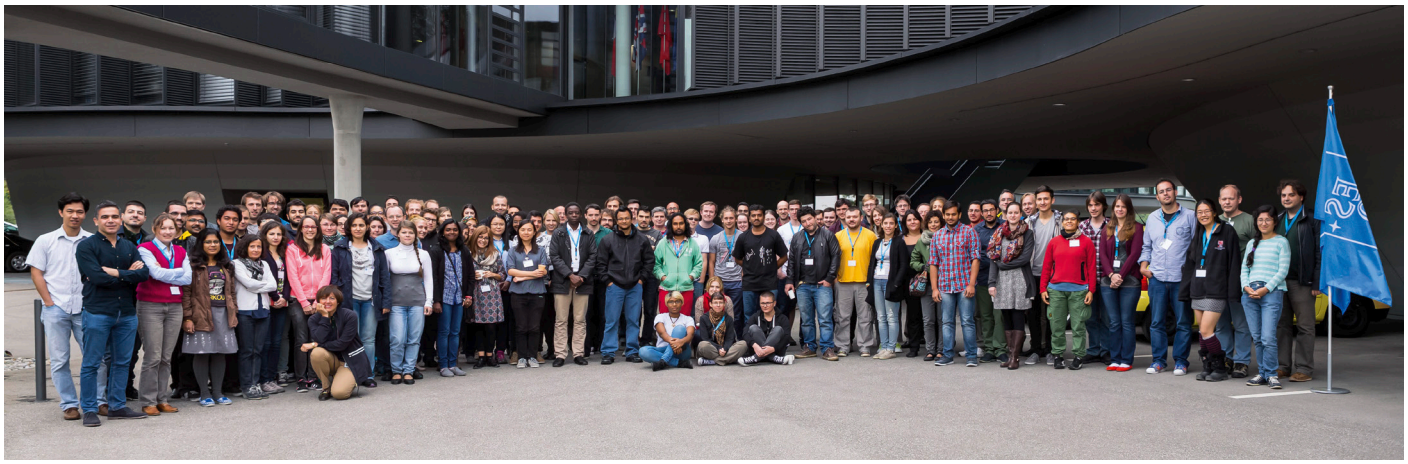

Figure 1. Participants at ERIS 2015 photographed outside the new ESO Headquarters building.

Social events included two buffet suppers at ESO (one a magnificent Bavarian barbecue). These were each followed by evening science lectures, by Katherine Blundell from the University of Oxford on the Galactic microquasar SS433 and by Tim de Zeeuw on the work of ESO. Both events proved very popular with the students and the nature of the questions suggested that we had (on average, if not for every individual) provided the right amount of alcohol beforehand. We decided that forcing the students to visit the local LOFAR station on their "free" afternoon was a bad idea, given the competition from other attractions in Munich, and gave them a U-Bahn ticket for the central zone instead. All arrived promptly at ESO the next morning, so this was probably the right decision!

Further information, including all of the lectures, tutorial scripts and datasets can be found at the school home page[1].

Acknowledgements

The meeting was co-sponsored by ESO and Radionet3, an EU Integrated Infrastructure Initiative to coordinate access, development, and training for radio astronomy facilities in Europe[2]. RadioNet3 has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 283393. We are grateful to the members of the Local and Scientific Organising Committees and to all of the lecturers, tutors and ESO helpers for their work in designing and presenting a coherent programme. Many other people helped to make the school a success. We would particularly like to thank: Tim de Zeeuw and Katherine Blundell for their after-dinner talks; Berkan Maruthadiyan and Tamas Tutundiscz for audio-visual and laptop support; Ana Vukovic for keeping us supplied with coffee; Andrea Dinkel and colleagues for sorting out the finances; and Wolfgang Wild for agreeing to the substantial ESO contribution. Finally, at every meeting there is usually one person without whom the whole organisation would have fallen apart. In our case, this was Elena Zuffanelli, who worked long and hard to make the school a success.

Links

[1] ERIS 2015 school home page: http://www.eso.org/sci/meetings/2015/eris2015.html
[2] Radionet3: http://www.radionet-eu.org

The AstroMundus–ESO Connection

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Gaitee Hussain[1]
Andy Biggs[1]
Hau-Yu Lu[1]
Eric Emsellem[1]
Annalisa De Cia[1]
Alexis Lavail[1]
Jason Spyromilio[1]

[1] ESO

The AstroMundus Programme is an E+ Erasmus Mundus Joint Masters Degree course in astronomy and astrophysics offered by a consortium of European universities and research institutes. In 2014 and 2016, AstroMundus Masters students visited ESO and participated in proposal-writing sessions, during which groups of students speed-wrote complete ALMA proposals, before presenting them to a pseudo Time Allocation Committee providing on-the-spot feedback. The AstroMundus visit of 25–26 January 2016 is described.

