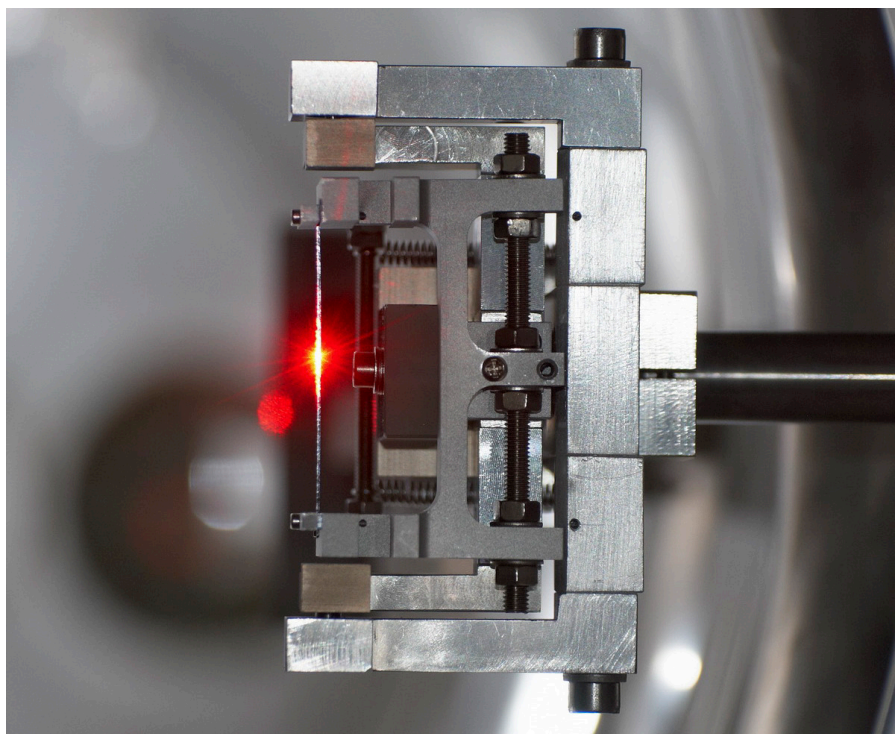


Crystals in the LHC



UA9 bent crystal tested with a laser.

Bent crystals can be used to deflect charged particle beams. Their use in high-energy accelerators has been investigated for almost 40 years. Recently, a bent crystal was irradiated for the first time in the HiRadMat facility with an extreme particle flux, which crystals would have to withstand in the LHC. The results were very encouraging and confirmed that this technology could play a major role in increasing the beam collimation performance in future upgrades of the machine.

Charged particles interacting with a bent crystal can be trapped in channelling states and deflected by the atomic planes of the crystal lattice (see box page 2). The use of bent crystals for beam manipulation in particle accelerators is a concept that has been well-assessed. Over the last three decades, a large number of experimental findings have contributed to furthering our knowledge and improving our ability to control crystal-particle interactions.

In modern hadron colliders, such as the LHC, the halo of particles surrounding the beam core may produce high-power loss in sensitive areas of the accelerator,

thereby endangering operation stability and machine protection. Multi-stage collimation systems are thus used to absorb them. "The UA9 experiment - supported by CERN, INFN, Imperial College, LAL, PNPI, IHEP and JINR - was set up in 2008 to investigate the advantages of using bent crystals in the collimation systems of high-energy hadron colliders," says Walter Scandale, UA9 spokesperson. "A bent crystal replacing the primary collimator can deflect the incoming halo coherently at angles larger than can be obtained with amorphous materials. This might increase the ability of crystals to cut halos in higher intensity beams at the LHC, especially in cases of operation problems at higher energies."

(Continued on page 2)



A word from the DG

Particle physics: a valuable driver of innovation in medicine... and physics

This year marks the 10th anniversary of the European Network for Light Ion Therapy (ENLIGHT), which is a good occasion a look back over the important contributions particle physics has made to medicine over the years. It's hard to know exactly where to start, but since this year also marks the 20th anniversary of Georges Charpak's Nobel Prize, that seems as good a place as any.

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Crystals in the LHC

(Continued from page 1)

From 2009 onwards, silicon crystals were tested at the SPS and their efficiency measured with Medipix detectors. In 2011, after the successful tests performed at the SPS, the LHC Committee endorsed the LUA9 experiment to test the idea at the LHC. "When using bent crystals for collimation, the entire halo particle power is deposited in a small spot of the collimator material," says Walter Scandale. "We knew that, at the nominal LHC intensity, crystals would have to extract a proton flux dissipating up to 500 kW short-term steady losses in a small spot of just a few square millimetres. An ad-hoc additional passive absorber system should be designed to ensure a high collimation performance."

An additional challenge for the LUA9 collaboration consists in orienting the crystal optimally for channelling. The operation requires the use of alignment mechanisms with angular accuracy beyond the state-of-the-art. Devices to orient the crystal in the LHC are under development in partnership with various industrial companies. The results of the first tests are very encouraging. "Bent crystals with the required properties will be installed in the LHC in time for tests to be carried out after the long shut-down in close collaboration with the LHC Collimation team," concludes Walter Scandale. "The expected result is to substantially improve the collimation efficiency, especially for lead ion beams."

Antonella Del Rosso

Why are particles channelled in crystals?

Charged particles have special interactions with crystals due to the anisotropy of the medium. The trajectory of a positive particle travelling at a small angle with respect to crystalline planes is strongly influenced by the repulsive potential averaged along the atomic planes. Channelling is the result of particle confinement in the potential well between neighbouring crystalline planes.



