

## WORLD-RECORD CURRENT IN A SUPERCONDUCTOR

In the framework of the High-Luminosity LHC project, experts from the CERN Superconductors team recently obtained a world-record current of 20 kA at 24 K in an electrical transmission line consisting of two 20-metre long cables made of Magnesium Diboride ( $MgB_2$ ) superconductor. This result makes the use of such technology a viable solution for long-distance power transportation.



Members of the CERN Superconductors and Superconducting Devices team in front of the test station.

"The test is an important step in the development of cold electrical power transmission systems based on the use of  $MgB_2$ ," says Amalia Ballarino, head of the Superconductors and Superconducting Devices section in the Magnet, Superconductors and Cryostat group of the Technology Department, and initiator of this project. "The cables and associated technologies were designed, developed and

tested at CERN. The superconducting wire is the result of a long R&D effort that started in 2008 between CERN and the manufacturer, Columbus Superconductors in Genova."

The result was achieved at a temperature of 24 K (about  $-249^\circ\text{C}$ ) using a test station that was purpose-designed and assembled at CERN. The temperature is kept homogeneous over the 20-metre length of the line by a



## TAKING CERN AND ESA TECHNOLOGY TO THE WORLD'S LARGEST INDUSTRY FAIR

Signed just two weeks ago, the new CERN-ESA agreement is already bearing fruit. This week, our two organisations went to the World's leading industrial fair, the Hannover Messe, with a joint stand showcasing technologies derived from particle physics and space research.

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# A word from the DG

## TAKING CERN AND ESA TECHNOLOGY TO THE WORLD'S LARGEST INDUSTRY FAIR

The notion that space brought us Teflon is something of a cliché, and of dubious veracity, while the World Wide Web is the technology most closely, and in this case correctly, identified with CERN. But technology transfer from ESA and CERN goes well beyond clichés: much of the technology we take for granted today can be traced back to basic research in the highly demanding research fields our organizations deal in. This is a message that both CERN and ESA strive to communicate, and the Hannover Messe gave us that opportunity.

But going to Hannover was about more than showcasing past success: it was first and foremost about laying the groundwork for future success. Much of the technology

developed by CERN and ESA pushes the envelope in disciplines as diverse as ultra high vacuum and lifecycle management, and it is incumbent on us to make sure that our innovations get to the people who can turn them into new technologies that will benefit mankind in ways that go beyond the laboratory. For that reason, we invited companies that have built on our technologies to share our stand, showcasing their products and passing the message to other industrialists that there's a lot more technology where that came from.

Going to the Hannover Messe is a new departure for CERN, though not entirely without precedent. We were there in 1977 showcasing the touch screen technology

that we'd invented for the control system of the SPS accelerator. That turned out to be an idea well ahead of its time, but it was nevertheless picked up by industry and commercialised for similar applications to that at CERN. We'd have to wait several decades, however, before finding that particular kind of technology in our pockets today.

I hope that our return to Hannover will become a regular fixture in the CERN-ESA calendar and that, as years go on, we'll be able to build a solid edifice of technologies that make the successful transfer from research to industry.

Rolf Heuer

# WORLD-RECORD CURRENT IN A SUPERCONDUCTOR

forced flow of helium gas. Following intense development, the full 2 x 20-metre long MgB<sub>2</sub> superconducting line was successfully powered to the world-record current of 20 kA, showing that this technology has great potential for the transmission of electrical power.

The superconducting properties of this relatively cheap material were discovered in 2001, but conductor technology only existed in the form of tape. Round wire, which is more appropriate for assembling into high-current cables, was not available when the CERN project started. "First, it was necessary to develop quality round wires adapted for use in this project, with high current density and uniform superconducting properties," explains Ballarino. "This work was done through a close collaboration between CERN and Columbus Superconductors, which manufactured different generations of wires with different architectures and with improved properties. In parallel, we at CERN developed the high-current cables and the electrical transmission line."

The project is part of the FP7 Hi-Lumi LHC Design Study. In the high-luminosity LHC configuration, the power converters supplying current to the superconducting magnets are planned to be moved from their present location in the LHC tunnel to

the surface or to radiation free underground areas and they will be connected to the magnets through a new cold powering system. A dedicated study in 2009 confirmed that electrical transfer lines based on the use of MgB<sub>2</sub> superconductor, having a critical temperature of 39 K, could be a viable and economical technology, bringing several advantages with respect to the conventional Nb-Ti bus cable used today for the LHC.

