

OPTICAL INTERFEROMETRY BRINGS NEW FRONTIERS IN ASTROPHYSICS

CHRISTIAN HUMMEL AND DANIELLE ALLOIN

ESO'S VLTI IS THE FIRST interferometer offered to the community of astronomers world-wide in service mode. Taking advantage of the presence of distinguished visiting interferometrists and members of the VLTI team at ESO Vitacura, a one-day micro-workshop was organized to introduce more ESO and Chilean astronomers and students to this observing mode and to make them consider the role the VLTI could play in their research. After introductory talks on interferometry, data reduction, and calibration, some outstanding recent results from VLTI/VINCI and other interferometers were presented, demonstrating impressively how optical interferometry has already con-

tributed to advances in some fields of astrophysics, e.g. in testing stellar evolution theory.

Research possible now or in the near future with existing or soon to be installed instruments on VLTI was highlighted in the field of stellar physics, where the possibilities are numerous, and in the field of AGN research.

The instruments and observation planning tools were described from the point of view of the user, conveying the feeling that those astronomers not specialized in optical interferometry are indeed encouraged to apply for observations with the VLTI.

Finally, the second generation of VLTI instruments was also presented, as well as some new concepts which will make inter-

ferometry in the optical and IR even more powerful.

The attendees, between 40 and 50, were astronomers and students from ESO, PUC, UChile, UTarapaca, as well as engineers, technicians, and telescope operators from Paranal.

It was a great pleasure to share the enthusiasm, inspiration, and lively discussion which were present throughout the micro-workshop. We hope this will bring more and more users to the interferometric observing mode and its immense promises.

Many thanks to the speakers, V. Coudé du Foresto, E. Galliano, C. Hummel, P. Kervella, S. Morel, A. Quirrenbach, M. Schoeller, and M. Vannier.

FELLOWS AT ESO

NICOLAS GRETTON



I CAME TO ESO Garching at the end of 2001, after a first post-doc at the Max-Planck Institute in Heidelberg. I got my physics diploma from Geneva University (Switzer-

land) before I moved to Leiden (The Netherlands) to work on a PhD project, under the supervision of Profs. Tim de Zeeuw and H.-W. Rix.

My research focuses on the dynamics of galaxies and their dark matter content: central supermassive black holes and large-scale dark halos. Studying unseen components of galaxies is intimately linked to the (dynamical) modelling one applies to the (kinematical) observations. Indeed, an over-simplified model could give the wrong answer regarding the presence of, say, black holes: it would only reveal its own limitations. In that spirit, I have implemented and extended the "orbit" method to model galaxies, originally invented by Martin Schwarzschild. This method makes no *a priori* assumptions about

the dynamical structure of the galaxies and is therefore well adapted to the question of dark matter.

Before coming to ESO, my work was almost purely theoretical, although I was modelling real galaxies and not just studying "academic" questions. The pertinence of my models also depends on the quality of the data (spatial and spectral resolution, S/N, extension, etc) so it was natural for me to try to get more expertise in the observational field. In this way, I was hoping to 1) better understand the observations and what they really mean (e.g., can we trust this error bar?) and 2) write better observing time proposals and 3) improve my general astronomy experience to increase my chances of getting a permanent position. Therefore I applied to ESO and fortunately got the job! At ESO, I got involved in the FLAMES group, led by Luca Pasquini. FLAMES is a multi-fibre spectrograph for the VLT which is revolutionizing the measurement of discrete stellar velocities, thanks to its multiplex capabilities, its spectral resolution and the collecting power of the VLT. In addition, it has two integral-field modes, where integrated spectra can be obtained over all the field of view simultaneously. I really enjoyed the atmosphere in Luca's group, mostly due to the personalities of its members and the success of

the instrument!

I am now in my last (third) year as an ESO fellow and I can say that I have really enjoyed my time here: ESO is a great place to do and discuss science, not only because of all the in-house expertise, but also because it is located right next to two Max Planck Institutes where astronomy research is also done. At ESO, one really has the feeling of being at the right place, where important things happen, where the latest news is discussed and where tons of talks are given each week and plenty of visitors pass by. Furthermore, Munich is a very nice city, with plenty of nature nearby (lakes, forests, hiking and skiing in the Alps).

EMANUELE DADDI



ASTRONOMY entered my life literally by accident. At the age of 15 I broke a leg playing football, and never-ending queues waiting in an Italian public hospital forced me to do plenty of

reading. With great excitement I realized from

a magazine of popular astronomy that a wealth of incredible wonders are out there in the sky, within the grasp of cheap instrumentation that even my own few savings of grandmothers' tips would suffice to buy. One month later the leg was OK, the grandmothers' tips had gone, and I had started exploring the Universe, with stars (uhm...), galaxies (ehi !), nebulae, planets, comets, etc, with a 14 cm telescope (0.03% of each of the 4 VLTs' collecting area!).

After 15 more years the passion for the Universe has even increased. In fact, I may say that research in astronomy is my favorite hobby, and I find myself very fortunate that it has also become my job. Since December 2001 I have been an ESO fellow in Garching, thus now in the third and final year of the fellowship. Before that I had done university and PhD studies in my home town, Firenze, working at the observatory on the Arcetri hill, where Galileo had been observing at the dawn of modern astronomy.

