

## Hit the gas: go green!



"Running on natural gas reduces carbon dioxide emissions by some 40%," explains Serge Micallef of the Services Industriels de Genève (SIG), CERN's partners for this green mobility project. CNG contains 20% biogas, which is carbon-neutral. CNG

produces 60 to 95% less pollution overall than ordinary petrol, and it is entirely soot-free.

It is true that filling up with gas requires a short drive to the BP station along the *Route du Nant d'Avril*, while petrol is available right on the CERN site. Still, it should be borne in mind that the BP station was equipped for gas specifically to cover CERN's needs, and

its capacity was dimensioned accordingly. The fuel badge is easy to use compared with other ways of paying. "We negotiated and set up a partnership with the BP station to simplify the payment procedure. It's also a matter of economics, because it would cost hundreds of thousands of Swiss francs to install a CNG filling station at CERN today," concludes Isabelle Mardirossian, head of the Integrated Services Group in the GS Department.

(Continued on page 2)

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### Active sharing

The big news this week is, of course, the conclusions from the LHC performance workshop held in Chamonix from 6 to 10 February. The main recommendation, endorsed by CERN's Machine Advisory Committee and adopted by the Management, is that the LHC will run at 4 TeV per beam this year. You can find all the details from Chamonix in the slides presented on Wednesday at the summary session (<http://indico.cern.ch/conferenceDisplay.py?confId=170230>), which leaves me free to talk about another important development coming up soon.

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## A word from the DG

(Continued from page 1)

### Active sharing

In ten days time, a new kind of gathering will be taking place in Geneva, bringing together two previously separate conferences, one driven by physics, the other by the medical community, but both looking to apply physics to the advancement of health. The merger of the International Conference for Translational Research in Radio-Oncology and CERN's workshop on Physics for Health in Europe (ICTR-PHE) makes for a very eclectic mix. Presentations range from active shielding for interplanetary flight to the rather more down-to-earth applications of particle physics technology to medicine.

What's really important about the ICTR-PHE conference, however, is that it is actively transferring know-how from the world of basic science to the world of applied research, and this is something we need to make more systematic. It is written in CERN's founding Convention that the Organization should do all it can to make the results of its research as widely known as possible, and this is something we have always strived to do. In the early days of CERN, we took a fairly simple approach, publishing everything we did. But then, in 1993, something happened to change that: CERN put the Web into the public domain in an act that would ensure a single open standard. Up until then, that was how CERN had always dealt with its inventions, but ever since, we've been more dynamic about sharing our technology. Today, we have a very proactive approach to knowledge and technology transfer, and are constantly looking for new ways to improve the flow. The ICTR-PHE conference is one clear manifestation of this.

Rolf Heuer

## Hit the gas: go green!

(Continued from page 1)

CERN's decision to make bi-fuel vehicles available to its users is part of its policy of respecting the environment, as befits any major organisation today. Everyone's help will be needed if this venture with 100 vehicles, the first corporate fleet of its type in Suisse romande, is to be a success.

So think about going for the green option, because you can make a real difference. Or, as the new awareness campaign has it:

"Hit the gas: go green!"

*CERN Bulletin*

The SIG will set up a stand at the entrance to Restaurant 1 where you can get answers to your questions and any other information you may need about how the CNG vehicles work and how best to use them. The stand will be open from Monday, 20 February to Friday, 24 February between 9.30 a.m. and 2.30 p.m.

Here is a video demonstrating how to use the gas pump (in French):

<https://cdsweb.cern.ch/record/1424717>

## LHC Report: Preparing for 4 TeV

The cool-down of all LHC sectors (left floating at around 80 K during the Christmas break) restarted three weeks ago. At present, more than half of the machine is at nominal cryogenic temperature and the completion of the cool-down is expected by 27 February. As soon as a sector is cold, the Electrical Quality Assurance (EQA) team starts the high-voltage qualification of the superconducting circuits, to check insulation and instrumentation integrity. These qualifications were initiated on the first Sector available (Sector 23) during the Charmonix workshop week, and have since been carried out on three other Sectors (Sectors 56, 67 and 78) without any non-conformity being found.

After more than two months since its stop in December, the LHC is slowly coming back from its hibernation - even if the temperature of the magnets in the tunnel has actually been getting lower and lower in recent days. The tunnel has been crowded with hundreds of people, busy with maintenance activities and preparations for the restart. The end of most activities (and the access to the tunnel) is scheduled for 21 February. On this date, the Operations team will take back ownership of the machine from the Programmed Stops Coordination team and push forward the preparations for the beam.

Once the circuits have undergone the high-voltage qualification, the powering tests of the superconducting circuits begin. These tests officially started on 10 February, after the validation and preparation of the first sector. To minimize the impact on the activities requiring access to the tunnel (which will continue for a few more days), the powering tests are only being performed during the evening and at night, to cope with the safety

(Continued on page 3)

# LHC Report: Preparing for 4 TeV

(Continued from page 2)

constraints. These tests aim at pushing the performance of all LHC circuits to their operational level. The tests involve injecting current through the superconducting circuits while checking the correct behaviour of the protection mechanisms, an essential element for the safe operation of the machine. After operating at 3.5 TeV for two years, the

LHC is entering another domain, with the main dipole and quadrupole circuits powered at a different current level for operation at 4 TeV.

Apart from some small issues and debugging (also of the new tools used this year to improve the performance in test execution), as at the beginning of each restart after a

long stop, the tests are progressing well. All superconducting circuits should be commissioned during the first week of March. A few days of machine checkout will then drive us to the first beam, planned for 14 March.

