

Faces & Places

AWARDS

Enrico Fermi Prize honours LHC physicists

The Italian Physical Society has honoured five Italian physicists with the Enrico Fermi Prize for their work on LHC experiments, in their roles as current or former spokespersons.

Former ATLAS and CMS spokespersons, Fabiola Gianotti and Guido Tonelli, respectively, were awarded the prize for the discovery with their experiments “of a new fundamental particle with mass around 125 GeV and properties consistent with a Higgs boson, theoretically predicted almost 50 years ago, the existence of which ensures a huge insight in the understanding of the Standard Model of particle physics”.

Spokesperson for LHCb, Pierluigi Campana, received the prize for “the first observation, with the LHCb experiment, of CP violation in B_s meson decays and for a large number of high-precision measurements in heavy flavour physics”. TOTEM’s spokesperson, Simone Giani, was honoured for “the first direct confirmation... that the total proton–proton cross-section increases with energy and for further in-depth studies on the proton structure”. Paolo Giubellino, spokesperson for ALICE, received the award for “the unveiling, with



Recipients of the 2013 Enrico Fermi prize. Left to right top, Pierluigi Campana, Simone Giani, Fabiola Gianotti; below, Paolo Giubellino and Guido Tonelli.

the ALICE experiment, of the new features of the hottest and densest state of matter ever produced in high-energy nucleus–nucleus collisions”.

The award was established 12 years ago

in honour of Enrico Fermi’s 100th birthday to recognize outstanding work done by members of the Italian Physical Society. The recipients received their awards at the society’s annual meeting in September.

Dirac Medals highlight evolution of the universe

The Abdus Salam International Centre for Theoretical Physics (ICTP) has awarded its 2013 Dirac Medal to three physicists whose work has deepened the understanding of the early universe, galaxy formation and black holes. Thomas Kibble, James Peebles and Martin Rees share the award for “independent, ground-breaking work throughout their careers elucidating many aspects of fundamental physics, cosmology and astrophysics”.

Kibble, of Imperial College London, has made important contributions to the physics of spontaneous symmetry breaking and to its cosmological consequences. In the 1960s, he was among the first to study the example of spontaneous symmetry breaking by which subatomic particles first gain their mass (*CERN Courier* January/February 2008 p17). He also investigated what happens when a symmetry apparently disappears as the universe evolves from the



Tom Kibble. (Image credit: Thomas Angus, Imperial College London.)

Big Bang and understood the importance of topological defects as relics of the past symmetrical phase.

Peebles, of Princeton University, was one of the first physicists to predict the existence of the cosmic microwave background (CMB) and to study its implications for the development and evolution of the universe. He also made major contributions on nucleosynthesis, dark matter, dark energy and structure formation. Rees, of Cambridge University, is well known for his important contributions on the origin of quasars and active galactic nuclei and the prediction of supermassive black holes at the centres of galaxies. His work also includes the physics of gamma-ray bursts, the polarization of the CMB and the study of dark matter.

The ICTP Dirac Medal is awarded annually on Paul Dirac’s birthday – 8 August – to scientists who have made significant contributions to theoretical physics.

CERN receives three National Instruments awards

At the NIWeek conference in Texas on 5–8 August, computer-engineering company National Instruments presented three awards to CERN: the National Instruments Graphical System Design Achievement Award, the National Instruments Humanitarian Award and the Intel Intelligent Systems Award.

The Graphical System Design Achievement Awards recognize companies and universities that use graphical-system design to develop applications that



Johannes Gutleber, centre, receives the National Instruments humanitarian award on behalf of CERN from NI cofounders – president James Truchard, left, and Jeff Kodosky, right. (Image credit: National Instruments.)

meet complex challenges in science and engineering. CERN was selected for the particle accelerator and control systems for the MedAustron ion-therapy facility, which was designed and constructed under the guidance of CERN in Austria (*CERN Courier* October 2011 p33).

Johannes Gutleber received the awards on behalf of CERN and gave a keynote presentation on CERN's synchrotron accelerator for medical applications and the underlying control-system technologies at NIWeek. Control systems can contribute significantly to the performance of ion-therapy facilities. The system must control the magnetic fields of several hundred magnets accurately, reconfigure the accelerator for large numbers of beam characteristics in a timely and reliable way and must be easy for medical teams to use.

Three young ISOLDE scientists win awards

Three young Portuguese researchers participating in an experiment on emission-channelling lattice location with short-lived isotopes (EC-SLI) at CERN's ISOLDE facility have won awards at major conferences in materials science.

