



CERN Bulletin

LHCf sheds new light on cosmic rays



Artistic impression of cosmic rays entering Earth's atmosphere. (Credit: Asimmetrie/lnfn).

It took physicists by surprise when analysis of the data collected by the two LHCf calorimeters in 2010 showed that high-energy cosmic rays don't interact with the atmosphere in the manner predicted by theory.

The LHCf detectors, set up 140 metres either side of the ATLAS interaction point, are dedicated to the study of the secondary particles emitted at very small angles during proton-proton collisions in the LHC, with energies comparable to cosmic rays entering the earth's atmosphere at $2.5 \cdot 10^{16}$ eV. The aim of the experiment is to refine the models currently used to study very high-energy

The energy spectrum of the single photon obtained using data from the LHCf experiment has turned out to be very different from that predicted by the theoretical models used until now to describe the interactions between very high-energy cosmic rays and the earth's atmosphere. The consequences of this discrepancy for cosmic ray studies could be significant.

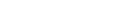
cosmic radiation. And according to the recent results of the LHCf experiment, these models will indeed require some changes. LHCf Deputy Spokesman Oscar Adriani explains: "We have used the data recorded to measure the energy spectrum of the single photon, which derives from the decay of a neutral pion appearing in the particle shower formed when very high-energy cosmic rays interact with atmospheric gas." The researchers can use studies of the single photon to extrapolate information on the physical processes induced by cosmic radiation.

(Continued on page 2)

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A word from the DG



Setting visible footprints for peace

Last week, Israel's cabinet agreed that Israel could become a member of CERN, bringing CERN's geographical enlargement one step closer. Council still has to discuss the timetable for accession. However, Israel's associate membership, an essential prerequisite for membership, could begin this year. It's a moment I'm looking forward to.

Israeli participation in CERN is nothing new. Israel was granted observer status in 1991, and ever since has contributed voluntarily to the Organization's activities, as well as to

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Setting visible footprints for peace

our intellectual wealth. Israeli institutions also participate in our summer student programmes, bringing both Israeli and Palestinian students to the lab. I'm told that one of the best parties at CERN in recent years was an Israeli-Palestinian summer students' party: young people sending an important message to the world.

Initiatives like this are part of our *raison d'être*. CERN was created in 1954 with the dual mandate of conducting excellent research in Europe and fostering peaceful international collaboration through science. The Organization's founding fathers had the foresight to recognise that science transcends all other barriers, and by encouraging links between academics, great advances in international understanding can be, and have been, made.

Israel's membership will further advance CERN's ideals. Israeli scientists can benefit from CERN, and CERN can benefit from them. Furthermore, I firmly believe that the cause of peace in the Middle East can be served by engagement with the academic communities of both Israel and its neighbours in the Arab world. This is a policy that CERN actively pursues.

CERN's approach to collaboration is and always has been one of openness to academic communities, wherever they may be. This brings richness to the intellectual life of CERN, and sends a message to the world about what can be achieved through peaceful collaboration. Academic inclusion is the route to understanding, setting visible footprints for peace.

Rolf Heuer

LHCf sheds new light on cosmic rays

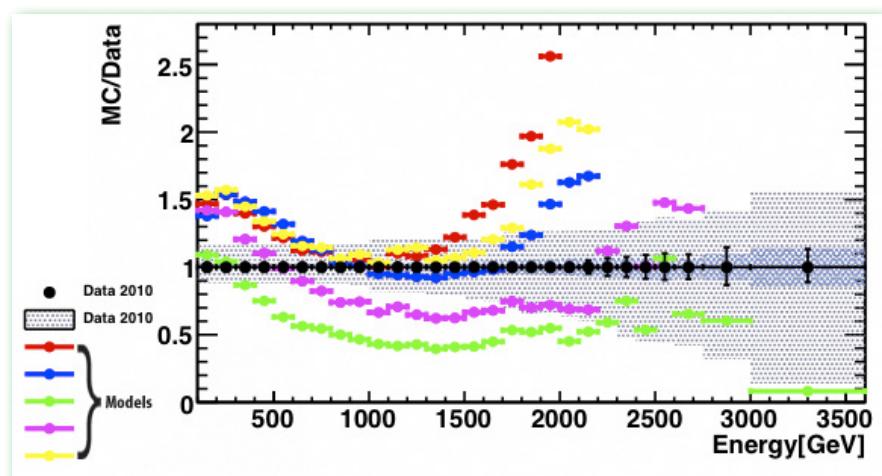
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The results of this work have caused quite a stir because of discrepancies with respect to the results predicted by the most common Monte-Carlo models used for the study of cosmic rays. The discrepancies appeared in the single photon spectrum for energies above 1.5 TeV. Beyond this value, the energy distribution no longer corresponds to that anticipated by the models. "Thanks to the LHC, we've been able to explore a hitherto inaccessible energy region," Oscar Adriani relates. "Given the significant disparities

between the theoretical predictions and our experimental data, I believe that physicists specialising in this research field will be obliged to re-visit their results in the light of this new information."

Although the jury is obviously still out, the members of the LHCf collaboration expect this news to cause some upheaval in the field of cosmic rays in the not-too-distant future.

Anais Schaeffer



A comparison between the different Monte-Carlo models and experimental data gathered by LHCf in 2010.

LHC Report: spring cleaning over, bunches of luminosity

A few issues with 50 nanosecond spacing had to be resolved when standard operations for luminosity production resumed. Once things had been tidied up, stable beams were provided for the experiments, firstly with 228 bunches per beam and then with 336 bunches per beam. The 336 bunch fill that went into physics mode early on Sunday morning (17 April) produced a new record luminosity of $3.7 \times 10^{32} \text{ cm}^{-2}\text{s}^{-1}$ and an integrated luminosity of 10 inverse picobarns in 9 hours. The LHC has now delivered over 62 inverse picobarns in 2011, easily passing the total of 49 inverse picobarns for the whole of last year.

Scrubbing was completed on Wednesday 13 April. The run had seen over 1000 bunches per beam successfully circulating at 450 GeV. Measurements showed that electron cloud activity in the cold regions had been suppressed. A decrease of vacuum activity in the warm regions demonstrated that the cleaning had also achieved the required results there. As discussed in the last Bulletin, the scrubbing was performed with high intensity bunches with 50 nanosecond spacing. Given the potential luminosity performance with this spacing (more bunches, higher bunch intensity from the injectors) and in the light of the results of the scrubbing run, the decision was taken to continue the 2011 physics run with this bunch spacing.

