Figure 5. Image of the Gegenschein obtained in October 2007 above Paranal Observatory.

correction of the background (see Figures 3 and 4).

Subsequent observations with IRAS and more sensitive photometric observations from NASA's STEREO satellites[3] have revealed a circumsolar dust concentration in a ring along the orbit of Venus. This was expected and is caused by the influence of the planet's gravitational resonance on the particles (Dermott et al., 1994; Jones et al., 2013). A brightening of the zodiacal cloud by ~ 10 % near the apex of the Earth's orbital motion has also been found (Dermott et al., 1994).

Recent observations of nearby stars have demonstrated that the Solar System may not be the only one to exhibit zodiacal light. Data from the Very Large Telescope Interferometer have revealed that other planetary systems are also surrounded by interplanetary dust leading to zodiacal light, but much brighter than in the Solar System (for example, Lebreton et al., 2013; Marion et al., 2014; Ertel et al., 2015).

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[1] IRAS: http://irsa.ipac.caltech.edu/Missions/iras.html
[2] COBE satellite: http://lambda.gsfc.nasa.gov/product/cobe/
[3] NASA STEREO satellites: http://stereo.gsfc.nasa.gov/mission/mission.shtml

The First NEON School in La Silla

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The NEON Observing Schools have long provided PhD students with practical experience in the preparation, execution and reduction of astronomical observations, primarily at northern observatories. The NEON School was held in Chile for the first time, with observations being conducted at La Silla. The school was attended by 20 students, all from South America, and observations were performed with two telescopes, including the New Technology Telescope. A brief description of the school is presented and the observing projects and their results are described.

After many years of discussions and preparations, the NEON Observing School could finally take place at La Silla for the first time, from 22 February to 4 March 2016, with joint sponsorship from ESO and OPTICON[1] and strong support from the ESO Director General, the Director for Science and the Heads of the Office for Science.

As is well known by now, the NEON Schools are intended to provide PhD students with practical training on how to prepare and execute an observing programme. The schools have taken place in several active observatories, comprising the Network of European Observatories in the North (NEON; including Asiago, Calar Alto, Haute-Provence and La Palma), with which ESO is also associated. Devoting a small fraction of the time at 4- and 2-metre-class telescopes to training purposes can thus be regarded as a useful investment for the overall efficiency of all the facilities, developing the observing skills of the next generation of astronomers.

The format of the schools is similar: beginning with writing a proposal followed by the preparation of observations (instrument set-up, calibrations, etc.) and the observations themselves, then completing the data reduction and finally presenting the results. Work is carried out in small groups of four students, with each group under the supervision of an experienced tutor, who also provides the science project to be executed. This kind of training is much needed, as instruments are getting more and more complex, and many observatories (and ESO not least…) offer a large fraction of their observing time at the large telescopes in Service Mode, so that practical experience can be lacking for many young astronomers.

The La Silla school

So, how did it work in La Silla? Thanks to a generous allocation from the Director's Discretionnary Time, the New Technology Telescope (NTT) was made available for three nights for the school, close to full Moon. As the operations there are quite similar to the Very large Telescope (VLT), with an operator for the telescope, the same set of observing preparation tools and operations principles (observing blocks to prepare, pipelines for reduction, etc.), this provided an excellent training for future use of larger (VLT) facilities. But it is still a bit too "automatic" to understand all the details needed to operate less advanced facilities. Thus, since according to the local Chileans, NTT also means *No Tocar al Telescopio* ("Do not touch the telescope"), we also used the Danish 1.54-metre telescope, made available during Czech time thanks to Petr Pravec and with the support of Jan Janik (Mazaryk University), who came over specially to support our run. The various science programmes used, as far as possible, a combination of both telescopes and instruments.

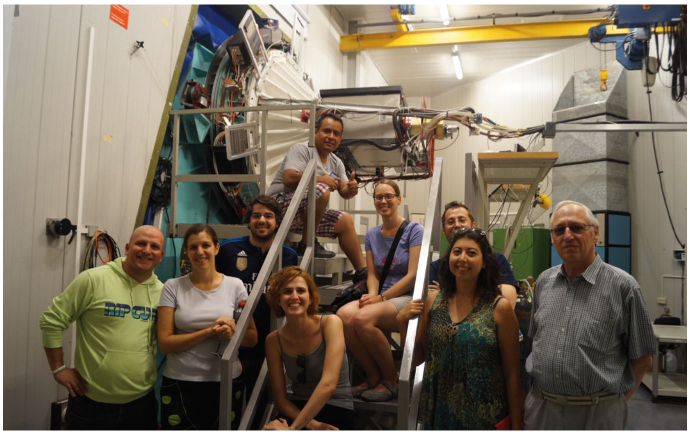

Figure 1. Two of the student project groups around the EFOSC2 Nasmyth focus of the NTT during the NEON School at La Silla.

The observations were prepared in Santiago, prefaced by a set of lectures on fundamental observing techniques, instrument and detector properties and data reduction. The full programme of the school can be found on the dedicated website[2]. The tutors leading the observations in groups were all current, or former, ESO staff in Chile, and thus perfectly aware of all the requirements and instrument performance.

