey. The ultraviolet galaxy luminosity function and luminosity density at $3 \leq z \leq 4$; A&A 463, 873–882

Pancino, E.; Galfo, A.; Ferraro, F. R.; Bellazzini, M.; The Rotation of Subpopulations in ω Centauri; ApJ 661, L155–L158

Pasquini, L.; Bonifacio, P.; Randich, S.; Galli, D.; Gratton, R. G.; Wolff, B.; Beryllium abundance in turn-off stars of NGC 6752; A&A 464, 601–607

Pastorello, A.; Mazzali, P. A.; Pignata, G.; Benetti, S.; Cappellaro, E.; Filippenko, A. V.; Li, W.; Meikle, W. P. S.; Arkharov, A. A.; Blanc, G.; Bufano, F.; Derekas, A.; Dolci, M.; Elias-Rosa, N.; Foley, R. J.; Ganeshalingam, M.; Harutyunyan, A.; Kiss, L. L.; Kotak, R.; Larionov, V. M.; Lucey, J. R.; Napoleone, N.; Navasardyan, H.; Patat, F.; Rich, J.; Ryder, S. D.; Salvo, M.; Schmidt, B. P.; Stanishev, V.; Székely, P.; Taubenberger, S.; Temporin, S.; Turatto, M.; Hillebrandt, W.; ESC and KAIT observations of the transitional Type Ia SN 2004eo; MNRAS 377, 1531–1552

Patat, F.; Chandra, P.; Chevalier, R.; Justham, S.; Podsiadlowski, P.; Wolf, C.; Gal-Yam, A.; Pasquini, L.; Crawford, I. A.; Mazzali, P. A.; Pauldrach, A. W. A.; Nomoto, K.; Benetti, S.; Cappellaro, E.; Elias-Rosa, N.; Hillebrandt, W.; Leonard, D. C.; Pastorello, A.; Renzini, A.; Sabbadin, F.; Simon, J. D.; Turatto, M.; Detection of Circumstellar Material in a Normal Type Ia Supernova; Sci 317, 924

Patat, F.; Benetti, S.; Justham, S.; Mazzali, P. A.; Pasquini, L.; Cappellaro, E.; Della Valle, M.; Podsiadlowski, P.; Turatto, M.; Gal-Yam, A.; Simon, J. D.; Upper limit for circumstellar gas around the type Ia SN 2000cx; A&A 474, 931–936

Paunzen, E.; Netopil, M.; Zwintz, K.; Investigating star formation in the young open cluster NGC 6383; A&A 462, 157–162

Pavlenko, Y. V.; Jones, H. R. A.; Martín, E. L.; Guenther, E.; Kenworthy, M. A.; Zapatero Osorio, M. R.; Lithium in LP944–20; MNRAS 380, 1285–1296

Peña, M.; Richer, M. G.; Stasińska, G.; A catalog of planetary nebula candidates and H II regions in NGC 3109; A&A 466, 75–82

Peña, M.; Stasińska, G.; Richer, M. G.; The chemical composition of planetary nebulae and H II regions in NGC 3109; A&A 476, 745–758

Pentericci, L.; Grazian, A.; Fontana, A.; Salimbeni, S.; Santini, P.; de Santis, C.; Gallozzi, S.; Giallongo, E.; Physical properties of $z \sim 4$ LBGs: differences between galaxies with and without Lyα emission; A&A 471, 433–438

Pepe, F.; Correia, A. C. M.; Mayor, M.; Tamuz, O.; Couetdic, J.; Benz, W.; Bertaux, J.-L.; Bouchy, F.; Laskar, J.; Lovis, C.; Naef, D.; Queloz, D.; Santos, N. C.; Sivan, J.-P.; Sosnowska, D.; Udry, S.; The HARPS search for southern extra-solar planets. – VIII. μ Arae, a system with four planets; A&A 462, 769–776

Pérez-Beaupuits, J. P.; Aalto, S.; Gerebro, H.; HNC, HCN and CN in Seyfert galaxies; A&A 476, 177–192

Pérez-Torres, M. A.; Mattila, S.; Alberdi, A.; Colina, L.; Torrelles, J. M.; Väisänen, P.; Ryder, S.; Panagia, N.; Wilson, A.; Radio Detection of Supernova 2004ip in the Circumnuclear Region of the Luminous Infrared Galaxy IRAS 18293–3413; ApJ 671, L21–L24

Péroux, C.; Dessauges-Zavadsky, M.; D'Odorico, S.; Kim, T.-S.; McMahon, R. G.; A homogeneous sample of sub-damped Lyman systems – IV. Global metallicity evolution; MNRAS 382, 177–193

Perrin, G.; Verhoelst, T.; Ridgway, S. T.; Cami, J.; Nguyen, Q. N.; Chesneau, O.; Lopez, B.; Leinert, C.; Richichi, A.; The molecular and dusty composition of Betelgeuse's inner circumstellar environment; A&A 474, 599–608

Persi, P.; Tapia, M.; Gòmez, M.; Whitney, B. A.; Marenzi, A. R.; Roth, M.; ISO-Cha I 192: A New Embedded Eruptive Variable in the Chamaeleon I Dark Cloud; AJ 133, 1690–1697

Phillips, M. M.; Li, W.; Frieman, J. A.; Blinnikov, S. I.; DePoy, D.; Prieto, J. L.; Milne, P.; Contreras, C.; Folatelli, G.; Morrell, N.; Hamuy, M.; Suntzeff, N. B.; Roth, M.; González, S.; Krzeminski, W.; Filippenko, A. V.; Freedman, W. L.; Chornock, R.; Jha, S.; Madore, B. F.; Persson, S. E.; Burns, C. R.; Wyatt, P.; Murphy, D.; Foley, R. J.; Ganeshalingam, M.; Serduke, F. J. D.; Krisciunas, K.; Bassett, B.; Becker, A.; Dilday, B.; Eastman, J.; Garnavich, P. M.; Holtzman, J.; Kessler, R.; Lampeitl, H.; Marriner, J.; Frank, S.; Marshall, J. L.; Miknaitis, G.; Sako, M.; Schneider, D. P.; van der Heyden, K.; Yasuda, N.; The Peculiar SN 2005hk: Do Some Type Ia Supernovae Explode as Deflagrations?; PASP 119, 360–387

Piatti, A. E.; Clariá, J. J.; Mermilliod, J.-C.; Parisi, M. C.; Ahumada, A. V.; CCD BVI photometry and Coravel observations of stars in the open cluster NGC 2489; MNRAS 377, 1737–1746

Piatti, A. E.; Sarajedini, A.; Geisler, D.; Gallart, C.; Wischnjewsky, M.; Two newly identified, relatively old star clusters in the Small Magellanic Cloud; MNRAS 381, L84–L88

Piatti, A. E.; Sarajedini, A.; Geisler, D.; Gallart, C.; Wischnjewsky, M.; Five young star clusters in the outer region of the Small Magellanic Cloud; MNRAS 382, 1203–1212
Piranomonte, S.; Perri, M.; Giommi, P.; Landt, H.; Padovani, P.; The sedentary survey of extreme high-energy peaked BL Lacs. – III. Results from optical spectroscopy; A&A 470, 787–809
Pirogov, L.; Zinchenko, I.; Caselli, P.; Johansson, L. E. B.; Chemical differentiation in regions of high-mass star formation. CS, dust, and $N2H^+$ in southern sources; A&A 461, 523–535
Pirzkal, N.; Malhotra, S.; Rhoads, J. E.; Xu, C.; Optical-to-Mid-Infrared Observations of Lyα Galaxies at $z \sim 5$ in the Hubble Ultra Deep Field: A Young and Low-Mass Population; ApJ 667, 49–59
Platais, I.; Melo, C.; Mermilliod, J.-C.; Kozhurina-Platais, V.; Fulbright, J. P.; Méndez, R. A.; Altmann, M.; Sperauskas, J.; WIYN open cluster study. – XXVI. Improved kinematic membership and spectroscopy of IC 2391; A&A 461, 509–522
Pohlen, M.; Zaroubi, S.; Peletier, R. F.; Dettmar, R.-J.; On the three-dimensional structure of edge-on disc galaxies; MNRAS 378, 594–616
Pompei, E.; Dahlem, M.; Iovino, A.; Optical and radio survey of southern compact groups of galaxies. – I. Pilot study of six groups; A&A 473, 399–409
Poncelet, A.; Doucet, C.; Perrin, G.; Sol, H.; Lagage, P. O.; An original interferometric study of NGC 1068 with VISIR BURST mode images; A&A 472, 823–831
Pontoppidan, K. M.; Dullemond, C. P.; Blake, G. A.; Evans II, N. J.; Geers, V. C.; Harvey, P. M.; Spiesman, W.; Modeling Spitzer Observations of VV Ser. – II. An Extended Quantum-heated Nebula and a Disk Shadow; ApJ 656, 991–1000
Pont, F.; Moutou, C.; Gillon, M.; Udalski, A.; Bouchy, F.; Fernandes, J. M.; Gieren, W.; Mayor, M.; Mazeh, T.; Minniti, D.; Melo, C.; Naef, D.; Pietrzynski, G.; Queloz, D.; Ruiz, M. T.; Santos, N. C.; Udry, S.; The "666" collaboration on OGLE transits. – I. Accurate radius of the planets OGLE-TR-10b and OGLE-TR-56b with VLT deconvolution photometry; A&A 465, 1069–1074
Pozzi, F.; Vignali, C.; Comastri, A.; Pozzetti, L.; Mignoli, M.; Gruppioni, C.; Zamorani, G.; Lari, C.; Civano, F.; Brusa, M.; Fiore, F.; Maiolino, R.; La Franca, F.; The HELLAS2XMM survey. – X. The bolometric output of luminous obscured quasars: The Spitzer perspective; A&A 468, 603–612
Pozzetti, L.; Bolzonella, M.; Lamareille, F.; Zamorani, G.; Franzetti, P.; Le Fèvre, O.; Iovino, A.; Temporin, S.; Ilbert, O.; Arnouts, S.; Charlot, S.; Brinchmann, J.; Zucca, E.; Tresse, L.; Scodeggio, M.; Guzzo, L.; Bottini, D.; Garilli, B.; Le Brun, V.; Maccagni, D.; Picat, J. P.; Scaramella, R.; Vettolani, G.; Zanichelli, A.; Adami, C.; Bardelli, S.; Cappi, A.; Ciliegi, P.; Contini, T.; Foucaud, S.; Gavignaud, I.; McCracken, H. J.; Marano, B.; Marinoni, C.; Mazure, A.; Meneux, B.; Merighi, R.; Paltani, S.; Pellò, R.; Pollo, A.; Radovich, M.; Bondi, M.; Bongiorno, A.; Cucciati, O.; de La Torre, S.; Gregorini, L.; Mellier, Y.; Merluzzi, P.; Vergani, D.; Walcher, C. J.; The VIMOS VLT Deep Survey. The assembly history of the stellar mass in galaxies: from the young to the old universe; A&A 474, 443–459
Prause, N.; Reimers, D.; Fechner, C.; Janknecht, E.; The baryon density at $z = 0.9$–1.9. Tracing the warm-hot intergalactic medium with broad Lyman α absorption; A&A 470, 67–72
Prisinzano, L.; Damiani, F.; Micela, G.; Pillitteri, I.; VLT/Flames observations of the star forming region NGC 6530; A&A 462, 123–138
Prisinzano, L.; Randich, S.; Lithium abundances in the old open cluster NGC 3960 from VLT/FLAMES observations; A&A 475, 539–547
Prochaska, J. X.; Chen, H.-W.; Dessauges-Zavadsky, M.; Bloom, J. S.; Probing the Interstellar Medium near Star-forming Regions with Gamma-Ray Burst Afterglow Spectroscopy: Gas, Metals, and Dust; ApJ 666, 267–280
Puech, M.; Hammer, F.; Lehnert, M. D.; Flores, H.; 3D spectroscopy with VLT/GIRAFFE. – IV. Angular momentum and dynamical support of intermediate redshift galaxies; A&A 466, 83–92
Puech, M.; Hammer, F.; Flores, H.; Neichel, B.; Yang, Y.; Rodrigues, M.; First detection of a minor merger at $z \sim 0.6$; A&A 476, L21–L24
Puzia, T. H.; Mobasher, B.; Goudfrooij, P.; Evidence for the Evolution of Young Early-Type Galaxies in the GOODS/CDF-S Field; AJ 134, 1337–1347
Raiteri, C. M.; Villata, M.; Capetti, A.; Heidt, J.; Arnaboldi, M.; Magazzù, A.; Spectroscopic monitoring of the BL Lac object AO 0235+164; A&A 464, 871–878
Rajagopal, J.; Menut, J.-L.; Wallace, D.; Danchi, W. C.; Chesneau, O.; Lopez, B.; Monnier, J. D.; Ireland, M.; Tuthill, P. G.; Mid-Infrared Interferometry of Dust around Massive Evolved Stars; ApJ 671, 2017–2027
Ramella, M.; Biviano, A.; Pisani, A.; Varela, J.; Bettoni, D.; Couch, W. J.; D'Onofrio, M.; Dressler, A.; Fasano, G.; Kjørgaard, P.; Moles, M.; Pignatelli, E.; Poggianti, B. M.; Substructures in WINGS clusters; A&A 470, 39–51
Ramírez, I.; Allende Prieto, C.; Lambert, D. L.; Oxygen abundances in nearby stars. Clues to the formation and evolution of the Galactic disk; A&A 465, 271–289
Randich, S.; Primas, F.; Pasquini, L.; Sestito, P.; Pallavicini, R.; Tracing mixing in stars: new beryllium observations of the open clusters NGC 2516, Hyades, and M67; A&A 469, 163–172
Ratzka, T.; Leinert, C.; Henning, T.; Bouwman, J.; Dullemond, C. P.; Jaffe, W.; High spatial resolution mid-infrared observations of the low-mass young star TW Hydrae; A&A 471, 173–185
Rauw, G.; Manfroid, J.; Gosset, E.; Nazé, Y.; Sana, H.; De Becker, M.; Foellmi, C.; Moffat, A. F. J.; Early-type stars in the core of the young open cluster Westerlund 2; A&A 463, 981–991
Ravikumar, C. D.; Puech, M.; Flores, H.; Proust, D.; Hammer, F.; Lehnert, M.; Rawat, A.; Amram, P.; Balkowski, C.; Burgarella, D.; Cassata, P.; Cesarsky, C.; Cimatti, A.; Combes, F.; Daddi, E.; Dannerbauer, H.; di Serego Alighieri, S.; Elbaz, D.; Guiderdoni, B.; Kembhavi, A.; Liang, Y. C.; Pozzetti, L.; Vergani, D.; Vernet, J.; Wozniak, H.; Zheng, X. Z.; New spectroscopic redshifts from the CDFS and a test of the cosmological relevance of the GOODS-South field; A&A 465, 1099–1108
Rawat, A.; Kembhavi, A. K.; Hammer, F.; Flores, H.; Barway, S.; Unravelling the morphologies of luminous compact galaxies using the HST/ACS GOODS survey; A&A 469, 483–501
Rea, N.; Torres, M. A. P.; Jonker, P. G.; Mignani, R. P.; Zane, S.; Burgay, M.; Kaplan, D. L.; Turolla, R.; Israel, G. L.; Steeghs, D.; Accurate X-ray position and multiwavelength observations of the isolated neutron star RBS1774; MNRAS 379, 1484–1490
Recio-Blanco, A.; de Laverny, P.; The extra-mixing efficiency in very low metallicity RGB stars; A&A 461, L13–L16
Reda, F. M.; Proctor, R. N.; Forbes, D. A.; Hau, G. K. T.; Larsen, S. S.; The spatially resolved stellar populations of isolated early-type galaxies; MNRAS 377, 1772–1784
Régulo, C.; Roca Cortés, T.; Stellar p-modes oscillation measurements in solar-like star signals: α Centauri A as an example; A&A 469, 233–237
Reid, M. J.; Menten, K. M.; Trippe, S.; Ott, T.; Genzel, R.; The Position of Sagittarius A. – III. Motion of the Stellar Cusp; ApJ 659, 378–388
Reiners, A.; Schmitt, J. H. M. M.; Liefke, C.; Rapid magnetic flux variability on the flare star CN Leonis; A&A 466, L13–L16
Reiners, A.; The narrowest M-dwarf line profiles and the rotation-activity connection at very slow rotation; A&A 467, 259–268
Reiners, A.; Seifahrt, A.; Käufl, H. U.; Siebenmorgen, R.; Smette, A.; Spectral-type dependent rotational braking and strong magnetic flux in three components of the late-M multiple system LHS 1070; A&A 471, L5–L8
Reiners, A.; Homeier, D.; Hauschildt, P. H.; Allard, F.; A high resolution spectral atlas of brown dwarfs; A&A 473, 245–255
Reiners, A.; Seifahrt, A.; Stassun, K. G.; Melo, C.; Mathieu, R. D.; Detection of Strong Activity in the Eclipsing Binary Brown Dwarf 2MASS J05352184–0546085: A Possible Explanation for the Temperature Reversal; ApJ 671, L149–L152
Reipurth, B.; Aspin, C.; Beck, T.; Brogan, C.; Connelley, M. S.; Herbig, G. H.; V733 Cep (Persson's Star): A New FU Orionis Object in Cepheus; AJ 133, 1000–1011
Rejkuba, M.; Dubath, P.; Minniti, D.; Meylan, G.; Bright globular clusters in NGC 5128: the missing link between young massive clusters and evolved massive objects; A&A 469, 147–162
Reunanen, J.; Tacconi-Garman, L. E.; Ivanov, V. D.; VLT/SINFONI integral field spectroscopy of the Super-antennae; MNRAS 382, 951–959
Reyniers, M.; Abia, C.; van Winckel, H.; Lloyd Evans, T.; Decin, L.; Eriksson, K.; Pollard, K. R.; AGB nucleosynthesis in the Large Magellanic Cloud. Detailed abundance analysis of the RV Tauri star MACHO 47.2496.8; A&A 461, 641–650
Reyniers, M.; van Winckel, H.; First detection of photospheric depletion in the Large Magellanic Cloud; A&A 463, L1–L4
Reyniers, M.; van de Steene, G. C.; van Hoof, P. A. M.; van Winckel, H.; IRAS 08281-4850 and IRAS 14325-6428: two A-type post-AGB stars with s-process enrichment; A&A 471, 247–254
Rhodes, J. D.; Massey, R. J.; Albert, J.; Collins, N.; Ellis, R. S.; Heymans, C.; Gardner, J. P.; Kneib, J.-P.; Koekemoer, A.; Leauthaud, A.; Mellier, Y.; Refregier, A.; Taylor, J. E.; Van Waerbeke, L.; The Stability of the Point-Spread Function of the Advanced Camera for Surveys on the Hubble Space Telescope and Implications for Weak Gravitational Lensing; ApJS 172, 203–218
Richard, J.; Kneib, J.-P.; Jullo, E.; Covone, G.; Limousin, M.; Ellis, R.; Stark, D.; Bundy, K.; Czoske, O.; Ebeling, H.; Soucail, G.; A Statistical Study of Multiply Imaged Systems in the Lensing Cluster Abell 68; ApJ 662, 781–796
Rizzi, L.; Tully, R. B.; Makarov, D.; Makarova, L.; Dolphin, A. E.; Sakai, S.; Shaya, E. J.; Tip of the Red Giant Branch Distances. – II. Zero-Point Calibration; ApJ 661, 815–829
Rizzi, L.; Held, E. V.; Saviane, I.; Tully, R. B.; Gullieuszik, M.; The distance to the Fornax dwarf spheroidal galaxy; MNRAS 380, 1255–1260

