CERN Bulletin

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YOUR GUIDE TO THE CERN OPEN DAYS

Essential information for the CERN community, from showcasing the Lab as a volunteer to site access and road closures

One of the visit sites during the 2013 Open Days (Image: CERN)

On 14 and 15 September, CERN will open its doors to the public from 9.00 a.m. to 6.00 p.m. Held every five to six years, during a Long Shutdown, the CERN Open Days are an exceptional opportunity to discover the Laboratory's installations and meet the people behind the science and technology. You are one of these people, and you can be a CERN ambassador by taking part in the many planned activities and sharing your personal experiences with the visitors.

Activities

Thanks to the fantastic commitment of all departments and many external contractors, more than 150 activities are planned on nine different sites : Meyrin, Prévessin, SM18, LHC1-ATLAS, LHC2-ALICE, LHC4, LHC5-CMS, LHC6 and LHC8-LHCb. Showcasing the diversity of CERN's science, technology and people, the weekend will provide an opportunity to explore experiments, buildings and sites, to play with hands-on activities for all ages, to interact at talks, debates and shows, and to visit the LHC and its detectors.The complete list of activities is available on the Open Days website (*https://opendays.cern/activities*).

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A WORD FROM CHARLOTTE LINDBERG WARAKAULLE

CERN OPEN DAYS – EXPLORING THE FUTURE TOGETHER

On the weekend of 14-15 September, CERN will again be throwing its doors wide open to welcome thousands of visitors from around the world coming to explore the future with us. We expect in the region of 30 to 40 thousand people each day, which is a sign of how excited people are about what we do and the exciting scientific future that lies ahead.

(Continued on page 2)

In this issue

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A WORD FROM CHARLOTTE LINDBERG WARAKAULLE

CERN OPEN DAYS – EXPLORING THE FUTURE TOGETHER

Open Days have become a key part of CERN's outreach. They allow us to showcase our passion for research, to show our openness and diversity in all its forms – so important in today's world – and to enjoy the simple pleasure of interacting with visitors from all corners of the globe who share our curiosity.

Our guests come to CERN to see our fantastic installations, but it's the people they meet here that they will remember the most. That's why our Open Days volunteers are so essential. Over 2700 of you have signed up, which is just overwhelming. Many colleagues from across the Laboratory have been working on preparing the Open Days for months, taking time from already very busy schedules. I'd like to thank you all for the enthusiasm and the commitment that make the Open Days so special.

You will not regret it – being part of the CERN Open Days is an opportunity that only comes around every few years, and it's an experience that everyone who does it treasures. It will doubtless leave you exhausted, and with a head full of indelible memories. If you've volunteered, you are an ambassador for science, for CERN, and for the values that this institution holds dear and that will sustain its future, for the unique spirit that is CERN. It's a vitally important role, but the most important thing of all is that you enjoy yourselves.

Have a great weekend!

Charlotte Lindberg Warakaulle
Director for International Relations

YOUR GUIDE TO THE CERN OPEN DAYS

Also, remember that on Friday, 13 September, the CERN community, as well as their families and friends, can register to visit underground sites. There are still a few places available and members of personnel do not need to submit a formal absence request to take part.

Volunteers

You can register as a volunteer (*https://espace.cern.ch/OD2019/Volunteers/_layouts/15/start.aspx#/SitePages/Welcome%20-%20Bienvenue.aspx*) until Friday, 6 September. More than 2700 volunteers have already signed up but we still need more to fill the many roles that remain open, especially on Sunday afternoon. Wherever you work at CERN and whatever your regular activities, everyone will have a role to play, from shop assistant to tour guide. More information about roles, shifts and training can be found here (*https://espace.cern.ch/OD2019/Volunteers/_layouts/15/start.aspx#/Lists/Roles%20and%20trainings*).

Visitors

Outside your slots as a volunteer, you can also attend the Open Days as a visitor. Even if you feel you know CERN well, the event will allow you to find out more about the Laboratory's activities and meet colleagues from other departments in a friendly atmosphere. Around 30 000 people have already registered for each day, but tickets are still available. Registration guarantees you access to the Open Days and indicates your point of arrival. All activities and visits are then accessible on a first-come, first-served basis, more details can be found here (*https://opendays.cern/plan-your-visit*). Remember that places will be limited for visits to the LHC, but there is so much to discover on the surface. If you register as a visitor, please complete the visitor survey before the event by clicking on the link in the registration confirmation e-mail.

Mobility, parking and logistics

With an estimated 30 000 to 40 000 visitors per day, we expect traffic disruption in the neighbouring area. To minimise this, CERN has worked closely with the local authorities to develop parking and mobility procedures. More information about these can be found here (*https://opendays.cern/plan-your-visit/getting-here*). Everyone is strongly encouraged to use public transport, car share, walk or cycle to CERN.

The Globe car park will not be available throughout the weekend (from Friday noon to Sunday 8.00 p.m.), so please plan to leave your car elsewhere. There will be dedicated parking areas for volunteers on each site. These spaces are also available for those of you working over the weekend for the Open Days or the normal running of the Laboratory. You can also use the parking areas for visitors.

