

Faces & Places

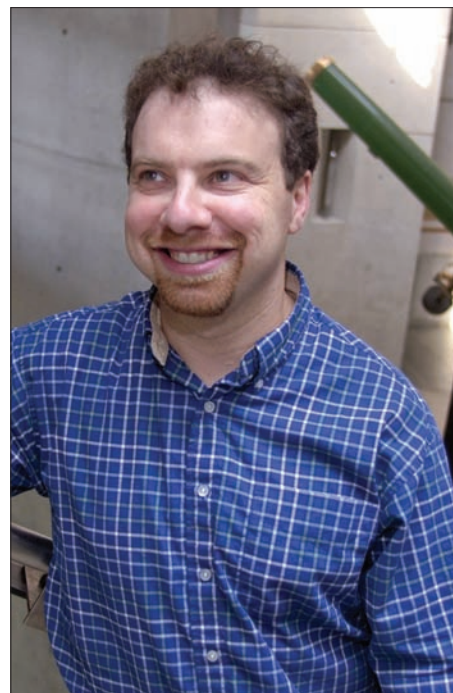
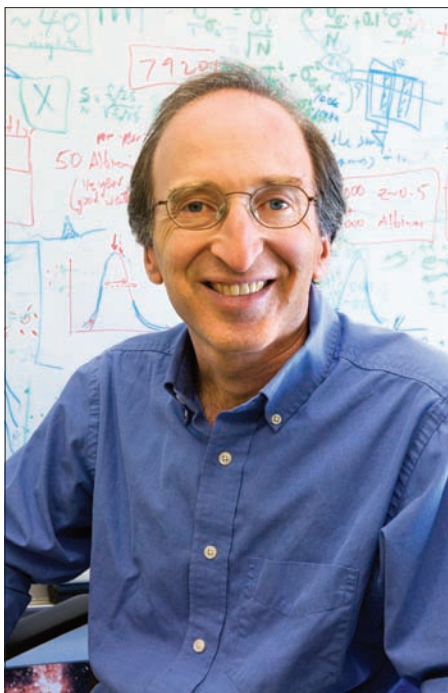
AWARDS

Perlmutter and Riess receive Einstein Medal

Saul Perlmutter and Adam Riess have been awarded the 2011 Einstein Medal. Both receive the medal for their work that indicates that the expansion of the universe is accelerating, an effect that is generally attributed to the existence of “dark energy” (*CERN Courier* September 2003 p23). The Albert Einstein Society in Bern gives the medal to individuals for “outstanding scientific findings, works or publications related to the work of Einstein”.

Perlmutter, of the University of California, Berkeley, is the leader and co-founder of the international Supernovae Cosmology Project based at the Lawrence Berkeley National Laboratory. Riess, of the Space Telescope Science Institute and the Johns Hopkins University, is a leading member of the High-*z* Supernova Search Team. In 1998, both teams announced that studies of distant supernovae showed that the expansion rate of the universe is accelerating, a finding that the magazine *Science* named “The Breakthrough Discovery of the Year”.

The Einstein Medals will be presented to Perlmutter and Riess during a ceremony held on 27 May in Bern.



Left: Saul Perlmutter. (Image credit: Lawrence Berkeley National Laboratory.) Right: Adam Riess. (Image credit: W Kirk/Homewood Photographic Services.)

APPOINTMENTS

Krücken takes over as new science leader at TRIUMF

On 1 February Reiner Krücken of Technische Universität München (TUM) took the helm of TRIUMF's science programme as head of the Science Division. Krücken succeeds Gordon Ball, who stepped down into active retirement at the laboratory.

Krücken brings worldwide expertise in nuclear physics to TRIUMF, including deep familiarity with rare-isotope beam facilities in Europe, the US and Asia. His research interests include: nuclear structure, reactions and astrophysics; hadron properties in hot, dense nuclear matter; detector development; biological and medical applications of nuclear methods; particle-induced light emission in dense gases and liquids; and transmutation of nuclear waste. He earned his PhD in nuclear physics from the University of Cologne and worked at Lawrence Berkeley National Laboratory and

the Wright Nuclear Structure Laboratory at Yale before moving to TUM in 2002. At TUM, he led the German research foundation's cluster of excellence team on the “Origins and Structure of the Universe”.

The Advanced Rare Isotope Laboratory (ARIEL) project was key to attracting Krücken to TRIUMF. When completed, ARIEL will have a competitive advantage in a number of areas involving isotopes for science and medicine and has the potential to transform Canada's global position in nuclear physics. Krücken is already organizing a summer workshop with international involvement to develop ARIEL's initial scientific programme.