Further to the CERN initiative, MgB<sub>2</sub> superconducting technology was also proposed by Prof. Carlo Rubbia, scientific director of the Institute for Advanced Sustainability Studies (IASS) in Potsdam, for an innovative transmission line for long-distance transport of green power. "MgB<sub>2</sub> superconducting cables cooled by liquid hydrogen have been proposed for use in long-distance underground power transmission lines, with periodically spaced cryogenic cooling stations. A collaboration agreement between CERN and IASS was signed in March 2012 with the objective of proving the feasibility of the technology. The development was aimed at testing a 20 kA DC line operated at 20 K (-253 °C), which was also conveniently close to the CERN requirement for powering the magnets," confirms Amalia Ballarino. She concludes: "The result of our tests is a demonstration that such high-current cables can be operated at and above

the temperature of liquid hydrogen, and that the basic related technology is now proven."

To find out more, watch this video:



Antonella Del Rosso

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# LS1 REPORT: ALIVE AND KICKING!

Following eleven months of meticulous maintenance and consolidation works, the LHC's extraction kicker magnets (MKDs) and its pulse generators are back in the accelerator for a new phase of tests. Used to dump the beam, these kicker magnets are essential for the safety of the machine.



Pulse generators for the extraction kicker magnets at Point 6. The high voltage cables leading to the magnets can be seen at the top of the image.

LS1 co-ordinator for the LHC Beam Dumping System consolidation. "As we had noticed some limitations in the generators during the first run of the LHC, it was essential to completely consolidate them before the next run. One key update was the replacement of the generator's high voltage connections, which carry a staggering 20 kA and 30 kV!"

These high voltage connections, of course, also influence the performance of the kicker magnets themselves. During the shutdown, the TE-ABT-FPS team worked on replacing and repairing high voltage semiconductor switches within the MKDs. Some 4,500 components have been individually tested. Hardware tests are being carried out on these switches, as well as the entire kicker magnet chain. Further tests are also ongoing to verify the shape and timing of each magnet's pulse, and ensure that the magnets work together to influence the LHC beam.

"The LHC's kickers are utterly unique; no other magnet can generate such a strong pulse in such a short time," concludes Francesco. "But while this is what makes them special, it also makes them quite a challenge!"

"During this shutdown, we completely removed the kicker's pulse generators from the tunnel, and disassembled them in Building 867 for cleaning, checks and part replacements," says Francesco Castronovo,



Maintenance and consolidation works are performed on the pulse generators in Building 867.

laboratory conditions. These tests began at the end of last year and will take about three months. After this, a team from Operations will take over to ensure the kicker's performance reliability and repeatability. These tests will take a further six months.

## Meanwhile, elsewhere

In the LHC, the two major R2E cabling campaigns at Points 5 and 7 are now finishing within schedule, with new cables and connectors being tested. Over in sector 8-1, pressure tests took place on 8 April to qualify the interconnection consolidations. These have been very successful.

The SMACC project continues to progress. A major success was the installation of the final diodes on the quadrupoles at the beginning of the week. Shunts are now being installed across the LHC and the wagon welding the M line has entered its last sector.

Over in the PS, the POPS (POWer for PS) is currently being tested with high voltage and the second phase of tests on the new PS Access System was performed last week. "The global test week of the new PS PSS is almost complete," says Pierre Ninin, project leader of the PS complex safety system. "It has been very fruitful to test the interfaces, dependencies and behaviour of all the safety chains. The outcome is very positive and no critical issues have been found." The complete system will be validated during the DSO tests of each facility.

Meanwhile in the PS Booster, TE-EPC is testing the power converters and, at the SPS, everything proceeds under schedule.

Katarina Anthony

# PHYSICS AT 13 TEV: LHCb - A NEW DATA-PROCESSING STRATEGY

Originally, the LHCb detector was designed for operation with moderate luminosity and low pile-up. However, in 2010, the collaboration opted for "luminosity levelling", a novel solution which allows the experiment to adapt automatically to normal variations in luminosity which occur during an LHC run.



Image: K. Anthony/CERN

In this way, the detector operates optimally at all times. "For the second LHC run, we will

have to redefine the luminosity, to adapt to the conditions at the new energy of 13 TeV," explains Patrick Koppenburg, physics coordinator of the LHCb collaboration. "However, the most important experimental challenge for us will be the new trigger system."

The trigger rapidly sorts the most interesting data from the data that can be discarded without a significant loss of information. The zero-level (i.e. the first level) trigger system of LHCb "only" lets through one sixteenth of the initial data, but even that is too much to be stored permanently. "During the first run, the data which got through the zero-level trigger was treated using the algorithms Hlt1 and Hlt2, almost in real-time," says Patrick Koppenburg. "Then we observed that on certain crucial parameters such as lifetime acceptance, differences started appearing between the values of the trigger system and those calculated after analysis. So from January 2015, we will temporarily store to disk all the data filtered by Hlt1. Then, we'll run Hlt2 on the data after having calibrated

the detector. This procedure will enable us to eliminate most discrepancies at source, as the reconstruction of the data will be the same in the trigger system as in the final analysis."