Between 7.45 a.m. and 7.30 p.m. each day, only pedestrian access will be possible on all sites, except for service vehicles, duly identified with a pass. Some parkings reserved for volunteers will be accessible during the day; please check this website (*https://espace.cern.ch/OD2019/Volunteers/_layouts/15/start.aspx#/SitePages/Access%20and%20parking%20-%20Acc%C3%A8s%20et%20parking.aspx*).

Safety and the environment

It's a “safety first” event and considerable effort has been made to ensure the safety and comfort of participants. All buildings, facilities and spaces that will be accessible are being cleared of equipment and made safe for our visitors. Access, capacity and evacuation procedures for visits to super-

vised areas, especially the LHC and detectors, are in place. There will be more than 90 tents across the nine sites and many kilometres of barriers, to safely guide visitors around the sites.

We care about the environment. Drinking water will be provided and, to avoid single-use plastics, drinks will be served in recyclable "Open Days" cups, available for a small deposit. You are of course free to keep these cups as souvenirs. The restaurants and food trucks around the site have been encouraged to provide drinks on tap.

Digital communications

You can find more details about the Open Days on the event's website and app. To ensure the event is as paper-free as possible, the app will serve as the main means of communication with visitors.

If you would like to post about the event on social media, use the hashtag #CERNOpenDays and take note of the social-media guidelines for the CERN community (*https://admin-eguide.web.cern.ch/en/procedure/social-media-guidelines*).

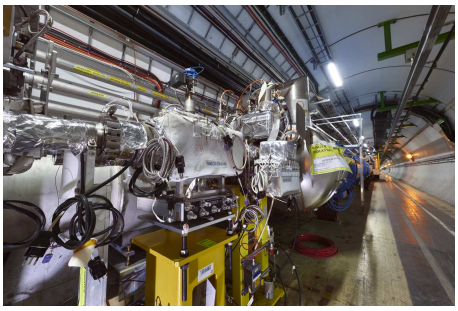
Accessing CERN for normal duties during the Open Days weekend

We hope that everyone will want to volunteer and/or visit for the Open Days. However, if you wish to access your usual workspace, you will be able to use your CERN card to access the sites on foot. Please note that access by car to the Meyrin site will be restricted to Gates C and E and only possible before 7.45 a.m. and after 7.30 p.m. on both days. If you have friends and family with you, they should use the visitors' registration desks and entrances for the Open Days.

Many thanks in advance to everyone for all the work that has been and is still being put into preparing these Open Days and making them happen. It's set to be an unforgettable event!

INSTALLING HIGH LUMINOSITY IN THE TUNNEL

The first definitive component of the High-Luminosity LHC, an absorber designed to protect the machine, has been installed in the LHC



The TANB absorber was installed in the LHC tunnel to protect the accelerator components from particles produced by collisions occurring in the LHCb experiment. (Image: Maximilien Brice/CERN)

The component concerned, known as a TANB, is the first definitive component of the High-Luminosity LHC to be installed in the Large Hadron Collider tunnel. An inauguration ceremony on Friday, 30 August, marked the arrival of this piece of equipment for the future collider.

The High-Luminosity LHC, which will be commissioned in 2026, will boost the performance of the current accelerator by substantially increasing the number of collisions in the experiments. Luminosity, which corresponds to the number of potential collisions per second per surface unit, is a crucial indicator of an accelerator's performance. The higher the luminosity, the higher the probability of new discoveries.

Increasing the number of collisions, and therefore the number of particles in circulation, requires the protection of the LHC's equipment to be reinforced, as particles that diverge from the trajectory can collide with sensitive components such as superconducting magnets and interfere with their operation. Protection is particularly important near the experiments. The billions of collisions occurring every second inside the detectors create the particles that are studied by the physicists. While almost all of these particles shoot off into the detector that surrounds the collision point, a miniscule number of them are emitted towards the tube where the beam circulates and can therefore reach the accelerator equipment.

The aim of the TANB absorber is thus to protect the accelerator equipment by stopping the particles near the LHCb experiment. During the current second long technical shutdown that will continue until 2021, the LHCb experiment will undergo major upgrades to enable it to record five times as many collisions from 2021 onwards. This collision rate will be kept at the same level for the LHCb when the High-Luminosity LHC comes into service.

"Two of the same type of absorbers are already used on either side of the ATLAS and CMS experiments," explains project leader Francisco Sanchez Galan. "However, we had to come up with a new design for LHCb, notably owing to a lack of space inside the accelerator." Space is at a premium in the LHC, especially around the experiments. Therefore, it was necessary to design the simplest and most compact absorber possible.

Simplifying things can sometimes turn out to be very complicated. After a detailed design study and numerous simulations, engineers proved that it was possible to design an absorber that was more compact yet just as effective by positioning the equipment further away. Several models were proposed and the optimal absorber was finalised on paper before being manufactured in Germany. It measures only 65 centimetres in depth, as opposed to 5 metres for previous models.

