CERN Bulletin

Up to the highest peak!

CERN Operations Group leader Mike Lamont (foreground) and LHC engineer-in-charge Alick Macpherson in the CERN Control Centre early this morning.

In the early hours of Friday 19 March, the beam energy was ramped to 3.5 TeV, a new world record and the highest energy for this year's run. Now operators will prepare the machine to make high-energy collisions later this month.

At 5-23, on Friday 19 March, the energy of both beams in the LHC was ramped up to 3.5 TeV, a new world record. During the night, operators had tested the performance of the whole machine with two so-called 'dry runs', that is, without beams. Given the good overall response, beams were injected at around 3-00 am and stabilized soon after. The ramp started at around 4-10 and lasted about one hour.

Over the last couple of weeks, operation of the LHC at 450 GeV has become routinely reproducible. The operators were able to test and optimize the beam orbit, the beam collimation, the injection and extraction phases as well as the associated protection system. On 12 March, both beams were ramped up to 1.18 TeV. The overall response from the machine was very positive.

The first part of this week saw a technical stop, during which the magnet and magnet protection experts continued their campaign to commission the machine to 6 kAmps – the current needed to operate at 3.5 TeV per beam. Tests are still ongoing to fully understand the electrical behaviour of the dipole circuits with currents higher than 2 kAmps, which has an impact on the quench protection system (see box) and on the procedure for ramping the beam energy to 3.5 TeV (6kAmps).

While the experts are working to fully understand the circuit performance (for details, watch the video interview with Andrzej Siemko, Group Leader of the LHC machine protection at http://cdsweb.cern.ch/record/1249324), the operators will continue ramping the beam energy and prepare for high-energy collisions later this month.

Bulletin CERN

(Continued on page 2)

A word from the DG

3.5 TeV: Patience pays dividends

In my message this week, I'd like to congratulate the LHC team on accelerating two beams to 3.5 TeV in the early hours of Friday 19 March. The timing could not have been better. Coming during a week of CERN Council meetings, it allowed us to show delegates the great progress we're making. The occasion also gave us the opportunity to set out again the prudent step-by-step approach that we're taking to get the LHC up and running, and it was refreshing to hear one member of the Scientific Policy Committee declare on Monday that we should never forget that the LHC is not a turnkey machine.

With the progress the LHC is making, that simple fact would be easy to

(Continued on page 2)

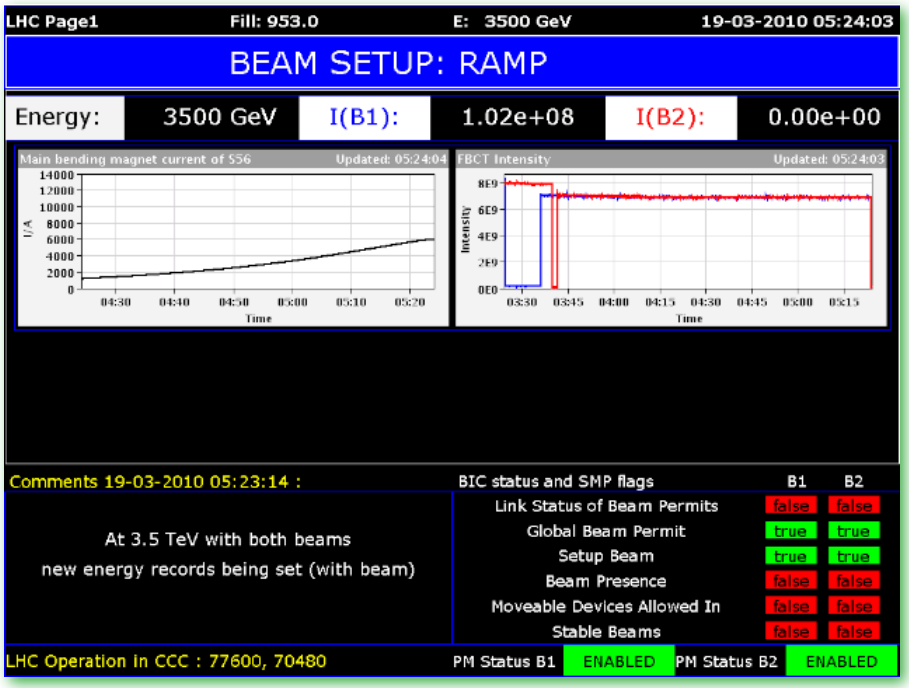
In this issue

News

Published by:
The European Organization for Nuclear Research - CERN
1211 Geneva 23, Switzerland - Tel. + 41 22 767 35 86
Printed by: *CERN Printshop*

Up to the highest peak!

(Continued from page 1)



The LHC Quench Protection System

The LHC quench protection system (QPS) has the crucial role of providing an early warning for any part of the superconducting coils and busbars that develops high resistance, as well as triggering the switch-off of the machine. Thousands of detectors are installed all along the machine and hundreds of crates, installed along the ring, house the detector boards.

One of the major consolidation activities for the LHC in 2009 was the addition of about 6000 new detectors to the quench protection system. The campaign was designed to sensibly improve the quality of the monitoring and the effectiveness of the response. Some non-conformities relating to the QPS appeared a few times during the machine commissioning and were successfully fixed by the experts.

For further information about the LHC quench protection system, please read a previous Bulletin article (http://cdsweb.cern.ch/record/1178509?ln=en) and watch the video:

http://cdsweb.cern.ch/record/1249749

(Continued from page 1)

3.5 TeV: Patience pays dividends

overlook. The figures coming back from this first run are already quite remarkable. In Week 10, the LHC's availability for the operators was over 65%: it usually takes a new accelerator years to reach that level. And over the last few weeks, operation of the LHC at 450 GeV has become routinely reproducible, which is again a feat that usually takes a new machine much longer to achieve.

All this augurs very well for the future, but we must not lose sight of the fact that the LHC is new, and it wasn't bought off the shelf. It is a state-of-the art prototype that is pushing the limits of technology across a wide range of disciplines, and as such it needs to be treated with the greatest respect. We have recovered well from the incident of 19 September 2008, and are now poised on the threshold of a new era of discovery. But the legacy of that incident will be with us for some time to come.

As we approached 3.5 TeV, we encountered a phenomenon linked to the machine protection systems that has obliged us to increase the ramp time from 15 minutes to around 75. This will only be a temporary solution while we correct this effect. With a machine like the LHC, this is typical of the kind of challenge we face through the switch-on phase, and we must be prepared for others.

Traditionally, CERN has operated its accelerators on an annual cycle, running for seven to eight months with a four to five month shutdown each year. With the LHC, things are different. Being a cryogenic machine operating at very low temperature, the LHC takes about a month to bring up to room temperature and another month to cool down. A four-month shutdown as part of an annual cycle no longer makes sense for such a machine. That's why we decided in Chamonix to move to a longer cycle with longer periods of operation accompanied by longer shutdown periods when needed. Only when the repairs and consolidation are complete after the LHC's next shutdown will we be fully able to consign 19 September 2008 to the history books.

In the meantime, we can take satisfaction in what we have achieved to date, while reminding ourselves, as that SPC delegate advised, that we are breaking new ground technologically as well as scientifically. Our stepwise approach, agreed by the management, the machine and the experiments, is the only sensible way to proceed. It takes time but, as we've seen this week, patience pays dividends.

Rolf Heuer

The magnificent seventh

MoEDAL is the LHC's newly approved seventh experiment. Unlike its general-purpose partners installed along the LHC ring, MoEDAL will search for very specific exotic objects such as the highly ionizing magnetic monopoles and massive, conventionally charged, supersymmetric particles. The experiment is relatively small, cheap and quick to install but its physics potential is huge and a true complement to the already wide exploration range of the LHC experiments.

