

Faces & Places

APPOINTMENTS

Nigel Lockyer becomes director of Fermilab

Physicist Nigel Lockyer, head of TRIUMF, Canada's national laboratory for particle and nuclear physics, will in September become the sixth director of Fermi National Accelerator Laboratory.

Lockyer will be a familiar face to many. He spent 22 years as a researcher on the CDF experiment at Fermilab, starting in 1984. He was co-spokesperson of the 600-member experiment from 2002 to 2004.

The Board of Directors of the Fermi Research Alliance, which operates Fermilab for the US Department of Energy, offered Lockyer the top job at the conclusion of a nine-month, international search. He will succeed Pier Oddone, who retired in July after eight years as head of the laboratory.

"The opportunity to lead one of the world's most prestigious particle physics laboratories was too good to pass up," says Lockyer. "The



Nigel Lockyer will be Fermilab's next director. (Image credit: TRIUMF.)

future of the field looks to be very exciting; it is a great time to be a particle physicist."

Lockyer is an accomplished physicist and leader. In 2006 he won the Panofsky Prize for measuring the lifetime of the bottom quark. During his time as director of TRIUMF, starting in 2007, the laboratory opened new facilities, developed new technology for creating medical isotopes, pushed for the commercialization of innovations from the physical sciences and established Canada's first accelerator-science co-operative agreements with Japan, India, China and Korea.

Brookhaven appoints new physics chair

Laurence Littenberg takes the reins as chair of the physics department at Brookhaven National Laboratory (BNL) as of 1 July. He succeeds Thomas Ludlam, who has served as chair since September 2007.

Littenberg joined BNL in 1974 and has been recognized for his role in ground-breaking research in particle physics. As part of an international team of 50 physicists, Littenberg discovered and measured the rare kaon decay $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ at the E787 experiment at the laboratory's Alternating Gradient Synchrotron (CERN Courier December 2008 p6).

In his new role, Littenberg will oversee BNL's physics portfolio. This includes the Relativistic Heavy Ion Collider, which is the only particle collider currently operating in the US, as well as the laboratory's role at the LHC – particularly in the ATLAS collaboration. He also takes charge of BNL's collaboration in the Baryon Oscillation Spectroscopic Survey and the development of a multi-gigapixel camera sensor for the



Laurence Littenberg is the new chair at Brookhaven's physics department. (Image credit: BNL.)

Large Synoptic Survey Telescope, as well as the long-standing programme in neutrino research, which includes the US proposal for a future Long Baseline Neutrino Experiment (CERN Courier April 2012 p12).

Rome honours memory of Pontecorvo

The year 2013 is the centenary of the birth of Bruno Pontecorvo, one of the great physicists of the 21st century and a pioneer of high-energy physics. To honour his memory as a person and a scientist, the Physics Department of Sapienza University, in Rome, will hold an international meeting, "The Legacy of Bruno Pontecorvo: the Man and the Scientist", on 11–12 September. Bruno Pontecorvo's life was characterized by his ground-breaking scientific ideas and by his ideological choices, sometimes dramatic, which marked his destiny as a person and as a scientist. The meeting will be a fitting tribute to the memory of the youngest *ragazzo di Via Panisperna* and provide an opportunity to encounter and celebrate his scientific vision and his civil commitment. The scientific programme will revisit the steps that led him to his important scientific results and review his legacy for today's neutrino experiments.

● For further information, see www.roma1.infn.it/pontecorvo/.

AWARDS

Prize time at EPS-HEP 2013

The ATLAS and CMS collaborations are among the winners of the 2013 European Physical Society High Energy Physics prizes. The High-Energy and Particle-Physics Prize, for an outstanding contribution to high-energy physics, is awarded to the two collaborations, “for the discovery of a Higgs boson, as predicted by the Brout-Englert-Higgs mechanism”, and to Michel Della Negra, Peter Jenni and Tejinder Virdee, “for their pioneering and outstanding leadership roles in the making of the ATLAS and CMS experiments”.

The Young Experimental Physicist Prize for outstanding work by one or more young physicists in the field of particle physics and/or particle astrophysics also recognizes research at the LHC. It goes to Diego Martinez Santos in the Nikhef LHCb group “for his outstanding contributions to the trigger and commissioning of the LHCb experiment, and the analyses leading to first evidence for the rare decay $B_s^0 \rightarrow \mu^+ \mu^-$ ”.

Zohar Komargodski of the Weizmann Institute receives the 2013 Gribov Medal for outstanding work by a young physicist in theoretical particle physics and/or field theory “for his deep insights into the structure of the renormalization group in four-dimensional field theories and, in particular, his proof (with Adam Schwimmer) of the a-theorem”.



Left to right: EPS-HEP prize-winners Tejinder “Jim” Virdee and Michel Della Negra of CMS and Peter Jenni of ATLAS.



In the field of neutrino physics, the Giuseppe and Vanna Cocconi Prize for an outstanding contribution to particle astrophysics and cosmology in the past 15 years goes this year to Arthur McDonald, director of the Sudbury Neutrino Observatory (SNO) collaboration and Yoichiro Suzuki, director of the Kamioka Observatory, “for their outstanding contributions to the solution of the solar neutrino puzzle by measuring the flux of all neutrino flavours from the Sun with the

Super-Kamiokande and SNO experiments”.

Finally, Don Lincoln of Fermilab (and the University of Notre Dame) is the first non-European to receive the Outreach Prize, for outstanding outreach achievement connected with high-energy physics and/or particle astrophysics, “for communicating in multiple media the excitement of high-energy physics to high-school students and teachers and the public at large”.

● The awards are to be presented at the EPS-HEP 2013 in Stockholm on 18–24 July.

In a ceremony on 29 May, Roy Kerr of Canterbury University in Christchurch, New Zealand, received the Albert Einstein Medal 2013, awarded by the Albert Einstein Society, in Bern. The medal, which is to honour extraordinary achievements related to Einstein's legacy, is awarded to Kerr for his “1963 discovery of a solution to Einstein's gravitational field equations”. The Kerr metric describes space-time around a spherical mass with angular momentum, such as a rotating black hole.



