

interesting when observing occultations, as exoplanets are relatively bright in the mid-infrared compared to their host stars. However, some challenges still remain in the form of high background noise in this wavelength domain, as well as VISIR's relatively small field of view. There are currently some ongoing ESO programmes to investigate the feasibility of such observations with VISIR. The relative brightness of planets in this regime also opens up the possibility of directly imaging exoplanets with this excellent angular resolution instrument.

Besides the talks mentioned above, Elyar Sedaghati from ESO Santiago presented results on transmission spectroscopy of the exoplanet WASP-19b, performed with the VLT's Focal Reducer/low dispersion Spectrograph 2 (FORIS2) instrument, for the purpose of characterising its atmospheric properties (Sedaghati et al., 2015).

This observation was made possible through the exchange of the previously damaged longitudinal atmospheric dispersion corrector (LADC) prisms (Boffin et al., 2015). Bill Dent from ALMA gave an introduction to some of the capabilities of the now fully functional submillimetre interferometer; possible applications to study exoplanets, young exoplanetary systems and protoplanetary discs were highlighted. Mark Booth, from the Universidad Católica discussed the place of debris discs in planetary systems, as well as the consequences of interactions between young planets and their neighbouring environments. Finally, Holger Drass, from the same institute, presented some preliminary results from deep HAWK-I and KMOS observations of the Orion Nebula Cluster, where a second peak in the sub-stellar initial mass function points to the possible presence of free-floating planetary mass objects.

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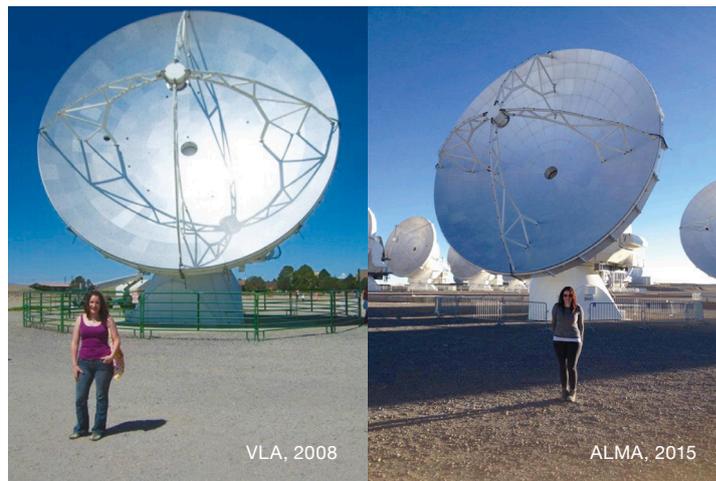
#### Links

- <sup>1</sup> Introduction, programme, list of participants and the presentations can be found at: <http://www.eso.org/sci/meetings/2015/Exoplanets2015.html>

## Fellows at ESO

### Lizette Guzman-Ramirez

Ever since I can remember I have always been fascinated by the Moon, so I guess that was how my interest in astronomy started. I'm originally from a small town in the north of Mexico, called Saltillo. I lived there with my parents and sister until I was seventeen, when I moved to the centre of Mexico to do my undergraduate degree in physics. By the time I decided to do physics, I was already planning to be an astronomer, although I didn't know what being an astronomer really meant. During my study of physics I learnt many things, but almost nothing related to astronomy. Luckily I managed to get a grant for an astronomy summer school organised by the Centre for Radio Astronomy and Astrophysics (CRyA) of the Universidad Nacional Autónoma de México (UNAM). Those two weeks in the summer of 2004 were a turning point in



Lizette Guzman-Ramirez

my life as an astronomer — they convinced me that I wanted to be an astronomer and learn about the Universe.

To receive a physics degree in Mexico you have to do a thesis on a research topic related to physics. To do this, I

moved to the south of Mexico, to the CRyA, to work on an astronomy project, and this was to become the start of my career as an astronomer.

I had the pleasure and honour to work with Yolanda Gomez on my project. She taught me everything about planetary nebulae, and, most importantly, how to analyse interferometric data using the Astronomical Image Processing System (AIPS). My thesis project was on measuring the distances to planetary nebulae using a technique called expansion parallax, where you observe the same planetary nebula at two different epochs. Then, because of the high resolution of radio interferometry from the Very Large Array (VLA), you can measure the expansion of the nebula. Having the expansion in the plane of the sky and the velocity corresponding to this expansion, gives the distance straightaway, so it is a simple and neat way to get the distance to a stellar object. I realised back then that knowing the distance to an astronomical object is one of the most important parameters an astronomer needs so that they can start to understand its luminosity, mass, temperature, and to be able to make an accurate model of the object.

