

# Faces & Places

CERN

## Agnieszka Zalewska is elected president of CERN Council

The CERN Council has elected Agnieszka Zalewska to be its 21st president from 1 January 2013. She takes over from Michel Spiro, whose three-year term finishes at the end of December. Zalewska has been a member of several CERN committees and has been the Polish scientific delegate to the CERN Council since January 2010.

Zalewska, who is currently a professor at the H Niewodniczański Institute of Nuclear Physics of the Polish Academy of Sciences in Krakow, has a distinguished career in particle physics and a long association with CERN. She received her doctorate in 1975 from the Jagellonian University in Krakow for work on the data from the 2-m bubble chamber at CERN. She later worked on the DELPHI experiment at the Large Electron–Positron collider, where she played an important role in the development of silicon tracking detectors.

Since 2000, she has worked primarily in neutrino physics through the ICARUS experiment at Italy's Gran Sasso National Laboratory, which studies a neutrino beam sent from CERN, and at the T2K



*Agnieszka Zalewska will be not only the first woman but also the first Polish physicist to be president of CERN Council.*

(Tokai-to-Kamioka) experiment in Japan. She has also been involved in feasibility studies for an underground laboratory in Poland.

"The coming years will be fascinating but demanding, as we prepare the LHC for running at higher energies and implement the updated European Strategy for Particle

Physics," said Zalewska. "CERN and its Council will become my only priority, and I would like to thank the council members and outgoing president for the confidence they have placed in me."

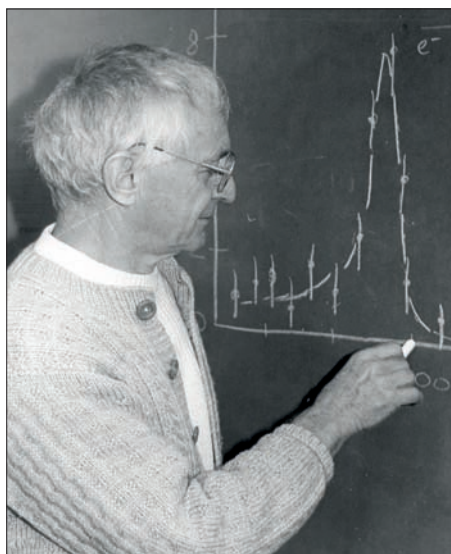
● For an interview with Agnieszka Zalewska, see *The Bulletin* <https://cdsweb.cern.ch/record/1479361?ln=en>.

CELEBRATION

## Slovenian particle-physics pioneer reaches his 80th

Friends and colleagues gathered at the Jozef Stefan Institute in Ljubljana on 13 September to celebrate the 80th birthday of Gabrijel ("Elko") Kernel. Speakers there outlined his contributions to experimental particle physics, recognizing him as the "founding father" of the field in his home country, Slovenia.

Kernel's involvement in experiments at CERN dates from the mid-1970s, when he joined an international group of physicists, led by the late Neil Tanner of Oxford University, who were building the Omicron spectrometer at the 600 MeV Synchrocyclotron. As spokesperson of a series of experiments on pion production near threshold, Kernel established a small group of young and capable Slovenian particle physicists. His later research included experiments at DESY with the



ARGUS spectrometer and at CERN's Large Electron–Positron collider with DELPHI. During this time, he supervised the PhD theses of many young colleagues, several of whom now lead Slovenian groups in large international collaborations such as ATLAS, Belle II and the Pierre Auger Observatory.

Kernel's contribution to science in general and Slovenian particle physics in particular is appreciated by not only the 40 or so members of the particle physics department at the Jozef Stefan Institute and particle physics groups at the Universities of Ljubljana, Maribor and Nova Gorica but also by national institutions that have recognized his work through many honours and awards.

*Gabrijel ("Elko") Kernel. (Image credit: Janez Zrnec.)*

## Faces & Places

### CONFERENCE

# QCD 12 and Higgs-like happiness

Amid the beauty of Montpellier in France, the 16th International Conference in Quantum ChromoDynamics, QCD 12, took place on 2–6 July. It brought together theorists and experimentalists from laboratories around the world, all working actively within QCD. Mid-way through the conference, a live webcast from CERN thrilled participants with the news of the discovery of a Higgs-like boson.