An innovative positioning table was developed at the same time. "All its actuators are positioned on the side with easy access. We had to develop this model because the lack of space makes difficult the adjustment of traditional tables on all four sides, and in addition we needed to limit intervention time," says Francisco.

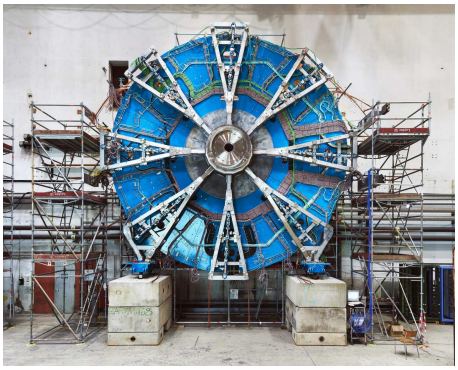
Finally, the TANB's integration was complicated by the lack of space. "Moving components and modifying the beam line allowed us to proceed millimetre by millimetre," underlines Francisco. Mission accom-

plished, “thanks to the collaboration between numerous teams”, he smiles. Two TANB models have now been installed on both sides of the LHCb, ready for the next collision run and high luminosity.

Corinne Pralavorio

LS2 REPORT: ATLAS UPGRADES ARE IN FULL SWING

The assembly of the new muon small wheels and the upgrades on the electronics and trigger systems are progressing well



One of the new small wheels of ATLAS, which you can see at Building 191 during the CERN Open Days (Image: CERN)

A few months ago, the ATLAS Collaboration presented its schedule for the second long shutdown 2 (LS2) concerning the detector's repair, consolidation and upgrade activities. Since then, the experiment's LS2 programme has been refined to best meet needs and constraints.

Although ATLAS was originally supposed to install two new muon detectors in the forward regions (new small wheels) – measuring 9.3 metres in diameter and developed to trigger and measure muons precisely despite the increased rate of collisions expected at the High-Luminosity LHC (HL-LHC) – only one will be installed during LS2. “While considerable progress has been made on the assembly, the second wheel will not be ready before the end of LS2. So we decided to aim for installing that one in the next year-end technical stop (YETS, at the end of 2021),” says Ludovico Pontecorvo, ATLAS Technical Coordinator. A replacement of the first small wheel (on side A of the detector) is foreseen for August 2020.

Another major component of the Phase-1 upgrade for ATLAS is the improvement of the trigger selection for the operation at the future HL-LHC, which requires new electronics to achieve a higher resolution of the electromagnetic calorimeter's trigger. It also involves upgrading the level-1 trigger processors, and installing new electronic cards for the trigger and data-acquisition (TDAQ) system. “The installation of new electronics for the liquid-argon calorimeter is proceeding smoothly and we are advancing through the different stages of production for the TDAQ deliverables. The upgrade of the infrastructure and the necessary maintenance work is almost completed. The first phase of our HL-LHC upgrade programme has started,” says Ludovico Pontecorvo.

In parallel, the consolidation of the detector system is progressing according to schedule. “We have replaced cooling connectors connecting the modules of the tile calorimeter to the overall cooling infrastructure in almost all 256 modules of the calorimeter and the standard maintenance of the read-out electronics is ongoing. In addition, the scintillators located between the central barrel and the extended barrels of the tile calorimeter are currently being installed,” adds Ludovico Pontecorvo.

ATLAS teams are also preparing for the following long shutdown (LS3, starting in 2024), which will see the installation of an all-new inner tracker. Located at the centre of the ATLAS detector, the role of the inner tracker is to measure the direction, momentum and charge of electrically charged particles produced in each proton–proton collision. During LS3, an all-silicon inner tracker will replace the current one, using state-of-the-art silicon technologies to keep pace with the HL-LHC rate of collisions. The manoeuvre to lower and insert this new element (2 m in diameter, 7 m long) looks arduous, so, in March, the team in charge of its installation took advantage of the shutdown to practice the procedure in the cavern with a mock-up of the tracker. The two lowering options tested required a great meticulousness, given that, at the worst moment, the margin was only a few centimetres.

** Don't miss the ATLAS new muon small wheel at Building 191 during the CERN Open Days on 14 and 15 September!*

Anaïs Schaeffer

SUPPORTING THE NEXT GENERATION OF HIGH-TECH ENTREPRENEURS

The CERN Entrepreneurship Student Programme (CESP) held its second residency recently

(Image: Lars Andreassen/CERN)

On 21 August, the second CERN Entrepreneurship Student Programme

(CESP) drew to a close with the 14 participating students presenting their final projects. After a unique five-week residency at the Laboratory, the students proposed new ventures based on CERN's technologies and expertise and their applications to society.

Finding application areas and market opportunities for technologies developed for a specific purpose at CERN can be challenging. But with coaching from experts in technology and entrepreneurship, as well as mentorship from CERN's Knowledge Transfer group, the students have developed four promising projects with the potential of becoming start-up companies in the near future.

CESP is a great opportunity to learn about entrepreneurship while working together with people from all over the world.

