

Timepix: from CERN's galleries to the Moon

The renowned Timepix detector celebrates its 10-year anniversary on the International Space Station by flying to the Moon: the chip features in NASA's future lunar programme



NASA astronaut Megan McArthur in the International Space Station - along with the HERA detector (purple box in the back) (Image: NASA)

In July 1969, just a few days after the first Moon landing, CERN's then Director-General, Bernard Gregory, sent the following message to NASA: "CERN, which investigates the smallest particles of the Universe, sends its sincerest congratulations to NASA, which investigates the largest particles, on the triumphant conclusion of the Apollo 11 mission". More than 50 years later, these two worlds collide as a CERN-based technology, Timepix, is being launched in Artemis I, the NASA mission heralding the next phase of human space exploration.

Stuart George, a physicist in NASA's Space Radiation Analysis Group (SRAG) and a CERN alumnus, is the person to talk to in order to understand how this detector technology landed in NASA's laboratories. During his time with CERN's Radiation Protection group as a Marie Skłodowska-Curie PhD student, Stuart cut his teeth on Medipix detectors, chips used for particle imaging derived from the ones used to track particle trajectories inside CERN's Large Hadron Collider. After his formative years with this versatile detector, he saw an opportunity at the University of Houston and then at NASA to apply the technology behind the Timepix detector (Medipix's cousin) to space. *Continued on page 2 >>*

A Word from Louise Zelia Carvalho

Celebrating LGBTQ+ in STEM

18 November marks LGBTQ+ STEM Day – Inclusion is for Everyone

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Celebrating LGBTQ+ in STEM

18 November marks LGBTQ+ STEM Day – Inclusion is for Everyone

Do you know what Carolyn Bertozzi and Svante Pääbo have in common? They both won a Nobel Prize in 2022 – in Chemistry and in Physiology or Medicine, respectively.

Did you also know they both identify as LGBTQ+? Imagine if they had quit scientific research due to a sense of non-inclusion based on sexual orientation, as so many have done before them. Wouldn't that have been a big loss?

CERN's Diversity & Inclusion Programme, which I have the privilege to lead, aims to strengthen the diverse working culture of this beautiful international organisation and to enhance the sense of inclusion for all. For example earlier this year in collaboration with the Users Office, and following a recommendation of the "Report from the Working Group on Strengthening the Support for Users at CERN", we established a study group to improve the inclusion of the non-binary gender population at CERN. The study group met with colleagues from the LGBTQ+ Network, who talked about several inclusion-related difficulties they experience at CERN. The study group also contributed input for Dr Mira Fey's comprehensive report on LGBTQ+ employees in Geneva-based international organisations.

In the wake of LGBTQ+ STEM Day, which took place on 18 November, we are delighted to announce that the following actions are already under way and will be implemented during the course of 2023, with the support of the SCE and HR department heads:

a number of non-gendered WC facilities will be made available across the Meyrin and Prévessin sites;

the issuance of CERN ID badges with the chosen name of members of the personnel in the process of gender transition will be authorised;

a technical analysis towards a more gender-inclusive personnel database will be undertaken; the D&I programme will work closely with the Learning and Development team on D&I training courses, to ensure that they include LGBTQ+ content.

How can you support the LGBTQ+ community toward a meaningful inclusion?

Well, being an "LGBTQ+ ally" can simply mean becoming familiar with the terms. For example, "trans" and "non-binary" globally refer to those whose gender identity does not conform to their sex assigned at birth. Non-binary refers to someone whose gender identity is neither "male" nor "female". Maybe you aren't sure how to address them? Try paying attention to which pronoun(s) they prefer or, if your language allows it, use gender-neutral terms. And if you observe a non-inclusive behaviour toward them? Call it out or follow up using your Active Bystander skills.

Together, we can all thrive in a diverse and inclusive work environment.

For more in-depth coverage of diversity and inclusion matters at CERN, please subscribe to the D&I newsletter here (<https://diversity-and-inclusion.web.cern.ch/2015/10/subscribe-diversity-newsletter>).

Louise Zelia Carvalho
Diversity & Inclusion Programme Leader

Timepix: from CERN's galleries to the Moon

>> Developed by the CERN-hosted Medipix2 collaboration, Timepix detectors are extremely small but powerful particle trackers capable of monitoring radiation in the environment. Particles interacting with its pixelated sensor can be classified according to their characteristic shape

and tell scientists about the radiation spectrum in various environments, such as spacecrafts.

With humans venturing again outside of Earth's protective magnetosphere, the issue of radiation has become increasingly salient. "Back in Apollo's days, trips consisted of one or two weeks. Future

missions are considering at least month-long stays,” explains Stuart. “On such long missions, the radiation environment must be monitored in real time in order to mitigate radiation hazards such as space weather.” Radiation detection technologies such as Timepix make it possible to measure the radiation dose received by crew members, to understand the in-vehicle environment and to design models to give personnel in space, spacecraft or lunar vehicles early-warning signals if they need to seek shelter and shield themselves. Timepix detectors were initially flown as a tech demo on the International Space Station (ISS) in 2012 thanks to the efforts of teams at the University of Houston, the Institute of Experimental and Applied Physics in Prague and NASA’s own SRAG. Since then, NASA’s SRAG and Advanced Exploration Systems have developed the technology to support a variety of missions, instituting Timepix-based systems as standard dosimeters at NASA.