(Continued from page 1)

Particle physics: a valuable driver of innovation in medicine... and physics

Charpak's prize was a long time coming. It was awarded for "his invention and development of particle detectors, in particular the multiwire proportional chamber" in 1968. Over the following years, these devices transformed particle physics, allowing particle collisions to be recorded electronically instead of optically, and they led to a wide range of electronic particle detection techniques in use today. All this was duly noted by the Nobel committee, which also pointed out Charpak's energy in applying the technology to medicine. Today, Charpak-like detectors are ubiquitous in hospitals, and the legacy lives on in the form of the Medipix collaboration, which develops state-of-the-art pixel detectors for both particle physics and medicine.

Another long running strand begins in the 1970s, when CERN scientists helped build a PET scanner for the Geneva Cantonal Hospital. Today, PET scanners are bought off-the-shelf, but many of them rely on crystal detector technologies developed for the L3 experiment at LEP in the 1980s, and some are able to carry out MRI scans as well as PET thanks to electronics developed with industry by CMS.

So what of ENLIGHT? The examples above are all about diagnosis, but particle beams can provide effective cancer treatment. Robert Wilson, founder of Fermilab, was one of the first to recognise this when he pointed out that proton beams, for example, could be tuned to deposit all their energy in a tumour causing limited damage to surrounding healthy tissue. Less than 10 years later, in 1954, the first patient was treated with proton-therapy at the Lawrence Berkeley National Laboratory (USA). In 1957, the first European patient was treated at the University of Uppsala (Sweden), and a few years later, the National Institute of Radiological Sciences (NIRS) in Japan began research on carbon therapy.

The already limited damage of particle therapy is further reduced for light ions, and has been successfully demonstrated in research labs such as GSI in Germany, PSI in Switzerland and TRIUMF in Canada. In the 1990s, CERN recognised a need for a dedicated accelerator design for such facilities, and the Proton Ion Medical Machine Study, PIMMS, was born. Today, the PIMMS design lies at the heart of a number of facilities, including the Italian hadron therapy centre, CNAO, which recently treated its first patient with ions.

ENLIGHT was created to build on the link between particle physics and medicine, and over its first 10 years, had marked a number of successes including the launch of a new kind of conference bringing physicists and doctors together. This kind of collaboration is valuable for medicine, and invaluable for particle physics. It is a tangible deliverable from basic science to society, and developments stemming from our technology are often picked up by industry and refined into better products for our research.

Rolf Heuer

Stopping the haemorrhage

The cryogenic line, which has been supplying liquid helium to the SM18 Hall area dedicated for tests on radiofrequency cavities and cryomodules for the past 20 years, is currently being dismantled. It will soon be replaced with a state-of-the-art infrastructure with an up to 10 times enhanced performance.



Performing preliminary assembly works on the new cryogenic infrastructure in SM18.

Part of the SM18 Hall is devoted to tests on radiofrequency (RF) cavities and cryomodules used for beam acceleration in various CERN experiments and accelerators. Inserted into cryostats and cooled to cryogenic temperatures, these cavities are tested at extreme conditions, which reflect their operating environment.

The existing cryogenic infrastructure supplying liquid helium to the six RF tests stations – four vertical cryostats and two bunkers for the horizontal cryomodules – hasn't quite been delivering the goods. Of the 25 g/s of liquid helium that the cryogenic tank was able to supply, only 15 to 17 g/s was actually delivered to the stations. This was due to alarming thermal losses caused by

the vaporisation of over 30% of the liquid. "The existing cryogenic line dates back to the beginning of the 1990s," explains Vladislav Benda, who is in charge of the operation of the cryogenic infrastructure at SM18. "Fortunately, nowadays, there are new design and insulation solutions that make it possible to construct much more efficient cryogenic lines."

Almost 50 m of line, from the helium tank to the last test station, will be replaced. "The new infrastructure has been designed and is being built at CERN," explains Olivier Pirotte, who is in charge of the project. "It will consist of a cryogenic line and six service modules, which will supply each of the six test stations." Vladislav Benda adds: "Thanks to this equipment, I am confident that thermal losses can be reduced by a factor 10."

In addition to its greater thermal efficiency, the future infrastructure will also have more functionality with the addition of a new option. The six stations can be used to conduct independent tests with superfluid helium (at 1.8 K) and three of them will now be devoted to this. "We are awaiting two new vertical cryostats which have been specially designed for the superfluid helium tests," points out Pierre Maesen, who is in charge of the RF tests in SM18. "They will enable us to meet the increasing demand for tests at temperatures below 2 K – particularly for the Superconducting Proton Linac (SPL) project and for the development of the 'Crab' cavities used for the luminosity upgrade of the LHC."

For the time being, the teams are continuing to dismantle the existing cryogenic line. The new cryogenic infrastructure should be commissioned next spring.

Anaïs Schaeffer

LHC Report: Omnium-gatherum

The last couple of weeks have seen a mixed bag of special runs, luminosity production, machine development and down-time.

Van der Meer scans were performed for ATLAS, CMS and ALICE. These scans step the beams transversely across each other and aim at a measurement of the absolute luminosity. A precise determination of the luminosity uncertainty is beneficial for many physics analyses and, indeed, measurements of important physics processes (such as top quark pair production) can be limited by luminosity errors. The scans were ultimately successful but the set-up and execution were affected by a number of technical problems.

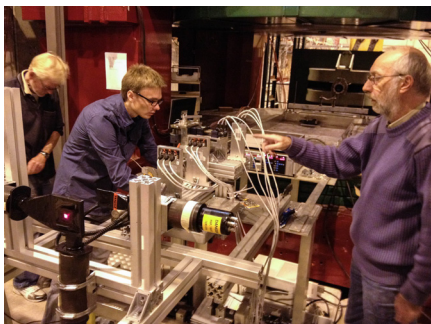
One of the main down-times was due to the replacement of an SPS dipole magnet which had developed a vacuum leak. A SPS magnet exchange is a well-practiced intervention. In this case, the whole exercise, including the pump down of the vacuum, took around 24 hours. There were also re-occurring problems with the fast switches of the SPS beam dump system. The LHC, as always, depends on the faultless operation of the rest of the accelerator complex. All of the machines are coming to the end of three long years of sustained operation with only short breaks for preventive maintenance.