– CESP Student 2019

The first team presented a concept using the C2MON framework to use agricultural data to better predict and improve production in greenhouses. The second team wants to use CERN's Structured Laser Beam for microplastics detection in wastewater, and are already in contact with potential customers and partners for further testing. Conversations about joint test projects are also ongoing for the third team, focusing on post-fire surveillance of wildfires using a flame detector developed at CERN. The final team presented a way to use CERN's REMUS framework for industrial control and monitoring at construction sites.

CESP was organised for the first-time last summer, and is a part of CERN's effort to foster a culture of entrepreneurship and nurture the next generation of high-tech entrepreneurs. It is supported by the CERN & Society Foundation, established to enhance CERN's beneficial footprint on society. The programme is aimed at master's level students with combined backgrounds in technology and entrepreneurship. Throughout the programme, the students explored and evaluated CERN technologies, looking for application areas outside of high-energy physics. The participants have the opportunity to come back to CERN, in order to continue developing their projects.

Thanks to this programme, I can make a difference by working on ideas that contribute to society.

– CESP Student 2019

View more photos on CDS (*https://cds.cern.ch/record/2688182*)

In 2019, like in 2018, CESP was made possible thanks to the generous support from entrepreneur William Hurley, also known as 'whurley'. Additional support was received from the Arconic Foundation. T he highly competitive and popular programme will be arranged again in 2020 and 2021. The CERN & Society Foundation is looking for additional donors to expand the programme. Applications for next year's edition will open in early 2020.

Silje Uhlen Maurset

SENSOR USED AT CERN COULD HELP GRAVITATIONAL-WAVE HUNTERS

A new seismic device developed by CERN and JINR is now being tested at the Advanced Virgo detector

Aerial view of the Advanced Virgo detector, where a precision laser interferometer used at CERN was installed and is being tested (Image: Virgo collaboration)

It started with a relatively simple goal: create a prototype for a new kind of device to monitor the motion of underground structures at CERN. But the project – the result of a collaboration between CERN and the Joint Institute for Nuclear Research (JINR) in Dubna, Russia – quickly evolved. The prototype turned into several full-blown devices that can potentially serve as early warning systems for earthquakes and can be used to monitor other seismic vibrations. What's more, the devices, called precision laser inclinometers, can be used at CERN and beyond. The researchers behind the project are now testing one device at the Advanced Virgo detector, which recently detected gravitational waves – tiny ripples in the fabric of space-time that were predicted by Einstein a century ago. If all goes to plan, this device could help gravitational-wave hunters minimise the noise that seismic events cause on the waves' signal.

Unlike traditional seismometers, which detect ground motions through their effect on weights hanging from springs, the precision laser inclinometer (PLI) measures their effect on the surface of a liquid. The measurement is done by pointing laser light at a liquid and seeing how it is reflected. Compared to weight–spring seismometers, the PLI can detect angular motion in addition to translational motion (up-and-down and side-to-side), and it can pick up low-frequency motion with a very high precision.

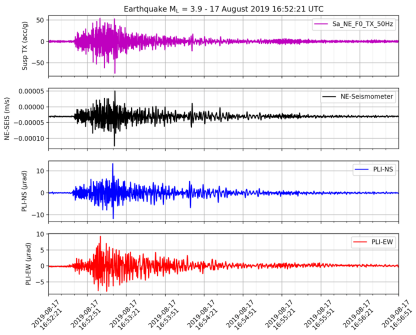
“The PLI is extremely sensitive; it can even detect the waves on Lake Geneva on windy days,” says principal investigator Beniamino Di Girolamo from CERN. “It can pick up seismic motion that has a frequency between 1 mHz and 12.4 Hz with a sensitivity of 2.4 × 10^{-5}µrad/Hz ^{½},” explains co-principal investigator Julian Budagov from JINR. “This is equivalent to measuring a vertical displacement of 24 picometres (24 trillionths of a metre) over a distance of 1 metre,” adds co-principal investigator Mikhail Lyablin, also from JINR.

The team assembled and tested the PLI prototype at JINR and at CERN's TT1 tunnel. It performed so well that it showed

the potential to be a helpful early warning seismic system for the High-Luminosity Large Hadron Collider (HL-LHC) and other machines and experiments. The Large Hadron Collider and its proton beams are extremely robust to seismic activity, but the HL-LHC will use narrower beams to increase the number of proton–proton collisions and as a result the potential for particle-physics discoveries. This means beams are more likely to go off centre in the event of a high-magnitude earthquake with an epicentre relatively close to CERN. PLIs located at several points around the machine could serve as early warning systems for such events.

Given the PLI's potential, the HL-LHC project has provided support to the team for the constructionof several new PLIs. One is already installed at the Garni Seismic Observatory in Armenia and another has been deployed with the support of CERN's Knowledge Transfer group and Italy's INFN institute to the European Gravitational Observatory in Italy, where Advanced Virgo is located. The Virgo PLI is the result of a collaboration that started after the APPEC conference in November 2018, triggered by the JINR Director-General and encouraged by CERN Management. The collaboration went so smoothly that, less than a year later, the Virgo PLI was tested.