With this appointment, TRIUMF's scientific programme in nuclear and particle physics and condensed matter will be in good hands for years to come.



Reiner Krücken has transferred to TRIUMF. (Image credit: TUM.)

Faces & Places

INDUSTRY

Germany and Holland show off their wares at CERN

Companies from two of CERN's member states have recently taken the opportunity to display their products and services at CERN.

First, in November, the main building was transformed into a showcase for industry from the Netherlands, in the exhibition Holland@CERN, which was opened by the ambassador for the Netherlands at the United Nations and sponsored by the Dutch Economic Agency, EVD. It was the first time in almost 15 years that Dutch companies have exhibited at CERN and this time 24 of them were there to show their wares. A further three companies participated in the B2B – “business to business” – meetings that took place during the exhibition. The programme of events also included a series of talks on purchasing

at CERN and future programmes for the LHC upgrade, Compact Linear Collider study and the upgrade for the European Synchrotron Radiation Facility (ESRF) in Grenoble. A delegation from the ESRF also attended the exhibition.

In January it was the turn of representatives from 30 German companies in sectors related to particle physics to meet scientists, engineers and other potential purchasers at the 11th Germany at CERN exhibition. The main subjects covered electrical engineering, electronics, informatics, mechanical engineering, vacuum and low-temperature technologies, instrumentation and safety. The exhibition was organized by the German Federal Ministry of Education and Research.



Sigurd Lettow, right, CERN's director for administration and general infrastructure, tours Holland@CERN.



CERN's director-general, Rolf Heuer, centre, meets participants in the 11th Germany at CERN exhibition.

CERN took part in the Technology World exhibition in London on 7–8 December. This offered the opportunity to present CERN to the then UK minister of state for business and enterprise, Mark Prisk, centre left, seen here in discussion with Dante Gregorio of CERN's Finance and Purchasing Department. (Image credit: UKTI BG.)



LETTERS

Beyond the ISR

Thank you for the three excellent articles on the Intersecting Storage Rings (*CERN Courier* January/February 2011), a genuine all-round achievement, a pleasure to read and an occasion to bring up reminiscences. (No doubt you are aware of the faulty figure 1 on p27, surely not by co-author Kurt Hübner).

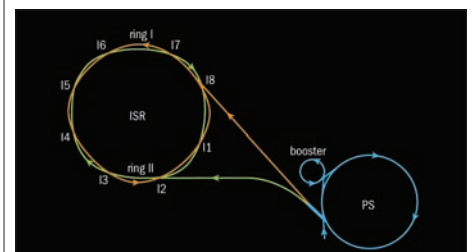
Looking at this series and at other CERN publications, I nevertheless could imagine a two-fold extension on the theme of accelerator articles:

1. As hinted at, for instance, in the articles on the Proton Synchrotron at 40 years (*CERN Courier* December 1999 p15) and on CERN at 50 years (*CERN Courier* January/February 2004 p23), and while not wishing in any way to detract from the achievements reached with any single accelerator/storage ring, is it not the working together of all of them (and the experimental areas) in a precise way and in a combination with the potential to change from pulse to pulse that is a distinctive strength of CERN? And would this also deserve to be presented in detail on some occasion?

2. That desirability, in my view, would apply also to the topic of “phase-space density” and how at least to avoid its dilution. I am aware that this is not easy to convey understandably to non-expert readers. (Although Simon van der Meer explained in his Nobel Lecture in Stockholm how he got round Liouville's theorem in order to increase phase-space density, few authors have tried to make it a theme for general audiences). However, if it had not been dealt with so successfully, collider luminosities would have been markedly lower and presumably physics results would not have been the same.

● Helmut Reich, Glion, Vaud.

Editor's note: The error in the figure showing the layout of the ISR and PS was indeed not the fault of the authors, but of an inversion that occurred during redrawing. Many apologies. The correct figure is reproduced here.



The ISR consisted of two interlaced proton-synchrotron rings, both 300 m in diameter, receiving protons from the PS.

New physics at the ISR

Neither science nor civilization could exist without memory. This statement by Enrico Fermi was the driving force for the celebration of the 40th anniversary of the first proton–proton collisions at the highest energy possible on Earth, thanks to Victor Weisskopf, CERN’s director-general (1961–1965), and to Kjell Johnsen, the ISR project leader.