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For 50 nanosecond injection into the LHC, the SPS takes batches of 36 bunches from the PS. It can stack 1, 2, 3, or 4 batches before sending the beam to the LHC. Up to now the SPS has been sending down 2 times 36 bunches. 72 bunch injection already represents a considerable amount of beam power, and the injection process needs to be carefully tuned and monitored. The importance of constant vigilance was underlined on Monday when an injection kicker misfire dumped half of an incoming 72 bunch batch on the downstream protection devices, leading to quenches in about a dozen superconducting magnets. After careful system checks normal LHC operation was resumed.

CERN Bulletin

Cornavin station to CERN non-stop in 20 minutes

From 30 April onwards you will be able to travel from Cornavin station to CERN non-stop in 20 minutes using the

No. 18 tram. This is great news, especially when you think that, only four years ago, no part of the stretch between Cornavin and CERN was served by a tramline. At present, if you want to travel between CERN and the city centre by public transport, you have to take the No. 14 or the No. 16 tram and the No. 56 bus, changing at Meyrin-Gravière, where you sometimes have quite a long wait. On 30 April all this will be a thing of the past!

The construction work for the Geneva-CERN tramline began in January 2006 and consisted of three phases. The first section of the tramline, linking Cornavin station with Avanchet, was completed in December 2007, while the second, linking Avanchet with Meyrin-Gravière, was completed in December 2009. The arrival of the tram at CERN marks the completion of the third and final phase of the work. 50 parking spaces on the flagpoles car park at CERN, opposite the Globe, will be set aside for passengers, complementing the 150-space "Planches" park and ride facility opposite the La Tour hospital.

Following several years of work, the construction of the Forum Meyrin – CERN tramline is almost complete, and the first tram is due to arrive at CERN on 30 April. Celebrations to mark the occasion will be held in Meyrin-Village and at CERN.

The State of Geneva's decision to extend the tramline to CERN came in response to a high level of demand from users on both sides of the Swiss/French border. The tramline may even cross the border into France in the future as plans for a further extension to Saint-Genis-Pouilly and for the construction of a large park and ride facility near the main roundabout there are under discussion. If it goes ahead, the project could help to significantly reduce the number of vehicles in Geneva city centre.

To celebrate the tram's arrival at CERN, an inauguration ceremony followed by a street party will be held on 30 April. The ceremony, which will be attended by representatives of the authorities of Meyrin, the State of Geneva and neighbouring France, as well as of the TPG public transport company, will take place in the morning. A street party including street theatre and concerts will then kick off at 1.00 p.m. in Meyrin. CERN will be joining in by giving physics demonstrations on the Meyrin-Village square and by opening up its exhibitions and the ATLAS visitor centre. Trams will travel back and

Programme for the day

From 10.30 a.m. to 1.30 p.m.: Official inauguration, with four trams running back and forth from one end of the line to the other, speeches by officials on the Meyrin-Village square between 11.50 a.m. and 12.10 p.m., then a big buffet where everyone will be welcome.

From 1.30 p.m. to 6.00 p.m.: Street party on the Meyrin-Village square, with concerts, demonstrations and street theatre. At the same time, an improvisational theatre company will give performances on the tram depicting CERN.

At CERN, the Globe of Science and Innovation, the Microcosm and the ATLAS visitor centre will be open to the public. More information on the programme of events can be found at :

http://www.meyrin.ch/jahia/Jahia/site/meyrin/Actualites_evenements/TCMC



First tests of the overhead lines, signals and tracks on the stretch between Jardin-Alpin and CERN on 7 April 2011.

forth along the newly inaugurated stretch of the tramline all afternoon, and journeys will be free of charge. One of them will depict CERN as the State of Geneva has generously donated the hire of a tram's advertising space for the next 6 months. On 30 April, the tram in question, which will be called the "Accélérateur de Voyageurs" or "Passenger Accelerator", will provide the venue for an improvisation performance in which the actors will play the role of particles!

Laëtitia Pedroso

New spokesperson for the LHCb collaboration

Pierluigi Campana, from the *Istituto Nazionale di Fisica Nucleare* in Frascati, has been with the collaboration since

2000 and was heavily involved in the construction of the muon chamber of the LHCb detector. He replaces Andrei Golutvin, from Imperial College London and Russia's Institute for Theoretical and Experimental Physics. "Leading such a large collaboration is not an easy task," says Campana. While he will rely heavily upon the work of his predecessor, he plans on leaving his own mark on the position: "One of the main goals of my job will be to enhance the spirit of collaboration between the different institutes within our experiment."

Pierluigi Campana begins his 3-year tenure as LHCb spokesperson this June. As the new voice for the collaboration, Campana will lead the experiment through what should prove to be a very exciting phase.

LHCb plays a key role in the search for new physics. The experiment is conducting a very precise search for the asymmetry between matter and antimatter, and is looking for new physics through the study of rare decays. "The important role of LHCb is to have a complementary approach with respect to the larger experiments," explains Campana. "While other experiments examine a wider range of processes, we are mainly interested in B quark decays."



With the LHC currently running at the ideal luminosity for LHCb, the experiment is collecting vast amounts of data specific to its lower luminosity needs. "It's important that we take full advantage of the current data taking," says Campana.

With the bulk of LHCb's search for new physics to be done over the next 4-5 years, it's an exciting time for the entire collaboration. "We are in the right place at the right moment, and I am looking forward to my job," concludes Campana.

Katarina Anthony

AMS launch on schedule

AMS is a CERN recognised experiment, created by an internal collaboration of 56 institutes. It will

be the first large magnetic spectrometer to be used in space, and has been designed to function as an external module on the ISS. AMS will measure cosmic rays without atmospheric interference, allowing researchers on the ground to continue

On 29 April, the Alpha Magnetic Spectrometer (AMS) will complete its long expedition to the International Space Station on board the space shuttle Endeavour. The Endeavour is set to lift off from NASA's Kennedy Space Station at 13:47 EST (18:47 CET).

their search for dark matter and antimatter in the Universe. Data collected by AMS will be analysed in CERN's new AMS Control Centre in Building 946 (due for completion in June 2011).

