CERN Bulletin

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Spectroscopic X-ray imaging now certified for medical use

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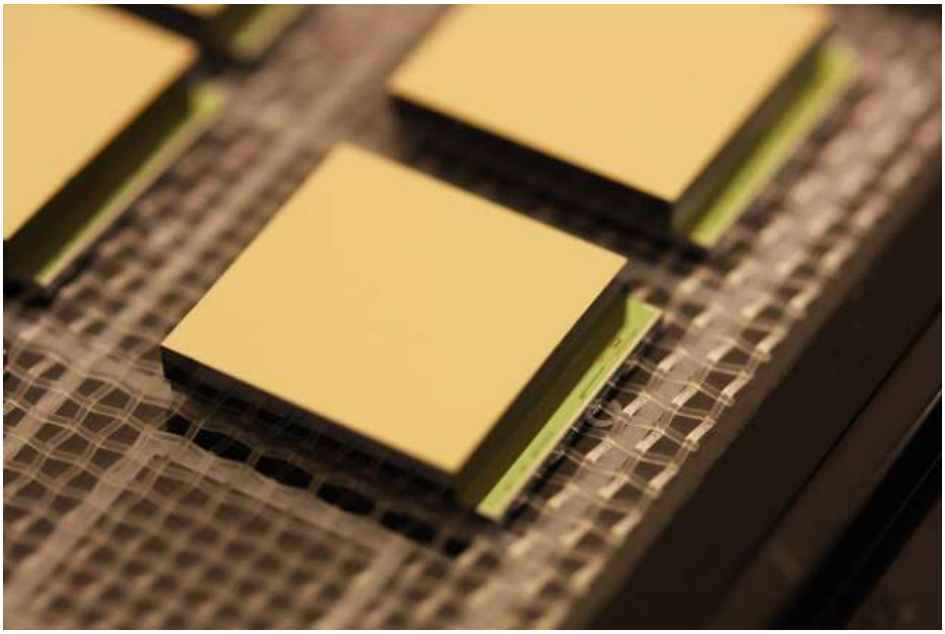

This close-up image shows the Medipix3 ASIC connected to a Cadmium Telluride sensor. CdTe is highly efficient in absorbing X-rays in the energy range used for diagnostic medical imaging. (Image: Advacam Oy)

The sixth Workshop on Medical Applications of Spectroscopic X-ray Detectors is currently taking place at CERN. Launched in 2011 and held every two years, this workshop brings together specialists from different fields to focus on how best to advance efforts and understanding in this new imaging technique (also known as “photon counting imaging”, a technology that makes colour computed tomography possible). This year, more than 100 participants – clinicians, radiologists, medical physicists, biologists, tracer developers, imaging system specialists and detector and ASIC developers – are taking part in the workshop. Their affiliations range from large medical equipment suppliers through to start-up companies and from world-renowned research hospitals to small but active university groups. “Eleven years ago, there was a lot of scepticism about the technical feasibility and the clinical benefits of spectroscopic X-ray imaging,” says Michael Campbell, spokesperson of the Medipix collabora ...

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An encouraging start for Run 3

In challenging times, it's reassuring to see CERN's accelerator complex fully up and running again, with physics being delivered to the experiments at ISOLDE and HIE-ISOLDE, n_TOF, AD-ELENA, the East Area, the North Area, AWAKE, HiRadMat, CLEAR and, of course, the LHC – the current temporary unscheduled stop notwithstanding – and great work being done with test beams and at the irradiation facilities.

On the LHC side, following extensive recommissioning with beam, the first collisions with the detectors on were produced the day after we celebrated the 10th anniversary of the discovery of the Higgs boson. The first stable beams were followed by a period of interleaved commissioning and intensity ramp-up. Every year, the number of bunches per beam is carefully increased in stages, with sign-off by the Machine Protection Panel after a designated length of time/number of fills at a given configuration. This year, the LHC ramped up from 72 to 315, 603, 987, 1227, 1551, 1935, 2173 and then 2413 bunches per beam in the space of five and a half weeks, with the first 1227-bunch fill taking place on 29 July, a few days ahead of schedule. Healthy progress was made, despite a familiar mix of issues along the way, and 2440 bunches were achieved by 12 August.