A productive weekend delivered around 0.5 fb^{-1} and led into a 3-day machine development programme. The programme included a proton-lead test in preparation for the run in the New Year, but mostly concentrated on characterization of the machine in view of post long shutdown operation.

Mike Lamont for the LHC team

Finding new answers to old questions

Last month, the NA63 collaboration presented its annual update at the 107th meeting of the SPS and PS experiments committee (SPSC). Among the many results presented were new insights into arenas of experimental quantum electrodynamics – including some that will have theorists heading back to the blackboard.



NA63 Collaboration members at work on the positron-production experiment. Image: NA63.

Based at CERN's SPS North Area, the NA63 experiment uses high-energy beams for crystalline studies of various electromagnetic processes. "This year has been very productive for us, both in terms of data gathering and data analysis," says Ulrik Uggerhoj, NA63 collaboration spokesperson. "We've released results based on previous runs, assembled and tested an entirely new experimental set-up, and have also gathered enough data to keep us occupied during the 2013 shutdown."

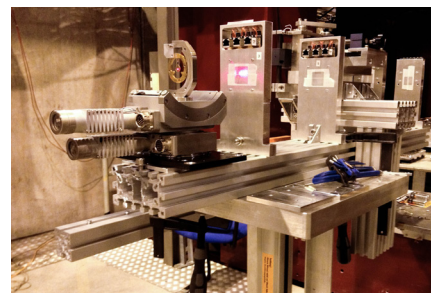
In September, the collaboration announced a new result that considerably improves our understanding of beamstrahlung – the process experienced in colliders when there

is an emission of synchrotron-like radiation due to interacting beams. By using crystalline targets in order to create virtual opposing bunches, NA63 was able to simulate the beamstrahlung effect using only a single beam. "We confirmed that there is a very important quantum effect that actually diminishes the beamstrahlung," explains Ulrik. "If you calculate the beamstrahlung using classical electrodynamics, you get something like a factor of 2 more than quantum theory says. So, the correction is quite significant, particularly for accelerators such as CLIC."

NA63 also examined the impact of the Landau–Pomeranchuk–Migdal (LPM) effect using low-Z targets. The LPM effect has been experimentally proved for high-Z materials for well over two decades, but its low-Z applicability had never been verified. Its effect at this level is especially important for analyses of extended air showers, as our nitrogen-heavy atmosphere is itself a low-Z material. Preliminary NA63 results indicate that the most widely used LPM theory is inaccurate for low-Z materials. While the extent of the theory correction that will have to be made is still unclear, this is a likely sign for theorists to reconsider the shelved problem.

The experiment's main task for 2014 will be the exploration of a new positron production technique. By bombarding a diamond crystal with electrons, NA63 will be able to generate a low-emittance positron beam with high intensity specifically suited for the needs of CLIC. "For this purpose, it turns out that single crystals are a big advantage," explains Ulrik. "It is likely that, in certain CLIC parameter regimes, the accelerator will be able to gain a factor of 2 in the combined emittance/intensity regime. We performed proof-of-principle measurements for this during the last run (see images), and we look forward to proving the technique."

Katarina Anthony



The complete positron-production experiment set-up: at the centre of the gold-coloured ring is the aligned diamond crystal that generates the positron beam. Image: NA63.

Destination Serbia: a new life for CERN's servers

In order to ensure the computing performances that CERN's research needs, the Computer Centre is obliged to replace its computers regularly. After Morocco, Ghana and Bulgaria, it's Serbia's turn to receive a donation of servers from CERN!



CERN Director-General Rolf Heuer and Jovan Puzovic from Belgrade Institute of Physics seeing off the servers on the beginning of their journey to Serbia.

On Monday 26 November, CERN donated 130 servers to two Serbian institutions: the Belgrade Institute of Physics and the Petnica Science School. In 2012, 559 computers were donated to institutions in Africa and Europe. Since the mid-2000s, the Computer Centre has changed technology and now have about 10,000 computers that have to be renewed every four to five years. Obsolete for the purposes of CERN's cutting-edge research, these computers are still suitable for less demanding applications.

Jovan Puzovic, Belgrade Institute of Physics team leader for the NA61 experiment (SHINE), and his deputy Dimitrije Malevic came to CERN to see off the lorry transporting the servers to Serbia. Warmly thanking

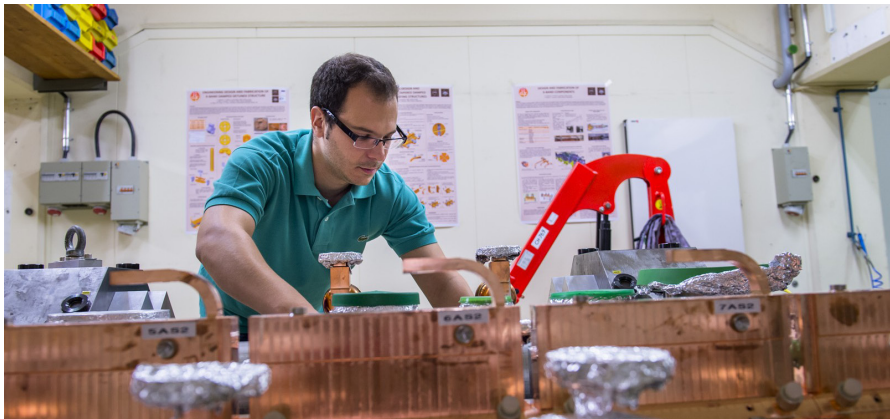
the Organization for its donation, Jovan Puzovic said: "We are delighted to receive this gift which will be a great support for our group, our students and our doctoral students. The servers will significantly enhance the performance of our computing grid, enabling us to process our own data more efficiently, in particular for active participation in the NA61 experiment."

