

You'll never guess these six unlikely benefits of being a CERN Guide

It may surprise you, but being a CERN Guide can give you unexpected benefits, especially with Science Gateway about to open this autumn



*Unlock the benefits of being a CERN Guide. Start small, guide quickly.
 (Image: CERN)*

Who would have thought that being a CERN Guide in the Science Gateway era could give you so many benefits. See for yourself in the list below (you'll never guess number six).

1. The why

"What made you want to work at CERN?" Answering this visitor's question unlocks the memories of why you came to CERN. CERN is constantly evolving, researching, developing and pushing boundaries. So, as a CERN Guide, each time you take part, you could see, hear, experience something new and exciting that reminds you why you chose to work in such an inspiring place.

2. Exclusive access

Unlock exclusive behind-the-scenes access to areas of CERN. Plus, access a dedicated space for CERN Guides in Science Gateway and join the community to share ideas, download content and sign up for talks and trainings.

3. Wellbeing

Emerging from the COVID-19 years, there's something all the more special about, once again, interacting with people of all ages. And now, Science Gateway activities are aimed at visitors aged from 5 to 105+. There's something for everyone. Engaging with these different audiences can bring joy to your job, make your eyes shine brighter and boost your spirits.

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A word from Fabiola Gianotti

Science Gateway will be a vibrant part of CERN life

In a few short months from now, on 7 October, we'll be formally inaugurating the CERN Science Gateway

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A word from Fabiola Gianotti

Science Gateway will be a vibrant part of CERN life

The ceremony will mark the culmination of a project to which many of you have contributed, and the start of a new phase of sharing our passion and drive for science with our neighbours and people from around the world.

Science Gateway is CERN's new flagship centre for science education and outreach. It will allow us to receive many more visitors than we're able to welcome today, going a considerable way towards satisfying demand, which currently runs at over 300 000 requests for visits per year. It will also allow us to expand our education and outreach activities, reach new audiences from 5 years old and upwards, engage more with the local population, attract the young generation to careers in science, technology, engineering and mathematics (STEM) and forge new links with science education and outreach centres in the Member States and beyond.

As well as being a vital window for science outreach and a source of inspiration for the public, Science Gateway will also be a vibrant part of CERN life. It will be a scientific hub, with its auditorium offering a venue complementary to the main auditorium with double the capacity. The first scientific event we will host is a symposium on 31 October to mark the 50th anniversary of the discovery of neutral currents and the 40th anniversary of the discovery of the W and Z bosons.

Science Gateway will open to the public on 8 October, the day after the inauguration ceremony. But before that happens, we plan to have an inauguration ceremony for the CERN community at the end of September, as well as two days of visits for members of the community and their families.

Between now and then, we'll be bringing details of the project to you through a series of articles in the CERN Bulletin. These will cover all aspects of the new venue, from what Science Gateway will offer to the CERN community, through to the building's architecture and the exciting exhibitions and activities that it will host.

Science Gateway would not have been possible without the generosity of our donors, who covered the full cost of the project, the support of the local authorities in Geneva, who accompanied us throughout all the administrative procedures, the help of the CERN & Society Foundation, and the hard and enthusiastic work of many CERN people and services. I would like to thank all of them very warmly.

Science Gateway is set to become the place where CERN's science and the public meet. I'm personally very excited by the prospect of having a venue where our scientific activities take place alongside public events, and where CERN personnel will rub shoulders with visiting members of the public.

Fabiola Gianotti
Director-General of CERN

4. Physical health

Ask any doctor, or PhD student at least, and they'll confirm that guiding groups increases your step count. It gets you away from a computer screen and into the fresh air. You can even add extra cardio to your workout by getting visitors to walk a little faster between visit points.

5. New skills

Find out something that you never knew about CERN, from engineering to physics to computing to funny anecdotes from CERN's history. You don't need a scientific background to be a CERN Guide – all profiles and languages are welcome, helping showcase CERN's diversity. You just need an active CERN affiliation for six months or more to sign up for training. Improve your skills in communicating, in adapting to different audiences, in languages, and get tips on how to answer the most bizarre visitor questions.

6. Productivity

The strangest benefit by far is that alternating your day-to-day work with being a CERN Guide could

actually make you more productive. As illustrated by this wonderful cartoon.



What now?

With Science Gateway opening this autumn, you have the chance to:

- Showcase interactive exhibitions
- Facilitate hands-on lab workshops
- Perform interactive science shows
- Guide visitors on tours of CERN sites
- Take part in local events

To find out more and sign up for newly available online courses, visit:
<https://guides.web.cern.ch/join>

Kate Kahle

Accelerator Report: reviving antimatter physics and fine-tuning luminosity measurements in the LHC

On Friday, 30 June, an exciting milestone was reached: the much-awaited antiproton physics season finally commenced. Originally scheduled for 11 May, the start had to be postponed due to an unforeseen water leak that occurred on 14 March in a special quadrupole magnet located in the Antiproton Decelerator (AD) machine. As a result, the magnet had to be removed for repair in the workshop before being reinstalled to finalise hardware and beam commissioning. Consequently, the start of antimatter physics was rescheduled for 30 June. The AD-ELENA operations team, together with many experts, have been working hard to meet – with success – this important deadline.

The delay caused by the leaking magnet resulted in a loss of 50 physics days for the experiments behind the ELENA machine. To partially compensate for this significant loss of precious physics time, the 2023 run for the antimatter

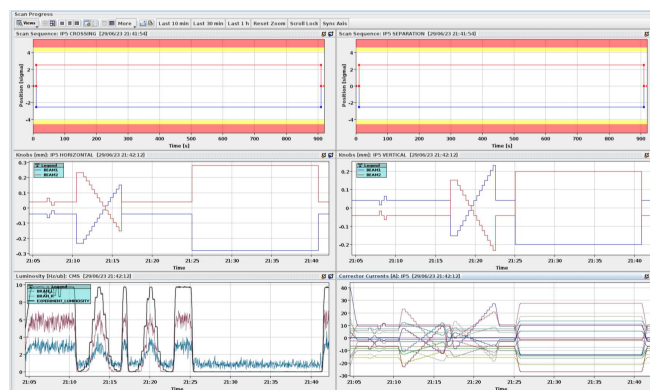
factory has been extended by 12 days. The extended run will now conclude at 6 a.m. on 13 November. This adjustment is intended to maximise scientific output and make best use of the available time for the experiments, without compromising on the many activities scheduled for the 2023–2024 year-end technical stop (YETS). On the LHC side, the technical stop mentioned in the last Accelerator Report has been successfully completed. Following the stop, special physics runs were conducted along with a short intensity ramp-up to revalidate the LHC machine for luminosity production. Despite some delays caused by technical issues, including a power cut affecting part of CERN, the machine has now resumed normal operation with the aim of maximising luminosity production.

