CERN Bulletin

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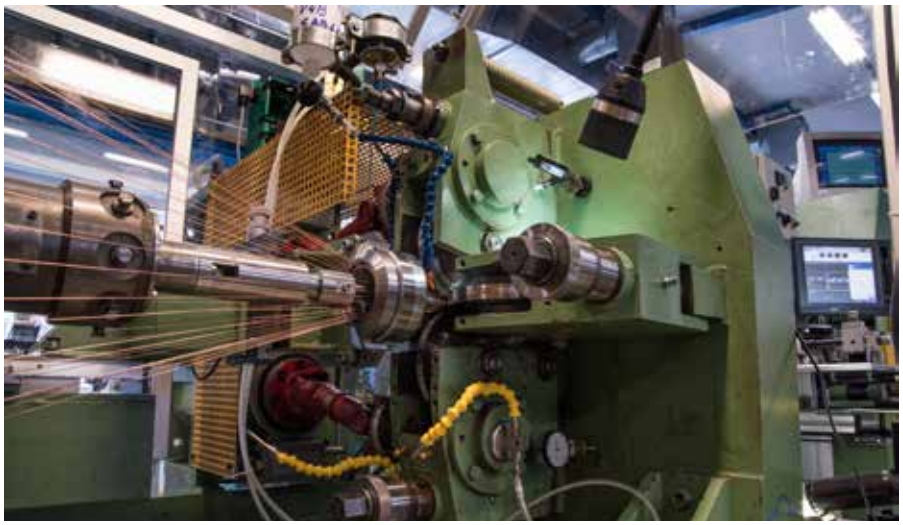
ONCE UPON A TIME, THERE WAS A BRITTLE BUT SUPERCONDUCTING NIOBIUM-TIN…

The production of the new niobium-tin cables for the high-performance superconducting magnets of the HL-LHC is now in full swing at CERN.



The Rutherford cabling machine is operating in the superconducting laboratory, in Building 163. (Photo: Max Brice/CERN)

Extraordinary research needs extraordinary machines: the upgrade project of the LHC, the High-Luminosity LHC (HL-LHC), has the goal of achieving instantaneous luminosities a factor of five larger than the LHC nominal value, and it relies on magnetic fields reaching the level of 12 Tesla. The superconducting niobium-titanium (Nb-Ti) used in the LHC magnets can only bear magnetic fields of up to 9-10 Tesla. Therefore, an alternative solution for the superconducting magnets materials was needed. The key innovative technology to develop superconducting magnets beyond 10 Tesla has been found in the niobium-tin (Nb_3Sn) compound.

This compound was actually discovered in 1954, eight years before Nb-Ti, but when the LHC was built, the greater availability and ductility of the Nb-Ti alloy and its excellent electrical and mechanical properties led scientists to choose it over Nb_3Sn.

The renewed interest in Nb_3Sn relies on the fact that it can produce stronger magnetic fields. In the HL-LHC, it will be used in the form of cables to produce strong 11-T main dipole magnets and the inner triplet quadrupole magnets that will be located at the ATLAS (Point 1) and CMS (Point 5) interaction points.

The Nb_3Sn wires that will be used in the coils of the HL-LHC magnets are made up of a copper matrix, within which there are several filaments of about 0.05 mm in diameter. These filaments are not initially superconducting, as they would be too brittle to withstand the cabling process and would lose their superconducting

(Continued on page 2)

In this issue

NEWS

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(Continued from page 1)

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properties. Therefore, the unreacted, not-yet-superconducting Nb_3Sn wires must first be assembled into cables and the cables then wound into a coil. Finally the coil must be heat-treated at about 650 °C for several days to make it superconducting via a complex reaction and diffusion process.

The cabling of the strands is done in the superconducting laboratory in Building 163 using a machine, which cables together 40 unreacted strands of Nb_3Sn into what is known as a Rutherford cable. The Rutherford cable is so far the only type of superconducting cable used in accelerator magnets. It consists of several wires that are highly compacted in a trapezoidal cross section to obtain high current density.

"The Nb_3Sn cables for the 11-T dipole magnet series and for the insertion quadrupole magnets have been developed by our section here at CERN," says Amalia Ballarino, head of the Superconductor and Superconducting Devices (SCD) section of the Magnets, Superconductors and Cryostats (MSC) group in the Technology department. "In the superconducting laboratory, in Building 163, we are now producing the series of cables for the new magnets that will be part of the HL-LHC."

There are several challenges connected to the cabling of the wires. First of all, the mechanical deformation due to the cabling must have a negligible influence on the shape, and therefore on the electrical performance, of the internal filaments. The deformed wire must be able to cope with the heat treatment without its performance deteriorating. To assure field quality, all the wires must be cabled, with the same tension, into a precise geometry across the whole cable length.

"With the HL-LHC, for the first time there will be Nb_3Sn magnets in an accelerator, it's a big responsibility", adds Ballarino. "For HL-LHC, we are not in an R&D phase anymore, and this means that we have reached the highest possible level of performance associated with the present state-of-the-art generation of Nb_3Sn wires," points out Ballarino. "Future higher-energy accelerators will require fundamental research on Nb_3Sn wire to produce even stronger magnetic fields," she concludes.

Stefania Pandolfi

LHC REPORT: IMAGINATIVE INJECTORS

A new bunch injection scheme from the PS to the SPS allowed the LHC to achieve a new peak luminosity record.

