

Faces & Places

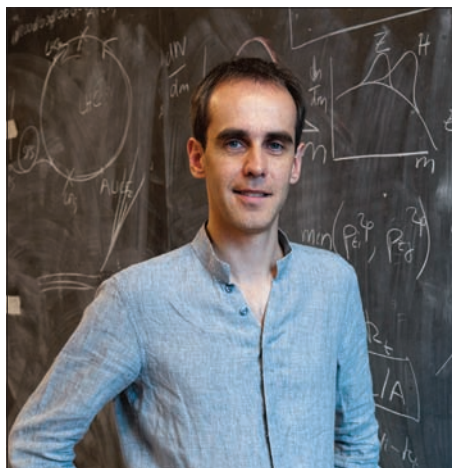
AWARDS

CNRS medals for particle and nuclear physics

The winners of the silver medals awarded for 2010 by the Centre national de la recherche scientifique (CNRS) include two researchers in the field of particle and nuclear physics. The awards are to recognize researchers for their originality and contributions on the national and international stages.

At 37, Gavin Salam is youngest of the 2010 medal winners. After studying at Cambridge University, where his thesis was on the energy distribution of quarks and gluons within high-energy protons, he moved on to the complementary problem of understanding the distribution of energy in quark fragmentation. He joined CNRS in 2000, in the Laboratory of Theoretical and High-Energy Physics attached to the University Pierre et Marie Curie in Paris. He is currently on a five-year attachment to CERN where he is continuing his research work in QCD.

Olivier Sorlin, of the Le Grand Accélérateur National d'Ions Lourds



Left: G Salam. Right: O Sorlin. (Image credit: CNRS Photothèque/Cyril Frésillon.)

(GANIL), submitted his thesis at the frontier of nuclear physics and astrophysics at the Institute of Nuclear Physics at Orsay in 1991. He joined GANIL in 2004 to search



for neutron-rich nuclei as found in stars and supernovae, as well as to put together a research programme for Spiral2, which is scheduled to start up in 2013.

CERN wins prizes for communication

Three different aspects of communication at CERN have received prizes for excellence.

In December, members of the Communication Group were in Prague to receive an EU European Excellence Award on behalf of CERN for the LHC First Physics event, during which the eyes of the world were on CERN as the first collisions at a total energy of 7 TeV took place in the LHC on 30 March (*CERN Courier* May 2010 p27). The prize, for the category on science and education, “rewards the cream of communications” in these areas.

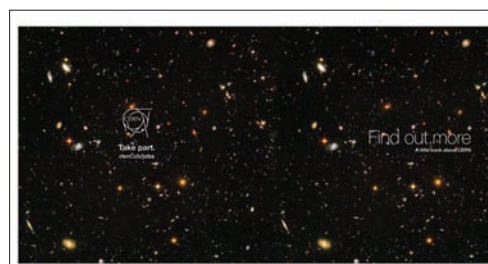
Earlier in the year, the website of the UK's Institute of Physics, *physics.org*, set out on a quest to find the best physics sites on the web, asking readers as well as a team of judges to vote for sites in various categories. The “people's choice” award for the best kids' site went to *CERNland*, CERN's interactive site for young people (*CERN Courier* May 2009 p35). The judges' award went to the NASA Kids' Club site.

Finally, one of the first awards to CERN for 2011 has gone to the Human Resources Department. Their new recruitment



Marie Anne Bugnon and Antonella del Rosso receive the European Excellence Award on behalf of the CERN Communication Group. (Image credit: European Excellence Awards.)

campaign, devised together with the agency Work Communications, took the top prize in two categories of the UK's Recruitment



Pages from the award-winning booklet, designed in conjunction with Work Communications.

Advertising Awards for 2011: recruitment literature and print advertisement (commercial).

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Lebrun named Engineer of the Year

Each year the French magazines *L'Usine Nouvelle* and *Industrie & Technologies*, in partnership with the National Council of the Engineers and the Scientists of France, organize the Engineers of the Year awards to honour exceptional engineers and highlight an often overlooked sector of society.

In December, CERN's Philippe Lebrun was one of eight scientists and engineers who were in Paris to receive the awards for



Philippe Lebrun (right) receives his award from Paul Boursier of InfoPro Communications. (Image credit: Pascal Guittet.)