The expectations of the LHCb collaboration for the second LHC run are focused on two topics: "In the first months, running at low luminosity, we'll do cross-section measurements at 13 TeV of the production of charm, the B particle, and the Z and W particles and, more generally, we'll measure the charged forward multiplicity," Patrick Koppenburg concludes. "Then we will continue to accumulate statistical data for our precision studies of b and charm physics."

Antonella Del Rosso



Image: K. Anthony/CERN

the shape of the expanding medium; and we will carry out multi-particle correlation studies."

The control of the experiment's operating luminosity is a challenge for ALICE. "We will need to monitor the beam overlap region carefully with our online systems to allow the experiment to run safely at its design luminosity and to ensure proper feedback to the LHC operators," says Antinori. "Sophisticated algorithms will be employed at the trigger level, to minimise the fraction of pile-up events in the sub-detectors, and offline, to deal with the residual pile-up."

The ALICE detector is installed at Point 2 of the LHC. Not far from the interaction area is the transfer line from the SPS for the injection of the clockwise beam into the LHC. Such a setup implies additional vacuum equipments and experiment protection systems such as collimators, which are a potential source of

Antonella Del Rosso

# PHYSICS AT 13 TEV: ALICE - SCRATCHING UNDER THE SURFACE

ALICE's wonderland materialises where the lead-lead ultrarelativistic collisions happen in the LHC. With a jump of over one order of magnitude in collision energy from the Relativistic Heavy Ion Collider (RHIC) and using state-of-the-art detectors, the experiment studies the quark-gluon plasma, a state of matter that existed during the Universe's infancy.

The hugely hot medium was observed to behave almost like an ideal fluid, which, although absorbing their energy, leaves single propagating quarks and gluons almost undeflected, enhances the production of strange quarks, suppresses the production of particles made of quarks and antiquarks, and seems to be emitting light in the early stages of its expansion. "The data from the first LHC run have already challenged some of the notions that had emerged from the previous RHIC programme," says Federico Antinori,

ALICE Physics Coordinator. "The abundance of hard probes, that is, high-energy particles that interact with the medium, has allowed us to get much clearer insights into the properties of this very peculiar state of matter. We have also had surprises in the study of proton-proton and proton-lead collisions, where intriguing signals of possible collective behaviour have been observed unexpectedly."

The higher-energy collisions of Run 2 will allow ALICE to dig deeper and explore farther

in this new land. "We expect a significant increase in the statistics for all types of collision systems. In addition, the increase in collision energy will translate into a further gain in the cross-sections for hard probes," explains Federico Ronchetti, ALICE Run Coordinator. "The increased statistics will allow us to perform much more detailed measurements. We will look at the production of several types of particles as a function of the orientation with respect to the collision plane; we will be able to classify events according to

# PHYSICS AT 13 TEV: TOTEM - A NEW ERA OF COLLABORATION WITH CMS

When two protons collide, the simplest thing that can happen is that they emerge with no loss of energy but with a slight change of direction. This is an example of "elastic scattering". Sometimes they lose some energy instead, a process called central diffraction, one of the diffractive phenomena that the Totem experiment observes in order to study gluon-gluon interactions.



Image: K. Anthony/CERN

common upgrade of the forward region (210-220 m from the interaction point) to perform diffractive physics studies on a common ground. "Totem and CMS will coordinate the use of their detectors to measure the total mass created in the collision with unprecedented accuracy," explains Nicola Turini, Totem Deputy Spokesperson.

In the next run, for the first time, data analysis will be performed in collaboration with CMS and using some common tools. Totem will, however, run alone for special runs dedicated to the measurement of the proton-proton cross section. The particle pile-up remains a significant issue for the experiment, whose specific setup does not allow scientists to reconstruct the collision vertex by looking only at the track geometry, because of the small angles of the incoming protons. "The main idea is to perform vertex matching by looking at the Time of Flight of the particles," explains Turini. "We are developing timing detectors to be inserted in the roman pots that will allow a complete reconstruction of the leading protons. In this regard, we foresee two possible scenarios: dedicated runs where

the beam collision directions are such that the pile-up can be kept to a minimum; or high-luminosity runs for which some new detectors, which are currently under study, will allow us to perform a very accurate pile-up rejection."

In order to meet the challenges of the new LHC run, the Totem collaboration is working on the development of new detectors, which will improve the performance of the experiment. "Some of these programmes will be carried out in the framework of a common Totem-CMS upgrade," says Turini. "The merging of the two experiments' expertise is growing and we will certainly have a very fruitful collaboration."