Lino Pereira, a postdoc at the Instituut voor Kern- en Stralingsfysica (IKS) of KU Leuven in Belgium, was runner-up in the Young Researcher for Best Manuscript Competition (sponsored by Elsevier) at the 21st International Conference on Ion Beam Analysis, which was held in Seattle on 23–28 June. Lígia Amorim, a PhD student

who is also at IKS/KU Leuven with a masters degree from Lisbon University, won the Award for Best Student Oral Presentation at the 17th International Conference on Radiation Effects in Insulators, which took place in Helsinki on 3 June–5 July. Last but not least, Daniel Silva, a PhD student from Porto University in Portugal, won the prestigious J W Corbett prize at the 27th International Conference on Defects in Semiconductors, which was held in Bologna on 21–26 July.

All three awards resulted from studies by the ISOLDE experiment IS453, which

includes researchers from IST/ITN Lisbon, the Centre for Nuclear Physics of the University of Lisbon (CFNUL), the University of Aveiro, the University of Porto and IKS/KU Leuven. The work made use of the Portuguese and Belgian experimental infrastructure that was commissioned and is maintained at ISOLDE by researchers from IST/ITN, CFNUL and KU Leuven. It was partially funded by the Portuguese Science Foundation Fundação para a Ciência e a Tecnologia within its CERN Projects funding scheme and by the Flemish Science Foundation FWO.

ACCELERATORS

First TTC Topical Meeting highlights continuous-wave SRF

The first topical meeting of the TESLA Technology Collaboration (TTC) took place this year at Cornell University on 12–14 June on the topic of continuous-wave (CW) superconducting-radiofrequency (SRF) technology. As more CW accelerators are planned and designed, CW SRF technology has increased in importance and more laboratories are pursuing R&D in this area. The topics that were covered during the meeting included cavity design for CW, SRF guns, CW cavity operation, high-Q performance and treatment procedures, couplers, high-order mode absorbers and CW cryomodules. More than 60 participants listened to 50 presentations, which focused on open issues and technical aspects. The programme allowed for discussion time that



Participants at the three-day workshop at Cornell. (Image credit: J Butler/Cornell University.)

was used efficiently for knowledge exchange on research topics in CW SRF.

The TTC evolved from the TeV-Energy Superconducting Linear Accelerator (TESLA)

collaboration in 2004, when the International Committee for Future Accelerators decided that work towards a future international linear collider should be based on SRF

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technology. The TESLA collaboration renamed itself the TTC, with the redefined aim of advancing SRF-technology R&D and related accelerator studies across a range of scientific applications. The TTC has grown to encompass the whole SRF community, so the collaboration board decided recently to reduce the frequency of full TTC meetings and alternate them with smaller TTC topical meetings that are narrower in scope and do not include a meeting of the collaboration or technical boards.

● For the full programme, see <http://lepp.cornell.edu/Events/TTCWorkshop/>.

APPOINTMENT

Gianotti becomes honorary professor at Edinburgh

CERN's Fabiola Gianotti – former spokesperson of the ATLAS collaboration – has been appointed an honorary professor in the School of Physics and Astronomy at the University of Edinburgh. She will be associated with the experimental particle-physics group, which carries out research with the ATLAS and LHCb experiments at the LHC. She will work with staff and PhD students from Edinburgh who are based at CERN and visit the university for specialist lectures.

Gianotti is a member of the International Advisory Committee of the Higgs Centre for Theoretical Physics at the University of Edinburgh. Last year, she co-announced, with Joe Incandela of CMS, the discovery at CERN of a new particle – later confirmed as a Higgs boson. Peter Higgs has been associated with the university since 1960.



Fabiola Gianotti, second from right, during a visit of senior members of Edinburgh University including, left to right, Peter Higgs, Victoria Martin and Tim O'Shea, the principal.



About 150 physicists met in Orsay and Paris at the 4th Higgs Hunting Workshop held on 24–27 July. Taking place just after the 2013 EPS-HEP Conference in Stockholm (p37), it provided an ideal occasion for in-depth discussions on the latest results from on-going analyses and detailed studies of the new boson that was discovered last year at CERN. Among those attending were, left to right, Ludwig Faddeev, Karl Jakobs, Guido Altarelli and Monica Pepe-Altarelli. (Image credit: L Fayard.)

SCHOOLS

INSS2013: nurturing young neutrino physicists in Beijing



Students, lecturers and organizers of INSS2013. (Image credit: Li Chen/INSS2013.)