Robin, A. C.; Rich, R. M.; Aussel, H.; Capak, P.; Tasca, L. A. M.; Jahnke, K.; Kakazu, Y.; Kneib, J.-P.; Koekemoer, A.; Leauthaud, A. C.; Lilly, S.; Mobasher, B.; Scoville, N.; Taniguchi, Y.; Thompson, D. J.; The Stellar Content of the COSMOS Field as Derived from Morphological and SED-based Star/Galaxy Separation; ApJS 172, 545–559
Rocca-Volmerange, B.; de Lapparent, V.; Seymour, N.; Fioc, M.; The 12 µm ISO-ESO-Sculptor and 24 µm Spitzer faint counts reveal a population of ULIRGs as dusty massive ellipticals. Evolution by types and cosmic star formation; A&A 475, 801–812
Rodighiero, G.; Cimatti, A.; Franceschini, A.; Brusa, M.; Fritz, J.; Bolzonella, M.; Unveiling the oldest and most massive galaxies at very high redshift; A&A 470, 21–37
Rodríguez-Gil, P.; Schmidtobreick, L.; Gänsicke, B. T.; Spectroscopic search for new SW Sextantis stars in the 3–4 h orbital period range – I; MNRAS 374, 1359–1376
Roelofs, G. H. A.; Groot, P. J.; Nelemans, G.; Marsh, T. R.; Steeghs, D.; On the orbital periods of the AM CVn stars HP Librae and V803 Centauri; MNRAS 379, 176–182
Roelofs, G. H. A.; Groot, P. J.; Steeghs, D.; Marsh, T. R.; Nelemans, G.; The long-period AM CVn star SDSS J155252.48+320150.9; MNRAS 382, 1643–1647
Rol, E.; van der Horst, A.; Wiersema, K.; Patel, S. K.; Levan, A.; Nysewander, M.; Kouveliotou, C.; Wijers, R. A. M. J.; Tanvir, N.; Reichart, D.; Fruchter, A. S.; Graham, J.; Ovaldsen, J.-E.; Jaunsen, A. O.; Jonker, P.; van Ham, W.; Hjorth, J.; Starling, R. L. C.; O'Brien, P. T.; Fynbo, J.; Burrows, D. N.; Strom, R.; GRB 051022: Physical Parameters and Extinction of a Prototype Dark Burst; ApJ 669, 1098–1106
Román-Zúñiga, C. G.; Lada, C. J.; Muench, A.; Alves, J. F.; The Infrared Extinction Law at Extreme Depth in a Dark Cloud Core; ApJ 664, 357–362
Ruiz-Velasco, A. E.; Swan, H.; Troja, E.; Malesani, D.; Fynbo, J. P. U.; Starling, R. L. C.; Xu, D.; Aharonian, F.; Akerlof, C.; Andersen, M. I.; Ashley, M. C. B.; Barthelmy, S. D.; Bersier, D.; Castro Cerón, J. M.; Castro-Tirado, A. J.; Gehrels, N.; Göğüş, E.; Gorosabel, J.; Guidorzi, C.; Güver, T.; Hjorth, J.; Horns, D.; Huang, K. Y.; Jakobsson, P.; Jensen, B. L.; Kızıloğlu, Ü.; Kouveliotou, C.; Krimm, H. A.; Ledoux, C.; Levan, A. J.; Marsh, T.; McKay, T.; Melandri, A.; Milvang-Jensen, B.; Mundell, C. G.; O'Brien, P. T.; Özel, M.; Phillips, A.; Quimby, R.; Rowell, G.; Rujopakarn, W.; Rykoff, E. S.; Schaefer, B. E.; Sollerman, J.; Tanvir, N. R.; Thöne, C. C.; Urata, Y.; Vestrand, W. T.; Vreeswijk, P. M.; Watson, D.; Wheeler, J. C.; Wijers, R. A. M. J.; Wren, J.; Yost, S. A.; Yuan, F.; Zhai, M.; Zheng, W. K.; Detection of GRB 060927 at z = 5.47: Implications for the Use of Gamma-Ray Bursts as Probes of the End of the Dark Ages; ApJ 669, 1–9
Russell, D. M.; Fender, R. P.; Jonker, P. G.; Evidence for a jet contribution to the optical/infrared light of neutron star X-ray binaries; MNRAS 379, 1108–1116
Ryabchikova, T.; Sachkov, M.; Weiss, W. W.; Kallinger, T.; Kochukhov, O.; Bagnulo, S.; Ilyin, I.; Landstreet, J. D.; Leone, F.; Lo Curto, G.; Lüftinger, T.; Lyashko, D.; Magazzù, A.; Pulsation in the atmosphere of the roAp star HD 24712. – I. Spectroscopic observations and radial velocity measurements; A&A 462, 1103–1112
Ryabchikova, T.; Sachkov, M.; Kochukhov, O.; Lyashko, D.; Pulsation tomography of rapidly oscillating Ap stars. Resolving the third dimension in peculiar pulsating stellar atmospheres; A&A 473, 907–922
Sacco, G. G.; Randich, S.; Franciosini, E.; Pallavicini, R.; Palla, F.; Lithium-depleted stars in the young σ Orionis cluster; A&A 462, L23–L26
Sacuto, S.; Chesneau, O.; Vannier, M.; Cruzalèbes, P.; A compact dust shell in the symbiotic system HM Sagittae; A&A 465, 469–480
Safi-Harb, S.; Ribó, M.; Butt, Y.; Matheson, H.; Negueruela, I.; Lu, F.; Jia, S.; Chen, Y.; A Multi-wavelength Study of 1WGA J1346.5–6255: A New γ Cas Analog Unrelated to the Background Supernova Remnant G309.2–00.6; ApJ 659, 407–418
Salaris, M.; Held, E. V.; Ortolani, S.; Gullieuszik, M.; Momany, Y.; Deep near-infrared photometry of the globular cluster 47 Tucanae. Reconciling theory and observations; A&A 476, 243–253
Salinas, R.; Richtler, T.; Romanowsky, A. J.; West, M. J.; Schuberth, Y.; The star pile in Abell 545; A&A 475, 507–512
Sana, H.; Rauw, G.; Gosset, E.; Constraining the Fundamental Parameters of the O-Type Binary CPD –41 7733; ApJ 659, 1582–1591
Sanders, D. B.; Salvato, M.; Aussel, H.; Ilbert, O.; Scoville, N.; Surace, J. A.; Frayer, D. T.; Sheth, K.; Helou, G.; Brooke, T.; Bhattacharya, B.; Yan, L.; Kartaltepe, J. S.; Barnes, J. E.; Blain, A. W.; Calzetti, D.; Capak, P.; Carilli, C.; Carollo, C. M.; Comastri, A.; Daddi, E.; Ellis, R. S.; Elvis, M.; Fall, S. M.; Franceschini, A.; Giavalisco, M.; Hasinger, G.; Impey, C.; Koekemoer, A.; Le Fèvre, O.; Lilly, S.; Liu, M. C.; McCracken, H. J.; Mobasher, B.; Renzini, A.; Rich, M.; Schinnerer, E.; Shopbell, P. L.; Taniguchi, Y.; Thompson, D. J.; Urry, C. M.; Williams, J. P.; S-COSMOS: The Spitzer Legacy Survey of the Hubble Space Telescope ACS 2 deg^2 COSMOS Field I: Survey Strategy and First Analysis; ApJS 172, 86–98
Santander-García, M.; Corradi, R. L. M.; Whitelock, P. A.; Munari, U.; Mampaso, A.; Marang, F.; Boffi, F.; Livio, M.; HST and VLT observations of the symbiotic star Hen 2–147. Its nebular dynamics, its Mira variable and its distance; A&A 465, 481–491
Santos, N. C.; Mayor, M.; Bouchy, F.; Pepe, F.; Queloz, D.; Udry, S.; The HARPS search for southern extra-solar planets. – XII. A giant planet orbiting the metal-poor star HD 171028; A&A 474, 647–651
Sargent, M. T.; Carollo, C. M.; Lilly, S. J.; Scarlata, C.; Feldmann, R.; Kampczyk, P.; Koekemoer, A. M.; Scoville, N.; Kneib, J.-P.; Leauthaud, A.; Massey, R.; Rhodes, J.; Tasca, L. A. M.; Capak, P.; McCracken, H. J.; Porciani, C.; Renzini, A.; Taniguchi, Y.; Thompson, D. J.; Sheth, K.; The Evolution of the Number Density of Large Disk Galaxies in COSMOS; ApJS 172, 434–455
Saripalli, L.; Mack, K.-H.; A search for molecular gas in restarting radio galaxies; MNRAS 376, 1385–1392
Saviane, I.; Jerjen, H.; NGC 5011C: An Overlooked Dwarf Galaxy in the Centaurus A Group; AJ 133, 1756–1762
Sbordone, L.; Bonifacio, P.; Buonanno, R.; Marconi, G.; Monaco, L.; Zaggia, S.; The exotic chemical composition of the Sagittarius dwarf spheroidal galaxy; A&A 465, 815–824
Scarpa, R.; Marconi, G.; Gilmozzi, R.; Carraro, G.; Using globular clusters to test gravity in the weak acceleration regime: NGC 7099; A&A 462, L9–L12
Schaerer, D.; Hempel, A.; Egami, E.; Pelló, R.; Richard, J.; Le Borgne, J.-F.; Kneib, J.-P.; Wise, M.; Boone, F.; EROs found behind lensing clusters. – I. Stellar populations and dust properties of optical dropout EROs and comparison with related objects; A&A 469, 47–60
Scharwächter, J.; Eckart, A.; Pfalzner, S.; Saviane, I.; Zuther, J.; The nearby QSO host I Zw 1: the stellar disk and adjacent objects; A&A 469, 913–923
Schaye, J.; Carswell, R. F.; Kim, T.-S.; A large population of metal-rich, compact, intergalactic CIV absorbers – evidence for poor small-scale metal mixing; MNRAS 379, 1169–1194
Schirmer, M.; Erben, T.; Hetterscheidt, M.; Schneider, P.; GaBoDS: the Garching-Bonn Deep Survey. – IX. A sample of 158 shear-selected mass concentration candidates; A&A 462, 875–887
Schmidtobreick, L.; Tappert, C.; Horst, H.; Saviane, I.; Lidman, C.; The emission line galaxy TV Reticuli. Evidence for an ultraluminous supernova; A&A 461, 943–947
Schödel, R.; Eckart, A.; Mužić, K.; Meyer, L.; Viehmann, T.; Bower, G. C.; The possibility of detecting Sagittarius A at 8.6 µm from sensitive imaging of the Galactic center; A&A 462, L1–L4
Scholz, A.; Jayawardhana, R.; Wood, K.; Meeus, G.; Stelzer, B.; Walker, C.; O'Sullivan, M.; Evolution of Brown Dwarf Disks: A Spitzer Survey in Upper Scorpius; ApJ 660, 1517–1531
Schödel, R.; Eckart, A.; Alexander, T.; Merritt, D.; Genzel, R.; Sternberg, A.; Meyer, L.; Kul, F.; Moultaka, J.; Ott, T.; Straubmeier, C.; The structure of the nuclear stellar cluster of the Milky Way; A&A 469, 125–146
Schöier, F. L.; Bast, J.; Olofsson, H.; Lindqvist, M.; The abundance of SiS in circumstellar envelopes around AGB stars; A&A 473, 871–882
Schröder, A. C.; Mamon, G. A.; Kraan-Korteweg, R. C.; Woudt, P. A.; The highly obscured region around PKS 1343–601. – I. Galactic interstellar extinctions using DENIS galaxy colours; A&A 466, 481–499
Schurch, M. P. E.; Coe, M. J.; McGowan, K. E.; McBride, V. A.; Buckley, D. A. H.; Galache, J. L.; Corbet, R. H. D.; Still, M.; Vaisanen, P.; Kniazev, A.; Nordsieck, K.; Optical follow-up of new Small Magellanic Cloud wing Be/X-ray binaries; MNRAS 381, 1561–1568
Scoville, N.; Aussel, H.; Brusa, M.; Capak, P.; Carollo, C. M.; Elvis, M.; Giavalisco, M.; Guzzo, L.; Hasinger, G.; Impey, C.; Kneib, J.-P.; LeFevre, O.; Lilly, S. J.; Mobasher, B.; Renzini, A.; Rich, R. M.; Sanders, D. B.; Schinnerer, E.; Schminovich, D.; Shopbell, P.; Taniguchi, Y.; Tyson, N. D.; The Cosmic Evolution Survey (COSMOS): Overview; ApJS 172, 1–8
Scoville, N.; Aussel, H.; Benson, A.; Blain, A.; Calzetti, D.; Capak, P.; Ellis, R. S.; El-Zant, A.; Finoguenov, A.; Giavalisco, M.; Guzzo, L.; Hasinger, G.; Koda, J.; Le Fèvre, O.; Massey, R.; McCracken, H. J.; Mobasher, B.; Renzini, A.; Rhodes, J.; Salvato, M.; Sanders, D. B.; Sasaki, S. S.; Schinnerer, E.; Sheth, K.; Shopbell, P. L.; Taniguchi, Y.; Taylor, J. E.; Thompson, D. J.; Large Structures and Galaxy Evolution in COSMOS at z < 1.1; ApJS 172, 150–181
Seabroke, G. M.; Gilmore, G.; Revisiting the relations: Galactic thin disc age-velocity dispersion relation; MNRAS 380, 1348–1368
Seifahrt, A.; Neuhäuser, R.; Hauschildt, P. H.; Near-infrared integral-field spectroscopy of the companion to GQ Lupi; A&A 463, 309–313