The Endeavour is set to return to Earth on 14 May, leaving AMS on board the ISS where it will stay for the station's remaining lifetime. This mission will be the last for the retiring shuttlecraft, and the penultimate mission in the space shuttle programme.

Audiences worldwide are invited to watch a live webcast hosted by CERN, on 29 April from 21.30-22.30 CET. The webcast will feature interviews with members of the AMS collaboration at CERN, as well as images from NASA. If you can't tune in for the event, follow @astroparticle on twitter for the latest updates on the launch. You can also tweet @cern during the webcast with your questions for the participating scientists.

Watch the webcast live at:

<http://webcast.cern.ch/>

Katarina Anthony



Samuel Ting, principal investigator for the AMS project, and Rolf Heuer, CERN Director-General, visit the Kennedy Space Centre before the AMS launch. Courtesy of NASA and Kennedy Space Center.

ISOLDE gets a new laser system

The first laser source for producing radioactive ion beams (see box) was installed in the ISOLDE hall in the 1990s. This method, which was highly innovative for its time, has since been adopted by several laboratories all over the world. "This laser system allows us to control the ionisation wavelength with precision and thus to select specific atoms in order to produce very pure radioactive ion beams", explains Valentin Fedossev of the EN Department. "These beams are then used for various experiments, in nuclear astrophysics and biology, for example. With

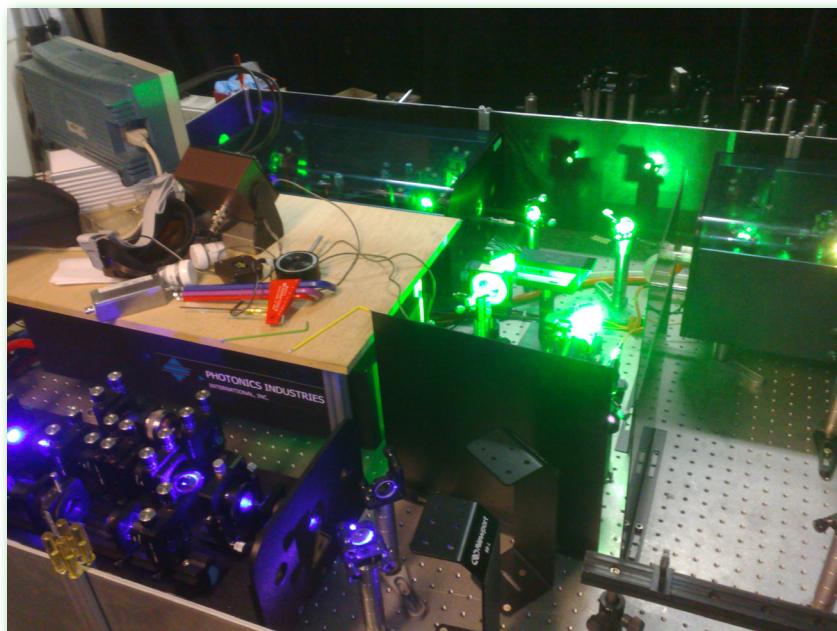
It's action stations at ISOLDE, the On-Line Isotope Mass Separator at CERN. The Laboratory is preparing to add a second laser ion source system to its arsenal. By alternating between two laser systems, the ISOLDE team will be able to switch from one type of beam to another in record time.

two laser systems we will be able to do more experiments by producing more beams of different types in a given amount of time."

The new lasers, which have been built by CERN in collaboration with the University of Mainz, are due to be installed at ISOLDE before the summer and will be used in conjunction with the existing lasers. "The new equipment will enable us to produce



Bruce Marsh, from the EN-STI Group, with one of the lasers from ISOLDE's current system.



The new laser system during recent tests.

The laser as a selection tool

ISOLDE produces radioactive nuclei by bombarding a target element with protons from the PS Booster, which have an energy of between 1 and 1.4 GeV. When the target reaches a high enough temperature, the isotopes created disperse and then decay.

In order to produce a pure beam, the desired isotopes have to be "captured". This is where the laser ion sources come in. Before being concentrated inside the beams, the selected nuclei are ionised by the laser and extracted in the form of ions, then separated from the other isotopes by a magnetic field.

totally new beams", explains Valentin Fedossev. "We will also be able to switch from one isotope to another a lot more quickly. While one laser system is operating with one type of nucleus, our team will be able to parameter the other system for another experiment. We hope to be able to switch beams in half a day in future, compared to three days at present."

In its current configuration, ISOLDE can produce 700 different beams from the isotopes of 70 chemical elements. The fields of application are already very varied, ranging from nuclear structure physics to nuclear astrophysics, atomic physics, solid-state physics and biology, and can only increase further with the arrival of the new system.

Anais Schaeffer

High-energy physics, the South American way

CLASHEP was established in 2001 as a way of engaging young Latin American scientists in the field of particle physics

- particularly in the experimental aspects of research. It has played an important role in encouraging Latin American institutes to collaborate with CERN and showing how non-Member-State physicists can work as equals with Member-State nationals. "CLASHEP reflects some of CERN's guiding policies: enlarging its membership and involving new nations in its programmes,"

The 6th CERN–Latin American School of High-Energy Physics (CLASHEP) was held in Brazil from 23 March to 5 April. With its record-breaking attendance and strong international spirit, CLASHEP is yet another sign of the continent's growing particle physics community.

says Nick Ellis, director of the CERN Schools of High-Energy Physics. "After the School was held in Argentina in 2005 and in Chile in 2007, these countries expanded their involvement with the Organization."