This October, we celebrated the 10-year anniversary of Timepix’s deployment in the ISS. The chip is now a key part of NASA’s new HERA radiation detector, which is included in the Artemis programme. Launched this week, Artemis I carried three Timepix chips on a HERA detector,

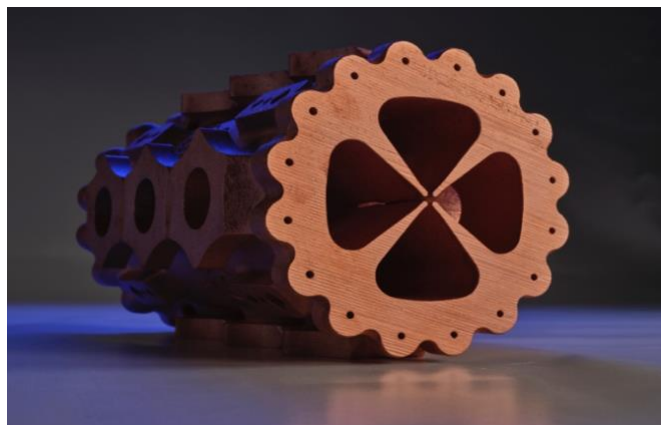
and another one as part of the first deep space biology experiment. A system based on the Timepix chip is also included on Astrobotic’s lander, one of the programme’s first three robotic missions to the Moon, which will be launched in the first quarter of 2023. The system will provide real-time data about the radioactive environment of the lunar surface for the first time in history. “Timepix is lighter, more capable and more energy-efficient than other hardware. It is also resilient to both the strong vibrations and shocks of space launches and the high flux rates of deep space,” adds Stuart.

Besides astronaut dosimetry, Timepix may be used to predict solar storms and other space events that could impact the Earth and its environment, disrupt telecommunications and cause power grid surges. “Harnessing Timepix to predict solar storms would pose more difficult challenges. While they are extremely reliable in their current form, Timepix chips would have to last five to ten years in space, live in a high-vacuum environment and resist extreme, sun-facing temperatures,” says Stuart. Today, he and his teammates are working to make the chip more reliable and autonomous than ever.

Antoine le Gall

First 3D printing of crucial component to bring accelerators closer to society

The first additive manufacturing of a critical accelerator component paves the way for more affordable and versatile particle accelerators.



Radiofrequency quadrupole (RFQ) modules are traditionally manufactured through a long series of machining, thermal treatment and brazing steps. Additive manufacturing would help streamline several operations. (Image: CERN)

Besides high-energy physics, particle accelerators play a crucial role in cancer therapy and material analysis and hold the potential for ambitious environment and energy applications. However, their size and manufacturing cost are often obstacles to their use outside of physics laboratories. Among other innovations, additive manufacturing, also known as 3D printing, could be part of the solution to make particle accelerators more readily available to society.

As part of the EU-funded I.FAST project, which aims to develop and enhance leadership in particle accelerators in Europe, the German high-tech company TRUMPF has for the first time additively manufactured a core component of future particle

accelerators – a radiofrequency quadrupole (RFQ). RFQs are among the most complex components of linear particle accelerators and are critical to providing the energy necessary to accelerate the particle beam ever closer to the speed of light. The 3D-printed RFQ will be shown at the leading 3D-printing trade show Formnext in Frankfurt this November.

“Additive manufacturing can help reduce the size and cost of accelerators, shorten their construction time and enhance their performance. Used at a wider scale, additive manufacturing could make accelerators more affordable for use outside of large scientific laboratories, such as in hospitals for isotope production and cancer treatment, in airports for cargo screening or in laboratories for industrial analysis,” explains CERN’s Maurizio Vretenar, I.FAST project coordinator. “Over 30 000 accelerators are currently in use worldwide, the vast majority of them in healthcare and industry.”

The I.FAST team of experts from CERN, Politecnico di Milano, CNRS-IN2P3, Fraunhofer IWS and RTU designed the RFQ specifically for a TRUMPF 3D

printer that relies on a highly energetic green laser beam. The successful “printing” of such a critical component in one piece of metal only is a technological milestone in itself. “This is proof that large copper components can be manufactured additively with sufficient precision thanks to our green laser beam, which can print even the finest copper structures. High-precision parts like the RFQ can be manufactured faster, cheaper and more energy-efficiently,” says Michael Thielmann, additive manufacturing expert at TRUMPF.

Additive manufacturing belongs to the portfolio of advanced technologies currently being explored by I.FAST. “I have no doubt that the accelerator community will increasingly rely on additively manufactured components when designing and building new facilities,” concludes Toms Torims, researcher at Riga Technical University (RTU) and I.FAST Work Package coordinator for advanced accelerator technologies.

