

## Fellows at ESO

### Paulo A. Miles-Páez

Astronomy has captivated my attention since I was a child, just like many of my colleagues. I was born in La Serena (Chile), a town almost unknown to most of the world, but very popular amongst astronomers. The first time I saw a dark, deep sky was when I was four or five years old. It was during a visit to my great-grandparents, who lived in a small village in the mountains near the Argentinian border. I still remember the darkness of that sky and the large collection of stars that populated it, some of them so faint that I was not sure if they were real or just my eyes tricking me. After this, one of my hobbies was to watch the Moon and some areas of the sky with a pair of binoculars from my backyard every night. Local outreach activities also contributed to my passion for the night sky. During the mid-1990s a group of astronomers used to visit public schools in La Serena with a portable planetarium. I am not sure which astronomical association organised this project, but I am very grateful as this was the first time that somebody talked to me about the things that are going on in the sky. This fascinated me so much that I used to ask my parents to take me to other schools just to visit the planetarium again.

Unfortunately, in the 1990s doing astronomy in La Serena was considered an eccentric activity, mostly reserved to the American and European researchers who visited the town before heading to the observatories in the area. When I started to ask how to become an astronomer, the best option that I found was to move to Santiago and try there. In addition, I was always advised (at school!) to study something “more useful” and “practical” in order to secure a “good job”. In this regard, my parents and my little sister were crucial, as they always supported me and gave me the freedom to choose any path for my career.

In 2001 my quiet life in La Serena changed completely, as my family moved to Madrid (Spain). I was so surprised (and confused) the first time I saw the Orion constellation upside-down! In the following years I could not see very dark skies in the capital of Spain, but I did visit the planetarium in Madrid many times. After high school I

started to study physics at the Universidad Complutense de Madrid (UCM). The (old) Licentiate in Physics degree consisted of five years of study. Three of general physics, in which I got a taste of research work by doing a couple of summer projects in optics and solid state physics, and two final years of specialisation — when obviously I chose astrophysics. Thanks to the Bologna Process, my generation had to take an extra academic year to get the new MSc degrees before qualifying to start a PhD programme in Spain. This final year was mostly research-focused, so I investigated the activity properties of ultra-cool dwarfs in the infrared under the supervision of David Montes — as preparatory work for the Calar Alto high-Resolution search for M dwarfs with Exoearths with Near-infrared and optical Échelle Spectrographs (CARMENES) instrument. Apart from the study time, I also have very good memories of my days in the faculty playing cards with my colleagues — more than 10 years later, when we all are in Madrid we still meet each other to have some drinks and play again.

By the end of my degree, I had developed a particular interest in brown dwarfs and extrasolar planets, so I decided to start a PhD. This was possible in 2011 when I was offered the Astrofísico Residente fellowship at the Instituto de Astrofísica de Canarias (IAC) in Tenerife. Leaving my comfort zone in Madrid was not an easy decision, but I was resolved to perform my research at an observatory. For my PhD I worked with Enric Pallé and María Rosa Zapatero Osorio on the atmospheric characterisation of very low-mass stars and brown dwarfs using observations of linear polarisation. At the IAC I had the opportunity to interact with researchers interested in topics as diverse as solar physics, stellar evolution and cosmology (and everything in between). I also got a lot of observing experience at the observatories of Izaña (Tenerife) and Roque de los Muchachos (La Palma). Some of my favourite telescopes during my PhD were the IAC80, the Nordic Optical Telescope and the William Herschel Telescope (and obviously the FOCal Reducer and low dispersion Spectrograph 2 [FOR2] on the Very Large Telescope [VLT], too!). At the end of my thesis I had accumulated about 100 nights of observations, and



lots of hours using robotic telescopes from home.

After defending my PhD, I moved to the University of Western Ontario, Canada, to start my first postdoc in Stan Metchev's substellar objects team. There I continued my studies on substellar atmospheres by using photometric and spectroscopic observations with data from Gemini, Hubble, Spitzer, and some robotic telescopes from the Southeastern Association for Research in Astronomy (SARA) network. I also had the opportunity to observe at Kitt Peak National Observatory in Arizona (another privileged place to contemplate the night sky), and helped in the initial construction of the Colibri Telescope Array near London, Ontario, sometimes in winter at  $-20$  degrees C! I am very thankful to my wife, who was crazy enough to join me on this adventure in North America, where our son was born. By the end of my postdoc in 2018, I was offered an ESO Fellowship in Munich. ESO is one of the key names that I heard as a child, and working there was a chance that I could not miss, so my little family and I switched continents again in September 2019.