Mirko Pojer for the LHC Team

## LHC performance workshop summary

### A critical review of 2011

The performance of the machine was examined during the workshop, identifying possible improvements to critical systems such as beam instrumentation and machine protection. The high-intensity beams that the LHC collided last year have raised issues around the ring including beam-induced heating of some hardware, and problematic vacuum spikes. The present understanding of these problems and possible solutions were presented.

One of the big successes of 2011 was the squeeze - the reduction of the beam size at the interaction point - that was pushed in the latter part of the year. Squeezing even further in 2012 might be possible in combination with the use of tighter collimator settings. This could give a peak luminosity of around  $6 \times 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$  compared with a maximum of  $3.6 \times 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$  in 2011.

### Possibilities for 2012

Steve Myers, CERN's Director for Accelerators and Technology, presented a summary of the workshop recommendations for the 2012 run. In brief, the LHC should operate at 4 TeV, with the key priorities being: delivering enough luminosity (of the order of  $15 \text{ fb}^{-1}$ ) to ATLAS and CMS to allow them to independently discover or exclude the Higgs; the proton-lead ion run; and a machine development programme that targets operation after the long technical shutdown. A run extension was not ruled out if necessary to meet the target integrated luminosity.

### The Chamonix workshop last week reviewed the performance of the LHC in 2011 and discussed plans for 2012 and beyond. Among other things, we can look forward to the LHC running at 4 TeV during 2012.

Machine availability should be improved in 2012 thanks to a number of mitigation measures taken during the Christmas stop. These include a number of measures aimed at reducing the effects of radiation on the electronics situated in the LHC tunnel.

### Plans for the long shutdown of 2013/2014

The total length of the long shutdown (LS1) for the LHC is provisionally around 20 months. The main focus will be the splice consolidation work, which involves opening every magnet interconnect in the ring, and measuring carefully the resistance of each joint in the cables which carry the current between the dipoles and quadrupoles in the arcs of the LHC. It is currently estimated that 15% of the splices will be re-done; shunts and clamps will be installed across each splice. The aim is to definitively exclude the possibility of a repeat of the incident of 19 September 2008 at the highest energies expected at the LHC.

Besides this, each of the LHC experiments has extensive programs of maintenance and upgrades. Some of the key LHC systems (cryogenics, vacuum, quench protection, electrical distribution, cooling, ventilation, access and RF) will undergo major maintenance and improvements.

### The machine after LS1

After LS1, a large number of re-training quenches of the LHC dipoles will be required in order to reach the nominal energy of 7 TeV per beam. Therefore, the beam energy in the first years after LS1

is expected to be around 6.5 TeV. The planned injector upgrades will not have been deployed at this stage, but the injector performance still looks capable of supplying sufficient beam quality to enable the LHC to reach the design luminosity of  $1 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$ . Potential limitations to post-LS1 performance (quenches, radiation to electronics, UFOs) were also considered.

### Future projects

Prospects for the LHC Injector Upgrade project and its principal client, the High-Luminosity LHC (HL-LHC), were also considered. Tentatively scheduled to start operation around 2023, HL-LHC aims to provide an ambitious 200 to 300 inverse femtobarns per year. An examination of the challenges of the HL-LHC included a look at the state of R&D for the new magnets required for the high-luminosity interaction regions.

There was also an entertaining look at the even more distant future. Possible future projects under consideration include the Large Hadron electron Collider (LHeC), which involves colliding 60 GeV electrons with 7 TeV protons, and the High Energy LHC (HE-LHC), in which the beam energy of the LHC is increased from 7 to 16.5 TeV. Serious technological challenges exist for both these options.

Edited by Katarina Anthony based on regular reports by the Bulletin's correspondent from Chamonix (Mike Lamont)

Steve Myers, CERN Director for Accelerators and Technology, and Sergio Bertolucci, CERN Director for Research, discuss the Chamonix workshop. Video at:

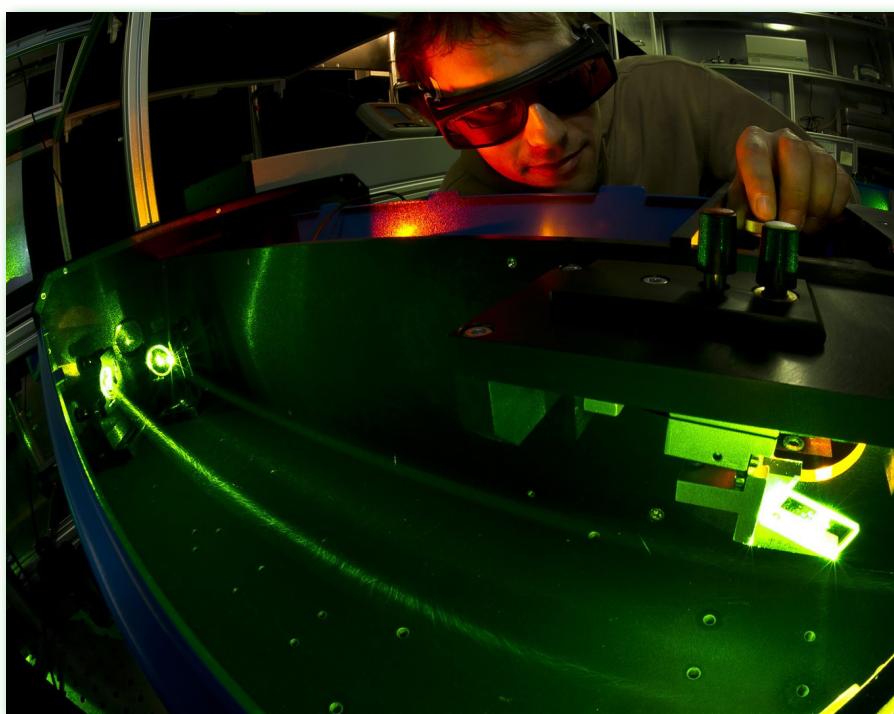
<https://cdsweb.cern.ch/record/1423359>

# Laser technology inspires new accelerator concepts

If you take a closer look at recent experimental developments, you'll notice a new topic trending: laser technology. It's being used to study the characteristics of particles, as incorporated into the new ALPHA-2 set-up; to conduct diagnostics of particle beams, as used in a laser wire scanner at Petra III; to "breed" unusual ion beams, as carried out by ISOLDE's Resonance Ionization Laser Ion Source (RILIS); and even to accelerate particles to high energies, as explored at Berkeley's BELLA facility. These projects notwithstanding, the application of lasers to accelerator technology is still a field that requires significant R&D – something the LA<sup>3</sup>NET network can provide.