The results from the first tests are encouraging. With just 15 minutes of data taken on 6 August, the PLI picked up the same signals as devices already installed at Virgo, and from that day onwards it started running continuously and detected several small-magnitude earthquakes. The Virgo and PLI teams are now setting up the flow of data from the PLI to the Virgo data system. This will make it easier to compare data from different seismic devices and to assess the PLI's potential impact on Virgo's operation and detection of gravitational waves. “Virgo and the two LIGO detectors in the US have recently begun another search for gravitational waves, one that will reach deeper into the universe than previous searches,” says former Virgo spokesperson Fulvio Ricci from La Sapienza University, Rome. “We're confident that the PLI can play a part in this important search,” he added.

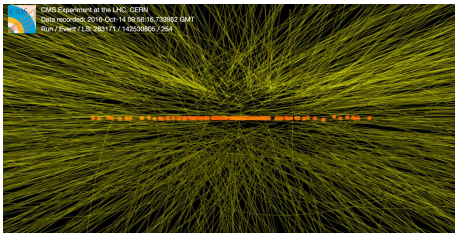


The PLI (bottom two plots) picked up the same signals as devices already installed at Virgo (top two plots) for an earthquake in Northern Italy on 17 August (Image: Beniamino Di Girolamo/CERN)

Ana Lopes

FROM CAPTURING COLLISIONS TO AVOIDING THEM

How CERN machine-learning techniques could improve autonomous vehicles



Around 100 simultaneous proton–proton collisions in an event recorded by the CMS experiment (Image: Thomas McCauley/CMS/CERN)

With about one billion proton–proton collisions per second at the Large Hadron Collider (LHC), the LHC experiments need to sift quickly through the wealth of data to choose which collisions to analyse. To cope with an even higher number of collisions per second in the future, scientists are investigating computing methods such as machine-learning techniques. A new collaboration is now looking at how these techniques deployed on chips known as field-programmable gate arrays (FPGAs) could apply to autonomous driving, so that the fast decision-making used for particle collisions could help prevent collisions on the road.

FPGAs have been used at CERN for many years and for many applications. Unlike the central processing unit of a laptop, these chips follow simple instructions and process many parallel tasks at once. With up to 100 high-speed serial links, they are able to support high-bandwidth inputs and outputs. Their parallel processing and re-programmability make them suitable for machine-learning applications.

The challenge, however, has been to fit complex deep-learning algorithms – a particular class of machine-learning algorithms – in chips of limited capacity. This required software developed for the CERN-based experiments, called “hls4ml”, which reduces the algorithms and produces FPGA-ready code without loss of accuracy or performance, allowing the chips to execute decision-making algorithms in micro-seconds.

A new collaboration between CERN and Zenuity, the autonomous driving software company headquartered in Sweden, plans to use the techniques and software developed for the experiments at CERN to research their use in deploying deep learning on FPGAs, a particular class of machine-learning algorithms, for autonomous driving. Instead of particle-physics data, the FPGAs will be used to interpret huge quantities of data generated by normal driving conditions, using readouts from car sensors to identify pedestrians and vehicles. The technology should enable automated drive cars to make faster and better decisions and predictions, thus avoiding traffic collisions.

To find out more about CERN technologies and their potential applications, visit kt.cern/technologies.

An FPGA-based readout card for the CMS tracker (Image: John Coughlan/CMS/CERN)

Kate Kahle

BIKE2WORK GOES FROM STRENGTH TO STRENGTH

Over 980 members of the CERN personnel took part in Bike2Work in 2019

Participants from the 2019 edition (Image: CERN)

For the first time, CERN participated in the Bike2Work initiative for two consecutive months, May and June. 245 teams pedalled close to 300 000 km, corresponding to a reduction in CO_2emissions of over 42 tonnes.

CERN therefore came fifth in terms of the number of participants among all the companies in Switzerland taking part. This year, the Bike2Work initiative brought together almost 72 000 participants from 2400 companies across Switzerland, 11% more than last year.

At CERN, various improvements have been made in recent years to encourage cycling, including new showers, the new cycle path between the Meyrin and Prévessin sites, the installation of bike repair stations and better road markings for increased safety.

Cycling at CERN is a year-round pursuit, as evidenced by the Bike to CERN programme. Join the community at: https://espace.cern.ch/bike2CERN/Pages/default.aspx

CERN OPENLAB SUMMER-STUDENT PROGRAMME CLOSES WITH LIGHTNING TALKS

Attendees at the second session of this year's lightning talks (Image: Hans Baechle/CERN)

Forty students were selected from over 1600 applicants for this year's CERN openlab summer-student programme. On 13 and 15 August, they presented the projects they have been working on over the past two months in a series of five-minute "lighting talks".

Through these projects, the students have been working hands-on with a range of cutting-edge computing technologies, including machine learning, data analytics, neuromorphic computing and much more.