One of the special physics runs was the so-called “van der Meer” run, which plays a crucial role in precisely calibrating the experiments’ luminosity

measurements. This calibration involves establishing a precise relationship between the beam separation and the observed rate of particle interactions. During the van der Meer scan, the separation between the colliding beams is intentionally varied, leading to changes in the number of particle interactions. Through meticulous control of the beam separation and thorough analysis of the resulting data, the experts in the experiments can accurately determine the relationship between beam separation and observed interactions. This relationship is referred to as the “luminosity calibration curve”, which serves as vital input towards an accurate – in the order of one per cent – determination of the number of collisions recorded by the LHC experiments.

The LHC will continue its proton collisions and luminosity production until a brief technical stop in mid-September. Subsequently, the focus will

shift to lead-ion collisions until 30 October, when the YETS is set to commence.

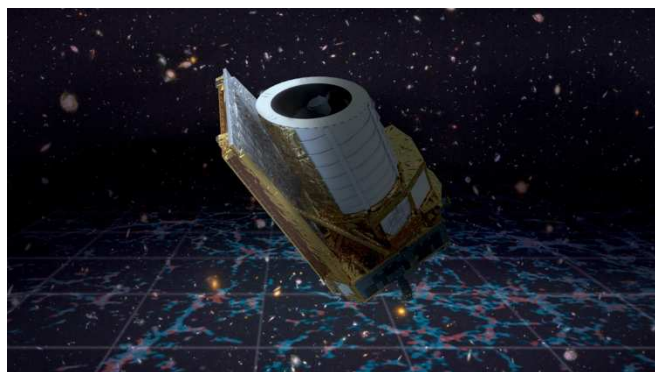


This is just one part of the LHC luminosity scan application, where the beam separation steps for the CMS van der Meer scan are clearly visible (second row of plots): on the left-hand side we see the horizontal separation, and on the right-hand side the vertical separation. The resulting luminosity is given in the bottom left-hand plot. (Image: CERN)

Rende Steerenberg

CERN tech to help investigate the dark universe

ESA’s recently launched Euclid telescope will rely on CERN software and computing infrastructure to help it map the effects of dark matter and dark energy on the Universe



The Euclid space probe. (Image: ESA/Euclid/Euclid Consortium/NASA)

On 1 July, at exactly 17.11 CEST, the European Space Agency’s newest mission was launched in a SpaceX Falcon 9 rocket from Cape Canaveral in Florida, USA. Called Euclid, the 2-tonne, 4.5-m-tall and 3.1-m-in-diameter space telescope will be used to map the geometry of the Universe, in particular to explore the nature of dark matter and dark energy. Euclid has been a CERN-recognised experiment since 2015 and will use key software

and computing infrastructure provided by CERN to process vast amounts of data.

Understanding the evolution of the Universe is a fundamental challenge in modern physics. Astronomical observations show that the Universe’s rate of expansion is not constant, and scientists believe that dark energy could be the culprit, while dark matter governs the large-scale structure of the Universe. As their names suggest, dark matter and dark energy are “invisible” to current telescopes, because they do not interact with light in the way that normal – or “visible” – matter does. Scientists instead use telescopes like Euclid to look for their effects on observable matter, such as measuring their redshifts to study the tiny deformations of galaxy shapes and the distribution of galaxies over space and time. Euclid will be the most comprehensive investigation to date, scanning optical light from billions of galaxies up to 10 billion light years away, covering almost a third of the sky. The aim is to create a map through

time and space of the large-scale structure of the Universe.

To do this, the mission requires vast amounts of data and data-processing capabilities. This is where CERN, which is used to processing and storing data from millions of high-energy particle collisions per second, comes in. CERN is involved in the Euclid programme's science ground segment (SGS). The SGS will process and analyse Euclid data and merge it with data from ground-based telescopes to study the properties of dark energy and dark matter.

The SGS will process over 850 Gbits of compressed images per day, the largest of any ESA mission to date, producing at the end more than tens of petabytes of reduced data. "Given the complexity of the infrastructure and the pressure in analysing the data as fast as possible, the support and expertise of CERN is of high relevance," says Luca Valenziano, Euclid Consortium representative at CERN. "The data will be processed in a distributed infrastructure of nine data centres. CERN provides the means to efficiently deploy the software to these data centres using CVMFS (CernVM File System), and will continue to support the Euclid SGS in this way during its mission lifetime."

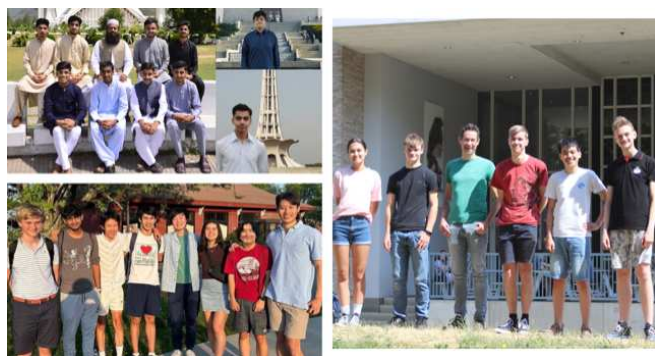
CERN's involvement is not limited to a technological contribution, as theoretical physics at the Laboratory has strong ties with the science of Euclid. "The exact properties of galaxy density fluctuations depend on the entire history of the Universe, and cosmologists at CERN have been working on developing theoretical frameworks to predict them," explains Marko Simonović, from CERN's Theoretical Physics department. "Tools developed among other places at CERN will be used by the Euclid collaboration to make comparisons of data and theory and test theories beyond standard models of cosmology and particle physics. Any new discovery in cosmology would indirectly be a new discovery in particle physics."

CERN is part of the Euclid consortium, an organisation that brings together about 2000 scientists in 300 laboratories in 17 different countries in Europe, USA, Canada and Japan. It is responsible for designing and building the NISP and VIS instruments, for gathering all ground-based complementary data, developing the survey strategy and the data processing pipeline to produce all calibrated images and catalogues and the scientific exploitation of the data.

Naomi Dinmore

Three teams of secondary school pupils from the Netherlands, Pakistan and the USA win the 10th edition of Beamline for Schools

Three teams of secondary school pupils from the Netherlands, Pakistan and the United States have been selected to carry out their own experiments using accelerator beams from CERN and DESY



Winners of the CERN Beamline for Schools 2023: «Particular Perspective» from Pakistan on the top left, «Myriad

Magnets» from the USA on the bottom left and «Wire Wizards» from the Netherlands on the right (Images: Particular Perspective, Myriad Magnets, Wire Wizards)

Geneva and Hamburg, 28 June 2023. In 2023, for the second time in the history of the Beamline for Schools competition, the evaluation committee selected three winning teams. The team "Myriad Magnets" from the Philips Exeter Academy, in Exeter, United States, and the team "Particular Perspective", which brings together pupils from the Islamabad College for Boys, the Supernova

School in Islamabad, the Cadet College in Hasanabdal, the Siddeeq Public School in Rawalpindi and the Cedar College in Karachi, Pakistan, will travel to CERN, Geneva, in September 2023 to perform the experiments that they proposed. The team “Wire Wizards” from the Augustinianum school in Eindhoven, Netherlands, will be hosted at DESY (Deutsches Elektronen-Synchrotron in Hamburg, Germany) to carry out its experiment.