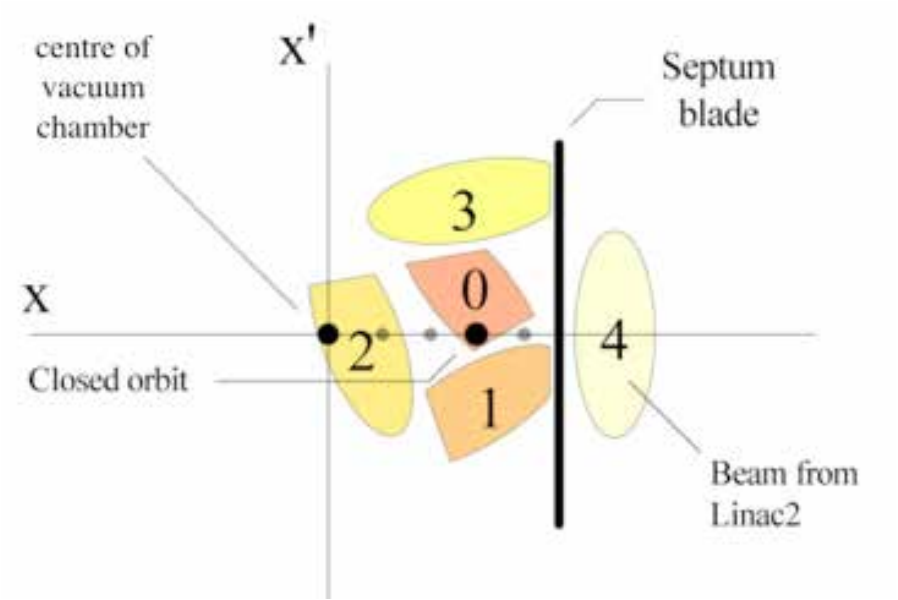


Figure 1: PSB multi-turn injection principle: to vary the parameters during injection with the aim of putting the newly injected beam in a different region of the transverse phase-space plan.

The LHC relies on the injector complex to deliver beam with well-defined bunch populations and the necessary transverse and longitudinal characteristics – all of which fold directly into luminosity performance. There are several processes taking place in the PS Booster (PSB) and the Proton Synchrotron (PS) acting on the beam structure in order to obtain the LHC beam characteristics. Two processes are mainly responsible for the beam brightness: the PSB multi-turn injection and the PS radio-frequency (RF) gymnastics. The total number of protons in a bunch and the transverse emittances are mostly determined by the multi-turn Booster injection, while the number of bunches and their time spacing come from the PS RF gymnastics. The emittance of a bunch is a combined measure of the transverse size and the angular divergence of the protons in a bunch. Smaller emittance means smaller beam size and, in this particular case, smaller beam sizes at the interaction points of the LHC and thus higher luminosity.

In providing beams to the LHC, the injectors have demonstrated remarkable flexibility, and on Saturday, 16 July the LHC made use of an imaginative beam production scheme called Batch Compression Merging and Splitting (BCMS), which offers significantly lower transverse beam size with respect to the nominal production scheme. Despite some blow-up in the LHC during the ramp, the BCMS beam gave an increase in peak luminosity of around 20% and a new record of 1.2×10^{34} $cm^{-2}s^{-1}$.

The multi-turn injection
The beam coming from Linac 2 is continuous and is injected sequentially into each of the four PSB rings. For each ring, the injection time can be longer than the proton revolution time. It is by choosing for how many turns beam is injected from Linac 2 into the PSB that the total beam intensity per ring is controlled. To inject more than one turn of continuous beam, the process relies on varying parameters during injection, such as the position of the beam at the injection point or the field in the main bending magnets. The aim is to put the newly injected and circulating beam in a different region of the transverse phase-space (figure 1). One consequence of such a process is that the more protons are injected, the larger the transverse emittance.

RF gymnastics and LHC bunch spacing
In order to obtain the 25-ns bunch spacing, a multiple of this value has to be found with the available PS RF harmonics: the PS has a length of 628 meters, giving a revolution time for the protons at 26 GeV of about 2.1 μs. The key harmonic to be reached is therefore H21. On H21, the bunch spacing will be 100 ns. Different RF harmonics are produced by the impressive range of RF cavities in the PS.

The nominal beam
Until recently, the nominal scheme to obtain the LHC production beam has used batches of two PSB cycles injected in a single PS cycle. Six PSB bunches are injected in the PS RF harmonic 7 (H7). The empty bucket is necessary for the PS and SPS kickers rise times. These six bunches are each longitudinally split into three to reach H21, then split in two, and again in two. This results in 72 bunches spaced by 25 ns.

The Batch Compression Merging and Splitting scheme
From the discussion of multi-turn injection into the PSB, it can be seen that to reduce the emittance it would be good to inject fewer turns into the PSB rings. So, instead of taking six PSB bunches into H7, the PS takes eight bunches into H9. The total intensity needed is then equalised between all eight slots available in the two PSB cycles. Accordingly, the injected intensity per ring is reduced. Therefore, a new scheme had to be invented by the PS RF team to obtain the required LHC beam parameters from eight bunches instead of six: the BCMS injection scheme.

