

Chapter 3: Navigating the Tides of Academia

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Imagine being on a tall mountain at night, far away from any civilization. You look up into the sky and see thousands of twinkling stars in all directions. Each of them is a Sun similar to ours and each of them theoretically could harbor planets, potentially even with life. Isn't it fascinating to think about how it all could have formed, why our Earth and life exist, and if on some distant planet somebody might be thinking exactly the same thing at the exact same moment? We are only a small dot in the universe, yet we are driven by the motivation to explore, to understand, and to always try to make progress.

I have always been fascinated by the sky and our universe, and I have spent countless nights outside. I probably was in primary school when I decided to study astronomy. In an age before the internet, all of my information came from the library. I remember spending many afternoons in the local library, reading any science books they had and going from astronomy and physics to chemistry, atmospheric sciences, and engineering. I believe strongly in wide exploration to find your true passion. Astronomy has always remained my greatest fascination, even if I cannot fully explain why. Nobody in my family had ever worked in a similar field; I had nobody to ask for advice, only the desire to explore our universe.

First Steps in Academia

My fascination with the universe remained throughout high school and I decided to study physics at ETH Zürich. I very much enjoyed learning

and also doing research, therefore the logical step after graduating was to pursue a PhD.

I was not aware that the choice of the PhD, in terms of both topic and supervisor, is critical for a career in science. During my PhD I witnessed several students who were unlucky with their supervisor or treated poorly in terms of their working conditions, and it had a detrimental effect on their career. My PhD supervisor left to take up a professorship in another country and I was assigned to another professor. In my case, I was lucky because this gave me the freedom to focus on my own preferred topics. But it also created a lack of support: there was nobody to ask or learn from on a daily basis and no one to support me later at the university, because my research direction ceased to exist in Switzerland. Unfortunately, science often works based on networks, and a strong supervisor can influence future invitations to conferences, or sometimes even whether one gets a professorship. I realized at that point that it would be very difficult to stay in my own country and continue doing research in my field. Overall, I highly enjoyed research and wanted to continue after my PhD. At that point I didn't know yet that with each step up the ladder, academia gets more difficult.

Noticing the Darker Sides of Academia

For my postdoc years I moved to the US. During my first postdoc I had a great advisor who even encouraged me to write a NASA grant. I did not think I had a strong chance, considering that success rates were below 20% and I was a first-year postdoc competing with senior scientists. But I was surprised with a positive evaluation. There, I started noticing unfairness in academia, because while I was allowed to write the grant, I was not allowed to submit it under my name, being “just” a postdoc; I had to put somebody else's name. When the director announced the successful grant at a staff meeting, the other person was congratulated, which makes one feel quite worthless. This is quite systematic in academia, and this history repeated itself years later in Switzerland, where I had the scientific idea for the grant and wrote the whole science case, but again

was not given any official recognition when the success was announced in a staff meeting. Unfortunately, the system still has not changed and I am certain that many postdocs are still in the same situation, getting no recognition for their hard work. I wish I were able to change that.

Fortunately, with the move to another institute for my second postdoc position, I was able to take my grant with me. My second postdoc position initially sounded very interesting, and the group was very nice. But upon arrival, I was not allowed to do any of the promised work and instead was made to debug software. While I would not have minded learning a new area, it was clear that the treatment of researchers was very unequal and that my having a grant, which could allow me to immediately quit, meant there was no sufficient leverage for my supervisor. Power games were often played and micromanagement was ubiquitous. Having my own grant allowed me to pay myself for a day per week, which I could at least use to work on science and to buy myself a decent laptop, something that I was not given at the institute. Through the grant I was also able to pay a postdoc, which is when I learned that my salary was lower than his. In my naive thinking about equality, I hoped to be able to make my salary equal to his by paying the difference from my grant, at no cost to the institute, but this was refused by my supervisor, even though I lived in one of the most expensive areas of the US, where half of my salary was spent on rent. I realized only later that this was very systematic, especially for women, and in several later jobs, I again noticed large salary gaps between myself and people with the same experience and seniority level. I just hope that someday I will be in a position to be able to fix such injustice for future generations. Unfortunately, the power games continued. For example, imaginary deadlines for certain software tests were invented in order to coerce me to work on other things during my own science day.

After a few months, I decided that this was not the scientific career I had dreamt of. I also missed my friends and family and decided to return to Switzerland. This posed a major problem because jobs in my field are very rare, which meant I again had to pursue a grant to fund myself. I spent most of my evenings and weekends on an application for a Marie Curie Fellowship. I was overjoyed when I got the positive notice,

and, while the referees are probably unaware of it, they can be credited for keeping me in academia. This improved my working situation considerably, because I was then able to quit my job, and switch fully to my NASA grant to finish some scientific work during the months before my European grant started.