Co-hosted by the Institute of High Energy Physics (IHEP) and Fermilab, the International Neutrino Summer School (INSS) 2013 took place in Beijing on 6–16 August. The school aims to provide a comprehensive programme to prepare young neutrino physicists who are either postgraduate students or in the early stage of their postdoctoral career. This is the first time that INSS and the annual NuFact workshop – before which it usually occurs – have been held in China.

Organized by a committee led by Deborah Harris of Fermilab and Zhi-zhong Xing of

IHEP, the two-week immersion school attracted 89 students and young researchers from nine countries. The curriculum covered the breadth of neutrino physics and related fields such as astrophysics and cosmology. Topics included an introduction to the Standard Model; neutrino-oscillation phenomenology; neutrino-mass models; neutrino cosmology and astrophysics; Majorana/Dirac neutrinos and absolute-mass measurements; fundamentals of neutrino cross-sections; physics of neutrino detection; accelerator-based neutrino programmes and non-accelerator-based neutrino programmes.

A concluding lecture offered a snapshot of the field and future directions.

The school also included research projects on involved and realistic theoretical and experimental problems. Students worked in international collaborations of three to five members on problems that they had chosen together from a collection that was suggested by lecturers and members of the organizing committee. At the end of the school, each collaboration gave a 10-minute presentation on their solutions and/or designs. Three groups received prizes awarded for “Outstanding pedagogy”, “Most unexpected answer” and “Most prolific answer”. Owing to the high quality of work by all of the groups and to reward the hard-working students, the school added three honorable mentions for “The most engaging and energetic presentation and the biggest dreamers”, “The bravest collaboration” and “The most efficient large collaboration”. IHEP generously provided a gift to each individual or collaboration and Yifang Wang, IHEP’s director, kindly signed certificates for the students. In addition to the lectures and projects, the students and lecturers enjoyed social events organized by the school, including an excursion to the Great Wall and two banquets.

Based on anonymous feedback, the students had a great time learning neutrino physics and interacting with their future international collaborators. In the words of one student: “INSS 2013 was just what I was hoping. It delivered answers to all of the neutrino-related questions I have had since entering the field.”

● For further information about INSS2013, including more details on the topics and lecturers, see <http://inss2013.ihep.ac.cn>. In 2014, INSS and NuFact will be hosted by the University of Glasgow and INSS2014 will be held in St Andrews, Scotland.

HASCO 2013 gives credits for hadron-collider physics

The second Hadron Collider Physics Summer School (HASCO 2013) took place on 7–19 July in Göttingen, where 65 undergraduate students from 20 institutes in eight countries and 20 lecturers spent two weeks learning about hadron-collider physics. The students learnt about the foundations of quantum field theory and physics.

Numerous research topics that are relevant for hadron-collider physics were discussed, including QCD, jet physics, statistical methods in data analysis, accelerator physics, detector physics, physics of the top quark and searches for supersymmetry or exotic models and particles. This year’s focus, however, was the physics of the Higgs boson—a suitable emphasis after the discovery of a Higgs-like boson by the ATLAS and CMS experiments, which was announced just a week before HASCO 2012 took place last year.

This type of fundamental research can be carried out only in large international collaborations, so the school aims for the students not only to learn about the relevant physics but also to experience the creative and productive atmosphere of working in an international team at an early stage in their career. Forming pairs from different institutes and countries, they summarized recent published papers from the LHC, the Tevatron or from theory. Excursions to the



Participants at HASCO 2013, at Göttingen University. (Image credit: Arnulf Quadt.)

Phaeno Science Centre in Wolfsburg or to Wernigerode and the Brocken mountain in the Harz region rounded off the programme.

All participating students passed the written examination at the end and received six European Credit Transfer System (ECTS) points each, which they can invest in study programmes at their home institutions. Many of the students became more interested in studying particle physics.

The HASCO school is funded as an ERASMUS Intensive Programme by the German Academic Exchange Service and the EU. The 20 partner institutes are the universities of Amsterdam, Barcelona, Bern, Bologna, Bratislava, Clermont-Ferrand, Geneva, Glasgow, Göttingen, Grenoble, Krakow, Madrid, Manchester, Milano, Orsay, Oxford, Roma Sapienza, Saclay, Stockholm and Uppsala, as well as CERN. In addition, five guest students from Cambridge (UK), Ferrara, Ljubljana, Sherbrooke in Canada and Tokyo Tech also took part.

● For further information, see <http://hasco.uni-goettingen.de>.