The Bologna-CERN-Frascati group was engaged for a decade in the search for new physics at the ISR. The most interesting result concerns the effective energy and universality features. Before the discovery of the effective energy it was taken for granted that each pair of interacting particles had the privilege of producing its own final state of particles. The effective energy led to the most unexpected result: all pairs of interacting particles – no matter if the interaction is strong, electromagnetic or weak – produce the same final state. This is the origin of the universality features, which show up in the following quantities: the fractional energy distribution, $d\sigma/dx$; the average number of charged particles, $\langle n_{ch} \rangle$; the ratio of the average energy in the charged channel to the total energy, $\langle E_{ch} \rangle / \langle E_{total} \rangle$; the transverse momentum distributions, $d\sigma/dp_T^2$; the normalized transverse momentum distribution; the event planarity; the two-particle correlations; the scale-breaking effects.

As Weisskopf later said: “One of my contributions to CERN was the decision to construct the [world’s] first proton–proton

collider, the ISR. The ISR allowed [us] to reach the highest collision energy in the interaction between protons. I am therefore very happy that it is thanks to a series of experiments performed by Zichichi and collaborators with the ISR that the multitude of final states produced when particles interact strongly, electromagnetically and weakly can be put on the same basis. In particular, the fact that each pair of hadronic particles ($\pi\pi$), (pp), ($\bar{p}p$), (Kp) etc, was producing its own final state, with different properties, such as the average charged multiplicity, the fractional momentum distribution of the secondary particles, and so on, was very disturbing. In fact, the properties of these final states appeared to depend on the nature of the pair of interacting elementary particles. This was called by Gribov the hidden side of QCD. Here QCD had no quantitative predictions but qualitative ones. If all baryons and mesons are made of the same constituents, quarks and gluons, then the multihadronic final states should show universality features. It is exactly here that Nino succeeded to solve the problem with his new quantity entering in all processes: the effective energy. He had the right idea at the right time. In fact, the universality features are experimentally hidden insofar as the effective energy is not introduced in the analysis. It is for me very gratifying that the discovery of the effective energy was implemented at the CERN ISR. Moreover, I like it because it still has to be quantitatively explained by QCD” (Weisskopf 2000).

And now Vladimir Gribov: “In the physics community there was a sort of gentlemen’s agreement: please do not speak about results in contrast with the so-much searched for gauge interaction to describe hadronic phenomena. These hidden results were the hadronic systems produced in the interactions between pairs of hadrons; they were all different. Each pair of interacting particles, when producing systems consisting of many hadronic particles, had its own final state. No one knew how to settle this flagrant contradiction. I wish I had the idea of the effective energy” (Gribov 1997).

The purpose of this short note is to let people know that many discoveries were made with the ISR.

● Antonino Zichichi, on behalf of the Bologna-CERN-Frascati (BCF) Group.

Further reading

V V F Weisskopf 2000 *The Creation of Quantum Chromodynamics and the Effective Energy, Proceedings of 1998 Galvani Bicentenary Celebrations*. World Scientific Series in 20th Century Physics **25** 1.

V N Gribov 1997 *Effective Theories and Fundamental Interactions, Proceedings of the International School of Subnuclear Physics* (Erice 1996) **34** 500.

For a complete report, see:

G Veneziano 2000 *World Scientific Series in 20th Century Physics* **25** 57 and 341–351.

Editor’s note: There will be more on discoveries at the ISR in a future issue.

SCHOOLS

Roger Bailey takes over as head of CAS

After eight years of growth in popularity for the CERN Accelerator School (CAS), Daniel Brandt has handed the baton over to Roger Bailey, who was until now head of LHC operations.

Established at the beginning of 1983, CAS has developed to include two courses a year offered to hundreds of students from all over the world. Courses are held in CERN member states and are taught by physicists from CERN and other institutions. Students worldwide are welcome to participate, although the popularity of the school has meant places are often limited.

Following Brandt’s successful management, Bailey joins the newly formed Office of the Director of Accelerators and Technology at CERN and becomes the new head of CAS.

“Daniel has left the CERN Accelerator School in great shape,” says Bailey. “In the short term, I see no reason to make any significant changes to the way that the regular schools are run. We are, however, looking into the possibilities of offering courses on accelerator physics to an even wider community in the not too distant future.”

The next CAS course will be held in the framework of the Joint US-CERN-Japan-Russia School on Particle Accelerators on the topic of Synchrotron Radiation and Free Electron Lasers. It will take place in Erice on 5–16 April. It will be followed by the first specialized CAS course of the year, on the subject of High Power Hadron Machines.