Selvelli, P.; Danziger, J.; Bonifacio, P.; The HeII Fowler lines and the O III and N III Bowen fluorescence lines in the symbiotic nova RR Telescopii; A&A 464, 715–734
Sestito, P.; Randich, S.; Bragaglia, A.; Element abundances in the metal-rich open cluster NGC 6253; A&A 465, 185–196
Setiawan, J.; Weise, P.; Henning, T.; Launhardt, R.; Müller, A.; Rodmann, J.; Evidence for a Planetary Companion around a Nearby Young Star; ApJ 660, L145–L148
Seymour, N.; Rocca-Volmerange, B.; de Lapparent, V.; A 12 μm ISOCAM survey of the ESO-Sculptor field. Data reduction and analysis; A&A 475, 791–799
Shahbaz, T.; Watson, C. A.; The rotational broadening of V395 Carinae. Implications on the compact object's mass; A&A 474, 969–973
Sikkema, G.; Carter, D.; Peletier, R. F.; Balcells, M.; Del Burgo, C.; Valentijn, E. A.; HST/ACS observations of shell galaxies: inner shells, shell colours and dust; A&A 467, 1011–1024
Simon, P.; Hetterscheidt, M.; Schirmer, M.; Erben, T.; Schneider, P.; Wolf, C.; Meisenheimer, K.; GaBoDS: The Garching-Bonn Deep Survey. – VI. Probing galaxy bias using weak gravitational lensing; A&A 461, 861–879
Simon, J. D.; Bolatto, A. D.; Whitney, B. A.; Robitaille, T. P.; Shah, R. Y.; Makovoz, D.; Stanimirović, S.; Barbá, R. H.; Rubio, M.; The Spitzer Survey of the Small Magellanic Cloud: Discovery of Embedded Protostars in the H II Region NGC 346; ApJ 669, 327–336
Sluse, D.; Claeskens, J.-F.; Hutsemékers, D.; Surdej, J.; Multi-wavelength study of the gravitational lens system RXS J1131-1231. – III. Long slit spectroscopy: micro-lensing probes the QSO structure; A&A 468, 885–901
Smiljanic, R.; Porto de Mello, G. F.; da Silva, L.; Abundance analysis of barium and mild barium stars; A&A 468, 679–693
Smith, N.; Bally, J.; Walawender, J.; And in the Darkness Bind Them: Equatorial Rings, B[e] Supergiants, and the Waists of Bipolar Nebulae; AJ 134, 846–859
Smoker, J. V.; Hunter, I.; Kalberla, P. M. W.; Keenan, F. P.; Morras, R.; Hanuschik, R.; Thompson, H. M. A.; Silva, D.; Bajaja, E.; Poppel, W. G. L.; Arnal, M.; Observations towards early-type stars in the ESO-POP Survey – II. Searches for intermediate- and high-velocity clouds; MNRAS 378, 947–954
Smolčić, V.; Schinnerer, E.; Finoguenov, A.; Sakelliou, I.; Carilli, C. L.; Botzler, C. S.; Brusa, M.; Scoville, N.; Ajiki, M.; Capak, P.; Guzzo, L.; Hasinger, G.; Impey, C.; Jahnke, K.; Kartaltepe, J. S.; McCracken, H. J.; Mobasher, B.; Murayama, T.; Sasaki, S. S.; Shioya, Y.; Taniguchi, Y.; Trump, J. R.; A Wide-Angle Tail Radio Galaxy in the COSMOS Field: Evidence for Cluster Formation; ApJS 172, 295–313
Snellen, I. A. G.; Covino, E.; *K*-band transit and secondary eclipse photometry of exoplanet OGLE-TR-113b; MNRAS 375, 307–312
Snijders, L.; Kewley, L. J.; van der Werf, P. P.; Mid-Infrared Diagnostics of Starburst Galaxies: Clumpy, Dense Structures in Star-Forming Regions in the Antennae (NGC 4038/4039); ApJ 669, 269–288
Sollima, A.; Ferraro, F. R.; Bellazzini, M.; Origlia, L.; Straniero, O.; Pancino, E.; Deep FORS1 Observations of the Double Main Sequence of ω Centauri; ApJ 654, 915–922
Sollerman, J.; Fynbo, J. P. U.; Gorosabel, J.; Halpern, J. P.; Hjorth, J.; Jakobsson, P.; Mirabal, N.; Watson, D.; Xu, D.; Castro-Tirado, A. J.; Féron, C.; Jaunsen, A. O.; Jelínek, M.; Jensen, B. L.; Kann, D. A.; Ovaldsen, J. E.; Pozanenko, A.; Stritzinger, M.; Thöne, C. C.; de Ugarte Postigo, A.; Guziy, S.; Ibrahimov, M.; Järvinen, S. P.; Levan, A.; Rumyantsev, V.; Tanvir, N.; The nature of the X-ray flash of August 24 2005. Photometric evidence for an on-axis $z = 0.83$ burst with continuous energy injection and an associated supernova?; A&A 466, 839–846
Sollima, A.; Ferraro, F. R.; Bellazzini, M.; The mass function of ω Centauri down to 0.15 Msolar; MNRAS 381, 1575–1582
Southworth, J.; Clausen, J. V.; Absolute dimensions of eclipsing binaries. – XXIV. The Be star system DW Carinae, a member of the open cluster Collinder 228; A&A 461, 1077–1093
Spezzi, L.; Alcalá, J. M.; Frasca, A.; Covino, E.; Gandolfi, D.; A WFI survey in the Chamaeleon II dark cloud; A&A 470, 281–294
Srianand, R.; Gupta, N.; Petitjean, P.; Multiwavelength investigation of a near-solar metallicity sub-DLA at zabs = 1.3647 towards PKS0237–233; MNRAS 375, 584–594
Stark, D. P.; Bunker, A. J.; Ellis, R. S.; Eyles, L. P.; Lacy, M.; A New Measurement of the Stellar Mass Density at $z \sim 5$: Implications for the Sources of Cosmic Reionization; ApJ 659, 84–97
Stello, D.; Bruntt, H.; Kjeldsen, H.; Bedding, T. R.; Arentoft, T.; Gilliland, R. L.; Nuspl, J.; Kim, S.-L.; Kang, Y. B.; Koo, J.-R.; Lee, J.-A.; Sterken, C.; Lee, C.-U.; Jensen, H. R.; Jacob, A. P.; Szabó, R.; Frandsen, S.; Csubry, Z.; Dind, Z. E.; Bouzid, M. Y.; Dall, T. H.; Kiss, L. L.; Multisite campaign on the open cluster M67 – II. Evidence for solar-like oscillations in red giant stars; MNRAS 377, 584–594
Stelzer, B.; Scholz, A.; Jayawardhana, R.; Emission Line Variability of the Accreting Young Brown Dwarf 2MASSW J1207334–393254: From Hours to Years; ApJ 671, 842–852
Stempels, H. C.; Gahm, G. F.; Petrov, P. P.; Periodic radial velocity variations in RU Lupi; A&A 461, 253–259
Sterken, C.; Vogt, N.; Schreiber, M. R.; Uemura, M.; Tuvikene, T.; WX Ceti: a closer look at its behaviour in quiescence and outburst; A&A 463, 1053–1060
Stratta, G.; Basa, S.; Butler, N.; Atteia, J. L.; Gendre, B.; Pélangeon, A.; Malacrino, F.; Mellier, Y.; Kann, D. A.; Klose, S.; Zeh, A.; Masetti, N.; Palazzi, E.; Gorosabel, J.; Castro-Tirado, A. J.; de Ugarte Postigo, A.; Jelinek, M.; Cepa, J.; Castañeda, H.; Martínez-Delgado, D.; Boër, M.; Braga, J.; Crew, G.; Donaghy, T. Q.; Dezalay, J.-P.; Doty, J.; Fenimore, E. E.; Galassi, M.; Graziani, C.; Jernigan, J. G.; Kawai, N.; Lamb, D. Q.; Levine, A.; Manchanda, R. K.; Martel, F.; Matsuoka, M.; Nakagawa, Y.; Olive, J.-F.; Pizzichini, G.; Prigozhin, G.; Ricker, G.; Sakamoto, T.; Shirasaki, Y.; Sugita, S.; Suzuki, M.; Takagishi, K.; Tamagawa, T.; Vanderspek, R.; Villasenor, J.; Woosley, S. E.; Yamauchi, M.; Yoshida, A.; X-ray flashes or soft gamma-ray bursts?. The case of the likely distant XRF 040912; A&A 461, 485–492
Stratta, G.; D'Avanzo, P.; Piranomonte, S.; Cutini, S.; Preger, B.; Perri, M.; Conciatore, M. L.; Covino, S.; Stella, L.; Guetta, D.; Marshall, F. E.; Holland, S. T.; Stamatikos, M.; Guidorzi, C.; Mangano, V.; Antonelli, L. A.; Burrows, D.; Campana, S.; Capalbi, M.; Chincarini, G.; Cusumano, G.; D'Elia, V.; Evans, P. A.; Fiore, F.; Fugazza, D.; Giommi, P.; Osborne, J. P.; La Parola, V.; Mineo, T.; Moretti, A.; Page, K. L.; Romano, P.; Tagliaferri, G.; A study of the prompt and afterglow emission of the short GRB 061201; A&A 474, 827–835
Stritzinger, M.; Sollerman, J.; Late-time emission of type Ia supernovae: optical and near-infrared observations of SN 2001el; A&A 470, L1–L4
Stroeer, A.; Heber, U.; Lisker, T.; Napiwotzki, R.; Dreizler, S.; Christlieb, N.; Reimers, D.; Hot subdwarfs from the ESO supernova Ia progenitor survey. – II. Atmospheric parameters of subdwarf O stars; A&A 462, 269–280
Sudilovsky, V.; Savaglio, S.; Vreeswijk, P.; Ledoux, C.; Smette, A.; Greiner, J.; Intervening Metal Systems in GRB and QSO Sight Lines: The Mg II and C IV Question; ApJ 669, 741–748
Sulentic, J. W.; Bachev, R.; Marziani, P.; Negrete, C. A.; Dultzin, D.; C IV λ1549 as an Eigenvector 1 Parameter for Active Galactic Nuclei; ApJ 666, 757–777
Swinbank, A. M.; Bower, R. G.; Smith, Graham P.; Wilman, R. J.; Smail, Ian; Ellis, R. S.; Morris, S. L.; Kneib, J.-P.; Resolved spectroscopy of a gravitationally lensed *L* Lyman-break galaxy at $z \sim 5$; MNRAS 376, 479–491
Sziládi, K.; Vinkó, J.; Poretti, E.; Szabados, L.; Kun, M.; New homogeneous iron abundances of double-mode Cepheids from high-resolution echelle spectroscopy; A&A 473, 579–587
Tachihara, K.; Rengel, M.; Nakajima, Y.; Yamaguchi, N.; André, P.; Neuhäuser, R.; Onishi, T.; Fukui, Y.; Mizuno, A.; Gas and Dust Condensations and a Peculiar Class 0 Object in the Lupus 3 Star-Forming Cloud; ApJ 659, 1382–1393
Tajer, M.; Polletta, M.; Chiappetti, L.; Maraschi, L.; Trinchieri, G.; Maccagni, D.; Andreon, S.; Garcet, O.; Surdej, J.; Pierre, M.; Le Fèvre, O.; Franceschini, A.; Lonsdale, C. J.; Surace, J. A.; Shupe, D. L.; Fang, F.; Rowan-Robinson, M.; Smith, H. E.; Tresse, L.; Obscured and unobscured AGN populations in a hard-X-ray selected sample of the XMDS survey; A&A 467, 73–91
Takahashi, M. I.; Shioya, Y.; Taniguchi, Y.; Murayama, T.; Ajiki, M.; Sasaki, S. S.; Koizumi, O.; Nagao, T.; Scoville, N. Z.; Mobasher, B.; Aussel, H.; Capak, P.; Carilli, C.; Ellis, R. S.; Garilli, B.; Giavalisco, M.; Guzzo, L.; Hasinger, G.; Impey, C.; Kitzbichler, M. G.; Koekemoer, A.; Le Fèvre, O.; Lilly, S. J.; Maccagni, D.; Renzini, A.; Rich, M.; Sanders, D. B.; Schinnerer, E.; Scodeggio, M.; Shopbell, P.; Smolčić, V.; Tribiano, S.; Ideue, Y.; Mihara, S.; The [O II] λ3727 Luminosity Function and Star Formation Rate at $z \sim 1.2$ in the COSMOS 2 Square Degree Field and the Subaru Deep Field; ApJS 172, 456–467
Tanaka, M.; Kodama, T.; Kajisawa, M.; Bower, R.; Demarco, R.; Finoguenov, A.; Lidman, C.; Rosati, P.; A deficit of faint red galaxies in the possible large-scale structures around the RDCS J1252.9–2927 cluster at $z = 1.24$; MNRAS 377, 1206–1214
Tapken, C.; Appenzeller, I.; Noll, S.; Richling, S.; Heidt, J.; Meinköhn, E.; Mehlert, D.; Lyα emission in high-redshift galaxies; A&A 467, 63–72

Tappert, C.; Gänsicke, B. T.; Schmidtobreick, L.; Aungwerojwit, A.; Mennickent, R. E.; Koester, D.; The pre-cataclysmic variable, LTT 560; A&A 474, 205–211

Tappert, C.; Gänsicke, B. T.; Schmidtobreick, L.; Mennickent, R. E.; Navarrete, F. P.; *K*-band spectroscopy of pre-cataclysmic variables; A&A 475, 575–583

Tatulli, E.; Isella, A.; Natta, A.; Testi, L.; Marconi, A.; Malbet, F.; Stee, P.; Petrov, R. G.; Millour, F.; Chelli, A.; Duvert, G.; Antonelli, P.; Beckmann, U.; Bresson, Y.; Dugué, M.; Gennari, S.; Glück, L.; Kern, P.; Lagarde, S.; Le Coarer, E.; Lisi, F.; Perraut, K.; Puget, P.; Rantakyrö, F.; Robbe-Dubois, S.; Roussel, A.; Weigelt, G.; Zins, G.; Accardo, M.; Acke, B.; Agabi, K.; Altariba, E.; Arezki, B.; Aristidi, E.; Baffa, C.; Behrend, J.; Blöcker, T.; Bonhomme, S.; Busoni, S.; Cassaing, F.; Clausse, J.-M.; Colin, J.; Connot, C.; Delboulbé, A.; Domiciano de Souza, A.; Driebe, T.; Feautrier, P.; Ferruzzi, D.; Forveille, T.; Fossat, E.; Foy, R.; Fraix-Burnet, D.; Gallardo, A.; Giani, E.; Gil, C.; Glentzlin, A.; Heiden, M.; Heininger, M.; Hernandez Utrera, O.; Hofmann, K.-H.; Kamm, D.; Kiekebusch, M.; Kraus, S.; Le Contel, D.; Le Contel, J.-M.; Lesourd, T.; Lopez, B.; Lopez, M.; Magnard, Y.; Mars, G.; Martinot-Lagarde, G.; Mathias, P.; Mège, P.; Monin, J.-L.; Mouillet, D.; Mourard, D.; Nussbaum, E.; Ohnaka, K.; Pacheco, J.; Perrier, C.; Rabbia, Y.; Rebattu, S.; Reynaud, F.; Richichi, A.; Robini, A.; Sacchettini, M.; Schertl, D.; Schöller, M.; Solscheid, W.; Spang, A.; Stefanini, P.; Tallon, M.; Tallon-Bosc, I.; Tasso, D.; Vakili, F.; von der Lühe, O.; Valtier, J.-C.; Vannier, M.; Ventura, N.; Constraining the wind launching region in Herbig Ae stars: AMBER/VLTI spectroscopy of HD 104237; A&A 464, 55–58

Tautvaišienė, G.; Geisler, D.; Wallerstein, G.; Borissova, J.; Bizyaev, D.; Pagel, B. E. J.; Charbonnel, C.; Smith, V.; First Stellar Abundances in the Dwarf Irregular Galaxy IC 1613; AJ 134, 2318–2327

Taylor, P. A.; Margot, J.-L.; Vokrouhlický, D.; Scheeres, D. J.; Pravec, P.; Lowry, S. C.; Fitzsimmons, A.; Nolan, M. C.; Ostro, S. J.; Benner, L. A. M.; Giorgini, J. D.; Magri, C.; Spin Rate of Asteroid (54509) 2000 PH5 Increasing Due to the YORP Effect; Sci 316, 274–

Tejos, N.; Lopez, S.; Prochaska, J. X.; Chen, H.-W.; Dessauges-Zavadsky, M.; On the Incidence of C IV Absorbers Along the Sight Lines to Gamma-Ray Bursts; ApJ 671, 622–627

Testa, V.; Marconi, M.; Musella, I.; Ripepi, V.; Dall'Ora, M.; Ferraro, F. R.; Mucciarelli, A.; Mateo, M.; Côté, P.; Infrared photometry of Cepheids in the LMC clusters NGC 1866 and NGC 2031; A&A 462, 599–605

Testor, G.; Lemaire, J. L.; Kristensen, L. E.; Field, D.; Diana, S.; VLT/NACO near-infrared imaging and spectroscopy of N159-5 in the LMC H II complex N159; A&A 469, 459–469

Thatte, N.; Abuter, R.; Tecza, M.; Nielsen, E. L.; Clarke, F. J.; Close, L. M.; Very high contrast integral field spectroscopy of AB Doradus C: 9-mag contrast at 0.2 arcsec without a coronagraph using spectral deconvolution; MNRAS 378, 1229–1236

Thompson, H. M. A.; Keenan, F. P.; Dufton, P. L.; Ryans, R. S. I.; Smoker, J. V.; Lambert, D. L.; Zijlstra, A. A.; Iron abundances of B-type post-asymptotic giant branch stars in globular clusters: Barnard29 in M13 and ROA5701 in ωCen; MNRAS 378, 1619–1632