The new boson was just one of the discussion topics at QCD 12. This biannual conference featured LHC physics alongside heavy-flavour spectroscopy, light flavours and glueballs, tau, kaon and B-decays, CP-violations and the QCD plasma.

Participants discussed several questions – including the hadron spectrum – suggesting approaches to manage the non-perturbative problems in a way similar to the weak coupling limit. Talks also dealt with the use of perturbation theory at high-energy in QCD to evaluate the production rate of pairs



Participants pose in the Montpellier sunshine. (Image credit: Alize Photo.)

of top quarks, and presented the different determinations of the QCD coupling  $\alpha_s$ .

The current work by Stephan Narison, the conference organiser, on heavy flavours with QCD spectral-sum rules could be a reference for experiments in much the same way as lattice computations. Elsewhere, researchers are now actively pursuing anti-deSitter models to map gravity and QCD.

Measuring the g factor of the muon could give a clue to new physics, although the critical point is determining the hadronic contributions. There is currently a  $3.6\sigma$

discrepancy between the theoretical computed value and the one measured. The programme concluded with talks on behalf of the ATLAS and CMS collaborations – a fitting end that allowed the participants to hear about the achievement announced on 4 July directly from some of the very people involved at CERN.

• For more information, visit [www.lpta.univ-montp2.fr/users/qcd/qcd2012/](http://www.lpta.univ-montp2.fr/users/qcd/qcd2012/) and Marco Frasca's blog at: <http://marcofrasca.wordpress.com/2012/07/08/qcd-12-and-higgs-tears/>.

### ASP 2012

# Ghana hosts 2nd African physics school

On 15 July – 4 August, the Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi, Ghana, played host to the African School of Fundamental Physics and its Applications 2012 (ASP2012), which was attended by 50 students, nearly all of whom were from African nations. This was the second such school, following the highly successful first edition, ASP2010, which took place two years ago in Stellenbosch, South Africa (*CERN Courier* November 2010 p26). One new feature for 2012 was an extension of the school with three extra days dedicated to the Grid, taking place on 6–8 August.

The goal of the school is to help advance basic science and its applications throughout Africa by increasing the number of students acquiring higher education and improving proficiency in applications and technologies related to research at particle accelerators. To this end, it is based on a close interplay between theoretical, experimental, applied physics



Students and lecturers at the physics school in Kumasi. (Image credit: ASP2012.)

and computing, with a duration that allows for student-to-student interactions, as

well as between students and lecturers. This year, the 32 lecturers – spread across

the three-and-a-half-week period – came from Belgium, France, Ghana, Italy, South Africa, Sweden, Switzerland, the UK and the US, as well as from CERN.

The success of ASP2010 had encouraged the organizers to work hard towards the original aim of holding the school every two years. By exploring the option to hold the school in a different host country, the international organizing committee (IOC) – which consists of members from the International Centre for Theoretical Physics (ICTP), Brookhaven National Laboratory, the European Spallation Source (ESS), King's College London and the Institut National de Physique Nucléaire et de Physique des Particules (IN2P3) of the Centre National de la Recherche Scientifique (CNRS) – selected Ghana for ASP2012. The local organizing committee (LOC) consisted of KNUST, the University of Ghana at Legon, the Ghanaian Atomic Energy Commission, the University of Cape Coast and the National Institute for Mathematical Sciences.

ASP2012 proved as successful as ASP2010, thanks to the dedication of the IOC, the organization by the LOC, the quality of the selected students and financial support from 23 institutions in Africa, Europe and the US, including ICTP, INFN, CERN and other major particle-physics laboratories, as well as governmental institutions in Africa, Europe and the US – all of whom foster the goals of the school. As Fernando Quevedo, the director of ICTP, commented: “The success of ASP2012 is a wonderful example of international scientific collaboration contributing to the development of fundamental science in Africa and the ICTP is proud to provide strong support to these schools.” The IOC is now preparing a report of activities for the sponsoring institutes, before the preparation for the next school in 2014 begins in earnest.

● ASP2012 was sponsored by AIMS-NEI (SA), BNL (US), CEA-IRFU (France), CERN, CNRS/IN2P3 (France), DESY (Germany), EPFL (Switzerland), ESS (Sweden), FNAL (US), ICTP, INFN (Italy), JLAB (US), JSA (US), Louisiana Tech University (US), NITheP (SA), PSI (Switzerland), Université Catholique de Louvain (Belgium), University of Texas Arlington (US), Uppsala University (Sweden); by the networks ARDENT and DITANET; by the American Physical Society (US), the Department of Science and Technology (SA), the French Embassy Ghana, the NRF (SA) and the NSF (US); and by private donation (M Lindroos).

