# ESO 50th Anniversary Gala Dinner

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To formally mark the 50th anniversary of the signing of the ESO Convention, a gala dinner was held in the Munich Residenz. A brief report of the event is presented and the speeches are reproduced. The speakers were the President of the Council. Xavier Barcons: the German Minister for Education and Research, Prof. Dr Annette Schavan; the Bavarian State Minister for Science, Research and the Arts, Dr Wolfgang Heubisch; physics Nobel Laureate, Brian Schmidt; the current Director General, Tim de Zeeuw and the Chilean Minister of Foreign Affairs, Alfredo Moreno Charme.

The signing of the ESO Convention by the five founding members, Belgium, France, Germany, the Netherlands and Sweden, took place on 5 October 1962. The anniversary day itself was marked by a press release and an image of the Wolf–Rayet nebula NGC 2359 taken with FORS2. The nebula was observed by Brigitte Bailleul, a French freelance aerospace writer and journalist, who, as prize winner of an ESO competition, became the first member of the public to observe at Paranal.

The anniversary gala event was held the following week, on Thursday 11 October 2012, in the Kaisersaal of the Munich Residenz, seat of the former kings of Bavaria in the centre of Munich. The Residenz dates back to the beginning of the 16th century and the Kaisersaal was first built in the 17th century as a large entertainment room.

Eighteen months in the planning, the gala was an impressive occasion that managed to capture both the warmth and spirit of ESO, celebrating not only the history of the organisation but also those who have contributed to its present success. The guests represented four decades of ESO history, including three former Directors General: Lo Woltjer (1975–1987), Harry van der Laan (1988– 1992) and Catherine Cesarsky (1999– 2007) and current senior representatives



Figure 1. (Top) Guests seated in the Kaisersaal of the Munich Residenz.

Figure 2. (Bottom) The fellows and students together with Tim de Zeeuw.



from all the Member States, Brazil and Chile. Many former and present members of ESO committees also attended, together with prominent retired staff, former senior staff members and a selection of the current staff from Garching. ESO Fellows and Students, acting as guides, represented the current and future generation of astronomers.

# Welcomes

A welcome cocktail and canapés gave everyone a chance to catch up with

old friends and colleagues before they took their seats and the compère for the evening, Jochen Liske (Dr J) outlined the order of proceedings. The current President of the Council, Xavier Barcons, welcomed the guests. He stressed the four ingredients of ESO: astronomy, courage, cooperation and excellence. Courage was shown by the visionary astronomers from those five founding states and later by others of the remaining nine that have since followed. Cooperation is one of the pillars that have enabled these valiant astronomical ventures both within Europe and with Chile. Excellence in technology, the telescopes and instruments built within the Member States and the competitive science produced by the telescopes have distinguished ESO and are reflected by the excellence of its staff. The next step in the development of ESO will be the building of the planned European Extremely Large Telescope (E-ELT) for which funding is being secured by the Member States.

The opening was followed by a welcome speech by the Headquarters' host and Member State, Germany, presented by the Federal Minister for Education and Research, Professor Annette Schavan. She congratulated ESO on its many achievements and expressed her pride that Germany could play a special role by hosting ESO's Headquarters. Prof. Schavan recently visited the Paranal Observatory and had been deeply impressed by the VLT operations. She emphasised the dual roles of science and technology that were central to ESO's success and for the extension of the European research area as outlined in the Horizon 2020 programme.

The address by the host state of Bavaria was given by Dr Wolfgang Heubisch, the State Minister for Science, Research and the Arts. He welcomed the attendees to Munich and praised the fine images that ESO produces. He emphasised that success lies in the combination of world-class technology and excellent scientists and that Bavaria has developed a range of facilities to make it into a world location for such activities. He closed by encouraging visitors to come again to Munich to celebrate its many treasures, including the Oktoberfest.

# Speech by a young astronomer

After a first course had been served, there was a short video of ESO facilities followed by a presentation by Nadine Neumayer, staff astronomer in the User Support Department. She described her travels on the long road to fulfilling her dream of becoming an astronomer. Entitled "Reaching for the Stars", she related childhood memories of lying out under the stars in her home in Baden-Württemberg looking up at the sky. She particularly remembers the release of the



Figure 3. Xavier Barcons giving his welcome address.

Figure 4. Annette

welcome remarks.

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Hubble Deep Field taken by the Hubble Space Telescope of a tiny region in the constellation of Ursa Majoris in December 1995 as being a defining moment. After unsuccessfully trying for an internship at ESO while still at school, she visited the observatory at La Silla when travelling through Chile after finishing school. She studied at Heidelberg University and the University of Cambridge and received her PhD from the Max-Planck-Institute for Astronomy in Heidelberg. Her thesis topic was the study of the black hole in the nearby galaxy Centaurus A and its influence on the elliptical host galaxy NGC 5128. She took the data for this study at the ESO Very Large Telescope. Nadine, a Fellow at ESO before becoming a staff member, is also the mother of three children and her first child was born during her PhD years. She described how challenging this combination was. She praised the support of her family and colleagues and the assistance she received through organised childcare,

from employers, and especially by the Christiane Nüsslein-Volhard-Foundation. Nadine ended her presentation by emphasising how important it was to feel the trust of the people around her, and appealed to the audience to give their

support and trust to students and col-

leagues facing challenging situations.