Roy Kerr with the 2013 Albert Einstein Medal. (Image credit: Edith Ruchti, Bruegg.)

The Albert Einstein Society was founded in Bern in 1977 and the first medal was awarded to Stephen Hawking in 1979, the centenary of Einstein's birth. The society also maintains Einstein's former flat at 49 Kramgasse in Bern as a commemoration site open to the public.

Steve Myers, director of accelerators and technology at CERN, is to become an officer of the Order of the British Empire (OBE) for services to science and technology, as announced in the Queen's Birthday Honours list for 2013. Myers has had a leading role in the development of CERN's particle colliders over the past 40 years, including the Intersecting Storage Rings, the Large Electron-Positron collider and the LHC. In his current role at CERN, he is responsible for the exploitation of the LHC.



Steve Myers, OBE.

Additional honours this year include an OBE for James Hough, chief executive of Scottish Universities Physics Alliance and research professor in natural philosophy at the University of Glasgow, for services to science. Hough is well known for his research on gravitational waves and is the UK's principal investigator on the GEO 600 Gravitational Wave Detector being built by a University of Hanover/MPQ/University of Glasgow consortium.

Faces & Places

2013 Markov prize recognizes progress in neutrino oscillations

Contributions to the study of neutrino oscillations in experiments with accelerator and reactor neutrinos, and to the measurement of the mixing angle θ_{13} , link the winners of the 2013 Markov Prize. Yury Kudenko of the Institute for Nuclear Research (INR) of the Russian Academy of Sciences (RAS), Moscow, and Alexander Olshevsky, head of the Nuclear Problems Laboratory of JINR, Dubna, received the award at the 2013 Markov Readings held at the INR on 14 May.

Under Kudenko's leadership, the Russian group working on the long-baseline experiment T2K in Japan developed a unique scintillation detector for the near detector. The group continues to participate in data taking and analysis. Olshevsky is a leader of the JINR teams working on the OPERA and the Daya Bay neutrino-oscillation experiments. He and his group made



Left to right: INR deputy director, Leonid Bezrukov, Alexander Olshevsky, Yury Kudenko and academician Victor Matveev. (Image credit: INR.)

significant contributions to the precision measurement of θ_{13} at Daya Bay.

The Markov Prize was established by INR-RAS in commemoration of Moisey Markov (1908–1994), one of the founders of the institute. The prize is awarded

each year at the Markov Readings, an international seminar held to commemorate the Russian physicist, who made pioneering contributions to neutrino physics, as well as to quantum gravity and at the borderline between particle physics and cosmology.

CERN, Higgs and Englert receive Prince of Asturias award

In an announcement made on 29 May, the Prince of Asturias Foundation awarded François Englert, Peter Higgs and CERN the 2013 Prince of Asturias Award for Technical and Scientific Research. The awards will



be presented in the autumn in Oviedo at a ceremony chaired by the Prince of Asturias, Felipe de Borbón, heir to the throne of Spain and honorary president of the foundation.

Award winners François Englert, left, and Peter Higgs at CERN on 4 July 2012.

The awards date back to 1981 and seek to encourage and promote scientific and cultural values.

The award recognizes that science is performed through collaboration of theory and experiment and through the efforts of the thousands of particle physicists involved in CERN's research. Both Englert and Higgs paid tribute to Robert Brout, who passed away in May 2011 and whose work contributed to the Brout-Englert-Higgs mechanism.

HONOURS

The Royal Society elects new fellows

Two particle physicists have joined the ranks of Fellows of the Royal Society (FRS) in the UK following the 2013 election in May.

Nigel Glover of the University of Durham has made pivotal research contributions to the understanding of data collected at high-energy particle colliders. His theoretical studies of weak boson, Higgs and jet production in particular are used worldwide. He is especially distinguished for his contributions to the development and



exploitation of the perturbative structure of QCD.

Terry Wyatt of the University of Manchester is distinguished for his contributions to the experimental verification of the Standard Model. In particular, he



has developed powerful discriminants of signatures for the production of heavy quarks (b and t) and electroweak bosons (W and Z) implemented at CERN's SppS and Large Electron–Positron colliders and at Fermilab's Tevatron.

Nigel Glover, left and Terry Wyatt, now both FRS. (Image credits: G Robson and T Wyatt.)

WORKSHOP

CAS course in Italy specializes in superconductivity

This year's spring CERN Accelerator School (CAS) focused on superconductivity for accelerators. Held at the Ettore Majorana Foundation and Centre for Scientific Culture (EMFCSC) in Erice on 24 April – 4 May, it attracted 94 participants representing 23 nationalities, including an Ethiopian studying in Germany.

Following some lectures to recapitulate background accelerator physics and the fundamental processes of superconductivity, the course covered a range of topics in superconductivity and highlighted the latest developments in the field. Realistic case studies and topical seminars completed the programme, which featured 35 lectures, three seminars and seven hours of case studies. The participants pursued the case



Participants at the spring CAS travelled to Italy from far and wide, including Belarus, China, India, Japan and North America. (Image credit: Alessandro Noto EMFCSC.)

studies with great enthusiasm and produced some excellent results.

The general feedback was positive and reflected the high standard of the lectures. In addition to the academic programme, the participants had the opportunity to visit the Museum of the Nave Punica in Marsala and the Greek temple and Hellenistic theatre at Segesta.

● The next CAS will be an advanced-level course held in Trondheim, Norway, on 18–29 August (<http://cas.web.cern.ch/cas/>).



Harald Fritzsch, right, of the Ludwig-Maximilians-Universität in Munich visited the University of Leipzig on 16 May to receive an honorary degree for his work on quantum chromodynamics. Growing up in East Germany, Fritzsch had studied at Leipzig in the years 1963–1968. Beate Schuecking, left, of the faculty of medicine, is the president of Leipzig University. (Image credit: Leipzig University.)