MEETINGS

The **27th ISODARCO Winter Course, Nuclear Governance: Prospects for a Strengthened Nonproliferation Regime**, will take place at Andalo on 8–15 January 2014. Topics will include: technical aspects of protecting the nuclear fuel cycle; assessing new efforts to secure, cut off and reduce fissile material stockpiles; issues posed by recent nuclear proliferation; the roles of international law and domestic measures in supporting a strengthened non-proliferation regime. Founded in 1966 by Edoardo Amaldi and Carlo Schaefer, ISODARCO

(the International School on Disarmament and Research on Conflicts) emphasizes the importance of inviting young people to attend meetings. For further information, see <http://isodarco.it/courses/andalo14/andalo14.html>.

ICTR-PHE 2014, the **2014 International Conference on Translational Research in Radio-Oncology and Physics for Health in Europe**, will be held on 10–14 February in Geneva. ICTR-PHE aims at developing new strategies for

improved diagnosis and treatment of cancer by uniting biology and physics with clinics. The five-day conference will review the most recent advances in translational research in physics, biology and clinical oncology. Through the various sessions and symposia, the scientific programme will offer the delegates the opportunity to discuss the latest progress in physics breakthroughs for health applications. For further details, including information on registration, see <http://ictr-phe12.web.cern.ch/ICTR-PHE14>.

Les physiciens des particules du monde entier sont invités à apporter leurs contributions aux CERN Courier, en français ou en anglais. Les articles retenus seront publiés dans la langue d'origine. Si vous souhaitez proposer un article, faites part de vos suggestions à la rédaction à l'adresse cern.courier@cern.ch.

CERN Courier welcomes contributions from the international particle-physics community. These can be written in English or French, and will be published in the same language. If you have a suggestion for an article, please send proposals to the editor at cern.courier@cern.ch.

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VISITS



Robert Madelin, right, director-general of the European Commission Directorate General for Communications Networks, Content and Technology (DG Connect), visited CERN on 4 July. After signing the guestbook he visited the CMS experimental area with collaboration deputy spokesperson Joao Varela, left.



Italian health ministers **Giuseppe Ruocco**, director-general for prevention, left, and **Daniela Roderigo**, director-general for European and international relations, right, visited CERN on 23 July to see the ATLAS experiment cavern and presentations of CERN's medical and health collaborations.

On 16 July, the visit of **Dalit Stauber**, left, director-general of the Israeli Ministry of Education, included a descent to the LHC tunnel with **Laurent Taviani**, right, from CERN's technology department and **Giora Mikenberg**, centre, from the Weizmann Institute of Science and ATLAS collaboration.



Aneliya Klisarova, left, Bulgarian minister of education and sciences, visited CERN on 16 August. As well as a tour of the CMS cavern, she saw the LHC tunnel accompanied by **Zornitsa Zaharieva**, right, of the beams department.



LETTERS

How to build an accelerator

Having read *The Particle at the End of the Universe* (reviewed in *CERN Courier* July/August 2013 p52), and especially the section on accelerators (pp55–73), I feel that more is needed to do justice to the work of accelerator physicists and engineers (while agreeing with the reviewer's praise for the particle-physics chapters).

Sean Carroll writes on p56: "The technological challenge is clear: Accelerate particles to as high an energy as we can, smash them together, and look to see what new particles are created". This may pinpoint a necessary condition for colliders (but not for all classical accelerators) but it does not provide all of the sufficient ones. In fact, the particle beams notably have to be as intense as possible (particles per unit time) and as "dense" as possible (take up the smallest possible volume in transverse and in longitudinal phase space)—and this is usually more difficult to achieve than the quoted necessary condition (see for example, *CERN Courier* September 2013 pp25–47).

A full description of what that means

would first describe the basic aspects to be dealt with by the builders. How to obtain the wanted type, intensity and "density" of particles from an appropriate source; which transfer system(s) to build to get the particles from the source to the first preaccelerator, to the next ones in the accelerator chain and to the main ring; how to achieve the very low pressure in the beam pipes; how to design the bending and focusing magnets that keep the beams individually together and guide them along the theoretical path, plus the accelerating units that increase the beam energy and the instrumentation that enables continuous detailed beam observation. All of this often requires the development of advanced technologies such as outgassing of vacuum chambers and superconducting magnet coils and accelerating cavities.