Antonella Del Rosso

# (RADIO)ACTIVE PARTICIPATION

This year, for the first time, CERN hosted the *Rencontres internationales lycéennes de la radioprotection*: a three-day event in which some 200 students from 16 schools in France and elsewhere came together to discuss the topic of radiation protection and to deepen their understanding of the field.



Participants of the Rencontres internationales lycéennes de la radioprotection 2014.

Each year since 2008, the *Centre d'étude sur l'évaluation de la protection dans le domaine nucléaire français* (CEPN, the French centre for studies of the evaluation of nuclear protection) and the *Institut de radioprotection et de sûreté nucléaire français* (IRSN, the French institute for radiation protection and nuclear safety), in partnership with various other bodies\*, have been organising radiation protection workshops. Aimed at students between the ages of 15 and 18 from France and beyond, who attend voluntarily and often in their own time, these workshops give the teenagers a deeper understanding of the scientific and social aspects of ionising radiation so that they can develop their own culture of radiation protection.

The students meet up with their teachers regularly over the school year for practical sessions on radiation protection themes, which the teachers choose in cooperation with experts. "These workshops have often given students the chance to meet experts in radiation protection and to make contact with local partners," explains Yann Donjoux, a member of CERN's Radiation Protection Group and the organiser of the 2014 *Rencontres*

*internationales de la radioprotection* event at CERN, "so it's also a great opportunity to find out more about the working world!"

To round off the hard work done throughout the year, the students are invited to the *Rencontres* event. The participants spend three days together presenting their work, exchanging ideas with other students and discussing the subject with the professionals. "This year, for the first time, these meetings were held at CERN," Yann enthuses. "So, from 31 March to 2 April, we played host to some 200 young people representing 16 schools and colleges in France, Germany, Morocco, Belarus, Ukraine and Japan!"

The programme included plenary sessions and exhibition stands run by the students, visits to CERN's Universe of Particles exhibition and the ATLAS, CMS, LHCb and ASACUSA experiments, as well as a trip to the city of Geneva and a chance to sample the famous Swiss fondue. "We were happy to have among us three students from a school in Fukushima, who came to talk about the current radiation levels in their town and tell us about life in Fukushima since the

tsunami," says Yann. "Professor Ryugo Hayano, ASACUSA spokesperson and professor at the University of Tokyo, also shared his personal experience of the disaster." Participants of the event also had the chance to learn all about the ALARA 360° system and the MediPix detectors being used by young researchers on the ARDENT project to detect cosmic rays. A packed schedule for these budding radiation protection experts.

\*The Pavillon des sciences de Franche-Comté, the Institut national des sciences et techniques nucléaires français (INSTN-CEA), the Autorité de sûreté nucléaire française (ASN), the Swiss Office Fédéral de Santé Publique (OFSP), the Association romande de radioprotection (ARRAD), the Société française de radioprotection (SFRP) and of course, this year, CERN.

Anaïs Schaeffer

# 2014 FAMELAB HEAT: CERN WELCOMES 11 NEW STARS OF SCIENCE COMMUNICATION!

The 2014 Swiss heat of the popular FameLab competition took place Thursday, 27 March at CERN. 11 young researchers from CERN, the Universities of Geneva, Lausanne and Neuchâtel, and the EPFL competed for the sought-after title of FameLab finalist. The winner and the four runners-up will participate in the Masterclass and the Swiss final, and just one will go on to represent Switzerland at the international Cheltenham Science Festival in the UK. Some of the participants share their feedback with us.



The FameLab 2014 contestants after their talks, at the Globe of Science and Innovation on 27 March.

**Miquel Oliu Barton (Swiss finalist):** Amazed by the other contestants' performances, I almost forgot the stage fright! But then I was given the hands-free microphone and knew the time had come to talk about my research to a large audience and to the cameras.... Both with fear and excitement, I played that three-minute game and, though it felt really short, I enjoyed it very much. The best part came afterwards, when I met the other contestants and the organisers, to whom I am truly grateful!

**Philippe Kobel (CERN heat winner and Swiss finalist):** The awesome surprise was the beautiful composition inspired by the Voyager spacecraft: space not only sends us beautiful images, but beautiful sounds as well! Who said it was silent?! I was also sooo honoured to have my prize announced by Claude Nicollier and to shake his hand! For me, who always dreamed of becoming an astronaut, who flew seven times in microgravity on board parabolic flights, Claude has been always a great source of inspiration and I have read his biography (*Espace Nicollier*) many times! So that was another prize, a priceless one. Many thanks for this wonderful day!