2010. Lebrun received the Science prize for his work on the LHC's superconducting magnets and cryogenic cooling systems.

LIGHT SOURCES

NSRRC celebrates 10th anniversary of beamlines at SPring-8

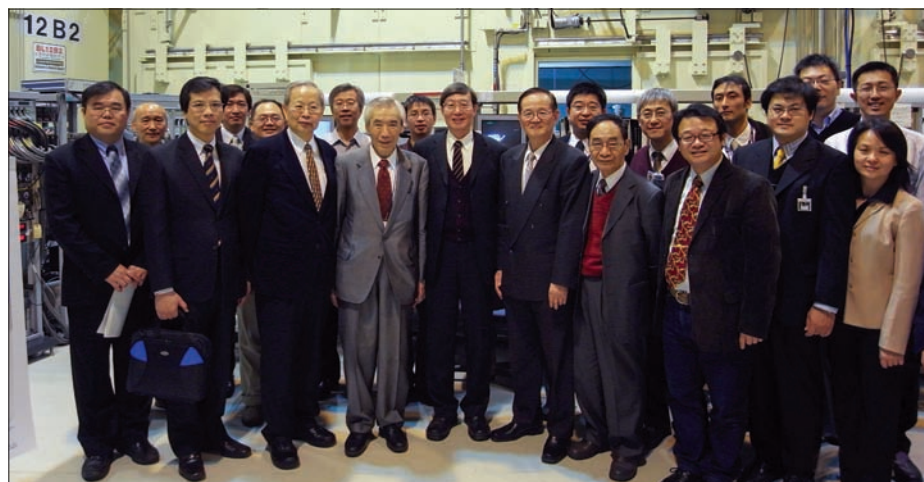
When the Taiwan Light Source (TLS) started up at the National Synchrotron Radiation Research Center (NSRRC) in 1993, it was clear that the need for a complementary high-energy photon flux would become increasingly urgent. The only realistic possibility pointed to the SPring-8 third-generation synchrotron-radiation facility of the Japan Synchrotron Radiation Research Institute (JASRI).

Chien-Te Chen, director of NSRRC from 1998 to 2005, the NSRRC management and governmental officials put together a proposal to build the Taiwan Beamlines (TW-BLs) at SPring-8 at a cost of \$9 million. This led to a memorandum for JASRI and the Asia and Pacific Council for Science and Technology (APCST), which was followed by agreements between APCST and NSRRC. These were signed on 18 December

1998, giving NSRRC control of 75–80% of the beam time, with the remaining time managed by SPring-8 for general users.

The first TW-BL (12B2), designed to provide time-resolved protein crystallography, was completed in 2000; the second (12XU) in 2002 was for inelastic X-ray scattering; and a side line (12XU) for hard X-ray photoemission spectroscopy started up in 2009.

On 22 December 2010, a celebration of the 10th anniversary of the TW-BLs was organized at SPring-8 by Di-Jing Huang, the deputy director, and hosted by Wen-Chang Chang, chair of the Board of Trustees, and Shih-Lin Chang, the director of NSRRC. The event gathered current and former staff from both facilities to reaffirm the long-lasting friendship and the effort to pursue further scientific collaboration.



Current and former members of staff gathered on 22 December to celebrate the 10th anniversary of the Taiwan Beamlines in SPring-8. (Image credit: NSRRC.)

ECFA STUDY

ECFA extends its linear collider study for another three years

The European Committee for Future Accelerators (ECFA) has extended the mandate of its Study of Physics and Detectors for a Linear Collider for another three years, from January 2011 to the end of 2013. The committee has also appointed a new chair to lead the study. Juan Fuster of Valencia has taken over from François Richard of the Laboratoire de l'Accélérateur Linéaire, Orsay, who was in charge from 2005. Fuster was responsible for high-energy physics funding in Spain during the period 2007–2010. A member of the ATLAS collaboration, he has been involved in the organization of ECFA workshops for this study for many years.

The ECFA study began in 1996 as the first Joint ECFA/DESY Study on Physics and Detectors for a Linear Collider, which held several workshops and reported the following year. A second joint study began in 1998 and was extended until 2003 (*CERN Courier* July/August 2001 p11). Since then, the study has continued as the ECFA study with regular workshops during two mandates, 2003–2005 and 2005–2010.

What has happened during the most recent period? The physics case for a light Higgs scenario has been studied to a high degree of realism using two detector concepts – named SiD and ILD – developed by international collaborations. This work demonstrated that by using the channel $e^+e^- \rightarrow ZH$, precise measurements can be achieved for the mass (to <100 MeV), cross-section (a few per cent) and branching ratios (a few per cent for all fermionic modes) of a Higgs particle with a mass of around 120 GeV, as predicted by theory and suggested from precision electroweak data. The case for top physics has also received growing attention because a linear collider allows precise and unique measurements of the mass (<100 MeV) and electroweak couplings (fraction of a per cent), giving a sensitive test for theories beyond the Standard Model. Searches for physics beyond the Standard Model have also been studied for a large variety of scenarios and have confirmed the potential of a linear collider for discovery and precision measurements.