WORKSHOP

Taming the beam–beam effect

An ICFA mini-workshop on “Beam–Beam Effects in Hadron Colliders” took place at CERN in March to discuss and summarize the current understanding of beam–beam effects. Organized by the LHC beam–beam team and sponsored by the International Committee for Future Accelerators (ICFA), the Ecole Polytechnique Fédérale de Lausanne and the High-Luminosity LHC project, it attracted around 60 accelerator physicists from laboratories worldwide.

A challenge with most particle colliders is the demand to extend the physics capabilities by increasing the luminosity, that is the collision rate. However, the “beam–beam interaction” has been and continues to be a performance-limiting effect for both hadron and lepton colliders. This occurs in colliders when the beams experience each other's electromagnetic fields as they pass through common beam pipes in the region of the experiments. Complex collision patterns can lead to unwanted and sometimes unexpected effects and problems including instabilities, particle losses, orbit distortions and increases in beam size. An unexpected additional problem occurs in the LHC where the instantaneous luminosity might be too large to be exploited efficiently by the experiments. The understanding, control and optimization

of these effects will be essential for extending the physics reach of today's colliders.

The workshop at CERN capitalized on what has already been learnt at existing colliders. Experimental data from the LHC, Fermilab's Tevatron and the Relativistic Heavy-Ion Collider at Brookhaven cast light on beam–beam effects in hadron colliders. Several years of LHC operation have provided valuable data and experience and led to much better understanding as well as some unexpected results. Data were also presented from lepton colliders such as KEKB, VEPP, BEPC and DAPHNE, where novel schemes including the use of crab cavities to minimize the side-effects of crossing angles have been tested. These concepts are highly relevant for the High Luminosity LHC upgrade programme and for future collider studies.

Advances in the theoretical treatment of beam–beam effects and in simulation techniques were discussed in dedicated sessions. New tools now enable beam–beam effects to be predicted more reliably, allowing improvements to be made in the design of future colliders and upgrade projects.

The impact of beam–beam effects on the operation of the LHC was discussed in other sessions, with presentations on

the requirements of the LHC experiments and for the operation of the collider. The need for luminosity-levelling techniques to make optimal use of the luminosity is a new aspect of beam–beam studies. The possible implementation of such techniques and their expected side effects through the beam–beam interaction need attention and careful design. Sufficient diagnostic tools form an important ingredient in this context. An important part of the work at the meeting was dedicated to discussing possible beam–beam compensation schemes and their application to the LHC.

The outcomes of the topical sessions were put together in a summary session chaired by Alex Chao of Stanford University and SLAC. Giving his personal impressions, he emphasized the remarkable progress and large number of new ideas and concepts that have been developed in recent years. New effects, such as the interplay between beam–beam interactions and other components – for example electron cloud and machine impedance – need to be studied in more detail. Although the work might not be easy, the approach to this interesting field of accelerator physics is promising.

● For further details, see <https://indico.cern.ch/conferenceDisplay.py?confId=189544>.

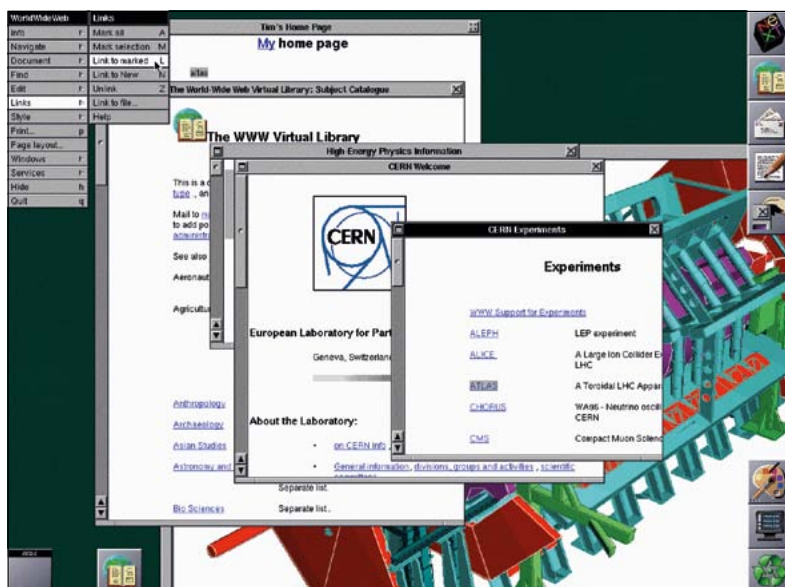
Faces & Places

COMPUTING

CERN launches project to restore info.cern.ch

On 30 April 1993, CERN published a statement making World Wide Web technology available on a royalty-free basis. This allowed the Web to flourish by making the software required to run a web server, a basic browser and a library of code, all freely available. To mark the 20th anniversary of this publication, CERN has started a project to restore the first website and preserve digital assets associated with the birth of the Web.

The plan is to re-establish the first web address – <http://info.cern.ch> – putting back the files that were there in their earliest possible iterations, enabling people to experience the line-mode browser and the NeXT browser and editor. The team will look at the first Web servers at CERN and see what assets from them can be preserved and shared, restoring machine names and IP



A screenshot of the original NeXT web browser as it looked in 1993.

addresses to their original state. Through this restoration and more, the project aims to tell the story of the early days of webs.

● To learn more about the first website project or to get involved, visit <http://first-website.web.cern.ch>.

BRUNOFEST

Berkeley honours Zumino

Friends, collaborators and colleagues of Bruno Zumino met at the Berkeley Center for Theoretical Physics at the beginning of May to honour him on the occasion of his 90th birthday. A leader in theoretical physics for many decades, Bruno is universally respected as a kind and generous colleague and adviser to many generations of younger physicists. The event was a multifaceted celebration with many personal reminiscences adding flavour to the scientific memories and latest news.