In my research I try to understand the atmospheric structure and composition of substellar objects by using different techniques and instruments from several telescopes. This has made me realise the

importance of the (sometimes invisible) tasks that take place in an observatory — from the moment that a proposal is approved to the time when data are collected. Because of this I decided to do my functional work at the ESO User Support Department. I currently give support to programmes related to FORS2 and the Echelle SPectrograph for Rocky Exoplanet and Stable Spectroscopic Observations (ESPRESSO), and soon to the CRyogenic high-resolution InfraRed Echelle Spectrograph+ (CRIRES+), too. I enjoy checking the observational strategies that other astronomers send us for their programmes, and helping them when they get stuck in the elaboration of this material. My duties give me the chance to interact with our colleagues from Paranal, and to learn from them when they identify an observing run that can be optimised to maximise the science return. I am also involved in the preparatory work for the upgrade of FORS (FORS-Up), which allows me to learn about the initial phases in the design of an instrument. Apart from my duties, I am currently the Fellow mentor of four PhD students at ESO, and have participated in the organisation of the second and third ESO Summer Programmes; these have been extremely rewarding experiences.

During my free time I enjoy exploring the beautiful area of Bavaria with my family, that recently got bigger with the birth of my daughter, or visiting some very old buildings. Astronomy has set out the path that I have followed for my career, taking me to several countries, living lots of adventures and meeting people from different cultures. Every minute invested in learning about it has been worth it!

### Nicola Pietro Gentile Fusillo

I was six years old when for the first time I looked through a telescope and observed the marks that the comet Shoemaker-Levy had left on Jupiter. I couldn't know it at the time, but the fascination I felt then, realising I was directly seeing events happening on another world, would never leave me.

When I was growing up astronomy became one of my passions and it drove my academic interest in physics. When I

was 16 I won a scholarship to attend the United World College of the Atlantic, a boarding school in Wales, so I moved from Italy to the UK. There I was very lucky to meet teachers who were passionate about their subjects and eager to foster the same passion in their students. I will forever be grateful to my physics teacher, Gabor Vincze, who recognised my interest in astronomy and helped me decide to apply to study physics at university.

I stayed in the UK and enrolled in the integrated Master's physics course at the University of Warwick where for my Master's I "mined" the database of rejected objects from the Wide Angle Search for Planets (WASP) looking for variable stars. This was my first real experience of a research environment in astronomy, and, despite its unique mix of frustration and excitement, it convinced me that I wanted to take my education further and apply for a PhD. I was offered the opportunity to stay at the University of Warwick and pursue a PhD with Boris Gänsicke on the topic of white dwarfs. Warwick became my second home and I dedicated myself to absorbing as much as I could from the amazing people who made up the astronomy group. I will never be able to thank Boris enough for all that he taught me as my PhD supervisor.

During my doctorate, I also took part in a one-year studentship in the Isaac Newton Group on the island of La Palma, where I worked as a support astronomer at the Isaac Newton Telescope (INT). The INT is a remarkable facility where most of the time one lone astronomer spends night after night running the 2.5-metre telescope completely on their own. Those were strange, but also somewhat magical, nights and the INT proved to be the perfect "school" for observational astronomy. I treasure every single day of my year in La Palma and the experience renewed my passion for astronomy. Back at Warwick I completed my PhD and almost immediately started a postdoc position in the same group under the leadership of Pier-Emmanuel Tremblay. I was given considerable freedom to pursue my own research interest and focused much of my work on constructing large samples of white dwarfs using the Gaia satellite and then using these white dwarfs as tools to explore the evolution of extra-



solar planetary systems. In my research I had the opportunity to use the ESO telescopes at Paranal Observatory in Chile and naturally became very interested in the international organisation behind these cutting-edge facilities. With a science focus in observational astronomy and my previous experience of large telescopes, I was soon drawn to the ESO Fellowship. I joined ESO in Garching as a fellow in 2019 and immediately felt welcome in the diverse social and scientific environment of this organisation. I had originally hoped that my functional work would be to support operations at Paranal, but after just my first trip to Chile the global pandemic made this duty option impossible. However, at ESO there is no lack of opportunities to take part in extremely interesting projects and in my new functional work I use my expertise in white dwarfs and large area surveys to find standard stars for the next-generation instruments that will be mounted on the ELT.

Despite the chaotic year we have just been through, ESO remains a unique place where I have found absolute freedom in my science objectives, an amazing and supportive group of peers, and an open international environment where in the space of one coffee break problems and doubts are answered with expertise and wild ideas can turn into successful projects.