Experience tells us that the first year of operation with beam after a three-year shutdown has the potential to be a little rocky. The challenges foreseen included additional main dipole training quenches due to the machine now operating at 6.8 TeV, electron cloud, and unidentified falling objects (UFOs).

The vacuum team had anticipated fully deconditioned beam screens and the need to restart from scratch with an electron cloud reduction campaign. A full scrubbing programme successfully brought the initially very high electron cloud to acceptable levels, with further conditioning foreseen during the long, high-intensity physics runs. Here, the key issue is the e-cloud heat load to the cryogenics system – a real operational limit on the maximum intensity that can be handled by the LHC.

UFOs, a real bugbear in 2015, were also expected to reappear in number after LS2. This did indeed prove to be the case but, fortunately, they have conditioned down quickly and are now occurring less often. Although still a cause of occasional premature dumps, thanks to careful management of beam loss thresholds, they haven't been debilitating.

In parallel, there has been the necessary re-bedding in and debugging of extensive, complex accelerator systems. Recent availability has been moderate compared with the impressive levels achieved at the end of Run 2.

Luminosity performance has been stunning. On the back of the improvements made during the injector upgrade programme (LIU), the injectors have been delivering high-quality beam, with low transverse beam size. Well established procedures and excellent parameter control in the LHC have enabled the full potential of the beams to be exploited. For the moment, the Operations team is still working with around nominal bunch intensity, with the possibility to go significantly higher yet to be exercised. The excellent performance is testament to the continued investment in understanding, tools, machine development, accelerator physics, accelerator systems such as instrumentation and transverse feedback, as well as a lot of hard work.

Although the LHC has the potential to go significantly higher, the peak luminosity for Run 3 is limited to around 2e34 cm^{-2} s^{-1} due to the heat load from the luminosity debris, which impacts the superconducting inner triplet magnets. The luminosity is limited through transverse displacement or by varying the beam size at the interaction point. Sophisticated new operation tools have been deployed to gently reduce the beam size in stable beams (beta* levelling) in order to keep the luminosity level at its maximum value for as long as possible.

With reasonable availability and some long fills, production rates have been good, and 11 fb^{-1} were delivered to ATLAS by 23 August. However, when the luminosity curve points high, never extrapolate – you will anger the accelerator gods. We'd foreseen training quenches, UFOs, electron-cloud heat load and system debugging and, indeed, got caught by a big one on 23 August.

A cooling tower control problem temporarily knocked out the cryogenics at Point 4. Here, the cryogenics system cools not only the magnets but also the superconducting RF cavities. Following the incident, the liquid helium in the RF cryomodules warmed and vaporised, increasing the pressure inside the modules. This situation is foreseen and release valves are in place should the pressure rise above a certain level, carefully set to avoid damage to the RF cavities. The release valves are backed up by thin graphite "burst discs", which are designed to open at a higher pressure than that which triggers the opening of the release valves.

On 23 August, the release valves opened as designed. Unfortunately, in the minutes that followed 3 burst discs (out of 16) opened at below their design value. A task force was already in place and had performed detailed investigations following a similar incident earlier in the year; mitigation measures had already been planned for the coming year-end technical stop.

A blown burst disc opens the modules to air, necessitating a ten-day warm-up to flush any moisture off the cavities, followed by cool-down and cavity reconditioning. The tail end of the recovery period overlaps with a planned five-day technical stop and we hope to be back in action with beam in the second half of September.

The cryogenics team has developed an energy economy mode for the LHC and is able to switch within a day to a configuration with fewer active units, saving around 9 MW. This mode is used during the beam commissioning period and ion runs, when the full cooling capacity of the system is not required. This mode was deployed immediately for the duration of the RF recovery.

Despite the RF incident, the performance of the LHC and, indeed, the whole accelerator complex is very encouraging and bodes well for a productive Run 3. That these decades-old machines (the PS is 63 this year!) and the associated facilities continue to deliver their incredible spectrum of physics at the limits of their capabilities is testament to the continuing dedication, commitment and ingenuity of everyone involved.