92 of the servers will be installed at the Belgrade Institute of Physics while the other 38 will enable the students at the highly prestigious Petnica Science School to get to grips with the principles of the computer cluster. There's still life in CERN's old computer equipment!

Caroline Duc

Now entering phase two...

Building on the success of their feasibility phase, the CLIC test facility, CTF3, has just launched into a five-year project development phase. This will involve detailed performance optimisation studies, marking the project's transition from pure research and development to prototyping and construction.



CLIC accelerator modules under construction at CERN.

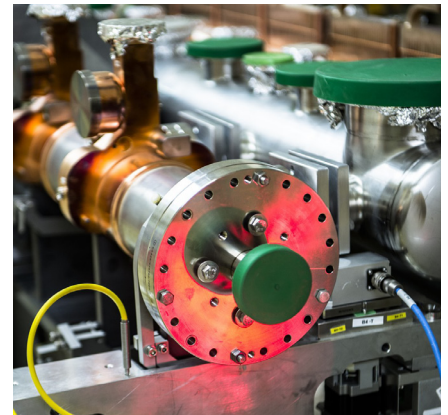
"With the feasibility phase now complete, we have established that CLIC can be built," says Roberto Corsini, CLIC Collaboration spokesperson. "Now we want to be sure that it can provide the luminosity and energy performance needed. We will be looking at the engineering, performance and cost of a real CLIC machine also seeing if we can reduce it."

CTF3's second phase will focus on selected performance-related research areas for further investigation. The largest of these involves the construction and testing of several authentic CLIC accelerator modules that are currently being assembled at CERN (see images). "Our primary focus will be the testing of these systems, as they can provide a 'real' results for the CLIC project," says Roberto.

Four of the CLIC modules will undergo mechanical testing in laboratory conditions, where they will have their alignment,

stabilization and thermal cycling tested. These tests will be done over the next 2 years outside of the CTF3 facility. The remaining three modules will be installed in CTF3's experimental area. "The laboratory tests have been purposefully scheduled to begin a year before those in CTF3," explains Roberto. "This way whatever we learn can be re-injected into the programme before the first module is installed in CTF3." Two further modules will be added in 2014, and will incorporate results from both the laboratory and CTF3 tests.

Alongside the module testing, the CTF3 team will be working to provide synchronicity between CLIC's drive beam and its main beam. This is accomplished by compensating for any phase "jitters" by adjusting the path length of the drive beam. Phase monitors and a kicker system (which will adjust the beam path) are currently being installed in the facility, and the first system tests are planned for next summer.



A CLIC accelerator module.

"We will also be examining the break-down rate within our accelerating structures," explains Roberto. "This is the rate of sparking within the structure, an important performance parameter. Current results are very promising but which may be affected by the presence of the beam." To do this, CTF3 will resurrect an old beam line that hasn't been in use since the early days of the facility. This line is currently being converted by installing an accelerating structure in it, and it should be running by late 2013.

CLIC's project development phase will wrap up in 2016-17, at a time where LHC results at full energy are expected to be available. These will provide the information needed for decisions to be made about potential new energy frontier accelerator projects at CERN beyond the LHC.

Katarina Anthony

CAS Introduction to Accelerator Physics in Spain

The CERN Accelerator School (CAS) and the University of Granada jointly organised a course called "Introduction to Accelerator Physics" in Granada, Spain, from 28 October to 9 November, 2012.

The course attracted over 200 applicants, of whom 139 were selected to attend. The students were of 25 different nationalities, coming from countries as far away as Australia, China, Guatemala and India.

The intensive programme comprised 38 lectures, 3 seminars, 4 tutorials where the students were split into three groups, a poster session and 7 hours of guided and private study. Feedback from the students was very

positive, praising the expertise of the lecturers, as well as the high standard and quality of their lectures. CERN's Director-General, Rolf Heuer, gave a public lecture at the Parque de las Ciencias entitled "The Large Hadron Collider: Unveiling the Universe".

In addition to the academic programme, the students had the opportunity to visit the well-known caves of Nerja. Many of the students also took the opportunity of a free

afternoon to visit the famous Alhambra site and the Nasrid Palaces.

The next CAS course will be a specialized one on "Superconductivity for Accelerators", which will be held in Erice, Italy, from 24 April to 4 May, 2013. The next course on general accelerator physics will be held in Norway in late summer 2013, and will be more advanced.

CERN Bulletin

Stronger synergies

CERN was founded 58 years ago under the auspices of UNESCO. Since then, both organisations have grown to become world leaders in their respective fields. The links between the two have always existed but today they are even stronger, with new projects under way to develop a more efficient way of exchanging information and devise a common strategy on topics of mutual interest.

CERN and UNESCO are a perfect example of natural partners: their common field is science and education is one of the pillars on which both are built. Historically, they share a common heritage. Both UNESCO and CERN were born of the desire to use scientific cooperation to rebuild peace and security in the aftermath of the Second World War.

"Recently, building on our common roots and in close collaboration with UNESCO, we have been developing more structured links to ensure the continuity of the actions taken over the years," says Maurizio Bona, who is in charge of CERN relations with international organisations. For years, the two organisations have been working together on projects like the development of digital libraries in Africa and the training of science teachers from developing countries.

"With our recent initiatives, we have reinforced the joint activities provided for in the existing co-operation agreement, which both parties are looking forward to updating," confirms Sonia Bahri, UNESCO's Chief of Section for Science Policy and Reform, who is in charge of UNESCO relations with CERN. "Our aim is to build on each organisation's

strength to leverage synergies for building capacity in science and technology in developing countries, notably in Africa."

UNESCO is a natural entry point to the world of the United Nations for all science-related matters. Through its strengthened links with UNESCO, CERN will be able to contribute better to projects that foster education in science and technology. UNESCO develops specific programmes designed to inspire youth and women. For example, in collaboration with L'Oréal, UNESCO organises the L'Oréal–UNESCO for Women in Science Programme, recognising scientific excellence among women and encouraging young female researchers to pursue their scientific career worldwide. "Next year, for the first time, CERN will be involved in the project, which is a great honour for the Laboratory," says Maurizio Bona.