# Keynote speeches

After the main course had been served, Brian Schmidt who, with Saul Perlmutter and Adam Reiss, shared the 2011 Nobel Prize for their discovery of an accelerated expansion to the local Universe, recalled other cultural icons that also began in 1962. From early views that astronomy is not fostered by the level of international co-operation practiced by ESO, he described how, from his astronomical experience, ESO had progressed and how his perspective had changed. He recalled the roles of the New Technology Tele-



scope (NTT), and later the VLT, and the role of two ESO staff members, Bruno Leibundgut and Jason Spyromilio, in the collection of the crucial data on the acceleration of the expansion of the Universe for the High-z Supernova Search team. These data eventually contributed to the award of the Nobel Prize. He closed by commending the governments that have invested in ESO, enabling it to achieve its current place at the peak of world astronomy.

While observing that 50 years is minute in terms of astronomical timescales, the current Director General, Tim de Zeeuw, celebrated the enormous developments since the founding of ESO. He paid tribute to the previous Directors General, and all the staff in bringing about these changes; and to the very supportive role of Chile in hosting the observatories. He noted that next year adds another 50th anniversary, that of the presence of ESO in Chile. While collaboration has allowed so much to be achieved, we should not forget that a spirit of competition still drives our scientific ventures. Even if the mysteries of dark matter and dark energy were to be solved soon, other great challenges lie in wait and extrasolar planets will remain an abiding topic. Looking to the future and to the critical importance for the future of mankind of society continuing to value science, Professor de Zeeuw quoted the

Figure 5. Brian Schmidt presenting his keynote speech.

Dutch astronomer Christiaan Huygens on the need to pay attention to wider issues and how the recent invention of the telescope can expand our vision.

# Closing ceremonies

The official delegates of all the Member States then signed the surface of an E-ELT mirror blank that had been brought to the Residenz for the occasion. Their signatures have since been engraved into the mirror blank as a remembrance of the gala event and the 50 years it celebrated. The Minister of Foreign Affairs for Chile, Alfredo Moreno, than expressed his appreciation of the wonderful science being done under the Chilean skies. Alfredo Moreno has been closely associated with ESO for more than 15 years and was involved in the resolution of land dispute on Cerro Paranal in 1995-6, and his engagement illustrates the supportive environment referred to by the Director General in his speech.

Finally Xavier Barcons wound up with some closing remarks. He exhorted all the Ministers and representatives of the ESO Member States present to be the proud ambassadors of ESO and its activities. He closed by wishing ESO a most successful next 50 years.



Figure 6. Group photograph of all the official representatives of the ESO Member States, the host nation Chile and the Director General.

# **Texts of Speeches**

#### Welcome

Xavier Barcons, President of ESO Council

Dear Ministers and dignitaries, dear Guests, Colleagues and Friends,

Welcome to this event that marks 50 years of ESO, the European Organisation for Astronomical Research in the Southern Hemisphere. Today we celebrate together a number of things. To start with, we celebrate astronomy, perhaps the most ancient of the sciences and surely among the most captivating ones. We also celebrate recent achievements in astronomy, made with the help of ESO:

- Knowledge of hundreds of planets orbiting stars far from our Solar System, which only two decades ago belonged to the realm of science fiction.
- Progress made during the last 50 years towards our understanding on how stars, planetary systems and galaxies form and evolve.
- A serious hiccup in the widely accepted cosmological model that occurred in the last 15 years when astronomers found that the Universe is expanding faster and faster as time goes by.

These and many other discoveries, as well as the many questions that astronomical investigations have raised, continue to be at the focus of intellectual interest of our society. The response of ESO's Member States to this quest has been to build and operate world-class astronomical observatories and to foster cooperation in astronomical research.

A little more than five decades ago, a group of visionary European astronomers succeeded in promoting the idea of building a 3-metre-class tele-scope in a new observatory to be placed in the southern hemisphere. The governments of Belgium, France, Germany, the Netherlands and Sweden were brave enough to sign the Convention establishing a European Organisation for Astronomical Research in the Southern Hemisphere. ESO soon after signed the first agreement with the Republic of Chile to establish its observatories in that country, opening a long-lasting and successful collaboration.

#### Courage

Today we celebrate the courage of those visionary astronomers, of the five governments that started ESO and of the remaining nine that have joined since: Denmark, Italy, Switzerland, Portugal, the United Kingdom, Finland, Spain, the Czech Republic and Austria. In addition we all encourage the efforts of the Brazilian government towards successful conclusion of the ratification process, after which Brazil will become ESO's 15th Member State.

