



Key words: ESO, Director General, Tim de Zeeuw

<p>ESOCast Episode 124: Q&A with ESO's Outgoing Director General Tim de Zeeuw — Thoughts and reflections on a decade at ESO</p>	
<p>00:00 New ESOCast intro</p>	<p>00:00 New ESOCast intro</p>
<p>00:14 [Visual starts] 1. This is the best job I've ever had in my life, so far. And nearly everything has been from the enormous scope of activities that you get exposed to.</p>	
<p>00:27 2. When I arrived at ESO, I had been on the ESO Council for four years and I thought I knew reasonably well how it operated. Well, I did not. So I learned that we were doing much more than I even knew. I found many, many interesting things to do and it was an extremely energizing experience because suddenly you have the opportunity to enable science for the community, to try to convince high level politicians to support science, astronomy, ESO, but all of them. You meet very, very interesting people all over the world, you get involved in things that I did not realize I would get involved in when I started studying astronomy—I learned a little bit about pouring concrete at 5000 metres altitude. All of this is just very exciting.</p>	
<p>01:25 3. ESO's role is to build and operate world class facilities for astronomy and to foster collaboration. So, that's what we are doing.</p>	

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4. ESO, has had an interesting role in shaping astronomy ever since its origins in the 1960s, but in the past decade the strong expansion of the program of ESO, with state of the art new facilities, the upgrade of Paranal with second generation instruments, the start of operations of the ALMA observatory and now the construction of a really transformational new telescope, the ELT, has clearly influenced the way astronomy is done today and will be done in the future.

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5. The growth of ESO into a partnership of fifteen countries with more to come, with a long term budget stability and planning ability, where lessons learned from previous facilities are being used to build new ones, has let ESO to become, I believe, the preeminent organisation in astronomy in the world.

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6. Astronomy has changed quite a bit over the past ten years in a number of ways. The observing facilities become significantly more powerful, taking advantage of developments in technology. At the same time there are many, many astronomers and much more work is being done in big things than it was maybe ten years ago. And there's a more sociological change, which is also quite interesting and it's triggered in part by the enormous data streams coming out of these facilities.

03:19

7. Another change that is very evident in the past decade in astronomy is that the attention is drawn more and more to the search for exoplanets, planets orbiting other stars. Not so much even the search, but finding the rocky ones and then asking yourself, "Do they have atmospheres?", "Can we observe them?", "Is there evidence for water, liquid water?", "Are they in what we call the habitable zone?" and, indeed, "Is it possible to

<p>detect elements in their atmospheres that betray or evidence for biological activity, called life?”. And is a field that also transcends science because it is of great interest to a large fraction of our society. We would all deep down like to know, “Is there life elsewhere in the Universe?”.</p>	
<p>04:14 8. Table: Asked on Social Media Which planet would you like to go to? Michael Hall</p>	
<p>04:19 9. If I had the opportunity to take a good look with my own eyes on Mars, I would love it.</p>	
<p>04:28 10. Table: Is ESO having a best-practice exchange with other large projects such as the SKA or the facilities at the South Pole? Eduardo Ros</p>	
<p>04:36 11. ESO is ready to provide its expertise to other projects, if they ask. After all, we are a non-profit organization. We are funded by the member states through the taxes they levy, and therefore, if there is something we learn, rather if it’s an astronomical result or engineering practice or some of these more practical issues in how you do things in different countries or in very remote locations, we are quite willing to help. But they have to ask.</p>	
<p>05:09 12. Table: Is the amount of data generated with the telescopes getting easier to manage or is it something that ESO needs to find new ways to face? Roberto Sanchez Alvarado</p>	

<p>05:17 13. If you look at the general field of the physical sciences, there are facilities that produce what is called big data. By that standard, ESO's telescopes do not produce a lot of data. They produce a fair amount, but not this giant stream this would be very difficult to handle. And the reason for this is not that difficult to understand. We take very deep images, for example, or spectra of objects in the Universe that are very, very faint. So, we have to expose a long time, integrate the measurements and then write on disk the resulting image or spectra. That doesn't run into the petabytes every night. And in that sense, that's all under control. It's growing, but not by the jump that you see in what is called big data.</p>	
<p>06:16 14. Table: Will the ELT be able to detect the chemical composition of the atmospheres of exoplanets and to make direct images of exoplanets down to sizes of 1-1.5 Earth masses? Adam Tuznik</p>	
<p>06:25 15. The short answer is yes. That is the reason why we are building it, and that is mostly the reason why we have to take a—build a mirror that is so big. What we are trying to see is the reflected light of the host star of a little rock, an Earth-like planet. And that light is incredibly much fainter than the light of the star. So what we try to do, is we have the star and the planet—if you make the mirror bigger, you have a bigger enlargement so you can separate the two, block the light of the star and then integrate long enough to get enough reflected light of the planet so you can take a spectrum and look for lines that maybe tell you there's methane or ozone or oxygen.</p>	
<p>07:17 [Outro]</p>	<p><i>Produced by ESO, the European Southern Observatory. Reaching new heights in Astronomy.</i></p>