Featuring among Bruno's many achievements that were recalled at the conference – in particular by Edward Witten – were his rigorous proofs with Gerhart Lüders of the spin-statistics and CPT theorems, among the most profound results in quantum field theory. Several speakers, including Steven Weinberg, also mentioned his beautiful formulation – together with Curtis Callan, Sidney Coleman and Julius Wess – of effective Lagrangians for spontaneously



Bruno during a trip to Europe in 2011. (Image credit: Courtesy Sergio Ferrara.)

broken symmetries. Participants were reminded that Bruno and Wess introduced ideas from geometry and topology into particle physics that underlie the modern treatment of anomalies and much else.

Currently, much theoretical and experimental interest centres on supersymmetry, a concept introduced into realistic 4D field theories in a brilliant series of papers that Bruno wrote in collaborations with Julius Wess, Sergio Ferrara and John Iliopoulos at CERN in 1973 and 1974.

Ferrara and many others talked about some of the tremendous theoretical ramifications of this pioneering work, which also underlies hopes for new physics beyond the Standard Model, as reviewed by Luciano Maiani, Fabiola Gianotti, Gigi Rolandi and John Schwarz, in particular. One highlight of the meeting was Gianotti's public lecture, which provided a welcome opportunity to share some of the latest news from CERN on the Higgs boson discovery with the Berkeley community and to remind them of the intellectual giant living in their midst.

Bruno's more recent influential developments were also the focus of discussion at the meeting, notably his pioneering work with Mary Gaillard on duality. The concept of duality underlies many of the most exciting developments in string theory throughout the past couple of decades.

Bruno has been a pillar of the Berkeley physics community since moving from CERN in 1981 and many of his present and former colleagues and students there expressed the scientific esteem and personal respect they have for him. All of the participants wish Bruno the best for the future. Will nature be kind enough to reveal supersymmetry soon?

OUTREACH

CERN hosts its first TEDx

The inaugural TEDxCERN event took place on 3 May in the Globe of Science and Innovation, with a live webcast elsewhere at CERN and participating institutes around the world and online. Using the theme of “multiplying dimensions”, the event went beyond particle physics with speakers ranging from pioneers to young scientists.

A packed audience was enthralled by talks on topics ranging from networking chemistry and DNA to citizen astronomy, the early universe and the Higgs boson, and from seafloor earthquakes and “big data” to consciousness, gendered innovation and



improbable research. Educators and students showed that you are never too young to be a research scientist, while surprises included a Google Glass tour of the LHC tunnel.

TED is a non-profit organization that supports “ideas worth spreading” through talks of 18 minutes or less given at two annual TED conferences and posted online. TEDx (x = independently organized TED event) is a programme of local events that create a similar experience. In addition to the event on 3 May, scientists from CERN worked with animators from TED-Ed to develop films about particle physics to educate and entertain.

● All videos and animations are available online via <http://tedxcern.ch>.

TEDxCERN hosts included Nobel laureate George Smoot.

Passport starts with a bang

In collaboration with its local partners, CERN inaugurated “Passport to the Big Bang” on 2 June – a new, permanent, scientific tourist trail that links key points above ground around the ring of the Large Hadron Collider. Ten exhibition platforms explain the fundamental research conducted at CERN. They are located in eight French and Swiss communes and are linked by 54 km of sign-posted itineraries.

The inauguration day began with a mountain-biking rally for hardened enthusiasts followed by a bicycle tour for families. In the afternoon a myriad of attractions at all stages of the circuit included oriental dance, reptiles, music schools, cryogenic demonstrations, building detectors from Kapla and much more.



With the route now in place, visitors to the area can pick up their own passports, available in French or English from CERN



The inauguration included a 54-km mountain bike rally (top left) and numerous activities including detector model-building (top right). From now on, visitors can tour the 10 stages around the LHC (bottom).

and local tourist offices. They can then tour the area on foot or by bike to “stamp” their passports at the various platforms and take part in “Mission LHC” to claim their personalized reward.

● Find out more about the trail at <http://passport-big-bang.web.cern.ch/en>.

A new timeline for ALICE

To celebrate the 20th anniversary of the ALICE experiment, its website presents a new timeline that traces its history from 1993, when the original letter of intent was submitted, to 2013, when the first proton–lead run took place.

The timeline highlights the connections between ALICE and other heavy-ion experiments at CERN and worldwide, as



well as theoretical advancements in QCD and the understanding of strong interactions. In this way, it shows how ALICE has adapted to the developments in heavy-ion physics over the years. The timeline brings people into the spotlight, showcasing those who have contributed to the success of ALICE, from building the detector to developing the software for data collection and analysis. The result is a media-rich online resource.

● Visit <http://alice20.web.cern.ch/alice20/> to view this journey of discovery.

The new online ALICE timeline traces the experiment's 20-year history.

Faces & Places

MEDICAL PHYSICS

CERN hosts workshop on X-ray detectors for medicine

The 2nd Workshop on Medical Applications of Spectroscopic X-ray Detectors attracted 104 participants to CERN on 22–25 April. Among those attending were some 50 representatives from industry and sizeable numbers from prestigious medical schools in Europe and the US.

The scientific committee – chaired by CERN's Michael Campbell – also included key staff from major medical-equipment suppliers. Many such companies now have active internal research programmes in this new field, which has taken off in the two years since the first workshop.

The meeting started with an overview given by Norbert Pelc of Stanford University. He highlighted some of the expected benefits of spectroscopic imaging, such as improved detector quantum efficiency, dose reduction and material identification, as well as some of the remaining challenges – principally charge sharing and pile up leading to

degraded spectral fidelity. The programme of talks then began with sessions on sensor materials, continuing with ASICs and image processing and concluding with pre-clinical and clinical applications.