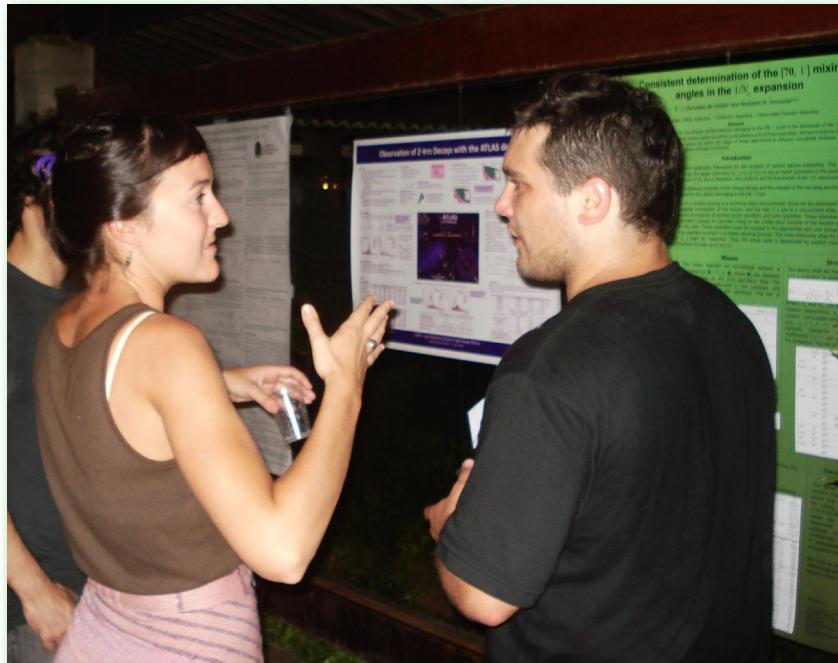
After a competitive selection process, a record number of students were chosen to attend this year's School in Natal in the

North East of Brazil. With students from over 15 countries on 3 continents, CLASHEP embodied CERN's multinational flavour. Students attended a comprehensive programme of 31 lectures and 9 discussion sessions, and were also given the opportunity to present their work at a student poster session. In projects new to this year's School, groups selected and discussed experimental papers from one of the LHC experiments in detail. "We asked each group to dissect both the theoretical and the experimental aspects of a single paper," says Ellis. "This gave the phenomenologists in attendance the opportunity to better understand the steps between starting an experiment and publishing a paper."

CLASHEP provides funding for many Latin American students wishing to attend the School, with support provided by CERN, Spain's national scientific research centre (*Centro de Investigaciones Energéticas Medioambientales y Tecnológicas, CIEMAT*), and several Brazilian organisations (CAPES, CNPq, FAPERJ, FAPESP and RENAFAE). "Brazil has made significant contributions to supporting neighbouring nations by helping students from across Latin America," explains Ellis.

Brazil has close ties with CERN, and has recently expressed its interest in becoming an Associate Member of the Organization. Expect ties between the Latin American physics community and CERN to have grown even closer by the time of the next CERN-Latin American School in 2013.

Katarina Anthony



Students present their work at the CLASHEP student poster session.



Participants in the 6th CERN–Latin American School of High-Energy Physics outside the Hotel Porto do Mar, Natal (Brazil), where the School was held.

It's all change at the Computer Centre

Every year CERN experiences around ten power cuts lasting from less than a second to several hours. In most cases

the two protection systems - the UPS* and the diesel generators – are able to ensure that the operation of the Computer Centre is not affected. As Vincent Doré, the project leader for the IT Department, and Paul Pepinster, the EN Department's technical coordinator in charge of modernising the infrastructure, explains: "Building 513 has two types of computing facilities – the "non-critical" ones, such as the servers for "off-line" computing, which have UPS systems ensuring that they can operate for 10 minutes after a power cut, and the "critical" ones, such as the computer network infrastructure and the databases used by the administrative services, which are connected to emergency diesel generators on the Meyrin site as well as to UPS systems. These generators can supply critical equipment with emergency power for a longer period than the UPS systems."

At present, in spite of these back-up systems, the operation of the critical installations cannot always be guaranteed in the event of an extended power cut, especially when outdoor temperatures are high. The infrastructure is therefore being enhanced to ensure that all critical computing facilities remain running 24 hours a day, 365 days a year. The EN and IT Departments have decided to create a special new room for the critical servers within the Computer Centre. The room will be powered and cooled by new secured, dedicated equipment, and the basement will be extended to house the new cooling system.

The IT and EN Departments are modernising the infrastructure of the Computer Centre to improve the conditions in which the equipment has to operate and to increase capacity. The construction work has already begun and is due to be completed in October 2012.

Today, all the critical and non-critical computers in the Centre are cooled by the same cooling units, most of which are positioned on the roof of Building 513. "As part of the modernisation project, we will separate the cooling systems according to the type of installation for optimum operation: the critical systems will be cooled by new air-conditioning equipment installed in the new basement extension, while the non-critical systems will remain connected to the existing cooling units," explains Paul Pepinster.

The project also involves increasing the power capacity of the Centre from 2.9 MW to 3.5 MW, which will allow some 2,400 new computers to be housed there. "Today, the Computer Centre comprises around 10,000 servers, which corresponds to a power consumption of 2.5 MW. In the coming months we will be increasing the number of computers by 1,600, which would push the Centre's capacity to the limit. The work that's just started will not only improve the back-up systems for the critical facilities but will also allow us to host an additional 2,400 computers, increasing our computing capacity by 20%," explains Vincent Dore.

In parallel with the modernisation of CERN's facilities, the critical computing systems are being decentralised to avoid problems during power cuts. "Part of the system that manages CERN's electronic mail has already been moved to a hosting facility in Geneva. We are now working on a plan to distribute



Did you know?



In the event of a power cut, the temperature in the Computer Centre can increase by 3 to 5 degrees per minute in certain cases. The operator in charge has three minutes to shut down all non-critical systems if he considers it a necessary precaution to prevent the critical systems from malfunctioning.

other computing services across different geographical locations," confirms Frédéric Hemmer, Head of the IT Department.

In addition to the EN and IT Departments, the project will call on the GS Department for the civil engineering and improvements to the building's safety systems. While the work is in progress, almost 60 parking spaces around Building 513 will be temporarily out of use due to the worksite. We apologise to users of the Computer Centre and Restaurant No. 2 for the inconvenience.

Laëtitia Pedroso

**Uninterruptible power supply.*

Workplace safety: Let's ask the right questions

The HSE Unit and the Safety Unit of the BE Department invite you to find out about everyday health and safety questions by visiting the stands they will be setting up at the entrances to the different restaurants at lunchtime on Thursday, 28 April. "This will be a chance to think about safety not just in the workplace but also at home and in the context of leisure activities," explains Charles-Edouard Sala, who came up with the idea for CERN's participation in the event. "Safety is, first and foremost, a matter of personal awareness of and sensitivity to risks. That is why we in the Safety Unit had the idea for a campaign with the motto, 'Let's ask the right questions.' A simple questionnaire on safety will be distributed at the stands, and the best responses will be awarded prizes.

