ond white-light pupil, where the cross disperser and the camera are located. With a few added optical elements, resulting in the loss of only a few percent of the light, the vignetting typical of traditional designs is removed and the image quality and overall luminosity substantially enhanced. This new design was again adopted by several instrument builders in Europe and overseas.

Bernard also developed the 4C concept, which enables camera chromaticism to be compensated through the chromatic effect introduced by the collimator. It was used in several VLT instruments including X-shooter and the VIsible Multi Object Spectrograph (VIMOS) and inspired the design of instrument concepts overseas, such as the Gemini Montreal-Ohio-VIctoria Echelle Spectrograph (MOVIES; Delabre et al., 1989). Bernard also developed a new "pupil slicing" technique for one of the early instrument concepts for the ELT and worked on the optical design of the Echelle SPectrograph for Rocky Exoplanet and Stable Spectroscopic Observations (ESPRESSO). This instrument combines pupil slicing with anamorphism and slanted volume phase holographic (VPH) gratings to achieve high resolving power.

Recently, Bernard also took a leading role in the development of optical designs for instruments using curved detectors, where no optical design with an affordable number of lenses can be found with identical transmission and identical field of view. This work is paving the way for future massively multiplexed spectrographs (Iwert & Delabre, 2010). All the ESO spectrographs under construction — the near-infrared Enhanced Resolution Imager and Spectrograph (ERIS) and the Multi-Object Optical and Near-infrared Spectrograph (MOONS) on the VLT, and the 4-metre Multi-Object Spectrograph Telescope (4MOST) on VISTA — are also benefitting from Bernard's incomparable expertise.

Award and retirement

Nearly all astronomers in Europe, and many outside, have used or will use a Delabre optical system for their science, be it at ESO or elsewhere. Three of the ten pioneering spectrographs of the twentieth century are attributed to Bernard (Hearnshaw, 2009). His genius and dedication were acknowledged in the award of the Tycho Brahe Prize for 2017 by the European Astronomical Society which was presented to Bernard at the meeting in Prague in July[1,2].

A retirement party was held in Bernard's honour on 28 July 2017 at ESO Headquarters and was attended by many friends and colleagues who have worked closely with him. Speeches were given by the ESO Director General Tim de Zeeuw, Gerald Hechenblaikner of the Directorate of Engineering and his colleagues Samuel Lévêque and Jason Spyromilio. At the party, it was announced that Bernard was to be made Emeritus Engineer at ESO in appreciation of his many achievements, and in anticipation of many more ingenious optical designs.

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Links

[1] Tycho Brahe Prize award 2017: http://eas.unige.ch/tycho_brahe_prize.jsp
[2] ESO Announcement of Tycho Brahe Prize: http://www.eso.org/public/announcements/ann17018/

Departure of Patrick Geeraert, Director of Administration

Tim de Zeeuw[1]

[1] ESO

Patrick Geeraert was appointed Head of Administration at ESO in 2008, initially on a one-year secondment from the European Organization for Nuclear Research (CERN) in Geneva. One year became three, three became five, five became seven, and seven became nine. He has now returned to CERN.

When he arrived at ESO the then Administration division consisted of two nearly independent units, one in Chile and the other in Garching, and the Human Resources (HR) department also needed to return to Administration. In the context of the unification of ESO's structures, and in order to increase the links between the sites in Chile and Germany, Patrick oversaw the evolution of Administration towards a much more inte-grated structure. After a while it became clear that HR also needed to be inside the Administration division and the title was changed to the Directorate of Administration, with Patrick as its Director.

Patrick played a key role in leading the last two collective bargaining rounds in Chile. The recent one in 2016 was particularly challenging as it involved the

Paranal Union, the La Silla Union and the group of non-unionised Local Staff Members. A single three-year agreement was concluded with all sides happy with the outcome. He also initiated a drive to raise external funding for non-core ESO business. This led to the donation, by the Klaus Tschira Foundation, of the building for the ESO Supernova Planetarium & Visitor Centre, due to open in April 2018.