First, a compression is performed by incrementing the harmonic number from H9 to H14. Then, a bunch merging puts the harmonic number back to seven. From this point, the RF gymnastics are similar to the nominal beam, with the bunches split in three, then two and two again. The number of bunches produced is different from the normal scheme: eight bunches are merged into four, multiplied by three, two and two again. The result is 48 bunches spaced by 25 ns, which is less than the nominal 72 bunches. Therefore, the PS and SPS have to perform more cycles to fill the entire LHC, but the gain in transverse emittance leads to higher beam brightness.

Pierre Freyermuth for the LHC team

VOICES OF ROMANIAN SCIENTISTS

As Romania has now become a Member State of CERN, Romanian scientists share their thoughts about this new era of partnership for their community.

Members of ATLAS from Romanian institutes at CERN (from left to right): Dan Ciubotaru, Michele Renda, Bogdan Blidaru, Alexandra Tudorache, Marina Rotaru, Ana Dumitriu, Valentina Tudorache, Adam Jinaru, Calin Alexa.

On 17 July 2016, Romania became the twenty-second Member State of CERN, 25 years after the first cooperation agreement with the country was signed. "CERN and Romania already have a long history of strong collaboration", says Emmanuel Tsesmelis, head of Relations with Associate Members and Non-Member States. "We very much look forward to strengthening this collaboration as Romania becomes CERN's twenty-second Member State, which promises the development of mutual interests in scientific research, related technologies and education," he affirms.

Romania's scientific community at CERN has grown over the years and currently numbers around a hundred visiting scientists involved in the LHC experiments ALICE, ATLAS and LHCb as well as NA62, n_TOF, ISOLDE and the Worldwide LHC Computing Grid. Some of these physicists share their thoughts about this new stage for their community.

"I am very proud and honored to be a member of the Romanian team in this very exciting moment when we become a Member State," comments Valentina Tudorache, a member of the ATLAS collaboration from the National Institute for Physics and Nuclear Engineering (IFIN-HH) in Bucharest. "I strongly believe that as a new Member State we will have the opportunity to contribute even more to CERN's mission particularly at this important time of the year while many analyses are under way so that we can publish LHC Run 2 results," she concludes.

"With Romania being a CERN Member State, we really hope that this will create the necessary conditions to enhance the synergies, with real benefits on both sides," declares Mihai Petrovici, head of the Hadron Physics department at IFIN-HH and leader of one of the Romanian teams within ALICE. "The Romanian scientific community has the chance to become more coherent, competitive and visible within the various research activities carried out at CERN. Having access to all CERN facilities on an equal footing with other Member States will have a significant impact on the efficiency and motivation of many researchers and young

talented students planning to join this field of research in Romania," he remarks.

"From the very beginning, we have received a huge amount of support from the CERN administration and we have been greatly encouraged by our colleagues," says Calin Alexa of IFIN-HH's Particle Physics department, who is also Romania's National Contact Physicist in ATLAS and head of his institute's ATLAS group. What it will change is that the Romanian groups at CERN will benefit from greater stability, increased confidence and a formal support structure. This stability is of a primary importance, especially for the funding agencies."

"The status of Romania as a Member State of CERN will have a major impact, especially for students, who will now have the opportunity to be much more involved in CERN experiments from a younger age thanks to the fellowship or summer student programmes," states Ana Elena Dumitriu, a PhD student in the ATLAS collaboration and member of the Department of Elementary Particle Physics at IFIN-HH.

"I don't see this as reaching a final destination, but rather as an important milestone in a long journey that we started many years ago," affirms Andrei Gheata, a member of CERN's EP-SFT group. "Romanian researchers, computer scientists, engineers and technicians have been participating in many CERN projects for quite some time, and I have witnessed a constant increase in this participation during the last 15 years," he continues. "I am confident that this will bring about many opportunities that will benefit both Romanian research and industry, while also contributing to CERN's mission to push the limits of knowledge and technology," he concludes.

Stefania Pandolfi

FIGHTING FIRES... WITH SCIENCE

CERN firefighters are working with a research centre in the United States to develop more effective firefighting techniques.

One of the UL FSRI's model houses is set alight... in the interest of science. (Photo: ©UL FSRI)

For around ten years, the Underwriters Laboratories Firefighter Safety Research Institute (UL FSRI) has been carrying out scientific research on the various techniques used by firefighters in the United States and around the world. This research has focused on evaluating the effectiveness and safety of current practices worldwide with the aim of developing even better techniques. In many cases the research has shown that a combination of techniques gives the best results.

Art Arnalich, who has worked with fire brigades in the United States and Europe and is now a member of CERN's Fire Brigade, has actively participated in this research since 2013. His knowledge of the techniques currently deployed on both sides of the Atlantic is much appreciated. "The UL FSRI laboratory has several life-size model houses that the researchers can set alight for their tests," explains Art Arnalich. "They have used them, in particular, to study the various tactics used to attack a fire. Some fire brigades prefer to fight fires from inside a building, others from the outside. But the researchers have shown that a combined internal/external approach, combined with the use of a ventilator at the entrance to the building to repel the smoke, is much more effective. Their work is really innovative; it's helping to improve the techniques used by firefighters all over the world!"

