Report on the ESO/OPTICON/IAU Summer School

Modern Instruments, their Science Case, and Practical Data Reduction

held at Masaryk University, Brno, Czech Republic, 31 August–12 September 2015

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The Astronomical Institute of the Czech Academy of Sciences organised, jointly with its local partners from Masaryk University, and international partners OPTICON, ESO and the IAU, a two-week practical training course in astronomy for young researchers. The summer school is briefly summarised: lectures covered a wide range of theoretical and observational topics and the emphasis of the practical work was on the analysis of archival data.

Introduction

The Czech Republic is an active but relatively young ESO Member State, having joined in 2007. Therefore, it is extremely important to broaden the expertise of young Czech astronomers with regard to the newest available instrumentation and observing facilities. In 2014, the first workshop with this goal, entitled "Seven Years in Chile: The Accomplishments and Goals of Czech Astronomers at ESO", brought together Czech researchers at Villa Lanna in Prague (see Kabath et al., 2014). It was decided that the next step would be the organisation of a summer school, potentially with international participation.

In early 2015, the Optical Infrared Coordination Network (OPTICON[1]) agreed to join forces and to co-organise an event within the traditional framework of the Network of European Observatories in the North (NEON) schools, aimed at the education of early-stage researchers in astronomy. Usually, the format of OPTICON schools comprises observing, archival data analysis or awareness-raising courses. The latter topics were chosen, with a special focus on a hands-on approach to archival data, together with presentations of other European telescopes accessible via the OPTICON Access programme. Finally, to broaden participation even further, the help of International Astronomical Union (IAU) was also obtained, within the International School for Young Astronomers (ISYA) scheme (sponsored by the Norwegian Academy of Sciences and Letters), to sponsor the participation of a few more students from outside the European Union.

Figure 1. All the participants at the summer school photographed on the steps of the lecture theatre at Masaryk University, Brno.

The summer school took place in Brno, Czech Republic, on the modern campus of Masaryk University between 31 August and 12 September 2015. Over the course of two weeks, the campus lecture hall witnessed a series of education sessions presenting the modern observatories of Europe, be it ESO, La Palma, Observatoire de Haute Province (OHP), Calar Alto, Pic du Midi or other facilities, along with their instrumentation and the most recent scientific highlights, ranging from the theoretical background to modelling and astrophysical interpretation. The school was organised under the auspices of the Czech Ministry of Education, Youth, and Sports, and the presence of the Czech Ambassador to Chile enhanced the recognition of the event.

The school was attended by 39 participants representing astronomy Masters and PhD students, and also several young postdoctoral researchers, mainly from EU Member States, supported by OPTICON. Additionally, nine students received support from the Czech Republic from local funding schemes. Moreover, IAU grants allowed the participation of seven non-EU students, from Armenia, Egypt, Iran and Ukraine. In total, 17 states were represented.

Programme

The school opened on 1 September 2015 with a speech from the Deputy Minister of Education, Youth and Sports of the Czech Republic, Robert Plaga, followed by welcoming speeches from the organising institutions. The Czech vice-president of the ESO Council, Jan Palouš, gave a lecture about the Czech road to becoming an ESO member.

The scientific part of the programme was supported by 15 lecturers from leading European institutions, including ESO, Institut d'Astrophysique de Paris (IAP), Instituto de Astrofisica de Canarias (IAC)

Tenerife, Calar Alto Observatory, Stanford University, Deutsche Luft und Raumfahrt (DLR) Berlin, the Czech Academy of Sciences and Masaryk University. The lecturers came from various fields in astronomy and astrophysics and covered topics of galaxies, black holes, stellar physics and exoplanets. Some lectures described technical aspects of the observatories, their operation and instrumentation, as well as future prospects and planned projects, whilst others presented modern observing methods and the most recent scientific discoveries. An overview of the current observing possibilities in Russia was also given by a Russian colleague.

The lectures were accompanied by projects under the supervision of experienced tutors, whose hard work, enthusiasm, professional experience and careful preparation were especially appreciated. The tutors were: Giacomo Beccari (ESO Garching), Remi Cabanac (Université Toulouse), Anthony Herve (Czech Academy of Sciences), David Jones (IAC, Tenerife), Juan Carlos Munoz (ESO Chile), Koraljka Muzic (ESO Chile), Martin Netopil (Masaryk University [MU], Brno), Ernst Paunzen (MU, Brno), Hadi Rahmani (Laboratoire d'Astrophysique de Marseille, LAM) and Marek Skarka (MU, Brno). Each project group included four students and the topics were mainly aimed at teaching data reduction techniques and work with archival data, that is to say a hands-on approach to data. The instrumentation covered imagers in the optical and near-infrared as well as multi-object and long-slit spectroscopy. A specific spectropolarimetry project was also offered, with real (remote) observations from the Pic du Midi 2-metre telescope, under the leadership of its director, Remi Cabanac.

In addition, during a career session, the experience of established astronomers was shared with students and the career prospects for young researchers were presented, giving rise to a very lively and constructive discussion.

Finally, a proposal-writing session and an Observing Programmes Committee simulation exercise were organised by Czech colleagues with experience in ESO's operational procedures, Adela Kawka and Ernst Paunzen. Students had to discuss in panels, with real (old) proposals provided, as if they were a real Observing Programmes Committee (OPC). At the end, students handed over their feedback and in the last part of the exercise, in an open discussion, the whole proposal process was discussed with senior astronomers. This was a unique opportunity to acquire insight into the OPC procedures and gain some hints on how to write high-quality proposals and thus increase one's chances of getting telescope time.

Figure 2. Some of the students engaged in project work.

Social events played an integral role in the school as well, including an opening reception in the campus hotel Campea, a guided tour through the historical city of Brno, and an afternoon organised by the Center of Technology Transfer of Masaryk University with cooperation of high-tech companies (Moravian Instruments). Students had a chance to foster new friendships and collaborations and interacted informally with experienced researchers. Furthermore, the picturesque region of Moravia was also presented.

On 11 September, the school ended with conference-style presentations of the student projects. The presentations of the results were of excellent quality, given the fact that the students had had a relatively short time for project work. In the evening a farewell dinner took place, again at Hotel Campea. The formal and informal feedback obtained from the participants was clearly positive, with new ideas generated for improvement of future events.

We believe that this kind of summer school is of enormous importance and impact for early-stage researchers, especially because it is not always easy to acquire hands-on experience with the most modern telescopes and instruments. We are happy to acknowledge the contributions of the lecturers and tutors, as well as significant financial support from ESO, OPTICON, the IAU, the Academy of Sciences of the Czech Republic and, last but not least, our local host Masaryk University. Hopefully, this summer school marks an important milestone for modern Czech astronomy and will also contribute to the competitiveness of European students in astronomy, for whom it was a unique astronomy education event of its kind.

All presentations, as well as the student project contributions from the last day of the school, can be found on the school website[2] and on the OPTICON website[1].

Acknowledgements

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References

Kabath, P. et al. 2014, The Messenger, 156, 58

Links

[1] OPTICON: http://www.iap.fr/opticon/
[2] Summer School website: http://awareness2015.physics.muni.cz/