Since 2003, the International Labour Organization and the World Health Organization have been organising an annual event on 28 April called "World Day for Safety and Health at Work." This year, CERN is taking part for the first time with campaigns organised by the Safety Unit of the BE Department and by the HSE Unit.

The HSE Unit is also fully involved in organising the day's activities, producing posters and other information material about safety at CERN. Visits to the laboratory of HSE's environmental service will be organised on the day, and a radioprotection monitoring system will be on display. "Our goal is to explain how safety is organised at CERN, both within the departments and at the level of the HSE Unit, and to describe what services HSE provides," explains the Unit's Isabel Bejar Alonso.

Next Thursday, take a minute to stop and chat with the people at the HSE and BE stands. They will provide you with some good advice for improving your everyday safety. The names of the people submitting the fifteen best responses to the "Let's ask the right questions" contest will be published in the Bulletin on 6 May.

CERN Bulletin

World Day for Safety and Health at Work

In order to improve our safety:

Let's ask the right questions!



- What hazards do I encounter in my daily activities?
- Are there enough means of protection?
- Are there easy ways to improve my safety?



Do not hesitate!
Take 5 minutes to ask yourself these questions and to consider your environment.



Document by the Safety Unit / BE in collaboration with HSE



Library
Bibliothèque

News from the Library

More than 15,000 titles (<http://cdsweb.cern.ch/collection/eBooks>), across all CERN-relevant disciplines, are now available for download from the Library. Recently, Springer physics and astronomy books, as well as

Over the last couple of years, the Library has been expanding its collection of electronic books. The most popular titles are, of course, also bought as paper copies and are available for loan.

all volumes from Lecture Notes in Physics, were added (<http://cdsweb.cern.ch/search?ln=en&cc=eBooks&sc=1&p=916%3ASPR>). So, from now on, readers will not have to

queue up for popular books such as "Particle Accelerator Physics" (Wiedemann) or "Particle Detection with Drift Chambers" (Blum, Rolandi and Riegler), which are often in high demand.

In addition to providing electronic access, the publisher offers people at CERN the possibility to purchase paperback copies, distributed under the label "My Copy", for the tempting price



Left to right: Tullio Basaglia (CERN Library), Christian Caron (Springer) and Wim van der Stelt (Springer).

of €25 (shipping and handling included, local VAT will be added), no matter what the list price of the book itself. In some cases, the MyCopy price can be a tenth of the normal publisher's price! Samples of MyCopy books are on display in the CERN Bookshop located in the Central Library (52-1-52).

A single click gives you access to e-books 24/7, wherever you are - and now you can even get paper copies shipped directly to your door by the publisher.

Springer e-books at CERN:

<http://tinyurl.com/springer-ebooks>

Please send questions and feedback to library.desk@cern.ch

CERN Library

Mini researchers for massive experiments

On Friday 15 April, CERN welcomed the first classes participating in the "Dans la peau d'un chercheur" project. Over the last two months, students from 30 primary school classes have been gaining new insight into life as a researcher and learning the principles of the experimental method (see Bulletin No. 05-06/2011).

The school visits to CERN or the University of Geneva are an important part of the project. For a few hours, students are given the chance to meet physicists to get a behind-the-scenes look at experimental physics in "real" laboratories. Laetitia Dufay-Chanat and Johan Bremer, from the cryogenics laboratory, delighted students from the Ornex School (see photo) by conducting experiments demonstrating different states of matter.

CERN Bulletin



CERN's travelling exhibition goes to Austria

The travelling exhibition was designed in collaboration with the University of Geneva, as part of the celebrations for its 450th anniversary, and has already notched up a good number of kilometres as it travels from country to country. "In 2010 the

exhibition already had around 55,000 visitors," explains Rolf Landua, who heads the Education Group. Since its inauguration in Geneva, the exhibition has moved onwards approximately every four to six months so that it can be enjoyed in as many Member States as possible. "The local organisers have organised events before the exhibition is set up as well as to coincide with it so that the general public is aware of its arrival," explains Landua. In Austria, the local scientific community, and especially

Since April 2009 CERN's travelling exhibition has been touring through some of the Organization's Member States. After Italy and Denmark it has been on show since February at Austria's Hartberg Ökopark, a very popular science museum situated some one hundred kilometres from Vienna. To coincide with the CERN exhibition, Austria's scientific community has organised a series of events for the general public which has had marked success. The exhibition's next destination will be Portugal and preparations are already underway to ensure that it is another resounding success.

Laurenz Widhalm of the Austrian Institute of High-energy Physics (HEPHY), has been very active in contributing to an inauguration ceremony with the heads of local government and has arranged specially dedicated afternoon visits for schools.

The exhibition covers a surface area of 450m² and is designed as an itinerary with five modules. The first module explains the evolution of the Universe with a projection of a film onto a circular screen on the floor. The second consists of touch screens and interactive tables that allow visitors to discover the world of particles. The third module comprises three audio points where the visitor can listen to physicists talking about their research at CERN. The fourth module is mainly devoted to the LHC and its operations, including the detectors and their scientific objectives. Finally, the fifth module shows how fundamental science generates different technological spin-offs



that lead to applications commonly used in daily life. "The various modules allow the exhibition to be adapted to the layout of the premises allocated to it and also allow other additional elements to be integrated, such as the contribution of the various Member States to CERN's achievements and objectives," explains Rolf Landua. In Austria, the local organisers have produced a stand presenting the large number of activities in which Austrian scientists are involved at CERN, as well as MedAustron, the new hadron therapy centre which will use accelerating modules developed in collaboration with CERN.

But how will the exhibition evolve in future? "The exhibition will continue to evolve as new discoveries are made at CERN in order to represent and transmit a constantly updated picture of our Laboratory," explains Rolf Landua.

Mélissa Lanaro



Official news

TAXATION IN FRANCE

Memorandum concerning the annual internal taxation certificate and the declaration of income for 2010

You are reminded that the Organization levies an internal tax on the financial and family benefits it pays to the members of the personnel (see Chapter V, Section 2 of the Staff Rules and Regulations) and that the members of the personnel are exempt from external taxation on salaries and emoluments paid by CERN.