The students' talks — in which they briefly outlined the results of their work, as well as the technical hurdles they have had to overcome — are available to watch on CDS (first session (*https://cds.cern.ch/search?f=490__a&p=First%20CERN%20openlab%20summer%20student%20lightning%20talk%20session*) ; second session (*https://cds.cern.ch/search?f=490__a&p=Second%20CERN%20openlab%20summer%20student%20lightning%20talk%20session*)).

A panel of judges highlighted a number of talks that were particularly impressive:

- First place: Hamza Javed – Fast inference on FPGAs (field-programmable gate arrays) for trigger systems in high-energy physics
- Second place: Raghav Kansal – Deep graph neural networks for fast HGCAL (high-granularity calorimeter) simulation
- Third place: Bartlomiej Borzyszkowski – Neuromorphic computing in high-energy physics

The judges also picked out presentations by Priyanka Mathur and Riccardo Maganza for special mention.

"Through my project, I gained new skills and improved my understanding of FPGAs, and developed new architectures for them," says Hamza. "I had some amazing supervisors who were supportive throughout my project and I made some amazing friends among my fellow CERN openlab students. This was, undoubtedly, the best summer of my life."

In addition to their projects, the students also participated in a range of other exciting activities. They took part in a dedicated series of lectures related to IT topics at CERN, participated in a special hackathon, and went on a trip to Zurich. During this trip, they visited ETH Zurich and the offices of CERN openlab members IBM and OpenSystems. At CERN, visits were organised to the CMS experiment, the Antimatter Factory, the Synchrocyclotron, the CERN Control Centre, the SM18 magnet-testing facility and the CERN Data Centre.

"CERN openlab plays an important role in CERN's educational mission, particularly through this IT-focused summer-student programme," says Frédéric Hemmer, head of CERN's IT department. "It is always a pleasure to see these passionate young students come here and bring fresh perspectives to the Laboratory."

If you are interested in applying to next year's CERN openlab summer-student programme, please visit this webpage for fur-

ther information (https://openlab.cern/education) . Applications will open later this year.

Hans Baechle

ACCESSIBILITY PROJECTS STAND OUT AT WEBFEST 2019

Over 60 participants worked on 14 projects, including web games, geo-applications, translation software and educational tools

Hacking away (Image: Hans Baechle/CERN)

The seventh CERN Summer Student Webfest took place from 26 to 28 July. The annual hackathon at CERN brings together bright and creative minds over a weekend to work on science and technology projects, using open web technologies. They work in small teams, focusing on specific ideas to design web and mobile applications that help people engage with CERN, the LHC, physics or science in general.

Participants share skills and experience with one another, as well as learning from mentors. “The Webfest was a fun and enriching experience,” said summer student Steffen Ludwig. “When we started on Friday, we didn't know anything about web development. Two days later, I presented a functioning prototype of our app.”

At the 2019 Webfest, over 60 participants — mainly CERN summer students — worked on 14 different projects, including web games, geo-applications, translation software and educational tools. Of course, the Webfest is not only for web developers and computer scientists. Skills in other domains — like physics, engineering and communication — are indispensable, too. “The Webfest is an excellent vehicle to drive collaboration and creativity, and to stimulate innovative thinking,” said Rachel Bray, the CERN Alumni community manager, who was one of four judges.

In just two days, most of the teams developed working prototypes, which they presented on Sunday evening in front of a jury that picked the winners.

- Third place: Awarded to *CERNlearn*, a knowledge-sharing app that helps people meet up face-to-face to share knowledge and skills, from cookery techniques to quantum mechanics and yoga.
- Second place: Shared by *9 Quantum's Morris*, a web game that allows the player to learn about quantum computing, and *Code in your language!*, a translation program that helps make coding more accessible to non-English speakers.
- Winner: The *CERNAccess* project, created by team of four students, is a software tool for translating sign language to text. A camera records sign-language gestures and translates them to text in real-time.

In addition, THE Port sponsored a new 'Impact Prize', which was awarded to *Kilimanjaro*. This app is designed to help people in western African nations to register cars with the local authorities in a quick and simple way. Mussa, who had the idea for this project and made his way from Africa to CERN without any higher education, is now developing an app that could make millions of lives easier.

The judges also highlighted the project *Can we predict the unpredictable?* with a special mention. This project examined methods proposed in a scientific paper dealing with the long-term prediction of complex non-linear time series and tested them on generated data.

You can find out more on the Webfest website.

Hans Baechle

COMPUTER SECURITY: PROFESSIONAL ACCESS TO PRIVATE DEVICES

Once you are connected to CERN's wired or wireless networks, you are bound by CERN's Computing Rules, which requires you to always keep your system up-to-date, fully patched and protected against unauthorised access

Today's buzzword, “bring your own device” (BYOD) – i.e. the possibility of bringing your own tablet, laptop or smartphone to work – has long been established practice at CERN. The nature of our community, the comings and goings, new arrivals and departures on a daily basis, researchers from abroad, students, teachers and lecturers, requires flexibility in device provisioning. While CERN's IT department supports centrally managed Windows laptops and PCs as well as centrally managed solutions for Linux systems, it is an unsurmountable challenge for them to provide any flavour of operating system for any type of hard-

ware in any kind of language. But BYOD does not mean that you can do whatever you want...