Beamline for Schools (BL4S) is a physics competition open to secondary school pupils from all around the world. The participants are invited to prepare a proposal for a physics experiment that can be undertaken at the beamline of a particle accelerator. A beamline is a facility that provides high-energy fluxes of subatomic particles that can be used to conduct experiments in different fields, including fundamental physics, material science and medicine.

BL4S started in 2014 on the occasion of the 60th anniversary of CERN. Following the success of the first edition, the competition continued, reaching its 10th edition in 2023. Since 2014, 22 teams have been awarded as winners in BL4S, while more than 16 000 pupils from all over the world have taken part in the competition. The participation rate has been rising consistently for the past few years, and this year, 379 teams from 63 countries submitted an experiment proposal.

“Congratulations to this year’s winners – may they have good beams, collect interesting data and generally have the time of their lives,” says Christoph Rembser, a CERN physicist at the ATLAS experiment and one of the founders of Beamline for Schools. “Every year I am astonished by how many young people submit very creative, interesting proposals. In 2014, we weren’t sure at all whether this competition would work. Ten years and 16 000 participants later, I am proud to say that it is obviously a resounding success.”

The fruitful collaboration between CERN and DESY started in 2019 during the shutdown period of the CERN accelerators. This year, the German laboratory will host its fifth team of winners.

“I am amazed that this time a record number of nearly 380 applications from school teams worldwide was received! It is fantastic that so many young people are interested in doing hands-on research at our laboratories,” says Beate

Heinemann, DESY Director in charge of particle physics. “DESY is very happy to be part of this endeavour together with CERN, and to offer its test beam this year to a team from the Netherlands.”

Preparing a proposal for a particle physics experiment is a very challenging task for secondary school pupils but, when provided with the right support, the participants design very creative experiments. The “Myriad Magnets” team from the United States plans to build and test a permanent magnet with the Halbach geometry that can be configured to produce a dipole or a quadrupole magnetic field.

“BL4S supported us to directly explore and apply new skills, particularly in the intersection of physics and engineering. It is hard to find challenging and intellectually fruitful opportunities that tackle research in both; BL4S filled this gap, and we look forward to continuing to build on these areas at CERN and in the coming years,” says Isabella Vesely, one of the “Myriad Magnets” pupils.

The Pakistan team “Particular Perspective” will measure in detail the beam composition of the T10 beamline of the CERN Proton Synchrotron accelerator. The experiment set-up they designed will make it possible to differentiate between different particle species and measure their intensity.

“I am grateful to BL4S for having provided me with an opportunity to represent my country, Pakistan, and its budding community of aspiring physicists. This is a chance for us to experience physics at the highest level and will inspire people with interests similar to ours to reach greater heights,” says Muhammad Salman Tarar from the “Particular Perspective” team.

The “Wire Wizards” team’s experiment focuses on detector development. The Dutch students designed and built a multi-wire proportional chamber (MWPC), a gas detector able to measure the position of a particle interacting with it, and they plan to characterise it using the electron beam available at DESY.

“The BL4S competition provides us with a unique educational experience that will be a highlight in our time as students,” says Leon Verreijt from the “Wire Wizards” team.

The winners have been selected by a committee of CERN and DESY scientists from a shortlist of 27 particularly promising experiments. All the teams in the shortlist will be awarded special prizes. In addition, one team will be recognised for the most creative video and 10 teams for the quality of physics outreach activities they are organising in

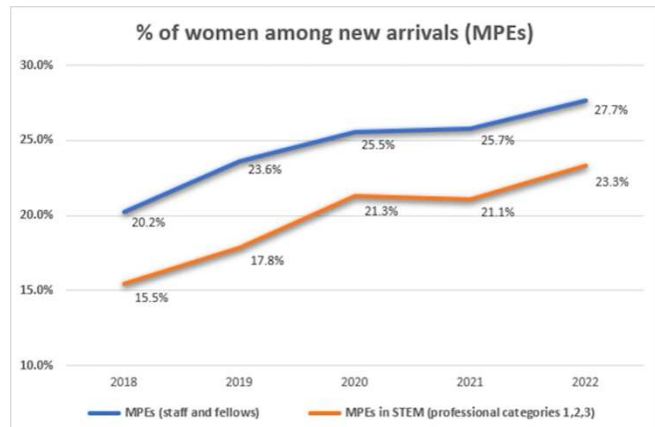
their local communities, taking advantage of the knowledge gained by taking part in BL4S.

Beamline for Schools is an education and outreach project funded by the CERN & Society Foundation and supported by individual donors, foundations and companies and, for this 10th edition, notably by ROLEX through its Perpetual Planet Initiative and the Wilhelm and Else Heraeus Foundation.

Gender diversity on the right track at CERN

Recent statistics on new arrivals at CERN are very encouraging: the proportion of women hired over the last five years has increased by 7.5%

In spring 2021, the Diversity & Inclusion programme launched the “25 by ’25” strategy, an aspirational target-based initiative to boost the gender and nationality diversity of CERN’s staff and fellows population (MPEs) by 2025. The overall percentage of women among MPEs has hovered around 20% for the past decade, but the “25 by ’25” strategy has got things moving, bringing CERN closer to its target: 25% of women among MPEs by the end of 2025.



The professional categories 1, 2 and 3 are: physicists, engineers and technicians. (Image: CERN)

The figures tell a very encouraging story when it comes to new recruits: in 2018, the proportion of women among new arrivals was 20.2%; in 2022 it was 27.7%. And the progression is even greater for roles in STEM (science, technology, engineering

and mathematics), going from 15.5% of women in 2018 to 23.3% in 2022.

“The numbers couldn’t be clearer: there is a high level of engagement and a concerted effort from the hiring management, in particular within the STEM categories. We are really thankful for the continued engagement of CERN’s Management since the endorsement of the strategy in 2021,” says Louise Carvalho, CERN’s Diversity & Inclusion (D&I) programme leader.

The increased awareness and collaboration regarding diversity and inclusion is visible at all grades and levels of the personnel, in particular since the department heads’ appointment last year of 19 Diversity & Inclusion Officers (DIOs). Through the DIO community, specific actions and communications are transmitted effectively to the personnel, serving as a highly useful and enriching “D&I multiplier” resource for the D&I programme. For nationality diversity, the overall aim is to improve the ratio of Member States’ budget contribution to hiring rate as well as to address nationality clusters. To this end, the D&I programme is currently undertaking a deeper analysis of each department. Progress in this domain will be reported toward the end of this year, so stay tuned!)

Anaïs Schaeffer

New management for the LHCb collaboration in 2023

On 1 July 2023, a new spokesperson and two deputies took over at the helm of the LHCb experiment



Vincenzo Vagnoni is the new spokesperson of the LHCb experiment. (Image : CERN)

On 1 July 2023, a new spokesperson, Vincenzo Vagnoni (INFN Bologna), and two deputies, Patrick Robbe (CNRS/IN2P3 and University of Paris-Saclay) and Ulrich Uwer (Heidelberg University), took over at the helm of the LHCb collaboration for the coming three years. They succeed an outgoing management team composed of former spokesperson Chris Parks (University of Manchester) and former deputy Matteo Palutan (INFN).