CERN and UNESCO have launched a common fundraising initiative to allow them to continue running – and possibly to extend – the very successful digital library schools in Africa. Many librarians and information technology engineers in Africa have no training in how to install and use the software, which is made available by

CERN free of charge. The training workshops offered by CERN and UNESCO help bridge this divide. So far, the two Organizations have organised three such schools, the first in 2009 in Rwanda, followed by another two in Morocco and Senegal. The next one will take place in Ghana at the beginning of 2013. Each school is attended by experts from the host country and five to six countries from the same region. CERN and UNESCO also run schools for high-school teachers from African countries, who are invited to participate in dedicated training courses in Geneva that were originally developed for teachers from CERN Member States. The fundraising initiative also aims to help support these special programmes.

The links between CERN and UNESCO have never been so promising and, as Maurizio Bona confirms, "this is only the beginning. The strengthened reciprocal awareness and interaction will certainly bring both organisations new ideas for collaboration." On 10 November each year, UNESCO celebrates World Science Day for Peace and Development. Next year CERN will be involved in organising the event.

Antonella Del Rosso

The Higgs boson on tour in Italy

In October and November 2012, several researchers from the Italian Institute of Nuclear Research (INFN) and the University of Bologna took part in "Higgs on Tour" - a series of events proposed by Graziano Bruni, the head of INFN Bologna, and Ivano Dionigi, Chancellor of Bologna University, and created and organised by Barbara Poli.

The event was a great success, with over 2,400 students and members of the public participating in Forlì, Reggio Emilia and Bologna, and with a full house at every event. "The comments we received from students and accompanying teachers were enthusiastic. Needless to say, we are very pleased with and proud of the result," says Fabrizio Fabbri, an INFN researcher in Bologna and one of the speakers at the event.

The "Higgs on Tour" show was presented by Patrizio Roversi, a very popular Italian TV presenter. It included a video link

with CERN, during which ATLAS and CMS researchers were able to give a taste of the activities going on in the experiment control rooms. For its third and final leg in Bologna on 17 November, the show was joined by CERN's Fabiola Gianotti and Joe Incandela, the ATLAS and CMS Spokespersons. CERN theorist Alvaro de Rujula was also on stage in Bologna, where he was awarded a gold "Sigillum" in recognition of his commitment to the popularisation of science by the University's chancellor.

Antonella Del Rosso



Dosimetry: an ARDENT topic

The first annual ARDENT workshop took place in Vienna from 20 to 23 November. The workshop gathered together the Early-Stage Researchers (ESR) and their supervisors, plus other people involved from all the participating institutions.



"The meeting, which was organised with the local support of the Austrian Institute of Technology, was a nice opportunity for the ESRs to get together, meet each other, and present their research plans and some preliminary results of their work," says Marco Silari, a member of CERN Radiation Protection Group and the scientist in charge of the programme. Two full days were devoted to a training course on radiation dosimetry, delivered by renowned experts. The workshop closed with a half-day visit to the MedAustron facility in Wiener Neustadt.

ARDENT (Advanced Radiation Dosimetry European Network Training) is a Marie Curie ITN project funded under EU FP7 with €4 million. The project focuses on radiation dosimetry exploiting several detector technologies for various applications: the characterization of the stray radiation field around particle accelerators, on board commercial flights and in space, in the medical field (radiation therapy), and for the characterization of radioactive waste.

CERN Bulletin

CERN's LHC is awarded the 2012 EPS Edison Volta Prize

The European Physical Society (EPS), the Centro di Cultura Scientifica "Alessandro Volta" and Edison S.p.A. have awarded the 2012 EPS Edison Volta Prize for outstanding contributions to physics to three CERN physicists.

The award was given to:

- Rolf-Dieter Heuer, CERN Director-General,
- Sergio Bertolucci, CERN Director for Research and Computing,
- Stephen Myers, CERN Director for Accelerators and Technology,

for having led - building on decades of dedicated work by their predecessors - the culminating efforts in the direction, research and operation of the CERN Large Hadron Collider (LHC), which resulted in many significant advances in high energy particle physics, in particular, the first evidence of a Higgs-like boson in July 2012.

CERN Bulletin

CERN exhibition attracts over 100,000 visitors in Belgrade

"This must be an 'all-time record'," says Ray Lewis, CERN travelling exhibition manager. "In all my time with the various permanent and travelling exhibitions that have taken place locally and within our Member States I have never experienced such figures."



Zarko Obradovic (left), Serbian Minister of Education, Science and Technology, and Rolf Heuer (right), CERN Director-General, at the CERN travelling exhibition in Belgrade.

Indeed, in approximately 20 days of exhibition time about 120,000 people, mainly school visitors and the general public, visited the 100 m² CERN mini-exhibition. It was set up in the centre of Belgrade in October, in association with the meeting of the Restricted European Committee for Future Accelerators (RECFA).

After attending the RECFA meeting, CERN's Director-General Rolf Heuer opened the CERN exhibition on the evening of 19

October. Lectures about CERN were held every afternoon, and two public debates were organised during the exhibition. "When the exhibition ended, it was moved it to the Faculty of Physics at Novi Sad. Lots of people are interested in this exhibition, so we are planning to show it in towns all over Serbia," concludes Ray Lewis.

Antonella Del Rosso

Google Science Fair winner visits CERN

Google Science Fair Grand Prize winner Brittany Michelle Wenger today wrapped up a day-and-a-half's visit of the CERN site. Her winning project uses an artificial neural network to diagnose breast cancer – a non-invasive technique with significant potential for use in hospitals.