In the framework of the collaboration with UL FSRI, Art Arnalich and Javier Cuadrado, another Spanish-speaking firefighter from the CERN Fire Brigade, have worked in cooperation with eight Spanish-speaking

The interiors of the model houses are fully furnished. (Photo: ©UL FSRI)

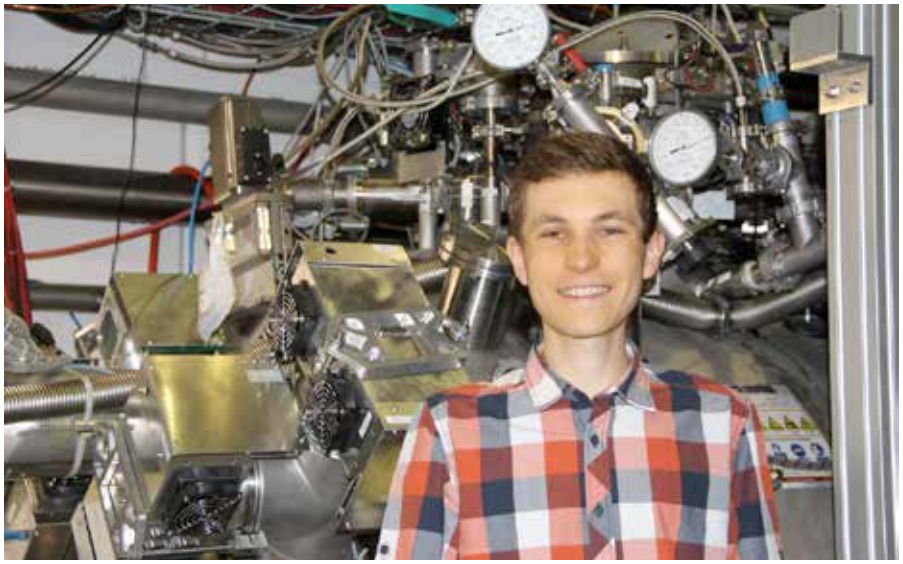
fire brigades from all over the world on the Spanish translation of Governors Island, a free online training programme that has already been followed by more than 30,000 firefighters worldwide. In addition, the Spanish audio for the training programme was recorded at CERN, with help from the Audiovisual Production service.

From 18 to 23 April, Art also participated as a guest instructor representing CERN at FDIC International 2016 in Indianapolis (United States), the world's biggest conference on firefighting techniques, which this year was attended by over 32,000 participants. Art gave a lecture on the differences between European and American techniques and the benefits of a combined approach, as demonstrated by UL FSRI. "At CERN, scientific research is part of our daily life," concludes Art, "and we know how essential it is for making progress. It's important for the firefighting world to be able to rely on sound research based on scientific data."

Anaïs Schaeffer

THE HUNDREDTH GENTNER DOCTORAL STUDENT HAS STARTED AT CERN

Almost ten years after the start of the programme in 2007, the hundredth Gentner Doctoral Student started his PhD at CERN.



The hundredth Gentner Doctoral Student, Christian Zimmer, in front of the AEgIS detector in the AD hall, where he will spend a significant portion of the next 3 years.

In 2007, the German Gentner Doctoral Student Programme was established at CERN, named in honour of the celebrated nuclear physicist Wolfgang Gentner, President of the CERN Council from 1972-74. On 1 July 2016, the 100th Gentner Doctoral Student, Christian Zimmer, started his PhD at CERN, where he will work on setting up the sympathetic laser cooling of antiprotons at the AEgIS experiment.

CERN's Doctoral Student Programme has been running for many years, with 200 students currently enrolled. The Gentner programme is fully integrated into the general CERN Doctoral Student Programme, but is entirely funded by the German Federal Ministry of Education and Research (BMBF). The programme sponsors 30 to 40 students for three years and is open to any EU nationals enrolled at a German university.

Many CERN groups have profited greatly from the Gentner programme. Lots of new and innovative ideas could not otherwise have been developed because of a lack of funding.

"The externally funded Gentner students give a unique opportunity for visions to become reality, and the programme is establishing new ties to research groups in Germany," says Michael Hauschild, coordinator of the programme.

The first 'Gentner Doktor' finished his PhD in 2011 and took up a position at the Karlsruhe Institute of Technology (KIT) in Germany. However, the majority of former Gentner students go on to pursue careers at CERN: about two-thirds of them became applied fellows and some are still employed here as staff. This indicates the excellent career prospects that the programme offers.

Christian Zimmer, the 100th Gentner PhD student, comments on his experience at CERN: "The framework of the Gentner programme at CERN offers a unique opportunity for me to contribute to the fascinating research that is performed here. For the next three years, I will be part of the AEgIS collaboration and will participate in the project aiming to cool antiprotons to temperatures in the range of millikelvins, which has never been done before. I am really excited about setting this up for the experiment."

Find out more information about the German Gentner Doctoral Student Programme at CERN here: ***http://cern.ch/go/l7mK***.

CERN Bulletin

EUCYS PRIZEWINNER VISITS CERN

Young Turkish student Baris Volkan Gürses visited CERN from 4 to 8 July after winning the prize in the 2015 European Contest for Young Scientists (EUCYS).

Baris Volkan Gürses, EUCYS prizewinner, visiting the Microcosm.

After winning both regional and national competitions in Turkey, 18-year-old student Baris Volkan Gürses competed against 169 young scientists and was awarded a visit to CERN by EIROforum for his physics project in EUCYS 2015.

His project, entitled "Generation of artificial gravity by using electrostatic force for prevention of muscle atrophy and osteoporosis occurring in gravity-free environments", focused on the design of a mechanism to help with the impact of spaceflight on the human body.

"My objective was to eliminate the negative effects of a gravity-free environment on astronauts who stay in space for longer periods of time, like in the International Space Station," explained Volkan.