Patrick Robbe and Ulrich Uwer are the new deputy spokespersons of the LHCb experiment (Image: CERN)

Vincenzo, Patrick and Ulrich will lead LHCb through a crucial period during which the performance of the upgraded detector will be demonstrated. This new detector, which was recently installed, will increase the beauty and charm particle data sample for many channels by an order of magnitude, and is now starting its physics data-taking period. In parallel, the new management team will oversee the finalisation of the project laying out future improvements, known as Upgrade II.

Read more on the LHCb website (<https://lhcb-outreach.web.cern.ch/2023/06/30/vincenzo-vagnoni-patrick-robbe-and-ulrich-uwer-new-management-for-the-lhcb-collaboration/>).

LHCb collaboration

Alumni assemble! “Third collisions” event to take place in February 2024

Major CERN alumni event to be held at Science Gateway on 9–11 February 2024



CERN alumni are invited to come together on the weekend of 9–11 February for a major reunion event at CERN’s new Science Gateway. Held at the start of CERN’s 70th-anniversary year, the event

provides a fantastic opportunity to celebrate what makes CERN such a special place: you and all the others who have contributed in many diverse ways!

The theme of the event is “Accelerating beyond”. This highlights the important role CERN can play as a career launchpad, as well as the positive impact CERN alumni – and technologies – frequently go on to have on wider society. CERN alumni now working in fields such as AI, the environment, data science and healthcare will present their fascinating work at the event. As at previous “collisions” events, there will also be a focus on diversity. This is especially important for this edition, with the final day of the event coinciding

with the International Day of Women and Girls in Science.

The event will also feature keynote talks on the future of CERN, a gala dinner, a jobs fair, CERN tours, workshops with alumni startup companies, entertainment, sporting activities and much more. In addition, there will be a special prize-giving ceremony, with awards going to alumni who have made a significant positive impact on wider society and alumni who have helped to foster growth of the CERN Alumni Network. Most importantly though, the event will provide a wonderful opportunity to catch up with former colleagues and establish new connections.

This will be the third major “collisions” event organised by the CERN Alumni team. The first edition was held in 2018 and the award-winning second edition was held in 2021 (online only, due to the coronavirus pandemic).

“Whether you’re a CERN alum or you’re working at CERN today, join us for this exclusive weekend,” says Rachel Bray, Head of the CERN Alumni programme. “We have talks and activities guaranteed to both inspire and entertain you, as

well as opportunities to reconnect and develop your network.” The network continues to grow rapidly, with active groups across the globe. Today, there are almost 9000 members from over 100 countries.

Save the date for this exciting weekend, which will be jam-packed with inspiration, insights and ideas. The event is open to alumni, current members of personnel and “plus ones”. A full list of speakers – and other special surprises – will be announced soon. Registration will also open soon. Places are limited, so make sure you’re a member of the CERN Alumni Network and stay tuned to the weekly alumni newsletter to find out as soon as tickets become available.

You can also help shape the upcoming alumni event by completing this survey (<https://alumni.cern/surveys/forms/4214>) and telling us what you’d like to see over this special weekend.

Andrew Purcell

From physics to finance: how can CERN tools help to uncover market manipulation?

With its world-renowned expertise in the analysis of massive volumes of data, CERN has started a unique collaboration with leading market-surveillance experts to explore how particle physics could help to build future manipulation-detection techniques



(Image: Frame Stock Footage on Artlist)

Whether on the trading floor or in the CERN control rooms, vast streams of constantly changing data cross each other under the watchful eye of experts. On the one hand, physicists analyse the results of particle collisions – now over one exabyte of data is stored in CERN’s computing

facilities – in search of the key data that will tell them more about the nature of the Universe. On the other hand, financial regulators scan markets riddled with hundreds of millions of algorithmically performed buy-and-sell orders with a view to exposing those who do not play by the rules and try to manipulate trade exchanges. With this in mind, it is clear that the world of physics, its tools and expertise, can be of help to the financial world.

Last month, academic financial experts and international market regulators met CERN representatives to launch a unique collaboration. Named the International Expert Group on Market Surveillance (IMS Group), the collaboration brings together 17 regulatory agencies across the world as well as CERN. “By combining academic

research, industry expertise and CERN's expert knowledge, we are uniquely positioned to drive innovation and create new solutions and tools for financial market surveillance," says Marjolein Verhulst, the chair of the IMS Group. "In the coming months, we hope to welcome additional regulatory agencies and develop a research agenda that addresses common surveillance challenges".

Over the last fifty years, stock exchanges have transitioned from open outcry to electronic trading, from loud shouting and hand gesturing to ever more automated, frequent and efficient processes. These changes have enabled new market manipulation techniques, such as spoofing, to thrive. Spoofing consists in distorting the price of certain financial instruments by placing "fake" buy or sell orders without the intent to trade, only to cancel them once the market has reacted. By doing so, the manipulator can then trade an opposite order at a more favourable price. This comes at the expense of other investors and lowers trust in financial institutions. To fight spoofing, it is important to closely monitor the market for microscopic signals.

When sifting through its vast stores of data, CERN has developed several tools – such as the open-source data analysis framework ROOT – to filter the data and visualise that which is potentially interesting for further analysis. Financial regulators are embracing such modern algorithms, transitioning away from the previous practice of comparing snapshots of the order book each second or minute, which misses the transactions made in between.

As a renowned expert in scientific data analysis and modelling, CERN is playing an active role in this collaboration with the IMS Group by providing some of the techniques it uses for particle physics, particularly ROOT. "ROOT has been used by physicists to analyse CERN data for over twenty

years and is continuously updated", explains Axel Naumann, a senior applied physicist at CERN. "Available as open source, ROOT provides a versatile solution for partners who are willing to make a positive impact on society and want to crack problems that require extreme data analysis, such as genomic analysis, vaccine production or Earth observation."