Antoine Le Gall

CERN staff member now ESA astronaut

Congratulations to CERN staff member Slawosz Uznanski for making it to the new class of European Space Agency astronauts in the reserve pool



Slawosz Uznanski at CERN (Image: Piotr Traczyk, CERN)

Congratulations to CERN staff member Slawosz Uznanski, reliability engineer of the LHC new power converters in the Accelerator Systems department (SY), for making it to the new class of

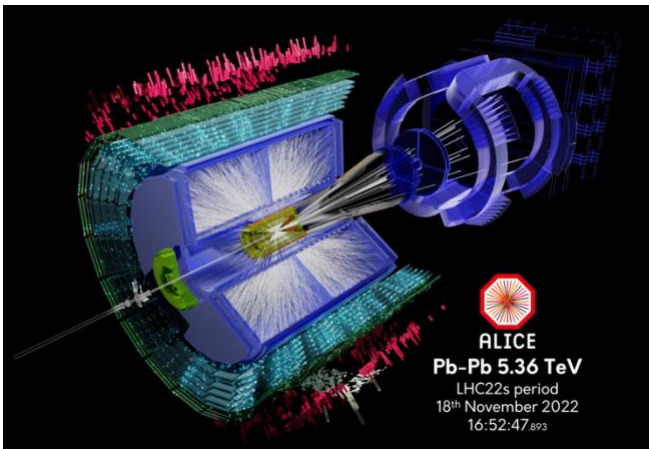
European Space Agency (ESA) astronauts, in the reserve pool. Slawosz, who has a passion for space and exploration since his early childhood, has successfully passed all the stages of a year-long extremely competitive selection process, which started in summer 2021 with more than 22 500 valid applications from across ESA Member States and Associate Members. This was the first call for new ESA astronaut applicants since 2008.

The new members of ESA’s astronaut corps have been announced today during a live media event aired on ESA TV. They will take up duty at the European Astronaut Centre in Cologne, Germany.

A longer article will be published in the next issue of the Bulletin, stay tuned!

First lead-ion collisions in the LHC at record energy

On Friday, 18 November, a test using collisions of lead ions was carried out in the LHC and provided an opportunity for the experiments to validate the new detectors and new data-processing systems ahead of next year's lead-lead physics run.



Event displays of the first Pb-Pb collision of Run3 taken on 18 November 2022 (Image: CERN)

After the successful start of Run 3 in July this year, which featured proton-proton collisions at the record energy of 13.6 TeV, it was the turn of lead nuclei to circulate in the Large Hadron Collider (LHC) again last Friday after a gap of four years. Lead nuclei comprise 208 nucleons (protons and neutrons) and are used at the LHC to study quark-gluon plasma (QGP), a state of matter in which the elementary constituents, quarks and gluons, are not confined within nucleons but can move and interact over a much larger volume.

In the test carried out last Friday, lead nuclei were accelerated and collided at a record energy of 5.36 TeV per nucleon-nucleon collision. This is an important milestone in preparation for the physics runs with lead-lead collisions that are planned for 2023 and the following years of Run 3 and Run 4. The CERN ion injector complex has undergone a series of upgrades in preparation for a doubling of the total intensity of the lead-ion beams for the High-Luminosity LHC. Achieving this goal requires a technique called “momentum slip-stacking” to be used in the Super Proton Synchrotron (SPS), where two batches of four lead-ion bunches separated by 100 nanoseconds “slip” to produce a single batch of 8 lead bunches separated by 50 nanoseconds. This will allow the total number of bunches injected into the LHC to increase from 648 in Run 2 to 1248 in Run 3 and onwards. After all the upgrades have been completed the LHC will

provide a ten-fold higher number of heavy ion collisions with respect to the past Runs.

The test was also a crucial milestone for ALICE, the LHC experiment that specialises in the study of lead-ion collisions. The ALICE apparatus was upgraded during the recent shutdown of the LHC and now features several completely new or greatly improved detectors, as well as new hardware and software for data processing. The new detectors provide a higher spatial resolution in the reconstruction of the trajectories and properties of the particles produced in the collisions. In addition, the upgraded apparatus and upgraded processing chain can record the full collision information at a rate two orders of magnitude higher.

Other experiments used the test run to commission their upgraded and newly installed subsystems in the new heavy-ion environment of higher energy and 50ns bunch spacing. ATLAS tested upgrades to its selection (trigger) software, which is designed to enhance heavy-ion-physics data taking in Run 3. In particular, physicists tested a new particle-track trigger designed to spot a wider range of “ultra-peripheral collisions”. CMS upgraded several components of its readout, data acquisition, trigger and reconstruction chains to be able to take full advantage of the high-energy lead-lead collisions. The lead-lead fills delivered by the LHC allowed CMS to commission the entire system with beam and spot the areas that could be further optimized for the 2023 heavy-ion runs. LHCb started commissioning its brand-new detector in the challenging conditions of lead-lead collisions characterised by a very large particle multiplicity. In addition to lead-lead collisions, LHCb collected lead-argon collisions in fixed-target mode using the new SMOG2 system, which is unique to the experiment and is designed to inject noble gases into the LHCb collision area.