In its final configuration, MoEDAL will consist of ten layers of plastic attached to the walls and ceiling of the cavern that houses the VELO detector of LHCb at Point 8 of the LHC ring. "When a heavily ionizing stable particle, such as a magnetic monopole or a massive stable super-symmetric particle, crosses the MoEDAL detectors, it produces damage in the plastic at the level of polymeric bounds in a small cylindrical region around its trajectory", explains James Pinfold, spokesperson of the newly approved experiment. "The subsequent etching of the solid nuclear detectors leads to the formation of etch-pit cones. These conical pits are usually of micrometre dimensions and can be observed with an optical microscope. Their size, shape and alignment yield accurate information about the charge and the direction of motion of the incident highly ionizing particle".

The particles for which MoEDAL is designed will have a highly characteristic signature in the detector to the point that, unlike other experimental set-ups, the background is not really an issue. "If it exists, a magnetic monopole will leave a very characteristic set of collinear etch-pits", explains James. "There is no other conventional particle that could produce such a distinctive track – one event will be very significant".

The main LHC experiments are designed to detect conventionally charged particles traveling fast enough to cross the various layers within the trigger window of 25 ns. Also, very highly ionizing particles will usually be absorbed well before fully traversing the general-purpose detector. Further problems could arise with saturation effects in the detectors and the electronics. Thus, the detection of massive slowly moving and/or highly ionizing exotic particles is a significant challenge for the main LHC experiments. However, MoEDAL is a passive device, unaffected by trigger considerations, consisting of detectors that are capable of accurately measuring ionization rates that are thousands of times that of a minimum ionizing particle. This is why James Pinfold maintains that the MoEDAL detector complements the main LHC experiments in the search for new physics. As he says, " If MoEDAL sees only a few candidates it will be a very clear indication that something new and very interesting has been produced. At that stage I would expect the other LHC experiments to look very closely for corresponding signals in their detectors".

MoEDAL collaborators install the first layers of plastic in the LHCb VELO cavern at LHC Point 8.

MoEDAL is an international collaboration of about 25 members from nine institutes worldwide. They have already installed the first square metre of plastic in the VELO cavern – as shown in the figure. The maximum possible surface area available for detectors is slightly less than 25 m2 per layer. During the long run of the LHC, MoEDAL scientists will study the general radiation levels in the cavern. "If the LHC has a technical stop in December, we hope to install the next five square metres of plastic. During the long shut-down we will install the full detector". Even with just the initial deployment, MoEDAL will be able to give a first indication of the possible existence of new heavy and highly ionizing particles. There is no doubts that, like its other partners, the seventh LHC experiment is up to meeting the expectations of the very demanding physics community.

Further information about MoEDAL can be found here:

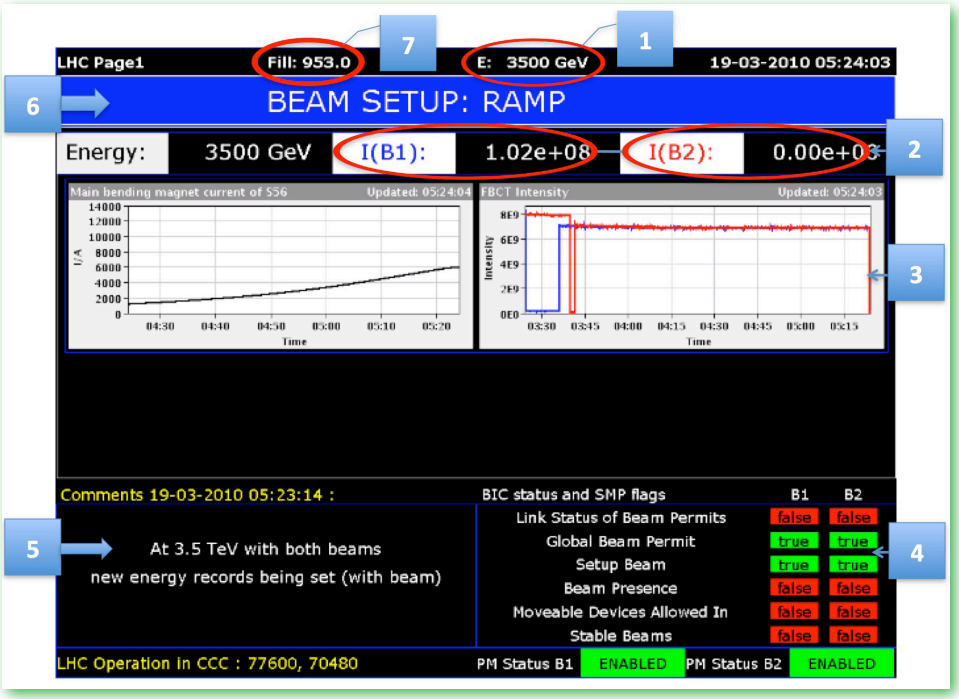
http://web.me.com/jamespinfold/MoEDAL_site/Welcome.html

CERN Bulletin

Switch on to the LHC!

The LHC is preparing to collide beams at 3.5 TeV for the first time ever! Be part of the event and follow live what goes on at the world's most powerful particle accelerator by connecting to LHC1. Hereafter we give you a key to understand the display as well as a typical event display from the ATLAS and CMS experiments.

http://op-webtools.web.cern.ch/op-webtools/vistar/vistars.php?usr=LHC1



1. This is the energy of beams.
   1 TeV=1000 GeV.
   The LHC set the world energy record of 3.48 TeV per beam, today, 19 March 2010.

2. Intensity of, respectively, B1 (blue) and B2 (red).

3. The information in these boxes can vary. Operators display the graphs that are relevant to the specific operation.

4. Most of the flags are set automatically. They provide a quick summary of the machine status. In order to have collisions the 'Stable Beams' flag must be set to green.

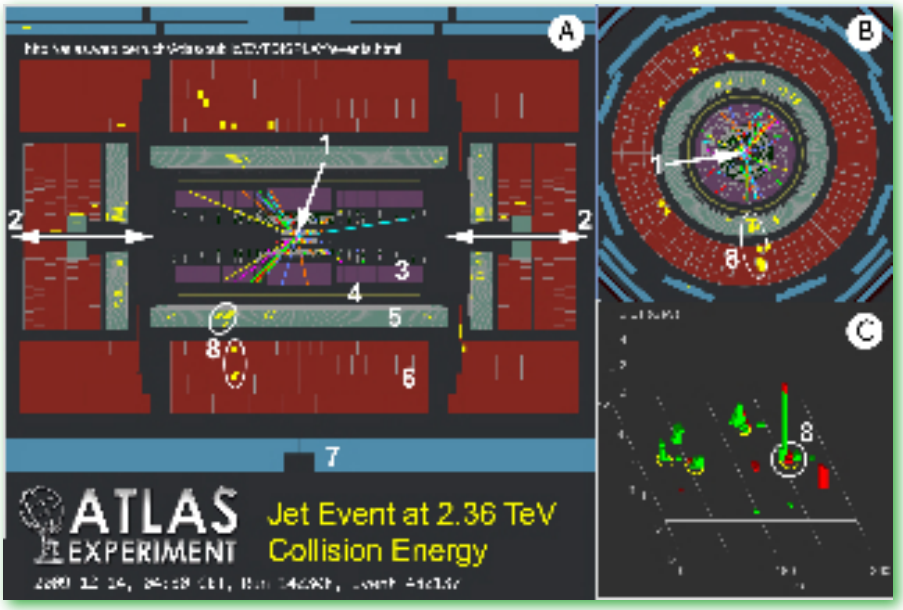
5. Here operators write their messages to the experiments. Often, they write the ongoing activity, followed by the plan for the coming hours.

