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Report on the

La Silla Observing School 2026

held at ESO Vitacura, Santiago, Chile, and ESO La Silla, Chile, 2–13 February 2026

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The La Silla Observing School, currently being held annually, comprises lectures and observations aiming at teaching students and early-career researchers various aspects of observational astronomy. Additionally, for this year's school, a group of public school teachers from communities near the ESO sites in Chile were also included with the aim of strengthening the bond between ESO and the local communities, as well as promoting astronomy to the younger generations. This year's school took place during the first two weeks of February 2026, starting with talks and lectures at ESO's Vitacura offices in Santiago, then continuing with four nights of observations at the observatory, using the ESO Faint Object Spectrograph and Camera 2 at the New Technology Telescope, the High Accuracy Radial velocity Planet Searcher and the Near Infra Red Planet Searcher at the 3.6-metre telescope and the PLATO-Spec instrument at the 1.52-metre telescope, culminating in three final days in Vitacura where the various groups analysed the data obtained and presented the results of their projects.

Introduction

Since 2016 ESO has hosted six observing schools at La Silla, aimed at senior Master's and doctorate students. The primary goal of the school is to give participants the necessary experience and know-how in observational astronomy, with a focus on ESO instrumentation and pipelines. They gain experience in identifying an interesting scientific problem to investigate, writing an observing proposal, preparing and planning observations using the p2 interface, performing these observations with their chosen instrument/s, reducing and analysing the obtained data using ESO pipelines and presenting their final results to their peers.

The La Silla Observing School 2026[1] (Figure 1) was opened to students worldwide; participants were required to fund their trips to and from Chile, while ESO provided lodging and transportation within Chile. In addition to the students, this year the school was opened to public school teachers from three regions around the two ESO sites in northern Chile, namely Atacama, Taltal and Coquimbo. The selection of the participating teachers was made by the corresponding regional governments, who chose eight teachers, spanning a wide range of educational levels and subjects. The purpose of this effort was to strengthen collaboration between ESO and the local communities in northern Chile, who for many decades have welcomed ESO so generously, as well as enriching Chilean basic education with specialised astronomical knowledge and enthusiasm, in the hope of inspiring future generations of astronomers from local communities. This group had exclusive access to the ESO 1.52-metre telescope, hosting the PLATOSpec[2] instrument (Kabáth et al., 2026), thanks to the consortium's offering time at the telescope to the school. Specific details of this aspect of the school are given later in this report.

The school started on Monday 2 February with two days of introductory lectures on the basic concepts of ground-based observing and telescopes, astronomical instrumentation, scientific detectors, imaging and spectroscopy, the La Silla instruments the High Accuracy Radial

Figure 1. Happy participants at the 6th La Silla Observing School upon arrival.

Figure 2. Group visit to the NTT.

velocity Planet Searcher (HARPS; Mayor et al., 2003), the Near Infra Red Planet Searcher (NIRPS; Bouchy et al., 2017) and the ESO Faint Object Spectrograph and Camera 2 (EFOSC2; Buzzoni et al., 1984), the Exposure Time Calculators, the p2 interface and Observation Blocks, data reduction and writing a proposal, as well as presentations of group projects and the participants themselves.

On Wednesday 4th, the group travelled to the observatory by bus, arriving in time for dinner, followed by views of the sunset and a safety talk, after which they briefly visited the control building. The following day included a tour of the 3.6-metre telescope and the New Technology Telescope (NTT; see Figure 2), followed by a short hike to the Swedish–ESO submillimetre telescope (SEST) and finishing the day by preparing for the upcoming observations in groups. During the following four nights, the groups performed their observations (Figure 3) under good sky conditions, with the only loss of time being due to an unexpected power cut for around one hour. On the final day at the observatory, an afternoon hike was organised to the petroglyphs close to the observatory site, a series of rock drawings dating back from 300 BCE to 700 CE. We had the good fortune to have Germán Rojas with us, one of the high school teachers participating in the school, who comes from the region and explained to all in great detail the significance of these drawings to the indigenous communities of the region (Figure 4).

On the 10th, the group travelled back to Santiago with many happy memories and lots of data to work on. The last three days of the school were dedicated to data analysis and a few further talks on optical and radio interferometry, ESO's Extremely Large Telescope, astronomy in Chile and possible career paths in astronomy and beyond. The school social dinner, which was held at a restaurant in the Providencia neighbourhood, was also organised at this time. On the final day of the school, the four groups presented the results of their observations to a wide audience, receiving many questions and positive feedback.