Even if very short, the 2022 lead-lead programme can be considered a success for the LHC accelerator, the experiments and CERN's heavy-ion injector complex. The four big LHC detectors

saw and recorded lead-lead collisions at a new record energy for the first time. Researchers are now looking forward to the heavy-ion physics campaign in 2023 and the following years.

ALICE collaboration

Science Gateway: the first trees for the forest have arrived

Forty-five large trees have been delivered to CERN this month. More than 400 trees will ultimately make up the Science Gateway forest



The first trees for the forest of the Science Gateway have been planted. (Image: CERN)

Since 10 November, you may have noticed the first few trees of the Science Gateway forest “springing up”: between now and April 2023, more than 400 trees will be planted around the five buildings that comprise CERN’s future education and outreach centre, which will open to the public in 2023.

The trees that make up the forest will be of different varieties and sizes* and between six and thirty years old. Many of them (374) will come from a German nursery that specialises in large trees. “The trees are transplanted at the nursery every four years to limit the development of their roots and get them used to the transplantation process. Their planting on the Science Gateway site will be their final move. For each transplantation – a delicate operation – a 9-m³ hole must be dug to ensure that the tree recovers well and develops optimally,” explains Frédéric Magnin, who is in charge of the Science Gateway construction. “Shrubberies, perennials and wildflower meadows will also be planted; by

working on several levels – from the ground up to the highest branches – we hope to give the impression of a wild forest.”

The Science Gateway forest will have tangible benefits, notably for local fauna. “The medley of plant species will provide various kinds of habitat, fostering biodiversity,” says Frédéric Magnin. In the long term, the forest will also play a useful role in reducing global warming, doing its bit to fix atmospheric CO₂ and limit heat islands, notably thanks to increased evapotranspiration and albedo (the amount of sunlight reflected by a surface).

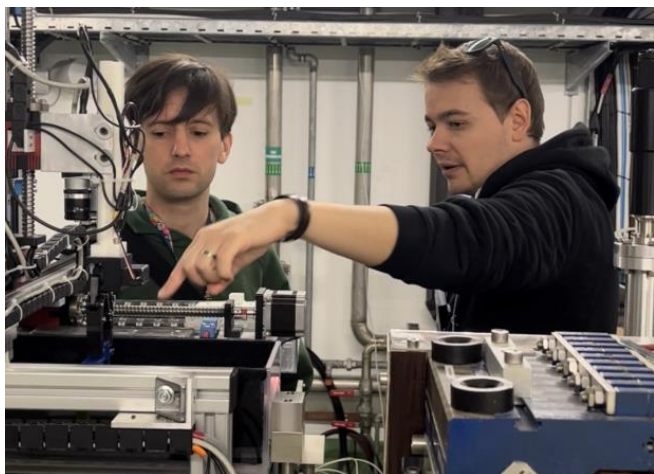
** The forest will comprise eleven different tree varieties: sessile oak, Turkey oak, Dutch elm, common hornbeam, European hop-hornbeam, wild cherry, rowan, silver birch, field maple, Swedish whitebeam and Scots pine. The trees will measure up to 20 metres in height and their trunk circumference will range from 40 to 100 cm (measurement taken one metre from the base).*

3800 m² of solar panels

The roofs of the three Science Gateway pavilions – representing a surface area of more than 3800 square metres in total – will soon be equipped with solar panels generating 500 kWp. Installation will begin in a few days’ time and will be completed in early spring. These solar panels will produce energy (500 MWh/year) to supply Science Gateway and, in particular, the buildings’ heat pumps. The surplus electricity, around 40% of the total amount produced, will be used to power facilities across CERN’s Meyrin site.

Ten years on, Arts at CERN cements its role fostering dialogue between physics and art

CERN scientists are keen to create connections with the international artistic and cultural communities



Swiss artist *Ilan Purnell* and CERN physicist *Pierre Korysko* in conversation at CLEAR, November 2022 (Image: CERN, *Faye Saulsbury*)

This summer, Arts at CERN launched an open call for scientists to take part in conversations with artists. Artists all over the world are eager to engage with the big questions pursued by fundamental science, and one of the main goals of Arts at CERN is to facilitate these connections. Having received more than 60 responses from across the CERN community, Arts at CERN is making a strong entry into its second decade.

Muhammad Ansar Iqbal, a physicist at CMS, met *Ilan Purnell*, a Swiss artist and filmmaker, earlier this month. “He was interested in what I do, but I had to explain it without the technical mumbo jumbo,” says Iqbal. “It’s very important to hear another perspective. Inside the CERN bubble, we can sometimes forget why we are doing all of this. Talking to artists helps you start thinking about the big questions again.” ATLAS physicist *Despina Sampsonidou*, who also recently became involved in the programme, feels the same: “In our work, we are focused on the details, but the artists help us see the bigger picture.”