Thöne, C. C.; Greiner, J.; Savaglio, S.; Jehin, E.; ISM Studies of GRB 030329 with High-Resolution Spectroscopy; ApJ 671, 628–636

Tillich, A.; Heber, U.; O'Toole, S. J.; Østensen, R.; Schuh, S.; The Multi-Site Spectroscopic Telescope Campaign. – II. Effective temperature and gravity variations in the multi-periodic pulsating subdwarf B star PG 1605+072; A&A 473, 219–228

Tisserand, P.; Le Guillou, L.; Afonso, C.; Albert, J. N.; Andersen, J.; Ansari, R.; Aubourg, É.; Bareyre, P.; Beaulieu, J. P.; Charlot, X.; Coutures, C.; Ferlet, R.; Fouqué, P.; Glicenstein, J. F.; Goldman, B.; Gould, A.; Graff, D.; Gros, M.; Haissinski, J.; Hamadache, C.; de Kat, J.; Lasserre, T.; Lesquoy, É.; Loup, C.; Magneville, C.; Marquette, J. B.; Maurice, É.; Maury, A.; Milsztajn, A.; Moniez, M.; Palanque-Delabrouille, N.; Perdereau, O.; Rahal, Y. R.; Rich, J.; Spiro, M.; Vidal-Madjar, A.; Vigroux, L.; Zylberajch, S.; The EROS-2 Collaboration; Limits on the Macho content of the Galactic Halo from the EROS-2 Survey of the Magellanic Clouds; A&A 469, 387–404

Toft, S.; van Dokkum, P.; Franx, M.; Labbe, I.; Förster Schreiber, N. M.; Wuyts, S.; Webb, T.; Rudnick, G.; Zirm, A.; Kriek, M.; van der Werf, P.; Blakeslee, J. P.; Illingworth, G.; Rix, H.-W.; Papovich, C.; Moorwood, A.; Hubble Space Telescope and Spitzer Imaging of Red and Blue Galaxies at $z \sim 2.5$: A Correlation between Size and Star Formation Activity from Compact Quiescent Galaxies to Extended Star-forming Galaxies; ApJ 671, 285–302

Tokovinin, A.; Sarazin, M.; Smette, A.; Testing turbulence model at metric scales with mid-infrared VISIR images at the VLT; MNRAS 378, 701–708

Tozzi, G. P.; Boehnhardt, H.; Kolokolova, L.; Bonev, T.; Pompei, E.; Bagnulo, S.; Ageorges, N.; Barrera, L.; Hainaut, O.; Käufl, H. U.; Kerber, F.; Locurto, G.; Marco, O.; Pantin, E.; Rauer, H.; Saviane, I.; Sterken, C.; Weiler, M.; Dust observations of Comet 9P/Tempel 1 at the time of the Deep Impact; A&A 476, 979–988

Tresse, L.; Ilbert, O.; Zucca, E.; Zamorani, G.; Bardelli, S.; Arnouts, S.; Paltani, S.; Pozzetti, L.; Bottini, D.; Garilli, B.; Le Brun, V.; Le Fèvre, O.; Maccagni, D.; Picat, J.-P.; Scaramella, R.; Scodeggio, M.; Vettolani, G.; Zanichelli, A.; Adami, C.; Arnaboldi, M.; Bolzonella, M.; Cappi, A.; Charlot, S.; Ciliegi, P.; Contini, T.; Foucaud, S.; Franzetti, P.; Gavignaud, I.; Guzzo, L.; Iovino, A.; McCracken, H. J.; Marano, B.; Marinoni, C.; Mazure, A.; Meneux, B.; Merighi, R.; Pellò, R.; Pollo, A.; Radovich, M.; Bondi, M.; Bongiorno, A.; Busarello, G.; Cucciati, O.; Lamareille, F.; Mathez, G.; Mellier, Y.; Merluzzi, P.; Ripepi, V.; The cosmic star formation rate evolution from $z = 5$ to $z = 0$ from the VIMOS VLT deep survey; A&A 472, 403–419

Trippe, S.; Paumard, T.; Ott, T.; Gillessen, S.; Eisenhauer, F.; Martins, F.; Genzel, R.; A polarized infrared flare from Sagittarius A and the signatures of orbiting plasma hotspots; MNRAS 375, 764–772

Tristram, K. R. W.; Meisenheimer, K.; Jaffe, W.; Schartmann, M.; Rix, H.-W.; Leinert, C.; Morel, S.; Wittkowski, M.; Röttgering, H.; Perrin, G.; Lopez, B.; Raban, D.; Cotton, W. D.; Graser, U.; Paresce, F.; Henning, T.; Resolving the complex structure of the dust torus in the active nucleus of the Circinus galaxy; A&A 474, 837–850

Trundle, C.; Dufton, P. L.; Hunter, I.; Evans, C. J.; Lennon, D. J.; Smartt, S. J.; Ryans, R. S. I.; The VLT-FLAMES survey of massive stars: evolution of surface N abundances and effective temperature scales in the Galaxy and Magellanic Clouds; A&A 471, 625–643

Tubiana, C.; Duffard, R.; Barrera, L.; Boehnhardt, H.; Photometric and spectroscopic observations of (132524) 2002 JF_{56}: fly-by target of the New Horizons mission; A&A 463, 1197–1199

Tumlinson, J.; Prochaska, J. X.; Chen, H.-W.; Dessauges-Zavadsky, M.; Bloom, J. S.; Missing Molecular Hydrogen and the Physical Conditions of GRB Host Galaxies; ApJ 668, 667–673

Tzanavaris, P.; Murphy, M. T.; Webb, J. K.; Flambaum, V. V.; Curran, S. J.; Probing variations in fundamental constants with radio and optical quasar absorption-line observations; MNRAS 374, 634–646

Udry, S.; Bonfils, X.; Delfosse, X.; Forveille, T.; Mayor, M.; Perrier, C.; Bouchy, F.; Lovis, C.; Pepe, F.; Queloz, D.; Bertaux, J.-L.; The HARPS search for southern extra-solar planets. – XI. Super-Earths (5 and 8 $M_\oplus$) in a 3-planet system; A&A 469, L43–L47

Urquhart, J. S.; Thompson, M. A.; Morgan, L. K.; Pestalozzi, M. R.; White, Glenn J.; Muna, D. N.; A tale of two cores: triggered massive star formation in the bright-rimmed cloud SFO 75; A&A 467, 1125–1137

Uttenthaler, S.; Hron, J.; Lebzelter, T.; Busso, M.; Schultheis, M.; Käufl, H. U.; Technetium and the third dredge up in AGB stars. – II. Bulge stars; A&A 463, 251–259

Uttenthaler, S.; Lebzelter, T.; Palmerini, S.; Busso, M.; Aringer, B.; Lederer, M. T.; Low-mass lithium-rich AGB stars in the Galactic bulge: evidence for cool bottom processing?; A&A 471, L41–L45

Valcheva, A. T.; Ivanov, V. D.; Ovcharov, E. P.; Nedialkov, P. L.; Carbon stars and C/M ratio in the WLM dwarf irregular galaxy; A&A 466, 501–507

Valenti, E.; Ferraro, F. R.; Origlia, L.; Near-Infrared Properties of 24 Globular Clusters in the Galactic Bulge; AJ 133, 1287–1301

van Hoof, P. A. M.; Hajduk, M.; Zijlstra, Albert A.; Herwig, F.; Evans, A.; van de Steene, G. C.; Kimeswenger, S.; Kerber, F.; Eyres, S. P. S.; The onset of photoionization in Sakurai's Object (V4334 Sagittarii); A&A 471, L9–L12

van der Meer, A.; Kaper, L.; van Kerkwijk, M. H.; Heemskerk, M. H. M.; van den Heuvel, E. P. J.; Determination of the mass of the neutron star in SMC X-1, LMC X-4, and Cen X-3 with VLT/UVES; A&A 473, 523–538

Vaz, L. P. R.; Andersen, J.; Claret, A.; Absolute dimensions of eclipsing binaries. – XXV. U Ophiuchi and the evolution and composition of 5 $M_\odot$ stars; A&A 469, 285–296

Venemans, B. P.; Röttgering, H. J. A.; Miley, G. K.; van Breugel, W. J. M.; de Breuck, C.; Kurk, J. D.; Pentericci, L.; Stanford, S. A.; Overzier, R. A.; Croft, S.; Ford, H.; Protoclusters associated with $z > 2$ radio galaxies . – I. Characteristics of high redshift protoclusters; A&A 461, 823–845

Venemans, B. P.; McMahon, R. G.; Warren, S. J.; Gonzalez-Solares, E. A.; Hewett, P. C.; Mortlock, D. J.; Dye, S.; Sharp, R. G.; The discovery of the first luminous $z \sim 6$ quasar in the UKIDSS Large Area Survey; MNRAS 376, L76–L80

Vergani, D.; Pizzella, A.; Corsini, E. M.; van Driel, W.; Buson, L. M.; Dettmar, R.-J.; Bertola, F.; NGC 5719/13: interacting spirals forming a counter-rotating stellar disc; A&A 463, 883–892

Verhoelst, T.; van Aarle, E.; Acke, B.; Direct diameter measurement of a star filling its Roche lobe. The semi-detached binary SS Leporis spatially resolved with VINCI/VLTI; A&A 470, L21–L24
Verma, A.; Lehnert, M. D.; Förster S., Natascha M.; Bremer, M. N.; Douglas, L.; Lyman-break galaxies at z ~ 5 – I. First significant stellar mass assembly in galaxies that are not simply z ~ 3 LBGs at higher redshift; MNRAS 377, 1024–1042
Vernazza, P.; Rossi, A.; Birlan, M.; Fulchignoni, M.; Nedelcu, A.; Dotto, E.; 832 Karin: Absence of rotational spectral variations; Icar 191, 330–336
Villar-Martín, M.; Humphrey, A.; De Breuck, C.; Fosbury, R.; Binette, L.; Vernet, J.; Lyα excess in high-redshift radio galaxies: a signature of star formation; MNRAS 375, 1299–1310
Villar-Martín, M.; Sánchez, S. F.; Humphrey, A.; Dijkstra, M.; di Serego Alighieri, S.; De Breuck, C.; González Delgado, R., VIMOS-VLT spectroscopy of the giant Lyα nebulae associated with three z ~ 2.5 radio galaxies; MNRAS 378, 416–428
Villanova, S.; Piotto, G.; King, I. R.; Anderson, J.; Bedin, L. R.; Gratton, R. G.; Cassisi, S.; Momany, Y.; Bellini, A.; Cool, A. M.; Recio-Blanco, A.; Renzini, A.; The Multiplicity of the Subgiant Branch of ω Centauri: Evidence for Prolonged Star Formation; ApJ 663, 296–314
Vink, J. S.; Constraining GRB progenitor models by probing Wolf-Rayet wind geometries in the Large Magellanic Cloud; A&A 469, 707–711
von Hippel, T.; Thompson, S. E.; Discovery of Photospheric Calcium Line-Strength Variations in the DAZd White Dwarf G29-38; ApJ 661, 477–481
Voss, B.; Koester, D.; Napiwotzki, R.; Christlieb, N.; Reimers, D.; High-resolution UVES/VLT spectra of white dwarfs observed for the ESO SN Ia progenitor survey. – II. DB and DBA stars; A&A 470, 1079–1088
Vreeswijk, P. M.; Ledoux, C.; Smette, A.; Ellison, S. L.; Jaunsen, A. O.; Andersen, M. I.; Fruchter, A. S.; Fynbo, J. P. U.; Hjorth, J.; Kaufer, A.; Møller, P.; Petitjean, P.; Savaglio, S.; Wijers, R. A. M. J.; Rapid-response mode VLT/UVES spectroscopy of GRB 060418. Conclusive evidence for UV pumping from the time evolution of Fe II and Ni II excited- and metastable-level populations; A&A 468, 83–96
Vučković, M.; Aerts, C.; Östensen, R.; Nelemans, G.; Hu, H.; Jeffery, C. S.; Dhillon, V. S.; Marsh, T. R.; The binary properties of the pulsating subdwarf B eclipsing binary PG 1336–018 (NY Virginis); A&A 471, 605–615
Wade, G. A.; Bagnulo, S.; Drouin, D.; Landstreet, J. D.; Monin, D.; A search for strong, ordered magnetic fields in Herbig Ae/Be stars; MNRAS 376, 1145–1161
Wallerstein, G.; Sandstrom, K.; Gredel, R.; A Preliminary Investigation of the Diffuse Interstellar Line at 8621 Å; PASP 119, 1268–1277
Walter, R.; Lubiński, P.; Paltani, S.; Produit, N.; Zurita, J.; Kuulkers, E.; Beckmann, V.; Gehrels, N.; Blecha, A.; Carrier, F.; Cherix, M.; IGR J17497-2821: a new X-ray nova; A&A 461, L17–L20
Wang, L.; Baade, D.; Patat, F.; Spectropolarimetric Diagnostics of Thermonuclear Supernova Explosions; Sci 315, 212
Wang, W.; Liu, X.-W.; Elemental abundances of Galactic bulge planetary nebulae from optical recombination lines; MNRAS 381, 669–701
Warren, S. J.; Mortlock, D. J.; Leggett, S. K.; Pinfield, D. J.; Homeier, D.; Dye, S.; Jameson, R. F.; Lodieu, N.; Lucas, P. W.; Adamson, A. J.; Allard, F.; Barrado Y Navascués, D.; Casali, M.; Chiu, K.; Hambly, N. C.; Hewett, P. C.; Hirst, P.; Irwin, M. J.; Lawrence, A.; Liu, M. C.; Martín, E. L.; Smart, R. L.; Valdivielso, L.; Venemans, B. P.; A very cool brown dwarf in UKIDSS DR1; MNRAS 381, 1400–1412
Weigelt, G.; Kraus, S.; Driebe, T.; Petrov, R. G.; Hofmann, K.-H.; Millour, F.; Chesneau, O.; Schertl, D.; Malbet, F.; Hillier, J. D.; Gull, T.; Davidson, K.; Domiciano de Souza, A.; Antonelli, P.; Beckmann, U.; Bresson, Y.; Chelli, A.; Dugué, M.; Duvert, G.; Gennari, S.; Glück, L.; Kern, P.; Lagarde, S.; Le Coarer, E.; Lisi, F.; Perraut, K.; Puget, P.; Rantakyrö, F.; Robbe-Dubois, S.; Roussel, A.; Tatulli, E.; Zins, G.; Accardo, M.; Acke, B.; Agabi, K.; Altariba, E.; Arezki, B.; Aristidi, E.; Baffa, C.; Behrend, J.; Blöcker, T.; Bonhomme, S.; Busoni, S.; Cassaing, F.; Clausse, J.-M.; Colin, J.; Connot, C.; Delboulbé, A.; Feautrier, P.; Ferruzzi, D.; Forveille, T.; Fossat, E.; Foy, R.; Fraix-Burnet, D.; Gallardo, A.; Giani, E.; Gil, C.; Glentzlin, A.; Heiden, M.; Heininger, M.; Hernandez Utrera, O.; Kamm, D.; Kiekebusch, M.; Le Contel, D.; Le Contel, J.-M.; Lesourd, T.; Lopez, B.; Lopez, M.; Magnard, Y.; Marconi, A.; Mars, G.; Martinot-Lagarde, G.; Mathias, P.; Mège, P.; Monin, J.-L.; Mouillet, D.; Mourard, D.; Nussbaum, E.; Ohnaka, K.; Pacheco, J.; Perrier, C.; Rabbia, Y.; Rebattu, S.; Reynaud, F.; Richichi, A.; Robini, A.; Sacchettini, M.; Schöller, M.; Solscheid, W.; Spang, A.; Stee, P.; Stefanini, P.; Tallon, M.; Tallon-Bosc, I.; Tasso, D.; Testi, L.; Vakili, F.; von der Lühe, O.; Valtier, J.-C.; Vannier, M.; Ventura, N.; Weis, K.; Wittkowski, M.; Near-infrared interferometry of η Carinae with spectral resolutions of 1500 and 12 000 using AMBER/VLTI; A&A 464, 87–106
Weiler, M.; Rauer, H.; Knollenberg, J.; Sterken, C.; The gas production of Comet 9P/Tempel 1 around the Deep Impact date; Icar 190, 423–431
Welty, D. E.; Monitoring the Variable Interstellar Absorption toward HD 219188 with Hubble Space Telescope STIS; ApJ 668, 1012–1027
Werner, K.; Rauch, T.; Kruk, J. W.; Identification of Ne VIII lines in H-deficient (pre-) white dwarfs: a new tool to constrain the temperature of the hottest stars; A&A 474, 591–597
Whelan, E. T.; Ray, T. P.; Randich, S.; Bacciotti, F.; Jayawardhana, R.; Testi, L.; Natta, A.; Mohanty, S.; Discovery of a Bipolar Outflow from 2MASSW J1207334–393254, a 24 M_{Jup} Brown Dwarf; ApJ 659, L45–L48
Wiersema, K.; Savaglio, S.; Vreeswijk, P. M.; Ellison, S. L.; Ledoux, C.; Yoon, S.-C.; Møller, P.; Sollerman, J.; Fynbo, J. P. U.; Pian, E.; Starling, R. L. C.; Wijers, R. A. M. J.; The nature of the dwarf starforming galaxy associated with GRB 060218/SN 2006aj; A&A 464, 529–539
Willott, Chris J.; Delorme, P.; Omont, A.; Bergeron, J.; Delfosse, X.; Forveille, T.; Albert, L.; Reylé, C.; Hill, G. J.; Gully-Santiago, M.; Vinten, P.; Crampton, D.; Hutchings, J. B.; Schade, D.; Simard, L.; Sawicki, M.; Beelen, A.; Cox, P.; Four Quasars above Redshift 6 Discovered by the Canada-France High-z Quasar Survey; AJ 134, 2435–2450
Wittkowski, M.; Boboltz, D. A.; Ohnaka, K.; Driebe, T.; Scholz, M.; The Mira variable S Orionis: relationships between the photosphere, molecular layer, dust shell, and SiO maser shell at 4 epochs; A&A 470, 191–210
Wood-Vasey, W. M.; Miknaitis, G.; Stubbs, C. W.; Jha, S.; Riess, A. G.; Garnavich, P. M.; Kirshner, R. P.; Aguilera, C.; Becker, A. C.; Blackman, J. W.; Blondin, S.; Challis, P.; Clocchiatti, A.; Conley, A.; Covarrubias, R.; Davis, T. M.; Filippenko, A. V.; Foley, R. J.; Garg, A.; Hicken, M.; Krisciunas, K.; Leibundgut, B.; Li, W.; Matheson, T.; Miceli, A.; Narayan, G.; Pignata, G.; Prieto, J. L.; Rest, A.; Salvo, M. E.; Schmidt, B. P.; Smith, R. C.; Sollerman, J.; Spyromilio, J.; Tonry, J. L.; Suntzeff, N. B.; Zenteno, A.; Observational Constraints on the Nature of Dark Energy: First Cosmological Results from the ESSENCE Supernova Survey; ApJ 666, 694–715
Worseck, G.; Fechner, C.; Wisotzki, L.; Dall'Aglio, A.; The transverse proximity effect in spectral hardness on the line of sight towards HE 2347–4342; A&A 473, 805–818
Wuyts, S.; Labbé, I.; Franx, M.; Rudnick, G.; van Dokkum, P. G.; Fazio, G. G.; Förster Schreiber, N. M.; Huang, J.; Moorwood, A. F. M.; Rix, H.-W.; Röttgering, H.; van der Werf, P.; What Do We Learn from IRAC Observations of Galaxies at 2 < z < 3.5?; ApJ 655, 51–65
Yakut, K.; Aerts, C.; Morel, T.; The early-type close binary CV Velorum revisited; A&A 467, 647–655
Yun, J. L.; Torrelles, J. M.; Santos, N. C.; A "diamond-ring" star: the unusual morphology of a young (multiple?) object; A&A 470, 231–237
Yun, J. L.; López-Sepulcre, A.; Torrelles, J. M.; A new young stellar cluster embedded in a molecular cloud in the far outer Galaxy; A&A 471, 573–578
Zamanov, R. K.; Bode, M. F.; Melo, C. H. F.; Bachev, R.; Gomboc, A.; Stateva, I. K.; Porter, J. M.; Pritchard, J.; Rotational velocities of the giants in symbiotic stars – II. Are S-type symbiotics synchronized?; MNRAS 380, 1053–1063
Zavagno, A.; Pomarès, M.; Deharveng, L.; Hosokawa, T.; Russeil, D.; Caplan, J.; Triggered star formation on the borders of the Galactic H II region RCW 120; A&A 472, 835–846
Zepf, S. E.; Maccarone, T. J.; Bergond, G.; Kundu, A.; Rhode, K. L.; Salzer, J. J.; [O III] λ5007 Emission from the Black Hole X-Ray Binary in an NGC 4472 Globular Cluster; ApJ 669, L69–L72
Zhang, J. S.; Henkel, C.; Mauersberger, R.; Chin, Y.-N.; Menten, K. M.; Tieftrunk, A. R.; Belloche, A.; The interaction of young massive stars with their environment. A millimeter and submillimeter line study of NGC 6334 FIR II; A&A 465, 887–898
Zuther, J.; Iserlohe, C.; Pott, J.-U.; Bertram, T.; Fischer, S.; Voges, W.; Hasinger, G.; Eckart, A.; Mrk 609: resolving the circumnuclear structure with near-infrared integral field spectroscopy; A&A 466, 451–466
Zych, B. J.; Murphy, M. T.; Pettini, M.; Hewett, P. C.; Ryan-Weber, E. V.; Ellison, S. L.; The host galaxies of strong Ca II quasar absorption systems at z < 0.5; MNRAS 379, 1409–1422