Besides winning a \$50,000 scholarship from Google and work experience opportunities with some of the contest hosts, Brittany was offered a personal tour of CERN. "This visit has just been incredible," she says. "I got to speak with [CERN's Director for Accelerators and Technology] Steve Myers about some of the medical applications and technologies coming out of the LHC experiments and how they can be used to treat cancer. We talked about proton therapy and hadron therapy, which could really change the way patients are treated, improving success rates and making treatment not such an excruciating process. That was huge for me."

Brittany and her mother Camilla visited some of CERN's most important facilities,

including the ATLAS control room, the Antiproton Decelerator facility, the CERN Computing Centre and the LHC superconducting magnet test hall (SM18). "Realising the scale of everything was amazing," says Brittany. "Today I got to see the GRID in the Computing Centre, which was incredible, especially as I am such a computer science buff."

Brittany used cloud computing to create her winning project - a computer program that models neural networks to detect complex patterns of cancerous cells in biopsies of breast tissue. "The ultimate goal is for doctors all over the world to be able to access the programme, using it to diagnose patients while contributing more data so

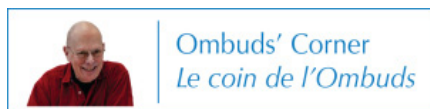


Brittany Michelle Wenger at CERN's SM18 Hall.

that it can 'learn' more and improve," says Brittany. "It's currently 99.1% sensitive to malignancy and may be hospital-ready. As I get more samples, this should increase."

"These aren't experiences that come along every day," she concludes, "and I've absolutely loved my time at CERN."

Katarina Anthony



Is our respectful workplace strategy working?

"I hope that the Code of Conduct will be a valuable tool in the maintenance and development of a workplace marked by mutual respect and understanding. We should familiarize ourselves with it, and incorporate it into our daily life at CERN."*

"The Organization does not tolerate harassment, which can result in administrative and/or disciplinary action."**

Our Code of Conduct ("the Code") sets the basic standards of ethical behaviour that we must first all set for ourselves. In addition, we are also entitled to expect our workplace colleagues to respect these standards. In biblical terms, if I may, the Code is an incentive for us to notice the beam obstructing our eyes and not focus on the speck in the eyes of our colleagues. In short, we should first look to ourselves to apply the Code. Managers, whatever their position, should be accountable for their team being aware of the Code and are acting according to its values - just as they are accountable for the technical achievements of their team.

Is having a Code enough to change people's behaviour? No, certainly not. To answer yes would be marvellous - but we should accept that it is not the case. Even some managers do not act according to its values and, if their upper management does not take action, they will be led to believe that they enjoy a kind of impunity due to their position or technical competence. Quick

action by management is the keystone of our strategy to build a respectful workplace environment. If this is not done, then a general umbrella of impunity will cover all unethical actions. As a result, our Code will go unheeded.

At the other end of the spectrum, we have our harassment policy. Only a formal procedure can lead to real managerial or administrative actions; an informal procedure with the Ombuds will not. But since the publication of the Operational Circular No. 9**, no harassment cases have been pursued through a formal procedure. Why? The reasons could be numerous: efficient informal treatment of cases, the culture of the house, fear of retaliation or the exhaustion of the alleged victims, feeling that the alleged harassers are protected and that no action will be taken? Whatever the reasons may be, it remains that this formal procedure - which is the only possibility that can lead to penalty - has yet to be used. Such circumstances also have the effect of favouring impunity.

In order for our strategy to build a better respectful workplace environment to work,

all possible means of conflict resolution should be considered normal. That includes formal procedures. It is equally important that management at every level embraces its responsibility to act quickly when it witnesses violations of CERN values.

It will take some time. As a Zen proverb says: "If a person does not reveal the truth, in the end the truth will reveal itself naturally." Let us not wait too long!

Conclusion:

We still have progress to make before we are "ensuring that CERN continues to pursue its mission in a manner that inspires trust and respect while maintaining a healthy and stimulating environment for all."

Vincent Vuillemin

* Rolf Heuer, Director General, CERN Code of Conduct

** Operational Circular No. 9 "Principles and Procedures Governing Complaints of Harassment"



"Security" is YOU!

Usually, people consider "Computer Security" a technical problem: firewalls, intrusion detection, anti-virus software, encryption... but I don't. I consider "Computer Security" being like swimming or crossing a road.

You usually don't actively think about your safety at all, you just do it. You just move your arms and legs or look "left-right-left" ("right-left-right" in countries of the British commonwealth or Japan). This was imprinted on us during our childhood... and I believe we should achieve the same for "Computer Security"!

So, like swimming or crossing traffic, I would like to see a similar culture evolve for "Computer Security". We need a new mind set. "Computer Security" starts with the human body sitting in front of the screen - the guy who configures a device, the lady who programs an application. "Computer Security" is a people problem, and it can only be solved by people, not by technique. It depends on us ensuring that our Windows/Linux/Mac/iOS/Android operating system is regularly patched. We should remember that passwords are personal and should never be shared. We should protect files and documents appropriately, and we should first take suitable training before writing software or configuring computing services. All this, of course, is independent to CERN. It applies to your life at home too.

Thus, make "Computer Security" a small part of your daily life - like swimming or crossing the road. I'm not asking for a big investment. Just you subconsciously thinking of doing IT the secure way whenever you touch a keyboard, mouse or touchscreen. Also recall that in the free academic environment of CERN, "Computer Security" has been delegated to you. You are, in first instance, responsible for the computer security of the laptops, smart phones and PCs you use, the accounts and passwords you own, the files and document you hold, the programs and applications you have installed or, in particular, you have written, and the computer services and systems you manage. The Computer Security Team is ready to help you assume this responsibility. Alternatively, you can delegate that responsibility to the IT Department who provides a multitude of secured computing services.

At CERN or at home, "Computer Security" is not complete without you!

For further information, please check our web site or contact us at: **Computer.Security@cern.ch**.

