

Fellows at ESO

Mark Westmoquette

I think I was around age 16 or 17 and doing my A-level examinations when I developed a serious interest in astronomy. This was due in part to a particularly engaging teacher called Mr Sheldrake, and, in another part (although I hate to admit it now) to *Star Trek*. Moving swiftly on ... My interest grew, such that in 1999 I decided to leave home and go to University College London (UCL) to study astrophysics. Unbeknownst to me then, I wasn't to escape UCL for another 11 years. The undergraduate research project that I did with Linda Smith set me up very well to do a PhD with her on super star clusters, feedback and galactic winds. I then did four years as a postdoc at UCL before being awarded an ESO Fellowship and moving here to Munich.

After my initial naïve and idealistic period of enthusiasm, I have encountered a number of moments in the past ten years when the thoughts of "what's the point of studying astronomy?" and "is it a good use of my life?" have risen to crisis point. One particularly memorable one came just after I'd finished my PhD and was travelling before starting my postdoc. I clearly remember realising that wherever I was, from a dark beach in Costa Rica to a wedding reception in Gloucestershire, people were always fascinated to find out that I study astronomy and often started asking the same fundamental questions about the Universe as I was actually being paid to research. Perhaps it is because the Universe is so vast, so full of wonders (albeit often very complicated and low signal-to-noise wonders), and the "what's out there?" question is so deeply engrained in our human consciousness. This universal interest convinced me that I was doing something meaningful.

I have come to think of studying astronomy as something similar to being an artist or musician. Since it has almost no commercial value — even Google can't sell a galaxy evolution model — its value to society comes solely through curiosity (of our origins), like art whose value is based on curiosity of the human condition. That, in this capitalist world domi-



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nated by advertising and profit, with the potential of financial ruin always (and particularly recently) just round the corner, we can still find billions of euros to fund projects of pure curiosity is marvellous! Doesn't knowing that the Sun was born out of an interstellar gas cloud that contained chemicals from many previous generations of stars give more meaning to life than knowing that 37% of smartphone users use their devices for shopping?

In my opinion, one of the most important things in life is to find a passion and do it 100%. I feel extremely honoured to be in the position of being able to do that. Not only am I paid to do it, but in academia my passion is continually and actively nurtured. That is part of what makes ESO such an amazing place to work. I'm surrounded on a daily basis by high-flying, brilliant people with high aspirations, and have many possibilities to meet and collaborate with other astronomers in ESO, in the Garching campus or visitors passing through.

My current research focuses on determining the interstellar medium conditions, both within the cores of nearby starburst galaxies and in their resulting feedback-driven winds, with the aim of understanding how these winds are driven and evolve. Integral field units (IFUs) are ideal for studying these complex gas environ-

ments, and I have made extensive use of instruments such as VIMOS and FLAMES, and of course the Hubble Space Telescope.

Among my extracurricular interests, yoga and zen are the two most important. One of the highlights of my week is the yoga class I run every Tuesday for ESO staff.

Amelia Bayo

Unlike most astronomers, studying the mysteries of the sky did not even cross my mind when I was a child. I grew up in a "bigish" city in the south of Spain, Malaga, where nobody around me was especially fascinated by astronomy. From a young age, though, as my parents can testify, it was clear that I wanted to do research. I loved discovering new things, and the challenge of tackling a problem until I could find the way to unveil what was going on.

I studied mathematics at Universidad de Malaga and I was leaning towards topology or geometry. But life decided otherwise. I moved to Madrid where the possibilities to do research were way higher. At the Universidad Complutense de Madrid there was a programme for students to participate at the European Space Astronomy Center (ESAC, at that

time the Villafranca satellite tracking station) in small summer projects. There was no such thing for pure maths students, so I joined the programme and that is how I got “hooked”.

I remember perfectly well the first day I arrived at ESAC. The place was the most advanced technological complex I had ever seen. But this was nothing compared to talking to my supervisor for that little project. ESA staff astronomer, Pedro Garcia Lario, was clearly in love with his research. In less than two minutes he convinced me that one would be out of one’s mind not to want to study planetary nebulae! He showed me beautiful images, and he could name plenty of objects by those weird names... I left the office fully convinced that this was the kind of passion I wanted for my career, and so, “astrophysics it was!”.

I finished studying mathematics, but with majors in astronomy and then started two Masters, one in artificial intelligence (connected to the Virtual Observatory) and one in astrophysics. With Masters ongoing, it was then time to look for a PhD project.

I learned about an opening for a PhD position at LAEFF; a Spanish laboratory located on the ESAC campus. I went for the interview with David Barrado y Navascues and the experience proved very different from my first day at ESAC. David did not show me the “in love with astronomy” side of him, he showed me the direct and competitive one and let me know very clearly that I was the one asking for a job and that I had to be able to “sell” myself. I was absolutely not prepared for this and I left the office thinking that this will not be “the perfect match” to start a PhD and being pretty sure that he would not offer me the position.

Funnily enough I did get an offer and I could not have been more wrong. No PhD student-supervisor relationship is perfect, but I am convinced that I would not be where I am now in my career (with exactly the job that I wanted to have) without his influence. The first time we went to observe together on La Silla he told me to stay outside for a while and let



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my eyes get used to the dark. There I found what I had wanted ever since I went to ESAC for the first time: I fell in love with the southern sky, and I decided that Chile and the ESO observatories should become my home very soon.

My main research field is the study of the formation of brown dwarfs, those intermediate objects between stars and planets. Do they form like the stars? Do they form like the planets? How often do they host planetary mass objects? Do their discs evolve similarly to the protosolar disc? To answer these questions we need to compare their properties with those of low-mass stars. During my PhD I studied an extremely interesting star-forming region that hosts clouds of different ages; the λ Orionis star-forming region. In particular, the study of the central cluster (Collinder 69) led to the ensemble of one of the most complete Initial Mass Functions (IMF) for a young association. This allowed us to put constraints on some formation scenarios proposed for brown dwarfs. Besides, the detailed study of the population of sources still harbouring discs in the region allowed us to put caveats on the possibility that a supernova triggered the star formation in the outer clouds.

During my PhD I realised that complete samples are mandatory in order to reach any strong conclusions. Therefore, I joined a very ambitious spectroscopic survey that, using ESO telescopes, will complement Gaia at the lower end of the mass function. On the other hand, to analyse and fully exploit the database that this project will generate, a solid base in astrostatistics and inference is absolutely mandatory. In a sense I am returning to my mathematical background, something I enjoy a lot.

Being at ESO Chile has allowed me to improve my observing skills and to deeply understand some of the instruments that I use for my science. Besides that, and certainly the most important benefit that I will take away from working at Paranal, is the interaction with colleagues and visitors, and the effort required to understand what each service programme needs. All this, I believe, has made me a more complete astronomer. I think that focusing too much on one problem can cause a lack of perspective that can prevent one from finding a solution. Well, being at ESO Chile has had the completely opposite effect on me; I will leave this country with a wider view of astronomy that hopefully will help me to find my answers.