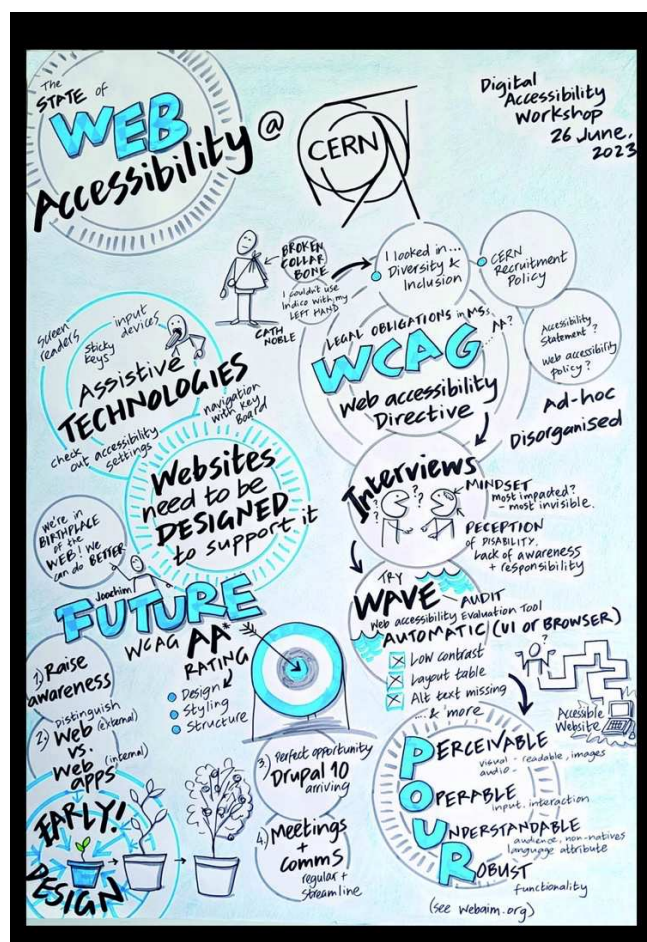
The basis of this collaboration is HighLO, a research project that was launched four years ago by CERN, the Wageningen University (WUR) / Maastricht University (UM) and the Dutch Commodity Risk Management Expertise Centre (CORMEC). Using ROOT and market data, the project team developed a unique visualisation method that enables market regulators to protect commodity and financial markets from malpractices and to analyse spoofing cases in detail, such as a record-breaking spoofing case encountered by JPMorgan in 2020.

CERN's technologies and expertise are available for scientific and commercial purposes through a variety of technology transfer opportunities. The CERN Knowledge Transfer group can help you to tap into this potential and find solutions based on CERN's many areas of expertise. Visit the KT website or write to kt@cern.ch.

The HighLO project team will present its research at the upcoming Knowledge Transfer (KT) seminar at 11 a.m. on 29 June. The presentation will be entitled "Discovering fraud: can CERN tools accelerate market surveillance?" During the talk, researchers will present this unique cooperation between CERN and the academic financial world and financial regulators. Find out more on the Indico event page (<https://indico.cern.ch/event/1254581/>).

Antoine Le Gall

A welcome web accessibility workshop



A visual summary of the workshop, created by Jennifer Cham from the FAP department. (Image: CC-BY-4.0)

As the birthplace of the web, it is essential that CERN has an accessible web presence.

With this in mind, an introductory workshop to digital accessibility took place at CERN on 26 June. It looked at the state of web accessibility at CERN, what's in the pipeline, and what we can all do to improve accessibility.

The slides and recording, both available on Indico (<https://indico.cern.ch/event/1293028/>), provide tips and guidance to make online content and interfaces more accessible in a wider range of situations.

From improving colour contrast to writing meaningful alternative text for images, and much more, this guidance not only helps people using assistive technologies, but also makes it easier and more efficient for all web users to access information online.

As a first step, web owners can use the WAVE browser extension to spot accessibility errors and how to fix them.

Computer Security: Dear summer students, welcome!

A warm welcome to the summer-student class of 2023! We're glad that you made it to CERN! We offer a packed agenda for the next two months: challenging lectures; interesting projects to tackle with your team; and lots of time to take a great big gulp of CERN's academic freedom, spirit and creativity! In order to make your digital life as comfortable as possible, however, there are a few things you need to know.

When you join CERN, you're given a CERN computing account. Take care of your account password as any evil-doer might misuse it to spam the world on your behalf, abuse CERN's computing clusters in your name, download journals in bulk from CERN's digital library, or simply compromise your CERN PC and extract your photos, documents or personal data, or spy on you using your computer's microphone or webcam. Worst-case scenario, the whole Organization is at risk!

Similarly, take good care of your CERN and personal computers, tablets and smartphones. Give them some freedom to update themselves so you benefit from the latest protective measures. "Auto-update" is a good friend, just make sure that it's enabled – as it should be by default.

A particularly nasty way to lose your password, at CERN or at home, is to reply to so-called "phishing emails", i.e. emails asking for your password. No serious person – the CERN Computer Security team, the CERN Service Desk or your CERN supervisor – would send such an email, only dishonest people or fraudsters would. So stay on the lookout and don't enter your password in weird webpages. Don't click on links in emails obviously not intended for you, for example, emails not addressed to you, not coming from the real CERN, not written in one of your native languages, or of no relevance to you. Ask us at Computer.Security@cern.ch if you have any

doubts. Similarly, don't randomly click on web links, but stop and think first. Otherwise, you might infect your computer in no time – and the sole remedy will be a full reinstallation of your device (easier if you have backups!).

CERN has awesome network connectivity to the world. But it's for professional purposes. While private usage is tolerated, please do not abuse

this. Keep your bandwidth low. In particular, refrain from bulk downloading movies or software. Remember "copyright"? It also applies at CERN. Any violation of copyright reported to CERN will be followed up and any infringement costs will be passed on to the perpetrator. The same holds true for pirated software. If you have stored pirated licence keys on your device, it's time to delete them. Companies are monitoring for abuse of their software and infringement costs can quickly reach five to six figures. This one is of particular importance: if you need particular software, have a look at CERN's central software repositories.

While you're at CERN, you might be working on a project requiring digital resources – setting up a webpage, writing some code, developing hardware. Please don't reinvent the wheel if you need a database. Or a webserver. Or some software. The CERN IT department can provide a wide variety of centrally managed and secure services for your digital convenience. Just put

yourself on their shoulders and build on top. Free up your time and brain for creativity and let CERN IT provide the tools. Moreover, make sure that all your development work, software, design drawings, documentation and so on are made available to your supervisor when you leave. This will ensure your legacy lives on at CERN. If you keep them to yourself, they'll get purged and deleted, and your time at CERN will be forgotten. Finally, like anywhere else, there are some rules to respect. Use of CERN's computing facilities is governed by the CERN Computing Rules. Basically, be reasonable. Don't do anything that could be considered immoral, illegal or abusive. Similarly, personal use of CERN's computing facilities is tolerated, but within the aforementioned limits. For example, browsing pornography is forbidden unless you have a good professional reason to do so (and it might be awkward receiving a corresponding cease-and-desist email from us). In another example, crypto-mining on CERN's computing clusters is definitely a no-no. Just don't. So, make sure that you respect these few ground rules – keep your system up to date – protect your password – STOP-THINK-DON'T CLICK – respect copyright – preserve your work – follow the CERN Computing Rules. We wish you a great and exciting stay at CERN. Have fun and enjoy!

Computer security team

Official news

Revised administrative circulars

The following revised administrative circulars have been approved by the Director-General and will enter into force on 1 July 2023:

- Administrative Circular No. 5 (Rev.3)
"Dependent child"
(<http://cds.cern.ch/record/2863051>)
- Administrative Circular No. 12A (Rev.4)
"Education fees"
(<http://cds.cern.ch/record/2863052>)

- Administrative Circular No. 12B (Rev.5)
"Education and language course fees"
(<http://cds.cern.ch/record/2863053>)

These revisions cancel and replace Administrative Circular No. 5 (Rev.2), dated November 2016, Administrative Circular No. 12A (Rev.3), dated September 2017, and Administrative Circular No. 12B (Rev.4), dated October 2022.