LA<sup>3</sup>NET will bring together more than 20 partner institutes to jointly train 17 early stage researchers in the field of laser applications. Undertaking cutting-edge research in centres across Europe, the researchers will be driving the development of laser techniques into previously unexplored research areas. At CERN, LA<sup>3</sup>NET researchers will be working on technology that could have a direct impact on the ISOLDE, CLIC and LINAC4 set-ups. Their research could help these CERN projects to reach unprecedented beam qualities and measure characteristics of high-intensity particle beams that cannot be determined by any other means.

"We'll be using lasers to generate, shape, characterise and even accelerate particle beams," says Carsten P. Welsch, a former CERN Fellow who is now coordinating the LA<sup>3</sup>NET from his University of Liverpool home-base. "New advanced accelerator concepts explore the use of lasers to bring particle beams to very high energies. While not a novel concept in itself, previous work using the technique has found significant issues, with a resulting energy spread of 10-50% in the accelerated beam. Using new developments in laser technology, some of our researchers will try to create better quality high-energy beams with this laser acceleration technique."



One of the laser systems now in use in the ISOLDE experiment.

A promotional graphic for the LA<sup>3</sup>NET project. It features a central image of a brain with a circuit board pattern, overlaid with a bright beam of light. The text "LA<sup>3</sup>NET" is prominently displayed with three stars above it. Below the main image, there is text about "Open positions within the LA<sup>3</sup>NET project". To the right, there is additional text about the importance of lasers in particle accelerators, information about application deadlines, and a list of partner institutions. Logos for various partners are shown at the bottom.

**Open positions within the LA<sup>3</sup>NET project**

Lasers have become increasingly important for the successful operation and continuous optimization of particle accelerators.

Each researcher will benefit from a wide ranging training programme consisting of a range of both local and network-wide activities, as well as of schools, conferences, and workshops. Excellent salaries will be offered.

**Application deadline:**  
April 15<sup>th</sup> 2012

You will find more information about LA<sup>3</sup>NET, all research projects and application details at:  
<http://www.liv.ac.uk/la3net>

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Logos of partner institutions: University of Liverpool, KIT, CLPU, GANIL, HZDR, Cobalt, cosylab, GSI, Foton, HighQ LASER, IUP, ICMA, aquenos, Fraunhofer, THORLABS, and others.

These LA<sup>3</sup>NET research projects are centred not just in academia and research organisations, but also in industry. "It's this diversity that makes the LA<sup>3</sup>NET so exceptional," says Carsten. "All of our participating researchers will spend significant time with an industry partner, giving them hands-on experience in both sides of the research field. Furthermore, we've kept the network open to new collaboration opportunities: any individual or organisation that wants to get involved in our activities can still 'join' as an adjunct partner."

The network will also be hosting a series of international schools looking at specific research areas in the field of laser applications, which will be open to external participants. The first of these schools will be held at GANIL (France) in October 2012.

For further information, visit the LA<sup>3</sup>NET network website:

<http://www.liv.ac.uk/la3net/>

Katarina Anthony

# Record breakers

"Diversifying the Fellowship programme has been the key theme in recent years," comments James Purvis, Head of the Recruitment, Programmes and Monitoring group in the HR Department. "In particular, the 2005 five-yearly review introduced the notion of 'senior' and 'junior' Fellowships, broadening the target audience to include those with Bachelor-level qualifications."

Diversification made CERN's Fellowship programme attractive to a wider audience but the number of Fellows on site could not have increased so much without the support of EU-funded projects, which were instrumental in the growth of the programme. "Significant EU Marie Curie funding has resulted in many more Fellows," says Seamus Hegarty, coordinator for Marie Curie

In the sixties, CERN's Fellows were but a handful of about 50 young experimentalists present on site to complete their training. Today, their number has increased to a record-breaking 500. They come from many different fields and are spread across CERN's different activity areas.

Actions at CERN. "While some Marie Curie Initial Training Networks are now finishing, three new projects – PicoSec, ARDENT and TALENT (for more on the last of these see this week's Bulletin article) – are starting. They will bring in eleven additional Fellows to CERN!"

The Fellowship programme grew out of the need to provide advanced training for researchers, as stipulated in the CERN Convention. Today, it has evolved into a real career opportunity, appreciated by young experts in different fields and from a variety of countries across Europe and beyond, with 45 different nationalities currently repre-

sented. "The selection of Fellows is made by the Associates and Fellows Committee in which all the departments are represented," says Katharine Thomas-Chevreux, coordinator for Fellows. "The Committee selects candidates on the basis of their excellence and potential."

The introduction of the Graduate Engineer Training scheme enabled departments to offer even more opportunities in engineering fields. The continuing success of this and the standard CERN Fellowship Programme is crucial and very much appreciated by departments. "The Fellows scheme is particularly suitable for young researchers and engineers on fixed-duration projects, allowing them to start and complete their own projects while at CERN. It has also proven to be a real career stepping stone, with Fellows going on to interesting careers both inside and outside CERN," concludes James Purvis.