Detector studies for a linear collider have received a considerable boost during this period, with the support of EU contracts



Juan Fuster (right) takes over from François Richard (left) as chair of the ECFA Study of Physics and Detectors for a Linear Collider. (Image credit: F Richard (left) and IFIC.)



(previously EUDET and now AIDA) and the creation of international collaborations such as CALICE, LC-TPC and others. These collaborations aim to develop ambitious subdetectors for both SiD and ILD, so as to achieve unprecedented performances for the tagging of flavours, momentum resolution and jet-energy reconstruction. The teams have built large prototypes and tested them at CERN, DESY, Fermilab, KEK and SLAC. Remarkably, these detectors – developed for the International Linear Collider (ILC) project operating at up to 1 TeV – are also able to satisfy the needs of a multi-tera-electron-volt collider, such as the Compact Linear Collider (CLIC) concept.

The regional studies (ECFA, ACFA in Asia and ALCPG in the Americas) are now co-operating more closely, with the installation of a research directorate for ILC detectors in 2007. This co-operation is also visible in the publication of the letters of intent from the detector groups in 2008, resulting in the approval of the ILD and SiD concepts.

The ECFA workshop in Valencia in 2006, with more than 400 participants, was for the first time a common meeting on activities for machine, detectors and physics. The Global Design Effort, in charge of preparing the technical design report for the ILC, has joined forces with the detector part, allowing the community to define better the requirements for the machine and in particular to strengthen activities at the “machine-detector interface”, which are extremely important for a linear collider. A

big challenge in this context was the decision to plan the ILC with only one interaction region, but serving two detectors in a so-called “push-pull” scheme.

Recognizing the need for a truly global approach towards the timely realization of a linear collider, the decision was made to have a common meeting under ECFA between CLIC and ILC at CERN in 2010. The resulting International Workshop on Linear Colliders (IWLC2010) was held in October, attracting around 500 participants (*CERN Courier* December p7). Building on its success, from now on there will be an annual common meeting among all linear-collider concepts organized in a global context. The next such meeting will take place this year in Granada on 26–30 September.

What are the prospects for these studies? As Rolf Heuer, CERN's director-general, pointed out during IWLC2010, the future relies on the successful start of the LHC and discoveries there. This implies that the international linear-collider community should be ready by 2012 to propose a viable project for a machine with two detectors. CLIC will produce a Conceptual Design Report in 2011 based on modified SiD and ILD concepts, with the active participation of contributors from the ILC. By the end of 2012, the ILC will have both a Technical Design Report, for the machine, and a Detailed Baseline Design, for the two detectors.

● For more about the ECFA Study of Physics and Detectors for a Linear Collider, see www.desy.de/conferences/ecfa-ic-study.html.

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CONFERENCE

Montpellier QCD conference celebrates 25 years

The 15th High-Energy Physics International Conference on Quantum Chromodynamics, which was held in Montpellier last year, marked the 25th anniversary of the QCD Montpellier Conferences. It also provided the opportunity to celebrate the discovery 31 years ago of the powerful analytic method of QCD spectral-sum rules for hadron physics found by Mikhail Shifman, Arkady Vainshtein and Valentin Zakharov in 1979. The SVZ sum rules earned their discoverers the JJ Sakurai Prize of the American Physical Society in 1999.

This series of conferences was initiated by Stephan Narison in 1985 as the Montpellier Conference on Non-perturbative Methods. It regularly hosts around 100–120 participants, composed of equal numbers of theorists and experimentalists, mainly young doctoral and post-doctoral physicists from laboratories around the world that work actively in QCD.

Besides the part dedicated to the SVZ sum rules, the topics discussed in the most recent meeting covered new results from the LHC as well as other, more traditional experiments; different aspects of hadron physics (the nature of scalar mesons, gluonia,



Left to right: Mikhail Shifman, Valentin Zakharov, Hans Günther Dosch and Stephan Narison at the conference in Montpellier. (Image credit: Rindra Narison.)

new charmonium states, B-physics etc.); and some more formal problems related to the non-perturbative aspects of QCD (large N_c , lattice calculations, confinement etc.).

The QCD Montpellier conferences

were named as Euroconferences from 1994 to 2000. They are regularly supported by IN2P3-CNRS, the Region of Languedoc-Roussillon and the University of Montpellier 2.

