

## Fellows at ESO

### Michaël Marsset

I come from a family of scientists: both my parents were ocean geologists. When I was a kid, they were spending a lot of time on oceanographic boats in various parts of the world, such as the delta of the Congo River, the coast of Djibouti, and the Black Sea near Romania. I was amazed that someone could be paid to travel to such fascinating places around the globe. This undoubtedly fueled my desire to become a scientist too.

My grandmother, ‘Babouchka’, also played an important role in my early life by giving me books on astronomy. She was a big fan of Hubert Reeves, our ‘French-speaking Carl Sagan’, who sadly passed away recently. In a beautiful coincidence, years later, I won a grant created by this great man while doing my Master’s studies in astronomy at the University of Montreal. This award contributed significantly to launching my career, as I used the funds to attend my first international conference on astronomy.

At university, I chose to study physics and then astronomy, trying to carve out my own path separate from my parents’ field of geology. Ironically, I now study meteorites and asteroids, essentially space rocks! These ancient ‘fossils’ from the early Solar System are truly fascinating, offering insights into our young proto-solar disc and the early migrations of the giant planets. They are also intimately linked to the history of life on Earth. For example, I recently had a paper accepted in *Nature*, in which we demonstrate that a very peculiar collisional cluster of asteroids in the main belt — the so-called Massalia family — was responsible for the mid-Ordovician ice age, and the major biodiversity event that followed.

But let’s take a step back in time. My first contact with ESO happened during my PhD when I was fortunate enough to be selected for a two-year studentship in Chile. During those two years, I fell in love twice: first with the country, and second with someone who would later become my wife. After the studentship, I moved back to France — my home country — to finish my PhD and then took on a post-doc at Queen’s University in Belfast, Northern Ireland. There, I studied the



Kuiper belt, the ring of small bodies beyond Neptune’s orbit, through multi-band photometry obtained at the Gemini Observatory on Maunakea — a breathtaking astronomical site I was lucky to visit twice!

Two years later, following the path of Irish immigrants from a couple of centuries ago, I moved from Ireland to the east coast of the U.S., settling in Boston. There, I worked for three years at MIT on two parallel projects: a spectroscopic survey of near-Earth asteroids and an imaging programme of large main-belt asteroids using SPHERE on the VLT. This next-generation instrument, providing diffraction-limited observations at optical wavelengths, is quite amazing. It enables us to see asteroids from Earth in unprecedented detail, offering insights into their... geology! (Ironic, isn’t it?)

After MIT, I returned to my first loves — ESO and Chile — working as a fellow at Paranal and Vitacura. I had the chance to be assigned to a brand-new instrument, ERIS, which offered me the incredible experience of participating in its commissioning and science verification. Later, I joined the Paranal team responsible for developing and maintaining our home-made set of software tools for first-level quality control. During my shifts at the observatory, I alternate between core operations and software development,

ensuring I never get bored. While at Vitacura, I thoroughly enjoy the scientific environment and continue working on my various projects.

The life of an observational astronomer can be a true adventure, offering many opportunities to travel the world and work in remarkable places like the Maunakea and Paranal observatories. In my case, the most surreal destination this journey took me to was undoubtedly the film set of the movie *Don’t Look Up*, where I served as a hand double for Leonardo DiCaprio, writing the comet’s equations on-screen. It was an incredible experience working alongside renowned actors and blending science with cinema.

Looking back, my journey has been a mix of opportunities, passion, and a bit of irony. From a kid avoiding geology to an astrophysicist studying space rocks, it’s been (and still is) a fascinating ride. And through it all, my goal has always remained the same: to understand the universe a little better and inspire others to look up at the stars (and space rocks) with wonder. Finally, I want to thank all the people who have helped me along the way: my family, my friends, colleagues, and importantly, my scientific mentors over the years: Doctors Pierre Vernazza, Christophe Dumas, Audrey Delsanti, Wesley Fraser, Francesca DeMeo, and the great Professor Richard Binzel.

## Ashley Barnes

To start with, I must say that I truly love my work in astronomy, the amazing people I collaborate with, and the day-to-day discoveries that keep my passion for the cosmos alive. However, my path to this stellar career wasn't something I envisioned from a young age.

Like many young boys, my first scientific love was not the stars, but dinosaurs. I was utterly captivated by them and could spend hours on end learning everything about all these ancient creatures (I think I saw them as something like real-life pokemon!). But around the age of 10, coinciding perhaps with the release of the prequel Star Wars films (and, probably, how the era of the dinosaurs ended), my fascination shifted upwards to the cosmos. I became engrossed in everything space-related, watching countless programmes on the Discovery Channel.

Yet, despite this growing interest, I didn't initially see a career in astronomy as something achievable. With no academics in my immediate environment, the concept of being a scientist was somewhat abstract and distant.

During my school years, I pursued a different path entirely. I aspired to become a chef, dreaming of emulating culinary stars like Jamie Oliver and such. My school required a work placement in our chosen field, so I spent a week in a small kitchen. It was a wake-up call. The professional cooking environment, with its intense heat, pressure, stress, and long, unsocial hours, was far from what I had imagined. It was a sobering experience that prompted me to reconsider my future.

After this pivotal moment, I shifted gear and focused on studying maths and science in college, subjects I found far more enjoyable and rewarding than during my earlier school years. Doing relatively well in these areas, I went on to study Physics with Astronomy at the University of Leeds. There, I had the opportunity to undertake two summer student projects, delving into astrochemistry within star-forming molecular clouds. This experience gave me my first real taste of a career in academia and cemented my interest in pursuing this path further.

My academic journey continued with a PhD jointly at Liverpool John Moores University in the UK and the Max Planck Institute for Extraterrestrial Physics (MPE) in Munich, Germany. My research focused on understanding star formation across the Milky Way, from the galaxy's disc to its very heart in the Galactic centre. I was incredibly fortunate to be working at a time when the Atacama Large Millimeter/submillimeter Array (ALMA) was providing cutting-edge, high-resolution observations of star-forming regions. This led to my involvement in the ALMA CMZ Exploration Survey (ACES) ALMA large programme, where I am now a lead co-PI, and currently pushing on ground-breaking science.

Following my PhD, I moved into a post-doctoral position at the University of Bonn's Argelander-Institut für Astronomie (IfA), where my research extended beyond the Milky Way to nearby galaxies. This work primarily utilised the multi-wavelength database from the PHANGS consortium, incorporating observations from ALMA, the Very Large Telescope (VLT) MUSE instrument, the Hubble Space Telescope (HST), and most recently, the James Webb Space Telescope (JWST). During this time, it became apparent that to fully understand star formation, we

must also consider the effects of the stars themselves, a process known as stellar feedback. In addition to my research, I found teaching and supervising students to be very rewarding. Many of these students have gone on to do great science themselves, and I am immensely proud of their achievements!

Now, as an ESO Fellow, I am focused on combining my work on external galaxies from the PHANGS project with my studies of the Milky Way (from e.g. ACES). My goal is to understand the high-mass star formation and stellar feedback cycle and how these processes drive the evolution of galaxies. I am currently conducting my fellow duties in the ALMA ARC at ESO, which I very much enjoy. Seeing the inner workings of a telescope I have used throughout my astronomy career has been incredibly insightful and rewarding. Overall, I am extremely grateful for my current position, which allows me to work with state-of-the-art observations and push the boundaries of our knowledge of the Universe.

Through my winding journey, I hope to inspire the next generation of young scientists to pursue their passions, no matter how unconventional their paths might seem!