**Daniel Gallichan (Swiss finalist):** The biggest surprise for me was that the toilets at the Globe are such a long way away! This is not ideal when needing to participate in a somewhat nerve-wracking presentation! I had

a great day out, and am really looking forward to the Masterclass and the chance to compete again in Zurich - thanks again!

**Jennifer Fowlie (Swiss finalist):** I was very impressed by how well taken care of we were and how well organised the day was. I was most surprised by how good the competitors were. After the rehearsal sessions I was thinking that I didn't have a chance! I think that this means good things for the future of science communication. Thank you again for a fantastic day!

**Gianluca Valentino:** I enjoyed the fact that it wasn't only a competition, and there were also plenty of opportunities to network with other young researchers and to get valuable feedback on our public speaking and science communication skills. I look forward to participating in next year's edition!

**Giovanni Porcellana:** I found the opportunity to meet and stay in touch with so many other scientists with a strong will to explain and communicate their passions and achievements to others incredible and amazing. I see in that the bright future of science, not detached from the rest of the world, but fully integrated with people in every day life.

**Vibhuti Chhabra (Swiss finalist):** I expected the majority of participants to be from CERN

This video takes you behind the scenes of FameLab 2014 at CERN:



or maybe be Swiss, so the biggest surprise for me was that we were all from different countries, we all had different research backgrounds, but still I sensed that we were all really passionate about one thing, i.e. explaining to others what we had learnt and what we were working on at present. I didn't know anyone before coming to the event and yet I really felt very comfortable with them all.

**Christopher Hemmings:** I think the biggest surprise for me was the consistently high-quality talks from all the participants. That and how far away lunch was from Reception. Had I known, I would have worn my hiking boots.

**Samira Asgari:** What I liked particularly about FameLab was that it did not feel like a competition at all. Everybody was really friendly and there was a vibe of excitement and motivation in the air. Furthermore I learned new things during the day and from the speeches.

**Andrii Rogov:** I am really impressed with the level of organisation: a guided visit to the ATLAS detector, a short yet informative training before the competition and the small dinner afterwards. On top it was a real pleasure to meet people who are in love with science and who are willing to share their knowledge and passion. The biggest surprise for me was the special gift from the organizer - live music from Domenico Vicinanza. It is the first time I've heard about this music project and I believe Famelab organisers did a great job putting it into the event.

# FULL SPEED AHEAD!

When he's not working at CERN, Jean-Yves Le Meur is a top-level skier. Fresh from the Winter Paralympics in Sochi and the French disability snowsport championship, he has agreed to answer a few questions.



Jean-Yves tackles a giant slalom. Image:@FFH.

Few athletes can boast of having participated in the Olympic or Paralympic Games even once in their sporting career, let alone four times... But Jean-Yves Le Meur, a member of both CERN's IT-CIS Group and the French disabled ski team, tells me modestly during our interview that this is what he has achieved. While the skier might act like it's no big deal, it leaves me, amateur sportsperson that I am, dumbfounded.

A few weeks ago in Sochi, the sun shining a little too brightly, Jean-Yves left his fourth Paralympics with the same enthusiasm he had for the previous three, and the same bitter taste in his mouth: "Just like in the 2010 Winter Paralympics in Vancouver, I failed to finish the sitting slalom, despite months of preparation," he says regrettfully. "I launched into the slope [a 65° gradient], on which, unfortunately, I

hadn't had a chance to practise, and missed a gate in the middle of the course. Maybe I shouldn't have done so much training just beforehand!"

Two days later, Jean-Yves competed in the sitting giant slalom event, finishing ninth out of 41 competitors, meaning that, he's sad to say, he didn't bring any medals home: "We all go with hopes of making the podium," he continues, "and it's really tough coming home empty-handed." Empty-handed in Russia, maybe, but, competing in the French Championships barely a week later, Jean-Yves took first place in the slalom event and second in both the giant slalom and the boardercross, not forgetting the gold medal he won at the World Cup in Colorado in January this year, which is how he came to be selected for the Paralympic team.

Jean-Yves has certainly brought back his fair share of anecdotes from "Sochi, the most expensive Games in history". "The Opening and Closing Ceremonies were truly magnificent!" the skier still marvels. "The organisers, the volunteers, the supporters and the public were there for us the whole time and made sure that everything was perfect. But the most memorable thing was the Mexican wave that we [the French team] started when we entered the stadium for the Closing Ceremony. A Mexican wave by 50,000

spectators that lasted for 10 minutes with an incredible roar. Unforgettable!" Add to that a surprise meeting with Russian President Vladimir Putin, the warmth of the Russian public and a good atmosphere among the French team. "As always, I had the strong support of my colleagues and managers at CERN," Jean-Yves emphasises. "It's really good to know that the Organization is behind me!"