6. Machine Mode, indicating what the machine is currently doing. Operators can choose from among several modes of operation, such as: circulate and dump, inject and dump, cycling, injection of physics beam, injection probe beam, prepare ramp, ramp, stable beams, etc.

7. Progressive number used for archiving purposes.

ATLAS Event Display

A Jet Event at 2.36 TeV



This ATLAS event display shows the production of jets in a proton-proton collision. Jets—sprays of particles —are an indication of a head-on proton collision.

A, **B**, **C**: This event display shows three different views of the same collision. View A shows the ATLAS detector from the side; view B shows a beams-eye view; and view C shows the energy deposited in the calorimeters.

1. **Collision point**—The point at which two protons collided in this event.
2. **Direction of the particle beams**—In view A, the proton beams travel horizontally. In view B, the beams travel into and out of the display through the collision point.
3. **Trackers**—Coloured lines radiating from the collision point show the passage of a particle that registered in all three tracking detectors, which measure the momentum of charged particles. Directly above and below the collision point are the pixel detectors; slightly farther away is the semiconductor tracker system; in purple is the transition radiation tracker.
4. **Central solenoid magnet**—The central solenoid magnet curves the tracks of particles as they pass through the tracking detectors.

5. **Liquid argon calorimeter**—This detector measures the energies of particles such as electrons and photons.
6. **Tile calorimeter**—This detector measures the energies of hadrons such as protons and neutrons. In both calorimeters, yellow dots in views A and B indicate that a particle has left an energy deposit. In view C, the energy deposits are shown as red (hadronic) and green (electromagnetic) bars. Yellow circles in view C indicate the energy deposited by jets.
7. **Muon spectrometer**—Yellow dots show deposits of energy by muons in the muon spectrometer. This detector system is only partially shown in this event display.
8. **Jet**—The white circles show how the same jet appears in views A, B and C.

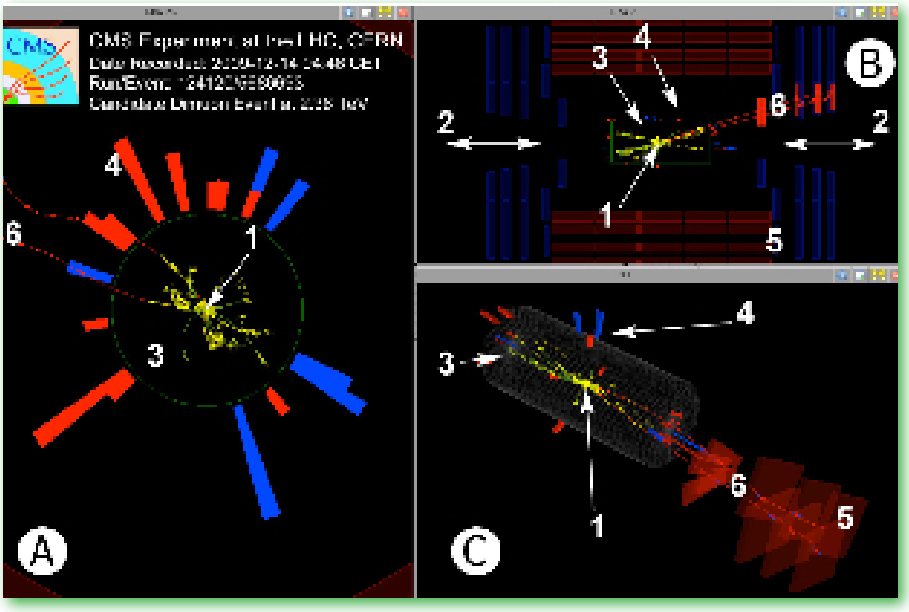
More information:

http://www.symmetrymagazine.org/breaking/2010/03/16/atlas-event-display-decoded/

CMS Event Display

A candidate dimuon event at 2.36 TeV

This event display illustrates the production of two muons in a proton-proton collision. The paths of the muons are shown by the thin red lines on each screen. The muons left signals that were reconstructed into tracks in the silicon tracker, deposited a little energy in the calorimeters, and passed through the muon chambers.



A, B, C: The event display is divided into different screens to give you different views of the split second when the proton-proton collision occurred.

1. **Collision point**—The collision point, or what particle physicists call the interaction point, is where the protons collided in this event. Collisions occur along the beam line at the centre of the detector.
2. **Beam line**— The beam line is the path that protons travel along in opposite directions and into collision.
3. **Silicon tracker** — The innermost portion of the detector is the silicon tracker, which includes the pixel and silicon strip detectors. The tracker follows the movement of charged particles point by point; these are represented by yellow dots. When we connect the dots we can see the particle track, tracing a particle's movement.
4. **Calorimeters**— Just outside the tracker are the electromagnetic and hadron calorimeters. When particles strike one or both, they leave an energy deposit. These deposits are represented by the bars just outside the tracker data. The height of the bar corresponds to the amount of energy deposited.
5. **Muon chambers**-- The third and outermost component of the detector are muon chambers. The chambers are visible as red and blue blocks on screen B, and the chambers through which a particle has passed have been highlighted. Screen C shows only those chambers through which a muon has passed.
6. **Muons**— The path of the muons can be followed in red from the point of the collision through the tracker and calorimeters to the muon chambers.

More information:

http://www.symmetrymagazine.org/breaking/2010/03/16/cms-event-display-decoded/

Another of CERN's many inventions!

CERN has often been the incubator for the development of innovative technologies but very few people know about the capacitive touch screens invented for the consoles of the SPS Control Room in 1973. The Bulletin interviewed their inventor, Bent Stumpe, who also developed the CERN tracker ball and the computer-programmable knob.

A specific goal, a lot of motivation and the technical skills to do it: that's all you need to create something nobody else has ever done before. Back in the 1970s, the SPS was being built and its control room required the installation of thousands of buttons, knobs, switches and oscilloscopes to operate the machine. Frank Bech, newly recruited from the DD Division to be in charge of the central control hub in the SPS control room, asked Bent Stumpe for solutions to the following problem: how to build the hardware for an 'intelligent' system which, in just three console units, would replace all those conventional buttons, switches, etc.

In just a few days, the Danish engineer, also from the DD Division, came up with a (handwritten) proposal to build a touch screen with a fixed number of programmable buttons, a tracker ball to be used as computer-controlled pointing device and a programmable knob. Following this proposal, Bent Stumpe was recruited by the SPS Controls Group to develop the hardware.

"We had very little time to design the new system and demonstrate that both the hardware and the software could really work", recollects Bent Stumpe. "Thanks to Chick Nichols from the CERN EP workshop, it was possible to evaporate a very thin layer of copper on a flexible and transparent Mylar sheet. This allowed us to produce the very first prototype of a capacitive touch screen."

Very soon, Bent Stumpe and Frank Bech were able to demonstrate that the first nine-button touch screen could really work, that is, the button pushed by the user could be reliably identified. They presented it to the Management, who accepted and supported the further development work. "In the final configuration of the SPS Control Room it was decided to install three main consoles, each equipped with a 16-button touch screen", he says. "I have read on Wikipedia that the natural lifetime of the current touch screens is about two years. The ones we developed remained in operation for more than 20 years!"