● For more about the school, visit <http://cern.ch/africanschoolofphysics>.

## OUTREACH

# ATLAS virtual visits awarded best online event

The ATLAS virtual visit project was awarded “best online event” at the recent Digital Communication Awards in Berlin, for excellence in online communication. More than 500 international communication projects competed for 36 awards and the project was shortlisted alongside major corporations as well as professional advertising agencies.

During a virtual visit, online participants can use web-based video-conferencing tools to talk to an ATLAS physicist, receive a tour of the control room and get answers to their questions. Visits have included students from Brazil and Palestine, as well as links with the UK, Poland and Italy during the recent EU Researchers’ Night in September. In one event, CERN directors were able to link remotely with ATLAS from a town square in Krakow.

With the number of requests for visits increasing steadily, virtual visits look set to continue and bring the excitement of research at the LHC to students and the general public. The virtual visits are organized by the ATLAS outreach and education team and are hosted by members of the collaboration.

● For more details, see <http://cern.ch/atlas-virtual-visit/>.



An ATLAS virtual visit for students at Al-Quds University, a Palestinian university with campuses in Abu Dis and al-Bireh. Top: The scene from the ATLAS control room transmitted to the students, who can also be seen asking their questions, below.



Si-Chen Lee (front right), president of the National Taiwan University (NTU), shakes hands with Chee-Chen Leung, vice-president and co-founder of Quanta Computer Inc, after signing the contract on 21 June for a donation of NT\$570 million (US\$19 million) to support the permanent operation of the Leung Center for Cosmology and Particle Astrophysics (LeCosPA), including the building of a dedicated building. The centre was made possible through an earlier donation from Leung in 2007 (CERN Courier July/August 2008 p38). (Image credit: LeCosPA.)

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### VISITS



The president of the Slovak Republic, **Ivan Gašparovič**, centre left, shakes hands with CERN's director-general, **Rolf Heuer**, flanked by **Silvia Gašparovič**, left, and **Karel Safarik**, physics and computing group leader at CERN for the ALICE experiment. The president and his wife visited CERN on 11 September, where they toured the LHC tunnel and the ALICE experiment, and spoke to members of the CERN Slovak community.



The German Chancellor, **Angela Merkel**, centre right, visited the DESY laboratory in Hamburg on 20 September. Together with Hamburg's First Mayor, **Olaf Scholz**, centre left, Nobel laureate, **Ada Yonath**, right, and DESY's director, **Helmut Dosch**, left, she participated in the ceremony to name the PETRA III experimental hall after Max von Laue, who discovered the diffraction of X-rays by crystals exactly 100 years ago.

### NEW PRODUCTS

**CUI Inc** has released its second-generation digital point-of-load DC-DC modules for distributed-power architecture applications. The NDM2P series is the latest addition to CUI's Novum Advanced Power product line. The modules offer true cycle-by-cycle compensation, autonomously balancing the trade-offs between dynamic performance and system stability. With efficiencies above 93% at half load, the series comes in three compact DIP configurations. For further details, contact Maggie Lefor, tel +1 503 612 2391, e-mail [mlefor@cui.com](mailto:mlefor@cui.com) or visit [www.cui.com](http://www.cui.com).

**Essex X-Ray and Medical Equipment Ltd** have extended the range of spring-loaded flanges manufactured for use with their high-voltage cable assemblies, covering voltages up to 300 kV. The constant tension created by these multi-spring flanges ensures that an even pressure is exerted on the contacts and all round the seals, regardless of external conditions. Detailed drawings and data sheets are available from [www.essex-x-ray.com/dadasheets.html](http://www.essex-x-ray.com/dadasheets.html). For further details, contact Ray Wood, tel +44 1371 875 665, e-mail [rwood@essex-x-ray.com](mailto:rwood@essex-x-ray.com) or see [www.essex-x-ray.com](http://www.essex-x-ray.com).