ESO has experienced huge changes during those 50 years, and they are particularly evident during the last couple of decades. Almost two decades ago, and with La Silla firmly established as ESO's observatory in Chile with its 3.6-metre telescope among others, came the building and deployment of the Very Large Telescope, the VLT, the most powerful optical observatory in the world; later the VLTI interferometer — a unique facility — and more recently the survey telescopes VST and VISTA, all of them on Cerro Paranal. ESO's Paranal Observatory in the world's most powerful astronomical observatory in the optical and near-infrared.

About one decade ago, ESO took a crucial step forward by going into radio astronomy with APEX and ALMA. Today, with ALMA fully integrated into the programme and with North American and East Asian partners, ESO has consolidated its leadership in ground-based astronomy, by expanding on its wavelength coverage, from the classical optical domain into the infrared and now into millimetre and submillimetre radio astronomy.

The next development is the European Extrmely Large Telescope (E-ELT) to which I will return later.

There is no doubt that ESO is a success, and there is plenty of evidence for it, in particular:

- ESO delivers the highest-quality astronomical data to astronomers, who bid in fierce competition for observing time.
- ESO's facilities offer the most advanced instrumentation, largely built in cooperation with institutions from Member States.
- ESO is the European forum where important decisions on ground-based astronomy can not only be discussed, but adopted and eventually implemented.

#### Cooperation

Cooperation is certainly one of the main pillars upon which ESO's success rests, and a major reason for our celebration today:

- Cooperation amongst ESO Member States is probably best seen at ESO Council. Delegations have made continuous progress together during the last 50 years, often putting aside national interests for the benefit of the full ESO.
- ESO's Member States today encompass the vast majority of European astronomers, who, through cooperation with ESO, devote the best of their efforts to secure a most advanced suite of instruments for our telescopes and the best possible science output of the facilities.
- The same spirit of cooperation was also the driving force behind the signature in November 1963 of the first site agreement between ESO and Chile, which allowed ESO's telescopes to be deployed there.
- Cooperation is also behind the ALMA agreements between ESO and its ALMA partners in North America and East Asia. Let us not forget that ALMA is the very first global ground-based infrastructure of its size without a leading partner. We are well aware that we are being carefully watched by large projects in other areas which are coming next.

#### Excellence

Looking for excellence is the guiding principle in the way that ESO works, something more to celebrate today:

 ESO's telescopes are amongst the most advanced in the world and placed in some of the best sites for astronomical observing.

- ESO's telescopes are highly demanded by the scientists; typically they request five times more observing time than is actually available. The choice of those projects that actually make it to the telescopes is based on scientific excellence. This has resulted in the astronomical researchers in all our Member States becoming more competitive, leading to the best possible science return from ESO's sophisticated and expensive infrastructures.

- The way ESO handles industrial return, and consequently the generation of R&D-based activity in the Member States, is also largely based in excellence criteria. Of course, a healthy industrial geo-return is also actively pursued by ESO management and carefully monitored by ESO's Finance Committee and Council.
- ESO also looks for excellence when it comes to hiring its staff. It is ESO's obligation to target the best professionals, so the mission charged to the Organisation by the governments of the Member States, can be successfully accomplished. Here, we must be proud of the success of ESO, which has a fully dedicated, professional and engaged staff complement.

Astronomy, courage, cooperation and excellence: these are the perfect ingredients to build the most successful future for ESO.

Several years ago, ESO Council approved how the principles stated in the Convention would need to be realised during the first quarter of the 21st century. This consists of three elements:

- Keeping Paranal at the forefront of optical and infrared ground-based astronomy through the next decade. The VLT is the most powerful observatory in the world, and this needs to be preserved by keeping it operational and with state-of-the-art instruments.
- Building and exploiting ALMA together with ESO's international partners. ALMA construction is not yet over, but we can see it coming closer. In March next year, ALMA will be inaugurated by Chilean President Sebastián Piñera, along with ministers and dignitaries of ESO's Member States and of our North American and East Asian partners. In the meantime, Early Science observations with a reduced version of ALMA are showing astonishing results and giving a glimpse of what a fully developed array with 66 ALMA antennas will bring.
- The third element is to build an Extremely Large Telescope that will keep Europe at the forefront of optical ground-based astronomy in the 2020s and beyond.

ESO, together with European industry, has produced a solid detailed design of the most powerful, and yet affordable, E-ELT. A number of reviews have shown that ESO is technically and programmatically ready to start the construction of this 39-metre giant telescope, provided that the funds are available.

At the moment, seven of our Member States have solidly committed to the project, and this needs to be recognised and appreciated. But the target is to have all ESO Member States joining the E-ELT, including Brazil as ESO's 15th Member State. I am well aware that all ESO Member States are working hard to be able to participate in the E-ELT, despite the current financial environment. But, the E-ELT is a project that will produce, in the short term, R&D activity in the industries of the Member States, a much-needed ingredient to overcome the current financial crisis. In the long term, it will ensure that ESO's Member States will remain at the forefront of astronomy. Together, we can make it happen.