Antonella Del Rosso

## ALICE installs new hardware in preparation for the 2012 run

The annual winter shutdown has been a very intense period for the ALICE collaboration. In conjunction with the general maintenance, modifications and tests of the experiment, two major projects – the installation of 3 supermodules of the Transition Radiation Detector (TRD) and 2 supermodules of the Electromagnetic Calorimeter (EMCal) – have continued on from last year. These new supermodules will give the two detectors

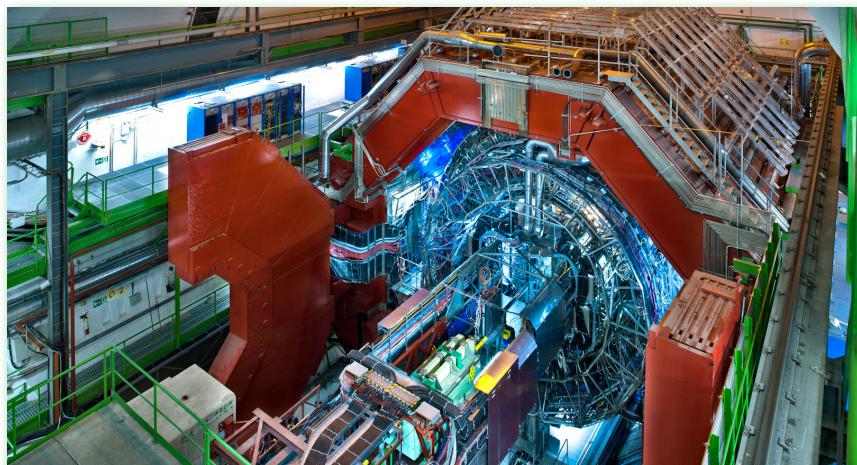
2011 was a fantastic year for the heavy-ion run at ALICE despite unprecedented challenges and difficult conditions. The data collected is at least one order of magnitude greater than the 2010 data. Thanks to a planned upgrade to two subdetectors during the 2011/2012 winter shutdown and a reorganisation of ALICE's Physics Working Groups that should allow them to better deal with the greater challenges imposed by the LHC, the collaboration is confident that the 2011 run will allow ALICE to extend its physics reach and improve its performance.

more coverage of collision events during the 2012 run. In addition, ALICE teams had to deal with technical issues that affected the filters of the cooling system of the Silicon Pixel Detector (SPD), some high-

voltage discharges occurring in the Time Projection Chamber (TPC) and some inefficiencies in the Muon Tracking Chambers caused by faulty low-voltage connections. Fixing and consolidation efforts are still ongoing.

Thanks to new hardware installed previously and a redefined, successfully tested high-level trigger, the ALICE collaboration eagerly awaits the completion of the 2011 run analysis. "We expect the data collected in 2011 to significantly extend ALICE's physics reach, particularly towards studying the thermodynamic properties of the quark-gluon plasma – the state of matter that is formed at the collision energy of the LHC," says Yves Schutz, deputy ALICE spokesperson. "We have also observed intriguing results concerning the formation of particles issued from the plasma. These results need further analysis but we can already say that some of the physics processes observed at lower energy at RHIC, such as those involving the production of the J/ $\psi$  particle, do not seem to be reproduced in the same way at the LHC."

In 2011, ALICE's Physics Working Groups were reorganised to better meet the needs of the collaboration, which have evolved over time. The 2012 proton run is about to start and the experiment is ready to cope with the beam's higher energy and intensity.



Photograph of ALICE taken by Antonio Saba during this year's winter shutdown.

# ISOTDAQ School: one of a kind

"Can I call you back in about an hour? I'm just in the middle of tutoring a group of four students in one of our practical sessions," says Markus Joos, one of the organisers, when we call him to ask some questions about the current ISOTDAQ School taking place in Cracow, Poland, from 1 to 8 February. He later explains that half of the teaching time at the School is dedicated to such practical sessions, where students complete exercises using computers, electronics hardware and even a small muon detector. The other half is taken up by lecture sessions with more theoretical content.

This format of the School is one of the things that contributes to its success, according to the participants. "It's really good that you can touch the hardware and get down to some programming in the lab sessions," says Sandra Saornil, who, when she's not participating in the School, works in the silicon tracker group at LHCb. "Other schools have a more theoretical approach, but here you can really see how the hardware works."

To make the hands-on practice possible, 600 kg of electronics modules and computers are shipped from CERN to wherever the School is taking place. The rest of the time, the equipment is kept in an operational state in a permanent lab at CERN. "We need it to train the tutors for the School," says Markus Joos, "and it's used for outreach

**Particle physics research has many unique needs and sometimes has to create its own expertise to keep its systems running. For specialised areas like cryogenics and high-voltage technology, labs often run their own training courses. In line with this trend, CERN has started a series of International Trigger and Data Acquisition (ISOTDAQ) Schools. 2012 has seen the third ISOTDAQ School, which generated a lot of enthusiasm among the future generation of TDAQ experts.**

activities too. It's also available to any Summer Students who are interested."

The School and its lab are quite a unique resource, as there are very few places to gain expertise on TDAQ outside of on-the-job learning. "We realised that universities and institutes were supplying manpower but not the TDAQ training, because trigger and data acquisition is just too specialised for university courses," explains Gökhan Ünel, who initiated the first ISOTDAQ School. Since the first School in 2010 in Ankara, Turkey, they have been able to repeat it in Rome, Italy in 2011 and this year in Cracow. "We already have candidates for the next two venues," says Markus.