The purpose of these modifications is to reflect, where applicable, the amendments to Article R IV 1.08 of the Staff Regulations on the non-concurrence of family benefits, presented to the Council at its session in June 2023.

These modifications are summarised as follows:

- In §15 of AC5, §51 of AC12 A and §49 of AC12 B:

The new wording clarifies that benefits to which a person other than a family member is entitled, such as benefits paid to non-spouses (e.g. another parent, in the case of stepchildren) or a former spouse, are also subject to the non-concurrence principle.

- In §16 and 17 of AC5, §52 and 53 of AC 12 A and §50 and 51 of AC12 B:

The circulars now include a reference to the obligation for members of the personnel to report concurrent benefits. It is further specified that members of the personnel are required to make all efforts in good faith to obtain the necessary information regarding benefits received by the other parent of their dependent child.

The French versions of these circulars are under preparation and will be communicated later.

HR department

Simplification of the procedure concerning leave in the event of the serious illness of a close relative

To make life easier for members of the personnel, the HR department is simplifying the procedure concerning leave in the event of the serious illness of a close relative. The new provisions will enter into force on 1 July

In accordance with Article R II 4.27 of the Staff Rules and Regulations, members of the personnel (employed and associated) are entitled to up to seven calendar days of remunerated leave per year (from 1 October to 30 September) if one of their close relatives is suffering from a serious illness and the need for them to be with the relative concerned is substantiated by a medical certificate. Single parents are entitled to five additional days of such leave per year to care for a dependent child with a serious illness.

Close relatives are defined as the spouses/partners, children, parents, siblings, parents-in-law and step-parents of members of the personnel.

In view of the scarcity of available appointments with healthcare professionals and to avoid exacerbating the situation, the Organization has decided that, from 1 July, a medical certificate will be required only in the case of requests for more than three consecutive days of leave in the event of the serious illness of a close relative. For requests of a shorter duration, a declaration by the

member of the personnel will suffice. The declaration must be sent to the departmental or group secretariat, who will register the absence in the EDH absence management system.

The HR department wishes to underline that accompanying a close relative to a medical appointment does not entitle the member of the personnel to leave in the event of the serious illness of a close relative. Please note also that this kind of leave does not cover the time spent travelling to reach the close relative concerned or a medical establishment.

Further information can be found in the "Leave for family reasons" procedure: <https://admin-eguide.web.cern.ch/en/procedure/leave-family-reasons>

Questions about the procedure should be addressed, in the first instance, to your departmental secretariat..

*Leave service
HR.leave@cern.ch*

Staff rules and regulations - 11th edition: Modification No. 21

In accordance with recommendations made by the Finance Committee and decisions taken by Council in June 2023 (CERN/FC/6704-CERN/3736), please find below the pages of the Staff Rules and Regulations which have been updated further to the modifications coming into force on 1 July 2023:

Chapter III – WORKING CONDITIONS

Section 1 – Working hours (modification of page 32)

Chapter IV – SOCIAL CONDITIONS

Section 1 – Family and family benefits (modification of page 38)

The complete updated electronic version of the Staff Rules and Regulations is accessible via CDS (<https://cds.cern.ch/record/1993099?ln=en>).

HR department

Announcements

Celebrating electroweak milestones at the Science Gateway – save the date!

On 31 October 2023, we mark the 50th anniversary of the observation of neutral currents and the 40th anniversary of the discovery of the W and the Z bosons with a symposium in the new Science Gateway auditorium

In 1973, neutral currents were first observed at the Gargamelle bubble chamber, a finding that paved the way for the discovery in 1983 of the W and Z bosons with the SppS. These two experimental discoveries put the electroweak theory on solid ground.

Starting mid-morning on 31 October, a joint anniversary symposium will celebrate these two milestones, offering a day full of scientific talks on the experimental discoveries. Other topics will

include the evolution of the electroweak theory, subsequent neutrino (-beam) experiments, rounding off with present-day measurements and FCC-ee perspectives.

The symposium will be the first public scientific event to be held in the new main auditorium of the Science Gateway.

Save the date and stay tuned for further updates on the full programme!

Don't miss the final presentation of the Connect India residency artists | 13 July

Arts at CERN invites you to the final presentation by the artists Rohini Devasher and Elisa Storelli, recipients of the Connect India residency award

Connect India is a dual artistic residency between CERN and the International Centre for Theoretical

Sciences (ICTS) in Bengaluru, India. The Connect collaboration framework was launched in 2021 by

Arts at CERN and Pro Helvetia to serve as a platform for interactions and dialogue between artistic and scientific communities across the world.

The first edition of Connect took place at CERN and in South Africa, where two artists explored the science of the South African Radio Astronomy Observatory (SARAO) and the South African Astronomical Observatory (SAAO). This second edition offered one joint residency for two artists, Elisa Storelli, from Switzerland, and Rohini Devasher, from India.

Swiss artist Elisa Storelli is interested in the artistic examination of time, which she refers to as “chronomorphology”. Her research delves into the ways time has been measured, calculated and experienced across cultures and centuries. Through installations, lectures and sound performances, she presents playful and poetic perspectives around the notions of time. In her residency project, A para-chronology of atoms and stars, Storelli intends to create a scientific narrative in the form of a multimedia poem that invites the audience to consider the notions of

time and chronology in shaping our understanding of the world.

Rohini Devasher is an artist and amateur astronomer. Her films, prints, sounds and drawings map the complexities of time and space. In a Mirror, Darkly, Devasher’s residency proposal, evolves as a close reading of the methods and interactions of observation in fundamental physics through the lenses of wonder and “the strange”. Its title references both the mirroring of matter and antimatter at CERN as well as the optics used to measure gravitational waves – a new horizon in observational astronomy and a key area of research at ICTS.

The two artists will present their ideas and progress during their residency final presentation at CERN on Thursday, 13 July, from 11.30 a.m. to 1.00 p.m., in Salle Curie (40/S2-C01).

The presentation will be followed by a Q&A session. Everyone at CERN is welcome to attend.

More information on the Indico page (<https://indico.cern.ch/event/1304853/>).

The on-site CERN Webfest hackathon is back – don’t forget to sign up!

Would you like to spend a weekend working with a team of people on an exciting small-scale project? The hackathon – a hacking marathon – is just like a real marathon except that it isn’t you who’s trying to run, it’s your app. In only one weekend you have to create a web or mobile application that supports education, science and research.

The best-app competition is not only for computer scientists and programmers, but for anyone working at CERN. Anyone with an idea or a project can participate! Participants are expected to find new use cases for CERN technologies or develop tools that could be used by CERN and its

community. It could even be a tool to promote the fascinating work carried out at CERN! Any subject area can be chosen, regardless of educational level. Applications to aid the research process and thus help science are particularly encouraged.