The working groups

The goal of the Group 1 project, led by ESO staff astronomers Anna F. Pala and Linda Schmidtobreick, was to provide the students with different examples of stellar variability. During the project, the students familiarised themselves with both spectroscopic and photometric data and learned about spectral features, radial velocities and stellar variability. The project was divided into four science cases: 1) Pulsating stars. HARPS and NIRPS were used to observe three Cepheids across different phases of their pulsation, to compare how the stellar spectral lines change in shape and depth during the pulsation period. The students also carried out a cross-correlation analysis of the data to derive the radial velocity,

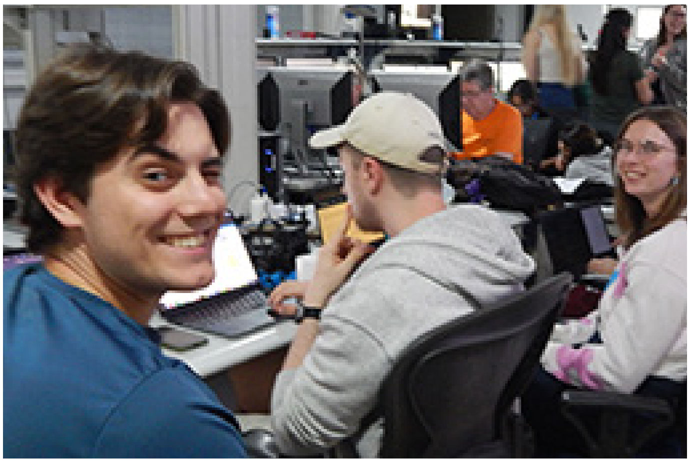

Figure 3. Happy students working hard at the control building.

which also revealed the presence of a possible binary companion in one of the three targets. 2) Binarity. Using the same instruments, two double white dwarf systems were observed — stellar binaries composed of two non-interacting white dwarfs. They obtained phase-resolved observations, which allowed them to reconstruct the radial velocity curve and derive an estimate of their orbital periods. 3) Variability in accretion discs. Using EFOSC2, the students obtained phase-resolved imaging of a cataclysmic variable — an interacting binary in which a white dwarf is accreting from a companion star via an accretion disc. The aim of the observations was to detect the double hump signature in the system lightcurve that would reveal the presence of possible spiral arms in the accretion disc. The extracted lightcurve revealed a periodicity consistent with the orbital period of the binary, but no clear signal ascribable to possible spiral arms was detected. 4) Nova eruptions. Narrow-band imaging of a nova shell around a cataclysmic variable was obtained. The size of the shell was calculated which, compared to previous observations in the literature, confirmed the free expansion of the ejecta. Finally, by combining the shell size and time since the eruption with the shell expansion velocity from the literature, the students derived the distance to the system, which was found to be in good agreement with the distance provided by the Gaia parallax.

Group 2 was led by ESO Fellow Camila de Sá-Freitas and the project aimed to characterise nearby barred galaxies using narrow-band Hα filters and long-slit spectroscopy with EFOSC2. Bars are prominent, common structures in the nearby Universe, present in around 2/3 of disc galaxies in the local Universe, and they act on galaxy evolution out to at least $z \sim 4$. Once formed, they affect their host galaxies in a range of ways, including redistributing angular momentum, funnelling gas inwards and forming a central rotation-supported structure known as nuclear disc. Historically, these structures are also known as discy bulges and/or a type of pseudo-bulge. de Sá-Freitas et al. (2025) found for a sample of nearby galaxies that the star formation rate density (ΣSFR) in the nuclear disc is tightly correlated with the age of the bar, such that younger bars relate to higher ΣSFR in the nuclear disc and older bars to lower ΣSFR. Since the SFR can be measured from the Hα emission flux, the idea of this project was to understand whether Hα emission correlates with bar age as well. We observed seven galaxies with known bar ages in both Hα narrow-band photometry and long-slit spectroscopy, positioning the slit along the bar. Each student focused on analysing a specific part of the project and the results are: there is a trend between Hα emission in the nuclear disc and the age of the bar, indicating that Hα narrow-band images might be used as SFR traces in future, broadly extrapolating bar ages; analysis of the global Hα emission with bar age showed that this could be an indication of quenching, although no significant trend was found; gas velocity was studied using Hα emission lines, allowing a preliminary characterisation of its velocity in the nuclear discs; and finally, observations of NGC1566, which represents a class of variable active galactic nucleus (AGN), showed that it has not varied since the last time it was studied, in 2020.