Spectroscopic imaging should complement other modalities such as magnetic resonance imaging (MRI) and positron-emission tomography (PET). In particular, it is potentially faster, more specific and has better spatial resolution, whereas MRI provides excellent soft-tissue detail and PET is extremely sensitive. Results from a team at the Mayo Clinic, Rochester, in the US, demonstrated that spectral information could be used to classify kidney stones according to their composition. With no increase in X-ray dose, optimized treatment plans were proposed to patients, in some cases avoiding unnecessary surgery. Other researchers presented biological tracers labelled with heavy atoms (e.g. gold nano-particles), which

are permitting the first functional imaging using spectral information.

There were presentations during the workshop from spin-off companies using technologies originating in high-energy physics at CERN, IN2P3 in France, INFN in Italy, the KTH Royal Institute of Technology in Sweden and the Paul Scherrer Institute in Switzerland. Taking advantage of the location at CERN, participants also appreciated a talk by John Ellis on the physics of the LHC and beyond, as well as a presentation on the ATLAS experiment by Markus Nordberg and a visit to the site of the detector.

The workshop summary talk was given by Anthony Butler of Christchurch, New Zealand, a member of the team developing the Medipix All Resolution System (MARS), which is a small-animal scanner. He concluded that “spectral molecular imaging” will provide clinicians with novel data for diagnosis.

VISITS

David Willetts, centre, the UK's minister for universities and science, visited CERN on 9 April. He is seen here in the ATLAS cavern with, left to right, **John Womersley**, chief executive of the UK's STFC, **Dave Charlton**, ATLAS collaboration spokesperson, **Paul Collier**, head of the beams department, and **Sarah Gillett**, the UK's ambassador to Switzerland.



The minister of communications, science and technology of Lesotho, **Tseliso Mokhosi**, came to CERN on 17 May. His time at the laboratory included a tour of the ATLAS visitor centre and underground experimental area.



Leoš Heger, the minister of health of the Czech Republic, was one of several important visitors to CERN on 21 May. His visit included a tour of the LHC superconducting magnet test hall and the LHC tunnel, as well as ATLAS and the Antiproton Decelerator.

The minister of health for Greece, **Andreas Lykouratzos**, was another visitor to CERN on 21 May. His tour included the CMS underground experimental area as well as the LHC tunnel.



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.

Faces & Places

MEDICAL PHYSICS

CERN hosts workshop on X-ray detectors for medicine

The 2nd Workshop on Medical Applications of Spectroscopic X-ray Detectors attracted 104 participants to CERN on 22–25 April. Among those attending were some 50 representatives from industry and sizeable numbers from prestigious medical schools in Europe and the US.

The scientific committee – chaired by CERN's Michael Campbell – also included key staff from major medical-equipment suppliers. Many such companies now have active internal research programmes in this new field, which has taken off in the two years since the first workshop.

The meeting started with an overview given by Norbert Pelc of Stanford University. He highlighted some of the expected benefits of spectroscopic imaging, such as improved detector quantum efficiency, dose reduction and material identification, as well as some of the remaining challenges – principally charge sharing and pile up leading to

degraded spectral fidelity. The programme of talks then began with sessions on sensor materials, continuing with ASICs and image processing and concluding with pre-clinical and clinical applications.

Spectroscopic imaging should complement other modalities such as magnetic resonance imaging (MRI) and positron-emission tomography (PET). In particular, it is potentially faster, more specific and has better spatial resolution, whereas MRI provides excellent soft-tissue detail and PET is extremely sensitive. Results from a team at the Mayo Clinic, Rochester, in the US, demonstrated that spectral information could be used to classify kidney stones according to their composition. With no increase in X-ray dose, optimized treatment plans were proposed to patients, in some cases avoiding unnecessary surgery. Other researchers presented biological tracers labelled with heavy atoms (e.g. gold nano-particles), which

are permitting the first functional imaging using spectral information.

There were presentations during the workshop from spin-off companies using technologies originating in high-energy physics at CERN, IN2P3 in France, INFN in Italy, the KTH Royal Institute of Technology in Sweden and the Paul Scherrer Institute in Switzerland. Taking advantage of the location at CERN, participants also appreciated a talk by John Ellis on the physics of the LHC and beyond, as well as a presentation on the ATLAS experiment by Markus Nordberg and a visit to the site of the detector.

The workshop summary talk was given by Anthony Butler of Christchurch, New Zealand, a member of the team developing the Medipix All Resolution System (MARS), which is a small-animal scanner. He concluded that “spectral molecular imaging” will provide clinicians with novel data for diagnosis.

VISITS

David Willetts, centre, the UK's minister for universities and science, visited CERN on 9 April. He is seen here in the ATLAS cavern with, left to right, **John Womersley**, chief executive of the UK's STFC, **Dave Charlton**, ATLAS collaboration spokesperson, **Paul Collier**, head of the beams department, and **Sarah Gillett**, the UK's ambassador to Switzerland.



The minister of communications, science and technology of Lesotho, **Tseliso Mokhosi**, came to CERN on 17 May. His time at the laboratory included a tour of the ATLAS visitor centre and underground experimental area.



Leoš Heger, the minister of health of the Czech Republic, was one of several important visitors to CERN on 21 May. His visit included a tour of the LHC superconducting magnet test hall and the LHC tunnel, as well as ATLAS and the Antiproton Decelerator.

The minister of health for Greece, **Andreas Lykouratzos**, was another visitor to CERN on 21 May. His tour included the CMS underground experimental area as well as the LHC tunnel.



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.

Faces & Places

Also on 21 May, **Viliam Čislák**, left, the state secretary of the ministry of health of the Slovak Republic, came to CERN. He was welcomed by **Rolf Heuer**, the director-general, seen here presenting the state secretary with a temperature-sensitive mug showing the history of the universe.



The Turkish minister of health, **Mehmet Müezzinoğlu**, left, visited CERN on 22 May. During his visit to the CMS underground experimental area, he was presented with a book of the experiment by **Tiziano Camporesi**, deputy spokesperson of the CMS collaboration.