This course will take place in Bilbao on 24 May – 2 June.



Roger Bailey, the new head of the CERN Accelerator School.

Faces & Places

OBITUARIES

Tetsuji Nishikawa 1926–2010

Tetsuji Nishikawa, former director-general of KEK, passed away on 15 December 2010. He was 84. The first son of Shoji Nishikawa, a renowned physicist and professor at the University of Tokyo, Tetsuji Nishikawa showed an extraordinary talent as a physics student and became a professor of physics of the same university in 1961 at the age of 34.

He was a man of extraordinarily wide interests. His initial research was in the field of atomic and molecular physics using microwave technology but he gradually shifted towards accelerator science and high-energy physics. One of his contributions to accelerator physics is the invention of the alternating periodic structure (APS) for linear accelerators, work done while he was at Brookhaven National Laboratory (1964–1966). He became a world expert on beam dynamics. From his laboratory came many excellent physicists, all of whom contributed a great deal to the later development of high-energy physics in Japan. These include Kunitaka Kondo, Yorikiyo Nagashima, Yoshitaka Kimura, Tsuneyoshi Kamae, Toshio Suzuki, Kenzo Nakamura and Shin-ichi Kurokawa, to name but a few.

He was a man of extraordinary patience. After a decade of negotiations with the government and of tireless discussions within the scientific community during the 1960s, high-energy physicists, led by Shigeki Suwa and Nishikawa, finally succeeded in starting KEK (the National Laboratory for High Energy Physics, now called the High Energy Accelerator Research Organization) in 1969 and in constructing the 12 GeV proton synchrotron. One of the most important contributions that this accelerator has made to high-energy physics is the first long-baseline neutrino experiment in which a neutrino beam was sent to the Kamiokande



Tetsuji Nishikawa. (Image credit: KEK.)

facility 200 km from KEK. This finally confirmed the oscillation of muon-neutrinos to electron- or tau-neutrinos. Moreover, KEK became a model in Japan for the development of national inter-university research institutes. Later, many research laboratories in different disciplines were created with the same organizational and management structure as KEK.

He was a man of extraordinary insight into the future. Nishikawa supported the development of a neutron beam from the KEK proton synchrotron, as initially suggested by a group at Tohoku University led by Motoharu Kimura. The KEK parasitic neutron facility was completed in 1980 and eventually upgraded substantially in the current Japan Proton Accelerator Research Complex (J-PARC). Nishikawa also realized the importance of hadron beams in cancer treatment and, together with the medical

school of Tsukuba University, he constructed a cancer-treatment facility at the booster synchrotron (500 MeV). The success of this facility continued with the construction of the National Institute of Radiological Sciences in Chiba Prefecture. Another example is his insight into synchrotron radiation facilities. The world's first dedicated synchrotron radiation facility was built at the Institute for Nuclear Study in the University of Tokyo, based largely on the foresight of Taizo Sasaki. Nishikawa decided to build the KEK Photon Factory, together with Kazutake Kora, with strong support from the synchrotron radiation user-community. The facility was completed in 1982.

He was a man of extraordinary wisdom in laboratory management and project design. After the completion of the KEK Photon Factory he decided to build TRISTAN, the world's highest energy e^+e^- collider. The KEK photon factory injection linac was used as an injector for TRISTAN, which was completed in 1986. The collider was later transformed into a B-Factory.

He was an extraordinary human being. Together with the late Shigeki Suwa, he was one of the founding fathers of KEK and the Japanese high-energy physics community. I always think that what he accomplished in Japan is comparable to what Panofsky did in the US. Indeed, Nishikawa and Panofsky were good friends and together, more than 30 years ago, they initiated the US-Japan Collaboration scheme. They also worked hard to launch the Superconducting Super Collider; unfortunately, the project was cancelled during its construction.

Those of us who knew him and worked with him feel a great loss. *Adieu, Professeur Nishikawa. Sayonara, Nishikawa-sensei.*

● Hirotaka Sugawara, KEK.

NEW PRODUCTS

Aurea Technology has launched the newly designed SPD_A_M2, an all-in-one DUAL single-photon counting module. The SPD_A_M2 is a series of ultra-low-noise, high-quantum efficiency near infrared, 900–1700 nm, single photon detectors. The detector's Geiger-mode InGaAs avalanche photodiode and thermoelectric coolers ensure a low and stable dark count, with a performance superior to 5.0×10^{-6} ns. The SPD_A_M2 series also provides

plug-and-play connections to personal computers via USB. For more information, tel +1 415 465 2280 or e-mail info@aubatechnology.com.