*If you'd like to find out more about Jean-Yves' participation in the Paralympic Games, head to the Georges Sand media centre in Saint-Genis-Pouilly at 8.30 p.m. on 15 May, when the Plume et Bémol association will be hosting a meet and greet with the skier.*

Anaïs Schaeffer



The French team at the Sochi Paralympic Games Opening Ceremony. Image:@FFH.

## ELENA GETS A ROOF OVER ITS HEAD

On Friday 11 April, CERN inaugurated the ELENA building (393) after less than a year's construction work.



Tacked on to the side of the Antiproton Decelerator (AD), this building will soon house a cleaning room, workshops and generators for the kickers in order to free space in the AD hall, where the future Extra Low ENergy Antiproton ring, ELENA, will be installed.

"Today we're celebrating the completion of a project which, I'm happy to say, has gone very well," exclaims François Butin, technical coordinator of the ELENA project (EN-MEF Group). "The deadlines and budgets have been perfectly respected and the building fully complies with our specifications. A

great vote of thanks to GS-SE and the outside contractors who have enabled us to complete this project."

Some 10,000 tonnes of earth had to be moved by around 500 trucks. The presence of the TT2 transfer tunnel directly beneath the building posed a number of technical challenges. An 800-mm thick shielding slab was implemented to protect the building from radiation.

Christian Carli, ELENA Project Leader (BE-ABP Group), adds: "The installation of the

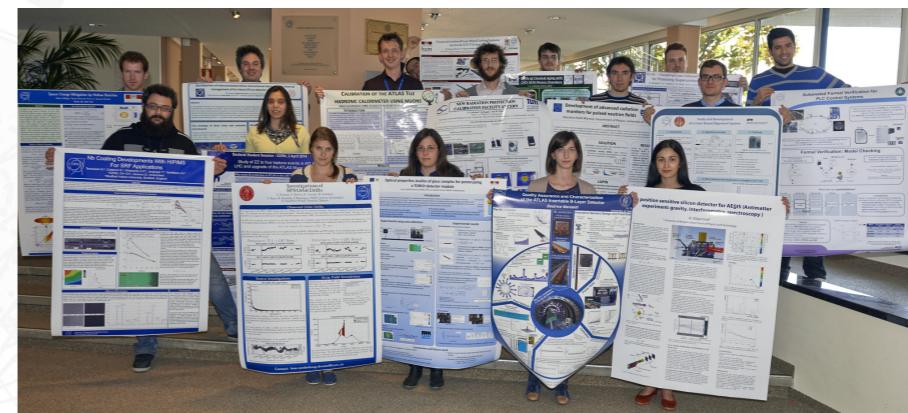
ELENA machine is approaching fast. The project's Technical Design Report has just been published and the work is progressing well, including on the transfer-line side." ELENA's magnetic deceleration ring, 30 m in circumference, will be installed in the AD hall mid-2015 and its research programme should begin two years later.

*For more information on the ELENA project, read our article in the Bulletin issue 26-27/2012.*

Anaïs Schaeffer

## ANOTHER SUCCESSFUL DOCTORAL STUDENT ASSEMBLY

On Wednesday 2 April, CERN hosted its third Doctoral Student Assembly in the Council Chamber.



CERN PhD students show off their posters in CERN's Main Building.

Speaking to a packed house, Director-General Rolf Heuer gave the assembly's opening speech and introduced the poster session that followed. Seventeen CERN PhD students presented posters on their work, and were greeted by their CERN and University supervisors. It was a very successful event!

Katarina Anthony

## Behind the scenes of GS

### OPEN SESAME!

The section in the GS-IS Group responsible for running the CERN Stores processes hundreds of orders per day, checks the quality of each and every product and is responsible for warehousing thousands of items available in a richly-stocked catalogue.

Sprawling across several buildings (73, 128 and 129), a total surface area of 3640 m<sup>2</sup>, and providing 28,300 cubic metres of storage space, the equivalent of 330 semi-trailers, the CERN stores are a veritable treasure trove! The products on offer range from office stationery and computer hardware to fire extinguishers, cables, steel and chemicals.

The CERN Stores catalogue contains nearly 48,000 referenced items, 12,000 of which are available on site. Goods arrive at either Building 194 (Meyrin) or Building 904 (Prévessin) and are then forwarded to the central stores in Building 73. "Every item that arrives here undergoes a strict quality control," says Manuel Sanchez Suarez, who

is responsible for the Stores within the GS-IS Group. "If it satisfies CERN's requirements, it's taken to a dedicated location for storage."

Since 2010, that "dedicated location" has been getting a face-lift – every year over the past four years, each of the seven industrial shelving systems which have served the



One of 13 industrial cutting machines in the raw material store. It can cut all types of materials with a precision of up to 100 microns, using a jet of water and sand under pressure.