On 4 June, **Elio Di Rupo**, the prime minister of Belgium, left, visited CERN accompanied by groups of Belgian school students. His tour included the CMS underground experimental area with theoretical physicist **François Englert** of the Université Libre de Bruxelles, centre, and **Joe Incandela**, the spokesperson for the CMS collaboration.

Tissa Vitharana, Sri Lankan senior minister of scientific affairs, right, toured the LHC tunnel during his visit to CERN on 5 June. He was accompanied by CERN's international relations adviser **Rüdiger Voss**, left, and vice-president CERN Council, **Walter Van Doninck**.



NEW PRODUCTS

Lake Shore has announced the introduction of its Model 121 programmable DC current source, which will replace a range of existing current sources. The Model 121 current source is intended for testing, measuring, and operating resistive and semiconductor devices such as diodes. The Model 121 provides a low-noise, highly stable DC current source with six decades of output current, operator-selectable or programmable in the range 100 nA – 100 mA, a large LED display and a USB interface for integration with automated test systems. For more details, contact sales@lakeshore.com or visit www.lakeshore.com.

Murata has introduced the UDC series of isolated digitally controlled DC/DC converters. Incorporating a 32-bit ARM7 processor, the 420 W regulated UDC2204/001 model is the first in a series of DC/DC converters from Murata to include a PMBus-compatible digital interface. The UDC is an isolated, fully regulated, quarter brick supporting the TNV input-voltage range of 36–75 V with a typical efficiency of 95.5%. The PMBus interface facilitates monitoring of input and output voltages and currents, as well as operating temperature.



The president of Austria, **Heinz Fischer**, second from right, with spouse, centre, and the Austrian minister for science and research, **Karlheinz Töchterle**, right, came to CERN on 11 June. Their visit included a tour of CERN's Antimatter Decelerator with AEGIS collaboration spokesperson **Michael Dosser**, left.

For more details, contact Aya Tonooka, tel +44 1252 811666, e-mail atonooka@murata.co.uk or visit www.murata.eu.

RST has announced the 4th generation of its cable glands that also protect sensitive plant from electromagnetic interference, ensuring their uninterrupted operation. The new Euro-Top EMC contact system facilitates quick and safe cable connection by remaining open and allowing the stripped cable to be pulled through. The new generation meets the requirements of protection types IP68 and IP69K for the entire gland range. For more details, contact

Oliver Kalmey, tel: +49 5407 8766–12 or e-mail oliver.kalmey@rst.eu.

Telonic Instruments has introduced a new range of low-cost high-performance benchtop digital oscilloscopes manufactured by Rigol Technologies. Designated the DS-2000 series, the range consists of three oscilloscopes with a bandwidth of 70 MHz (DS2072), 100 MHz (DS2102) and 200 MHz (DS2202). The 8-inch (800 mm × 480 mm) wide colour WVGA screen enables easy viewing of waveform displays. For more details, contact Bob or Doug Lovell, tel: +44 118 9786911 or e-mail doug@telonic.co.uk.

Faces & Places

OBITUARIES

Massimiliano Ferro-Luzzi 1932–2013

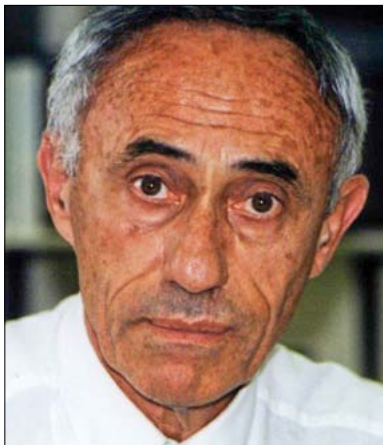
Massimiliano (Max) Ferro-Luzzi, a well known CERN physicist, passed away on 18 March. His contributions to particle physics span a period of more than 40 years.

Max grew up in Asmara (Eritrea) and studied at Rome University, where he joined the nuclear-emulsion group of Edoardo Amaldi and graduated in 1955. Here, he investigated antiproton reactions in emulsions exposed at Berkeley's Bevatron, where antiprotons had just been produced for the first time.

From the start – and throughout his career – Max combined careful analysis of data with special attention to technical improvements (in this case the automation of track measurement) and better instruments. With the scarce statistics available then, no unexpected features showed up but the observation of a first candidate for the decay of a Σ^- seems to have marked the beginning of Max's interest in strange baryons, including the Y^* hyperons, as they were known in those days.

Starting in 1960, he spent three years at Berkeley as a National Academy of Sciences fellow in Luis Alvarez's legendary group. He analysed the pictures of the 15 inch hydrogen bubble chamber exposed to a K^- beam. With the $\Lambda(1520)$ and $\Sigma(1660)$, he began a fruitful career as a discoverer of hyperon states. By carefully analysing data collected in $\Lambda(1520)$ formation in K^-p interactions, he was also able to determine – together with Bob Tripp and Mason Watson – the $Kp\Sigma$ parity. This result, when put together with previous knowledge on the $Kp\Lambda$ parity, indicated that the $\Sigma\Lambda$ parity was even. This was a key test for $SU(3)$ symmetry because, if the Σ and the Λ are to be assigned to the same $SU(3)$ octet, they must have even relative parity. The issue was settled definitely one year later by another team, in an experiment at CERN that measured directly the $\Sigma\Lambda$ parity to be even.

In 1963 Max moved to CERN, where he spent the rest of his working life – with the exception of a sabbatical year at SLAC in 1976. As one of the leaders in the Track Chamber division, he continued to analyse



Max Ferro-Luzzi. (Image credit: D Drijard.)