After this short project, I was more convinced than ever that astronomy was my ideal job. Therefore I applied for a grant to do a Masters degree at the same institute, to keep working with Yolanda Gomez and measuring the distances to more planetary nebulae. In Mexico the Masters programme lasts two years, or four semesters; for the first three semesters you have to take courses, covering anything from star formation to cosmology. In the last semester you prepare for an exam, called the general exam and anything from the last year and a half will be covered in this exam. In the third semester I went to the VLA summer school to learn more about interferometry and data reduction. During this summer school we visited the site where the antennas are based; that was an amazing experience and I also saw the first prototype of what was going to be an ALMA antenna (see Figure). I remember thinking back then that my next dream would be to work for ALMA.

During the last semester when I was preparing my exam, my Masters supervisor, Yolanda, told me about a conference that she thought it would be good for me to go to: the Asymmetric Planetary Nebulae IV conference, held in La Palma, in 2007. This was my first international conference, and the one at which I could meet all the authors of the “famous” papers I was reading. I think this conference also marked a milestone in my life in astronomy; I met a lot of people with whom I am now working, and, more specifically, the conference summary was given by Albert Zijlstra, who became my PhD supervisor a few months later.

After passing my exam and getting the Masters degree, I applied for a grant to do my PhD in England and by the beginning of 2009 I was living in sunny Manchester, ready for four years of full-on research towards a PhD in astrophysics at the Jodrell Bank Centre for Astrophysics of the University of Manchester.

I moved to Manchester with the idea that, because it was going to be so different from Mexico, I was not going to like it, and that the weather was going to be my worst enemy. It turned out that those four years in Manchester were probably some of the best years of my life. I met amazing people and I ended up loving the city and its rain. After a year of living in Manchester I really learnt to appreciate the Sun and warm days. From 2009 to 2013 I specialised in infrared and optical astronomy and performed a lot of spectroscopic observations in order to find new planetary nebulae in the Galaxy. I had to do the observations with small-ish telescopes in the US, South Africa and Australia. During my travels I met a few people from each institute, and I ended up spending three months in Sydney, Australia, working at Macquarie University with Quentin Parker, and two months in ESO Garching, working with Eric Lagadec on some infrared data taken with the VISIR instrument on the VLT. This was my first encounter with data from an 8-metre telescope and with ESO specifically. These infrared data made me focus more on observations of polycyclic aromatic hydrocarbons (PAHs) in planetary nebulae, and more specifically, trying to understand their formation and evolution in different environments.

During my PhD I worked as a teaching assistant in the physics department of the University of Manchester and I taught Spanish to English students who had received an Erasmus grant to go to Spain for a year, in order to help them in their preparations. I really enjoyed teaching, but I always loved going observing a lot more, so I decided that I wanted to work at an observatory. This decision led me to the next step on my career, applying for an ESO Fellowship to work for ALMA. In the last months of my PhD my supervisor gave me some data that was abandoned in his hard drive; this was radio interferometry data from the VLA, and I analysed them with CASA (Common Astronomy Software Applications). I had to get all my rusty knowledge on AIPS back and used the AIPS-to-CASA guides. This gave me a huge advantage when I applied for the ESO Fellowship, because I already knew how to use CASA, the software used to analyse ALMA data.

Luckily I was awarded the ESO Fellowship, so in April 2013 I moved to Chile to start a new chapter of my life. I was happy to be back in a country where I could speak Spanish again, where it turns out that in Chile people speak Chilean (not exactly Spanish), but I think I manage to understand them and make myself understood “most” of the time. I’m on the third year of my Fellowship now, and I have to start thinking about the next step already. But the last three years have been nothing but amazing. I really enjoy going up to the ALMA Observatory; for me the ESO Fellowship is a great compromise between your science and being able to learn all about the instrument you are using, from planning the observations to delivering the data. During the Fellowship, I have done observing shifts, collecting as much data as possible, and have also done commissioning shifts, where we test new software, try different modes, and test the telescope to its limits, like the Long Baseline Campaign in 2014, or the high frequency campaign.