Demand for the School will hopefully continue, because the organisers have been careful to cast their net wide. "TDAQ is a generic concept. It can be used in a one-person lab experiment or in any other project right up to the scale of the LHC detectors, and we reflect that in our curriculum," explains Krzysztof Korcyl, a researcher in Cracow and a member of ATLAS, who took on much of the local organisation of the School. The School's wide reach explains

why it appeals to people from a range of disciplines from inside CERN and elsewhere, whether physicists, computer scientists or engineers. "We hope the School makes a real contribution to knowledge transfer from CERN," concludes Markus.

*Joannah Caborn Wengler*

## Key facts

- 48 students from most European countries, as well as India and Canada;
- 20 lecturers and tutors; 4 of the tutors are from the A.C.E.O.L.E. / Marie Curie project;
- hosted by the Department of Physics, Mathematics and Computer Science of the Cracow University of Technology and co-organised by the Institute of Nuclear Physics of the Polish Academy of Sciences in Cracow;
- co-sponsored by the A.C.E.O.L.E. Marie Curie programme and the Polish Academy of Sciences who subsidised 15 students either in full or partially;
- one exercise sponsored and run by a representative of National Instruments.



Markus Joos tutoring a group of students.

# Luminosity declines in the Globe as it increases at the LHC

Inaugurated in 2004, the Globe of Science and Innovation has become one of the Organization's key landmarks. Housing the permanent exhibition "The Universe of Particles" (which recently received a silver design award, as reported in the last issue of the Bulletin) and a multimedia auditorium, the Globe hosts many events every year. "The Globe has rapidly become an important communication tool for CERN," enthuses Bernard Pellequer, who is in charge of event planning for the venue. "This is particularly true for the first floor, which is equipped with a giant screen.

A few weeks ago, the skylight at the top of the Globe was fitted with "smart glass". The new glazing will allow the intensity of the light in the auditorium to be adjusted, thus solving the problem of sunlight reflecting on the giant screen during the day.

Unfortunately, we soon realised that the magnificent skylight, which is one of the Globe's most striking features, rendered the screen unusable during the daytime since the light coming through it made it impossible to see what was on it."

After seeking a suitable solution for four years, the Globe's managers finally turned to an Irish company called Smart Glass International, which offers a new suspended

particle device technology known as SPD Smart Glass. The fitting of smart glass in the skylight means that it can now be made light or dark at the flick of a switch, as Bernard Pellequer explains: "When no voltage is applied, the suspended particles are arranged in a random pattern, blocking the passage of light. When the electrical supply is switched on, the suspended particles align and let light pass. We can now control the amount of light coming through the roof by simply turning the power on or off."

The glazing company paid two visits to CERN, the first in October 2011 to measure the dome and sides of the skylight 18 metres up in the roof, and the second in December to fit the 50 m<sup>2</sup> of SPD glass. The result was a real triumph of technology as hitherto the materials had only ever been fitted in luxury cars.

"Aside from purely practical considerations, we had to make sure that we didn't change the atmosphere of the Globe or spoil its architectural beauty. The new technology meets all these criteria. It's also consistent with the message of science and innovation we want to convey," concludes Bernard Pellequer. "The screen now has an excellent contrast, so our goal has been achieved – in the smartest way you could imagine!"

Anaïs Schaeffer



*The Globe skylight while "off": the smart glass remains opaque.*



*The Globe skylight while "on": light enters the auditorium. Note that this photo was taken mere moments after the first.*

# Highlights from e-EPS: Fusion experiment nears completion, nominations open for prize, and technology transfer group launched

## Core of fusion experiment completed

The last major part of the Wendelstein 7-X fusion experiment was installed on 21 December last year. The addition of the 14 tonne final part of the device – the lid of the thermally insulating outer shell – sees the completion of the ring-like base machine at the Greifswald branch of the Max Planck Institute of Plasma Physics, which will begin operation in 2014.

Fusion research aims to draw energy from the fusion of atomic nuclei. To achieve this, hydrogen plasma must be super-heated to temperatures above 100 million degrees, within the confines of a restricting magnetic field. The Wendelstein 7-X – which will be the largest fusion device of its type – will investigate the feasibility of such a power plant and its potential for continuous operation.

For more information, please visit the Max Planck Institute website:

[http://www.ipp.mpg.de/ippcms/eng/presse/pi/15\\_11\\_pi.html](http://www.ipp.mpg.de/ippcms/eng/presse/pi/15_11_pi.html)

## Call for 2012 IUPAP C11 Young Scientist Prize

Nominations are now open for the IUPAP Young Scientist Prize for the Commission of Particles and Fields (C11). Two prizes are presented each year in recognition of outstanding young experimental or theoretical particle physicists.

The awards, consisting of a medal and 1000 euros in prize money, will be presented at the 36th International Conference on High Energy Physics. Nominees should have a maximum of eight years of research experience, excluding career interruptions, following their PhD. Previous award recipients are not eligible.

For more information, please visit the IUPAP website:

[http://www.iupap.org/youngscientist/page\\_50920.html](http://www.iupap.org/youngscientist/page_50920.html)

## EPS launches new Technology and Innovation Group

The EPS is launching a new Technology and Innovation Group, in accordance with the EPS Strategy Plan 2010+. This initiative confirms the longstanding role of the EPS in establishing links between industry, research institutes, society and universities within Europe.

The Technology and Innovation Group is hoping to build a close collaboration with the newly created Technology Transfer Offices (TTO) Circle, by means of CERN, which is both a founding EPS member as well as a major player in the TTO circle organisation.

The TTO network brings together technology transfer offices from European public research organisations, to facilitate the spread of technology and research-based innovation to industry and society and to provide models of best practice to smaller member offices.

e-EPS News



## News from the Library

This resource includes more than 300,000 technical papers from SPIE journals, e-books and conference proceedings from 1990 to the present. The SPIE Digital Library covers many areas of interest for CERN users, such as

**SPIE (Society of Photo-Optical Instrumentation Engineers) is a not-for-profit international society which publishes one of the largest collections of applied optics and photonics research papers in the world: the SPIE Digital Library.**

astronomy, nanotechnology, sensors, lasers, electro-optics and imaging.