The SPS control consoles also included a tracker ball, a device that could identify x-y movements by rolling a ball and move the cursor on the screen accordingly. Does this remind you of anything? "We can't say that this was the forerunner of the mouse. The first mouse was also an x-y pointing device, but worked on a different mechanical and electrical principle", Bent Stumpe explains. "The tracker ball we developed in 1973 worked on the same principle as the mice that industry developed later in the 1980s".

The technology developed for the capacitive touch screen was immediately transferred to industry, in particular to the Danish firm Ferroperm. At CERN the touch screen was used for a number of other control applications. CERN touch screens were also used by other big laboratories.

However, despite the numerous publications on the subject by CERN and specialist reviews, the use of touch screens was limited for a number of years partly because the system needed considerable computer power, which was very expensive at the time. Later, when computer power became cheap, the same technology was taken up again, further developed, and commercialized on the very large scale we observe today, for instance in some mobile phones.

The SPS touch-screens originally developed by Bent Stumpe were in operation from 1973 until the new LHC Control Room was installed in 2008.

CERN Bulletin

How does a capacitive touch-screen work?

In a capacitive touch-screen like CERN's, the touch-sensitive area of the screen (the button) is actually part of an electric circuit. When a user touches the screen with his finger, he changes the dielectric of the capacitor, measurable as a change in capacitance. The software calculates the differences in capacitance relative to areas on the screen that are not being touched and identifies exactly where on the screen the change occurred. This information is then used by the software to execute the desired operation.

Bent Stumpe, inventor of the CERN touch screens, tracker ball and programmable knob. We see him with one the first touch screens developed in 1973.

George Shering, head of the section responsible for the development of the central controls in the SPS Division. He was one of the main developers of NODAL, the software behind the SPS control system, which included the touch screens.

CERN helps with the mapping of natural disasters

The headquarters of UNOSAT, the Operational Satellite Applications Programme of the United Nations Institute for Training and Research, are in an unassuming office, not far from Restaurant 2. There, UN experts are on hand twenty-four hours a day, seven days a week, waiting for an emergency message from anywhere on the globe and ready to respond. It was there that experts were called upon to respond to the recent earthquakes in Haiti and Chili, using CERN computing resources to develop some of the first response maps.

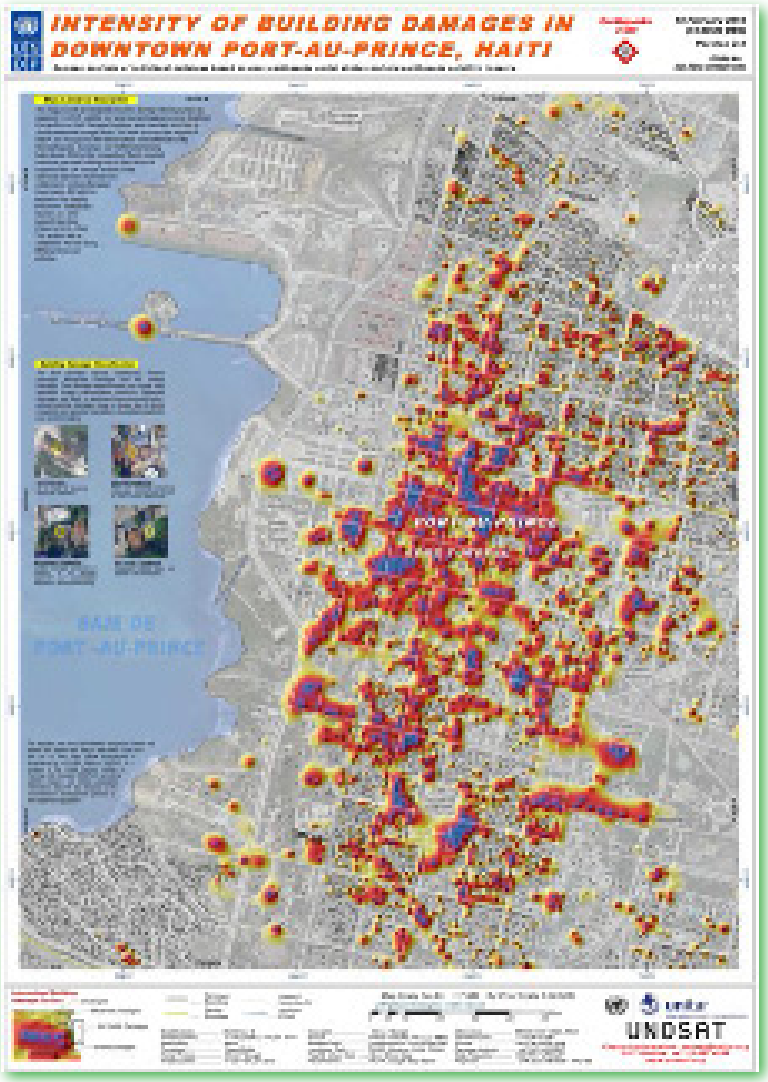
In the case of January's earthquake in Haiti, an SMS message was received at 23:20, Geneva time, on January 12, only minutes after the quake. Immediately, UNOSAT began organizing and downloading satellite images for analysis, to create the very first maps used by relief workers in Haiti.

In the weeks following, UNOSAT members were on shift continually, day and night, working nonstop to develop reports of the damage. UNOSAT also sent two staff members on the ground to verify and improve upon their reports.

"Especially in the early days of a disaster like Haiti or Chili, you hear 'oh, the whole city is flattened,' but normally, that's not the case... Using satellite technology allows us to have more objective information available," explains UNOSAT's Humanitarian Task Manager, Einar Bjorgo.

UNOSAT downloads data from scientific and commercial satellites to CERN servers. These satellites have a resolution of down to 40 cm, allowing images with tremendous detail. In the case of Haiti, satellite technology was complemented by aerial photography at 15 cm resolution, and frequently radar data are also used. The collected data are then analyzed by UNOSAT experts.

Rather than relying exclusively on automated computer software, UNOSAT analysts conduct painstaking analyses themselves and have developed innovative techniques to answer questions often difficult to answer using from satellite imagery. Their analytical techniques have earned the attention and support of several large companies, including ESRI, Google, and Microsoft, with which UNOSAT works, as well as government agencies, including those from the United States and Switzerland.



UNOSAT reports are used for multiple applications. Emergencies and natural disasters, such as Haiti and the more recent earthquake in Chile, require rapid mapping. Typically, UNOSAT is called in to assist with an average of forty humanitarian emergencies a year, easily three emergencies each month, and remains involved for five or six weeks, long after media attention has died down.

UNOSAT is also called on by the UN to assist in human security and human rights issues. UNOSAT has mapped out conflict zones in Gaza and Georgia, and reported on Somalian pirate activity. Working with satellite archives, UNOSAT is also assisting efforts in Indonesia to re-grow mangrove forests destroyed by the shrimp farm industry, which are vital to protecting the country from major tsunamis such as the one in 2004.

Developing countries request UNOSAT's assistance in geospatial training and mapping to lay out cities, farms, and transportation. There are also pure research projects at UNOSAT, such as developing GIS technologies on the computing grid or studying different geospatial correlates to social and humanitarian issues.

In all of their projects, UNOSAT relies on CERN computing support and IT.

"CERN is the secret of our success," explains Francesco Pisano, Manager of UNOSAT. "If we weren't here we would have to equip ourselves with such an amount of IT that it would make this venture very difficult to fund from the UN. Compared to other set-ups around the world, we have virtually unlimited computing capacity."

In turn, what CERN gains in the relationship with UNOSAT is the pride of participating in a project that provides global and humanitarian applications for the laboratory's computing infrastructures.