**Keithley Instruments Inc** has introduced three new economical source measurement unit (SMU) instruments to its Series 2600B System SourceMeter line. The

2604B, 2614B and 2634B are optimized for bench-top research, product development and student labs. Series 2600B offers single- and dual-channel models that combine the capabilities of a precision power supply, true current source, 6½-digit multimeter, arbitrary waveform generator, pulse generator and electronic load in one instrument. Keithley has also announced the Model 2110 5½-digit Dual-Display Digital Multimeter, which is optimized for general-purpose systems and bench-top design applications. System features such as external triggering and a built-in reading buffer to enhance ease of use. Its capabilities include DC voltage (up to 1000 V) and current (up to 10 A), AC voltage (up to 750 V) and current (up to 10 A) measurements. For further details, tel +49 89 84 93 07 40, e-mail [info@keithley.de](mailto:info@keithley.de) or visit [www.keithley.com](http://www.keithley.com).

**Kurt J Lesker Company** has introduced the Chamber Builder, for designing and ordering custom vacuum chambers. Combined with the online drawing service, VacuCAD, the Chamber Builder programme allows a customer to take a standard KJLC chamber, customize it to fit their application and generate a 3D model in both PDF and STP formats. It is possible to add up to 20 ports per chamber. For further details, tel +1 412 387 9200, e-mail [chambers@lesker.com](mailto:chambers@lesker.com) or see [www.lesker.com](http://www.lesker.com).

**Siemens Industry Automation Division** has extended its range of single-phase power supplies, Sitop, with three 24 V power supplies with rated output voltages of 2.5 A, 5 A and 10 A, as well as two 12 V power supplies with 7 A and 14 A. The output voltage is adjustable for 24–28 V for the 24 V power supplies and for 12–15.5 V for the 12 V models. The units can be used at ambient temperatures between –10 °C and 70 °C and are characterized by up to 90% efficiency, ensuring minimal heat generation. For further details, contact Peter Jefimiec, tel +49 911 895 7975, e-mail [peter.jefimiec@siemens.com](mailto:peter.jefimiec@siemens.com) or visit [www.siemens.com/sitop](http://www.siemens.com/sitop).

**Unitemp** has launched a range of energy efficient compact vacuum chambers manufactured by **Japan ESPEC Corporation**. The range, primarily for testing electronic/electrical components, materials, small assemblies and adhesives under low pressure, consists of three models, VAC-101P/-201P/-301P. A 20–40% energy saving is claimed by advanced manufacturing processes giving improved air tightness and sealing capacity. The pressure pull-down range is from atmospheric to less than 133 Pa, which can be obtained in 4 to 15 minutes, depending on the model. For further details, contact Paul Brown, tel +44 1628 850611 or e-mail [paul@unitemp.co.uk](mailto:paul@unitemp.co.uk).

## COSMIC RAYS

## Hess and his scientific legacy

There have been many meetings to celebrate the centenary this year of the discovery of cosmic rays but only one took place close to the site where Victor Hess landed after his historic balloon flight of 7 August 1912 (*CERN Courier* September 2012 p14). Not only did this conference bring together historians and key people in the ongoing study of cosmic rays, Hess's two grandsons from the US were also present and for, added flavour, participants had the opportunity to see the area themselves from a balloon.

The meeting on "100 Years of Cosmic Rays – Anniversary of Their Discovery by V.F. Hess" took place in the small town Bad Saarow-Pieskow, some 50 km south-east of Berlin, on 5–8 August. It was organized by the University of Potsdam, the Max Planck Institute for the History of Science and members of the DESY institute at nearby Zeuthen, which has a large involvement in the appropriately named HESS (High Energy Stereoscopic System) in Namibia, as well as with the IceCube experiment at the South Pole.

As with many important advances, the discovery of cosmic rays was "of its time". Hess was not alone in studying the conductivity of air. His ground-breaking measurements owed much to Theodor Wulf, for instance, who had invented a sensitive electroscope. Examples of this and other early instruments were on display at the meeting and presentations on the first day reminded the audience of other pioneers who refined instrumentation or took to the skies in hydrogen balloons – both before and after Hess. As an appropriate start, William "Bill" Breisky, an American writer and former editor of the *Cap Cod Times*, recalled his childhood visits to "Grandpa" Hess in New York (to where Hess had fled from the Nazis), providing a tangible link with the man whose work was being celebrated.