NEW PRODUCTS

Aerotech has released a wide-base version of its ABL1500 air-bearing linear translation stage for high-precision positioning of heavy and offset loads. The new ABL1500WB has a nominal width of 400 mm and is available in four travel options, from 200 mm to 500 mm. The stage can support a direct load of 60 kg with submicron resolution and accuracy, with speed/acceleration up to 2 m/s and 2 g. For further details, contact Simon Smith, tel +44 118 940 9400, fax +44 118 940 9401, e-mail ssmith@aerotech.com, or visit www.aerotech.com.

Chamois Metrology has introduced the Martell Electronics BetaProbe TI high-precision, small-sized digital thermometer. This compact, low cost instrument features a probe that rotates through 90°, making it easy to use in locations where space is restricted. It is an ideal replacement for liquid-in-glass thermometers and allows for a temperature range of –50 to 160°C with $\pm 0.06^\circ\text{C}$ accuracy and a resolution of 0.1°C, 0.01°C and 0.001°C. For more information, contact Dave Pretty, tel +44 1926 812 066, e-mail info@chamois.net or see their website, at www.chamois.net.

Elsys Instruments has expanded its line of LAN-controlled transient recorders to include high-speed modules that offer sampling speeds of 240 MS/s or 120 MS/s at 14-bit or 16-bit vertical resolution. Housed in a single-width PCI slot, the TPCX-24014 and TPCX-12014 series transient recorders feature analogue bandwidth at Nyquist frequency of 120 MHz for 240 MS/s versions and 60 MHz for 120 MS/s versions. For further details, contact Peter Wilhelm, tel +41 56 496 01 10, e-mail peter.wilhelm@elsys-instruments.com or visit their website, at www.elsys-instruments.com.

Heason Technology has launched a new range of manual translation stages for linear and rotary multi-axis micropositioning applications. The “Mini Stage” range from GMT Global includes a diverse selection of bearing technologies, mounting/assembly configurations and build specifications. The new linear stages are available with cross-roller, linear ball and dovetail slide bearings with typical travel from 13 mm to over 100 mm. For more information, contact Jon Howard, tel +44 1403 755 800, fax +44 1403 755 810, e-mail jhoward@heason.com or see www.heason.com.

Keithley Instruments Inc has introduced several enhancements to its line of S350 Parametric Test Systems. These include the addition of Keithley’s new high-throughput switch mainframe for high-integrity signal switching, greater low-ohm accuracy, new hardware protection modules that safeguard sensitive system instruments from high voltages and a complete range of “probes up” system specifications and diagnostic tools. For further details, tel +1 440 248 0400, fax +1 440 248 6168, e-mail info@keithley.com or visit www.keithley.com.

Wavelength Electronics has announced the new RHM5K-CH Precision Unipolar Temperature Controller, which can be used to achieve precision control at off-ambient temperatures. The PID control loop drives resistive heaters or thermoelectric coolers. The RHM offers a high level of stability and can supply up to 5 A with a small footprint. On-board 12-turn trim pots control temperature set-point, proportional gain and output voltage limit. A single 10-pin terminal strip provides easy access to connections. For more information, tel +1 406 587 4910, e-mail sales@teamwavelength.com or see www.teamwavelength.com.

CELEBRATION

Brookhaven honours Radeka with a VeljkoFest

On 9 December, colleagues from Brookhaven and institutions as far away as California, Switzerland and France, as well as members of his family and friends, attended a symposium to celebrate the influence of Veljko Radeka in many scientific fields. At the VeljkoFest, organized by Howard Gordon, Paul O'Connor and Graham Smith, colleagues in diverse areas of science discussed Radeka's past and planned future contributions to their work.

Radeka joined the Instrumentation Division at Brookhaven in 1962, and a decade later became head of the division – a title he has retained to this day. Since then he has influenced developments in detection and instrumentation in a variety of subjects.

In particle physics, Bill Willis of Columbia University recalled that Radeka and his team built the first electromagnetic calorimeter in the 1970s, later followed by liquid-argon calorimeters, first used at the Intersecting Storage Rings at CERN in 1976 (*CERN Courier* January/February 2011 p32). Now, Radeka and Brookhaven's Instrumentation Division have a leading role in the design of

the 100-tonne, liquid-argon time-projection chamber for MicroBooNE, which will enable high-precision neutrino measurements.

Christophe de la Taille, of the Linear Accelerator Laboratory, Orsay, praised Radeka and his team for developing low-noise electronics for detectors in the 1960s. The technology for eliminating much of the background noise proved to be a critical ingredient for numerous experiments, from Ray Davis's pioneering solar neutrino experiment in the Homestake Mine to calorimetry for ATLAS at the LHC.