Additional peer-reviewed publications by ESO Scientists

Ganguly, R.; Brotherton, M. S.; Arav, N.; Heap, S. R.; Wisotzki, L.; Aldcroft, T. L.; *Alloin, D.*; Behar, E.; Canalizo, G.; Crenshaw, D. M.; de Kool, M.; Chambers, K.; Cecil, G.; Chatzichristou, E.; Everett, J.; Gabel, J.; Gaskell, C. M.; Galliano, E.; Green, R. F.; Hall, P. B.; Hines, D. C.; Junkkarinen, V. T.; Kaastra, J. S.; Kaiser, Mary E.; Kazanas, D.; Konigl, A.; Korista, K. T.; Kriss, G. A.; Laor, A.; Leighly, K. M.; Mathur, S.; Ogle, P.; Proga, D.; Sabra, B.; Sivron, R.; Snedden, S.; Telfer, R.; Vestergaard, M.; Hubble Space Telescope Ultraviolet Spectroscopy of 14 Low-Redshift Quasars; AJ 133, 479–486

Alloin, D.; Kneib, J.-P.; Guilloteau, S.; Bremer, M.; Dust and molecular content of the lensed quasar, MG0751+2716, at $z = 3.2$; A&A 470, 53–60

Lutz, D.; Sturm, E.; Tacconi, L. J.; Valiante, E.; Schweitzer, M.; Netzer, H.; Maiolino, R.; *Andreani, P.*; Shemmer, O.; Veilleux, S.; PAH Emission and Star Formation in the Host of the $z \sim 2.56$ Cloverleaf QSO; ApJ 661, L25–L28

Kawakatu, N.; *Andreani, P.*; Granato, G. L.; Danese, L.; Exploring Supermassive Black Hole Growth with ALMA; ApJ 663, 924–932

Williams, B. F.; Ciardullo, R.; Durrell, P. R.; Feldmeier, J. J.; Sigurdsson, S.; Vinciguerra, M.; Jacoby, G. H.; von Hippel, T.; Ferguson, H. C.; Tanvir, N. R.; *Arnaboldi, M.*; Gerhard, O.; Aguerri, J. A. L.; Freeman, K. C.; Virgo's Intracluster Globular Clusters as Seen by the Advanced Camera for Surveys; ApJ 654, 835–843

Williams, B. F.; Ciardullo, R.; Durrell, P. R.; Vinciguerra, M.; Feldmeier, J. J.; Jacoby, G. H.; Sigurdsson, S.; von Hippel, T.; Ferguson, H. C.; Tanvir, N. R.; *Arnaboldi, M.*; Gerhard, O.; Aguerri, J. A. L.; Freeman, K.; The Metallicity Distribution of Intracluster Stars in Virgo; ApJ 656, 756–769

Durrell, P. R.; Williams, B. F.; Ciardullo, R.; Feldmeier, J. J.; von Hippel, T.; Sigurdsson, S.; Jacoby, G. H.; Ferguson, H. C.; Tanvir, N. R.; *Arnaboldi, M.*; Gerhard, O.; Aguerri, J. A. L.; Freeman, K.; Vinciguerra, M.; The Resolved Stellar Populations of a Dwarf Spheroidal Galaxy in the Virgo Cluster; ApJ 656, 746–755

Gerhard, O.; *Arnaboldi, M.*; Freeman, K. C.; Okamura, S.; Kashikawa, N.; Yasuda, N.; The kinematics of intracluster planetary nebulae and the on-going subcluster merger in the Coma cluster core; A&A 468, 815–822

Douglas, N. G.; Napolitano, N. R.; Romanowsky, A. J.; Coccato, L.; Kuijken, K.; Merrifield, M. R.; *Arnaboldi, M.*; Gerhard, O.; Freeman, K. C.; Merrett, H. R.; Noordermeer, E.; Capaccioli, M.; The PN.S Elliptical Galaxy Survey: Data Reduction, Planetary Nebula Catalog, and Basic Dynamics for NGC 3379; ApJ 664, 257–276

Murante, G.; Giovalli, M.; Gerhard, O.; *Arnaboldi, M.*; Borgani, S.; Dolag, K.; The importance of mergers for the origin of intracluster stars in cosmological simulations of galaxy clusters; MNRAS 377, 2–16

Snel, R. C.; Mangum, J. G.; *Baars, J. W. M.*; Study of the Dynamics of Large Reflector Antennas with Accelerometers; arXiv 0710, 4254

Baars, J. W. M.; Lucas, R.; Mangum, J. G.; Lopez-Perez, J. A.; Near-Field Radio Holography of Large Reflector Antennas; arXiv 0710, 4244

Catala, C.; Alecian, E.; Donati, J.-F.; Wade, G. A.; Landstreet, J. D.; Böhm, T.; Bouret, J.-C.; *Bagnulo, S.*; Folsom, C.; Silvester, J.; The magnetic field of the pre-main sequence Herbig Ae star HD 190073; A&A 462, 293–301

Balestra, I.; Tozzi, P.; Ettori, S.; Rosati, P.; Borgani, S.; Mainieri, V.; Norman, C.; Viola, M.; Tracing the evolution in the iron content of the intra-cluster medium; A&A 462, 429–442

Sarajedini, A.; *Bedin, L. R.*; Chaboyer, B.; Dotter, A.; Siegel, M.; Anderson, J.; Aparicio, A.; King, I.; Majewski, S.; Marín-Franch, A.; Piotto, G.; Reid, I. N.; Rosenberg, A.; The ACS Survey of Galactic Globular Clusters. – I. Overview and Clusters without Previous Hubble Space Telescope Photometry; AJ 133, 1658–1672

Piotto, G.; *Bedin, L. R.*; Anderson, J.; King, I. R.; Cassisi, S.; Milone, A. P.; Villanova, S.; Pietrinferni, A.; Renzini, A.; A Triple Main Sequence in the Globular Cluster NGC 2808; ApJ 661, L53–L56

Wirström, E. S.; *Bergman, P.*; Hjalmarson, Å.; Nummelin, A.; A search for pre-biotic molecules in hot cores; A&A 473, 177–180

Olofsson, A. O. H.; Persson, C. M.; Koning, N.; *Bergman, P.*; Bernath, P. F.; Black, J. H.; Frisk, U.; Geppert, W.; Hasegawa, T. I.; Hjalmarson, Å.; Kwok, S.; Larsson, B.; Lecacheux, A.; Nummelin, A.; Olberg, M.; Sandqvist, A.; Wirström, E. S.; A spectral line survey of Orion KL in the bands 486–492 and 541–577 GHz with the Odin satellite. – I. The observational data; A&A 476, 791–806

Persson, C. M.; Olofsson, A. O. H.; Koning, N.; *Bergman, P.*; Bernath, P.; Black, J. H.; Frisk, U.; Geppert, W.; Hasegawa, T. I.; Hjalmarson, Å.; Kwok, S.; Larsson, B.; Lecacheux, A.; Nummelin, A.; Olberg, M.; Sandqvist, A.; Wirström, E. S.; A spectral line survey of Orion KL in the bands 486–492 and 541–577 GHz with the Odin satellite. – II. Data analysis; A&A 476, 807–827

Bono, G.; Caputo, F.; di Criscienzo, M.; RR Lyrae stars in Galactic globular clusters. – VI. The period-amplitude relation; A&A 476, 779–790

Piatek, S.; Pryor, C.; *Bristow, P.*; Olszewski, E. W.; Harris, H. C.; Mateo, M.; Minniti, D.; Tinney, C. G.; Proper Motions of Dwarf Spheroidal Galaxies from Hubble Space Telescope Imaging. – V. Final Measurement for Fornax; AJ 133, 818–844

Casali, M.; Adamson, A.; Alves de Oliveira, C.; Almaini, O.; Burch, K.; Chuter, T.; Elliot, J.; Folger, M.; Foucaud, S.; Hambly, N.; Hastie, M.; Henry, D.; Hirst, P.; Irwin, M.; Ives, D.; Lawrence, A.; Laidlaw, K.; Lee, D.; Lewis, J.; Lunney, D.; McLay, S.; Montgomery, D.; Pickup, A.; Read, M.; Rees, N.; Robson, I.; Sekiguchi, K.; Vick, A.; Warren, S.; Woodward, B.; The UKIRT wide-field camera; A&A 467, 777–784

Guimarães, R.; Petitjean, P.; Rollinde, E.; de Carvalho, R. R.; Djorgovski, S. G.; Srianand, R.; Aghaee, A.; *Castro, S.*; Evidence for overdensity around $z_{em} > 4$ quasars from the proximity effect; MNRAS 377, 657–666

Christensen, L.; Wisotzki, L.; Roth, M. M.; Sánchez, S. F.; Kelz, A.; Jahnke, K.; An integral field spectroscopic survey for high redshift damped Lyman-α galaxies; A&A 468, 587–601

Kendall, T. R.; Tamura, M.; Tinney, C. G.; Martín, E. L.; Ishii, M.; Pinfield, D. J.; Lucas, P. W.; Jones, H. R. A.; Leggett, S. K.; Dye, S.; Hewett, P. C.; Allard, F.; Baraffe, I.; Barrado Y Navascués, D.; Carraro, G.; Casewell, S. L.; Chabrier, G.; Chappelle, R. J.; *Clarke, F.*; Day-Jones, A.; Deacon, N.; Dobbie, P. D.; Folkes, S.; Hambly, N. C.; Hodgkin, S. T.; Nakajima, T.; Jameson, R. F.; Lodieu, N.; Magazzù, A.; McCaughrean, M. J.; Pavlenko, Y. V.; Tadashi, N.; Zapatero Osorio, M. R.; Two T dwarfs from the UKIDSS early data release; A&A 466, 1059–1064

Comerón, F.; Pasquali, A.; A very massive runaway star from Cygnus OB2; A&A 467, L23–L27

Schneider, N.; Simon, R.; Bontemps, S.; *Comerón, F.*; Motte, F.; A multiwavelength study of the S106 region. – III. The S106 molecular cloud as part of the Cygnus X cloud complex; A&A 474, 873–882

Conn, B C.; Lane, R. R.; Lewis, G. F.; Gil-Merino, R.; Irwin, Mike J.; Ibata, R. A.; Martin, N. F.; Bellazzini, M.; Sharp, R.; Tuntsov, A. V.; Ferguson, A. M. N.; The AAT/WFI survey of the Monoceros Ring and Canis Major dwarf galaxy – I. From $l = (193–276)°$; MNRAS 376, 939–959

Seymour, N.; Stern, D.; *De Breuck, C.*; Vernet, J.; Rettura, A.; Dickinson, M.; Dey, A.; Eisenhardt, P.; Fosbury, R.; Lacy, M.; McCarthy, P.; Miley, G.; Rocca-Volmerange, B.; Röttgering, H.; Stanford, S. A.; Teplitz, H.; van Breugel, W.; Zirm, A.; The Massive Hosts of Radio Galaxies across Cosmic Time; ApJS 171, 353–375

Greve, T. R.; Stern, D.; Ivison, R. J.; *De Breuck, C.*; Kovács, A.; Bertoldi, F.; Wide-field mid-infrared and millimetre imaging of the high-redshift radio galaxy, 4C41.17; MNRAS 382, 48–66

Garay, G.; Rodríguez, L. F.; *de Gregorio-Monsalvo, I.*; Very Large Array Observations of Candidate High-Mass Protostellar Objects at 7 Millimeters; AJ 134, 906–911

De Silva, G. M.; Freeman, K. C.; Bland-Hawthorn, J.; Asplund, M.; Bessell, M. S.; Chemically Tagging the HR 1614 Moving Group; AJ 133, 694–704

Hao, H.; Stanek, K. Z.; *Dobrzycki, A.*; Matheson, T.; Bentz, M. C.; Kuraszkiewicz, J.; Garnavich, P. M.; Howk, J. C.; Calkins, M. L.; Worthey, G.; Modjaz, M.; Serven, J.; Strongly Variable $z = 1.48$ Fe II and Mg II Absorption in the Spectra of $z = 4.05$ GRB 060206; ApJ 659, L99–L102

Stanek, K. Z.; Dai, X.; Prieto, J. L.; An, D.; Garnavich, P. M.; Calkins, M. L.; Serven, J.; Worthey, G.; Hao, H.; *Dobrzycki, A.*; Howk, C.; Matheson, T.; "Anomalous" Optical Gamma-Ray Burst Afterglows Are Common: Two $z \sim 4$ Bursts, GRB 060206 and GRB 060210; ApJ 654, L21–L24