The Berkeley Nucleonics Corporation has a new digital delay/pulse generator, available from **Southern Scientific**. The Model 575 provides multichannel, 250 ps resolution timing, delay, gate, pulse and synchronizing signals for laser timing and nuclear

instrumentation testing. It is available in two-, four- and eight-channel configurations, with optional ethernet, high-voltage and dual-input trigger capacity. For more information, see www.ssl.gb.com.

Goodfellow Cambridge Ltd can supply custom glass formulations for use in a range of technical fields. These can be supplied in quantities as small as 1 kg, with custom particle-size distributions and

Faces & Places

properties tuned for specific applications. Modifications can also be carried out to existing compositions to adjust properties such as colour, viscosity and density. For more information, tel +44 1480 424 800, e-mail info@goodfellow.com or see www.goodfellow.com.

Highland Technology Inc has announced the PH200, the first in the “PH” series of extreme-performance photonic instruments. The PH200 Nanowatt Photoreceiver is a free-space optical/electrical converter that provides near shot-noise performance in a rugged, compact package. The photon feedback architecture delivers a bandwidth greater than 1 MHz, with an unprecedented combination of linearity, bandwidth, and dynamic range for 10 nA to 100 μ A photodiode signals. For more information, tel +1 415 551 1700, e-mail info@highlandtechnology.com or visit www.highlandtechnology.com.

Specialised Imaging now supplies their renowned SIM-D Ultra Fast Framing Camera in a new multispectral imaging configuration. The SIM-D can fit up to 16 filters with wavelength from 400 nm to 850 nm within the optical system. Coupled with the ability to take images at exposures down to 3 ns with 0 interframe time, this enables the accurate study of wavelength dispersion when materials are stressed, as well as temperature measurement, and calorimetry applications. For more information, tel +44 1442 827 728 or e-mail info@specialised-imaging.com.

Unitemp has launched a new constant temperature and humidity chamber, the LHU-123. This versatile product has a temperature range from -20°C to 85°C and a relative humidity range of 40 to 95%rh with a temperature of $\pm 0.5^{\circ}\text{C}$ and $\pm 3\%$ rh. Program operation can be run on 9 steps per pattern and can specify ramp time for each step. The LHU-123 model's cross-control system lowers the maximum current during operation, reducing the amount of required power. For more information, contact Paul Brown, tel +44 1628 850 611 or e-mail paul@unitemp.co.uk.

ZTEC Instruments has introduced a low-noise direct path option for the high-resolution 4400 digital oscilloscopes series, including specifically the ZT4421, ZT4422, ZT4431, ZT4432, ZT4441 and the ZT4442. The direct path option provides an alternative analogue signal-conditioning analogue front end to ZTEC's popular 12-bit, 13-bit and 14-bit series of digitizers and digital oscilloscopes. For more information, tel +1 505 342 0132 or visit www.ztecinstruments.com.

VISITS



Octavi Quintana Trias, director of EURATOM, left, accompanied by **Roger Garbil** of the European Commission Directorate-General for Research, centre, was welcomed to CERN on 11 January by the deputy spokesperson of CMS, **Joe Incandela**. Their tour included the CMS experiment and a look inside the LHC tunnel.

It was the turn of Korean vice-minister II of education, science and technology, **Kim Chang-Kyung**, to tour the CMS experimental area at CERN on 19 January. He also had the opportunity to view part of the LHC tunnel, as well as to visit the CERN Control Centre.



Michael Boddenberg, Hessian Minister for Federal Affairs and Representative of Hessen in the Federal Government, right, visited CERN on 20 January. His tour included the ALICE experiment, the LHC tunnel, the CERN Computer Centre and CERN Control Centre.

Didier Burkhalter, Swiss federal councillor, head of the Interior Federal Department, right, came to CERN on 25 January. His visit included a tour of the ATLAS experimental area with former ATLAS spokesperson, **Peter Jenni**, left. The federal councillor was accompanied by his wife, **Sabine Friedrun Burkhalter**.



Faces & Places



On 25 January **Avi Hasson**, the Israeli chief scientist for the ministry of industry, trade and labour, seated, visited CERN, including the ATLAS experiment. Here he signs the guestbook with, from left to right, **John Ellis**, CERN's adviser for Israel, **Giora Mikenberg**, ATLAS collaboration and Weizmann Institute of Sciences, Israeli Industrial Liaison Office, and **Peter Jenni**, former ATLAS spokesperson.