A month earlier, Radeka received the 2010 Radiation Instrumentation Outstanding Achievement Award from the IEEE Nuclear and Plasma Sciences Society's Radiation Instrumentation Technical Committee. He was presented with the award at the Nuclear Science Symposium and Medical Imaging Conference in Knoxville on 1 November. The citation recognized Radeka for "breakthroughs in radiation-detector development, which enabled discoveries in many areas of science, in a career of sustained productivity spanning 50 years".



Howard Gordon, far left, organizer of the VeljkoFest and Veljko Radeka (third from right, front row) are pictured with the VeljkoFest speakers (from left): Christophe de la Taille, University of Paris XI, Orsay; Peter Siddons, BNL Photon Sciences; Steven Kahn, SLAC National Accelerator Laboratory; Pier Oddone, Fermilab; Dieter Schneider, BNL Biology Department; Bill Willis, Columbia University; and Paul Vaska, BNL Medical Department.

INSTITUTES

Karlsruhe marks 50 years of particle and astroparticle physics

On 14 December the Karlsruhe Institute of Technology (KIT) marked the 50th anniversary of research in particle and astroparticle physics at the institute. Half a century ago, research on nuclear and particle physics was initiated jointly by the former University of Karlsruhe and the Forschungszentrum Karlsruhe, which are now combined in the KIT Center for Particle and Astroparticle Physics (KCETA). This soon led to a range of theoretical and experimental activities. Anselm Citron and Herwig Schopper were the founding fathers of the experimental branch, while Gerhard Hühler laid the foundation for particle phenomenology and was later joined by Julius Wess to cover research on all facets of quantum field theory.

At the celebration, Schopper recalled the historical development of nuclear and particle physics at Karlsruhe. In a lively talk he described the original plans of the Karlsruhe groups and their fundamental contributions to a variety of experiments performed both at Karlsruhe and at other laboratories, including Dubna, the Rutherford Appleton Laboratory, CERN and DESY. Research at the high-energy frontier was complemented by precision studies in low-energy neutrino physics, cosmic-ray experiments and technological developments, for example on superconducting cavities.

The following three talks were devoted to ongoing research at KCETA. Steen Hannestad cast light on the role of neutrinos in the cosmos and in the laboratory, emphasizing the important role of an absolute measurement of neutrino mass, as the KATRIN experiment will perform in the near future. Wolfgang Hollik then described the importance of precision calculations for experiments at the Large Electron-Positron Collider, the LHC and the International Linear Collider, together with their amazing success in determining the fundamental constants of the Standard Model, predicting the mass of the top quark and limiting the mass of the Higgs boson. Joachim Mnich presented the status of the LHC machine as well as the experiment, pointing in particular to the KCETA's contributions to the CMS

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experiment as well as to the importance of GridKa, the German Tier 1 centre for Grid computing. The audience was impressed by the rapid increase in LHC luminosity as well as the quality and large variety of the physics results.

Two years ago, the KCETA decided to establish the Julius Wess Award in memory of Julius Wess, who for more than two decades devoted himself to the advancement of theoretical and experimental physics at Karlsruhe. The final highlight of the celebration was therefore the presentation of the Julius Wess Award for 2010 to Valery Rubakov for his outstanding contributions in theoretical physics, in particular for his work connecting the appearance of anomalies in quantum field theory with experimentally testable predictions, for high-energy interactions as well as for cosmology. In his lecture, Rubakov described the latest progress towards understanding the inhomogeneities in the universe, thus connecting the latest data from cosmological observations with recent advances in quantum field theory.



Left to right: Johannes Blümer, spokesperson for KCETA, Detlef Löhe, vice president of KIT, Valery Rubakov, the Julius Wess Award winner, Susanne Wess, the daughter of Julius Wess, and Johann Kühn, vice-spokesperson for KCETA. (Image credit: KIT.)

WORKSHOP

Precision: worthwhile but not free

“It is amazing to see what precision is in store at the LHC, which is commonly perceived as a discovery machine,” said Guido Altarelli in his concluding talk at a gathering of some 50 precision aficionados in Paris on 15–18 December. The meeting, aimed at broadening the awareness of the formidable challenges facing precision measurements in the environment of the LHC’s proton–proton collisions, naturally started with reviews of the impressive results on W and Z production achieved by the ATLAS, CMS and LHCb experiments on a record time-scale. This, together with the prospect of harvesting eventually hundreds of millions of events with leptonic W and Z decays, fosters prospects of significant improvements even beyond the epic precision results from the Large Electron-Positron (LEP) collider on parameters of the electroweak Standard Model, notably on the W mass and the electroweak mixing angle.