The idea behind Arts at CERN is to foster two-way, lasting dialogue between people who share similar research interests, but who approach their research from different backgrounds. “Creativity is needed to write a novel, but it is also needed when designing a piece of hardware or software,” says *Maria Elena Angoletta*, electronics engineer at CERN. She took part in a sci-fi writing workshop with UK artist *Suzanne Treister* last May. “I definitely went out of my comfort zone! But I believe that not doing creative activities can be detrimental to our work.” *Scientific Dreaming*, a collection of drawings and short stories which resulted from *Treister’s* workshops, will be published by Arts at CERN in 2023.

Through residencies like *Purnell’s* and *Treister’s*, Arts at CERN brings the international arts and physics communities closer together. Since 2012, more than 200 artists from 80 countries have been hosted at CERN – residencies that usually inspire the completion of an art piece. This coming year, the Connect residency programme will partner CERN and ICTS in Bengaluru, India, with the support of the Swiss Arts Council, Pro Helvetia. Through this partnership, an artist from Switzerland and an artist from India will take part in a joint residency in dialogue with scientists, engineers and staff from the two institutions.

The last ten years have seen Arts at CERN become a leading platform for dialogue between artistic and scientific communities worldwide. Art commissions from previous artist residencies at CERN will be on display at Science Gateway, opening in summer 2023. If you would like to be involved with Arts at CERN in the upcoming year, send an email introducing yourself to info.arts@cern.ch.

Faye Saulsbury

Mobility is changing at CERN

Contribute to the evolution of mobility at CERN by taking a new survey



For many years, CERN has been committed to providing mobility solutions for its entire community, facilitating access to and movement around the sites.

The SCE department is responsible for providing and maintaining the infrastructure and services needed to enable people to move around the CERN sites easily. For several months, a working group comprising representatives from all sectors of the Organization has been rethinking the overall mobility strategy to align it with emerging needs: sustainability, low carbon emissions, variety and flexibility of supply, connectivity, and so on.

At present, CERN users have access to a varied range of vehicle rentals: cars for daily use on the CERN sites (car sharing) or for three-month (car rental) to four-year (departmental car fleets) rental periods, electric or standard bicycles for half-day (bike sharing) or longer-term (bicycle rental) rental, electric scooters from June to

September (eScooter sharing) and dedicated transport for groups (transportation) and regular shuttle services (shuttles) throughout the year.

The mobility working group wants to position the user at the centre of CERN's new mobility policy and develop a user-oriented and environmentally friendly range of services. In a dense, cross-border urban area, this is a major challenge. This is why this week, the group is launching a survey to assess the practices and needs of people who use mobility services at CERN:

French:

<https://fr.surveymonkey.com/r/CERNsondagemo bilite>

English:

<https://fr.surveymonkey.com/r/CERNmobilitysurvey>

This survey echoes the one conducted in 2018, which led to the elaboration of the first mobility plan in 2019. Due to global warming and the energy crisis of recent years, a new approach to mobility is being developed. It focuses not only on urban planning and motorised traffic, but also on human needs and the active participation of users in discussions around mobility issues.

We therefore strongly encourage you to take the 15 minutes or so needed to complete this survey. Your input will be extremely useful in determining the next steps in the development of mobility at CERN.

Expanding Your Horizons: a new generation inspired by women in science

Female ambassadors from CERN shared their passion for science and technology at the University of Geneva's Expanding Your Horizons event



A CERN-organised workshop held at Uni Mail as part of the Expanding Your Horizons event. (Image: CERN)

On Saturday, 12 November 2022, some twenty female volunteers from CERN took part in the seventh edition of the science event organised by the Expanding Your Horizons – Geneva (EYH) association. The event, which takes place every other year, is designed to encourage girls to study and take up careers in mathematics, computing, natural sciences and technology.

More than 300 girls aged 11–14, living in Geneva and the surrounding area, took part. After a short welcome talk, the participants headed to the workshops and stands. Each girl could choose two 75-minute workshops from a selection of 23, covering a wide range of fields: physics, chemistry, mathematics, computing, engineering, technology, life sciences and planetary science. Between workshops, the girls had the opportunity to talk to professionals at the stands in the “Discovery Room”, where interactive scientific activities had been set up.

26 CERN ambassadors ran four activities: three workshops and a stand.

The workshop participants took on the challenge of building their own electromagnet. Like scientists seeking particles that cannot be seen, they used logic to figure out the contents of mystery boxes and, in so doing, make the invisible visible. Finally, with the help of the CERN volunteers, they explored how a website works and learned some computer language basics.

At the stand, which was run by female computing engineers and technicians, an impressive virtual visit of the CERN Data Centre plunged the girls into the heart of the Worldwide LHC Computing Grid. They also learned about the range of exciting professions relating to the creation of computer systems.