The Webfest will run over the weekend of 21–23 July, following an introductory session on the Friday. The participants will have the next two days to put their ideas into action and come back for the judging session to present their work on the Sunday afternoon. If you already have an idea, don’t forget to share it on the Mattermost channel and set up your team beforehand. Check out the website webfest.cern for more information!

The 2023 CERN openlab Summer Student programme is under way – don't miss our lectures on exciting computing topics!

Almost all the summer students have arrived for the 2023 CERN openlab Summer Student programme. A set of special lectures begins on Monday, 4 July. Given by CERN experts, these lectures will cover a diverse range of topics, including exascale supercomputing, technologies related to artificial intelligence, and quantum computing. Tune in for the livestream via the CERN Webcast website and the CERN Lectures YouTube channel.

Education and dissemination are at the heart of the CERN openlab mission. To help train the computing experts of tomorrow, CERN openlab opens its doors to bright new minds. Out of 1880 applicants, 30 students – from 21 countries – have been chosen to work on a range of computing projects. Nine weeks of hands-on experience with

cutting-edge computing technologies is an auspicious start for the students' future careers. Anyone interested in learning about different aspects of computing at CERN is welcome to attend the free and open programme of online lectures. The complete list of topics can be found here (<https://indico.cern.ch/category/16988/>). Lecture attendees can find out how CERN sifts through extremely large data volumes from particle collisions in the LHC, which techniques are being employed to optimise data flows, what innovative solutions are being explored to address the enormous computing challenges posed by the upcoming High-Luminosity Large Hadron Collider, and much, much more!

Marina Banjac

Library - new books and e-books in June

The Library team adds new resources for the CERN community every day in its catalogue. Check the June 2023 additions here (https://catalogue.library.cern/search?q=_created%3A%5B2023-06-01%20TO%202023-06-31%5D%20AND%20publication_year%3A%5B2018%20TO%202023%5D&f=doctype%3ABOOK&f=doctype%3APROCEEDINGS&l=grid&order=asc&p=1&s=60&sort=bestmatch).

Find more books and e-books in the CERN Library Catalogue (<https://catalogue.library.cern/>).

Please let us know if you cannot find the book you need via our request form (<https://catalogue.library.cern/request>).

Enjoy reading! For any question or suggestion, contact the Library: library.desk@cern.ch

The July/August issue of the CERN Courier is out

Dealing with 1000 proton–proton collisions per bunch crossing is just one of the challenges in designing a detector for the Future Circular Collider (FCC), describes our cover feature (p30). Meanwhile, FCC Week 2023 projected a strong sense of momentum amongst the community toward this visionary proposed facility (p5), a feasibility study for which is in full swing. In line

with the way astronomers and other fields of fundamental exploration view their tools, the FCC would be better branded as an international particle “observatory” than a collider, argues this issue’s Viewpoint (p45).

This issue also describes how the discovery of neutral currents at CERN 50 years ago put the nascent Standard Model on solid ground (p35),

asks whether the 5 σ rule is still the best criterion for discoveries in particle physics (p24), gets up close with event displays (p41) and explores the wonderful world of welding in CERN's workshops (p51).

Unique measurements of thorium isomers at ISOLDE advance a nuclear clock (p7), CERN shares

its expertise in vacuum and materials for gravitational-wave observatories (p18), record precision on key CP-violation observables by LHCb (p8), an interview with physicist and YouTuber Don Lincoln (p47), and much more inside.

Read the digital edition of this new issue on CDS (<https://cds.cern.ch/record/2863407?ln=en>).

New mobile phone service contract conditions

Following a call for tender issued in 2022, CERN has granted a contract to Swisscom[1] for the provision of mobile telephony services starting in July 2023.

As this means that there is no change in our service provider, your mobile number (+4175411XXXX) remains unchanged and there is no need to replace your SIM card.

Orange continues to provide outdoor coverage in France.

While the service providers have not changed, the subscription fees have been reduced and we are introducing a new "Europe" subscription[2] for people who travel frequently for professional reasons to countries in Europe other than Italy, Germany, Austria and the Host States.

To enable the necessary changes to be made for the implementation of the new contract, it will not be possible to cancel or modify phone subscriptions from 26 June to 3 July. Modifications and cancellations will be processed on 3 and 4 July. New subscriptions can still be requested at any time.

Please remember, when using a CERN mobile subscription, that you must comply with the

mobile service terms and conditions. To minimise costs to CERN, you should use the CERNPhone application when calling outside Switzerland and the neighbouring countries rather than making voice calls with your mobile phone.

Please be aware that Swisscom's cockpit application does not show the negotiated tariffs for CERN's contract. The standard Swisscom price of 0.3 CHF/MB is shown for mobile data in Europe, while the real tariff is much lower.

For further details, please see the mobile service documentation.

[1] Under the terms of the contract, our mobile infrastructure has been upgraded to add 5G and LoRa services in the underground areas and experimental facilities.

[2] This subscription is likely to be cost-effective for people who use, on average, more than 2 GB/month when roaming in Europe. Full details of the subscriptions can be found [here](#). Subscription modifications can be made via the Mobile Subscription Management EDH form

Carpooling platform Mov'ici available at CERN from 20 June

From June 2023, CERN will be partnering with Mov'ici, a car-sharing platform provided by the Auvergne-Rhône-Alpes region that is also available free of charge in French-speaking Switzerland.

Everyday actions add up to a big difference: think about carpooling!

For more information and to register, visit: <https://movici.auvergnerhonealpes.fr/>

The 2022 CERN Annual Report is available

You can read it online or get a paper copy at the Library

The 2022 CERN Annual Report, which highlights CERN's main achievements and activities from last year, was presented to the CERN Council in their June meeting.

You can read this, and previous, Annual Reports online here :

<https://cds.cern.ch/collection/CERN%20Annual%20Reports?ln=en> – paper copies are also available at the CERN Library.

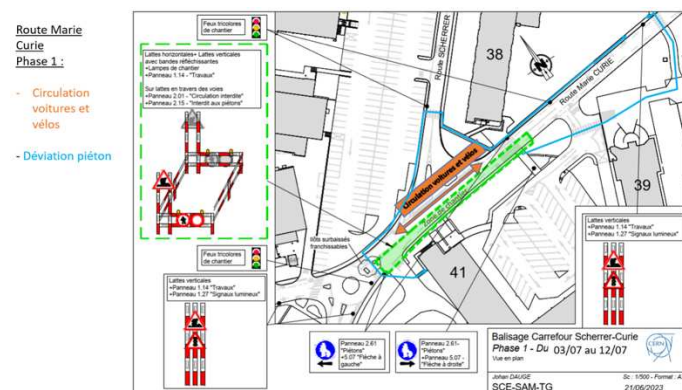
Work at the junction between route Marie Curie and route Scherrer

The junction between Route Marie Curie and Route Scherrer has deteriorated and needs repair. As this is a major traffic route, the work will be carried out in phases to minimise the impact on traffic. The road will remain open and traffic authorised during the works, but pedestrian traffic will be diverted.