The CERN Library has trial access to the complete resource till 31 March 2012, don't hesitate to give it a try!

Access to the SPIE Digital Library at:

<http://spiedigitallibrary.org/>

We welcome any comment or question at library.desk@cern.ch.

CERN Library

# Who's got TALENT?

As the LHC ramps up towards full capacity, the detectors will need to update their technology to meet the extra demands created by significantly increased levels of both radiation and signals reaching the sensors. This can only be done by ramping up research and development to create the new technologies needed.

To meet this challenge, the Marie Curie Initial Training Network TALENT is currently seeking 17 researchers from the fields of applied physics, mechanical and software engineering, electronics and economics to work in five key areas:

- Radiation-hard precision pixel sensors;
- Radiation-hard high-density electronics and interconnection technologies;

As part of a training initiative funded under the European Commission's Seventh Framework Programme, 17 new Fellow positions have just been opened with three positions at CERN and the remainder around Europe. The mission is to contribute to the development of key sections of the ATLAS tracker upgrade.

- New mechanical integration methods for lightweight support and cooling systems;
- Detector performance and system integration;
- Dissemination, knowledge transfer and external research funding.

As well as 2 and 3-year contracts, TALENT offers interesting training possibilities for Fellows. These range from courses in physics and engineering to languages and business skills as well as case workshops and a dedicated summer school, where best practices can be exchanged and networks created. Fellows will also be able to spend up to 10



months of their contract working in industry if they have a research background, and vice versa for those from industry. This collaboration is made possible by the composition of the project network, which is made up of two research facilities, seven universities and eight industry partners.

TALENT is now accepting applications and it is expected that the first contracts will start before the summer. Applications can be made via the CERN e-RT website or via the TALENT website which you can visit at:

<http://talent.web.cern.ch>

*Joannah Caborn Wengler*



Computer Security  
Sécurité informatique

## Found an USB stick? Go and infect your PC!

**S**o, you found a USB stick in the cafeteria? Take care. If this were a lollipop, you wouldn't just pick it up and lick it, would you? So beware of USB sticks whose origin or previous usage you don't know. They might infect your PC once plugged in. In order to be on the safe side, accept and share only USB sticks whose owner you trust. Run up-to-date anti-virus software on your PC, make sure that its operating system is patched regularly,

**Err. Wait. Please no! USB sticks are not innocent little things. They can quickly mutate into malicious nasty beasts! Just in the recent past, at least two physics experiments were suffering as their control and data acquisition PCs, respectively, were infected by USB sticks holding malicious code. A bit longer ago, a series of laptops were infected at a 2008 computing conference as an infected USB stick made its tour around. Bad luck for those who ran a Windows operating system and inserted that stick...**

and turn off the "auto-play" feature (which should already be off by default on recent systems).

If you are involved in the maintenance or development of control systems for accel-

erators or experiments, please note that the use of USB sticks on such systems is strictly restricted. Any violation (and a subsequent infection of a control PC) is considered to be a professional fault.

For further information, please check our recommendations ([https://security.web.cern.ch/security/recommendations/en/how\\_to\\_secure\\_your\\_pc.shtml](https://security.web.cern.ch/security/recommendations/en/how_to_secure_your_pc.shtml)) or contact us at [Computer.Security@cern.ch](mailto:Computer.Security@cern.ch).

Computer Security Team



## Ombuds' Corner Le coin de l'Ombuds

In this series, the Bulletin aims to explain the role of the Ombuds at CERN by presenting practical examples of misunderstandings that could have been resolved by the Ombuds if he had been contacted earlier. Please note that, in all the situations we present, the names are fictitious and used only to improve clarity.

# Do not put things under the rug!

**D**ue to his technical expertise and a mastery in his domain of activity, Jim\* was nominated supervisor of his Unit at CERN. In fact, he was considered perhaps the only person who could face, along with his team, the great challenges of a very complicated technical development, and succeed in overcoming all the difficulties.

Jim really believed in his strategy, so he developed on his own a solid plan of action. He set strict milestones for the project and the ways to operate, so that the overall project could be done on time and budget. Of course he counted on everyone in the team to be fully dedicated to his master plan. His management applauded his work and was confident that they had made the correct choice, although they knew that Jim did not have any experience leading a team of so many people and handling all the associated human communications.

In the beginning, everything went well. But later the usual difficulties linked to any project started to show up: the late deliveries of materials, a few mistakes in the blue prints discovered after construction, the breakdown of some equipment, and a large increase in some raw material costs. What's more, several people became ill during the winter. It became obvious to Jim that the plan would have

to be revised, which he saw as a dangerous threat to his own image.

Scared of being dismissed as manager and fearful for his career, Jim started, almost unconsciously, to use every possible mean to defend himself. He could no longer accept suggestions, as he saw them as critiques. He refused any modification to the schedule, asking for more and more work from his team. With time, he became aggressive in meetings and people did not dare talk or react, in the hope of making the situation a bit quieter. Jim then accused them of being totally inefficient and amorphous, and systematically refused to approve vacations. Quickly everybody lost their enthusiasm for the project, and sick leaves started to increase dangerously. The situation came to the point where Jim's high technical abilities could no longer balance the destructive effect of his abrasive and bullying behaviour.

Jim's upper management was very hesitant, as they had no one to replace him and, furthermore, they did not know what they would do with him if they removed him from the project. They spoke with him on various occasions, trying their best to make him aware of the situation. At the same time, they were also covering him from the complaints of his team. As a result, they had reassured Jim that his way of handling the situation was correct and that he should adopt a harder management style to drive this project to a successful end.