Dear Ministers and dignitaries, dear guests. Thank you very much for coming and joining the big ESO family tonight. And now, enjoy the celebrations.

#### Welcome Remarks

#### Annette Schavan, German Federal Minister for Education and Research

Dear Guests, Excellencies, Ambassadors, Mr President, dear Colleagues, Ladies and Gentlemen,

Welcome to Germany. It is a great pleasure for me to have you here for this very special anniversary. It is almost 50 years to the day since the establishment of the European Southern Observatory marked the beginning of the present success story. The five founding states of ESO, have meanwhile grown to 14 and, as we are deeply convinced, 15, on the accession of Brazil. Today ESO is a world-leading and certainly most productive institution for groundbased astronomical research. We are all pleased about this outstanding scientific development, which is a confirmation of the excellent productivity of this partnership.

A few days ago I visited one of the unique observation locations — the observatory of Cerro Paranal in Chile. I was deeply impressed, and with the Director General and the German delegation it was a great pleasure to witness this special place. I was deeply impressed by my visit to the Very Large Telescope there. It is no coincidence that the VLT is an optical telescope with the best performance worldwide. It stands for the international importance of the entire organisation. All three locations of ESO in Chile are operating equipment which is one of a kind, and is greatly in demand by astronomers from all over the world.

The most recent Nobel Prize for Physics, which was awarded for the discovery of the accelerating expansion of the Universe, was based on data obtained from ESO. I believe the Nobel Laureate Prof. Brian Schmidt will tell us about this special theme for scientists — since Monday a very special week for us all, for scientists and for science politicians. He will tell us more about this great research success. Welcome, and we are looking forward to hearing you.

We in Germany are proud to be among the ESO Member States. We are also fully involved with our special responsibility as host country and have greatly contributed to the Headquarters extension building in Garching. We support the ambitious but very realistic objective that research conducted at ESO is at worldclass level. We want it to stay that way.

We realise that the construction of the European Extremely Large Telescope will be decisive in maintaining European leadership role in this field. We need the European leadership role. The performance of the E-ELT will be revolutionary and will provide answers to some of the most pressing questions in astrophysics. Let's jointly make sure that these important findings are European findings. European astronomy has resumed its leadership position on a sound base of cooperation. In particular in the challenging times we face in Europe, ESO's achievements remind us of what we can achieve jointly.

Cooperation in science and research points the way to Europe's continued success in the future.

Research in science is, I am deeply convinced, the sole basis for the future of our society. Europe's real wealth lies in the skills and intellectual potential of its people. That is very important for the further development of the European Research Area (ERA) and to understand it, not only as an instrument of research, but quite specifically as part of the European process of integration.

In addition to the prize ERA initiatives since 2008, the European research Framework Programme has also brought this process forward. Scientists from all over Europe are cooperating in the most diverse projects, sometimes even with researchers in Asia and America. The financial crisis shows us that we must make further efforts for Europe to stay successful in the future. This is the major issue in the context of Horizon 2020. Germany has tried to translate the German high-tech strategy to the Europeanwide Horizon 2020 in order to focus on the entire information chain, as we have been doing in Germany since 2006. This will distinguish the new research Framework Programme from the former ones. The close network of science, research and innovation is a key to both economic success and social coherence: the bold way to provide young people in Europe with a positive argument for the future. In the 21st century the European Union must become a union of innovation - that will be our great wish for the scope of Horizon 2020. This also provides the opportunity to build new bridges between people in Europe on the topics of education and science, research and development. We must bear in mind the words of John Lee, "We don't unite states unite people."

The integration of research and innovation with nationality has been remarkably successful in ESO, making it a model for the burgeoning European science community, which actively contributes to the process of integration.

On this 50th anniversary of its founding I would like to congratulate the European Southern Observatory for all its achievements to date. I would like to thank your staff, your partners and the scientists who have always made sure that ESO users are able to work at a high level and at the cutting-edge of astronomical research and will continue to do so by designing, building and operating telescopes and instrumentation. I would like also to thank our international partners who laid the foundations of this success story together. Let's continue along these lines together.

So once more welcome to Germany and congratulations to ESO.

# Welcome Remarks

Wolfgang Heubisch, Bavarian State Minister for Science, Research and the Arts

Dear Professors Schavan, Barcons and de Zeeuw, Vice Minister Wilhelm, State Secretary Dell'Ambrogio, your Excellencies, Ladies and Gentlemen,

On behalf of the Bavarian State Ministry for Science, Research and the Arts, it is my pleasure to welcome you to the Munich Residenz. Together, we want to celebrate the 50th anniversary of ESO. The Prime Minister of Bavaria, Horst Seehofer, regrets that he is not able to join us tonight and sends his best regards.