The UNOSAT website:

http://unosat.web.cern.ch/unosat/

Daisy Yuhas

A day to celebrate

After several weeks of preparations and hard work on the part of many people, the events to mark International Women's Day at CERN on 8 March were a genuine success. They were followed with great interest by the outside world, judging by the flurry of activity on twitter, various blogs and the media coverage they generated.

Women were overwhelmingly in the majority at the controls of the experiments and accelerators throughout the day, as well as acting as the guides for all official visits. There was no shortage of enthusiasm!

"I'm very happy that CERN has supported the project, and I'm especially encouraged by the enthusiastic response from everyone who's taken part", says Pauline Gagnon, a physicist from the Indiana University group and a member of the ATLAS collaboration, who was behind the idea. "I hope that this kind of initiative will help to show that women have a place in science and that young women thinking of going into physics will be reassured that they will not be on their own".

The day's events underlined that the disciplines of science and engineering are equally well suited to women as to men. "What counts are your talents and skills. Science and physics are not the exclusive preserve of men. Mentalities have to change", says Director-General Rolf Heuer.

There are plenty of people who can testify that it's possible to combine an exciting career in science with a normal family life.

"All the women working at CERN have contributed to the Organization's success. It's true that there's still a long way to go when it comes to numbers but we've already achieved a lot. Today's events are proof of that, and we can be proud of what we've done", adds Paula Collins, a physicist with the LHCb experiment.

International Women's Day at CERN on 8 March highlighted the role of women in technical fields, but it's clear that the Organization relies on the contributions of all its personnel to operate successfully. "The gender imbalance in the technical professions is an issue but it's also important to stress that women play an essential role in all sectors of CERN's activities", concludes Rolf Heuer.

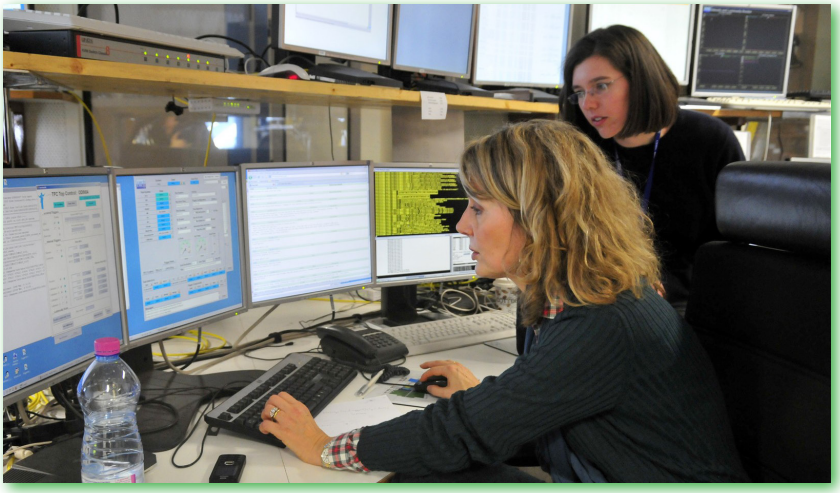
The official website of the event, which will remain active, features videos, interviews, photos and posters of the occasion:

http://internationalwomensday.web.cern.ch/internationalwomensday/

The organising committee wishes to thank the Management for its support, as well as all those who helped to make the event a success.

Laëtitia Pedroso

Watch the video at:
http://cdsweb.cern.ch/record/1249323



Women on shift in the CERN control rooms.

Video-link with Fermilab (US) from the CMS control room.

Take heart!

Recently, ten new semi-automatic defibrillators were installed at various locations around CERN. This is a preventive measure intended to provide cardiac arrest victims with the best possible response. The first responder could be you!

You have probably seen them on your way to the restaurant, for example: brand new semi-automatic defibrillators, ready for an emergency. Housed in a white wall-mounted case, the bright red defibrillators are marked with a white heart symbol crossed by a lightning bolt (see photo). The defibrillator is designed so that anyone can use it. "Anyone can use it, you don't need to be a health professional," says Dr Reymond from CERN's Medical Service. Together with the CERN Fire Brigade, he is behind the initiative to have these units put in place. And with good reason, as the unit provides spoken instructions (in English or French) to guide the user. "The defibrillator gives you simple instructions, and as long as you follow them there is no risk of any error: it's impossible to hurt the victim!" says Dr Reymond.

Positioned at heavily frequented points like the restaurants, the Globe and the Main Building (see box), the defibrillators are designed to be as visible and accessible as possible, so that they can be deployed quickly. "It's important for defibrillation to start as rapidly as possible," explains Patrick Berlinghi, in charge of logistics for the Fire Brigade. "The faster someone pulls the unit out of its case and attaches the electrodes to the victim's body [see illustration], the better the chances of resuscitation." Dr Reymond confirms this: "Having one of these units available for immediate use can save a life, even before the Fire Brigade or the Medical Service arrive on the scene." Furthermore, as soon as the white protective housing is opened, it sets off a local alarm that signals a medical emergency. So start using the defibrillator right away, begin chest compressions and have someone call 74444 immediately so the emergency services can get there as quickly as possible.

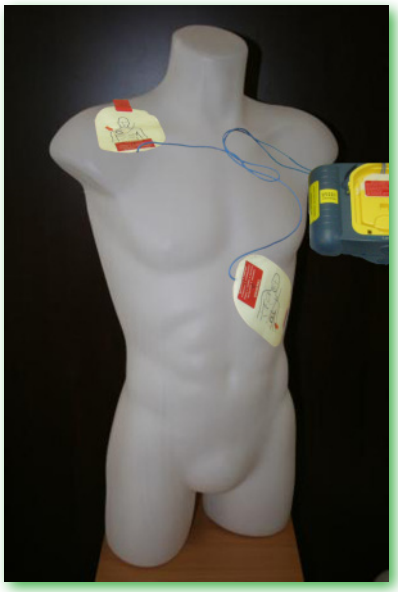
"A combination of immediate defibrillation, chest compressions, an emergency call and rapid deployment of the emergency services gives the person the best possible chance of surviving. This kind of response has proven its effectiveness in a non-hospital environment," concludes Patrick Berlinghi. So now it's up to you!

How to recognise cardiac arrest and use a defibrillator

To bystanders, a person with cardiac arrest appears to be dead: the victim collapses, makes no movements and stops breathing. To show you how to use the recently installed semi-automatic defibrillators, the Fire Brigade has created a training video that you can view by clicking on the link below:

http://cdsweb.cern.ch/record/1248708

The illustration above shows where to attach the electrodes.



Correct positioning of the electrodes on the chest.

To become a more skilled and effective first-aider, you can sign up for basic first-aid courses and refreshers. Please go to the Safety section of the HR CERN Training catalogue.

Alizée Dauvergne

Where the ten new semi-automatic defibrillators have been installed:

- Building 80 (Globe), upper level, next to the pharmacy and telephone;
- Building 33, to the left of the CERN Shop, at the Microcosm entrance;
- Building 60, across from the bank, at the right-hand pillar as you go up the stairs to the amphitheatre;
- Building 40, to your left as you enter behind the counter;
- Building 39, to your left at the hostel reception;
- Building 504, to your left as you go up to INTERFON;
- Buildings 30 and 112, at the ground floor where the two buildings meet;
- Building 866, at the Restaurant 3 entrance on the Prévessin site;
- Building 874, in the CCC reception area, to the left behind the counter;
- Building on the escape breathing apparatus training grounds on the Prévessin site.

The Director-General supports the initiative of the Medical Service and Fire Brigade for the installation of ten new semi-automatic defibrillators.