### What would you think happen in the end?

Jim burned out, his team was totally discouraged and the project was in jeopardy. If taken in time, there are positive actions that can prevent such a situation.

### Conclusion

Whenever cases of abuse are known, the hierarchy has to act promptly. If not, the parties in question will get a feeling of immunity, which will reinforce their harmful behaviour without any risk at all. Not only will they not be offered any chance to improve their behaviour but, even worse, such behaviour – if covered by an umbrella of immunity from their upper management – may escalate, ruining their career and destroying the careers of collaborators. Is it best to consider coaching these abusive people before it is too late!

### Contact the Ombuds early!

<http://cern.ch/ombuds>

Vincent Vuillemin

\* Names and story are purely fictitious.

# André Petermann (1922-2011)

The CERN theory community mourns the loss of André Petermann, one of the first members of the Theory Division, who passed away last August in his 89th year. He pioneered, together with his advisor Stueckelberg, the renormalization group, one of the fundamental ideas in quantum field theory that underlies the modern theory of phase transitions as well as asymptotic freedom and the quest for unification of all the particle interactions.

André was among the very first staff members of CERN, which at the beginning was a small group of theorists at the Niels Bohr Institute in Copenhagen, headed by Bohr himself. When the group moved to Geneva, they first occupied a set of barracks in Cointrin, next to the airport, before moving to the University of Geneva, and then finally settling on the Meyrin site. André was our last direct contact with our nomadic origins.

The importance of André's early work on the renormalization group was recognized by Kenneth Wilson who, when he was awarded the Nobel Physics Prize for his work applying the renormalization group to critical phenomena, kindly acknowledged a congratulatory letter from André by paying tribute to his joint paper with Stueckelberg for initiating the whole renormalization group effort.

Another of André's important contributions to field theory and particle physics was his pioneering calculation of the next-to-leading order correction to the anomalous magnetic moment of the muon. This was key to the interpretation of the famous CERN experimental measurement of this quantity, and is still a reference for today when the theoretical interpretation of this quantity is much debated.

André's scientific interests ranged far and wide, extending in later years to include grand unification and the study of superstring compactifications. Long after his formal retirement, he would often be encountered browsing preprints late at night, and many of us recall with fondness long telephone calls from André, quizzing us about some recent publication.

André was a very special person, somebody with great purity of vision, breadth of interest and integrity. He had a deep understanding of physics and mathematics, and was an exceptional man whose manifold contributions to physics will live on.

CERN-TH is grateful to him: we feel deeply his passing.

Luis Alvarez-Gaumé, Ignatios Antoniadis,  
John Ellis & André Martin



## Official news

### OFFICIAL HOLIDAYS IN 2012 AND END-OF-YEAR CLOSURE 2012/2013

(Application of Articles R II 4.38 and R II 4.39 of the Staff Regulations)

Official holidays in 2012 (in addition to the special leave during the annual closure):

- \* Sunday, 1st January (New Year);
- \* Friday, 6th April (Good Friday);
- \* Monday, 9th April (Easter Monday);
- \* Tuesday, 1st May;
- \* Thursday, 17th May (Ascension day);
- \* Monday, 28th May (Whit Monday);
- \* Thursday, 6th September ("Jeûne genevois");
- \* Monday, 24th December (Christmas Eve);
- \* Tuesday, 25th December (Christmas);
- \* Monday, 31st December (New Year's Eve).

Annual closure of the site of the Organization during the Christmas holidays and day of special leave granted by the Director-General :

- \* The Laboratory will be closed from Saturday, 22nd December 2012 to Sunday, 6th January 2013 inclusive (without deduction of annual leave). The first working day in the New Year will be Monday, 7th January 2013.

Human Resources Department  
Tel. 73903



## Take note

### SUMMER WORK FOR CHILDREN OF MEMBERS OF THE PERSONNEL

During the period from 18 June to 14 September 2012 inclusive, there will be a limited number of jobs for summer work at CERN (normally unskilled work of a routine nature), which will be made available to children of members of the personnel i.e. anyone holding an employment or association contract with the Organization.

Candidates must be aged between 18 and 24 inclusive on the first day of the contract, and must have insurance cover for both illness and accident. The duration of all contracts will be 4 weeks and the allowance will be CHF 1717.- for this period. Candidates should apply via the HR Department's electronic recruitment system (e-RT) at:

[https://ert.cern.ch/browse\\_www/wd\\_portal.show\\_job?p\\_web\\_site\\_id=1&p\\_web\\_page\\_id=10220](https://ert.cern.ch/browse_www/wd_portal.show_job?p_web_site_id=1&p_web_page_id=10220)

Completed application forms must be returned **by 10 April 2012 at the latest**. The results of the selection will be available by the end of May 2012.

For further information, please contact:  
Virginie.Galvin@cern.ch

HR Department  
Tel. 72855



## Take note

### EUROPEAN STRATEGY PREPARATORY GROUP - CALL FOR SUBMISSIONS

As part of the Update of the European Strategy for Particle Physics, the European Strategy Preparatory Group (ESPG) welcomes submissions on issues related to the strategy from individual physicists, from groups of scientists representing a community (an experiment, a topic of theoretical research, etc.) as well as from Institutions and Organizations (funding agencies, ministries, etc.).

These contributions will be discussed at the meetings of the Preparatory Group and during the Open Symposium to be held on 10-12 September 2012 in Cracow, and will be made available to the Strategy Group for drafting the Update of the Strategy.

#### How to submit a contribution?

Send your contribution on the scientific issues below using the form under [http://indico.cern.ch/event/espg\\_input](http://indico.cern.ch/event/espg_input) (preferably as an attached PDF file):

- Accelerator Physics;
- Astroparticle Physics, Gravitation and Cosmology;
- Flavour Physics and Symmetries;
- Physics at High Energy Frontier;
- Physics of Neutrinos;
- Strong Interaction Physics;
- Particle Physics Theory;
- General Infrastructure and Facilities;
- General Comments.