I - Annual internal taxation certificate for 2010

The annual certificate of internal taxation for 2010, issued by the Finance and Procurement Department, has been available since 1st March 2011. It is intended exclusively for the tax authorities.

1. If you are currently a member of the CERN personnel you will receive an e-mail containing a link to your annual certificate, which you can print out if necessary.
2. If you are no longer a member of the CERN personnel or are unable to access your annual certificate as indicated above, you will find information explaining how to obtain one at the following link:

https://cern.ch/admin-eguide/Impots/proc_impot_attestation_interne.asp

In case of difficulty in obtaining your annual certificate, send an e-mail explaining the problem to helpdesk@cern.ch.

II - 2010 income tax declaration form in France

The 2010 income tax declaration form must be completed in accordance with the instructions available at the following address:

https://cern.ch/admin-eguide/Impots/proc_impot_decl-fr_fr.asp

IF YOU HAVE ANY SPECIFIC QUESTIONS, PLEASE CONTACT YOUR TAX OFFICE DIRECTLY.

This information does not concern CERN pensioners, as they are no longer members of the CERN personnel and are therefore subject to the standard national legal provisions relating to taxation.

HR Department
Contact : 73903

Members of the personnel shall be deemed to have taken note of the news under this heading. Reproduction of all or part of this information by persons or institutions external to the Organization requires the prior approval of the CERN Management.

TAX DECLARATION: FOR THE ATTENTION OF MEMBERS OF THE PERSONNEL AND PENSIONERS LIVING IN FRANCE

Exchange rate for 2010

For 2010, the average annual exchange rate is **0.73 EUR for 1 CHF**.

HR Department



COMMUNICATION FROM THE RADIOACTIVE SHIPPING SERVICE

The radioactive materials Import/Export service reminds you that all movements of potentially radioactive material must be declared in advance. For exports, shipping requests must be made via the EDH request form, ticking the box "radioactive material". For imports, an electronic form must be completed before the arrival of the material. Requests which do not comply with the above procedure and any unauthorized imports of radioactive material will be refused. The same applies to imports/exports of radioactive sources.

Full information is available on the web site:
<http://cern.ch/service-rp-shipping>

*Yann Donjoux / Radioactive Shipping Service
Phone: +41 22 767.31.71 - Fax: +41 22 766.92.00
Email: service-rp-shipping@cern.ch*

COMMUNICATION FROM THE RADIOACTIVE WASTE SERVICE

The Radioactive Waste service of the Radiation protection Group informs you that as of 15 April 2011 radioactive waste can be delivered to the waste treatment centre (Bldg. 573) only during the following hours:

**Mon- Thu: 08:00 – 11:30 / 13:30 – 16:00
Fri : 08:00 – 11:30**

An electronic form must be filled in before the arrival of the waste at the treatment centre:

<https://edh.cern.ch/Document/General/RadioactiveWaste>

for further information, please call 73875.



Take note

CERN RESTAURANT OPENING TIMES DURING THE EASTER WEEKEND

Restaurants No. 1 (NOVAE) and No. 3 (AVENANCE) will be closed from Friday 22 April to Monday 25 April 2011 inclusive.

Restaurant No. 2 (DSR) will be open from 8.30 a.m. to 8.00 p.m. on Friday 22 April 2011 and from 9.00 a.m. to 8.00 p.m. on Saturday 23 April, Sunday 24 April and Monday 25 April 2011.

Hot meals will be served from 11.30 a.m. to 1.30 p.m. and from 6.00 p.m. to 7.30 p.m.

FP Department

DUTCH SCHOOL IN GENEVA

The Dutch School in Geneva organizes Dutch education for children in the primary and secondary school. For the school year 2011-2012 the Dutch School in Geneva is looking for qualified part time teachers Dutch for the primary and secondary school. If you are interested, please send your application and curriculum vitae in Dutch by email to the NTC coordinator, Mrs. Anne Saeys (anne.saeys@free.fr).

More info :

www.ntcgenve.info

De vereniging Nederlandse Taal en Cultuur De Taalfontein, kortweg NTC Genève, is een oudervereniging, die tot doel heeft de Nederlandse taal en de Nederlandse en Vlaamse cultuur in de regio Genève te stimuleren. Dit geschiedt d.m.v. het organiseren van Nederlandse les voor leerlingen zowel in het basisonderwijs als het voortgezet onderwijs. Voor het volgende schooljaar zoekt NTC parttime docenten (M/V) vanaf 2 uur per week, zowel voor het Primair Onderwijs als voor het Voortgezet Onderwijs, met name voor de IB-opleiding.

Voor het Primair Onderwijs dienen geïnteresseerden een PABO opleiding voltooid te hebben. Voor de IB-opleiding een universitaire talenopleiding.

Salaris en werktijden zullen in onderling overleg worden vastgesteld. Meer info over NTC vindt u op www.ntcgenve.info

Bent u geïnteresseerd ? Stuur dan uw sollicitatie, inclusief uw curriculum vitae, per e-mail naar Anne Saeys (anne.saeys@free.fr).



PART TIME POST FOR QUALIFIED TEACHER OF SECONDARY MATHEMATICS IN ENGLISH

The English National Programme, part of the Lycee International de Ferney-Voltaire, is looking for an English mother-tongue teacher of secondary Mathematics, able to teach up to GCSE Statistics and Mathematics. This is a part time post (4-6 contact hours per week) from September 2011. Please note that a relevant secondary Mathematics teaching qualification is required.

For full details and how to apply, refer to the Programme's website. The page is:

http://www.enpferney.org/enpv2/index.php?option=com_content&view=article&id=169:secondary-maths-posts&catid=21:staff-vacancies&Itemid=41

Enquiries to:

Peter Woodburn, Head of Programme / hop@enpferney.org

ONE WEEK LEFT TO REGISTER FOR THE 2011 CERN SCHOOL OF COMPUTING - DEADLINE 3 MAY!

ATTENTION: Registration for the CERN School of Computing – which will take place in Copenhagen from 15 to 26 August – closes on 3 May.