If only it were that simple. The LHC produces collisions between protons, so the understanding of W and Z production necessitates an adequate understanding of the proton’s structure in terms of its parton density functions (PDFs). In the course of the meeting, perspectives changed gradually from optimism to realism on two fronts.

First, it was realized that the PDFs

are perhaps less well understood than is necessary for precision experiments at the LHC. “Tensions” (a euphemism for mild discrepancies that became the catchword of the meeting) between PDFs from different data sets, or employing different concepts for their derivation, attest to this. Second, the advantage of the Tevatron’s proton–antiproton collisions over the LHC’s proton–proton collisions became apparent, for reasons of intrinsic error compensation and smaller contributions to W and Z production from heavy quarks.

Thus, the way to improve the precision

on the W mass over the LEP and Tevatron results is thorny rather than easy. There are a number of challenges to face on both the theoretical and the experimental sides. However, the commonly accepted and encouraging conclusion of the meeting was that the noble goal justifies major efforts in these directions, and the workshop participants appeared determined to live up to the challenge.

● For more about the workshop on Challenges for Precision Physics at the LHC see, www.lpthe.jussieu.fr/~kbenakli/FRIF2010.



Guido Altarelli and Bryan Webber moderating a lively debate. (Image credit: W Krasny.)

OBITUARIES

Boris Dolgoshein 1930–2010

Boris Dolgoshein, one of the most imaginative of experimental particle physicists, passed away in his office at the Moscow Engineering and Physics Institute (MEPhI) on 14 December.

Born in 1930 in Kazan, Boris studied at the Moscow Engineering and Physics University, where he graduated in 1954. He later became professor of the MEPhI and head of the particle-physics department.

In 1962 Boris and his colleagues invented the streamer chamber and went on to develop this novel technology to perfection. Unlike the bubble chamber, the streamer chamber could be triggered externally and thus was suited to the study of rare and complex events. In 1968 Boris and his team constructed the largest streamer chamber ever built, with a volume of $8 \times 2 \times 1 \text{ m}^3$, which operated for many years in Protvino at the 70 GeV synchrotron. It was used to search for the W boson in an experiment that identified prompt muons for the first time and measured their spectrum and polarization.

In 1977 Boris proposed the detection of high-energy neutrinos by measuring the acoustic signals from hadron showers created by neutrinos in water. This method was realized in prototypes in the US and in Lake Baikal, and it is currently being explored in the context of the ANTARES and IceCube neutrino telescopes (p28). Boris also proposed measuring the density distribution of the Earth using high-energy neutrino scattering.

Boris developed and pioneered transition radiation detectors (TRDs) for particle tracking and particle identification. His experience and expertise with this sophisticated detector dates back to the early 1970s and there is hardly a TRD in the world to which Boris has not significantly contributed. Among them are the TRDs of the HELIOS spectrometer at the Super Proton Synchrotron, the ZEUS and HERA-B experiments at HERA, the AMS spectrometer that will fly in space and the huge Transition Radiation Tracker (TRT)



Boris Dolgoshein. (Image credit: MEPhI.)

of the ATLAS experiment at the LHC. Most TRDs, whether at accelerator-based experiments or in space, were built following one or other of these examples and profited from the intensive and careful R&D programmes that Boris and his collaborators carried out.

As spokesperson of the RD6 collaboration at CERN, for many years – and through troubled waters – Boris led the design and performance studies of a TRT for the LHC based on drift tubes, also known as “straws”. His unmatched experience, brilliant ideas and the painstaking care that he continuously put into understanding fully the complex behaviour of the straws at high occupancies and in an extremely harsh radiation environment were invaluable in many aspects of this daunting project. Thanks in great part to Boris, the ATLAS TRT today provides excellent measurements of charged-particle trajectories and beautiful views of the tracks in the collisions at the LHC.

Parallel to the construction of the ATLAS TRT, Boris continued to develop ideas for new detectors. In 1993, in collaboration with DESY, he started to develop a new type of silicon photodetector with high gain, which he called the silicon photomultiplier (SiPM). Consisting of an array of miniaturized

silicon Geiger–Müller counters on a silicon wafer, the SiPM is sensitive to single photons but insensitive to magnetic fields. Boris immediately realized the enormous potential of this technology and put his creativity and energy into its development. It is to his merit that SiPMs today have a vast number of applications ranging from the read-out of highly segmented calorimeters and photodetectors for astroparticle physics to medical applications, such as positron-emission tomography.

From the late 1970s, Boris was a frequent visitor to CERN and DESY, where he not only worked on his experiments and detector developments but was also active in science policy. As a member of the CERN–Russia Committee in 1991–1996, he contributed to an agreement for scientific and technological co-operation, which enabled Russian research institutes with the assistance of sectors of Russian industry to provide major contributions to the construction and utilization of the LHC.