German state secretary of the ministry for innovation, science and research of North Rhine-Westphalia, **Helmut Dockter**, visited CERN on 28 January and had the opportunity to see the ATLAS experimental area. His tour also included touring the CERN Control Centre and viewing the LHC tunnel.



Michael Russell, Scottish cabinet secretary for education and lifelong learning, left, was welcomed to CERN on 7 February by **Paul Collier**, head of the beams department, and presented with a temperature-sensitive mug depicting the history of the universe. The visit included the CERN Control Centre, as well as practical exercises in the Teachers' Laboratory and a meeting with Scottish scientists working at CERN.



On 31 January, **José Ángel Gurria**, secretary-general for the Organization for Economic Co-Operation and Development, left, was welcomed to CERN by **Felicitas Pauss**, head of international relations at CERN, centre, and **Sigurd Lettow**, director for administration and general infrastructure. During the visit he toured the LHC tunnel and the ATLAS experimental area.

Turkish minister of foreign affairs, **Ahmet Davutoğlu**, left, received a general introduction to CERN by CERN's director for research and scientific computing, **Sergio Bertolucci**, right, on 28 February. During his visit he signed the CERN guestbook, spoke to Turkish scientists and toured the ATLAS Visitor Centre.



Gabriel Rodriguez, the Chilean ambassador and director of the directorate of energy, science and technology, and innovation, ministry of foreign affairs, left, was welcomed to CERN on 1 February by **Rüdiger Voss**, CERN adviser for non-member states. The ambassador visited the ATLAS experiment, CERN Control Centre and the CERN Computing Centre.

MEETINGS

The Royal Society, London, is holding a discussion meeting on **Physics at the high energy frontier – the Large Hadron Collider project** on 16–17 May. The aim is to discuss the scientific, technical, sociological, political and financial challenges of bringing this huge international project to fruition. It will bring together leading figures in high-energy physics, including the director-general of CERN, the director of Fermilab and spokespersons of three major experiments. The meeting is free to attend but pre-registration (online) is essential. For further information and to access the online registration form, visit <http://royalsociety.org/events>.

Quark Matter 2011 will take place in Annecy on 23–28 May. The Quark Matter conferences aim to bring together specialists in experimental and theoretical heavy-ion physics from around the world. This year the meeting will discuss the first heavy-ion results at the new energies of the LHC, as well as the technologies needed for more

powerful experimental and software tools. The conference will be preceded by a student day on 22 May. For further information about the programme and how to register, see <http://qm2011.in2p3.fr>.

Physics at the LHC 2011 will be held in Perugia on 6–11 June. The conference provides a traditional forum for the LHC experiments to discuss latest results and new ideas. It consists of invited and contributed talks, as well as posters, covering experiment and theory. Topics cover the range of LHC physics from Higgs and supersymmetry to diffraction and forward physics. The conference is sponsored by CERN, INFN and University of Perugia. For further information about the programme and how to register, see www.pg.infn.it/plhc2011/.

The **XXV International Symposium on Lepton Photon Interactions at High Energies** will be held at the Tata Institute of Fundamental Research, Mumbai on 22–27 August. Following the traditional

format, the programme will feature plenary reports covering topics of major interest to the particle-physics community and a poster session for students and young post-docs. Unlike past symposia, there will be no country-wise quota of delegates for this symposium. Interested parties can obtain an invitation letter for attending by completing the invitation-request form on the symposium webpage <http://www.tifr.res.in/~lp11>.

The International Workshop on e^+e^- collisions from phi to psi (PHIPSI11) will be held at the Budker Institute of Nuclear Physics, Novosibirsk, on 19–22 September. The aim is to discuss in detail the state of the art of various problems in hadronic physics at low energy e^+e^- colliders and the potential of existing and future facilities. The workshop will be followed by the satellite meeting of the Working Group on Radiative Corrections and Monte Carlo Generators on 23–24 September. For further information about the programme and how to register, see <http://phipsi11.inp.nsk.su>.



Welcome to LT-26

August 10-17, 2011 Beijing, <http://LT26.iphy.ac.cn/>

- Quantum Gases, Fluids and Solids
- Superconductivity
- Magnetism and Quantum Phases
- Electronic Quantum Transport in Condensed Matter
- Cryogenic Techniques and Applications

Important Dates: Abstract submission deadline: April 15

Early registration fees deadline: May 15

Manuscript submission deadline: July 1

Beijing International Convention Center