Once you are connected to CERN's wired or wireless networks, you are bound by CERN's Computing Rules (also known as CERN's Operational Circular No. 5) which requires you to always keep your system up-to-date, fully patched and protected against unauthorised access. In addition, the personal use of CERN's computing facilities, i.e. its network, is regulated, must be limited in terms of resource consumption, and must not be detrimental to your official duties, constitute political, commercial or profit-making activity, or be inappropriate, offensive or illegal. While the CERN Computer Security Team is mandated to enforce the CERN Computing Rules and therefore automatically monitors all activity on its networks (see our *Bulletin* article on "Transparency for your privacy"), CERN also values your privacy ("Your privacy at CERN matters") as governed by the office of data privacy protection.

Your personal device is yours and only yours. Neither your supervisor, line management or hierarchy, nor IT desktop support, ServiceDesk or local support personnel have the means to access your computer without your consent. If they do need to access your device, e.g. to help you to resolve computer issues, to install software or for any other reason, they should ask for your consent. The consent requirement also holds true for the CERN Computer Security Team. If this consent cannot be obtained, access is still possible with the explicit authorisation of the DG in accordance with CERN's policy on "third-party access to users' accounts and data". Your collaboration, however, is always appreciated to allow us to resolve and follow up on computer security incidents or to carry out fraud investigations.

Please let us know if you believe that your device has been subject to any unauthorised access by a third party within or outside CERN, in particular during (duty) travel. By the way, during any absence, CERN's policy on "third party access to users' accounts and data" provides a procedure for a requestor to get access to data or a CERN-owned device – if genuinely needed, and only under very strong scrutiny.

Do you want to learn more about computer security incidents and issues at CERN? Follow our Monthly Report. For further information, questions or help, check our website or contact us at Computer.Security@cern.ch.

The Computer Security Team

Official communications

CHOICE OF A B PERMIT OR A SWISS CARTE DE LÉGITIMATION

Family members who are nationals of the EU or EFTA and live in Switzerland: Choice of a B permit or a Swiss carte de légitimation

The Swiss Permanent Mission in Geneva has informed CERN that henceforth, pursuant to the Agreement on the Free Movement of Persons (AFMP), family members who are nationals of a Member State of the European Union (EU) or the European Free Trade Association (EFTA) may apply for a B permit instead of a *carte de légitimation*, either:

1. on arrival in Switzerland, or
2. as an exchange if they already have a *carte de légitimation*.

(cf. https://www.dfae.admin.ch/dam/mission-onu-omc-aele-geneve/en/documents/Lignes-directrices-OI%20anglais.pdf).

Those interested are invited to carry out the exchange formalities with the *Office cantonal de la population et des migrations* (for residents of the canton of Geneva: https://www.ge.ch/organisation/office-cantonal-population-migrations-ocpm) or their commune's *Bureau des étrangers* (for residents of the canton of Vaud). They will also need to make sure that they apply for exemption from the obligatory membership of a Swiss health insurance scheme, at the latest within the three months following receipt of their B permit (cf. http://cds.cern.ch/record/2668435/files/Note%20-%20Information%20on%20the%20écompulsory%20health%20insurance%20scheme%20in%20Switzerland.pdf).

Relations with the Host States service
Tel.: 72848 / 75152
relations.secretariat@cern.ch
www.cern.ch/relations/

Announcements

CLOSURE OF THE INTER-SITE TUNNEL: 6 SEPTEMBER

Due to renovation work, the Meyrin inter-site tunnel will be exceptionally closed to traffic on Friday, 6 September 2019.

Thanks for your understanding.

The SMB department

TIME TO REGISTER FOR 'EXPANDING YOUR HORIZONS GENEVA'

Lots of inspiring experiences, workshops and a discovery fair for girls aged 11-14

Workshop participants discovering what happens when building a cloud chamber (Image: Annette Dubois)

Saturday, 16 November, 2019, “Expanding your Horizons Geneva” (EYH) will hold its sixth biennial science event for young girls to encourage them to study science, technology, engineering and mathematics (STEM). The event will be held at the University of Geneva (Uni Mail).

The science event of EYH is free and for girls from the ages of 11 to 14 years old living in Geneva and the surrounding region. Workshops, held in French and in English, will be packed with activities to show the 450 girls participating that science and technology are fun and interesting. Parents are also invited to partake in a panel discussion on ways to encourage and support their daughters' interest in STEM at school. Thanks to the contribution of about 20 volunteers, CERN will be present at EYH's 2019 event and lead two different workshops and a stand at the “Discovery Fair”.

Feel free to pass the messages to girls aged 11-14!

To know more and register (from 1 September): www.elargisteshorizons.ch.

CERN OPEN DAYS: STILL TIME TO BECOME A VOLUNTEER

The registration for volunteers for the CERN Open Days are extended until Friday, 6 September

A volunteer during the CERN opendays 2013 (Image: Marzena Lapka, Achintya Rao/CERN)

We are still short of volunteers for the CERN Open Days on Sunday (especially in the afternoon).