Hess's work led directly to further research on cosmic rays and the discovery of extensive air showers of secondary particles generated by very-high-energy cosmic rays. It also led to high-energy particle physics: Brookhaven's 3.3 GeV Cosmotron was so named in the early 1950s because it would accelerate protons to energies similar to those of cosmic rays. Jim Cronin, who epitomizes the links between the two fields, set the scientific scene for the conference with an overview of the developments that followed Hess's discovery up until around 1950. Awarded the Nobel prize for the discovery in



*Some conference participants fly over the area of Bad Saarow-Pieskow, a century after Hess landed in the region.*



*Arthur (left) and Bill Breisky unveil the plaque dedicated to Hess and his achievement, in the village of Pieskow. (Image credits: T Pritchard.)*

1964 of CP violation in neutral kaons, Cronin was later one of the instigators of the Pierre Auger Observatory in Argentina, which currently detects extensive air showers from the highest-energy cosmic rays.

Several speakers cast more light on the different techniques for detecting cosmic rays developed during the first part of the 20th century, from the cloud chamber, which made cosmic rays visible, to the discovery of Cherenkov radiation emitted by air showers. Claus Grupen carefully detailed the many "elementary" particles observed in cosmic rays during this period, from the positron of 1932 to the  $\Sigma$  particles and even maybe the  $\Omega^-$  of the early 1950s. More of Hess the scientist and his work was the subject of Peter Schuster, who together with a group of other physicists set up the Victor Franz Hess Society in Graz, in 2007.

A move towards the present day began on the second day, with an overview by Alan Watson, who with Cronin led the construction of the Auger Observatory.

Watson laid out the path from the late 1940s to the present, "chasing the highest-energy cosmic rays". Understanding where cosmic rays of the highest energies originate and the mechanisms that could accelerate them are still unknown – and the subject of debate, as some lively discussions demonstrated. Back to Earth, Ralph Engel reminded the audience of the essential role that current particles physics plays in understanding hadronic interactions, a crucial matter for simulating the production of showers in the atmosphere. Experiments at CERN, especially by LHCf and TOTEM at the LHC, as well as by NA61 and HARP, are making valuable contributions in this respect.

Cosmic-ray physics is now a part of the broader field of astroparticle physics and is advancing knowledge of the universe in a number of ways. Imaging air-Cherenkov telescopes, such as HESS, detect  $\gamma$ -ray sources through the air showers that high-energy  $\gamma$ -rays generate, providing a complementary view to that obtained by satellites. The age of neutrino astronomy began with the detection of neutrinos from the supernova SN1978a and continues today with IceCube, which aims to detect cosmic-neutrino sources. Closer to home, there still remain questions about the interactions of cosmic rays with the charged particles of the heliosphere that surrounds the Solar System. Last but not least, links between cosmic rays and climate and life on Earth remain fascinating areas of research, as the closing talks revealed.

While the meeting provided a broad, up-to-date look at cosmic-ray research, history was never far away. On 7 August – 100 years to the day after Hess landed close by – Bill and Arthur Breisky unveiled a plaque on a geological "erratic", a stone deposited after having been carried from afar by a glacier during the last ice age. It was a fitting tribute to their grandfather, who had found himself near the same place after making a long journey to study an intriguing natural phenomenon – and setting researchers onto a road that would lead to modern particle physics.

● For more about the conference, see <https://indico.desy.de/conferenceDisplay.py?confId=4213>. For Bill Breisky's article about Hess in *The New York Times* of 7 August, see [http://www.nytimes.com/2012/08/07/science/space/when-victor-hess-discovered-cosmic-rays-in-a-hydrogen-balloon.html?\\_r=0](http://www.nytimes.com/2012/08/07/science/space/when-victor-hess-discovered-cosmic-rays-in-a-hydrogen-balloon.html?_r=0).

## Faces & Places

### OBITUARY

# Michael Edwards 1939–2011

Mike Edwards, who made valuable contributions to several generations of particle-physics detectors, passed away on 23 November 2011.

Mike began his scientific career in 1960 when he joined John Holt's group working on pion scattering experiments at the synchrocyclotron at Liverpool University. There he developed spark chambers with automatic acoustic read-out, which kindled his interest in the techniques of particle physics, a career path that he was to follow.