All input submitted to this form will be brought to the attention of the ESPG. Each submission should be self-contained (no external links except in the references), and be up to 15 pages in length. Should you encounter problems sending a file, please send a short message using this address: [espg-general@cern.ch](mailto:espg-general@cern.ch).

Unless the authors request otherwise, the documents will be made public on the Strategy Group Web-page (<http://europeanstrategygroup.web.cern.ch/EuropeanStrategyGroup/welcome.htm>).

This is an important occasion to submit your input, and your knowledge and experience is of much help and greatly appreciated. Please feel free to extend this invitation to other people you think could be interested.

*Tatsuya Nakada  
Chairman of the European Strategy  
Preparatory Group*

### HEALTH, HYGIENE AND SAFETY IN THE WORKPLACE AND THE MARS INTERVIEW

The MARS exercise provides a unique opportunity for exchange between staff members and their supervisors. It is also an opportunity to review workplace health, hygiene and safety issues, and in particular to identify occupational risks to which the staff member may be exposed. That information can also be used to identify and arrange for safety training, and to agree on the personal protective equipment that may be required.

Please remember that it is stipulated in Article 4.3 of Safety Code A1 that: "The member of the personnel concerned and the Group Leader are responsible for updating the questionnaire on occupational hazards. (...) The Group Leader is also responsible for ensuring that his personnel do not undertake work forbidden by a medical decision."

CERN's Medical Service can use the identified occupational risks to verify that the state of health of each member of the personnel is compatible with the work

assigned, which is one of the Service's responsibilities.

Part 4 of the 2012 MARS form ("Aspects related to health, safety and working conditions") will therefore have a new box, which should be checked to confirm that the staff member and the supervisor have identified occupational risks using form OHS 0-0-3. The safety courses should be listed under "Development objectives". The personal protection equipment should be purchased from the CERN store.

- Send the form to the Medical Service, as indicated on the first page of the form.
- Check the corresponding box on the MARS form.

**As a reminder:** anyone in possession of a dosimeter must tick box 500 (risks related to ionizing radiation); however, if exposure is infrequent, please specify this in the box marked "Other".

The current form OHS 0-0-3 will be an electronic document handled by EDH for the forthcoming MARS exercise. Please send any suggestions for improving this document to [safety-general@cern.ch](mailto:safety-general@cern.ch).

*HSE Unit*

#### Instructions for completing form OHS 0-0-3:

- Print the form out (use the link on the MARS form).
- Fill it out together (staff member and supervisor):
  - describe the staff member's work;
  - tick the boxes that are applicable to the staff member; and
  - date and sign the form (both staff member and supervisor).



Take note



Save lives  
Give your blood

**On Thursday 15 March 2012  
From 9.00 to 17.00**

### BLOOD DONATION

Organized by the Cantonal Hospital of Geneva

**CERN - Main building  
1<sup>st</sup> floor – Room : Pas Perdus**

**Give 30 minutes of your time to save lives...**

<http://dondusang.hug-ge.ch/>





## Take note

### SOLIDARITY

Association Ensemble pour N'DIAGO

du 5 au 9 mars

de 11h30 à 14h30

Chantal Fournier et Laurence Greggio  
vous attendent au rez-de-chaussée du  
bâtiment principal

Aide au développement du groupe scolaire de N'Diago, ayant comme objectif :

- construction d'un mur d'enceinte ;
- aménagement d'une bibliothèque ;
- soutien d'une cantine scolaire.

Venez soutenir ce projet en achetant une brique symbolique

**5.- CHF**



## Seminars

### TUESDAY 21 FEBRUARY

**TH STRING THEORY SEMINAR**  
14:00 -TH Auditorium, Bldg. 4

**k-String Tension**

A. ARMONI / SWANSEA UNIVERSITY

### WEDNESDAY 22 FEBRUARY

**TH COSMO COFFEE**  
11:00 - TH Auditorium, Bldg. 4

**Very weakly interacting slim Dark Matter**

M. GOODSELL / CERN

**TH THEORETICAL SEMINAR**  
14:00 -TH Auditorium, Bldg. 4

**Lattice QCD: a theoretical femto-scope for non-perturbative strong dynamics**

L. GIUSTI / UNIV. DEGLI STUDI MILANO-BICOCCA (IT)

### THURSDAY 23 FEBRUARY

**COLLIDER CROSS TALK**  
11:00 -TH Auditorium, Bldg. 4

**Energy Loss in Heavy Ion Collisions**

C. A. SALGADO / UNIVERSITY OF SANTIAGO DE COMPOSTELA

**A&T SEMINAR**

14:15 -Kjell Johnsen Auditorium, Bldg. 30

**Direct CP violation in charm and flavor mixing beyond the SM**

P. PARADISO / CERN

### FRIDAY 24 FEBRUARY

**PARTICLE AND ASTRO-PARTICLE PHYSICS SEMINARS**

14:00 -TH Auditorium, Bldg. 4

**TBA**

M. GRAZZINI / UNIVERSITY OF ZURICH

### TUESDAY 28 FEBRUARY

**TH STRING THEORY SEMINAR**  
14:00 -TH Auditorium, Bldg. 4

**TBA**

SONG HE / AEI POTSDAM

### WEDNESDAY 29 FEBRUARY

**TH COSMO COFFEE**  
11:00 - TH Auditorium, Bldg. 4

**TBA**

G. TASINATO

**TH THEORETICAL SEMINAR**  
14:00 - TH Auditorium, Bldg. 4

**TBA**

ZVI BERN / UCLA/CERN