Patrick was also instrumental in convincing the Finance Committee and ESO Council to fund the expansion of the programme required by the Extremely Large Telescope (ELT). This meant developing the unusual funding model and helping to convince Brazil to sign the Accession Agreement with ESO. Alongside this, Patrick's other achievements included streamlining ESO spending, staying on budget with construction of the Atacama Large Millimeter/submillimeter Array (ALMA), establishing the tools for medium and short term borrowing, hedging of the Chilean Peso, working on the Polish accession and, last but not least, securing the Strategic Partnership with Australia (see Comendador-Frutos, de Zeeuw & Geeraert, p. 2).

Patrick left ESO at the end of August to return to CERN. Farewell parties were held in Chile and Garching in August and Figure 1 shows a photograph from the one held at the ESO Vitacura premises in Santiago. We wish Patrick every success "back home" at CERN.

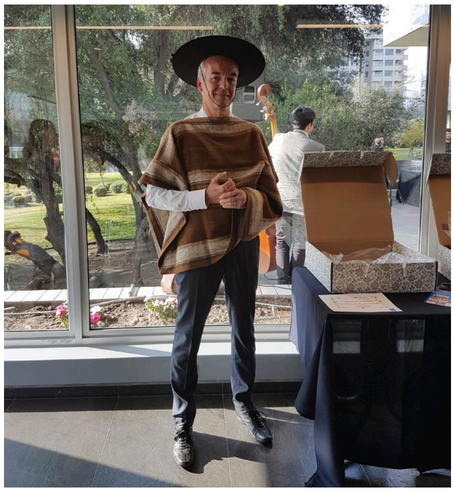

Figure 1. Patrick Geeraert being fêted at his farewell party in Chile.

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Jerry Nelson — An Appreciation of his Pioneering Telescope Work

Jason Spyromilio[1]
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[1] ESO

Jerry Nelson, the intellectual, technical and spiritual father of the Keck telescope project passed away in Santa Cruz on 10 June 2017. The telescope world has lost one of its true masters. At the 4th conference on Large Telescopes held at ESO in Geneva in 1977, Jerry presented the work of astronomers at the University of California who had "looked seriously at the possibility of constructing a large, 10-metre-class, optical telescope [...] which would match superlative seeing" with "modern area detectors (CCD arrays, photographic emulsion)". Although in 1977 Jerry was leaving open the possibility that the primary might be monolithic, it is clear in that publication that segmentation was the solution that he considered best. Jerry was at least two decades ahead of the field.

The cost of a telescope is largely connected to its kinematic volume and its weight, driven by the mass needed to support the optics. Heavier optics implied more expensive telescopes. Telescope mirrors have to keep their shape and relative positions if the instruments are to receive an acceptably sharp focal plane. The stiffness of the optics is related to their thickness-to-diameter ratio; the 4-metre-class mirrors in the late 1970s were monsters, expensive, difficult to produce and slow to reach thermal equilibrium. Either a thin meniscus or a sandwich would be needed to increase the aperture using a monolithic mirror. Segmentation of the primary mirror results in stiffness of the local optical surface, while the overall shape is determined by the control system, at a much more manageable weight budget. As for kinematic volume, containing the length of the telescope — hence the size of its dome — drives the system design towards a fast primary mirror.

Figuring off-axis aspheres and cutting them to hexagonal shape is a daunting challenge. The steeper the primary mirror, the more difficult this task becomes. Everything had to be developed and Jerry was at the heart of all of these efforts. With Jacob Lubliner, Jerry developed stress mirror polishing, converting the problem from an aspherical one to one of spheres. Jerry was active in the development of the edge sensors that measured the positions of the mirrors with nanometric precision and the actuators that moved the mirrors with similar precision. All of this was done without the power of the tools that we now have at hand and without the prior knowledge that it can be made to work.