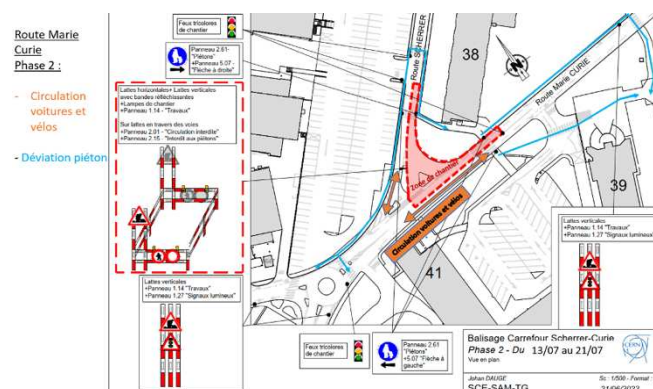
The works are scheduled to take five weeks from Monday 3 July 2023. Eight parking spaces in the car park opposite building 38 will be used as a storage area.

You will find the phasing, signposting and diversion plans below.

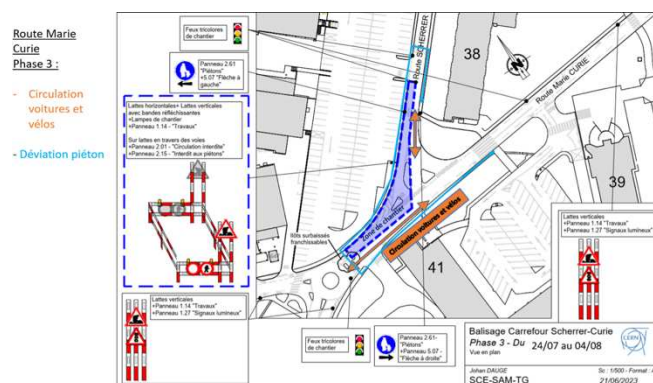
Phase 1: 3 – 12 July



Phase 2: 13 – 21 July



Phase 3: 24 July – 4 August



We apologise in advance for any inconvenience this work may cause.

Next blood donation campaign on 17 July

At the last blood donation campaign on 7 March 2023, 120 donors came along to give blood, of which 51 were first-timers. 95 donations were collected.

The Geneva blood barometer, which is regularly updated, shows that blood stocks continue to run extremely low. CERN will hold another blood donation session on Monday 17 July, from 8.30 a.m. to 4.30 p.m. in collaboration with the Hôpitaux universitaires de Genève (HUG).

Please note that, on this occasion, the campaign will take place in a new location, Building 29.

Before coming to the Building 29 donation point, please make sure that:

- you are in good health and have no symptoms such as fever, cough, a cold or breathing difficulties;

- you are eligible to give blood – please consult this information sheet (https://www.hug.ch/sites/interhug/files/structures/don_du_sang/cts-gb_sheetinfo_v0223.pdf) and complete this questionnaire (https://www.hug.ch/sites/interhug/files/structures/don_du_sang/cts-gb_qmedical_v0223.pdf) issued by the HUG (but note that only the pre-donation conversation with the nurse or doctor on the day can confirm your eligibility).

As a thank you, the HUG will be giving each donor a 10 CHF voucher, to be used in Novae's Restaurants 1 and 2 at CERN.

We hope to see many of you at the donation point!

Obituaries

Kitty Wakley (1928 – 2023)



Kitty Wakley at CERN in 1991. (Image: Marie-Suzy Vascotto)

A pillar of CERN is no more. Kitty Wakley, originally from Liverpool, started working at CERN in around 1960 and was the beloved leader of the document typing service (“typing pool”) until it was dissolved

over 30 years later. Back in the days before physicists and engineers became familiar with word-processing systems and LaTeX, they would present her with their scruffy, hand-written manuscripts for preprints and technical reports. The (occasionally approximate) English would be polished and typed to the highest standards by her team, following the CERN publication rules that her service had established.

Kitty presided over a close-knit team assembled from diverse backgrounds. She was a rather strict boss, in keeping with the usual unwritten standards of the time, but her team members still remember her fondly over 30 years later. Throughout her career at CERN, Kitty was unfailingly kind, cheerful and helpful towards all those who called on her services, from early-career researchers and technicians to Nobel prizewinners. Her mission was to help them disseminate their science in the best possible way,

such as by working through the weekend with her team on the presentation of the discovery of the W boson.

Kitty was a much-loved institution of CERN. A lover of Italian opera, following her retirement from CERN she settled in Spain, where she lived for

many years before passing away on 13 May, just four days before her 95th birthday.

Kitty is remembered fondly by many scientists who have passed through CERN, and our thoughts now are with her children, Joan and Peter.

Marie-Suzy Vascotto & John Ellis

Ombud's corner

From lone wolf to inclusive leadership (Act I)

Stefano* has extensive experience as a leader. He has been deploying a management style that is authoritative and leaves little space for collaborative decision making. Stefano has been successful for many years, but he realises that the members of his team may be more competent than him on the latest technologies and may be as hungry for success and as confident as he is. He has more and more difficulty imposing his management style and has started to worry that he might not be accepted as a leader anymore. Indeed, his team members are finding it increasingly difficult to cope with his overly controlling style and have started to respond passively, waiting for a change of manager.

In this and the next two articles, I propose to take you through the three steps that Stefano could take to shift his management style from making unilateral decisions to leveraging the collective knowledge and intelligence of his team.

The first step that Stefano should take to change his management style and build a psychologically safe environment for his team is to understand why he makes his decisions in isolation.

Stefano has worked hard for CERN for many years and has made many tough decisions, which have brought him to his current position. Because he is very experienced, Stefano is in the habit of trusting his gut reaction when it comes to making decisions. Stefano does not realise that, by doing so, he is depriving himself of the input, data, expertise and diverse perspectives that his team and other stakeholders could bring him.

Stefano needs to reflect on how his authoritative decision-making style is perceived by his supervisees. Making decisions without seeking the views of others sends the message: "I don't value your opinion". The team members, like Stefano himself, need to feel trusted, valued, recognised and relevant. By taking decisions on his own, Stefano loses the buy-in and accountability that collaborative decision making would grant him.

It is also possible that Stefano believes that his position in the hierarchy entitles him to make unilateral decisions. This might also be encouraged by messages from his own hierarchy. However, Stefano needs to take a step back and reconsider this. Position authority, i.e. the authority that comes solely from an individual's position in the Organization, is weak. The strongest authority is one that comes with collaborative management and the recognition of the values of each member of a diverse team.

Finally, Stefano may also be over-confident in his abilities to make the right decision. This often comes with a successful career in the Laboratory. However, the danger is that Stefano may overestimate his abilities, knowledge and judgment. Neglecting the input of others could lead Stefano to take risks and make wrong and costly decisions.

Reflecting on these possible beliefs could help Stefano understand why he needs to feel in control and why he takes unilateral decisions.

In the next Ombud's Corner article, we will meet Stefano again, as he determines how he wishes to reposition himself as a leader.

Laure Esteveny

** Name is fictitious.*

NB: would like to hear your reactions and suggestions – join the CERN Ombud Mattermost team at <https://mattermost.web.cern.ch/cern-ombud/>