One of the highlights during my last months in the US was a trip to the observatory where I had spent my diploma thesis in order to observe eruptions on the Sun. Such eruptions are very hard to predict, which made the observations quite challenging. But with good planning and a little luck, my colleagues and I managed to catch the “best-ever observed eruption,” as NASA later called it in a press release. It was the first time that nearly all solar satellites, which we had coordinated to point to this location a day in advance, and a ground-based telescope captured such a large eruption simultaneously, giving us extremely valuable data. That night we had a party to celebrate the good measurements. For an astronomer, having such an observation succeed was the greatest gift. There was a subsequent live press conference by NASA, in which I was invited to participate. In normal cases, I would avoid anything live — even documentaries make me nervous in spite of being able to repeat the scene if I screw up. But this was such a great observation that it was worth it. The measurements were vital later because I was able to lead and participate in more than a dozen publications that led to many nice collaborations and helped me to become an expert in the field.

The Unpredictability of an Academic Career

I think this experience shows very nicely that achievements are unpredictable, in terms of both science and career paths; one should never be discouraged by bad odds. For every single grant I applied for, I was told not to get my hopes up because only about 15% of the applicants succeed, and so I never expected to get a grant. By now, I have received four of these grants, recently including the most prestigious grant of Europe: the European Research Council (ERC) grant. Of course, I was convinced I would not get it after the interview and read the subsequent acceptance

letter several times. I felt immensely grateful reading the kind and very positive reviews of my scientific proposal and of my career, making me believe that some people respect and appreciate my work. I have thought more than once about quitting academia, especially after also experiencing the darker sides of it. But such kindness has now several times helped me continue, and I hope that the referees are aware of it, even though I will never be able to thank them properly because of their anonymity. I would always recommend taking any odds over not applying for grants, where chances clearly are 0%.

Returning to Switzerland, I was able to work on my own project, I had nice collaborations, and the only drawback was that my job was not permanent. After a few years I started worrying what would be next, whether I would have to choose between my home and my favorite job. In Switzerland, there was no prospect of a professorship in my field; it simply no longer existed. I also ran out of options to apply for grants because existing research groups in other fields only supported applicants they knew and who worked in their field — again the famous networking issue. When I saw a job announcement to lead Europe's largest solar telescope, I found it a highly interesting opportunity and applied. The job was based in Germany, close enough to the border that would allow me to keep living in Switzerland.

Leadership Positions in Academia and Crashing against Barriers

The job was the most interesting ever — no two days were the same. I experienced a steep learning curve in optics, mechanics, electronics, and management. The institute had generous funds and the opportunities and projects it led were impressive. It operates several telescopes on the island of Tenerife in Spain, one of which had been inaugurated more than half a decade earlier, but unfortunately was experiencing some quality problems. When I asked about my job description, I was given the simple reply: “make the telescope work.” While the technical challenges were relatively straightforward, the management unfortunately

was not. For the first time, I had a management position with a large responsibility and budget, and I started experiencing every single bias that I much later heard about in leadership seminars.

As somebody who has visited many different observatories, I was surprised about the lack of control and safety rules at the telescope. This was also reflected in the complaints of the observing assistants, who told me that they were usually asked to leave and were called only when problems occurred; by that time, they could not tell who had touched which part to fix anything. There were no scientific publications from this telescope at all, even three years after its inauguration, which is the metric that scientists are judged on. I started introducing rules — for example that optical elements can only be touched by the relevant optical scientists, that all changes and errors are to be documented, and that trained assistants are responsible for the telescope. But going from “I can do everything” to “there are some rules” was not easy, and it led to many discussions.

I started experiencing every single barrier in academia. Intimidation was used as an attempt to keep old kingdoms and power structures. Information was withheld on purpose. Some people acted so maliciously that they even started random rumors to make me look bad and to set the technical staff against me. Every time I would meet some technical staff, they would ask me questions about why I decided to stop supporting something, when in fact I had never even thought about these topics, let alone decided anything about them. In summary, it was a huge culture clash because most of them had also never been observing in other facilities and did not know how they were professionally operated. It was also the first time in decades that they had a much younger and female colleague, and I had the impression that many did not seem to be able to cope with this. In the entire institute, there were only two women in leadership positions: me and the institute director, who had been appointed just a few months earlier. We both experienced similar issues and I was very glad about her support. It was only later, in events organized by the Swiss National Science Foundation (SNSF), that I learned that most women in leadership positions face very similar problems. Any type of decisiveness or enforcement of change is often seen as being too

aggressive for women, while doing the opposite would have labeled me as weak and incompetent.