Kp and Kn interactions in hydrogen and deuterium bubble chambers. His most important contribution using data from bubble chambers was the discovery and study of baryonic resonances, especially the elucidation of hyperon resonances. For this he organized several successful European collaborations, for example the CERN-Heidelberg-Saclay (CHS) collaboration that for a decade was the world champion team for studying KN two-body interactions below an incident momentum of 2 GeV/c. Again, the systematic studies of Y^* formation were the basic ingredient for fully establishing $SU(3)$ symmetry and the quark model.

In the late 1960s Max was among the first to realize the need to move to electronic detectors. "In this twilight of the old fashioned hadron spectroscopy," as he put it, Max formed a small group of counter- and bubble-chamber physicists who from 1970 to 1980 focused – by purely electronic means – on a high-statistics study of low-energy hadron elastic-scattering and the search for structures. Here, he pioneered a number of new techniques in multiwire proportional chambers and ultraviolet Cherenkov-light detection.

Max then turned for a while to weak interactions and neutrinos, first in 1984 with an experiment at CERN's Proton Synchrotron, then in 1986 at the Alternating Gradient Synchrotron in Brookhaven, using Conversi flash tubes. He also conducted some tests of the first prototype for the ICARUS neutrino detector. Narrow resonances were again at stake from 1989 onwards, this time in $\bar{p}p$ annihilations in the JETSET experiment at the Low-Energy Antiproton Ring (LEAR), with an emphasis on $\bar{p}p \rightarrow \phi(1020)\phi(1020) \rightarrow 4K$. Various particle-identification devices were used to cope with the four-kaon final state, including a variant of the ring-imaging Cherenkov detector designed specially for this purpose.

When LEAR ceased operation in 1995, Max joined the DIRAC collaboration, looking for the formation of $\pi\pi$ atoms, and led the CERN group that played an important role in setting up and carrying out the experiment. He also took care of the design and implementation of the ionization hodoscope and trigger at the core of the detector. Overall, the first steps of the experiment greatly benefited from his participation and guidance.

Max was a member of the Proton Synchrotron and Synchrocyclotron Committee in 1981 and the scientific secretary of the Research Board in the years 1984–1997. He retired from CERN in 1997.

Intellectually rigorous yet tempered by a degree of pragmatism in interpreting experiments, Max was a keen advocate of linguistic precision. The papers reporting his own results are models of the kind. He also took great care in presenting physics in an "organized", pedagogical way, as shown by his review papers and summer-school courses. He had a highly individual view of the world. He used to "call a spade a spade" and could be blunt but his steps were always those of a prudent, correct and rigorous person.

Max was a remarkable physicist. His friends loved him: his death is a hard loss for them.

• *His colleagues and friends.*



VACUUM VALVES

Request our NEW catalogue: www.vatvalve.com



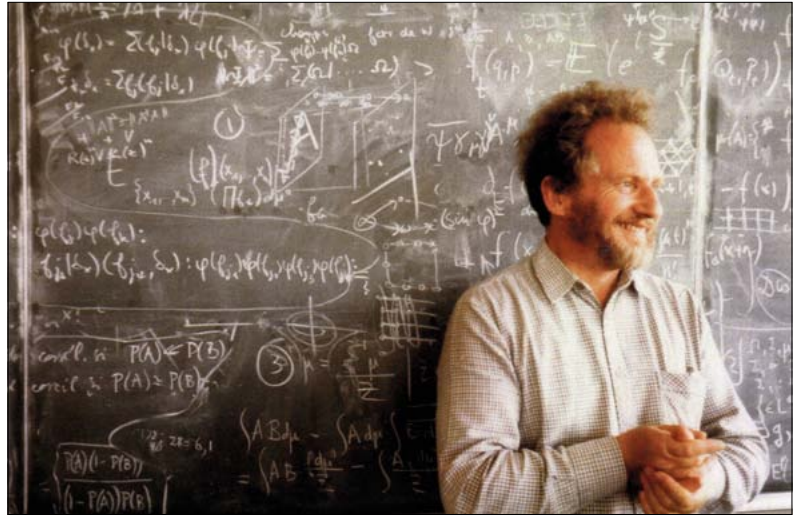
Jean-Jacques Loeffel 1932–2013

Jean-Jacques Loeffel passed away from Alzheimer's disease on 22 April. He was 80 years old.

Jean-Jacques was born in the "Jura bernois" in Bienne. He studied at ETH Zurich and began working on a PhD under Wolfgang Pauli. However, Pauli died at the end of 1958 so it was Res Jost who became his supervisor. In autumn 1962, Jost sent Jean-Jacques to CERN and it was then that we in the Theory Division discovered his immense talents. He played a major role in the collaboration that led to the KLM (Toichiro Kinoshita, Loeffel and André Martin) paper. This considerably improved the fixed-angle bound on the high-energy scattering amplitude compared with the previous result of Marcel Froissart, assuming the Mandelstam representation.

Jean-Jacques then travelled to various places: Dubna (where he spoke French with Nicolai Bogoliubov and learnt a little Russian), Seattle, New York University, the Institute for Advanced Study in Princeton and Orsay – where he acted as a neutral negotiator between students and professors during the events of May 1968, but nevertheless produced a fundamental paper on the "inverse problem" at fixed energy (the reconstruction of a potential from the scattering amplitude). Last, he returned to Switzerland and – after some time – became professor at the University of Lausanne, teaching also at the École Polytechnique Fédérale de Lausanne. He was a rigorous teacher and published relatively few papers but they were all of a high level.

He was sharp, deep and sometimes quick,



Jean-Jacques Loeffel. (Image credit: Liliane Loeffel.)

as illustrated by the following example. There were meetings between physicists and mathematicians in Strasbourg every year. On one occasion, Arthur Wightman (who died not long ago), said that his student, Barry Simon, was convinced that Carl Bender and Tai Tsun Wu had made a mistake in their treatment of the anharmonic oscillator. On the train back to Switzerland, Jean-Jacques took a piece of paper and in three lines proved that it was Simon who was wrong. This led to important results on the bound states of the anharmonic oscillator. Jean-Jacques also did excellent work on Borel summable functions and on

Bethe lattices, illustrating the diversity of his interests.