On one of my recent trips to the ALMA Observatory I went to visit the antennas (at 5000 metres above sea level) and I remembered my photo from the summer school back in 2008. So I took a similar photo to remind myself that whatever

dream you have, with enough effort and dedication, you can reach it. Now I just need to keep dreaming!

## Rebeca Aladro

I had the luck to grow up in a house full of books. My mum always liked to read science fiction and outreach. I fondly remember a couple of books, written by Carl Sagan and Isaac Asimov, which I read when I was in school. I was fascinated by the explanations about physics and the Universe. I exerted myself to understand all these strange theories about quarks, the Big Bang and the first seconds of the Universe, black holes, and many others. Of course, I just grasped half of the things (if that), but the curiosity was already there.

Time passed, and for many years I basically continued to read outreach and science fiction. Questions accumulated in my mind: what was there before the Big Bang? How does a black hole form and die, and what happens inside? Some questions that, years after, when motivated by curiosity, I began to study astrophysics, I discovered do have not answers so far. It's so funny that you decide to embark on a career to understand those rare things, only to find out that we do not have answers for many of them. Plop!

I studied astrophysics in Tenerife, where I met my husband. As a student at La Laguna University and Instituto de Astrofísica de Canarias (IAC), my little bit of experience was centred on optical telescopes. But when the moment to look for a PhD place came, I chose to do my thesis in radio astronomy, at the Institut de radioastronomie millimétrique (IRAM). I admit that I had no idea of what radio astronomy was. But the prospect of working at a telescope and living in Granada (in the south of Spain) was very tempting. During the interview for my PhD, my supervisor explained to me how cool the 30-metre telescope was (is). And I was completely surprised to hear that the pixel size changed with the observed frequency, and that they were very proud of a new instrument of  $3 \times 3$  pixels (only!). Oh yes, radio astronomy is a different world!



Rebeca Aladro

My PhD thesis was about the study of the physical and chemical properties of the molecular clouds in the central parts of active galaxies, where starburst events and supermassive black holes are typically found. In particular, the study centred on how the cold gas is influenced by the heating processes taking place in such regions (mainly ultraviolet [UV] fields, shocks, X-rays, cosmic rays, or a combination of them). During those years, I carried out duties at the 30-metre telescope during 25 % of my time, learning the basics related to observation at millimetre and submillimetre wavelengths, instrumentation, and single-dish data reduction.

I also learned other important things. Probably one of the most important was how the life of an astronomer really is. I still wonder why they don't talk about that during career sessions. The pros and the cons. When you finish university you have your head full of numbers and theories, but know nothing about real life. Again, when I started a PhD, I had no idea that giving talks at international conferences is a big part of the deal. I remember the two months prior to my first talk with terror and anxiety. The idea of quitting even crossed my mind. But I survived, as we all do. I learned to confront and overcome my concerns, and that made me stronger and more independent.

After completing my PhD I moved to University College London as a postdoc. There I worked with time and optical depth dependent chemical models, which I applied to NGC 1068, one of the

most famous Seyfert 2 galaxies. Simultaneous modelling of the abundances of 25 molecular species had never been performed before, and allowed me to constrain the physical characteristics of the circum-nuclear molecular gas, strongly influenced by cosmic rays and UV fields. On the personal side, although there for only one year and a half, my husband and I really enjoyed London. Yes, living in a place that you like is for me as important as working. We are not only astronomers. Before that, we are people and we have to enjoy life.

My second and current postdoc is at ESO Chile, with duties at ALMA and APEX. I had the luck to arrive at a very exciting moment, when ALMA started the first Early Science observations. Being part of the operations of such a big interferometer, whose potential we are just starting to realise, is really exciting and motivating. Just few days ago we were celebrating a new milestone, reaching 1770 baselines with 60 antennas.

However, my time in Chile is now coming to an end. In September we are moving to Sweden for my fourth ESO Fellowship year, plus another postdoc. I will continue doing ALMA duties from the Nordic Arc Node while, on the research side, I will be studying the molecular outflows of active galaxies, a quite new topic in radio astronomy. Many questions are just starting to be addressed — such as the quenching effects of the outflows in the star formation and activity of a galaxy.