Boris’s creative and innovative work was recognized with numerous honours, including Academician of the Russian Academy of Natural Sciences, the Lenin Prize, the Kapitza Gold Medal and the Alexander-von-Humboldt Award. His advice was sought by many committees and he was member of the Advisory Editorial Board of *Nuclear Instruments and Methods in Physics Research Section A*, and member of the editorial board of the *Journal of Instrumentation*.

Boris’s creativity, knowledge and enthusiasm have been an inspiration and motivation for many scientists. Working with him has been an unforgettable experience. Georges Charpak in 1995 said: “I have a long-standing history of scientific contacts on particle detectors with Boris Dolgoshein’s team. I have great esteem for its ideas and achievements. Boris Dolgoshein is one of the most creative specialists in particle detectors science in the world.”

● His friends and colleagues.



VACUUM VALVES

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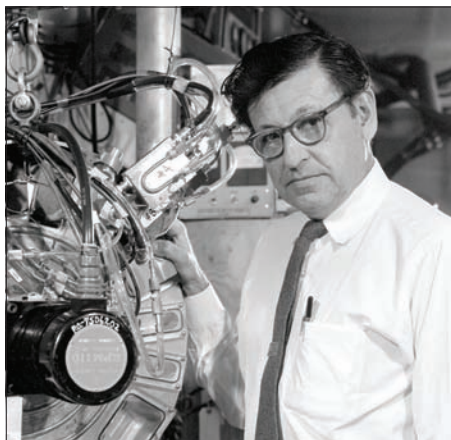
Albert Ghiorso 1915–2010

One of the last remaining veterans of the Manhattan project, Albert Ghiorso, passed away on 24 December 2010, at the age of 95.

Ghiorso was an astonishingly productive scientist whose successes go back to an earlier day, when science was done differently. Ghiorso began working in nuclear science in 1941 after receiving his bachelor's degree in electrical engineering from the University of California, Berkeley. His talents for building radiation detectors attracted him to Glenn Seaborg, and the two of them moved to Chicago in 1941. There, Ghiorso designed new instruments, including a 48-channel pulse-height analyser, which he and Seaborg used to discover two new artificial elements, americium (95) and curium (96), by irradiating plutonium with deuterium.

After the Second World War, they both returned to Berkeley, where they used the 60-inch cyclotron to produce elements 97 and 98. Ghiorso found the next elements, 99 and 100, in the debris collected after the first hydrogen-bomb test, in the Pacific. From there, it was back to the 60-inch cyclotron, where he found mendelevium (101) in 1955. This was discovered on the basis of 17 atoms, initiating the era of single-atom detection of new elements.

To cope with the steadily decreasing cross-sections, a new machine was needed, with more intense beams. Better detection techniques were also needed, to



Al Ghiorso in 1969, standing by the target wheel used to discover element 104, rutherfordium. (Image credit: LBNL.)

cope with the smaller cross-sections and shorter isotope lifetimes. Ghiorso led the construction of the Berkeley Heavy Ion Linear Accelerator (HILAC) and a later upgrade, the super-HILAC. These machines were used to discover five elements, from 102 (einsteinium) to 106 (seaborgium). This made a total of 12 elements, a record that earned Ghiorso a place in the *Guinness Book of World Records*.

By the 1970s, decreasing US support for heavy-element research rendered the Super-HILAC uncompetitive for discovering new elements and Ghiorso turned to a

new endeavour. He proposed coupling the ageing Super-HILAC with the also-ageing Bevatron, to produce the Bevalac, the first relativistic heavy-ion accelerator. It ushered in the field of relativistic ion collisions, laying the groundwork for experiments at Brookhaven's Alternating Gradient Synchrotron and CERN's Super Proton Synchrotron, as well as at Brookhaven's Relativistic Heavy Ion Collider and the lead-ion programme at the LHC.

Throughout his life, Ghiorso displayed enormous passion, curiosity and drive for physics. The lack of an advanced (post-bachelor) degree did not stop this remarkable scientist from helping to build, define and lead a field of nuclear science.

During his life, he was awarded a host of honours, including the Lifetime Achievement Award of the Radiochemistry Society, the Potts medal from the Franklin Institute, the GD Searle award from the American Chemical Society and an honorary doctorate from Gustavus Adolphus College. He was a fellow of the American Academy of Arts and Sciences and the American Physical Society.

Al Ghiorso is survived by his son, William Belt Ghiorso, an engineer at Lawrence Berkeley National Laboratory, and his daughter, Kristine Pixton, who is an artist and software designer.