"I designed a mechanism that would create an electric field and designed a suit to be worn by the astronauts and a plate to be placed on the floor of the spacecraft."

Using this mechanism, astronauts would have to use more force to overcome the pressure of the electric field and electrostatic force,

thereby minimising the effects of low-gravity environments such as osteoporosis and muscle atrophy.

His stay at CERN comprised a visit to see experiments such as CMS, ATLAS, SM18, AMS, and CLIC first hand, a meeting at the Theory department and a trip to the Globe of Science and Innovation.

"You hear about CERN and the experiments in the news from a more distant perspective," said Volkan. "But when you come here, there is a just seven-metre-thick wall between you and a world-renowned experiment. It was very exciting to be so close and see all the live data."

EUCYS was established in 1989 to encourage the interests of potential future scientists and to foster collaboration between science and society.

Volkan will begin attending the Georgia Institute of Technology in the United States in autumn 2016 and aims to major in electrical engineering.

Jennifer Toes

EIROFORUM GOES TO ESOF 2016

CERN and its partners from the EIROforum network participate in the EuroScience Open Forum, Europe's largest public-facing scientific event.

Sunday saw the opening of the seventh EuroScience Open Forum, which takes place every two years in a different European city. In 2016, it's Manchester's turn to host Europe's largest public-facing scientific event, and CERN is there along with our EIROforum partners.

Reflecting Manchester's historical and ongoing association with science and industry, the eight members of EIROforum have put together a programme of activity focusing on how science gives rise to innovation. The focal point of EIROforum's activity is a stand developed by the EIROforum Innovation Management and Knowledge Transfer working group, highlighting science and innovation. Sessions in the main programme will cover the science done at the EIROs and how they generate business value. A keynote session featuring the Directors-General of CERN and EMBL and the Science Director of ESO will cover the importance of science on a European scale.

Other EIROforum activities include sessions in the exhibition hall on innovation, business opportunities and working at the EIROs.

If you are interested in attending, you can still sign up for the event. Look out for the page in the programme covering all EIROforum's activities at ESOF, and for a session about SESAME, which will feature the work coordinated by CERN under the EU's CESSAMag project.

James Gillies

THE CERN & SOCIETY PROGRAMME LAUNCHES ITS NEWSLETTER

The newsletter will be issued quarterly. Sign up to remain informed about the latest initiatives of the CERN & Society programme!

The CERN & Society programme encompasses projects in the areas of education and outreach, innovation and knowledge exchange, and culture and creativity that spread the CERN spirit of scientific curiosity for the inspiration and benefit of society.

The programme is funded primarily by the CERN & Society Foundation, a charitable foundation established by CERN and supported by individuals, trusts, organisations and commercial companies. The projects are inspired or enabled by CERN but lie outside of the Laboratory's specific research mandate. We especially want to help young talent from around the world to flourish in the future.

The programme is now launching its newsletter, which will be issued quarterly. Everybody who wants to be informed about CERN & Society's activities, stay up-to-date with its latest initiatives and challenges and explore the possibilities to join in is invited to sign up here: **http://cern.ch/go/j9Ck**.

Matteo Castoldi

BIKE2WORK 2016 IS OVER – KEEP ON PEDALLING!

142 CERN teams cycled more than twice around the Earth in the thirteenth year of Switzerland's Bike2Work initiative.

Teams cycle to work at CERN's Meyrin site in June, as part of Bike2Work 2016. (Image: Sophia Bennett/CERN)

A record number of 142 CERN teams battled June rain to achieve ninth place in this year's SwissBike2Work competition, in terms of the number of participating teams.

Close to 54,000 employees from more than 1700 companies and organisations took part in this annual, national campaign, launched in 2004.

It aims to encourage commuters to grab a helmet and travel on two wheels, improving fitness and reducing congestion on the roads.

Overall, the CERN teams cycled 97,091 kilometres; amounting to a 15,000 kg reduction in carbon dioxide emissions, compared to what would have been produced by cars.

A 15% participation rate also placed us third among companies with 1000-5000 employees.

Both the *École polytechnique fédérale de Lausanne* (EPFL) and the *Eidgenössische Technische Hochschule Zürich* (ETH) had more teams than CERN: 149 EPFL teams cycled over two months and 209 ETH teams cycled over one month.

But it was the Paul Scherrer Institute's 67 teams who were crowned victorious in terms of distance cycled, accumulating an impressive 140,000 kilometres over May and June.

Despite this year's Bike2Work being over, there is no reason to put your bike away: a new cycle path is under construction between CERN's two sites and more showers are being installed.

What are you waiting for? Sign up to "*Bike To CERN through the year*" and join the ever-growing list of people adopting a healthier, more eco-friendly commute to work.

Kathryn Coldham

Bike2Work: facts & figures 2016

Participating companies/ organisations	1,773
Teams	14,171
Participants	53,922
Total km	10,250,969
CO_2-equivalents (kg)	1,640,155

SPACEFLIGHT PARTICIPANT VISITS CERN!

On 15 July, CERN welcomed spaceflight participant Anousheh Ansari.

Anousheh Ansari's grin stretches from ear to ear, during an intriguing conversation with Nobel laureate Samuel C.C. Ting at AMS POCC. (Image: Maximilien Brice/CERN)

Iranian-American Anousheh Ansari was the first-ever female spaceflight participant, spending eight days on the International Space Station (ISS) in 2006. She now has a new addition to her list of extraordinary sights – the home of the world's largest particle accelerator: CERN.