Antimatter in the classroom

A brand new teaching resource has just been made available on the CERN Education website. The Antimatter Teaching Module contains eight lesson plans, together with background materials and extension topics, which are part of a wide educational project whose aim is to stimulate interest in science by introducing themes in modern physics to students aged 14-15 years, that is, earlier than is the practice in most national curricula.

In his capacity as CERN's first Teacher in Residence, Terrence Baine's primary project was to develop teaching modules to help high school teachers around the world incorporate modern particle physics into their curricula. "Back in October, it was decided that the first module should be on antimatter", explains Terrence, who worked on it in collaboration with Rolf Landua, head of the Education Group and antimatter expert. "I started with designing a pedagogical platform, then did curriculum reviews to see what background students normally have in science at that age, and what I could build on from that background".

During his stay at CERN, Terrence benefited from frequent exchanges with colleagues who were visiting CERN in the framework of the various programmes that the Education Group regularly organises. "Thanks to the teacher programmes I have been associated with since October, I have had the opportunity to talk with colleagues from all over Europe and learn about their national curricula", he recollects.

Introducing antimatter at such an early age is a challenge, both for the teachers and the students. "When you first talk about antimatter with students, they have ideas that essentially come from science-fiction. The goal of this resource is to allow the student to move on from these misconceptions and learn that science can be even more exciting than science-fiction", says Terrence. "We used elements from Angels&Demons and Star Trek to first capture the students' imagination, and then show the real science facts".

Terrence Baine (left) and Rolf Landua (right) with an antimatter trap from the film 'Angels & Demons'.

In such a complex scenario, the most challenging thing for Terrence was to tailor the module in such a way that the end result was neither too difficult nor too easy for the students. "We did not want it to be superficial. We wanted the students to learn from it", points out Terrence. "The whole purpose of this idea is that we need more modern physics when the students are younger. We want to catch the attention of students in science when it is still a mandatory subject, and to do so in an exciting way. This will increase the chances of having more students who will be willing to continue their education in science".

If at present, in most secondary schools, modern physics is very often taught at the end of the student's training plan, useful resources like the one that Terrence has produced might help the teacher acquire the necessary confidence to start reversing the trend. "The module is made on PowerPoint slides. This gives teachers maximum flexibility as it allows them to take parts of it and even build their own lesson plans, if they wish", he explains.

So far, the module has been tested with teachers and has received a lot of positive feedback. Very soon, Terrence and his colleagues will start using it with the end users, that is, the students. Translations of the module into other European languages are also in the Education Group's future plans.
The Antimatter Teaching Module is available from the CERN Education Group website at:

http://education.web.cern.ch/education/Chapter2/Teaching/atm.html

CERN Bulletin

Library news

Access to the electronic resources to which CERN's library holds a subscription has been restricted in the past to users with a CERN IP address. Thanks to a joint project launched by the IT Department and the Library a few weeks ago, you can now consult them from outside the site.

The new remote service is available to anyone who has a CERN account. All you have to do is register and then configure your proxy settings as per the instructions at:

https://webservices.web.cern.ch/webservices/Tools/LibraryProxy/Default.aspx

The procedure only takes a few clicks, and you should only have to perform it once. Then you can consult electronic periodicals, databases, on-line encyclopaedias etc. while waiting for a flight or relaxing in your sitting room. Now you can take the library with you wherever you go.

While we're on the subject: starting with the next issue, there will be a new column in the Bulletin: "Library news" in which we will provide regular updates on our services, resources and activities, as well as the books available in the Bookshop.

To find out how to use electronic resources from outside CERN, go to this URL:

http://library.web.cern.ch/library/Library/remote.html

CERN Library

Launch of the new CERN Admin e-guide

The CERN Admin e-guide is a new guide to the Organization's administrative procedures, which has been drawn up for the benefit of members of the personnel and the various administrative services alike and replaces the old "Administrative Procedures Manual". All the different procedures currently available on separate department sites will henceforth be accessible at a single website.

The goal of creating a compendium of CERN's administrative procedures, available at a single website and accessible with a simple click of the mouse, has now been realised. "It had become difficult to know where to find the relevant up-to-date information on administrative procedures", says Yaël Grange-Lavigne of the HR-SPS-OP Section (Organisation and Procedures), coordinator of the working group that compiled the e-guide.

The team, which comprised members of the HR Department, observers from other departments, representatives of the Departmental Secretariats and the HR Department's legal advisers, began working on the project in October 2008. "We met once a week and set ourselves clear objectives, such as making it easier to find information, promoting transparency, ensuring traceability and improving the presentation to make the procedures easier to read and more user-friendly", explains Yaël.

The staff survey conducted by the HR Department in 2009 underlined the need to improve communication on the application of the Staff Rules and Regulations. "The time had come to harmonise the procedures applied by the various departments and to present them in a more modern and user-friendly way", says Gabriele Thiede, head of the Organisation and Procedures section.

That goal has now been achieved: by simply entering a key word in the CERN Admin e-guide you can go straight to the administrative procedures, in English and French, that derive from the application of the Staff Rules and Regulations. The site will be gradually supplemented to cover all CERN's administrative procedures.

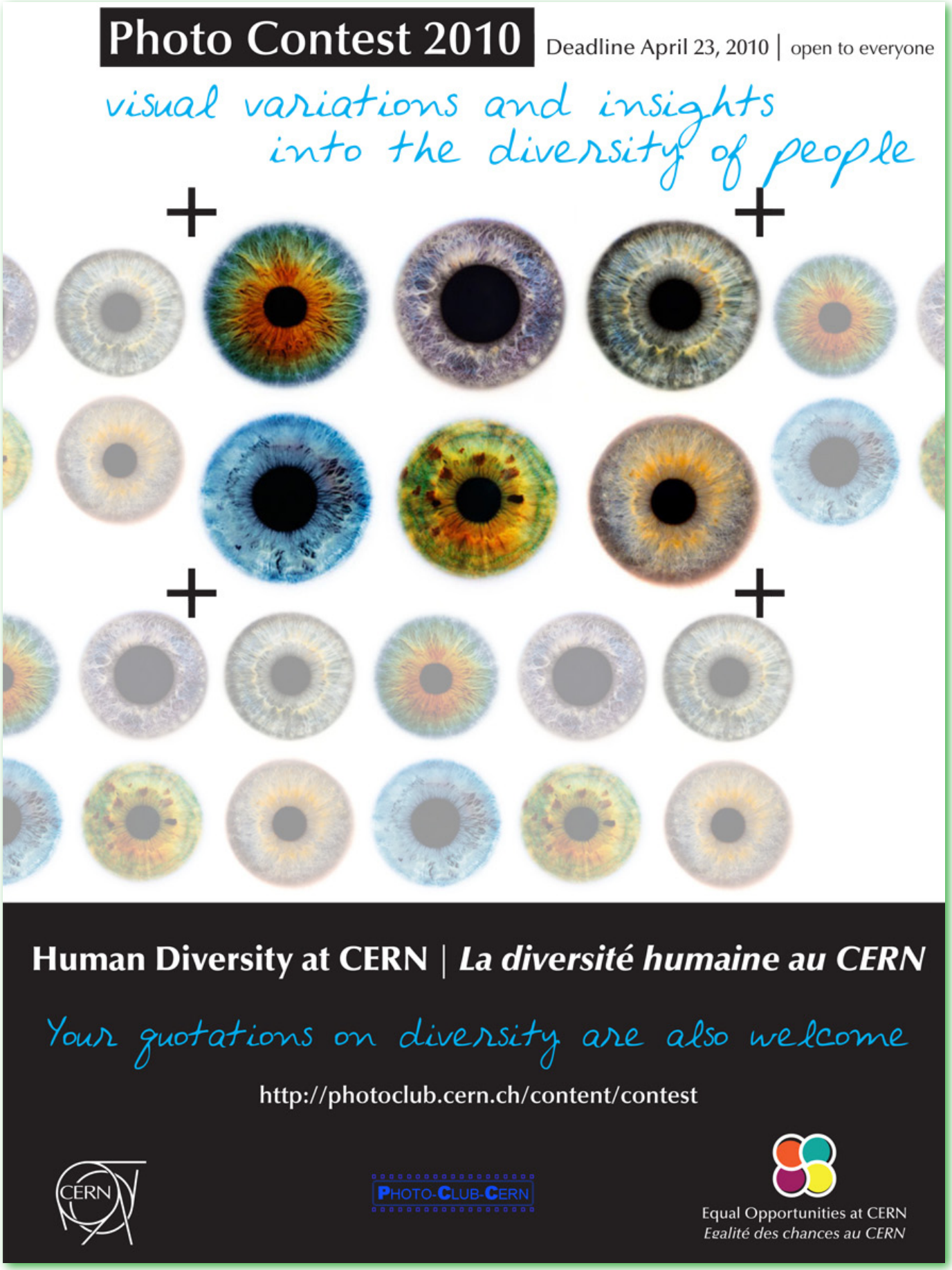
We invite you to take a look at the new CERN Admin e-guide as soon as you get the chance. A questionnaire allowing you to give your feedback and suggestions will be available shortly.