Curiosity is at the basis of research. It is the driving force for discoveries and inventions. [The Mars Science Laboratory *Curiosity*: demonstrates what curious scientists and researchers can achieve and provides us with fascinating colour images of the red planet.] The success of ESO is due to the

far-sighted decision to let an alliance of countries work together in order to further progress. Fourteen — and soon fifteen — countries from Europe and beyond are joining their efforts to realise unique and pioneering projects in astronomy.

Today, ESO is the foremost intergovernmental astronomy organisation in the world. It operates three world-class observing sites in Chile. Its powerful facilities give astronomers the necessary instruments to make discoveries which lead to new insights and a deeper understanding of the Universe. It is no wonder that the discovery of the accelerating expansion of the Universe was based in part on data taken with ESO telescopes. For this breakthrough finding, the Nobel Prize for Physics was awarded to Saul Perlmutter, Brian Schmidt, and Adam Riess in 2011. Two ESO staff members (Bruno Leibundgut and Jason Spyromilio) worked in the team of Schmidt and Riess. Once again we see that success lies in the combination of both world-class technology and excellent scientists.

This is also why Bavaria has developed into a firstrate international location for science and research. Bavaria's fertile research landscape is based on a sophisticated network of state-of-the-art facilities including nine state universities, seventeen state universities of applied sciences, thirteen Max Planck Institutes, five research facilities of the Leibniz Society, several institutes of the Fraunhofer Society and many other renowned non-university research facilities.

Within this rich research landscape, ESO is an outstanding and precious landmark. It contributes to Bavaria's reputation as an important site for science and it attracts a large number of top scientists from around the globe. They enrich research in Bavaria with their expertise and excellence. Bavaria also benefits from ESO because a good part of the ESO budget is invested in Garching: about 30 million euros per year. Moreover, within the last ten years ESO concluded contracts in the high-tech sector in Bavaria and Germany amounting to 100 million euros.

As an international research organisation, ESO knows about the importance of EU research programmes and funding. In 2011, the organisation

participated in seven EU 7th Framework Programme projects. Bavaria also profits greatly from EU research funds. In the last few years, the Bavarian universities alone received the remarkable amount of more than 70 million euros per year.

Research and innovation are at the core of the Europe 2020 strategy and its flagship initiative, Innovation Union, because research and innovation help to create new jobs and prosperity, and to turn ideas into social progress. The next framework programme — Horizon 2020 — goes in the same direction. It is expected to start in 2014 and to have a budget of 80 billion euros to fund research and innovation over a span of seven years. One of the priorities that Horizon 2020 will focus on is excellence. It is my firm belief that to secure Europe's long-term competitiveness, we need to raise and strengthen the level of excellence.

#### Dear ESO staff,

Fifty years of working together to uncover the mysteries and secrets of our Universe: I congratulate you on that. With courage, passion and perseverance you make it possible to further astronomical research. Your excellent work also strengthens Bavaria as a key location for science and industry. Thank you very much for your dedication and commitment. Keep on being curious and contributing to new and groundbreaking discoveries.

I am looking forward to an interesting evening and wish all of us a fruitful exchange of ideas and views. And for those guests who have come from far away: I hope that you also find some time in the next few days to discover and enjoy the natural and cultural gems that Bavaria has to offer. Enjoy your dinner!

#### Keynote Speech

#### Brian Schmidt, Physics Nobel Prize Laureate, 2011

Meine Damen und Herren, Senoras y Senores, Hyvät naiset ja herrat, Dames en heren, Dámy a pánové, Signore e signori, Mine damer og herrer, Senhoras e senhores, Mina damer och herrar, Mesdames et Messieurs, Ladies and Gentlemen.

While ESO is an institution of many languages, it is the place where people from around the world come together to speak astronomy.

On 5 October 1962, the Beatles released their first single, *Love Me Do. Dr No* premiered on this same day, starting the James Bond franchise and helping make all of us order our Martinis "shaken not stirred". But it is the birth of the European Southern Observatory that we celebrate today — a scientific organisation whose discoveries will ensure that it is the longest remembered of these cultural icons born on that faithful and rather remarkable Sunday in 1962.

That is — as big a Beatles fan that I am (I have owned all the albums since I was a kid), and as much as I am looking forward to *SkyFall*, the next James Bond film (and yes, I have seen every James Bond film — the good and the bad), I am sure that the discovery, for example, of the supermassive black hole in our Galaxy's centre will outlast them both. And so I say ESO is a great cultural icon — because astronomy is more than just science — it is an expression of humanity to understand our place in the Universe — an understanding which is shared across the world, and a science which dates back to the beginnings of civilisation — and probably before.

