

for ALMA has enabled me to exploit my newly acquired knowledge in radio interferometry to address my science questions. Since coming to ESO I have been awarded 100 hours of observations with ALMA and the Very Large Array (VLA) to study cold gas in early galaxies. By combining radio interferometry with optical and near-infrared observations at the Very Large Telescope, I plan to investigate how star formation proceeds in the early Universe.

As much as I enjoy the intellectual stimulation of my job, I draw satisfaction from bringing people together with science. ESO is a prime example of the success and value of international collaborations. This summer, I taught at the West African International Summer School for Young Astronomers<sup>1</sup> held in Ghana. The students were remarkably motivated and “code-savvy”, at least compared to myself as a bachelor student! Since returning from Ghana, I have launched a mentorship programme to connect these students with astrophysi-

cists across the world, and have begun to develop a research-training programme for them with other ESO astronomers. My own mentors have been crucial to my journey to becoming a professional astrophysicist, so I hope that I can engage more colleagues to support and encourage these bright students to pursue science as a career.

#### Links

<sup>1</sup> West African International Summer School for Young Astronomers: <http://www.astrowestafrika.org>

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## External Fellows at ESO

In addition to the ESO fellowships, a number of external fellows are hosted at ESO. A profile of one of these fellows is presented here.

### Iván Oteo

Perhaps contrary to most astronomers, my love-hate relationship with astronomy did not start when I was a child. In fact, until I was about 16 I was really passionate about medicine and was convinced I would become a surgeon. However, everything changed when I started my last year of high school, when I had a great physics teacher whose lessons made me change my mind. The decision to pursue a degree in physics was not easy, and I still sometimes wonder what could have happened if I had studied medicine instead. I have the impression that it would have been a job that I would have enjoyed as much as being a researcher in astronomy. I studied in Sevilla, a beautiful city about 120 km away from Cádiz, the city where I was born and where I lived until I was eight years old, and Chiclana de la Frontera, the place where I spent most of my adolescence.



Iván Oteo

When I started my physics degree I was not thinking of specialising in astronomy, but rather in quantum or nuclear physics. My passion for these topics increased over the course of my five-year degree, and in my final year I even received an offer to start a PhD in quantum physics with one of my teachers beginning in 2008. I really wanted to take that career path, but in June 2008 I had the oppor-

tunity to complete a three-month summer studentship at the Instituto de Astrofísica de Canarias (IAC) in Tenerife. I could choose from a list of projects and I selected the one on solar physics, but a couple of weeks before starting I was informed that the project had been cancelled and I had to choose another one. This time, I chose one on high-redshift quasars amplified by gravitational lensing.

Those three months were quite intense, both in terms of work and my social life. I made many friends; there were 14 summer students in total and most of us came from outside Tenerife so it was easy to form a close-knit group. I enjoyed living on that amazing island and, most importantly, I also realised that I wanted to keep working on astronomy. Unfortunately for my degree teacher back in Sevilla (or perhaps fortunately), I decided to stay in Tenerife and start a master's degree in astrophysics. At the time, it was possible to start a PhD at the same time as a master's degree, but most deadlines for PhD positions in Tenerife had already passed so I decided to stay there, begin the two-year master's, and then start the PhD one year later. The plan worked. A year later I received an offer to complete a PhD at the Instituto de Astrofísica de Canarias, working on the multi-wavelength characterisation of star-forming galaxies at different redshifts, with a focus on the galaxies detected in the deep extragalactic surveys taken with the Herschel Space Observatory.

I had a great time during my PhD and enjoyed doing research in astronomy. For this reason, I decided to apply for a postdoctoral position to keep working on high-redshift dusty star-forming galaxies, specifically on the properties of their dust and molecular gas using submillimetre, millimetre and radio interferometric observations. I moved from Tenerife to Edinburgh to work at the Royal Observatory and am currently based at ESO. I had not done any submillimetre, milli-

metre or radio interferometry work before, so this was a challenge, but also a lot of fun. I worked with interferometers such as the Atacama Large Millimeter/submillimetre Array (ALMA), the Very Large Array (VLA), the NOthern Extended Millimeter Array (NOEMA), the Submillimeter Array (SMA) and the Australia Compact Telescope Array (ATCA), as well as with single-dish submillimetre/millimetre telescopes such as the James Clerk Maxwell Telescope (JCMT), the Atacama Pathfinder EXperiment (APEX) and the Institut de Radioastronomie Millimétrique (IRAM) 30-metre telescope; the latter being my favourite! Interestingly, despite working at ESO I have never observed directly with any ESO telescope, although I did get some data from the Very Large Telescope (VLT) and Visible and Infrared Survey Telescope for Astronomy (VISTA) in service mode. I wish I could visit Paranal and La Silla soon — as well as ALMA and APEX, of course!

One of my main research areas is the study of ultra-luminous dusty galaxies in the early Universe. I first try to find them using far-infrared, submillimetre and millimetre bands to sample the dusty emission peak, then confirm their distances (i.e., their redshifts), and finally study their gas, dust and stars to investigate their properties and evolution. This requires the use of multi-wavelength observations, which is the reason why I use so many telescopes around the world and why I spend a significant amount of my working time in observatories as well as writing telescope proposals. In fact, the latter is

one of my most enjoyable activities: it's exciting to write proposals to discover new galaxies and study them in detail!

I am also involved in ALMACAL, a wide and deep submillimetre/millimetre survey being carried out by gathering publicly-available ALMA calibration observations. This is a huge project; so far, it has collected more than 700 hours of ALMA observations in more than 500 calibrator fields. This represents a much larger dataset than any other ALMA project — larger than all the current ALMA Large Programmes combined. Working with such a huge dataset is not easy, but discovering galaxies that no one has seen before is awesome. I am also the Principal Investigator of a VISTA Public Survey called SHARKS (Southern Herschel-Atlas Regions *K*-band Survey), which is completing relatively deep *K*-band imaging over the Herschel-Astrophysical Terahertz Large Area Survey (H-ATLAS) equatorial and southern fields. It aims to characterise the stellar emission of all H-ATLAS galaxies, among other goals such as completing a cosmographic study of lensed galaxies and looking for the most massive high-redshift galaxies and extreme structures.

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The Atacama Large Millimeter/submillimeter Array.