Nine students from the AstroMundus Programme[1] visited ESO during the afternoon of Monday 25 January 2016, with a welcome and introduction to ESO given by Eric Emsellem. Annalisa De Cia, Alexis Lavail and Jason Spyromilio then took

the students on a tour of ESO, including the assembly hall where they could gain an insight into instrument development activities (see Figure 1), and a chance to see components of the European Extremely Large Telescope (E-ELT) and the upgrade work on the Very Large Telescope (VLT) instrument CRIRES+.

The following morning was devoted to a single topic: how to write a good proposal. The sessions started with short talks by Liz Humphreys and Gaitee Hussain, outlining the mission (to speed-write an Atacama Large Millimeter/submillimeter Array [ALMA] proposal), introducing ALMA and explaining the important points of proposal-writing. Hau-Yu (Baobab) Lu, an ESO Fellow, then presented one of his successful ALMA proposals and explained what information he had included in the proposal, and why.

The students then split into three groups to prepare their own ALMA proposals. Each group was provided with a technical assistant with ALMA expertise (Andy Biggs, Baobab Lu and Liz Humphreys), who could help them to prepare the technical case and guide them in the use of the ALMA Observing Tool (OT). The topics of the proposals were pre-selected by these technical assistants, based on exciting ALMA results that the students could use as a basis for their work. The topics were: protoplanetary discs, based on the iconic ALMA HL Tau image (ALMA Partnership, Brogan et al., 2015); the high-redshift Universe, based on ALMA observations of normal galaxies at $z \sim 7$ (Maiolino et al., 2015); and astrochemistry, based on the finding that the disc of the nearby low-mass star MWC 340 has a comet-like composition (Oberg et al., 2015). Each group needed to prepare a complete science case (up to four pages) and provide the technical information required by the ALMA OT. A justification of the technical setup in the OT was also required. Due to the short time available, the students were allowed to write their science case in the form of bullet points.

After a very hectic and enjoyable 2.5 hours, filled with discussions on how to set up observations, how to make science cases unique and compelling, and brainstorming memorable proposal titles, the students completed their mission to submit their proposals by the deadline. Each team of students then gave a ten-minute presentation of their proposals, highlighting the important scientific and technical aspects. The Time Allocation Committee, comprised of Biggs, Humphreys, Hussain and Lu, then gave feedback on the proposals' strengths and weaknesses. We were thoroughly impressed by what the students were able to achieve in such a short time.

Based on the quality of their work and their enthusiasm for the task at hand, we are sure we will see AstroMundus graduates using ESO and ALMA facilities in the near future. One current example is Aleksandar Cikota, an AstroMundus graduate who is a PhD student at ESO and the International Max-Planck Research School (IMPRS). Aleksandar was a participant in the first AstroMundus-ESO speed-proposal writing session held in 2014.

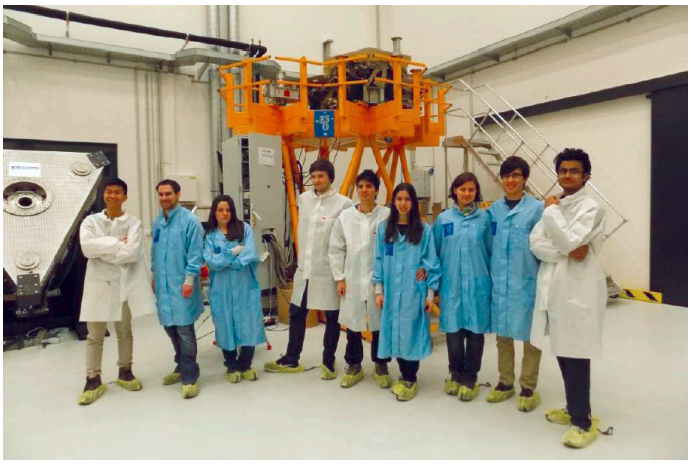

Figure 1. The nine Masters students, who participated in the AstroMundus 2016 visit to ESO, shown in the Assembly Hall.

Figure 2. Participants in the 2016 AstroMundus–ESO speed-writing proposal session. The technical assistants, and some members of the Time Allocation Panel, are also present: Baobab Lu (first on the left), Andy Biggs and Liz Humphreys on the far right.

References

ALMA Partnership, Brogan, C. et al. 2015, ApJ, 808, L3
Oberg, K. et al. 2015, Nature, 520, 198
Maiolino, R. et al. 2015, MNRAS, 452, 54

Links

[1] AstroMundus programme: http://www.astromundus.eu

Information on the AstroMundus Programme

The E+: Erasmus Mundus Joint Masters Degree (EMJMD) course in astronomy and astrophysics (AstroMundus Programme) is offered by a consortium of universities. The institutes participating in AstroMundus include the host University of Innsbruck (Austria), the universities of Belgrade (Serbia), Göttingen (Germany), Padova and Rome Tor Vergata (Italy). Associated partners are: the Astronomical Observatory of Belgrade; Istituto Nazional Di Fisica Nucleare – Gran Sasso Science Institute (Italy); and the Max Planck Institute for Solar System Research (Germany). All students start at the University of Innsbruck and then continue their studies, getting the chance to work in at least two of the four countries participating in the programme.