

## The Primary Mirror Segments of the ELT

Tim de Zeeuw

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Dear Mr Brunet, Mr Berkoukchi, Mr Fark, Mr Rioufreyt, and Mr Westerhoff, Council delegates from France and Germany, other distinguished guests, members of the ESO ELT team, colleagues, it is a great pleasure to welcome you to ESO Headquarters for today's event.

Four days ago on Paranal, President Michèle Bachelet of Chile and I ceremonially sealed the time capsule which will be part of the Extremely Large Telescope. The ELT is being built on Cerro Armazones in the Atacama desert as an integral part of ESO's Paranal Observatory. The ELT will be the largest optical telescope in the world. Its primary mirror will be a marvel of modern technology with an astounding diameter of 39 metres.

Contracts have already been placed for the secondary and tertiary mirrors and for the adaptive quaternary mirror, some indeed with SCHOTT and REOSC. Today we are taking a further major step forward by signing two giant contracts for the primary mirror. One is (again) with SCHOTT, this time for the blanks/substrates of the hexagonal segments which make up the M1 mirror. The other contract is (again) with SAFRAN-REOSC, and is for the precision polishing of all these segments.

The combination of SCHOTT and REOSC provided the 8.2m mirrors for the VLT back in the 1990s, is already involved in M2 and M3 of the ELT, and is now teaming up, once again, for the biggest and most exquisite mirror of them all.

The full primary mirror will have 798 hexagonal segments, which have to be polished (and controlled) to very high precision. Together they will form a single 39-metre mirror with a collecting power greater than all the current major optical telescopes combined. It will consist of six identical petals, each with 133 segments that are all different. The mechanical support structure needs to be able to move the primary mirror with amazing precision so that it follows the stars without blurring as the Earth rotates under the night sky.

The currently authorised spending on the first phase of the ELT excludes the inner five rings of segments of M1, but the contracts have options for them, as well as for the seventh sector which, by providing a full “spare” set of 133 segments, is critical for operations. I am confident that the ESO Council will very soon also authorise these so that the mirror is complete and the telescope will have stupendous power to study the deep Universe, to resolve the light of nearby galaxies into that of their constituent stars, and, most importantly, to characterise the earth-like planets we now know are orbiting other stars. It is even possible that the ELT will find evidence of life on other worlds, which would be a truly transformational development in the history of our species.

A large and motivated team of engineers, procurement officers and scientists at ESO prepared for these contracts for nearly a decade. This included proto-typing and working together with industry to establish the final technical specifications and the statements of work. The team also oversaw the procurements, and it will of course continue to follow the development. It is a pleasure to thank all team members for their efforts, and in particular Marc Cayrel, Alain Delorme, Philippe Dierickx, Lotti Jochum, Andreas Förster, Fabio Biancat-Marchet, Martin Dimmler, Juan Carlos Gonzalez, Mauro Tuti, Johannes Schimpelsberger, Arnout Tromp, all under the inspired and energetic leadership of Roberto Tamai.

ESO is committed to deliver the ELT by 2024, which would make it the first and largest of the planned giant optical telescopes, allowing many discoveries by astronomers in the ESO Member States and in Chile. This exciting opportunity is of course also a challenge, and puts pressure on our partners in industry to stay within specifications, deliver on schedule and stay within cost. I am confident that you will do so, and am sure the ELT team will work with you towards this common goal of building the biggest eye on the sky!