On 15 July, Anousheh Ansari came to CERN and, unsurprisingly, visited the control room of the experiment attached to the ISS: the AMS.

At the AMS Payload Operations Control Centre (AMS POCC) on CERN's Prévessin site, she met the Nobel laureate Samuel Ting, spokesperson of the AMS experiment.

Ansari and her accompanying guests were thrilled to expand their knowledge about CERN, its research and its people, as part of one inspiring, unforgettable day.

Kathryn Coldham

Computer Security

WWW CENSORSHIP? NOT AT CERN

Whoops! We received a number of critical responses to our previous article on the upcoming DNS firewall. While they were mostly constructive, the main question was "How dare we censor Internet access?" Let us clarify this.

Computer security at CERN must always find the right balance between CERN's academic environment, its operations and security itself. Of course we can easily overdo it one way or another, but that would kill our academic freedom and bring the Organization to a halt. That certainly isn't in our interest. On the other hand, CERN is permanently under attack and we have to do everything possible to ensure that those attacks are kept at bay. Otherwise they could impact CERN's operations… So, have we found the right balance?

Concerning access to the Internet and in particular to the web, we have not and will not block random websites because of their content unless – and this is crucial – unless the website hosts malicious content that could impact the operation of CERN's computers or accounts. Malware hosting sites are a good example, as browsing onto such a website might infect a large number of CERN Windows or Mac computers. This is why we blocked the website "20min.ch" a while ago (see our *Bulletin* article "Drive-bye" on this subject). Sites resembling the CERN Single Sign-On webpage and deliberately created for phishing attacks against CERN are also blocked as a protective measure. And we block Doppelgänger domains, i.e. domain names which resemble those of CERN (like "cem.ch") or are just one typo away from CERN's (like "cern.cg", etc.), in order to protect you against typo-squatting.

But that's it. We do not block webpages because of other, arguably undesirable content, whatever "undesirable" might mean. For example, we do not filter pornographic sites. Of course, the consultation of pornographic content violates the CERN Computing Rules and CERN's Code of Conduct and I doubt there is anyone at CERN with a professional need to consult such material, but we do not block them (just monitor their illicit usage). Hence, in response to the question: "How dare we censor Internet access?" the answer is: "We don't dare: we do not censor at all. We believe in and value academic freedom at CERN and aim to balance our computer security measures accordingly."

For further information, questions or help, check: ***https://security.web.cern.ch*** *or contact us at* ***Computer.Security@cern.ch****.*

Do you want to learn more about computer security incidents and issues at CERN? Follow our Monthly Report: ***https://security.web.cern.ch/security/reports/en/monthly_reports.shtml***

Stefan Lueders, Computer Security Team

Ombud's Corner

DUE CREDIT!

Patents, copyrights, trademarks… there are many ways to protect intellectual property and yet, despite these precautionary measures, it seems that colleagues sometimes still slip up: plots done by one person are used in another's presentation without being appropriately credited, citations are wrongly assigned, references are inaccurate…

Plagiarism and misappropriation do not only happen in the worlds of art, music and literature. Often in our world, during the preparation phase of a scientific paper or even just in their daily work, scientists are required to share the work of many contributors and sometimes they do not keep track of who did what. No-one minds as long as this stays within the limits of teamwork, in which credits are distributed evenly and nobody's contribution gets forgotten. Problems arise however, when one person's work ends up being presented by another without the correct credit, or indeed when someone is held back from presenting work because it contributes to a result that someone else needs for promotion or other purposes.

Mary works on the first phase of a project during her fellowship before moving on to other responsibilities within the collaboration. The project is completed a few months later and to her surprise she learns that a senior colleague has presented the final results without any reference to her contribution, although her findings had been critical to the subsequent orientation of the work. When she raises the matter with the project leader, he brushes off her concerns, saying that it was crucial for the senior colleague's CV to get an indefinite position, as he was a key player in the team. Mary feels that the work was critical for her own CV but does not dare to take the issue further as she too hopes for a future position on the team.

CERN's Code of Conduct clearly states that we are expected to comply with the value of Integrity by "ensur[ing] that we credit others for their contribution".

This guideline applies to all CERN contributors, but in case of doubt, it is surely the supervisor's responsibility to ensure there is no misappropriation of credit in the work done by a team. Where fellows are concerned, there is an additional responsibility for the Organization to provide a learning experience that is correctly represented so as to assure the best possible career development opportunities for them in the future.

Ensuring that individuals are recognised for their contributions while at the same time promoting teamwork can sometimes be a challenge for supervisors whose main focus is on getting the work done, but there can be no doubt that this is a vital component in the longer-term motivation and productivity of their teams. Indeed, while the CERN Code of Conduct rightly protects intellectual property under its value of *Integrity*, this guideline also needs to be balanced with its value of *Creativity*, which invites contributors to "share with internal parties any information that could benefit them in their work." In large collaborations involving many people, if individuals occasionally fall prey to blind spots regarding shared work, it is up to supervisors to ensure that there is absolutely no ambiguity as to where the lines of credit lie.

From fellows and students to senior scientists, we all contribute in our own ways to the success of our projects – so too do we all deserve appropriate recognition for the parts we play in this complex scientific endeavour.