Astronomy is ultimately empowered by telescopes, and the technology behind them. To make progress, it is necessary to marry good ideas with cuttingedge equipment — equipment that can exceed the ability of a single nation to afford. The sky has no owners and no measurable bounds — and as such, astronomers are born to collaborate. Conceived in 1954, born in 1962, ESO was an approach for five countries to be able to better do astronomy — by combining together the resources and ideas of many into a much greater whole. Although this was a new way of doing things in astronomy, it was not a new way of doing things in Europe, as ESO was clearly born out of the ideas surrounding CERN — ESO's highly successful scientific sibling. As someone who grew up in the United States, the European way of doing things was a bit foreign and not just to me, but to my entire country. Why would anyone wish to go through the effort to bring together so many cultures through the complexity of an inter-governmental treaty? Why not just go out and do it, one piece and one country at a time? These were my attitudes to ESO when I started my PhD in 1989. I had failed to understand that ESO was not built around a single era of telescope, living a golden age and then fading into obscurity. Rather it was an observatory always with one foot in the present and one foot in the future.

My first glimpse of what was possible came with the New Technology Telescope — the NTT — which, true to its name, employed all sorts of new technology to help the telescope obtain higher quality data. Starting in 1990, we began seeing press reports that talked about phenomenal image quality — too good to be true, we thought; it cannot possibly be that good — there must be a catch. But it was that image quality that both made possible the discovery of the black hole in the centre of the Milky Way, and as it turns out, saved the High-z Supernova Search Team.

In 1994, my colleagues and I formed the High-z Supernova Search Team — a collection of astronomers interested in supernovae — wanting to take advantage of the opportunity to use Type Ia supernovae to measure the change in the expansion rate of the Universe. We took our first data in 1995, but finding supernovae was not as easy a task as I had hoped, made even harder by my foolish decision to try to orchestrate a search from Australia with virgin software through an internet connection that was one character per second.

When all seemed lost and it seemed that our project would fizzle without finding a single exploding star, we found an object at the last possible moment. This object — it looked like a supernova on our images but the all-important confirming spectrum evaded us. Our last chance was with Bruno Leibundgut and Jason Spyromilio on the NTT, and through the great image quality of the telescope and the amazing persistence of these two astronomers, a spectrum was obtained, revealing this as the most distant supernova then detected. The High-z team was saved. ESO facilities continued to play a pivotal role in our programme up to and well beyond the discovery of acceleration in 1998 with these supernovae. Today ESO is no longer dismissed as some irrelevant European organisation by anyone in the world. Rather it is often referred to as "Gold Plated" or "The Observatory that God would have built, if only He or She had enough money". I had the chance on my way to this celebration to visit Paranal for the first time. What I saw was not decadence, except possibly for a few fake rocks put in place for the last James Bond movie. Instead, what I saw gave me far more than a quantum of solace that ESO's resources were being well deployed. I saw an amazing observatory - one with a scale that enables efficiencies of operations that make other observatories envious. I saw a vigorous investment in the future, with new instruments being brought online unlike anywhere else in the world. After all, a telescope is only as good as the instruments on it, and it only makes sense to ensure a constant supply of cutting-edge instrumentation on your flagship facilities.

This strategic ability to plan is at the core of ESO's ascension to the pinnacle of world observatories, and this same structure enables ESO to run its first generation facilities on La Silla more efficiently and cheaper than any other comparable observatory. The ESO structure has also allowed forays into new exciting areas - like the ALMA telescope, currently being deployed. Despite millimetre-wavelength astronomy being previously largely foreign to ESO, ESO, by engaging with industrial partners, and the vast array of European universities and research institutes, has managed to guickly catch up. Using its ability to plan, it already has a second generation instrument in the works for this newest of its telescopes. While this planning may have surprised its partners, it is only sensible to plan upgrades to ALMA so that the initial capital investment in the telescope will pay healthy scientific dividends into the future.

ESO is now embarking on its most ambitious project yet — the European Extremely Large Telescope (E-ELT). A project that is no longer just in step with the rest of the world, but rather a step ahead. Although the E-ELT is the most formidable of the next generation of telescopes, its design is already the most technically advanced. I have no doubt it will be a success. There is no doubt that as the E-ELT nears completion in the future, ESO will be able to plan the next big thing — be it another optical telescope, next generation gravity-wave telescope, or a huge radio telescope — it is uniquely able to formulate a portfolio of facilities for its members. It is for this reason that the Australian astronomical community, in our latest report to our government, have advocated that Australia join ESO with its highest priority. Of course we still have the challenging task of convincing our government that it should invest in ESO, as well as ensuring that ESO itself would like us as a member. But as I contemplate the future of astronomy — I do not just see that the future of astronomy is bright at ESO, instead, I see that the future of astronomy is ESO.

So on that note, I would like to commend the governments that have invested in ESO. Your investment has enabled the staff of ESO, and the broader community it serves, to achieve an impressive rise over the last 50 years to its current magnificent state at the top of world astronomy. ESO is poised to continue to thrive into the future, providing the world with an exciting and wonderful look into our Universe. Happy 50th Birthday!

#### Keynote Speech

#### Tim de Zeeuw, ESO Director General

#### ESO's Past, Present and Future

Your Excellencies, Delegates, former Directors General, other luminaries, colleagues and friends,

It is a great pleasure and privilege to be at the helm of ESO and to be able to address you on this special occasion.