Dobrzycki, A.; Nikolajuk, M.; Bechtold, J.; Ebeling, H.; Czerny, B.; Różańska, A.; Absorption spectrum of the quasar HS1603+3820. – I. Observations and data analysis; A&A 476, 1205–1217

Döllinger, M. P.; Hatzes, A. P.; Pasquini, L.; Guenther, E. W.; Hartmann, M.; Girardi, L.; Esposito, M.; Discovery of a planet around the K giant star 4 Ursae Majoris; A&A 472, 649–652
Spencer, J. R.; Stern, S. A.; Cheng, A. F.; Weaver, H. A.; Reuter, D. C.; Retherford, K.; Lunsford, A.; Moore, J. M.; Abramov, O.; Lopes, R. M. C.; Perry, J. E.; Kamp, L.; Showalter, M.; Jessup, K. L.; Marchis, F.; Schenk, P. M.; *Dumas, C.*; Io Volcanism Seen by New Horizons: A Major Eruption of the Tvashtar Volcano; Sci 318, 240
Conrad, A. R.; *Dumas, C.*; Merline, W. J.; Drummond, J. D.; Campbell, R. D.; Goodrich, R. W.; Le Mignant, D.; Chaffee, F. H.; Fusco, T.; Kwok, S. H.; Knight, R. I.; Direct measurement of the size, shape, and pole of 511 Davida with Keck AO in a single night; Icar 191, 616–627
Schrabback, T.; Erben, T.; Simon, P.; Miralles, J.-M.; Schneider, P.; Heymans, C.; Eifler, T.; *Fosbury, R. A. E.*; Freudling, W.; Hetterscheidt, M.; Hildebrandt, H.; Pirzkal, N.; Cosmic shear analysis of archival HST/ACS data. – I. Comparison of early ACS pure parallel data to the HST/GEMS survey; A&A 468, 823–847
Cescutti, G.; Matteucci, F.; *François, P.*; Chiappini, C.; Abundance gradients in the Milky Way for α elements, iron peak elements, barium, lanthanum, and europium; A&A 462, 943–951
Kamp, I.; *Freudling, W.*; Chengalur, Jayaram N.; H I 21 cm Emission as a Tracer of Gas During the Evolution from Protoplanetary to Debris Disks; ApJ 660, 469–478
Bastian, N.; Ercolano, B.; *Gieles, M.*; Rosolowsky, E.; Scheepmaker, R. A.; Gutermuth, R.; Efremov, Y.; Hierarchical star formation in M33: fundamental properties of the star-forming regions; MNRAS 379, 1302–1312
Smith, L. J.; Bastian, N.; Konstantopoulos, I. S.; Gallagher III, J. S.; *Gieles, M.*; de Grijs, R.; Larsen, S. S.; O'Connell, R. W.; Westmoquette, M. S.; The Young Cluster Population of M82 Region B; ApJ 667, L145–L149
Gieles, M.; Lamers, H. J. G. L. M.; Portegies Zwart, S. F.; On the Interpretation of the Age Distribution of Star Clusters in the Small Magellanic Cloud; ApJ 668, 268–274
Gilmour, R.; Gray, M. E.; Almaini, O.; Best, P.; Wolf, C.; Meisenheimer, K.; Papovich, C.; Bell, E.; Environmental dependence of active galactic nuclei activity in the supercluster A901/2; MNRAS 380, 1467–1487
Gilmozzi, R.; Selvelli, P.; The secrets of T Pyxidis. – I. UV observations; A&A 461, 593–603
Richards, A. M. S.; Muxlow, T. W. B.; Beswick, R.; Allen, M. G.; Benson, K.; Dickson, R. C.; Garrett, M. A.; Garrington, S. T.; Gonzalez-Solarez, E.; *Harrison, P. A.*; Holloway, A. J.; Kettenis, M. M.; Laing, R. A.; Richards, E. A.; Thrall, H.; van Langevelde, H. J.; Walton, N. A.; Wilkinson, P. N.; Winstanley, N.; Using VO tools to investigate distant radio starbursts hosting obscured AGN in the HDF(N) region; A&A 472, 805–822
Evstigneeva, E. A.; Gregg, M. D.; Drinkwater, M. J.; *Hilker, M.*; Internal Properties of Ultracompact Dwarf Galaxies in the Virgo Cluster; AJ 133, 1722–1740
Briquet, M.; *Hubrig, S.*; De Cat, P.; Aerts, C.; North, P.; Schöller, M.; On the co-existence of chemically peculiar Bp stars, slowly pulsating B stars and constant B stars in the same part of the HR diagram; A&A 466, 269–276
Hubrig, S.; North, P.; Schöller, M.; Evolution of magnetic fields in stars across the upper main sequence: II. Observed distribution of the magnetic field geometry; AN 328, 475
Zavala, R. T.; Adelman, S. J.; *Hummel, C. A.*; Gulliver, A. F.; Caliskan, H.; Armstrong, J. T.; Hutter, D. J.; Johnston, K. J.; Pauls, T. A.; The Mercury-Manganese Binary Star ϕ Herculis: Detection and Properties of the Secondary and Revision of the Elemental Abundances of the Primary; ApJ 655, 1046–1057
Mei, S.; Blakeslee, J. P.; Côté, P.; Tonry, J. L.; West, M. J.; Ferrarese, L.; *Jordán, A.*; Peng, E. W.; Anthony, A.; Merritt, D.; The ACS Virgo Cluster Survey. – XIII. SBF Distance Catalog and the Three-dimensional Structure of the Virgo Cluster; ApJ 655, 144–162
Jordán, A.; Blakeslee, J. P.; Côté, P.; Ferrarese, L.; Infante, L.; Mei, S.; Merritt, D.; Peng, E. W.; Tonry, J. L.; West, M. J.; The ACS Fornax Cluster Survey. – I. Introduction to the Survey and Data Reduction Procedures; ApJS 169, 213–224
Sivakoff, G. R.; *Jordán, A.*; Sarazin, C. L.; Blakeslee, J. P.; Côté, P.; Ferrarese, L.; Juett, A. M.; Mei, S.; Peng, E. W.; The Low-Mass X-Ray Binary and Globular Cluster Connection in Virgo Cluster Early-Type Galaxies: Optical Properties; ApJ 660, 1246–1263
Jordán, A.; McLaughlin, D. E.; Côté, P.; Ferrarese, L.; Peng, E. W.; Mei, S.; Villegas, D.; Merritt, D.; Tonry, J. L.; West, M. J.; The ACS Virgo Cluster Survey. – XII. The Luminosity Function of Globular Clusters in Early-Type Galaxies; ApJS 171, 101–145
Hardcastle, M. J.; Kraft, R. P.; Sivakoff, G. R.; Goodger, J. L.; Croston, J. H.; *Jordán, A.*; Evans, D. A.; Worrall, D. M.; Birkinshaw, M.; Raychaudhury, S.; Brassington, N. J.; Forman, W. R.; Harris, W. E.; Jones, C.; Juett, A. M.; Murray, S. S.; Nulsen, P. E. J.; Sarazin, C. L.; Woodley, K. A.; New Results on Particle Acceleration in the Centaurus A Jet and Counterjet from a Deep Chandra Observation; ApJ 670, L81–L84
Donahue, M.; *Jordán, A.*; Baum, S. A.; Côté, P.; Ferrarese, L.; Goudfrooij, P.; Macchetto, D.; Malhotra, S.; O'Dea, C. P.; Pringle, J. E.; Rhoads, J. E.; Sparks, W. B.; Voit, G. M.; Infrared Emission from the Nearby Cool Core Cluster Abell 2597; ApJ 670, 231–236
Côté, P.; Ferrarese, L.; *Jordán, A.*; Blakeslee, J. P.; Chen, C.-W.; Infante, L.; Merritt, D.; Mei, S.; Peng, E. W.; Tonry, J. L.; West, A. A.; West, M. J.; The ACS Fornax Cluster Survey. – II. The Central Brightness Profiles of Early-Type Galaxies: A Characteristic Radius on Nuclear Scales and the Transition from Central Luminosity Deficit to Excess; ApJ 671, 1456–1465
Kainulainen, J.; Juvela, M.; Alves, J.; Determination of the mass function of extra-galactic GMCs via NIR color maps. Testing the method in a disk-like geometry; A&A 468, 581–585
Martinez, P.; Boccaletti, A.; *Kasper, M.*; Baudoz, P.; Cavarroc, C.; Optimization of apodized pupil Lyot coronagraph for ELTs; A&A 474, 671–678
Kellerer, A.; Tokovinin, A.; Atmospheric coherence times in interferometry: definition and measurement; A&A 461, 775–781
Rauch, T.; Ziegler, M.; Werner, K.; Kruk, J. W.; Oliveira, C. M.; Vande Putte, D.; Mignani, R. P.; *Kerber, F.*; High-resolution FUSE and HST ultraviolet spectroscopy of the white dwarf central star of Sh 2-216; A&A 470, 317–329
Hajduk, M.; Zijlstra, Albert A.; van Hoof, P. A. M.; Lopez, J. A.; Drew, J. E.; Evans, A.; Eyres, S. P. S.; Gesicki, K.; Greimel, R.; *Kerber, F.*; Kimeswenger, S.; Richer, M. G.; The enigma of the oldest 'nova': the central star and nebula of CK Vul; MNRAS 378, 1298–1308
Gerardy, C. L.; Meikle, W. P. S.; *Kotak, R.*; Höflich, P.; Farrah, D.; Filippenko, A. V.; Foley, R. J.; Lundqvist, P.; Mattila, S.; Pozzo, M.; Sollerman, J.; Van Dyk, S. D.; Wheeler, J. C.; Signatures of Delayed Detonation, Asymmetry, and Electron Capture in the Mid-Infrared Spectra of Supernovae 2003hv and 2005df; ApJ 661, 995–1012
Stanishev, V.; Goobar, A.; Benetti, S.; *Kotak, R.*; Pignata, G.; Navasardyan, H.; Mazzali, P.; Amanullah, R.; Garavini, G.; Nobili, S.; Qiu, Y.; Elias-Rosa, N.; Ruiz-Lapuente, P.; Mendez, J.; Meikle, P.; Patat, F.; Pastorello, A.; Altavilla, G.; Gustafsson, M.; Harutyunyan, A.; Iijima, T.; Jakobsson, P.; Kichizhieva, M. V.; Lundqvist, P.; Mattila, S.; Melinder, J.; Pavlenko, E. P.; Pavlyuk, N. N.; Sollerman, J.; Tsvetkov, D. Y.; Turatto, M.; Hillebrandt, W.; SN 2003du: 480 days in the life of a normal type Ia supernova; A&A 469, 645–661
Pastorello, A.; Taubenberger, S.; Elias-Rosa, N.; Mazzali, P. A.; Pignata, G.; Cappellaro, E.; Garavini, G.; Nobili, S.; Anupama, G. C.; Bayliss, D. D. R.; Benetti, S.; Bufano, F.; Chakradhari, N. K.; *Kotak, R.*; Goobar, A.; Navasardyan, H.; Patat, F.; Sahu, D. K.; Salvo, M.; Schmidt, B. P.; Stanishev, V.; Turatto, M.; Hillebrandt, W.; ESC observations of SN 2005cf – I. Photometric evolution of a normal Type Ia supernova; MNRAS 376, 1301–1316
Peletier, R. F.; Falcón-Barroso, J.; Bacon, R.; Cappellari, M.; Davies, R. L.; de Zeeuw, P. T.; Emsellem, E.; Ganda, K.; Krajnović, D.; *Kuntschner, H.*; McDermid, R. M.; Sarzi, M.; van de Ven, G.; The SAURON project – XI. Stellar populations from absorption-line strength maps of 24 early-type spirals; MNRAS 379, 445–468
Cappellari, M.; Emsellem, E.; Bacon, R.; Bureau, M.; Davies, R. L.; de Zeeuw, P. T.; Falcón-Barroso, J.; Krajnović, D.; *Kuntschner, H.*; McDermid, R. M.; Peletier, R. F.; Sarzi, M.; van den Bosch, R. C. E.; van de Ven, G.; The SAURON project – X. The orbital anisotropy of elliptical and lenticular galaxies: revisiting the (V/σ, ε) diagram with integral-field stellar kinematics; MNRAS 379, 418–444
Emsellem, E.; Cappellari, M.; Krajnović, D.; van de Ven, G.; Bacon, R.; Bureau, M.; Davies, R. L.; de Zeeuw, P. T.; Falcón-Barroso, J.; *Kuntschner, H.*; McDermid, R.; Peletier, R. F.; Sarzi, M.; The SAURON project – IX. A kinematic classification for early-type galaxies; MNRAS 379, 401–417