Jean-Jacques was not only immensely cultured in mathematics and physics but also in literature, philosophy, religion, mineralogy, botany, ornithology and amateur astronomy. He liked art, including modern art and music: he sang in the Bach choir in Lausanne with his wife, Liliane. In short he was a perfect *honnête homme*. He also liked to make his friends taste excellent Vaudois white wines.

For all of us, his passing is a great loss.

● *André Martin, CERN.*

Albert (Bacco) Messiah 1921–2013

Albert M.L. (Bacco) Messiah died on 17 April 2013 in Paris. He had a remarkable life, both as a physicist and educator who wrote the first books on modern quantum mechanics from which two generations of French physicists learnt quantum mechanics and as a member of the Free French Army during the Second World War.

Albert Messiah was born in Nice on 23 September 1921. At the start of the Second World War, he and his brother André were studying at the École Polytechnique in the north of France. Their uncle hired them to drive himself and his wife to

San-Jean-de-Luz in the south-west of the country where they hoped to be sheltered from the Nazis. After hearing a radio talk by Marshal Pétain during the drive south – and realizing that Pétain would not resist the Nazis – Messiah resolved to leave France, expecting to fight the Germans in Africa. He joined a group of Poles on a ship that he thought would go to Africa. Instead the ship went to London where Messiah joined Charles de Gaulle and the Free French forces.

In September 1940 Messiah joined an expedition to Dakar that failed to liberate

the French colony from the Vichy French military forces who actively opposed the Allies. At the end of 1944 he joined the 2nd Armored Division in the liberation of Strasbourg and was part of the allied advance into Germany. He was in the unit that occupied Berchtesgaden and he took trophies, including Hermann Goering's briefcase and Adolf Hitler's ruler, both of which he later donated to the Museum of the Liberation.

Having been a French Jew who escaped France to fight in the Free French Army of de Gaulle, he was awarded a grant to study

Faces & Places

and work at the Institute for Advanced Study, Princeton, in the US. The seminars at the institute were incomprehensible to Messiah, who had only a high-school education in physics, and he became depressed to the extent that he considered abandoning his plans to become a physicist. Fortunately he met Robert Marshak at a meeting of the American Physical Society in Washington, DC. Marshak suggested that Messiah move to the University of Rochester and work for a US PhD in physics.

When Messiah returned to France, he taught quantum mechanics at the French Nuclear Centre at Saclay. There was no text on quantum mechanics in French until he wrote his two-volume *Mécanique Quantique*, published by Dunod in 1959. His books were translated to English by G M Temmer, as well as to other languages. The books were the standard references in



Albert "Bacco" Messiah. (Image credit: Janine Messiah.)

French on quantum mechanics for many years. Messiah later became the director of the physics division at the French Atomic Energy Commission and a professor at the Pierre and Marie Curie University in Paris.

Messiah collaborated with Oscar Greenberg on identical particle statistics other than bosons or fermions. This work led directly to Greenberg's suggestion of parastatistics of order 3 for quarks, which was the first suggestion that quarks carry a hidden three-valued charge, now colloquially called "colour".

Messiah's first wife Jacqueline, died suddenly in 1962. He then married Janine Grenier in 1964. He has three children, Martine, Antoine and Pierre Henri, as well as four grandchildren.

We will remember Bacco for his warmth and kindness, for his sense of humour and for the depth of his understanding of physics.

● O W Greenberg, University of Maryland.

Perihan Tolun 1934–2013

Perihan Tolun, the first experimental particle physicist at the Turkey and Middle East Technical University (METU), passed away on 27 May in Istanbul at the age of 79.

Perihan Tolun graduated in the top rank from the science branch of Arnavutköy American College for Girls, a renowned high school in Istanbul, in 1955. She then came first among the physics applicants for a Rockefeller scholarship to study abroad for an advanced degree. She used the scholarship to go to Bristol University, where she earned her BSc in 1961 and a PhD in 1966. While in Bristol, she worked in Cecil Powell's group, participating in experiments at the Proton Synchrotron, which is how her association with CERN began.

Following invitations from the eminent Turkish physicists Erdal İnönü and Feza Gürsey, Tolun joined the Physics Department at METU, Ankara, in 1966. She spent the rest of her career there until her retirement in 2001, with periods as a research associate at Yale University (1970–1971) and CERN (1976–1977). She was remained an active researcher at METU until the beginning of 2013, just before her illness was diagnosed.

At METU, Tolun started the first group in experimental particle physics and set up a laboratory where manual stereo microscopes were installed for analysis of elementary-particle tracks in plates of photographic emulsion. The lab was then equipped with an automatic microscope system, in which a CCD camera reads out the



Perihan Tolun. (Image credit: M and N Simuhin.)

image for the CHORUS experiment. A new system was later developed for the OPERA experiment in the Gran Sasso National Laboratory.

Tolun's first experiment at CERN, with Powell's group for her PhD, involved the measurement of the magnetic moments of the Λ^0 and Σ^+ hyperons. After she joined METU in 1966, under her leadership the group from Ankara collaborated with CERN, Lausanne, Munich and Rome in the subsequent experiment, making precision measurements of the magnetic moment of the Λ^0 hyperon. In 1977, her group joined the WA17 experiment, measuring the lifetime of charmed hadrons produced in neutrino interactions. From

1991 onwards, her participation in the CERN neutrino programme continued with the CHARM II and CHORUS experiments, with significant Turkish contribution, especially in CHORUS. Following her lead, after the CHORUS experiment, METU joined the OPERA collaboration.

Tolun was highly respected: she was compassionate, courteous, thoughtful and candid. She dedicated her life to science and her passing away is a great loss to the particle-physics community in Turkey. She will be remembered by her students and colleagues as a brilliant researcher, inspiring teacher and adviser.

● Mehmet Zeyrek, METU/Ankara.