Second, the hardware components have to perform in a way that achieves the theoretical beam behaviour. This requires close collaboration between accelerator theoreticians and hardware designers. It concerns, for instance, the time-shape of the magnet cycle as a function of the

energy increase, the change in accelerating frequency as a function of the energy reached, as well as the minimization of perturbing influences. As an example, the mechanical stability requirements for the CERN Proton Synchrotron led to its installation on a concrete ring beam hung from a series of reinforced pillars. The positioning of each finely adjustable magnet unit on that beam was done with the help of a specially designed sophisticated geodetic system.

Last, the bibliography on accelerators could be more plentiful. Interested readers can search the web for books on particle accelerators.

● *Helmut Reich, formerly working at CERN.*

The web goes public

On p43 of the September 2013 issue, under the title "CERN launches project to restore info.cern.ch", there is the sentence "On 30 April 1993, CERN published a statement making World Wide Web technology available on a royalty-free basis."

In fact, the official document, of which I am one of the authors, put the software

in the public domain and relinquished all intellectual property rights in it. This is quite different from “royalty free”. The declaration on p2 of the document – which is available on <http://cds.cern.ch/record/1164399> – leaves no ambiguity in reference to either “public domain” or the “intellectual property rights”.

However, the declaration concerns only the software of that moment. There never was a statement about the technology, whatever indeed that might mean.

● Robert Cailliau, *Préveſsin*.

3D trench electrode detectors

I read with interest the article published in *CERN Courier* (April 2013 p35) that accurately copied parts of an erroneous press release from Brookhaven National Laboratory on Zheng Li. Li won an award from the IEEE Long Island section for his “groundbreaking work in the development of novel silicon detectors,” including the development of the “3D trench electrode detector” – one in which at least one type of electrode is made by depositing doped polycrystalline silicon in etched trenches.

However, I would like to make it clear that

Zheng Li was not the first to discuss the “3D trench electrode detector,” which was in fact already proposed in our group by Chris Kenney. Sensors were fabricated in 1998 at the Stanford Nanofabrication Facility with internal and peripheral trenches as part of our first 3D sensor batch. Our group also made and tested all-trench electrode sensors and showed photographs of them at the 2003 IEEE Nuclear Science Symposium.

Li also wrote an article, “New BNL 3D-Trench electrode Si detectors for radiation hard detectors for LHC and for X-ray applications” (Li 2011), where on p91 references to our 2001 paper on wall or trench electrodes (Kenney *et al.* 2001) are made: “There was a trench-wall-electrode proposed by Kenney *et al.* [11], where the detector boundary was etched and doped as trench-wall for the fabrication of edgeless or active-edge detectors, while the electrodes in the bulk are column ones.” On the third page of our 2001 paper, taking almost a quarter of the page, is figure 5, a photomicrograph of “part of a sensor with alternating n-type wall and p-type cylinder electrodes” clearly fitting Li’s definition of a 3D trench electrode detector.

It is difficult to see how Li could make the

sweeping comment “while the electrodes in the bulk are column ones” without looking at our first wall or trench electrode paper (his reference 11). It is equally difficult to see how he could look at the paper and miss the obvious figure 5.

Still, I would like to express my happiness to see Zheng Li working on 3D technology. He must just avoid incorrect claims of originality and should feel free to ask members of our 3D group for help on that subject.

● Sherwood Parker, *member, ATLAS collaboration*.

● Further reading

Z Li 2011 *Nucl. Inst. Meth. A* **658** 90.

C Kenney *et al.* 2001 *IEEE TNS Trans. Nucl. Sci.* **NS-48** 2405.

CORRECTION

The article on IceCube’s detection of neutrinos with energies >1 PeV (*CERN Courier* July/August 2013 p5) should have stated that “the probability that the two observed events are background is 2.9×10^{-37} ”. Unfortunately, the word “not” entered this sentence by mistake.

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OBITUARY

Lorenzo Resegotti 1928–2013

Lorenzo (Renzo) Resegotti, renowned accelerator physicist and engineer at CERN from 1954 to 1988, passed away on 23 May 2013.

A native of Piemonte, Italy, Renzo earned his laurea in industrial and electrical engineering at the prestigious Politecnico di Torino, later gaining a diploma in radio engineering from the National Electro-Technical Institute. He became interested in accelerators during a further year spent as a fellow at the Institute of Physics, Rome University. This training provided the perfect background for working at CERN and he was recruited to work in the newly formed organization in April 1954.