Since the founding of ESO, the Earth has been 50 times around the Sun, Jupiter only four times, and Saturn a little over 1.5 times. The Sun itself has covered one-fifth of one millionth of its orbit around the centre of the Milky Way. So fifty years is a tiny period on cosmic scales, yet astronomy has progressed at an unprecedented pace. ESO can be proud to be an integral part of the many discoveries that clearly fascinate young and old across the world.

Over these fifty years, ESO has expanded far beyond the dreams of its founding fathers. This has been made possible by the strong support of the Member States and Chile, by the previous Directors General and by the motivated and highly skilled staff.

The DGs Otto Heckmann and Adriaan Blaauw laid the foundations of ESO and built La Silla. Unfortunately they are no longer with us, although Adriaan visited La Silla and Paranal two and a half years ago, at age 95. I am very pleased that Lo Woltjer, Harry van der Laan and Catherine Cesarsky are here. Riccardo Giacconi has sent warm congratulations. Lo had the vision of the Very Large Telescope and Harry and Riccardo oversaw its construction. Catherine developed ESO's role in ALMA, and managed the early planning for what is going to be the E-ELT. In the process ESO grew to 14 Member States, with Brazil poised to be the fifteenth. Together these countries represent 30% of the world's astronomers. What a change!

This entire development is captured in two excellent books commissioned for this special year. *Europe to the Stars* by Govert Schilling and Lars Christensen, and *The Jewel on the Mountaintop* by Claus Madsen. They contain beautiful images, as well as many of the stories, and some of the legends, that made ESO what it is today. I want to emphasise the key role of Chile. After the initial idea to go to Namibia or South Africa, the clear skies of Chile quickly became irresistible, and I am pleased to note that next year we will not only inaugurate ALMA with our intercontinental partners on 13 March, but also, in early November, celebrate 50 years of ESO's presence in Chile. The government of Chile has been very supportive of ESO, and it is a singular honour that the Foreign Minister, Chancellor Alfredo Moreno, is with us today. He had a personal hand in valuing the Paranal property during a difficult episode in the mid-1990s, and he was instrumental in the generous gift by Chile one year ago to extend the Paranal property to the east, to contain Cerro Armazones, where the E-ELT will be constructed soon

ESO is an excellent example of the benefits of collaboration, but we should not forget the advantages of healthy competition. Examples include the discovery of the accelerating Universe, the search for exoplanets and the irrefutable evidence for a giant black hole in the centre of our Milky Way. In all cases there has been intense but fruitful competition between teams using different groundbased telescopes and instruments. This allowed the teams to get to the scientific results sooner and to have their conclusions accepted by the community, and was also very beneficial for pushing the observatories to stay at the leading edge. For these reasons it is my firm belief that ESO should not become a "world lab" where a few giant teams work on a small number of focused experiments.

And this brings me to the future. Much of the truly tremendous progress in our field has come from the huge developments over a wide range of technologies. Astronomy has very happily taken advantage of these, and sometimes pushed them, all with the goal to build better and better telescopes. We should continue to do so, in close collaboration with high-tech industry.

I am convinced that new scientific questions will continue to emerge. Fifty years ago we had no inkling that we would find that the expansion of the Universe was speeding up — as Brian just described. Although finding evidence for planets orbiting other stars was a dream for centuries, the technology to find them didn't become available until the 1990s. Arguing by analogy, there will no doubt be big surprises and probably major paradigm shifts. As the Greek philosopher Heraclitus stated 2500 years ago: If you do not expect the unexpected, you will not find it. I hope we can crack the problem of dark matter and dark energy. The excitement in the exoplanet field is only just starting and will no doubt continue for decades. This new field addresses questions that transcend astronomy and even science, as it connects with the bigger question of the origin of biological activity and the presence of life elsewhere in the Universe. As Dire Straits put it: *So many different worlds, so many different Suns.* The E-ELT has a big role to play here!

Looking further ahead, it is critical that our society remains interested in science. I am always pleased to see people being excited about their latest app which allows them to see what's happening in the sky. But few realise this application requires an astronomer and a skilled software engineer to make it work. If we stop doing science and only watch reality shows, our society is doomed. This is why ESO and many other scientific institutions have active outreach programmes to inspire young people and emphasise the importance of fundamental science for society.

To conclude, let me quote: No doubt many will say that I am overly fascinated by matters which barely touch us, while there is so much else to investigate closer to home. You might think this is a recent quote from a spokesperson of a ministry of economic affairs only interested in short term results with immediate financial advantage. In fact, it is taken from the dedication of Christiaan Huygens' book on the Saturnian System, in 1659, presented to Prince Leopold of Tuscany, and written in difficult financial times.

Huygens goes on to say: Few seem to realise that the study of the heavens surpasses all other endeavours. If we think that what is far away is not important for us, then our mind is without any doubt unworthy of the enlightenment provided by the pure reasoning that transcends even the immensity of the Universe. And we also do not deserve to take advantage of the invaluable invention of the means to improve our vision to be able to reach the realm of the stars.