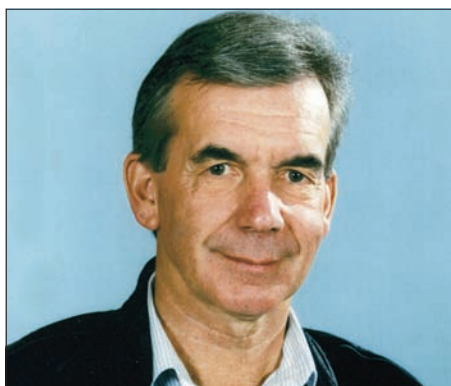
● *Spencer Klein, Lawrence Berkeley National Laboratory.*

Stuart Tovey 1939–2010

Stuart Tovey, who did much to bring about Australian participation in CERN, died on 21 October 2010 after a short illness.

Born in Southampton in 1939, Stuart grew up in Bristol. He studied physics at Trinity College, Cambridge, and received his BA in 1960. Returning to Bristol he joined Cecil Powell's cosmic-ray group and gained his PhD there in 1964. A series of fellowships followed at Bristol, University College London, CERN and the Rutherford Appleton Laboratory. He joined the University of Melbourne as a lecturer in 1975, being rapidly promoted to senior lecturer and then to reader and associate professor.

Stuart was prominent in the 1960s and 1970s in the study of hyperons and kaons and discovered a new baryon containing both charm and strange quarks. He put the many



(Image credit: University of Melbourne.)

interestingly named particles to good use in the numerous popular articles he wrote. He also studied antiprotons and participated

in the discovery of the W and Z bosons at CERN in the UA2 experiment. This experience further evolved into development of the ATLAS experiment at the LHC.

For many years Stuart co-ordinated the honours physics programme at the University of Melbourne, which was not for the faint hearted. He showed how adept and in-tune with people he was in this role, treading the fine line between encouragement and realism – in the latter case counselling students towards alternative directions when he thought that it be in their best interest. The honours students of the period were well served and many went on to PhD studies, often under Stuart's guidance.

Stuart's international engagement and solid personal and professional ties with CERN ensured strong participation in

ATLAS by Australia. While ATLAS and the LHC were being built, Stuart and his friend and colleague, Lawrence Peak from Sydney, shared a role as the fathers of modern high-energy physics in Australia. The Australian Institute for High Energy Physics was formed, for which Stuart was chair for many years. Australia also joined the NOMAD experiment at CERN, followed by the Belle experiment in Japan.

Fortunately, Stuart was able to share in the

excitement of the successful operation of the LHC and ATLAS. Although formally retired in 2001, he maintained an active interest in the project, being Australia's representative on the ATLAS Resource Review Board until recently. He also witnessed the successful establishment of a national Centre of Excellence in Particle Physics (CoEPP) in Australia, something that he strove for over many years. After writing a paper on collider physics together in 1984, Stuart and Allan

Clark of the University of Geneva pursued a role for Australia's participation in CERN and ATLAS. They were ahead of their time: the CoEPP gives justification to their early recognition of the need for such participation.

Stuart's untimely death is acutely felt by colleagues and friends at the University of Melbourne, and by those at the many institutions around the world who have worked with him. He will be missed.

● *Geoffrey Taylor, University of Melbourne.*

MEETINGS

The conference on **Technology and Instrumentation in Particle Physics (TIPP)** will take place on 9–14 June at the Sheraton Hotel and Towers in Chicago. This conference, the second in the series, will focus on all areas of detector development and instrumentation in particle physics and closely related fields, such as nuclear physics, particle astrophysics, synchrotron radiation sources and applications in biology, medicine and engineering. Registration is now open and the deadline is 1 April. For further information, see <http://conferences.fnal.gov/tipp11/>.

The **15th International Conference on RF Superconductivity** will take place on 25–29 July in Chicago. The goal of this conference is to provide a lively forum for SRF scientists, engineers, students and industrial partners to present and discuss the latest developments in the science and technology of superconducting RF for particle accelerators. Tutorial sessions preceding the conference will be held on 21–23 July at Argonne National Laboratory. Registration is now open and the deadline is 1 May. For more details, see <http://conferences.fnal.gov/srf2011/index.html>.

The **15th Lomonosov Conference on Elementary Particle Physics** will be held at Moscow State University on 18–24 August. These biennial conferences bring together around 300 theorists and experimentalists from different countries to review the current status and future prospects in elementary particle physics. The programme of the 15th conference will include neutrino physics, astroparticle physics, developments in QCD and heavy-quark physics. For further information and registration details (deadline 1 March), see www.icas.ru/english/15lomcon.htm.

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