Stores since 1977 has been replaced by state-of-the-art equipment. Five of these distributors, which are a bit like 11-metre high vending machines, have already been installed in the Central Stores. "These new storage devices are mainly used for warehousing small-volume articles, from high-tech components such as connectors and electronic parts to more conventional

items such as nuts, bolts and screws, ID cards, pens and other articles of stationery," explains Stores Operations Supervisor, Dominique Perez. "The goods are placed on mobile trays which are then activated by a dedicated programme once the desired reference has been keyed in."

For the launch of LS1 in 2013, a Safety section was specially created to enable teams working in the tunnels to acquire their safety equipment at short notice. Over the course of the year, some 1,457 pairs of safety shoes were sourced from the Stores. Over the same period, the Stores received more than 12,700 orders for cabling (for 5 MCHF) and 9,000 orders for connector components (for 2 MCHF). The CERN Stores are also responsible for distributing and checking self-rescue masks, which are obligatory for people working in the tunnels; every year, the Stores experts carry out safety checks on all 1,400 masks and replace any that need replacing.

Anaïs Schaeffer

Seventeen permanent staff are required to keep this behemoth in working order, controlling stocks, managing the warehouse and processing orders. Five of these run the raw material store. "Since CERN is an industrial-type site, we basically supply raw materials such as steel, stainless steel and wood, which we then cut down to size according to the customers' requirements," explains Manuel Sanchez Suarez. "For this we have 13 industrial cutting machines, some of which can reach a precision of 100 microns."

With 400 orders per day on average and an "urgency window" catering for up to 500 people per week, the CERN Stores are present at the start of all the Laboratory's activities, from the installation of superconducting cables in the LHC to the adjustment of the seat-back on your office arm-chair.

## Computer Security

### BYE, BYE, WINDOWS XP SECURITY... WELCOME INFECTIONS!

**Rest in peace, Windows XP.** Since your birth on 25 October 2001, you have struggled hard to survive this harsh Internet world. You fell prey to "Melissa", "Sasser" and "Conficker", and brought CERN its last large-scale infection with "Blaster" in 2004.

After being upgraded to "SP2", you discovered software development lifecycles, regular "Patch Tuesdays" and a local firewall that rejected everything by default. In the end, you outlived your weird brother "Vista" and survived as the ugly duckling cousin to the beautiful Mr. Mac. But all your ups and downs are over now. On 8 April 2014, you were given your very last security updates. These life-sustaining measures will be stopped now. Game over.

From now on, you are a zombie: presumed dead, but still kept running by your master/owner/user. They might not even understand that you now pose a risk to them. Viruses and worms are on the prowl, hunting for any Windows XP system still connected to the Internet. Unprotected and naked, you are now an easy target for infections.\* Web browsing and opening emails becomes Russian roulette with you.

It's best if your master gives you a facelift, and upgrades you to Windows 7 (or to Windows 8.1). Alternatively, your master might disconnect you from the Internet (see <http://network.cern.ch>, select Upgrade and uncheck "Internet Connectivity" at the bottom of that page), or, even better, from any network at all (just cut the cable). Putting you on a separated and isolated network would do, too. There you can wait for your retirement... along with your friends, Windows 95/98/NT/2000 and Windows server 2003, as well as your arch-enemies CERN Scientific Linux 3 or 4 and MacOS pre-version 10.6 ("Snow Leopard"). They shouldn't be here anymore either. Go away!

If you want to learn more about computer security incidents and issues at CERN, just follow our [Monthly Report](#).

Computer Security Team

\* Even if many anti-virus vendors, including Microsoft, will continue to provide anti-virus signature files, you'll still be a zombie. Only

you'll be a zombie wearing body-armour with some weak spots.

Check out our website for further information, answers to your questions and help, or e-mail [Computer.Security@cern.ch](mailto:Computer.Security@cern.ch).

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## Official news

### TAXATION IN FRANCE: MEMORANDUM CONCERNING THE ANNUAL INTERNAL TAXATION CERTIFICATE AND THE DECLARATION OF INCOME FOR 2013

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

For any other income, the Organization would like to remind members of the personnel that they must comply with the national legislation applicable to them (cf. Article SV 2.02 of the Staff Rules).

#### I - Annual internal taxation certificate for 2013

The annual certificate of internal taxation for 2013, issued by the Finance, Procurement and Knowledge Transfer Department, is available **since 21 February 2014. It is intended exclusively for the tax authorities.**

- If you are currently a member of the CERN personnel you received an e-mail containing a link to your annual certificate, which

you can print out if necessary.