Following his PhD at Liverpool University, he went to the US to work on the Carnegie-Mellon synchrocyclotron in Pittsburgh. From there he moved back to the UK, where he had been invited to the Daresbury Laboratory to develop automatic film-scanning systems. He then went to CERN to work on the Omega Spectrometer with the Liverpool University group. After this, he joined the Experimental Physics Group at Daresbury, playing a pivotal role in the construction and testing of multiwire proportional chambers (MWPCs) and their on-board electronics for the LAMP group.

When high-energy physics moved from Daresbury to the Rutherford Appleton Laboratory (RAL) attempts were made to keep Mike at Daresbury to help with the detector needs of the new synchrotron



Mike Edwards. (Image credit: Edwards.)

radiation facility. However, he wished to remain in high-energy physics and joined the RAL team working in the European Muon Collaboration (EMC) at CERN. He was responsible for the development and testing of even larger MWPCs inside the EMC forward magnet spectrometer and with the huge EMC muon drift chambers.

Mike then became involved in the design and construction of the endcap electromagnetic calorimeters for the ALEPH

experiment at CERN's Large–Electron Positron collider. Here his “down-to-earth” approach gave him a central role throughout. That the detectors worked perfectly during the 11 years of ALEPH data taking is a fitting memorial to him. He ended his career working first on the design of apparatus for experiments at the aborted Superconducting Supercollider in Texas and finally on the cooling system for the barrel and endcap silicon detectors for the ATLAS experiment at the LHC.

Much of the success of the LAMP, EMC and ALEPH detectors was built on the dedicated efforts of Mike and his team, working behind the scenes to make them operate. He did not take the accolades for the successes of the experiments on which he worked, but they would not have produced the same results without him. He was a genial man who would move mountains to make sure that the detectors worked.

Mike always smiled, was kind and fair to everyone and was a good source of humour while pushing back the frontiers of detector technology. He became a much respected colleague on all of the projects in which he was involved. He is sorely missed by all of us and by his family for whom he was a much loved husband, father and grandfather.

● *His friends and colleagues.*

### LETTER

#### Boosting the Booster

Congratulations to the Booster team for achieving such impressive progress and thank you to the authors of the recent article for letting readers of *CERN Courier* participate (September 2012 p27). Having been the co-ordinator of the Booster Study Group 1966/67 (and the leader of Booster Group 1973–1983), I would like to add a few comments.

When I participated in a session of the Tevatron design group, I learnt that one of Robert Wilson's aims was to build a machine as compact and inexpensive as possible compatible with the performance aims. If that had been a design criterion for the Booster, the improvements described in the article would have required much deeper changes, such as the replacement of the complete magnet system. As it happened, the Booster improvements were able to benefit from the original implied design aims of: (i) flexibility of operation; (ii) keeping sources of beam instabilities as small as

possible, with early provision of means to combat remaining ones; and (iii) ensuring machine reliability.

After intensive studies of possible alternatives, the consequences were: a slow-cycling separate-function synchrotron with triplet focusing and an even number of superposed rings (as against five rings preferred by some); the achievement of magnet characteristics as uniform as possible plus plenty of correction magnets; the maximum possible reduction of the beam-equipment coupling impedance; low magnetic, electric and thermal stress of machine components; radiation hardening and protection against stray protons; safety margins of 10–20% with respect to nominal electric currents and voltages; standardization of components wherever possible; an extension of the theory of various beam instabilities and their reduction by appropriate feedback systems (F J Sacherer and F Peterson 1977 *IEEE Trans. Nucl. Sci.* **NS-24** 1396).

More details on these and more can be found in the original Booster proposal, MPS/Int.DL/B 67-19, and later CERN documents MPS/Int.BR/74-10 and PS/BR/77-1 as well as *CERN Courier* July/August 1973 p219 and July/August 1997 p4.

To conclude, I take my hat off again to all who have achieved so many great improvements on those potentially fruitful foundations, which are still considered good enough for the upgrade to CERN's accelerator complex.

● *Helmut Reich, Glion, Vaud.*

### CORRECTION

An unfortunate error crept into the article on the discovery of air-Cherenkov radiation in the September issue of *CERN Courier*. On p36, it states that Trevor Weekes “had worked with Jelley in a collaboration between AERE and the University of Dublin”. The correct attribution should be to University College Dublin. Many apologies to all concerned.