As well as the workshops and stands, the young “apprentices” visited the “Mentoring Café”, which was new this year and gave them the chance to chat informally, in small groups, with female professionals working in fields connected to science, technology, engineering and mathematics (STEM), hear their inspiring stories and discover how they got to where they are today.

Many thanks to the organisers of this highly successful event, as well as to all CERN volunteers, who were exemplary ambassadors. There can be no doubt that this day, jam-packed with conversations and discoveries, sparked the girls’ curiosity – it may even have set some of them on a course to their future careers.

CERN takes part in the 2022 edition of “Futur en tous genres”

A day designed to break down gender stereotypes and broaden professional horizons



A workshop held at CERN during the 2022 edition of Futur en tous genres. (Image: CERN)

On Thursday, 10 November 2022, as part of the Futur en tous genres event, CERN welcomed 24 children from Swiss schools for a day of discovery. Futur en tous genres is an annual event organised by the Swiss Department of Public Education,

Training and Youth (DIP). Young people are invited to spend a day discovering the wide range of jobs and fields in which their gender is underrepresented. The goal is to help them to break free of prejudices and to open their eyes to futures they may not have considered, encouraging them to pursue their own ambitions with confidence.

This year, 24 children aged 12 and 13 spent the day with CERN scientists, who told them about their jobs and answered their questions. The programme included a visit to the cryogenics laboratory, a radiation protection workshop, conversations with science communication experts and an introduction to jobs in civil engineering and superconductivity. The jam-packed day certainly sparked the children's interest, and may even have set some of them on a course to their future careers.

A new video to answer your data privacy questions

Have you ever wondered what data privacy is all about? What is CERN doing to protect our personal data, and why should we care?

For those of you finding the world of data privacy hard to navigate, the Office of Data Privacy (ODP), together with the Data Privacy Coordination Committee (DPCC), is producing a series of short videos to provide a brief and practical guide to data privacy at CERN.

The first of these short videos (<https://videos.cern.ch/record/2296864>) gives an introduction to data privacy and directs you to resources about the subject.

If this first video gets you thinking about data privacy, you can find out more on the ODP website (<https://privacy.web.cern.ch/>).

Computer Security: Freemium paywalls

In an open, academic environment, the use of free commercial (“freemium”) and open-source software (“FOSS”) and tools is not unusual. Actually, many researchers, software developers and students embrace the concept of free downloads from the internet. However, while we discussed in the past the risk to the software

supply chain of blindly downloading, copy/pasting and incorporating any kind of third-party software, we now need to consider the word “free” – “free” as in “free speech”, not “free” as in “free beer” – and its limitations.

In fact, lots of software are provided to CERN for free, and not just FOSS. But what do they actually

mean when they say “free”? Many software providers offer a free download and use scheme to promote their product, attract more users and increase their market share. The devil, as usual, lies in the detail, namely licence conditions. Licence conditions may stipulate that such a download is only free for personal use, for small teams, for universities or non-profits, or something else – and programming for CERN may or may not fall into these categories. Indeed, reading licence agreements requires advanced philosophical thinking: what is research, in fact? An activity that results in literature published in academic journals, an activity carried out by someone with a PhD, an activity that is internal to CERN only (excluding the possibility to collaborate with universities even)? Believe us, we have seen every school of thought. Suffice to say, pinpointing how CERN’s status should be interpreted in the context of each licence agreement and the extent to which we are really permitted to use so-called “free” licences is a very slippery exercise.

Paywall #1: Beyond personal use. Teamviewer provides a download that is “free for private use”. Obviously, this excludes any professional use, including any use while at CERN or connected to the CERN network. As stipulated in their knowledge base, professional or “commercial” use applies when you provide support to colleagues, when you connect remotely from home to your organisation, for remote maintenance and support purposes, and also for non-profit organisations, if you or another person in the organisation receive a salary from that organisation.

Paywall #2: You++. Slack allows “small” teams to use its service for free but, if you integrate that throughout CERN, “small” becomes “large”. It is probably not surprising that Slack has approached CERN several times suggesting that we may want to purchase a licence to cover the Organization’s “large-scale” use. So ask yourself this, when you use your CERN email address to sign up for Slack,

are you also willing to provide a budget code to contribute to this licence?

Paywall #3: Not the full menu. Anaconda, a Python platform, provides free downloads of “thousands of open-source packages and libraries” for “students, academics, and hobbyists”. While “academics” certainly seems to apply to the research environment of CERN, the download comes with additional limitations (e.g. “mirroring rights not included”). Stepping outside what is covered in the “free” envelope can create financial obligations that you might not be aware of or ready to engage with.

Paywall #4: Embedded paywalls. And if this is not enough, Adobe has informed CERN that part of its freely available Creative Cloud software catalogue is not authorised for use any longer. Apparently, some Adobe apps contain copyrighted software or features by third-party companies, and using this software is beyond Adobe’s agreed terms with those third-party companies.

Similarly, CERN was once approached by an external company about using their copyrighted fonts. While their licensing arrangement was quite opaque, the issue arose when redistributing their fonts either as part of an app or publishing them on a website / web app. Curiously, these fonts were distributed by default with a number of different operating systems including the Oculus app development environment “Unity”.