- If you are no longer a member of the CERN personnel or are unable to access your annual certificate as indicated above, you will find information explaining how to obtain one here: [http://https://cern.ch/admin-eguide/impots/proc\\_impot\\_attestation\\_interne.asp](http://https://cern.ch/admin-eguide/impots/proc_impot_attestation_interne.asp).
- In case of difficulty in obtaining your annual certificate, send an e-mail explaining the problem to [service-desk@cern.ch](mailto:service-desk@cern.ch).

#### II - 2013 income tax declaration form in France

The 2013 income tax declaration form must be completed following the general indications available at the following address: [https://cern.ch/admin-eguide/impots/proc\\_impot\\_decl-fr.asp](https://cern.ch/admin-eguide/impots/proc_impot_decl-fr.asp).

If you have any specific questions, please contact your LOCAL SERVICE DES IMPÔTS DES PARTICULIERS (SIP, private citizens' tax office) DIRECTLY.

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

HR Department  
Contact: 73903

## Training

### PLACES AVAILABLE: HOW TO WRITE A COMPETITIVE PROPOSAL FOR HORIZON 2020

**Format:** Lectures and presentations

**Language:** English

**Duration:** 5 hours

**This training aims to help perspective proposal writers to prepare competitive proposals for projects under the new EU Horizon 2020 programme. Note: the course is not designed to address the specific aspects of Marie-Curie and ERC projects.**

**Contact:** Silvia Schuh, 79871, [silvia.schuh@cern.ch](mailto:silvia.schuh@cern.ch) or Nathalie Dumeaux, 78144, [nathalie.dumeaux@cern.ch](mailto:nathalie.dumeaux@cern.ch)

**Upcoming Sessions:**

9 a.m. - 1 p.m., 13 May 2014

**Sign Up in EDH!**

**Content:**

- Module 1: Structure and Terminology used in Horizon 2020
- Module 2: How the Research Topics were selected (Lobby)
- Module 3: How Proposals are Evaluated
- Module 4: How to Write the 'Potential Impact' of the Proposal
- Module 5: The One Page Proposal
- Module 6: How to Streamline Proposal Writing
- Module 7: How to Find the Best Partners

### LANGUAGE COURSES

#### General and Professional French Courses

The next session will take place from **5 May to 11 July 2014**.

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

For registration and further information on the courses, please consult our Web pages:

<http://hr-training.web.cern.ch/hr-training/> or contact Kerstin Fuhrmeister ([kerstin.fuhrmeister@cern.ch](mailto:kerstin.fuhrmeister@cern.ch)).

#### 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.

Suitable candidates should contact Kerstin Fuhrmeister (70896) in order to arrange an appointment for a test.

The next session will take place from **5 May to 11 July 2014**.

#### Writing professional documents in French

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

Suitable candidates should contact Kerstin Fuhrmeister (70896) in order to arrange an appointment for a test.

The next session will take place from **5 May to 11 July 2014**.

# Take note

## PRÉVESSIN SITE – PEDESTRIAN AND CYCLE ENTRANCES

Entrances for pedestrians and cyclists on *Route du Maroc* and on *Chemin du Moulin des Ponts*, in Prévessin, will be re-opened:

- from 7 April to 31 October 2014,
- from 7.00 a.m. to 9.00 a.m. and from 5.00 p.m. to 7.00 p.m. on working days (Monday to Friday).

**IMPORTANT:** all users must show their access cards to the security guard as a matter of course when passing through the gates, both on entering and leaving the site.

GS-DI

# Seminars

## TUESDAY APRIL 22, 2014

- 14:00 TH String Theory Seminar **TBA** TH Conference Room

## SUNDAY APRIL 20, 2014

- 18:00 HUPP Group - Turkish students meetings **Hupp C++**

## TUESDAY APRIL 22, 2014

- 14:00 TH String Theory Seminar **TBA** TH Conference Room

## WEDNESDAY APRIL 23, 2014

- 11:30 TH Cosmo Coffee **Phase transitions and asymptotic state of scalar field on de Sitter** TH common room
- 14:00 TH Theoretical Seminar **Cosmic birefringence and B-modes** TH Conference Room

## THURSDAY APRIL 24, 2014

- 11:00 Collider Cross Talk **Theory uncertainties in Higgs cross section calculations** TH common room
- 14:15 A&T Seminar **Status of the Chinese Accelerator Driven System (ADS) project** Kjell Johnsen Auditorium

## FRIDAY APRIL 25, 2014

- 14:00 Particle and Astro-Particle Physics Seminars **TBA** TH Conference Room

## TUESDAY APRIL 29, 2014

- 11:00 TH Exceptional Seminar **Mass gap and Floer homology in large-N Yang-Mills** TH Conference Room