Ganda, K.; Peletier, R. F.; McDermid, R. M.; Falcón-Barroso, J.; de Zeeuw, P. T.; Bacon, R.; Cappellari, M.; Davies, R. L.; Emsellem, E.; Krajnović, D.; *Kuntschner, H.*; Sarzi, M.; van de Ven, G.; Absorption-line strengths of 18 late-type spiral galaxies observed with SAURON; MNRAS 380, 506–540
Worrall, D. M.; Birkinshaw, M.; *Laing, R. A.*; Cotton, W. D.; Bridle, A. H.; The inner jet of radio galaxy NGC 315 as observed with Chandra and the Very Large Array; MNRAS 380, 2–14
Davis, T. M.; Mörtsell, E.; Sollerman, J.; Becker, A. C.; Blondin, S.; Challis, P.; Clocchiatti, A.; Filippenko, A. V.; Foley, R. J.; Garnavich, P. M.; Jha, S.; Krisciunas, K.; Kirshner, R. P.; *Leibundgut, B.*; Li, W.; Matheson, T.; Miknaitis, G.; Pignata, G.; Rest, A.; Riess, A. G.; Schmidt, B. P.; Smith, R. C.; Spyromilio, J.; Stubbs, C. W.; Suntzeff, N. B.; Tonry, J. L.; Wood-Vasey, W. M.; Zenteno, A.; Scrutinizing Exotic Cosmological Models Using ESSENCE Supernova Data Combined with Other Cosmological Probes; ApJ 666, 716–725
Beuther, H.; *Leurini, S.*; Schilke, P.; Wyrowski, F.; Menten, K. M.; Zhang, Q.; Interferometric multi-wavelength (sub)millimeter continuum study of the young high-mass protocluster IRAS 05358+3543; A&A 466, 1065–1076
Beuther, H.; Zhang, Q.; Bergin, E. A.; Sridharan, T. K.; Hunter, T. R.; *Leurini, S.*; Dust and gas emission in the prototypical hot core G29.96–0.02 at sub-arcsecond resolution; A&A 468, 1045–1056
Leurini, S.; Beuther, H.; Schilke, P.; Wyrowski, F.; Zhang, Q.; Menten, K. M.; Multi-line (sub)millimetre observations of the high-mass proto cluster IRAS 05358+3543; A&A 475, 925–939
Melbourne, J.; Dawson, K. S.; Koo, D. C.; Max, C.; Larkin, J. E.; Wright, S. A.; Steinbring, E.; Barczys, M.; Aldering, G.; Barbary, K.; Doi, M.; Fadeyev, V.; Goldhaber, G.; Hattori, T.; Ihara, Y.; Kashikawa, N.; Konishi, K.; Kowalski, M.; Kuznetsova, N.; *Lidman, C.*; Morokuma, T.; Perlmutter, S.; Rubin, D.; Schlegel, D. J.; Spadafora, A. L.; Takanashi, N.; Yasuda, N.; Rest-Frame *R*-band Light Curve of a $z \sim 1.3$ Supernova Obtained with Keck Laser Adaptive Optics; AJ 133, 2709–2715
Alves, J.; *Lombardi, M.*; Lada, C. J.; The mass function of dense molecular cores and the origin of the IMF; A&A 462, L17–L21
Kuhlen, M.; Diemand, J.; *Madau, P.*; The Shapes, Orientation, and Alignment of Galactic Dark Matter Subhalos; ApJ 671, 1135–1146
Magliocchetti, M.; Brüggen, M.; The interplay between radio galaxies and cluster environment; MNRAS 379, 260–274
Hasinger, G.; Cappelluti, N.; Brunner, H.; Brusa, M.; Comastri, A.; Elvis, M.; Finoguenov, A.; Fiore, F.; Franceschini, A.; Gilli, R.; Griffiths, R. E.; Lehmann, I.; *Mainieri, V.*; Matt, G.; Matute, I.; Miyaji, T.; Molendi, S.; Paltani, S.; Sanders, D. B.; Scoville, N.; Tresse, L.; Urry, C. M.; Vettolani, P.; Zamorani, G.; The XMM-Newton Wide-Field Survey in the COSMOS Field. – I. Survey Description; ApJS 172, 29–37
Finoguenov, A.; Guzzo, L.; Hasinger, G.; Scoville, N. Z.; Aussel, H.; Böhringer, H.; Brusa, M.; Capak, P.; Cappelluti, N.; Comastri, A.; Giodini, S.; Griffiths, R. E.; Impey, C.; Koekemoer, A. M.; Kneib, J.-P.; Leauthaud, A.; Le Fèvre, O.; Lilly, S.; *Mainieri, V.*; Massey, R.; McCracken, H. J.; Mobasher, B.; Murayama, T.; Peacock, J. A.; Sakelliou, I.; Schinnerer, E.; Silverman, J. D.; Smolčić, V.; Taniguchi, Y.; Tasca, L.; Taylor, J. E.; Trump, J. R.; Zamorani, G.; The XMM-Newton Wide-Field Survey in the COSMOS Field: Statistical Properties of Clusters of Galaxies; ApJS 172, 182–195
Mieske, S.; Hilker, M.; Infante, L.; Mendes de Oliveira, C.; The early-type dwarf galaxy population of the Fornax cluster; A&A 463, 503–512
Mieske, S.; Baumgardt, H.; On the efficiency of field star capture by star clusters; A&A 475, 851–857
Combi, J. A.; Bronfman, L.; *Mirabel, I. F.*; New evidence on the origin of the microquasar GRO J1655–40; A&A 467, 597–602
Dhawan, V.; *Mirabel, I. F.*; Ribó, M.; Rodrigues, I.; Kinematics of Black Hole X-Ray Binary GRS 1915+105; ApJ 668, 430–434
Mora, M. D.; Larsen, S. S.; Kissler-Patig, M.; Imaging of star clusters in unperturbed spiral galaxies with the Advanced Camera for Surveys. – I. The low luminosity galaxy NGC 45; A&A 464, 495–505
Nilsson, K. K.; Orsi, A.; Lacey, C. G.; Baugh, C. M.; Thommes, E.; Narrow-band surveys for very high redshift Lyman-α emitters; A&A 474, 385–392
Ptak, A.; Mobasher, B.; Hornschemeier, A.; Bauer, F.; *Norman, C.*; X-Ray Luminosity Functions of Normal Galaxies in the Great Observatories Origins Deep Survey; ApJ 667, 826–858
Weidner, C.; Kroupa, P.; *Nürnberger, D. E. A.*; Sterzik, M. F.; On the infant weight loss of low- to intermediate-mass star clusters; MNRAS 376, 1879–1885
Shepherd, D. S.; Povich, M. S.; Whitney, B. A.; Robitaille, T. P.; *Nürnberger, D. E. A.*; Bronfman, L.; Stark, D. P.; Indebetouw, R.; Meade, M. R.; Babler, B. L.; Molecular Outflows and a Mid-Infrared Census of the Massive Star Formation Region Associated with IRAS 18507+0121; ApJ 669, 464–482
Larsson, B.; Liseau, R.; Pagani, L.; Bergman, P.; Bernath, P.; Biver, N.; Black, J. H.; Booth, R. S.; Buat, V.; Crovisier, J.; Curry, C. L.; Dahlgren, M.; Encrenaz, P. J.; Falgarone, E.; Feldman, P. A.; Fich, M.; Florén, H. G.; Fredrixon, M.; Frisk, U.; Gahm, G. F.; Gerin, M.; Hagström, M.; Harju, J.; Hasegawa, T.; Hjalmarson, Å.; Johansson, L. E. B.; Justtanont, K.; Klotz, A.; Kyrölä, E.; Kwok, S.; Lecacheux, A.; Liljeström, T.; Llewellyn, E. J.; Lundin, S.; Mégie, G.; Mitchell, G. F.; Murtagh, D.; Nordh, L. H.; *Nyman, L.-Å.*; Olberg, M.; Olofsson, A. O. H.; Olofsson, G.; Olofsson, H.; Persson, G.; Plume, R.; Rickman, H.; Ristorcelli, I.; Rydbeck, G.; Sandqvist, A. A.; Schéele, F. V.; Serra, G.; Torchinsky, S.; Tothill, N. F.; Volk, K.; Wiklind, T.; Wilson, C. D.; Winnberg, A.; Witt, G.; Molecular oxygen in the ρ Ophiuchi cloud; A&A 466, 999–1003
Tafoya, D.; Gómez, Y.; Anglada, G.; Loinard, L.; Torrelles, J. M.; Miranda, L. F.; Osorio, M.; Franco-Hernández, R.; *Nyman, L.-Å.*; Nakashima, J.; Deguchi, S.; Detection of HCO^+ Emission toward the Planetary Nebula K3-35; AJ 133, 364–369
Dhillon, V. S.; Marsh, T. R.; Stevenson, M. J.; Atkinson, D. C.; Kerry, P.; Peacocke, P. T.; Vick, A. J. A.; Beard, S. M.; Ives, D. J.; Lunney, D. W.; McLay, S. A.; Tierney, C. J.; Kelly, J.; Littlefair, S. P.; Nicholson, R.; Pashley, R.; Harlaftis, E. T.; *O'Brien, K.*; ULTRACAM: an ultrafast, triple-beam CCD camera for high-speed astrophysics; MNRAS 378, 825–840
Giommi, P.; Massaro, E.; *Padovani, P.*; Perri, M.; Cavazzuti, E.; Turriziani, S.; Tosti, G.; Colafrancesco, S.; Tagliaferri, G.; Chincarini, G.; Burrows, D. N.; McMath Chester, M.; Gehrels, N.; ROXA J081009.9+384757.0: a 10^{47} erg s^{-1} blazar with hard X-ray synchrotron peak or a new type of radio loud AGN?; A&A 468, 97–101
Parker, L. C.; Hoekstra, H.; Hudson, M. J.; van Waerbeke, L.; Mellier, Y.; The Masses and Shapes of Dark Matter Halos from Galaxy-Galaxy Lensing in the CFHT Legacy Survey; ApJ 669, 21–31
Murphy, M. T.; Udem, T.; Holzwarth, R.; Sizmann, A.; *Pasquini, L.*; Araujo-Hauck, C.; Dekker, H.; D'Odorico, S.; Fischer, M.; Hänsch, T. W.; Manescau, A.; High-precision wavelength calibration of astronomical spectrographs with laser frequency combs; MNRAS 380, 839–847
Pasquini, L.; Döllinger, M. P.; Weiss, A.; Girardi, L.; Chavero, C.; Hatzes, A. P.; da Silva, L.; Setiawan, J.; Evolved stars suggest an external origin of the enhanced metallicity in planet-hosting stars; A&A 473, 979–982
Simon, J. D.; Gal-Yam, A.; Penprase, B. E.; Li, W.; Quimby, R. M.; Silverman, J. M.; Prieto, C. A.; Wheeler, J. C.; Filippenko, A. V.; Martinez, I. T.; Beeler, D. J.; *Patat, F.*; Constraints on Circumstellar Material around the Type Ia Supernova 2007af; ApJ 671, L25–L28
Khare, P.; Kulkarni, V. P.; *Péroux, C.*; York, D. G.; Lauroesch, J. T.; Meiring, J. D.; The nature of damped Lyman α and sub-damped Lyman α absorbers; A&A 464, 487–493
Meiring, J. D.; Lauroesch, J. T.; Kulkarni, V. P.; *Péroux, C.*; Khare, P.; York, D. G.; Crotts, A. P. S.; New abundance determinations in $z < 1.5$ QSO absorbers: seven sub-DLAs and one DLA; MNRAS 376, 557–572
Kulkarni, V. P.; Khare, P.; *Péroux, C.*; York, D. G.; Lauroesch, J. T.; Meiring, J. D.; The Role of Sub-Damped Lyα Absorbers in the Cosmic Evolution of Metals; ApJ 661, 88–94
Bouché, N.; Lehnert, M. D.; Aguirre, A.; *Péroux, C.*; Bergeron, J.; The missing metals problem – III. How many metals are expelled from galaxies?; MNRAS 378, 525–540

Popesso, P.; Biviano, A.; Böhringer, H.; Romaniello, M.; RASS-SDSS galaxy cluster survey. – VII. On the cluster mass-to-light ratio and the halo occupation distribution; A&A 464, 451–464
Elbaz, D.; Daddi, E.; Le Borgne, D.; Dickinson, M.; Alexander, D. M.; Chary, R.-R.; Starck, J.-L.; Brandt, W. N.; Kitzbichler, M.; MacDonald, E.; Nonino, M.; *Popesso, P.*; Stern, D.; Vanzella, E.; The reversal of the star formation-density relation in the distant universe; A&A 468, 33–48
Popesso, P.; Biviano, A.; Romaniello, M.; Böhringer, H.; RASS-SDSS galaxy cluster survey. – VI. The dependence of the cluster SFR on the cluster global properties; A&A 461, 411–421
Popesso, P.; Biviano, A.; Böhringer, H.; Romaniello, M.; RASS-SDSS galaxy cluster survey. – V. The X-ray-underluminous Abell clusters; A&A 461, 397–410
Krips, M.; Eckart, A.; Krichbaum, T. P.; *Pott, J.-U.*; Leon, S.; Neri, R.; García-Burillo, S.; Combes, F.; Boone, F.; Baker, A. J.; Tacconi, L. J.; Schinnerer, E.; Hunt, L. K.; NUclei of GAlaxies. – V. Radio emission in 7 NUGA sources; A&A 464, 553–563
Randall, S. K.; Green, E. M.; van Grootel, V.; Fontaine, G.; Charpinet, S.; Lesser, M.; Brassard, P.; Sugimoto, T.; Chayer, P.; Fay, A.; Wroblewski, P.; Daniel, M.; Story, S.; Fitzgerald, T.; Observations and asteroseismic analysis of the rapidly pulsating hot B subdwarf PG 0911+456; A&A 476, 1317–1329
Petrov, R. G.; Malbet, F.; Weigelt, G.; Antonelli, P.; Beckmann, U.; Bresson, Y.; Chelli, A.; Dugué, M.; Duvert, G.; Gennari, S.; Glück, L.; Kern, P.; Lagarde, S.; Le Coarer, E.; Lisi, F.; Millour, F.; Perraut, K.; Puget, P.; *Rantakyrö, F.*; Robbe-Dubois, S.; Roussel, A.; Salinari, P.; Tatulli, E.; Zins, G.; Accardo, M.; Acke, B.; Agabi, K.; Altariba, E.; Arezki, B.; Aristidi, E.; Baffa, C.; Behrend, J.; Blöcker, T.; Bonhomme, S.; Busoni, S.; Cassaing, F.; Clausse, J.-M.; Colin, J.; Connot, C.; Delboulbé, A.; Domiciano de Souza, A.; Driebe, T.; Feautrier, P.; Ferruzzi, D.; Forveille, T.; Fossat, E.; Foy, R.; Fraix-Burnet, D.; Gallardo, A.; Giani, E.; Gil, C.; Glentzlin, A.; Heiden, M.; Heininger, M.; Hernandez Utrera, O.; Hofmann, K.-H.; Kamm, D.; Kiekebusch, M.; Kraus, S.; Le Contel, D.; Le Contel, J.-M.; Lesourd, T.; Lopez, B.; Lopez, M.; Magnard, Y.; Marconi, A.; Mars, G.; Martinot-Lagarde, G.; Mathias, P.; Mège, P.; Monin, J.-L.; Mouillet, D.; Mourard, D.; Nussbaum, E.; Ohnaka, K.; Pacheco, J.; Perrier, C.; Rabbia, Y.; Rebattu, S.; Reynaud, F.; Richichi, A.; Robini, A.; Sacchettini, M.; Schertl, D.; Schöller, M.; Solscheid, W.; Spang, A.; Stee, P.; Stefanini, P.; Tallon, M.; Tallon-Bosc, I.; Tasso, D.; Testi, L.; Vakili, F.; von der Lühe, O.; Valtier, J.-C.; Vannier, M.; Ventura, N.; AMBER, the near-infrared spectro-interferometric three-telescope VLTI instrument; A&A 464, 1–12
Dünner, R.; *Reisenegger, A.*; Meza, A.; Araya, P. A.; Quintana, H.; Redshift-space limits of bound structures; MNRAS 376, 1577–1587
Soto, M.; Minniti, D.; *Rejkuba, M.*; Spectroscopic and light curve characterization of bulge microlensing events; A&A 466, 157–164
Mouhcine, M.; *Rejkuba, M.*; Ibata, R.; The stellar halo of the edge-on galaxy NGC 891; MNRAS 381, 873–880
Scoville, N.; Abraham, R. G.; Aussel, H.; Barnes, J. E.; Benson, A.; Blain, A. W.; Calzetti, D.; Comastri, A.; Capak, P.; Carilli, C.; Carlstrom, J. E.; Carollo, C. M.; Colbert, J.; Daddi, E.; Ellis, R. S.; Elvis, M.; Ewald, S. P.; Fall, M.; Franceschini, A.; Giavalisco, M.; Green, W.; Griffiths, R. E.; Guzzo, L.; Hasinger, G.; Impey, C.; Kneib, J.-P.; Koda, J.; Koekemoer, A.; Lefevre, O.; Lilly, S.; Liu, C. T.; McCracken, H. J.; Massey, R.; Mellier, Y.; Miyazaki, S.; Mobasher, B.; Mould, J.; Norman, C.; Refregier, A.; *Renzini, A.*; Rhodes, J.; Rich, M.; Sanders, D. B.; Schiminovich, D.; Schinnerer, E.; Scodeggio, M.; Sheth, K.; Shopbell, P. L.; Taniguchi, Y.; Tyson, N. D.; Urry, C. M.; Van Waerbeke, L.; Vettolani, P.; White, S. D. M.; Yan, L.; COSMOS: Hubble Space Telescope Observations; ApJS 172, 38–45
Taniguchi, Y.; Scoville, N.; Murayama, T.; Sanders, D. B.; Mobasher, B.; Aussel, H.; Capak, P.; Ajiki, M.; Miyazaki, S.; Komiyama, Y.; Shioya, Y.; Nagao, T.; Sasaki, S. S.; Koda, J.; Carilli, C.; Giavalisco, M.; Guzzo, L.; Hasinger, G.; Impey, C.; LeFevre, O.; Lilly, S.; *Renzini, A.*; Rich, M.; Schinnerer, E.; Shopbell, P.; Kaifu, N.; Karoji, H.; Arimoto, N.; Okamura, S.; Ohta, K.; The Cosmic Evolution Survey (COSMOS): Subaru Observations of the HST Cosmos Field; ApJS 172, 9–28
Capak, P.; Aussel, H.; Ajiki, M.; McCracken, H. J.; Mobasher, B.; Scoville, N.; Shopbell, P.; Taniguchi, Y.; Thompson, D.; Tribiano, S.; Sasaki, S.; Blain, A. W.; Brusa, M.; Carilli, C.; Comastri, A.; Carollo, C. M.; Cassata, P.; Colbert, J.; Ellis, R. S.; Elvis, M.; Giavalisco, M.; Green, W.; Guzzo, L.; Hasinger, G.; Ilbert, O.; Impey, C.; Jahnke, K.; Kartaltepe, J.; Kneib, J.-P.; Koda, J.; Koekemoer, A.; Komiyama, Y.; Leauthaud, A.; Lefevre, O.; Lilly, S.; Liu, C.; Massey, R.; Miyazaki, S.; Murayama, T.; Nagao, T.; Peacock, J. A.; Pickles, A.; Porciani, C.; *Renzini, A.*; Rhodes, J.; Rich, M.; Salvato, M.; Sanders, D. B.; Scarlata, C.; Schiminovich, D.; Schinnerer, E.; Scodeggio, M.; Sheth, K.; Shioya, Y.; Tasca, L. A. M.; Taylor, J. E.; Yan, L.; Zamorani, G.; The First Release COSMOS Optical and Near-IR Data and Catalog; ApJS 172, 99–116
Sasaki, S. S.; Taniguchi, Y.; Scoville, N.; Mobasher, B.; Aussel, H.; Sanders, D. B.; Koekemoer, A.; Ajiki, M.; Komiyama, Y.; Miyazaki, S.; Kaifu, N.; Karoji, H.; Okamura, S.; Arimoto, N.; Ohta, K.; Shioya, Y.; Murayama, T.; Nagao, T.; Koda, J.; Hainline, L.; *Renzini, A.*; Giavalisco, M.; Le Fèvre, O.; Impey, C.; Elvis, M.; Lilly, S.; Rich, M.; Schinnerer, E.; Sheth, K.; A Potential Galaxy Threshing System in the COSMOS Field; ApJS 172, 511–517
Busso, G.; Cassisi, S.; Piotto, G.; Castellani, M.; *Romaniello, M.*; Catelan, M.; Djorgovski, S. G.; Recio Blanco, A.; Renzini, A.; Rich, M. R.; Sweigart, A. V.; Zoccali, M.; The peculiar horizontal branch morphology of the Galactic globular clusters NGC 6388 and NGC 6441: new insights from UV observations; A&A 474, 105–119
Wang, J. X.; Jiang, P.; Zheng, Z. Y.; Tozzi, P.; Norman, C.; Giacconi, R.; Gilli, R.; Hasinger, G.; Kewley, L.; Mainieri, V.; Nonino, M.; *Rosati, P.*; Streblyanska, A.; Szokoly, G.; Zirm, A.; Zheng, W.; Most Hard-X-Ray-Selected Quasars in the Chandra Deep Fields are Obscured; ApJ 657, 95–101
De Propris, R.; Stanford, S. A.; Eisenhardt, P. R.; Holden, Brad P.; *Rosati, P.*; The Rest-Frame *K*-Band Luminosity Function of Galaxies in Clusters to $z = 1.3$; AJ 133, 2209–2215
Böhringer, H.; Schuecker, P.; Pratt, G. W.; Arnaud, M.; Ponman, T. J.; Croston, J. H.; Borgani, S.; Bower, R. G.; Briel, U. G.; Collins, C. A.; Donahue, M.; Forman, W. R.; Finoguenov, A.; Geller, M. J.; Guzzo, L.; Henry, J. P.; Kneissl, R.; Mohr, J. J.; Matsushita, K.; Mullis, C. R.; Ohashi, T.; Pedersen, K.; Pierini, D.; Quintana, H.; Raychaudhury, S.; Reiprich, T. H.; Romer, A. K.; *Rosati, P.*; Sabirli, K.; Temple, R. F.; Viana, P. T. P.; Vikhlinin, A.; Voit, G. M.; Zhang, Y.-Y.; The representative XMM-Newton cluster structure survey (REXCESS) of an X-ray luminosity selected galaxy cluster sample; A&A 469, 363–377
Gouliermis, D. A.; Henning, T.; Brandner, W.; Dolphin, A. E.; *Rosa, M.*; Brandl, B.; Discovery of the Pre-Main-Sequence Population of the Stellar Association LH 95 in the Large Magellanic Cloud with Hubble Space Telescope Advanced Camera for Surveys Observations; ApJ 665, L27–L30
Rzepecki, J.; Lombardi, M.; Rosati, P.; Bignamini, A.; Tozzi, P.; Strong lensing analysis of the cluster RCS0224-0002 at $z = 0.77$; A&A 471, 743–752
Sana, H.; Rauw, G.; Sung, H.; Gosset, E.; Vreux, J.-M.; An XMM-Newton view of the young open cluster NGC 6231 – III. Optically faint X-ray sources; MNRAS 377, 945–956
De Becker, M.; Rauw, G.; Pittard, J. M.; *Sana, H.*; Stevens, I. R.; Romero, G. E.; INTEGRAL-ISGRI observations of the Cygnus OB2 region. Searching for hard X-ray point sources in a region containing several non-thermal emitting massive stars; A&A 472, 905–910
Leon, S.; Eckart, A.; Laine, S.; Kotilainen, J. K.; Schinnerer, E.; Lee, S.-W.; Krips, M.; Reunanen, J.; *Scharwächter, J.*; Nuclear starburst-driven evolution of the central region in NGC 6764; A&A 473, 747–759
Siebenmorgen, R.; Krügel, E.; Dust in starburst nuclei and ULIRGs. SED models for observers; A&A 461, 445–453
Stanke, T.; Williams, J. P.; Molecular CO Outflows in the L1641-N Cluster: Kneading a Cloud Core; AJ 133, 1307–1320