Group 3, nicknamed Unicorns and supervised by Henri Boffin and María José Rain, was devoted to the study of binary stars. Several projects were considered and followed up by some of the six students in this group. The first subgroup used HARPS to study the Rossiter–McLaughlin effect in binary stars to infer the relative inclination of the rotation axis of the primary with respect to the orbital plane. A detailed study of the contact binary system HD 115264 led to the conclusion that the primary is well aligned, likely as a result of strong tidal forces within the binary. The second subgroup analysed blue straggler stars (BSS) in open clusters, using both HARPS and

Figure 4. Visit to the petroglyphs with Germán Rojas giving a local's perspective.

Figure 5. The teachers group outside the 3.6-metre telescope.

EFOSC2. With HARPS, they looked at some well-known long-period binaries with the aim of determining their chemical abundances, thereby confirming their membership of the cluster, as well as looking for any chemical anomalies that might be explained by mass transfer. EFOSC2 was used to derive radial velocities of rapidly varying BSS. For one of them — the star Rediet — the students clearly detected and analysed the radial velocity variations due to the second overtone pulsation, thereby confirming its delta Scuti character. Finally, one student used EFOSC2 to study planetary nebulae (PN), taking nice images of some of these intricate objects as well as obtaining time-resolved photometry and spectra of some others. In one case, the binary nature of the central star of the PN was confirmed, reflecting some previous estimates done with the Zwicky Transient Facility (ZTF). The work of these students was published in four Research Notes (Barone et al., 2026a; Divakaran et al., 2026; di Stefano et al., 2026; Steimle et al., 2026), with all being summerised by Barone et al. (2026b).

The group led by ESO Fellow Thallis Pessi aimed to discover and classify supernovae with the EFOSC2 instrument. Every day, tens of newly discovered astronomical transients are reported by all-sky surveys. The nature of these events is only completely understood after spectroscopic characterisation following their discovery. The main goal of the group was therefore to obtain spectra of recently discovered transients, in order to classify and constrain their true nature, especially looking for young supernovae resulting from the core-collapse of massive stars. The students searched for recent transients discovered by surveys such as the ZTF and the Asteroid Terrestrial-impact Last Alert System, planned observations and reduced and analysed the obtained spectroscopic datasets. Spectroscopic classification of the events was performed with Gelato (Harutyunyan et al., 2008) and SNID (Blondin & Tonry, 2007). In total, eight transient events were observed and classified by the students, including four type Ia and two type II supernovae, one AGN, and one unknown event with a blue featureless spectrum. These classifications were reported by the students in AstroNotes in the Transient Name Server (Lemus et al., 2026a,b). Remarkably, one of the type II supernovae, SN 2026cff, was discovered very early, within a few days of explosion (Pessi et al., 2026a). The students performed follow-up spectroscopic observations of this event during the four nights of the school, and noted that it presented a decrease in temperature, an increase in the integrated spectral luminosity, and an increase in the Hα luminosity (Pessi et al., 2026b).

The teachers group using PLATOSpec

For the first time, in this year's La Silla Observing School it was decided to also include a group of public school teachers from communities around the ESO sites in northern Chile (Figure 5). This was done with the aim of promoting astronomy to the youngest generations, while enhancing the visibility of ESO and its observatories among the communities who reside closest to the telescopes. To this end, a total of eight teachers were selected by three different municipalities, those being Taltal, Coquimbo and Atacama. The group of teachers participated in the school for the full two weeks, with ESO Fellow Abel de Burgos Sierra as their dedicated tutor. We had participation from: Colegio Pedro Pablo Muñoz (Dana Donoso & Manuel Arancibia) and Escuela José Santos Ossa (Karen Mondaca), both in La Higuera, Coquimbo; Liceo Pedro Troncoso Machuca (Camila Herrera & Karla Rivera) and Liceo Pedro Troncoso Machuca (German Rojas) in Atacama; and Liceo Juan Cortés-Monroy Cortés (Carolina Catalán & Bastián Olivares) in Taltal.