While my main goal was of a purely scientific nature, certain other people seemed to have personal goals related to power and control. Nevertheless, I aimed to improve the stability and operation of the facility.

I asked our technical staff to look at the causes of the errors. With proper documentation, one could also see which ones occurred under which conditions. As the stability improved, the whole operation improved and committees started noticing it. I was asked to give a presentation to the scientific advisory committee, and the responses were very positive and culminated in the suggestion of extending my power to the institute's full observatory and its operation. However, this meant that somebody else, a male colleague a few years before his retirement, would lose power. Even though I had nothing to do with it, this person still blamed me. Unfortunately, this created even more jealousy. The new, young, and female scientist got promoted faster than anybody else and the director was blamed for favoritism, even though she only executed the advisory committee's recommendations. Unethical behaviors with the goal of demoralizing me followed regularly, until I had to defend myself by filing an official complaint. Even though the person was found guilty and even apologized, he was at first only given an oral warning, and it took another bullying case and defamation in front of more than two dozen people before he received a real disciplinary warning. While the situation was definitely unpleasant, I find it highly important to always speak up about unfair treatment. I also highly appreciated the few people that openly supported me, because change in academia and a reduction of bullying can only happen if courageous people join forces.

I asked myself many times if it is worth it to continue doing a job I love under these conditions. I was away from my friends and family and stressed by the actions of a few malicious people. What made it worthwhile was the collaboration with a few very nice and highly competent colleagues. These colleagues supported changes and out-of-the-box thinking, which led to a complete redesign of the faulty telescope. Throughout the next year, we worked tirelessly on our upgrade. We flew to Tenerife just before the start of the pandemic, when things did not yet

look bad. Unfortunately, the situation changed rapidly. By the second week, we were trapped at the observatory during a government lockdown. No one was allowed to go outside, and our flights were canceled. Being an observatory, the next grocery store was a long drive away, so we had to start searching all freezers for food that other people had left. In the end, we spent three weeks together at the observatory, unable to drive anywhere. We had common lunches and dinners, and everybody got along very well. When we saw the first sharp image on the screen, my colleague and I just had to look at each other and we knew that it was a great success. In only a year, we managed to improve the facility more than in the decade before, and, finally, the telescope was working with the proper resolution.

Taking Opportunities

After a few years, I was given the great opportunity to apply for a PRIMA grant because of a collaboration I had with the department of computer science at the University of Geneva. While I enjoyed my job at the observatory, the frequent bullying was tiring, and I was curious about leading a research group with students and learning a new topic. My proposed project was about the Sun and its eruptions. Such eruptions can significantly influence Earth. They not only cause Aurora, but they can also bring down satellites, cause power outages, or increase radiation levels for astronauts and people in airplanes. Yet nobody could predict these events. This was a perfect application for computer science: using machine learning, it is possible to analyze the millions of recorded data points before eruptions to automatically find common patterns and thus aim to predict eruptions. When my PRIMA proposal was accepted, I was in Australia, on my first vacation after a long time. So instead of getting the acceptance letter — which landed at an empty apartment in Switzerland — I got a strange email request to “release funds,” making me wonder why I would have any funds to release. As usual, I hadn’t expected to get the grant. I logged into the grant system to find an incredible amount of more than 1.5 million CHF on the display. I still couldn’t believe it,

prompting me to send an email to the SNSF asking if that really meant I got the grant.

I started in Geneva during the middle of the pandemic, when home office was first mandatory and later recommended. The first time I met my colleagues in person was nearly two years later, at a faculty dinner. While home office increased the quality of life considerably and also enabled me to work very productively, it was not ideal for starting new collaborations, especially as a completely new person at the institute. But one of the very positive aspects about the grant was that it enabled us to create a network of PRIMA grantees to share support and advice. Having quit my permanent job leading the observatory, I again faced temporary employment through the PRIMA grant, in addition to not being allowed to apply for other Swiss grants that could have created collaborations and increased my chances for a permanent job. While such situations stressed me immensely at earlier stages in my career, I have now come to accept that a career in academia simply cannot be planned, and I enjoy whenever my research group and I can work in astronomy peacefully.

As of February 2024, I am fortunate and grateful to have obtained a tenured professorship at the University of Bern. This unexpected opportunity became possible by repeatedly shifting my research focus in different directions and through the support of various people. The path was definitely not straightforward, not easy, and apparently, I am now the first ever female astronomy professor who is a member of the faculty at the University of Bern. While several of the problems mentioned earlier still remain, I have learned much better how to navigate academia. I still very much enjoy going to observatories, spending nights outside, and looking at the stars. I am very grateful to be able to do a job that I love and to now be in a position where I can aim to improve equality and ethics for students and scientists.