Computer Security Team



Pension payment dates in 2013

- Monday 7 January
- Thursday 7 February
- Thursday 7 March
- Monday 8 April
- Tuesday 7 May
- Friday 7 June
- Monday 8 July
- Wednesday 7 August
- Friday 6 September
- Monday 7 October
- Thursday 7 November
- Friday 6 December

End-of-year closure 2012/2013

As announced in the Bulletin N° 8-9/2012, the Laboratory will be closed from Saturday 22 December 2012 to Sunday 6 January 2013 inclusive.

This period consists of:

- 4 days' official holiday, i.e. 24, 25 and 31 December 2012 and 1st January 2013;
- 6 days' special paid leave in accordance with Article R II 4.38 of the Staff Regulations, i.e. 26, 27, 28 December 2012, and 2, 3, 4 January 2013;
- 3 Saturdays, i.e. 22, 29 December 2012 and 5 January 2013 and 3 Sundays, i.e. 23, 30 December 2012 and 6 January 2013.

The first working day in the New Year will be Monday 7 January 2013.

Further information is available from Department Secretariats, specifically concerning the conditions applicable to members of the personnel who are required to work during this period.

*Human Resources Department
Tél. : 73903*



CERN Bookshop Christmas sales

News from the Library

If you are looking for an idea for your Christmas gifts, CERN's Central Library Bookshop offers a wide choice of titles in physics, mathematics, computing and popular science.

The Bookshop will have a stand on the Ground Floor of the Main Building (Building 500) from 4 to 5 December 2012. You are welcome to come by, and browse and buy books at very competitive prices!

This Bookshop is located in the Central Library, Building 52 1-052, and is open on weekdays from 8.30 a.m. to 7.00 p.m. You can contact the Bookshop by e-mail. Accepted forms of payment in the Bookshop are: cash, credit card and budget code. You can also purchase books using your budget code via the CERN Stores: "Catalogue - CERN Stores" > "BOOKS - PUBLICATIONS" (category 90).

CERN Library

98th ACCU Meeting

The meeting will be held on Friday 7 December 2012 at 9:15 a.m. in room 60-6-002. Consult the draft agenda on <http://bulletin.cern.ch>.

Michael Hauschild (Secretary)



Take note

Latest from the TPG

With effect from 9 December, the TPG (Transports publics genevois) network will be introducing several improvements to its services:

- The existing 14 tram service (CERN - Bel-Air) will become the 18 (CERN - Stand), and its frequency will be increased to a tram every 10 minutes;

- The Y bus service (Ferney-Voltaire-Mairie - Val-Thoiry via CERN and Geneva airport) will also be improved:

- from Monday to Friday, there will be a bus every 15 minutes at rush hours (between 6.30 a.m. and 9.30 a.m. and between 4.30 p.m. and 7 p.m.), i.e. an increase of 50%;
- on Saturdays, the frequency of this service will be increased to a bus every 45 minutes;
- on Sundays, there will be one bus per hour throughout the day between 6 a.m. and midnight.

You can consult the details of these new services on the TPG web site, where you can download all information on the new services together with updated network maps from the *Les + du réseau* page.

In addition, on 15 January 2013, between 10:30 a.m. and 2:30 p.m., TPG officials will be on hand at a special stand near Restaurant No. 1 in CERN's Main Building:

- to provide you with further information on the public transport system (network maps, practical guides, information on prices, etc.)
- to answer any questions you may have and help you identify the best route to meet your needs.

Please note that it will not be possible to purchase tickets, season tickets or other material at the stand.

Mail Office

On the occasion of the annual closure of CERN, there will be no mail distributed on Friday 21st of December 2012 but mail will be collected in the morning.

Nevertheless, it will be possible for you to bring your mail for the departure until 12:00 at building 555-R-002.

Restaurant closures

Christmas Restaurant closures

Please note that the Restaurant 1 and Restaurant 3 will be closed from Friday, 21 December at 5 p.m. to Sunday, 6 January, inclusive. They will reopen on Monday, 7 January 2013.

Restaurant 2 closure for renovation

To meet greater demand and to modernize its infrastructure, Restaurant 2 will be closed from Monday, 17 December.

On Monday, 14 January 2013, Sophie Vuetaz's team will welcome you to a renovated self-service area on the 1st floor. The selections on the ground floor will also be expanded to include pasta and pizza, as well as snacks to eat in or take away.

To ensure a continuity of service, we suggest you take your break at Restaurant 1 or Restaurant 3 (Prévessin).

Novae Restauration

Information for cyclists

Please note that the temporary gate for cyclists on the Prévessin Site will be closed during the winter period starting on 3 December 2012.

From this date, until further notice, access to the Prévessin Site will be through the main gate only.

GS Department



Seminars

THURSDAY 6 DECEMBER

INDUCTION SESSIONS

08:30 INDUCTION PROGRAMME - 2nd Part

CERN (40-S2-D01 - SALLE DIRAC)

A&T SEMINAR

14:15 Status of ITER Magnet and Conductor Production

BY ARNAUD DEVRED (ITER)

CERN (500-1-001 - MAIN AUDITORIUM)

FRIDAY 7 DECEMBER

PARTICLE AND ASTRO-PARTICLE PHYSICS SEMINARS

08:00 Reserved for LPCC activities

CERN (4-3-006 - TH CONFERENCE ROOM)

DETECTOR SEMINAR

11:00 A novel detector and trends in physics

BY IOANIS GIOMATARIS (CEA - CENTRE D'ETUDES DE SACLAY (FR))

CERN (40-S2-B01 SALLE BOHR)

9 TO 15 DECEMBER

MISCELLANEOUS

08:00 Ühenädalane füüsikaõpetajate koolitus CERNis

CERN

TUESDAY 11 DECEMBER

TH STRING THEORY SEMINAR

14:00 TBA

BY OLIVER SCHLOTTERER

CERN (4-3-006 - TH CONFERENCE ROOM)

WEDNESDAY 12 DECEMBER

TH COSMO COFFEE

11:30 Millicharged Atomic Dark Matter and Dark Matter Direct Detection

BY WEI XUE (INFN, SISSA, TRIESTE)