It was hard to leave the nice Tuscany weather for breezy Garching, but after two years I can say it was worth it. ESO is the best place to be in Europe for those like me who are interested in astronomical observations, as most of the cutting edge European instrumentation and telescopes are planned, built and operated here. It is a great advantage for research competitiveness to be in daily contact with the most experienced people in the field.

As a change from my early beginnings, my main research field is distant, faint galaxies: those that even after hours of VLT integration sometimes show just a barely significant detection. My duties at ESO are well matched to my own research interests as I am working for the GOODS survey which is releasing deep public data to the community. The final goal of these efforts is to understand how galaxies formed through the ages and thus in some sense to go past searching for our cosmic origins. There are so many big open questions and technical and practical challenges (the speed of light is finite and the Universe perhaps is not), that it sounds like we will never finish making new discoveries in these fields, and space for jobs will hopefully always be there for astronomers to enjoy!

POSHAK GANDHI

After my very first job interview in 2001 (for the Fellowship), I found it difficult to believe that ESO would want to employ me; or that I would agree to come to Chile, very far from my native India. I'm glad that I was wrong on both counts!

The friendly and stimulating environment of ESO-Chile helped to make the tran-

sition from student to post-doctoral fellow easy. The large international staff at the Santiago premises, constant stream of visitors and world-class instrumentation expertise sets the scene for collaborative scientific exchange, always helped along with a glass of excellent Chilean wine.

ESO operations at Cerro Paranal are a good lesson in team-work. Like a restless bees' nest, the united effort of all individuals assures a constant hatching of incredible scientific results. I am a night-astronomer for ISAAC and the FORSSs, as well as the web-manager for Science Operations. It is sometimes a challenge to work under the demanding conditions and deliver quality support. But the beautiful vista of the Southern sky on a dark night is deeply refreshing.

I am studying obscured active galactic nuclei – supermassive black holes at the centres of distant galaxies that emit huge amounts of energy (typically rivaling 10 billion Suns), yet do not show obvious signs of this activity because they are surrounded by a thick veil of gas and dust. X-ray telescopes can penetrate this veil, but follow-up work in the optical and near-infrared regimes, with telescopes such as those at ESO, is vital to truly understand these black holes.

I love the Chilean people's friendliness, but often complain about the food. Meanwhile, we're giving good business to the only Indian restaurant here. Perhaps in the distant future, Chile Chicken Korma con Choclo will be a 'traditional' dish on the menu...

DIETER NÜRNBERGER

Originally, I come from Franconia in the northern part of Bavaria, Germany. In my younger days I was often found star gazing there. Later on, for my studies of Physics and Astronomy, I enrolled at the nearby University of Würzburg which is well known due to Röntgen's discovery of X-rays more than one century ago. In fact, when I was searching for a suitable topic for my Diploma thesis, work related to data taken

with the X-ray satellite ROSAT would have been very timely. Instead, I ended up studying the gas and dust emission of circumstellar disks and envelopes around low mass pre-main sequence stars.

Although I was officially still affiliated to my home university over the next few years, I left Germany in October 1997 to work on my PhD thesis. I joined the Institut de Radio-Astronomie Millimétrique (IRAM) in Grenoble, France, to learn about radio astronomy in general and millimeter interferometry in particular. During that time I had the pleasure of spending several weeks per year as Astronomer-on-Duty at IRAM's Plateau de Bure interferometer (PdBI). At this remote observatory, located at an altitude of about 2550m in the midst of the French Alps, I had some of the most memorable experiences of my life.

Since the time of my PhD thesis, my own scientific work has been focused on the identification and characterization of intermediate and high mass protostars. For that purpose I am using two independent approaches. The first one deals with high angular resolution studies of protostellar candidates, which I had selected from the IRAS point source catalogue. The planned follow-up PdBI observations of the most promising sources would have been crucial for my thesis but were unfortunately severely affected by two tragic accidents on Plateau de Bure during 1999.

The second approach and my PhD thesis itself deal with a comprehensive multi-wavelength study of the galactic starburst region NGC 3603. The basic idea is to find evidence for ongoing star formation processes which are triggered and/or revealed by energetic photons and strong stellar winds originating from the OB stars of the central star cluster. As this region is only accessible from the southern hemisphere I was visiting Chile once or twice per year to observe with several ESO facilities, like the SEST, the 3.6m and the VLT Antu.

Currently, my curiosity about the formation of high mass stars pushes me towards the feasibility limits of today's telescopes and antennae, including the Australia Telescope Compact Array (ATCA) in Narrabri, Australia, and, of course, ESO's VLT(I) on Paranal, Chile. Thus, in order to keep track of the most recent generation of instruments as well as due to all the positive experiences which I gained at IRAM's PdBI, it was my greatest desire to continue working at one of the state-of-the-art observatories. In August 2002, when I started my ESO fellowship in Santiago with functional work on Paranal my wildest dream became true: here I'm able to live my profession with all my heart, enthusiasm and dedication.