All previous Ombud's Corners can be accessed in the Ombud's blog: ***http://cern.ch/go/p9ZS****.*

Sudeshna Datta-Cockerill

Official news

DON'T LEAVE YOUR BAGGAGE UNATTENDED

"Don't leave your baggage unattended" is a familiar request to anyone who travels by air, but it's good advice wherever you may be.

At CERN, if an unattended bag is found anywhere on the site, the Fire and Rescue service will be called to evacuate the area, maintain a security perimeter for as long as necessary, and attempt to identify the owner. If the owner cannot be found in a reasonable amount of time, there's a very strong chance that the bag will be destroyed. You can take two simple steps to avoid this fate:

- Don't leave your baggage unattended;
- Make sure that your contact details are clearly visible on the bag or suitcase so that, should you find yourself separated from it, you can easily be reunited.

PROCEDURE FOR OBTAINING VISAS FOR SWITZERLAND AND FRANCE - SIGNATURE RIGHTS

In accordance with the Status Agreements with CERN, Switzerland and France facilitate the entry of members of the Organization's personnel on to their territories. Where relevant, detailed procedures for obtaining visas apply.

Within the framework of those procedures, only the following individuals are authorised to initiate the *Note verbale* procedure as well as to sign the Official Invitation Letters and the *Conventions d'accueil*.

1. Kirsti ASPOLA (EP – CMO)
2. Maria BARROSO LOPEZ (IT – DI)
3. Catherine BRANDT (DG – DI)
4. Michelle CONNOR (TH – GS)
5. Gaëlle DUPERRIER (EP – AGS)
6. Patrick FASSNACHT (EP – ADO)
7. Fernando FERNANDEZ SAVORGNANO (HR – TA)
8. Nathalie GOURIOU (EP – AGS)
9. Nathalie GRÜB (EP – AGS)
10. Laurie HEMERY (BE – ASR)
11. Cécile NOELS (ATS – DO)
12. Tania PARDO (EP – AGS)
13. Maria QUINTAS (HR – TA)
14. Kate RICHARDSON (EP – AGS)
15. Jeanne ROSTANT (TH – GS)
16. Ulla TIHINEN (EP – AGS)
17. Emmanuel TSESMELIS (IR – REL)

The French and Swiss Authorities will reject any request signed by a person who is not on this list.

We would like to remind you that in accordance with the memorandum of 7 December 2000 issued by the Director of the Administration, (ref. DG/DA/00-119), "the Organization shall not request any legitimisation document (or residence permit) or visa from the Host States for persons registered as EXTERNAL" (people who do not hold a contract of employment, association or apprenticeship with CERN).

We would also like to remind you that those coming to CERN should find out in good time about the conditions of entry to Switzerland and France applying to them and ensure that they obtain the requisite visas, where applicable, in the country in which they are habitually resident.

Useful information can be obtained from the Swiss and French diplomatic representations abroad, as well as from the following Web pages:

- **https://www.sem.admin.ch/sem/en/home/themen/einreise.html** (Swiss State Secretariat for Migration) ;
- **http://www.diplomatie.gouv.fr/en/coming-to-france/** (French Ministry of Foreign Affairs and International Development).

The Authorities of the Host States have informed the Organization on a number of occasions that they insist upon scrupulous compliance with visa legislation.

Relations with the Host States Service
http://www.cern.ch/relations/
relations.secretariat@cern.ch
Tel.: 72848

ADMINISTRATIVE CIRCULAR NO. 11 (REV. 4) - CATEGORIES OF MEMBERS OF THE PERSONNEL

Administrative Circular No. 11 (Rev. 4) entitled "Categories of members of the personnel", approved by the Director-General following discussion in the Standing Concertation Committee meeting on 29 April 2016, will be available on 1 August 2016 via this following link: https://cds.cern.ch/record/2201552.

This revised circular cancels and replaces the Administrative Circular No. 11 (Rev. 3) also entitled "Categories of members of the personnel" of September 2014.

The main changes concern the status of apprentices and their transfer from the category of employed members of personnel to associated members of personnel.

This circular will enter into force on 1 August 2016.

Department Head Office
HR Department

Learning

SAFETY TRAINING: "*HABILITATION ÉLECTRIQUE* - NON-ELECTRICIAN - INITIAL" COURSE IN SEPTEMBER

The next "*Habilitation électrique* - Non-Electrician - Initial" course will be given, in French, on 12 September 2016.

This course is designed for anyone required to safely perform simple non-electrical operations. Grade of authorisation: B0-H0-H0V.

There are places available. If you are interested in following this course, please fill in your EDH training request via our catalogue: **http://cern.ch/go/8Sfd**.

Safety Training, HSE Unit

Take note

NEW AIDA-2020 CALL FOR BREAKTHROUGH DETECTOR TECHNOLOGIES

Physicists, engineers, and industry will be interested in a new proof-of-concept fund for breakthrough projects from the general field of detector development and testing.

Launched in the framework of the European project AIDA-2020, this open call will provide up to 200k€ of seed funding to support innovative and societal applications with a focus on industry-oriented applications. The deadline for applying is 20 October 2016.

For more information:
http://cern.ch/go/6ClG

CERN ANNOUNCES THE FOURTH ANNUAL BEAMLINE FOR SCHOOLS COMPETITION!