Group projects

The group led by Amelia Bayo (University of Valparaiso) and Koraljka Muzic (ESO, and University of Diego Portales) studied the widest binary stars in young stellar groups from the Search for Associations Containing Young stars (SACY) sample, to find out whether or not they belonged to the same group. The Hα and Li I 6708 Å lines were used as age indicators and observed with the ESO Faint Object Spectrograph and Camera (EFOSC), and the K I + Na I lines were observed with Son of ISAAC (SOFI). This approach allowed four out of the eight stars observed to be confirmed as young stars of the same age.

The group led by Fernando Selman and Evelyn Johnston (ESO) tried to disentangle the counter-rotating discs in the lenticular galaxy IC 719. Long-slit spectroscopy with EFOSC for velocities, and *B*, *V*, *R*, Hβ photometry with the Danish 1.54-metre (the Hα filter had inexplicably disappeared…) revealed the different structures, and that more than one stellar component (identified through Lick indices) was present from the radial velocities. Evidence was also found for a young stellar population. This is clearly a case where a full 3D map with the Multi-Unit Spectroscopic Explorer (MUSE) would reveal the full power of this technique.

The group led by Giacomo Beccari (ESO) tried to find protoplanetary discs around young stars, from ultra-violet, Hα or infrared excesses. Multi-band photometry of candidate regions in Carina was done at the Danish 1.54-metre telescope. As Hα imaging was not possible, Brackett γ imaging was done instead with SOFI at the NTT. Finally, six new disc candidates were identified, whose confirmation is pending with spectroscopy.

Linda Schmidtobreick (ESO) observed a candidate cataclysmic variable detected in the Sloan Digital Sky Survey (SDSS) with her group, in order to measure/confirm its orbital period both by photometry, and by radial velocity measurements. Long series of imaging (with the Danish 1.54-metre telescope) and spectroscopy (with EFOSC at the NTT) data were thus

Figure 2. All NEON School students and tutors pose in the dome of the ESO 3.6-metre telescope for a group portrait.

obtained, the expected periods being about 80 minutes. The students, after being confronted by all sorts of drifting and aliasing problems, could finally show that the real period was in fact closer to 3–4 hours for one target, and 6–7 hours for the other, but longer series of data are still needed to confirm these values. Another, unknown, variable star was also found in one of the fields, the nature of which remains to be clarified.

Finally, Bruno Dias (ESO) conducted an ambitious, and difficult (at least for beginners) multi-object spectroscopy programme at the NTT with his group, to determine the nature of the globular cluster NGC 3201: whether it is a member of the Milky Way or an absorbed dwarf galaxy. This first required pre-imaging, then preparation of the masks, and finally observing during the last night of the run. After all the hard work, those students presented superb results, showing a trend of Fe abundance versus heliocentric velocity (demonstrating that the selected stars did indeed belong to the cluster). The CH versus CN indices showed that two different abundance groups were present, but both belonging to the Milky Way.

In addition to their main tasks, two of the groups were triggered to observe a Target of Opportunity (a situation that many observers have to face nowadays), led by Michel Dennefeld (IAP, Paris). The targets were provided by the European Space Agency's Gaia satellite, which has very recently started to provide dozens of alerts per day. One of them, Gaia16agf, proved to be a young Type Ia supernova, caught about one week before maximum, while the other, Gaia16afz, was classified as a dwarf nova in eruption. Both results were immediately published as Astronomer's Telegrams, Nos. 8754 and 8766, respectively. Many of the other results from the student groups will also lead to publications, but over a slightly longer timescale.

Back to Santiago

The last days in Santiago were mainly devoted to data reduction, before the scientific results were presented on the last day of the school. In addition, lectures on other topics of great interest for the future were presented: on the Atacama Large Millimeter/submillimeter Array (ALMA), on adaptive optics, the European Extremely Large Telescope, etc. There were also lively discussions about career prospects, how to make a good presentation or how to write a good telescope observing proposal.

Overall, the 20 students, all from South America, selected from over 140 applicants in total, were very enthusiastic, worked hard during the two weeks, both in Santiago and on the mountain, and presented excellent results at the end. The groups of four were very dynamic, covering a wide range of levels (from first year PhD to postdoc) and origins, although the majority came from those countries with a larger astronomical population, namely Argentina, Brazil and Chile, and with a good gender balance. The ambiance was very friendly, as it should be for a summer school, favoured by nice weather and excellent environment at the ESO premises in Santiago and La Silla, including nice lunches in the ESO gardens in Vitacura.

Prospects

One may wonder about the motivation to organise such a school at La Silla, as it is not especially intended for European students, who have ample opportunities to attend the regular NEON Schools in Europe, except for those students doing their PhDs in Chile. In fact, there is a high demand, as shown by the huge number of applications, and it is in ESO's interests (and the European community at large) to ensure the most efficient use of its facilities, which are open to everybody, since the allocation of observing time is based on scientific merit only. In addition, the operation of all the facilities in Chile requires a large number of dedicated and skilled astronomers and engineers, who have to be trained somewhere. In this sense, such a school also reinforces the European links with the local communities and emphasises the various job opportunities for the future. The success of the present event is already generating suggestions for future similar schools, a point well taken at ESO, and enthusiastically supported by the ESO tutors. It is a revival of past successes as the first observing school was organised jointly by ESO and Centre national de la recherche scientifique (CNRS) at the Haute-Provence Observatory in 1988 (Chalabaev & D'Odorico, 1988).

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[2] School website: http://www.eso.org/sci/meetings/2016/lasilla_school2016.html