Link to the website:

https://admin-eguide.web.cern.ch/admin-eguide/accueil.asp

Laëtitia Pedroso

Home page of the new CERN Admin e-guide.



More information:

http://photoclub.cern.ch/content/contest

and

http://cdsweb.cern.ch/journal/CERNBulletin/2010/09/News%20Articles/1241792?ln=fr

Meeting "real" physicists in the flesh

CERN physicists don't wear white coats (at least not very often); they don't all wear glasses and they don't concoct dangerous potions. They are often even women. These are some of the discoveries made by children from local schools taking part in the "Draw me a physicist" project.
20 school-classes from the Swiss communes of Meyrin, Satigny and Vernier and from the French Pays de Gex in France have been taking part in this project, which involved the children making an initial drawing and writing a "dictionary-style" definition of a physicist in their classrooms, and then visiting CERN during the week of March 15th. The Swiss children were also treated to a show put on by the Physicscope group. During their visit to CERN they were able to see the laboratories and experiments for real and get an idea of what a physicist's job involves by interviewing a real male or femal physicist in the flesh. After these first tentative steps into the world of fundamental physics, the children will be able to complete the next stage in their project, which is to make a new drawing and write a new dictionary-definition of a physicist (male and female). The hope is that their trip to CERN will have altered their original, stereotype perception of scientists!

Franck Martin and Valeria Perez Reale, two ATLAS physicists, answer questions from children from the Satigny-Village school.

Read the CERN press release:

http://press.web.cern.ch/press/PressReleases/Releases2010/PR04.10F.html

Bulletin CERN

Pavol Földes (1986-2010)

On Saturday, 27 February our good friend and colleague Pavol Földes died in a tragic accident. He was snowboarding with some of us in Les Gets when a big avalanche took him away. While exploring a surrounding area just a few metres from the piste, he fell through a cornice. It was just an unfortunate coincidence that his fall triggered the avalanche where he lost his life.
Pavol was a master student from Bratislava. He majored in electronics and telecommunications at Technical University and he brought his skills to CERN through the Technical Student Programme on 30 January. The CERN programme wasn't his first experience abroad. He spent some time in the United States and Italy before coming to CERN.
In the short time we knew him, he became a really good friend to all of us. It wasn't hard to get to know Pavol because of his positive attitude, his charismatic personality and his big smile. There was always something to do with Pavol. Whether it was traveling, snowboarding or just going out, he was always ready to join us and never spoiled the fun. But in the hard times, he gave support to those who needed it. Of all the activities he loved, snowboarding had always held a special place in his life. He spent every free minute he had on the slopes, and joining the Ski Club was one of the first things he did when he arrived at CERN.
His passion for the mountains was also reflected in his life dreams. He often mentioned how he would like to buy a cabin in the Alps where he could spend his free time, snowboarding in winter and fishing in summer. It is a tragic irony that he died in the mountains he loved so much, but it is a small consolation for us knowing that he died while doing something he loved.
We miss Pavol very much, and our thoughts go to his family. He was more than just a colleague, he was also a very good friend to all of us.

Love from all of his friends and colleagues

INFORMATION FROM THE COLLECTION SERVICE

As from Thursday 11 March two containers for the collection used NESPRESSO capsules will be at your disposal:

* One container near Building 133 (Recuperation and Sales Service);
* One container near Building 904 (Goods Reception).

The used capsules will be dispatched to an industrial processing centre for recycling.

GS Department

INSTALLATION SERVICE - CHANGES IN OPENING HOURS

For organizational matters, please note that, as from 15 March 2010, the Installation Service will have new opening hours. The new schedule will be from 14:00 to 17:00 (Monday to Friday). Contact persons are:

Martine Briant, Karine Robert and Claudia Bruggmann.

The office address remains 73-3-014.

Installation Service
GS Department

TO ALL MEMBERS OF THE PERSONNEL

Summer work for children of members of the personnel

During the period from 14 June to 17 September 2010 inclusive, a limited number of jobs for summer work at CERN (normally unskilled work of a routine nature) 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 coverage for both illness and accident. The duration of all contracts will be 4 weeks and the allowance will be 1717 CHF for this period. Candidates should apply via the HR Department's electronic recruitment system (E-rt):

https://ert.cern.ch/browse_www/wd_pds?p_web_page_id=7716

Completed application forms must be returned by 9 April 2010 at the latest. The results of the selection will be available on 21 May 2010.

For further information, please contact:

Inger.Carriero@cern.ch

HR Department - Tel. 71372

Marie-Laure LECOQ 74924
ENSEIGNEMENT TECHNIQUE
TECHNICAL TRAINING
technical.training@cern.ch

CERN TECHNICAL TRAINING: AVAILABLE PLACES IN FORTHCOMING COURSES

The following course sessions are scheduled in the framework of the 2010 CERN Technical Training Programme and places are still available. You can find the full updated Technical Training course programme in our web catalogue (http://cta.cern.ch/cta2/f?p=110:9).

Software and system technologies

C++ Part 2: Object-Oriented and Generic Programming	25-MAY-10	28-MAY-10	3 days	English
CERN openlab Multi-threading and Parallelism Workshop	04-MAY-10	05-MAY-10	2 days	English
Developing secure software	22-Mar-10	22-Mar-10	0,5 day	English
ITIL Foundations (version 3)	12-APR-10	14-APR-10	3 days	English
ITIL Foundations (version 3) EXAMINATION	25-Mar-10	25-Mar-10	1 hour	English
ITIL Foundations (version 3) EXAMINATION	29-APR-10	29-APR-10	1 hour	English
JAVA - Level 1	22-Mar-10	24-Mar-10	3 days	English
JCOP - Finite State Machines in the JCOP Framework	27-APR-10	29-APR-10	3 days	English
JCOP - Joint PVSS-JCOP Framework	19-APR-10	23-APR-10	4.5 days	English
Le Langage C (ANSI et C99)	12-APR-10	15-APR-10	4 days	English
Object-Oriented Analysis and Design using UML	23-Mar-10	25-Mar-10	3 days	English
Object-oriented Design Patterns	10-MAY-10	12-MAY-10	3 days	English
Oracle - Programming with PL/SQL	06-APR-10	08-APR-10	3 days	English
Oracle - SQL	22-Mar-10	24-Mar-10	3 days	English
Oracle Database: RAC Administration	03-MAY-10	07-MAY-10	5 days	English
Oracle Databases: Advanced PL/SQL Programming	26-APR-10	28-APR-10	3 days	English
Project Development using Python	26-APR-10	29-APR-10	4 days	English
Web 2.0 development with AJAX	05-MAY-10	07-MAY-10	3 days	English