The teachers had exclusive access to the ESO 1.52-metre telescope, hosting the PLATOSpec high-resolution spectrograph, as well as a photometric camera (Figure 6). The spectrograph was built by Universidad Católica and the pipeline was developed at the Universidad Adolfo Ibáñez, both in Santiago, Chile. A specialised programme was prepared by Abel, who created several front-to-back scientific cases covering different astrophysical topics. The idea behind this was to provide the teachers with the necessary background, observational data and tools to be able to reproduce each case performed at the

1.52-metre telescope in their classrooms. To also allow them to experience how scientific observations are planned, and ultimately decide which targets to observe, an introduction to celestial coordinates, magnitudes and object visibility was provided during the first days at the ESO Vitacura offices. Once in La Silla, other aspects such as telescope and instrument control and procedures were covered, also including the calibration of the data, all of which were performed during the observations by the teachers themselves. In this way, the teachers got a realistic hands-on experience of what the lives of astronomers and operators are like at the observatories.

The scientific cases designed by Abel covered a wide range of topics. Some of the cases also included different levels of difficulty to adapt them to students of different ages. The main topics were: a) spectral-type classification of stars — isolated or in clusters — with very different temperatures using both photometry and spectroscopy; b) interpretation of colours in different nebulae and stellar clusters; c) morphological classification of several galaxies; d) understanding Doppler shifts from radial velocity measurements in isolated or known binary systems; e) interpreting images and spectra of Solar System bodies.

During the observations the teachers were provided with a basic knowledge of photometry and spectroscopy, which allowed them to understand the raw and reduced data. The reduction of the spectra was done by the PLATOSpec pipeline and then Abel developed a portable program so that the teachers could visualise and make measurements on the spectra. The reduced imaging data were handed to the teachers in common image formats for easier use, to take back to their classrooms.

As a result of this initiative, the teachers have acquired an introductory but practical understanding of the work carried out at ESO and the astronomical observatories, bringing this knowledge directly to the communities in northern Chile who, despite their proximity to these facilities, may not always be familiar with the scientific activities happening in their own regions. Equally important is that they have gained the knowledge, skills and data necessary to help raise interest in astronomy and science among younger generations.

Figure 6. The teachers group at the 1.52-metre telescope before starting their observations.

Demographics

The school was open to students worldwide and we received more than 200 applications, evenly distributed between male and female applicants, as well as across career stage. The selection was made by the tutors of the school, who did not have access to information on the names, gender, nationality, career stage or any other detail that could have potentially biased their evaluation during the selection process. Of the 21 selected students, we had 15 female and six male participants, coming from Germany, Italy, Portugal, France, Finland, the UK, Argentina, Colombia, India, Slovakia, Brazil and Chile. The selection was made based on the students’ background in astronomy, their motivation for participating in the school, their potential career gain from the school and the reference letters provided.

After the completion of the school, the feedback received from the participants was highly positive, with the students highlighting the quality of the talks given and the level of the organisation of the school. Possible improvements included other, more efficient modes of transport to and from the observatory.

Acknowledgements

We greatly thank the PLATOSpec consortium[a] for awarding the school four half-nights at the 1.52-metre telescope for the use of the teachers group, the ESO office for science and Joseph Anderson for the financial support of the school, Itziar de Gregorio-Monsalvo (ESO representative in Chile) for the financial support of the teachers’ participation and, last but not least, the La Silla Observatory for the kind and impeccable hospitality and generous support. The logistical aspects of the school were handled by Paulina Jiron, Leslie Kiefer and Francisco Tapia, to whom we extend our deepest gratitude. Special thanks also go to the La Silla site manager, Ivo Saviane, as well as Petr Kabáth, Leonardo Vanzi, Luca Antonucci and Jiri Srba from the PLATOSpec consortium for their support. We also thank the invited speakers of the school, Eleonora Sani, Johnathan Smoker, Henri Boffin, Gaspare Lo Curto, Florian Rodler, Aaron Labdon, Elizabeth Artur de la Villarmois, Claus Tappert and Robert de Rosa.

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Links

[1] Workshop programme: www.eso.org/sci/meetings/2026/lasilla_school2026.html
[2] PLATOSpec website: https://stel.asu.cas.cz/plato

Notes

[a] The PLATOSpec consortium consists of the Astronomical Institute of the Czech Academy of Science, Thüringer Landesternwarte Tautenburg, Universidad Católica de Chile, Masaryk University Brno, Universidad Adolfo Ibáñez and the Institute of Plasma Physics of the Czech Academy of Sciences.