Molinari, E.; Vergani, S. D.; Malesani, D.; Covino, S.; D'Avanzo, P.; Chincarini, G.; Zerbi, F. M.; Antonelli, L. A.; Conconi, P.; Testa, V.; Tosti, G.; Vitali, F.; D'Alessio, F.; Malaspina, G.; Nicastro, L.; Palazzi, E.; Guetta, D.; Campana, S.; Goldoni, P.; Masetti, N.; Meurs, E. J. A.; Monfardini, A.; Norci, L.; Pian, E.; Piranomonte, S.; Rizzuto, D.; *Stefanon, M.*; Stella, L.; Tagliaferri, G.; Ward, P. A.; Ihle, G.; Gonzalez, L.; Pizarro, A.; Sinclaire, P.; Valenzuela, J.; REM observations of GRB 060418 and GRB 060607A: the onset of the afterglow and the initial fireball Lorentz factor determination; A&A 469, L13–L16

Tanaka, M.; Hoshi, T.; Kodama, T.; Kashikawa, N.; A huge filamentary structure at $z = 0.55$ and star formation histories of galaxies at $z < 1$; MNRAS 379, 1546–1556

Koyama, Y.; Kodama, T.; *Tanaka, M.*; Shimasaku, K.; Okamura, S.; Dependence of the build-up of the colour-magnitude relation on cluster richness at $z \sim 0.8$; MNRAS 382, 1719–1728

Vig, S.; *Testi, L.*; Walmsley, M.; Molinari, S.; Carey, S.; Noriega-Crespo, A.; IRAS 18511+0146: a proto Herbig Ae/Be cluster?; A&A 470, 977–989

Zirm, A. W.; van der Wel, A.; Franx, M.; Labbé, I.; Trujillo, I.; van Dokkum, P.; *Toft, S.*; Daddi, E.; Rudnick, G.; Rix, H.-W.; Röttgering, H. J. A.; van der Werf, P.; NICMOS Imaging of DRGs in the HDF-S: A Relation between Star Formation and Size at $z \sim 2.5$; ApJ 656, 66–72

Quadri, R.; Marchesini, D.; van Dokkum, P.; Gawiser, E.; Franx, M.; Lira, P.; Rudnick, G.; Urry, C. M.; Maza, J.; Kriek, M.; Barrientos, L. F.; Blanc, G. A.; Castander, F. J.; Christlein, D.; Coppi, P. S.; Hall, P. B.; Herrera, D.; Infante, L.; Taylor, E. N.; *Treister, E.*; Willis, J. P.; The Multiwavelength Survey by Yale-Chile (MUSYC): Deep Near-Infrared Imaging and the Selection of Distant Galaxies; AJ 134, 1103–1117

Gronwall, C.; Ciardullo, R.; Hickey, T.; Gawiser, E.; Feldmeier, J. J.; van Dokkum, P. G.; Urry, C. M.; Herrera, D.; Lehmer, B. D.; Infante, L.; Orsi, A.; Marchesini, D.; Blanc, G. A.; Francke, H.; Lira, P.; *Treister, E.*; Lyα Emission-Line Galaxies at $z = 3.1$ in the Extended Chandra Deep Field-South; ApJ 667, 79–91

Gawiser, E.; Francke, H.; Lai, K.; Schawinski, K.; Gronwall, C.; Ciardullo, R.; Quadri, R.; Orsi, A.; Barrientos, L. F.; Blanc, G. A.; Fazio, G.; Feldmeier, J. J.; Huang, J.-s.; Infante, L.; Lira, P.; Padilla, N.; Taylor, E. N.; *Treister, E.*; Urry, C. M.; van Dokkum, P. G.; Virani, S. N.; Lyα-Emitting Galaxies at $z = 3.1$: L Progenitors Experiencing Rapid Star Formation; ApJ 671, 278–284

Pastorello, A.; Smartt, S. J.; Mattila, S.; Eldridge, J. J.; Young, D.; Itagaki, K.; Yamaoka, H.; Navasardyan, H.; *Valenti, S.*; Patat, F.; Agnoletto, I.; Augusteijn, T.; Benetti, S.; Cappellaro, E.; Boles, T.; Bonnet-Bidaud, J.-M.; Botticella, M. T.; Bufano, F.; Cao, C.; Deng, J.; Dennefeld, M.; Elias-Rosa, N.; Harutyunyan, A.; Keenan, F. P.; Iijima, T.; Lorenzi, V.; Mazzali, P. A.; Meng, X.; Nakano, S.; Nielsen, T. B.; Smoker, J. V.; Stanishev, V.; Turatto, M.; Xu, D.; Zampieri, L.; A giant outburst two years before the core-collapse of a massive star; Natur 447, 829–832

Rich, R. M.; Origlia, L.; *Valenti, E.*; The First Detailed Abundances for M Giants in the Inner Bulge from Infrared Spectroscopy; ApJ 665, L119–L122

Robbe-Dubois, S.; Lagarde, S.; Petrov, R. G.; Lisi, F.; Beckmann, U.; Antonelli, P.; Bresson, Y.; Martinot-Lagarde, G.; Roussel, A.; Salinari, P.; *Vannier, M.*; Chelli, A.; Dugué, M.; Duvert, G.; Gennari, S.; Glück, L.; Kern, P.; Le Coarer, E.; Malbet, F.; Millour, F.; Perraut, K.; Puget, P.; Rantakyrö, F.; Tatulli, E.; Weigelt, G.; Zins, G.; Accardo, M.; Acke, B.; Agabi, K.; Altariba, E.; Arezki, B.; Aristidi, E.; Baffa, C.; Behrend, J.; Blöcker, T.; Bonhomme, S.; Busoni, S.; Cassaing, F.; Clausse, J.-M.; Colin, J.; Connot, C.; Delage, L.; Delboulbé, A.; Domiciano de Souza, A.; Driebe, T.; Feautrier, P.; Ferruzzi, D.; Forveille, T.; Fossat, E.; Foy, R.; Fraix-Burnet, D.; Gallardo, A.; Giani, E.; Gil, C.; Glentzlin, A.; Heiden, M.; Heininger, M.; Hernandez Utrera, O.; Hofmann, K.-H.; Kamm, D.; Kiekebusch, M.; Kraus, S.; Le Contel, D.; Le Contel, J.-M.; Lesourd, T.; Lopez, B.; Lopez, M.; Magnard, Y.; Marconi, A.; Mars, G.; Mathias, P.; Mège, P.; Monin, J.-L.; Mouillet, D.; Mourard, D.; Nussbaum, E.; Ohnaka, K.; Pacheco, J.; Perrier, C.; Rabbia, Y.; Rebattu, S.; Reynaud, F.; Richichi, A.; Robini, A.; Sacchettini, M.; Schertl, D.; Schöller, M.; Solscheid, W.; Spang, A.; Stee, P.; Stefanini, P.; Tallon, M.; Tallon-Bosc, I.; Tasso, D.; Testi, L.; Vakili, F.; von der Lühe, O.; Valtier, J.-C.; Ventura, N.; Optical configuration and analysis of the AMBER/VLTI instrument; A&A 464, 13–27

Tatulli, E.; Millour, F.; Chelli, A.; Duvert, G.; Acke, B.; Hernandez Utrera, O.; Hofmann, K.-H.; Kraus, S.; Malbet, F.; Mège, P.; Petrov, R. G.; *Vannier, M.*; Zins, G.; Antonelli, P.; Beckmann, U.; Bresson, Y.; Dugué, M.; Gennari, S.; Glück, L.; Kern, P.; Lagarde, S.; Le Coarer, E.; Lisi, F.; Perraut, K.; Puget, P.; Rantakyrö, F.; Robbe-Dubois, S.; Roussel, A.; Weigelt, G.; Accardo, M.; Agabi, K.; Altariba, E.; Arezki, B.; Aristidi, E.; Baffa, C.; Behrend, J.; Blöcker, T.; Bonhomme, S.; Busoni, S.; Cassaing, F.; Clausse, J.-M.; Colin, J.; Connot, C.; Delboulbé, A.; Domiciano de Souza, A.; Driebe, T.; Feautrier, P.; Ferruzzi, D.; Forveille, T.; Fossat, E.; Foy, R.; Fraix-Burnet, D.; Gallardo, A.; Giani, E.; Gil, C.; Glentzlin, A.; Heiden, M.; Heininger, M.; Kamm, D.; Kiekebusch, M.; Le Contel, D.; Le Contel, J.-M.; Lesourd, T.; Lopez, B.; Lopez, M.; Magnard, Y.; Marconi, A.; Mars, G.; Martinot-Lagarde, G.; Mathias, P.; Monin, J.-L.; Mouillet, D.; Mourard, D.; Nussbaum, E.; Ohnaka, K.; Pacheco, J.; Perrier, C.; Rabbia, Y.; Rebattu, S.; Reynaud, F.; Richichi, A.; Robini, A.; Sacchettini, M.; Schertl, D.; Schöller, M.; Solscheid, W.; Spang, A.; Stee, P.; Stefanini, P.; Tallon, M.; Tallon-Bosc, I.; Tasso, D.; Testi, L.; Vakili, F.; von der Lühe, O.; Valtier, J.-C.; Ventura, N.; Interferometric data reduction with AMBER/VLTI. Principle, estimators, and illustration; A&A 464, 29–42

Meurer, G. R.; Tsvetanov, Z. I.; Gronwall, C.; Capak, P.; Blakeslee, J. P.; Benítez, N.; Ford, H. C.; Illingworth, G. D.; Bradley, L. D.; Pirzkal, N.; *Walsh, J.*; Bouwens, R. J.; Srinivasan, S.; Automated Selection and Characterization of Emission-Line Sources in Advanced Camera for Surveys Wide Field Camera Grism Data; AJ 134, 77–95

Bania, T. M.; Balser, D. S.; Rood, R. T.; *Wilson, T. L.*; LaRocque, Jennifer M.; ^{3}He in the Milky Way Interstellar Medium: Ionization Structure; ApJ 664, 915–927

Wold, M.; Brotherton, M. S.; Shang, Z.; The dependence of quasar variability on black hole mass; MNRAS 375, 989–999

de Diego, J. A.; Binette, L.; Ogle, P.; Andersen, A. C.; Haro-Corzo, S.; *Wold, M.*; Quasar 3C 298: a test-case for meteoritic nanodiamond 3.5 μm emission; A&A 467, L7–L10

Wold, M.; Lacy, M.; Armus, L.; The influence of AGN nuclear parameters on the FRI/FRII dichotomy; A&A 470, 531–538

Meyer, M. J.; *Zwaan, M. A.*; Webster, R. L.; Brown, M. J. I.; Staveley-Smith, L.; The Weak Clustering of Gas-rich Galaxies; ApJ 654, 702–713

Oey, M. S.; Meurer, G. R.; Yelda, S.; Furst, E. J.; Caballero-Nieves, S. M.; Hanish, D. J.; Levesque, E. M.; Thilker, D. A.; Walth, G. L.; Bland-Hawthorn, J.; Dopita, M. A.; Ferguson, H. C.; Heckman, T. M.; Doyle, M. T.; Drinkwater, M. J.; Freeman, K. C.; Kennicutt, R. C., Jr.; Kilborn, V. A.; Knezek, P. M.; Koribalski, B.; Meyer, M.; Putman, M. E.; Ryan-Weber, E. V.; Smith, R. C.; Staveley-Smith, L.; Webster, R. L.; Werk, J.; *Zwaan, M. A.*; The Survey for Ionization in Neutral Gas Galaxies. – III. Diffuse, Warm Ionized Medium and Escape of Ionizing Radiation; ApJ 661, 801–814

ESO Europe

Headquarters
Karl-Schwarzschild-Straße 2
85748 Garching bei München
Germany
Phone +49 89 320 06-0
Fax +49 89 320 23 62
www.eso.org

ESO Chile

Santiago Office
Alonso de Córdova 3107
Vitacura
Casilla 19001
Santiago de Chile 19
Chile
Phone +56 2 463 31 00
Fax +56 2 463 31 01

La Silla Paranal Observatory
La Silla Site
IV Región
Chile
Phone +56 2 464 41 00
Fax +56 2 464 41 01

La Silla Paranal Observatory
Paranal Site
II Región
Chile
Phone +56 55 43 51 00
Fax +56 55 43 51 01

APEX Radio Observatory
Séquitor
II Región
Chile
Phone +56 55 44 82 00
Fax +56 55 44 82 21

La Serena Office
Avenida El Santo 1538
Casilla 567
La Serena
Chile
Phone +56 51 22 53 87
Fax +56 51 21 5175

Guest House
Rey Gustavo Adolfo 4634
Las Condes
Santiago de Chile
Chile
Phone +56 2 208 42 54
Fax +56 2 228 93 33

Antofagasta Office
Avenida Balmaceda 2536
Office 504
Edificio 'Don Guillermo'
Antofagasta
Chile
Phone +56 55 26 00 32
Fax +56 55 26 00 81

ESO is a partner in the international ALMA project

ALMA Office Santiago
El Golf 40, Piso 18
Las Condes
Santiago de Chile
Chile
Phone +56 2 467 61 00
Fax +56 2 467 61 01

ALMA Office San Pedro de Atacama
Kilómetro 121 CH 23
II Región
Chile
Phone +56 55 44 84 16
Fax +56 55 44 84 81

Front cover: The extended tail of Comet McNaught was captured at Paranal by Hans Hermann Heyer on the evening of 18 January 2007. In the foreground, one can distinguish one of the VLT Unit Telescope and two Auxiliary Telescopes.

Back cover: A 30-min VLT/NACO *K*-band exposure has been combined with archive HST/ACS *B*- and *I*-band images to produce a three-colour image of the 'Bird' interacting galaxy system. The NACO image has allowed Finnish astronomer Petri Väisänen and his colleagues to identify, in addition to the two previously known galaxies, a third, clearly separate component, an irregular, yet fairly massive galaxy that seems to form stars at a frantic rate.

Produced by the
Public Affairs Department

ISSN 0531-4496