CERN is pleased to announce the fourth annual Beamline for Schools (BL4S) competition. Once again, in 2017, a fully equipped beamline will be made available at CERN for students. As in previous years, two teams will be invited to the Laboratory to execute the experiments they proposed in their applications. The 2017 competition is being made possible thanks to support from the Alcoa Foundation for the second consecutive year.

The competition is open to teams of high-school students aged 16 or older who, if they win, are invited (with two supervisors) to CERN to carry out their experiment. Teams must have at least five students but there is no upper limit to a team's size (although just nine students per winning team will be invited to CERN). Teams may be composed of pupils from a single school, or from a number of schools working together.

As science-loving mega-celebrity Will.I.Am told us: "If you're interested in science, technology, engineering or mathematics you should sign up: if I was a kid I'd do the same thing."

Previous winners have tested webcams and classroom-grown crystals in the beamline, others have studied how particles decay and investigated high-energy gamma rays. What would you do?

Interested? Think of a simple, creative experiment and pre-register your team in order to receive the latest information about the competition and to hear when the proposal submissions open.

Not sure if you should apply? Don't be scared: a clever idea is all it takes to enter the competition. We can put every team in contact with experts who will help them to refine their ideas, and extensive documentation is available to both teachers and students.

Don't miss this unique opportunity! BL4S does more than just give high school students a chance to play with real, functioning scientific equipment: it exposes a host of students and teachers to particle physics and gives them the chance to be real scientists.

You can find out more about how to apply, about the beamline and facilities, and about previous winning teams on the BL4S website. **The deadline for submissions is 31 March 2017.**

Take part!

BL4S team

NEW SHUTTLE STOP IN FRONT OF THE SAFETY TRAINING CENTRE

Since the 4 July, a free shuttle runs between the Meyrin and Prévessin sites every 45 minutes.

You can consult the timetable of the Circuit 2, stop "Safety Training Centre" (Blgd. 6959) here: **http://cern.ch/go/x7gz**.

‘LIGHTNING TALKS’ FROM THE CERN OPENLAB SUMMER STUDENTS | 15 AND 18 AUGUST 2016

On Monday 15 and Thursday 18 August, this year’s CERN openlab summer students will present their work in dedicated public ‘lighting talk’ sessions.

In 5-minute presentations, each CERN openlab summer student will introduce their project, explain the technical challenges and describe the results of what they have been working on for the past few weeks.

This year, the CERN openlab Summer Student Programme is hosting 39 students representing 21 different nationalities for nine weeks.

The lightning talks will take place **in the IT Amphitheatre (31/3-004) from 15:00 to 18:00 on Monday 15 August and Thursday 18 August.**

For more information, please visit the CERN openlab website and the Indico pages ***https://indico.cern.ch/event/557789/*** *and* ***https://indico.cern.ch/event/557791/****.*

Andrew Purcell

Seminars

THURSDAY, 28 JULY 2016

09:15 **Summer Student Lecture Programme Course** Search for BSM Physics at Had. Colliders (3/3) **Main Auditorium**
10:20 **Summer Student Lecture Programme Course** Physics at Future Colliders (1/3) **Main Auditorium**
11:25 **Summer Student Lecture Programme Course** Physics and Medical Applications (1/3) **Main Auditorium**

FRIDAY, 29 JULY 2016

09:15 **Summer Student Lecture Programme Course** Physics at Future Colliders (2/3) **Main Auditorium**
10:20 **Summer Student Lecture Programme Course** Physics at Future Colliders (3/3) **Main Auditorium**
11:25 **Summer Student Lecture Programme Course** Physics and Medical Applications (2/3) **Main Auditorium**

MONDAY, 1 AUGUST 2016

08:30 **Monthly induction** HR INDUCTION PROGRAMME - 1st Part **Globe of Science and Innovation - 1st Floor**
09:15 **Summer Student Lecture Programme Course** Monte-Carlo Techniques (1/2) **Main Auditorium**
10:20 **Summer Student Lecture Programme Course** Introduction to Cosmology (1/3) **Main Auditorium**
11:25 **Summer Student Lecture Programme Course** Physics and Medical Applications (3/3) **Main Auditorium**

TUESDAY, 2 AUGUST 2016

09:15 **Summer Student Lecture Programme Course** Monte-Carlo Techniques (2/2) **Main Auditorium**
10:20 **Summer Student Lecture Programme Course** Astroparticle Physics (1/3) **Main Auditorium**
11:25 **Summer Student Lecture Programme Course** What is String Theory? **Main Auditorium**

WEDNESDAY, 3 AUGUST 2016

09:15 **Summer Student Lecture Programme Course** Astroparticle Physics (2/3) **Main Auditorium**
10:20 **Summer Student Lecture Programme Course** Collimation Systems (1/2) **Main Auditorium**
11:25 **Summer Student Lecture Programme Course** Introduction to Cosmology (2/3) **Main Auditorium**
14:30 **e-learning** e-learning-interest-group meeting - products, videos and plans **513-1-024**

THURSDAY, 4 AUGUST 2016

09:15 **Summer Student Lecture Programme Course** Astroparticle Physics (3/3) **Main Auditorium**
10:20 **Summer Student Lecture Programme Course** Collimation Systems (2/2) **Main Auditorium**
11:25 **Summer Student Lecture Programme Course** Introduction to Cosmology (3/3) **Main Auditorium**

FRIDAY, 5 AUGUST 2016

10:15 **Summer Student Lecture Programme Course** Closing Lecture **Main Auditorium**