CERN (4-2-011 - TH COMMON ROOM)

TH THEORETICAL SEMINAR

14:00 TBA

BY LEONARDO SENATORE (STANFORD UNIVERSITY)

CERN (4-3-006 - TH CONFERENCE ROOM)

ISOLDE SEMINAR

14:30 The Fukushima accident: from the tsunami to radiation monitoring across the globe

BY ANDREAS KNECHT (EIDGENÖSSISCHE TECHNISCHE HOCHSCHULE ZÜRICH/ETH (ETH))

CERN (26-1-022)



If you would like more information on a course, or for any other inquiry/suggestions, please contact Technical.Training@cern.ch

Valeria Perez Reale, Learning Specialist, Technical Programme Coordinator (Tel.: 62424)
Eva Stern and Elise Romero, Technical Training Administration (Tel.: 74924)

Electronic Design

Certified LabVIEW Associate Developer (CLAD)
Compatibilité électromagnétique (CEM): Applications
Compatibilité électromagnétique (CEM): Introduction
Effets des Radiations sur les composants et systèmes électroniques
LabVIEW for beginners
UNICOS-CPC Basic Course

Next Session

06-Dec-12 to 06-Dec-12
23-Nov-12 to 23-Nov-12
23-Nov-12 to 23-Nov-12
11-Dec-12 to 12-Dec-12
14-Jan-13 to 16-Jan-13
28-Jan-13 to 29-Jan-13

Duration

1 hour
3.5 hours
3 hours
1 day 4 h
3 days
4 days

Language

English
English
English
French
French
English

Availability

1 place
3 places
43 places
9 places
4 places
8 places

Mechanical design

ANSYS - Introduction à ANSYS Mechanical APDL
ANSYS CFX.
Applications de la cotation fonctionnelle et du langage ISO
AutoCAD 2012- niveau 1
CATIA V5 – Surfacique
CATIA-Smarteam Base

Next Session

04-Feb-13 to 07-Feb-13
10-Dec-12 to 13-Dec-12
06-Feb-13 to 08-Feb-13
22-Nov-12 to 30-Nov-12
14-Jan-13 to 15-Jan-13
26-Nov-12 to 14-Dec-12

Duration

4 days
32 hours
2 days 4 h
4 days
2 days
10 days

Language

English
English
French
French
French
English

Availability

7 places
3 places
6 places
3 places
3 places
4 places

Office software

CERN Document Server (CDS), Inspire and Library Services
CERN EDMS - Introduction
CERN EDMS for Local Administrators
Dreamweaver CS3 - Niveau 1
EXCEL 2010 - Niveau 2: ECDL
EXCEL 2010 - niveau 1 : ECDL
Expression Web - Niveau 1 (ex-Sharepoint Designer ou Frontpage)
Expression Web - Niveau 2 (ex-Sharepoint Designer ou Frontpage)
Indico avancé - Organisation d'une Conférence
Indico pour débutants - Organisation des Reunions
MS Project - niveau 2
Sharepoint Collaboration Workspace - niveau 1
Sharepoint Collaboration Workspace - niveau 2

Next Session

23-Nov-12 to 23-Nov-12
29-Nov-12 to 29-Nov-12
10-Dec-12 to 11-Dec-12
14-Jan-13 to 15-Jan-13
18-Feb-13 to 19-Feb-13
17-Dec-12 to 18-Dec-12
17-Jan-13 to 18-Jan-13
14-Feb-13 to 15-Feb-13
03-Dec-12 to 03-Dec-12
03-Dec-12 to 03-Dec-12
30-Nov-12 to 30-Nov-12
26-Nov-12 to 27-Nov-12
11-Feb-13 to 12-Feb-13

Duration

4 hours
8 hours
2 days
2 days
2 days
2 days
2 days
2 days
3 hours
2 hours
8 hours
2 days
2 days

Language

French
English
French
French
French
French
English
English
English
English
English
English
French

Availability

9 places
5 places
3 places
4 places
6 places
6 places
3 places
6 places
6 places
4 places
7 places
3 places
6 places

Software and system technologies

C++ Part 1 - Hands-On Introduction
Developing secure software
Drupal in a Day
Hadoop for Administrators
ITIL Foundations (version 3)
ITIL Foundations (version 3) EXAMEN
Introduction to Linux
Javascript/jQuery/AJAX course
Joint PVSS-JCOP Framework
Oracle Application Express APEX 4.1 (Web Applications with Oracle Application Express): Introduction

Next Session

18-Feb-13 to 21-Feb-13
21-Jan-13 to 21-Jan-13
15-Feb-13 to 15-Feb-13
03-Dec-12 to 05-Dec-12
28-Jan-13 to 30-Jan-13
22-Feb-13 to 22-Feb-13
04-Dec-12 to 06-Dec-12
13-Mar-13 to 15-Mar-13
21-Jan-13 to 25-Jan-13
10-Dec-12 to 12-Dec-12

Duration

4 days
3.5 hours
8 hours
24 hours
3 days
1 hour
3 days
3 days
4 days 3 h
3 days

Language

English
English
French
English
English
English
English
English
English
English

Availability

4 places
26 places
6 places
2 places
4 places
9 places
4 places
6 places
10 places
4 places



FRENCH COURSES

For registration and further information on the courses, please contact Kerstin Fuhrmeister.

Oral Expression

This course is aimed for students with a good knowledge of French who want to enhance their speaking skills. Speaking activities will include discussions, meeting simulations, role-plays etc.

The next session will take place from 28th January to 5th April 2013.

Writing professional documents in French

These courses are designed for non-French speakers with a very good standard of spoken French.

The next session will take place from 28th January to 5th April 2013.

General and Professional French Courses

These courses are open to all persons working on the CERN site, and to their spouses.

The next session will take place from 28th January to 5th April 2013.