Sign up before Friday, 6 September, and join 2700 volunteers in sharing your enthusiasm for fundamental research and its applications.

More than 150 activities will be offered to the 80 000 visitors expected on our sites.

Whether you are a member of CERN personnel, contractor's personnel or Honorary Staff, everyone will have a role to play! Instructions and other practical information can be found on cern.ch/od2019/volunteers.

RESTAURANT OPENING HOURS OVER THE JEÛNE GENEVOIS WEEKEND

Over the *Jeûne genevois* weekend, from **Thursday, 5 September to Sunday, 8 September inclusive**, all restaurants and cafeterias will be closed EXCEPT:

- Restaurant 1, open from 7.00 a.m. to 10.00 p.m. every day.
- Restaurant 3, open from 7.45 a.m. to 5.00 p.m. (normal hours) on Friday, 6 September
- ODELICE (Building 774), open from 8.00 a.m. to 5.00 p.m. (normal hours) on Friday, 6 September

"LA NUIT EST BELLE!": A NIGHT WITHOUT STREET LIGHTING

On 26 September, switch off your lights and take some time to observe the stars

CERN is taking part in Geneva's first ever switch-off of street lighting on 26 September. The "La nuit est belle" project is aimed at raising awareness about the impact of light pollution resulting from excessive artificial lighting. No fewer than 109 communes on both sides of the border are contributing to the project.

CERN encourages you to join in as well: switch off your lights, take advantage of the dark and look up at the stars. The astronomical conditions on the night of 26 September will be ideal (provided the sky is cloud-free) with a new moon, the Milky Way visible from sunset and a chance to see Saturn and Jupiter.

For those of you working late at CERN, please note that the sites will not be lit that night. Cyclists and pedestrians should make sure that they are visible. Follow the event live on social media via the hashtag #lanuitestbelle.

For more information, visit the website: https://www.lanuitestbelle.org

HELP US DESIGN A MORE COMFORTABLE AND EFFICIENT LIBRARY SPACE

We are considering a future redesign of our premises. Our objective is to offer more ergonomic workspaces, adapted to the needs of our users

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That is why we are conducting a survey. From 20 August to 6 September 2019, please complete the online questionnaire at: http://cern.ch/go/6LL9.

Since early summer, our team has been considering the question: how do we improve the physical spaces of the library? We have reviewed state-of-the-art libraries and started collecting your opinions through a brainstorming wall and interviews within the library.

Now we would like even more points of view on, for instance, the furniture that would suit you best, the electrical outlets you need or even how brightly lit the room should be.

The survey will not take you more than 10 minutes. Whether you are a regular user or only come to the library occasionally, we are interested in your opinion. The answers to the questionnaire are of course anonymous and confidential. We will not collect your personal data.

If you have any questions, please contact us at this address: library.desk@cern.ch.

Thank you in advance for your participation!

Ombud's corner

NEGOTIATION: ART OR TECHNIQUE?

Many of us feel anxious at the thought of having to negotiate, but, whether we like it or not, negotiation is part of everyday life, both at work and in our personal lives. Negotiation is when two people communicate with the aim of achieving goals that may initially seem contradictory or mutually exclusive. Successful negotiation ends in a win-win situation, in which each party obtains what's important to them without compromising the needs of the other.

80% of a successful negotiation lies in the preparation. Anyone who's well prepared can enter into a negotiation without coming out in a cold sweat.

The first step is to decide on your limits. For example, if you're negotiating a mortgage with your bank, what's the maximum rate you're willing to pay? This requires time and preparation: comparing the conditions of various banks and showing your bank the best offer you've found.

Then, what will be your alternative if your discussions aren't successful? This is where BATNA ("Best Alternative to a Negotiated Agreement") comes in. Would you be willing to change your bank or even abandon your purchase if you didn't manage to stay below the maximum rate you'd decided on? This framework is essential in any negotiation: you have the psychological benefit of knowing there's an alternative solution if the negotiation fails. You're not under pressure.

Finally – and this is the most important thing – establish what the other party needs. Don't assume that the ball's totally in your bank's court: making a deal with you is in its best interests and it will do everything in its power to stop you running off to the competition.

"But work relationships aren't as simple as that", you'll tell me. Don't be so sure: the same principles apply to any negotiation.

Eric would like to take on more responsibility at work. If he isn't successful, his BATNA will be to request a new job in a service that can offer him the responsibility he wants. Eric has made discreet enquiries and identified the services that require his skills and have the necessary budget. He also knows that his boss needs his experience and values stability in his team.*

Negotiation is a rational activity, not an art reserved for a handpicked elite. By preparing well, starting to plan early, collecting all the essential information and, above all, keeping a fallback position in mind, anyone is capable of negotiating with a cool head.

**Names have been changed*

Pierre Gildemyn

If you'd like to comment on any of my articles or suggest a topic that I could write about, please don't hesitate to e-mail me at Ombuds@cern.ch .