Fellows at ESO

Luca Cortese

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Becoming an astronomer was definitely not my childhood dream. Until secondary school, I wanted to become an architect and design something as amazing as the Sydney Opera House. I suspect that this was mainly driven by my early great passion for LEGO.

I was born and grew up in Milano (Italy) and only started to develop a deep interest in astrophysics during high school. A significant influence on this passion came from my father's fascination with astronomy and, probably, also from the fact the walls of my parents' house have always been filled with maps of the night sky and images of Jupiter's moons taken by *Voyager 2*. Thus, when I started my undergraduate degree in physics at Milan University in the autumn of 1997, my goal was to become a professional astronomer. However, I had to wait until winter 2001 to start getting my hands dirty with what, since then, has become my everyday job.

As part of Peppo Gavazzi's course of laboratory astrophysics, we went to the Loiano Observatory (in the Italian Apennines) to observe galaxies in nearby clusters. At least this was the original plan. Out of the ten nights we had, eight were lost due to bad weather and we were almost ready to pack and go back home when the sky finally started to clear. Unfortunately, it had snowed a lot during the previous days and the dome was covered in snow. Thus, we ended up spending the entire afternoon manually clearing the dome and the roof of the building, just to be able to have our first hands-on experience at the telescope. The following night turned out to be an amazing experience, and I realised then that observational astronomy was exactly what I wanted to do. For the final stage of my undergraduate degree, I decided to undertake a Master's thesis with Peppo on the analysis of Hα images of galaxies in nearby clusters. The experience was so rewarding that I was even more certain that I had taken the right path.

My initial plan was to leave Italy and carry out a PhD abroad. However, finding a PhD place turned out to be more complicated than anticipated and I ended up staying in Milan, where I started a PhD under Peppo's supervision at the end of 2002. Looking back at those days, I am very glad with how things went. I was lucky enough to win a grant that allowed me to carry out half of my thesis work in France, at the Laboratoire d'Astrophysique de Marseille, under the supervision of Alessandro Boselli. This gave me the opportunity to become heavily involved in the exploitation of the data obtained by the GALEX mission, a NASA space telescope which carried out the first survey of the entire sky at ultraviolet wavelengths. So, I spent the three years of my PhD studying the effects of the environment on the star formation and dust extinction properties of cluster galaxies. It was during this time that I had my first experience at ESO, observing at the 3.6-metre telescope in La Silla. This was a very different experience compared to my previous observing trips: the system performance was very smooth, which made the observations almost too easy (when it comes to observations, "boring is good"!).

With a PhD degree in the bag, on a rainy day in January 2006 I filled up my car with all my stuff and drove the 1500 kilometres between Milan and Wales to start a postdoctoral position at Cardiff University, in the group led by Jonathan Davies. Although my initial contract was for just one year and half, I spent four and half amazing years in Wales. Working at Cardiff has been a great experience both professionally and personally. At first, my investigations shifted from the ultraviolet to the radio regime, as I carried out 21 cm observations of nearby galaxies to study their atomic gas reservoir. This gave me the opportunity to use the Arecibo radio telescope in Puerto Rico, the largest single-dish telescope in the world, and definitely one of the most amazing astronomical facilities I have had the privilege to use. Then, starting from 2008, I changed wavelength domain again, becoming deeply involved in the planning and exploitation of far-infrared and submillimetre surveys of nearby galaxies carried out with ESA Herschel Space Observatory. Herschel observations are crucial to gain information on the role played by the dust on the star formation cycle of nearby galaxies.

In the summer of 2010, I crossed the Channel again to start a Fellowship at ESO in Garching. Working at ESO has allowed me to experience directly how the Atacama Large Millimeter/submillimeter Array (ALMA) works. The opportunity to help carry out Cycle 0 observations at the ALMA site, and experiencing how this amazing facility works, is definitely the highlight of my time at ESO. Moreover, by getting involved in ALMA, I have been able to gain familiarity with millimetre interferometric observations. This is one of the most amazing parts of this job. In the last ten years I have been able to keep studying the same galaxies, but the advent of new facilities has made it possible to look at them from very different points of view, thus always yielding new insights into how they formed and evolved.

ESO is definitely a unique place at which to carry out a postdoctoral fellowship. It provides you with deep insights into how modern observatories work, something that it is impossible to imagine while working at other universities or research institutes.

Sadly, my experience at ESO is now coming to an end. In just a few months I will leave Europe to move to Australia, opening another, certainly exciting, chapter of my job as an astronomer.

Grant Tremblay

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When I was nine years old, I was the world's worst paleontologist. Based on embarrassingly weak evidence, I was convinced that there was a dinosaur buried in the field behind my house in Maine, USA. I asked my father to inform the local science museum of my impending find, and I launched a carefully planned and well-researched expedition to excavate it. When I mistook the white root of a sapling for the neck bone of a *Dilophosaurus*, I was overcome with the sort of elation that could only herald a future astronomer's first spectacular failure in science.

I may have been disappointed when I realised my dinosaur was actually a mound of dirt and shrubbery, but the experience was a perfect illustration of why I love science. Amid the collapse of my hypothesis, I learned the difference between bones and fossils, discovered that plant roots could be bright white, and realised, after some follow-up research, that a field in Maine is not the likeliest place to find giant ancient reptiles. Most importantly, I learned that human beings advance our understanding of Nature not by becoming more right, but by slowly becoming less wrong. Today, I am grateful for the privilege of working in a field where getting things wrong is the most important part of eventually getting it right.

This is why I feel so lucky to be at ESO. After doing half of my PhD research at the Space Telescope Science Institute (the operational heart of the Hubble Space Telescope) and the other half in Rochester, I had dreamed of going to Europe for my first postdoc. Being from the US, an ESO Fellowship felt so out of reach. Yet in addition to building the world's greatest telescopes, one of ESO's most important gifts to the world is its perfect illustration of international cooperation toward a common goal, and of human collaboration that is blind to borders and flags. ESO welcomed me, and I now live in both Germany and Chile, and have an incredible group of friends and collaborators from no less than 27 different countries. In addition to my Fellowship in Garching, my ESO duties are performed as an astronomer in the Paranal Observatory Science Operations team, supporting UT2/Kueyen on the Very Large Telescope. Every night at the telescope, I feel like that kid in the field in Maine.

My own research uses data from the VLT, as well as the Hubble Space Telescope, Chandra X-ray Observatory, Herschel and now ALMA to study the black-hole-powered outflows of nearby radio galaxies. They are amongst the largest and most powerful objects in the Universe, and many of them are embedded in megaparsec-scale halos of ultra-hot primordial gas. The mechanical feedback associated with the propagation of these outflows amid their atmospheres excavates buoyant bubbles large enough to encompass 500 Milky Way galaxies. And I thought dinosaurs were big!

I don't know where I'll end up next, but I'll always be grateful for my years at ESO. A year after my failed dinosaur hunt, I first saw the rings of Saturn through my tiny toy telescope, and it started me on the path towards becoming an astronomer. Twenty years later, thanks to ESO, I find myself writing these words in the Paranal Observatory control room, using a telescope with 12 000 times greater light-collecting area. I still haven't found any dinosaurs, but I guess I haven't stopped searching.