So, if you are a software developer, system architect, programmer, webmaster or friendly hacker, beware: make sure that the software stack you use is legitimate and licensed. Ensure that the tools you employ are either really FOSS (with “free” as in “free speech”!) or that you have the appropriate licence. Refrain from “personal” use if the software/code/product is intended for professional usage. Instead, consider using FOSS alternatives like the EP-SFT group’s software repositories and CERN’s Mattermost instance. And check with us whether CERN already holds the right licence, like we do for Teamviewer: Software-License-Officer@cern.ch.

Computer security team

Announcements

Provisional catering services during refurbishment works in Restaurant 1

As announced in the Bulletin, a new phase of the Restaurant 1 (R1) refurbishment works will take place from November 2022 to March 2023. Measures are being taken to ensure minimum disruption and the catering services have been adapted to ensure the continuity of the service in R1 under the best possible conditions.

As of Saturday 26 November 2022, some of the catering services will be reorganised: R1 remains open until 5 p.m. every weekday (Monday to Friday), while Restaurant 2 (R2) provides service on the plate as was proposed in the GlassBox (on

reservation only). Opening hours in Restaurant 2 are extended to 9 p.m. each day, and the restaurant will be open during the weekend. The Grab'n Go is moving into the old Post office in the Main building to continue offering a wide range of hot and cold meals to take away, as well as its renowned crepes.

All details of this temporary arrangement are available on the Catering webpage (<https://scedep.web.cern.ch/refurbishment-r1>) or via the QR codes on the dedicated posters.

Modernisation of the telephony system at CERN – an update

We announced in February that fixed phones at CERN are being replaced by CERNphone – a software phone for desktop and laptop PCs (Windows, Macintosh and Linux), as well as for Android and Apple mobile phones. In the first stage of the replacement, spanning the first half of 2022, over 2000 Skype for Business users were migrated to CERNphone. The CERNphone community is now well above 5000 users, with fewer than 1000 people still using phones directly connected to the Alcatel phone exchange.

Further migrations were put on hold as the first wave of migrated Skype for Business users highlighted the importance of two missing features: quick access to the CERN phonebook on mobile phones and the visibility of a contact's availability (busy, in a meeting, away from CERN) in the desktop app.

We are happy to announce that both features have been developed and are now available.

The search feature in the “contacts” tab now finds contacts from the CERN phonebook in the app on Android and iOS.

The desktop client now shows whether your contacts are on a call, in a meeting or busy (i.e. they have set their status to “do not disturb”). Additionally, when setting your status to “do not disturb”, you can now choose for how long the status lasts before resetting: until manually disabled, for an hour, or until the evening, the next day, the following week or a time set by you.

Now that these features are available, we will start migrating those of you with phones that are still directly connected to the Alcatel PABX, with the aim to complete the migration to CERNphone for everybody by mid-2023.

Be safe on the roads, whatever your mode of transport

With the days getting shorter, we're all using the roads in the hours of darkness. Extra vigilance is therefore in order, regardless of your mode of transport. While driving, be aware that other road users may be harder to see at night, and make sure to leave at least 1.5 metres of clearance when overtaking cyclists. While cycling or walking, make sure you are visible to drivers.

Road accidents are unfortunately all too frequent. Since the start of 2022, 23 road accidents and a further 53 near misses have occurred on the CERN sites.

In addition to respecting the speed limits, road signs and applicable rules, here are a few tips to help us all stay safe on the roads this winter:

- Wear a helmet at all times when using a two-wheeled vehicle;

- Wear high-visibility jackets and reflectors;

- Be mindful of all other road users, especially at dusk when visibility is at its worst;

- Take special care when roads get slippery due to leaves, rain, snow or ice.

If you are involved in or witness an accident or near miss on the site, you must complete an incident declaration form. These are then used by the HSE unit and departmental safety offices to compile statistics and analyse the problems so that they can take measures to enhance safety. By reporting a near miss, you are helping to prevent similar incidents and, therefore, to reduce the accident toll.

Be vigilant. Be visible. Be safe.

Flu vaccination campaign: doses still available at the infirmary

Following the flu vaccination campaign held at CERN from 17 October to 11 November, vaccine doses are remaining and available at the infirmary (building 57). As in previous years, the Medical Service welcomes any person working on the

CERN sites who did not get their vaccine during the campaign to do so at the infirmary. You can register now on plamed (<https://home.cern/news/announcement/cern/plamed.web.cern.ch>).

Call for projects: a funding instrument for policy-oriented research in Geneva

Submissions are open for the Impact Collaboration Programme (ICP), a funding and support instrument that aims to bridge the gap between international policy in Geneva and academic research globally.

Designed by the Geneva Science-Policy Interface, the ICP is aimed at both scientists willing to channel their research towards policy needs, and international policy professionals looking to ground their work in scientific expertise. It offers a 60 000 CHF grant to accepted projects, as well as interactive support.