The programme comprises three main themes: Data Technologies, Base Technologies and Physics Computing, and will address a number of timely questions, including:

- Do you know how to bridge Grids and **Clouds** using virtualization technology?
- Is it possible to simplify LHC physics analysis using a **virtual machine**?
- How can **reliable storage** services be built from unreliable hardware?
- Why are **tapes** still used in high energy physics data storage?
- How can I write code for **tomorrow's hardware**, today?
- Do you want to see your software though an **attacker's eyes**?
- Can you **hack** your own code?
- What's so special about high energy physics' **data format**?
- What are the key **statistical methods** used in physics data analysis?

The CSC is a true **Summer University**. The focus is on delivering knowledge rather than know-how, which can better be provided in the form of training at home institutes.

A final examination is offered to students. Successful participants will receive the highly recognized **CSC Diploma** as well as formal **Certificates of Credits** awarded by the University of Copenhagen.

Networking and socialization is the other goal of CSCs. One vehicle for social networking is the CSC Sports Programme which proposes two to three hours of sport every afternoon to those who are interested.

François Fluckiger, CSC Director
IT Department

dential data, access protection and data encryption are a must! This is particularly true if you keep this kind of data on a USB stick or a laptop, both of which can easily be lost or stolen while you're travelling... TrueCrypt is a good open source, on-the-fly encryption tool for data stored in Windows, Mac and Linux PCs.

If you are looking for recommendations or need help, check out <https://cern.ch/Computer.Security> or contact us at Computer.Security@cern.ch. The site gives furher information about:

- securely connecting to CERN (https://security.web.cern.ch/security/recommendations/en/connecting_to_cern.shtml)
- encrypting connections with SSH
- tunnelling through LXPLUS
- transferring files with SSH, and plenty of other useful tips!

IT Department

*... if your wireless access point does not encrypt traffic using e.g. the recommended WPA2 standard. At CERN, all wireless access points have no encryption in order to allow free roaming. Encryption would mean distributing a shared secret among all our users, colleagues and guests, so it would hardly be a "secret" anymore...

ENCRYPTION IS USELESS!?

This week FTP (the file transfer protocol) celebrated its 40th birthday - and will hopefully retire soon! While a nice and simple means of transferring files, it is totally insecure: both the transferred contents and the authentication password are transferred unencrypted. FTP is not the only protocol that transfers data unencrypted: standard web traffic ("HTTP") and e-mail ("SMTP") are not encrypted either.

Not an issue? Think again! Nowadays, we all use wireless Ethernet from our laptops and mobile phones. This means that your traffic can be intercepted by anyone*... What if I could your web browsing history, read your last e-mail to your boyfriend/girlfriend, or see which commands you've just executed? I could easily intercept your Facebook session...

If this worries you, check for secrecy and encryption. Usually this is shown by an "S" in your communication protocol:

- "HTTPS" for secure web browsing, as displayed in your browser's address bar;
- IMAPS/POPS for secure e-mail transfer; the default at CERN for sending e-mails to the CERN mail servers;
- "SSH" and "SCP" for secure remote access and data transfer, mainly on Linux PCs. On Windows PCs, there is also "RDP", the Remote Desktop Protocol, which is encrypted too. "SSH" can even be used to encrypt other protocols, a technique called "tunnelling".

Of course, there is more to encryption than this. If you host sensitive or confi-



Take note

CERN RELAY RACE

The CERN relay race will take place around the Meyrin site on Thursday 19 May starting at 12-15. If possible, please avoid driving on the site during this 20-minute period. If you do meet runners while driving your car, please STOP until they have all passed. Thank you for your cooperation.

Details of the course and of how to register your team for the relay race can be found at:

<https://espace.cern.ch/Running-Club/CERN-Relay/default.aspx>

Some advice for all runners from the Medical Service can also be found at:

<https://espace.cern.ch/Running-Club/CERN-Relay/RelayPagePictures/MedicalServiceAnnouncement.pdf>

41th CERN Relay Race

*** New route ***

Thursday 19 May 2011

Registration:

<https://espace.cern.ch/Running-Club/CERN-Relay/default.aspx>



Entertainment from 12h on
the arrival area (lawn in front
of Restaurant No.1)

- 12h à 12h45 jazz concert;
- **12h15 Start of the race;**
- 12h45 to 13h15 Music Club
concert;
- 13h15 to 13h30 results and prize
giving ceremony (*including a
raffle to win offered by
the Micro club*);
- 13h30 to 14h Music concert.

Several information stands,
Belgian beer from the Aglup,
fast food served by Novae,
etc...

Organized by the CERN Running Club
with the support of the
CERN Staff Association



Courir...Ensemble
Courir Ensemble
For each runner, 1 CHF is given
to the association.



With the participation of the following associations:



Lunchtime Film presentation

Film Presentation: *CERN or the Factory for the Absolute* by Jan Sacher (2010)

This film is about the Largest Hadron Collider in the world, the LHC, which is located near the French - Swiss border. By means of the accelerator, the scientists want to simulate the situation shortly after the Big Bang. As a result, they hope to acquire basic information about the structure of mass and reveal the last secrets of the universe. This observational documentary deals with several serious questions, such as the introduction of the CERN institution, explanation of the experiments and their expected results, as well as the technological complexity of the project. Finally, the possible risks are discussed.

***CERN or the Factory for the Absolute will be presented on
Friday, 6 May from 13:00 to 14:05
in the Council Chamber***

Please note that the Czech version of this film, CERN neboli Továrna na absolutno, will be shown on Friday, 20 May in the Council Chamber.

Carolyn Lee

Isabelle CUSATO - HSE Unit

Tel. 77381

Isabelle.Cusato@cern.ch

SAFETY TRAINING: SCHEDULED SESSIONS IN APRIL

The following training courses are scheduled in March. You can find the full Safety Training programme on the online Safety Training catalogue:

<https://espace.cern.ch/info-safetytraining-official/Pages/Newcourses.aspx>

If you are interested in attending any of the courses below, please talk to your supervisor, then apply electronically via EDH from the course description pages, by clicking on SIGN-UP.

Registration for all courses is always open – sessions for the less-requested courses are organized on a demand-basis only. Depending on the demand, a session will be organised later in the year.