I hope I have convinced you that Huygens' words of 350 years ago are as true as ever. This bodes well for ESO's future. Thank you.

## Speech of Thanks

Alfredo Moreno Charme, Chilean Minister of Foreign Affairs

As mentioned before, almost 20 years ago I was called by the then Chilean Foreign Minister because there was a serious problem. Chile had donated to ESO a very large piece of land to build the Paranal Observatory. In fact, the observatory was already being built. But there was a Chilean family claiming this piece of land saying that there had been a mistake. The Chilean government commissioned a tribunal to determine who the legitimate owner of that land was and determine its value for the Observatory.

Both the family and the government agreed to set a price for Paranal and I was chosen to determine that price. I don't know why but they chose me to decide the price for the Paranal site. Whatever price I set would have to be the price that the government would pay to the family. Since I was an economist, I had to learn a lot about astronomy. I went to Paranal to see what they were doing there and I talked with many astronomers to find out the price for the site to build an observatory. To make a long story short, I finally came to the conclusion that the Chilean skies were unique. The only competition for Paranal was a small peak nearby called Armazones. In my final report to the Chilean Senate, I stated the probability of having a very large observatory on that mountain peak in a few years. That was in 1995. The Chilean Senate approved unanimously the high price to be paid for Paranal. This price was related to the enormous value of the site. In the near future on that little peak of Armazones the E-ELT will be built.

Thanks to those unique Chilean skies, today I have the opportunity to be part of this ceremony commemorating the 50th anniversary of the foundation of ESO. I am proud to represent the country where all ESO's astronomical sites are located. By the way, referring to Brian Schmidt's speech mentioning James Bond, some scenes from the recent film *Quantum of Solace* were shot at Paranal.

The work carried out by ESO over the last 50 years in the design of structures and the operation of the most important astronomical projects has been of paramount importance to Chile. We have had an opportunity of being part of some of the most important discoveries in astronomy.

As you may all know, our country has received and will continue to receive most of the world's investment in astronomy. In a few more years, Chile will be home to more than 68 percent of the world's largest optical and radio telescopes. ESO will be part of the E-ELT, the largest optical telescope, and part of ALMA, the largest radio telescope in the world, both in Chile. We are fully aware of the opportunities and challenges that these observatories bring to us. We will continue to work with you in the scientific field but also collaborate with the engineering, innovative and technological challenges ahead.

We are also aware that astronomy can be a great way to attract children to science. To this end, we are working jointly with ESO in the creation of a national astronomical network open to all citizens. This is a new step towards making astronomy an essential part of Chile's track record. This is also why we issue so many press releases on this matter and encourage people to visit Paranal.

We really appreciate the work you have carried out in our country and we want people to know that we are doing things together. To set an example, only a few months ago Chile, Mexico, Colombia and Peru signed — in Paranal — the Agreement for the Pacific Alliance. Let me once again extend my appreciation to Massimo Tarenghi and the Director of the Observatory for their warm hospitality.

I would like to propose a toast — not to the last 50 years, but to the coming 50 years. I am sure that the next 50 years will provide us with many more incredible things, new discoveries, not only for Chile but also fantastic developments for all mankind.

#### **Closing Remarks**

Xavier Barcons, President of ESO Council

Dear Ministers, Dignitaries and Guests

I'm fully confident that you have enjoyed tonight's celebration of the fiftieth anniversary of ESO. The delightful talks by ESO astronomer Nadine Neumayer, by Nobel Laureate Brian Schmidt and by ESO Director General Tim de Zeeuw have surely promoted a most enjoyable dinner.

I also hope that this night has, in addition, served the purpose of explaining better how ESO works, what are its main achievements and what are the plans for the immediate future of the Organisation. These plans have been put together by delegations from the Member States in ESO's Governing bodies. It is now up to the governments of the Member States to secure these plans, including the E-ELT programme, by applying and extending the principles of cooperation and excellence that have been at the root of ESO's successful 50-year history. I'm fully confident that we, all together, will achieve this.

But before you leave, I have one very important request for all of you, and most especially for the ministers and authorities that represent ESO's Member States: Be proud of ESO!

ESO is your achievement. It is part of your R&D systems, which happens to be in the form of an Intergovernmental Organisation, which has reached far beyond than which would be conceivable for a single country. Spread the word and be the proud ambassadors of ESO. Tell people in your ministries, tell other ministers in your governments, tell your prime ministers, tell your heads of state and tell all the citizens in your countries:

- that ESO builds and operates the most powerful astronomical observatories in the world;
- how ESO enables astronomical research in your country and fosters scientific cooperation with others; and
- explain to them how ESO promotes R&D in institutions and industries in your home country.

And now, please join me in wishing a most successful next 50 years to ESO. To ESO!

Thank you very much for your continued support, for having been here tonight and for being part of the big ESO family.



Figure 7. The E-ELT prototype mirror segment after signing by the ESO Member State representatives.