Projects must be submitted before 12 February 2023. They must explicitly address a science-policy

gap around a specific global policy issue and involve at least:

- One academic partner, that is, anyone formally affiliated with an academic institution anywhere in the world;

- One policy partner based in Geneva. This partner should be attached to a policy-related institution in Geneva, such as an NGO or an international organisation.

More on the GSPI website (<https://gspi.ch/icp/>).

The Geneva Science-Policy Interface (GSPI) is an independent platform based at the University of Geneva and backed by leading Swiss and European academic institutions, including CERN. It counts

Obituaries

Donald Perkins (1925 – 2022)



British physicist Don Perkins, who played a significant role in shaping the world of particle physics from the 1940s onwards, passed away on 30 October at the age of 97.

After graduating from Imperial College, London, Perkins obtained a PhD under the supervision of Nobel Laureate George Paget Thomson. As part of his thesis work, he took a photographic emulsion onto an RAF transport plane to record cosmic rays at altitude. This resulted in what was later recognised to be the first observation of the pion, published in *Nature* in 1947.

In 1951, Perkins joined another Nobel Laureate, Cecil Powell, in Bristol, where, working with Peter Fowler, he discovered some of the decay properties of pions. This involved touring some of the world's mountain tops with photographic

emulsions, as well as sending them into the stratosphere on balloons. As a result of their studies, Perkins and Fowler were the first to suggest that irradiation with negatively charged pions might be used to treat cancer. In 1965, Perkins moved to Oxford where, under the overall leadership of Sir Denys Wilkinson, he established a world-leading particle physics group. One year later, he was elected a Fellow of the Royal Society, one of many honours that would crown his long career.

In the 1970s, Perkins's research brought him to CERN, where his work with the Gargamelle bubble chamber contributed to the 1973 discovery of neutral currents, a seminal contribution to the field. He realised that combining neutrino and electron-scattering data established that both were scattering from quarks inside the nucleon. He was also an early supporter of quantum chromodynamics, the theory that describes the interactions between the quarks.

As the 1970s progressed, Perkins became increasingly interested in proton decay experiments, and was a leading advocate of the Soudan-II experiment in the United States. Although Soudan-II never saw evidence of proton decay, the experiment made important contributions to advancing the field of neutrino physics.

Over his long career, Perkins's brilliance benefitted generations of physics students, many of whom were drawn to particle physics through his "Introduction to High Energy Physics", a text book based on his undergraduate lectures first published in 1972. Besides his experimental and theoretical contributions to the field, Perkins was also active in the governance of particle physics, having chaired both the Nuclear Physics Board of the UK's Science and Engineering Research Council

and CERN's Scientific Policy Committee. A charismatic and influential figure, his wisdom, delivered in a northern English accent and

accompanied by his distinctive laugh, will be greatly missed by his many friends and colleagues.

Brian Foster

Ombud's corner

Books and plenty more besides...

The Ombud's office is a large office in the Main Building (room 500-1-004), close to one of the entrances to the Main Auditorium. It's fitted out in a way that allows me to receive visitors comfortably and in a relaxed and pleasant environment.

When I took up my duties – 18 months ago already! – I was delighted to find that there were also vast bookshelves containing all the books that my predecessors had bought to support their initial training in the Ombud's role and to continue developing the knowledge they needed to help them tackle interpersonal relationship challenges in the workplace.

These sixty or so books cover a wide variety of subjects: conflict resolution, mediation, coaching, diversity, ethics, supervision techniques, moral harassment, burnout, etc. They have proven and continue to prove extremely useful to me.

In addition to this inheritance from my predecessors, countless training books on coaching have been given to me by a certified coach, formerly the ombud for the IT department, to whom I am very grateful. I've also acquired other books for CERN that were recommended to me through the professional ombud networks.

My reflex when it came to buying these books was to turn to our colleagues at the CERN Library, who do a remarkable job in tracking down the works you need, in the format you want, and getting them delivered to your office.

This book collection is an invaluable resource for cultivating a deeper understanding of the

mechanisms of interpersonal relationships, developing the tools required to manage complex situations and finding answers to the questions that arise in this area.

Whatever your profession, role or responsibilities, you might find them useful.

That's why, with the help of our colleagues at the CERN Library, I decided to make the full collection available to you through the CERN Library catalogue (tag: Ombud library).

Some of my favourites include:

- The Skilled Facilitator by Roger Schwartz
- The Conflict Resolution Toolbox by Gary T. Furlong
- Le harcèlement moral dans la vie professionnelle by Marie-France Hirigoyen
- Le métier de coach by François Délivré
- The fearless organization by Amy C. Edmondson
- Bringing Peace into the Room by Daniel Bowling and David Hoffman.

Please note that many of the works are also available in electronic format. These include David Rock's fantastic book *Your Brain at Work*, which explores how the brain functions and how it can play tricks on you!

Feel free to borrow any of these books via the CERN Library catalogue – it will give us a chance to meet in person when you collect them and perhaps have a chat about them once you've read them, if you feel like it!

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