Biocell Training

26-APR-11 (08.30 – 10.00) in French

26-APR-11 (10.30 – 12.00) in French

Conduite de plates-formes élévatrices mobiles de personnel (PEMP)

28-APR-11 to 29-APR-11 (08h00 – 17h30) in French *)

Sécurité chimique – Introduction

29-APR-11 (09h00 – 11h30) in French

*) Session in French with the possibility of receiving the documentation in English

COURS SÉCURITÉ

« Sécurité de travail avec laser »

Session le 13 mai 2011

de 14h00 à 18h00

(en français)

À qui s'adresse ce cours ?

Ce cours s'adresse aux personnes travaillant avec des produits laser de classe 3B ou 4. Ce cours est recommandé aux personnes travaillant avec des produits laser de classe 3R, ou des lasers à faisceau divergent ou collimaté de classe 1M ou 2M.

Quel est le contenu du cours ?

Après un rappel des principales caractéristiques des différents types de lasers, l'accent sera mis sur les conditions de travail et les précautions à prendre :

* Risques associés aux faisceaux laser : Danger de la lumière cohérente - Risques pour les yeux - Exposition maximale permise pour l'œil - Risque thermique pour les tissus biologiques - Autres effets du faisceau laser sur le milieu biologique - Autres risques : électrique, chimique (dye, eximère), bruit, rayons-X, incendie/chaleur ;

* Moyens de protection : Règles de sécurité pour les différentes classes de laser - Lunettes de protection - Résistance des filtres aux faisceaux puissants - Protection de la peau.

Exemples d'utilisation des lasers au CERN.



CERN ACADEMIC TRAINING PROGRAMME 2011

Regular lecture

27, 28 & 29 April 2011

27 and 29 April from 11:00 to 12:00 and Thursday 28 April 2011 from 11:00 to 12:00 and from 14:30 to 15:30

at CERN (222-R-001 - Filtration Plant)

An Introduction to the Standard Theory of Electroweak Interactions

by Giovanni Ridolfi (INFN, Genova)

The construction and experimental foundations of the unified theory of weak and electromagnetic interactions will be reviewed. Special attention will be given to the Standard Model symmetry properties and how symmetries must be broken in order to obtain a realistic theory for the observed pattern of masses and mixing among generations and to accommodate longitudinal degrees of freedom for the vector bosons. A careful discussion of the Higgs sector, both in the perturbative and in the strongly interacting regime, will be presented. Finally, the motivations towards extensions of the standard model will be discussed.

Organiser: Maureen Prola-Tessaur/PH-EDU

Comment s'inscrire ?

Vous pouvez vous inscrire sur le catalogue des formations sécurité, ou en contactant Isabelle Cusato (73811).



Seminars

TUESDAY 26 APRIL

HR SEMINAR

13:30 - Council Chamber, Bldg. 503

Information Session for CCRB members

TH STRING THEORY SEMINAR

14:00 - TH Auditorium, Bldg. 4

TBA

G.S PAPADOPOULOS / KING'S COLLEGE

WEDNESDAY 27 APRIL

TH BSM FORUM

11:00 - TH Auditorium, Bldg. 4

TBA

Z. KOMARGODSKI / IAS PRINCETON

ACADEMIC TRAINING LECTURE

REGULAR PROGRAMME

11:00 - Bldg. 222-R-001 - Filtration Plant

An Introduction to the Standard Theory of Electroweak Interactions (1/4)

G. RIDOLFI / INFN, GENOVA

ISOLDE SEMINAR

14:30 - Bldg. 26-1-022

Physics of Baseball

R. CASTEN / YALE UNIVERSITY

TH STRING THEORY SEMINAR

16:00 - TH Auditorium, Bldg. 4

TBA (Note Unusual Day!)

J. GOMIS / PERIMETER

THURSDAY 28 APRIL

ACADEMIC TRAINING LECTURE

REGULAR PROGRAMME

11:00 - Bldg. 222-R-001 - Filtration Plant

An Introduction to the Standard Theory of Electroweak Interactions (2/4)

G. RIDOLFI / INFN, GENOVA

COLLIDER CROSS TALK

11:00 - TH Auditorium, Bldg. 4

Measurement of the charge asymmetry in top quark pair production with the CMS detector

T. PEIFFER / KIT (KARLSRUHE INSTITUTE OF TECHNOLOGY)

ACADEMIC TRAINING LECTURE

REGULAR PROGRAMME

14:30 - Bldg. 222-R-001 - Filtration Plant

An Introduction to the Standard Theory of Electroweak Interactions (3/4)

G. RIDOLFI / INFN, GENOVA

FRIDAY 29 APRIL

ACADEMIC TRAINING LECTURE

REGULAR PROGRAMME

11:00 - Bldg. 222-R-001 - Filtration Plant

An Introduction to the Standard Theory of Electroweak Interactions (4/4)

G. RIDOLFI / INFN, GENOVA

MONDAY 2 MAY

TH JOURNAL CLUB ON STRING THEORY

14:00 - TH Auditorium, Bldg. 4

TBA

C. GROJEAN

TUESDAY 3 MAY

TH STRING THEORY SEMINAR

14:00 - TH Auditorium, Bldg. 4

TBA

M. TARONNA

WEDNESDAY 4 MAY

TH THEORETICAL SEMINAR

14:00 - TH Auditorium, Bldg. 4

TBA

S. FRIXIONE / CERN AND EPFL

ISOLDE SEMINAR

14:30 - Bldg. 26-1-022

The description and role of fluctuations in collective degrees of freedom in mean-field-based models of nuclear structure

M. BENDER / CENTRE D'ETUDES NUCLÉAIRES DE BORDEAUX GRADIGNAN

THURSDAY 5 MAY

COLLIDER CROSS TALK

11:00 - TH Auditorium, Bldg. 4

Z->tautau and H->tautau at CMS

S. GENNAI / INFN-MILANO BICOCCA

TH BSM FORUM

14:00 - TH Auditorium, Bldg. 4

Discrete anomalies and implications

M. RATZ

FRIDAY 6 MAY

TRAINING AND DEVELOPMENT

09:00 - Bldg 593, Room 25

Post Induction day training on popular IT and GS services

TRAINING AND DEVELOPMENT

14:00 - Bldg 593, Room 25

Post Induction day training on popular IT and GS services - French version