Renzo quickly acquired a reputation for being technically competent, rigorous and hard-working – attributes that led him to being given ever-increasing responsibilities in the young organization. His first assignments included the design, purchase and commissioning of the power supply for the Proton Synchrotron, as well as the design and construction of the 120-cm heavy-liquid bubble chamber and its magnet where, with Colin Ramm as his chief and mentor, he honed practical skills of equipment design and project leadership that complemented the thorough understanding of electromagnetism and mechanics that was acquired through his formal studies.

From 1961, he was deputy head of the Nuclear Physics Apparatus division. He was therefore a natural choice to lead the Magnet Group under Kjell Johnsen in the newly created Intersecting Storage Rings (ISR) department in 1966. In common with the other ISR group leaders, Renzo was determined to design, measure and install top-quality equipment, purchased



Lorenzo Resegotti. (Image credit: Ruth Haas.)

at the lowest price. The success of the ISR bore witness to this dedication. In addition, he regarded it as his duty to imbue the engineers and scientists in his group with training of the sort that he had received (e.g. to get best value for taxpayers' money by applying the "Would you buy at that price with your own money?" rule). When the magnet equipment was installed and working, the group continued to work on the machine and evolved into the Beam Optics and Magnets group (BOM) – an ideal creation for improving the accelerator by optimal use of the magnet system. Therefore coupling-control systems using sets of skew quadrupoles were designed, plus low- β insertions to enhance luminosity.

Aware of the recent advances in superconductivity and of the importance that this could have for CERN, Renzo established a strategic project to build a set of eight reliable superconducting quadrupoles

(four magnets per ring) to equip a crossing point at the ISR with a powerful low- β insertion. This was to be the first major use of superconducting magnets in an accelerator and the magnets were to be developed at CERN and built in industry. Through this project CERN not only acquired an extremely useful piece of apparatus – the ISR achieved the record luminosity of $1.4 \times 10^{32} \text{ cm}^{-2} \text{ s}^{-1}$ – but in parallel it trained engineers and scientists in the practical application of superconductivity and associated cryogenics. This enabled the organization to continue and progress – and eventually led to the LHC.

Renzo was a tough master, truly devoted to doing his utmost for the good of the organization and expecting the same of others. It is generally agreed that he could be "difficult", but he was always straight and just and would be caring with regard to the families of group members. In the words of one scientist on hearing the sad news of Renzo's death, "He was hard – but definitely the best boss I ever had!" The BOM group went on to develop the magnets for the Large Electron-Positron collider, a machine for which Renzo accumulated the responsibility of being a member of the Management Board. However, plagued by ill-health, he found it increasingly difficult to live up to his own standards and took early retirement in 1988. He subsequently devoted himself to voluntary work with his wife Katy through their church in Meyrin and performed duties within the pensioners' association for several years where his insight and common-sense were highly esteemed. The sense of camaraderie instilled into the members of the ISR/BOM group is such that to this day there is a biannual reunion.

● *His friends and colleagues.*

NEW PRODUCTS

Agilent Technologies has introduced the IDP-15 Dry Scroll Pump and the TwisTorr 304 FS Turbomolecular pumps. The IDP-15 Dry Scroll vacuum pump offers a peak pumping speed of $15.4 \text{ m}^3/\text{h}$ (60 Hz) and $12.8 \text{ m}^3/\text{h}$ (50 Hz). The TwisTorr 304 FS turbomolecular high-vacuum pump combines TwisTorr drag stage technology and Agilent Floating Suspension. In the TwisTorr 304 FS, the bearing and dry lubrication eliminate oil and maintenance, and permit operation of the pump in any orientation. For more details, visit www.chem.agilent.com.

ID Quantique has added two new detectors to its id120 series of compact single-photon detector modules based on a silicon avalanche-photodiode that is sensitive in the visible spectral range. The new detectors have high efficiency (up to 80%) in the red region of the visible spectrum and a $500 \mu\text{m}$ large active area. The modules – which are equipped with a dual universal output signal port – are versatile with a LabView interface that allows the user to control quantum efficiency, dark count rate, etc. For more information, see www.idquantique.com/instrumentation.html.

XP Power has announced the SDL400 series of 400 W single- and dual-output AC-DC power supplies. Suitable for 1U applications, they are available in four mechanical formats, most less than 39.9 mm high. Single-output models are available with nominal outputs between +12 and +48 VDC, as well as +54 and +60 VDC variants. Dual-output models have a +5 VDC output in combination with a +12, +24 or +48 VDC, or +12/+24 VDC. For further details, contact Steve Head, tel +44 118 984 5515, e-mail shead@xppower.com or visit www.xppower.com.