Technical training

Marie-Laure LECOQ 74924
ENSEIGNEMENT TECHNIQUE
TECHNICAL TRAINING
technical.training@cern.ch

Mechanical design				
ANSYS DesignModeler	25-MAY-10	26-MAY-10	2 days	English
ANSYS Workbench	29-Mar-10	01-APR-10	4 jours	French
AutoCAD 2010 - level 1	29-Mar-10	01-APR-10	4 jours	French
CATIA V5 – Surfacique 1	07-MAY-10	12-MAY-10	2 jours	French
Travailler en salle propre	29-Mar-10	29-Mar-10	1 jour	French
Office software				
ACCESS 2007 - Level 1 : ECDL	22-Mar-10	23-Mar-10	2 jours	French
ACCESS 2007 - Level 2 : ECDL	06-MAY-10	07-MAY-10	2 jours	French
CERN EDMS for Engineers	13-APR-10	13-APR-10	1 day	English
Dreamweaver CS3 - Level 2	27-MAY-10	28-MAY-10	2 days	English
Dreamweaver CS3 - Niveau 1	26-APR-10	27-APR-10	2 days	English
Individual Coaching	20-MAY-10	20-MAY-10	1 hour	Bilingual
Individual Coaching	06-APR-10	06-APR-10	1 hour	Bilingual
Individual Coaching	04-MAY-10	04-MAY-10	1 hour	Bilingual
Novelties Office 2007: POWERPOINT 2007	11-MAY-10	11-MAY-10	1 jour	French
OUTLOOK 2007 (Short Course I) - E-mail	03-MAY-10	03-MAY-10	3 hours	Bilingual
OUTLOOK 2007 (Short Course II) - Calendar, Tasks and Notes	03-MAY-10	03-MAY-10	3 hours	Bilingual
OUTLOOK 2007 (Short Course III) - Meetings and Delegation	04-MAY-10	04-MAY-10	3 hours	Bilingual
Project Planning with MS-Project	17-MAY-10	18-MAY-10	2 days	English
Sharepoint Collaboration Workspace	29-Mar-10	30-Mar-10	2 jours	French
Sharepoint Collaboration Workspace Advanced	18-MAY-10	18-MAY-10	1 day	English
Sharepoint Designer (Frontpage) - Level 1	25-Mar-10	26-Mar-10	2 jours	French
WORD 2007 - level 1 : ECDL	29-APR-10	30-APR-10	2 jours	French
WORD 2007 (Short Course I) - HowTo... Mail merge (with Outlook)	17-MAY-10	17-MAY-10	3 hours	Bilingual
WORD 2007 (Short Course II) - Working with long document: styles and tables of contents	17-MAY-10	17-MAY-10	3 hours	Bilingual
Electronic Design				
LabVIEW Basics 2 / LabVIEW Core II	19-APR-10	20-APR-10	2 days	English
LabVIEW Intermediaire 1/ LabVIEW Core III	21-APR-10	23-APR-10	3 days	English
MATLAB - Fundamentals and Programming Techniques (ML01)	29-APR-10	30-APR-10	2 days	English
Siemens - Simatic Net Network	12-APR-10	13-APR-10	2 jours	French
Special course				
Egroups training	20-APR-10	20-APR-10	3 hours	English
Egroups training	21-MAY-10	21-MAY-10	3 hours	French

If you are interested in attending any of the above course sessions, please talk to your supervisor and/or your DTO, and apply electronically via EDH from the course description pages that can be found at: http://cta.cern.ch/cta2/f?p=110:9 under 'Technical Training' with the detailed course program. Registration for all courses is always open – sessions for the less-requested courses are organized on a demand-basis only. CERN Technical Training courses are open only to members of the CERN personnel (staff members and fellows; associates, students, users, project associates; apprentices: employees of CERN contractors, with some restrictions). In particular, quoted prices and programmes refer specifically to the CERN community.

Seminars

MONDAY 22 MARCH

ISOLDE SEMINAR
09:30 - Bldg. 304-1-001

Isolde theory course (1/2): Status of the density functionnal theory in nuclei

E. KHAN / IPN-ORSAY

TH JOURNAL CLUB ON STRING THEORY
14:00 - Bldg. 1-1-025

TBA

P. TZIVELOGLOU / CERN & CORNELL U.

CERN JOINT EP/PP SEMINARS
16:30 - Main Auditorium, Bldg. 500

Charged-particle multiplicity at LHC energies

J. F. GROSSE-OETRINGHAUS / CERN

TUESDAY 23 MARCH

ISOLDE SEMINAR
09:30 - Bldg. 304-1-001

Isolde theory course (2/2): Status of the density functionnal theory in nuclei

E. KHAN / IPN-ORSAY

CERN JOINT EP/PP SEMINARS
11:00 - Council Chamber - Bldg. 503

KLOE measurement of the σ (e+e-->π+π-(gamma) with initial state radiation and the π π contribution to the muon anomaly

G. VENANZONI / INFN

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

Modified Gravity and Supergravity

S. KETOV / TOKYO METROPOLITAN UNIVERSITY

WEDNESDAY 24 MARCH

TH COSMO COFFEE
11:00 - Bldg. 1-1-025

Standard model CP violation and baryogenesis

KONSTANDIN T. / CERN

COMPUTING SEMINAR
14:00 - Kjell Johnsen Auditorium, Bldg. 30-7-018

Cells-as-a-Service: Enterprise-Grade Cloud Infrastructure Research at HP Laboratories

P. GOLDSACK / HP LABS

ISOLDE SEMINAR
14:30 - Bldg. 304-1-001

Are there nuclear structure experiments relevant for neutron stars physics

E. KHAN / IPN-ORSAY

THURSDAY 25 MARCH

HR SEMINAR
08:30 - Bldg. 40-S2-C01

INDUCTION PROGRAMME - 2nd Part

C. GRANIER, L. LEROUX / CERN

A&T SEMINAR
14:00 - Kjell Johnsen Auditorium, Bldg. 30-7-018

Modeling, Simulation and Control of CERN cryogenic systems

B. BRADU / CNRS - LABORATOIRE DES SIGNAUX ET SYSTEMES

TH PHENCLUB
14:00 - Bldg. 1-1-025

Analyses with Fat Jets

G. SOYEZ

CERN COLLOQUIUM
16:30 - Main Auditorium, Bldg. 500

Paul Dirac and the religion of mathematical beauty

G. FARMELO

FRIDAY 26 MARCH

PARTICLE AND ASTRO-PARTICLE PHYSICS SEMINARS
14:00 - TH Auditorium, Bldg. 4

TBA

A. JUETTNER / CERN

MONDAY 29 MARCH

TH JOURNAL CLUB ON STRING THEORY
14:00 - Bldg. 1-1-025

TBA

NORIHIRO IIZUKA

TUESDAY 30 MARCH

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

TBA

YUJI TACHIKAWA / IAS PRINCETON

THURSDAY 1 APRIL

TH BSM FORUM
14:00 - TH Auditorium, Bldg. 4

TBA

B. GRINSTEIN / UNIVERSITY OF CALIFORNIA SAN DIEGO