Mike Lamont

Spectroscopic X-ray imaging now certified for medical use

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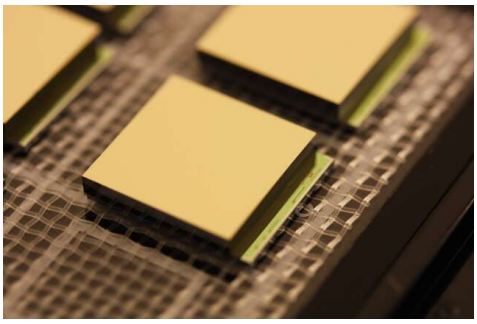

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The sixth Workshop on Medical Applications of Spectroscopic X-ray Detectors is currently taking place at CERN. Launched in 2011 and held every two years, this workshop brings together specialists from different fields to focus on how best to advance efforts and understanding in this new imaging technique (also known as "photon counting imaging", a technology that makes *colour* computed tomography possible). This year, more than 100 participants – clinicians, radiologists, medical physicists, biologists, tracer developers, imaging system specialists and detector and ASIC developers – are taking part in the workshop. Their affiliations range from large medical equipment suppliers through to start-up companies and from world-renowned research hospitals to small but active university groups.

"Eleven years ago, there was a lot of scepticism about the technical feasibility and the clinical benefits of spectroscopic X-ray imaging," says Michael Campbell, spokesperson of the Medipix collaborations (https://medipix.web.cern.ch/collaborations) at CERN. "CERN is the world's largest physics laboratory, with field-leading capabilities in microelectronics and particle detectors and a long history of global scientific collaboration, making it the ideal venue for such a workshop. The CERN workshops have helped in crystallising the ideas and in forming a vibrant community of specialists who were convinced of the potential of the technology."

And here they are today, celebrating a major milestone for the technology: the US Food and Drug Administration (FDA) approval in 2021 of "the first new major technological improvement for computed tomography imaging in nearly a decade (https://www.fda.gov/news-events/press-announcements/fda-clears-first-major-imaging-device-advancement-computed-tomography-nearly-decade)" in the form of a photon counting scanner from Siemens. This is the first scanner using spectroscopic X-ray imaging officially approved for regular medical use in the world. "The CERN workshops have been instrumental in advancing this technology and bringing it from the lab to the clinic," says keynote speaker Dushyant Sahani MD, Professor and Chair, Department of Radiology, University of Washington. "Spectroscopic X-ray imaging is set to revolutionise diagnostic medical imaging by providing better images with a lower dose to the patient, allowing new workflows that optimise precious hospital resources."

Even closer to CERN, MARS Bioimaging's 3D colour X-ray wrist scanner (https://home.cern/news/news/knowledge-sharing/first-european-hospital-receives-3d-colour-x-ray-scanner-using-cern) is awaiting approval to start clinical trials at Lausanne University Hospital (CHUV, Switzerland) and is the subject of ongoing clinical trials within the Pacific Radiology Group, New Zealand's largest radiology service provider. CERN and the New Zealand company MARS Bioimaging (https://www.marsbioimaging.com/) teamed up in 2008 to develop this 3D colour X-ray scanner based on the Medipix3 (https://kt.cern/technologies/medipix3) technology.

"A lot of the technology that makes spectroscopic X-ray imaging possible emerged from fundamental research and, in particular, from detector R&D for experiments in high-energy physics," says Giovanni Anelli, head of CERN's Knowledge Transfer group. "CERN has a proactive knowledge transfer (https://kt.cern/) policy and I am proud of the role the Medipix project participants and our commercial partners have played in pioneering high-resolution spectroscopic X-ray imaging."

Why are spectroscopic X-ray detectors such a breakthrough technology?

The X-ray beams used in medical equipment contain a wide spectrum of X-ray energies, which can be thought of as different X-ray colours. In conventional detectors, the image taken is based on the total X-ray energy absorbed by each pixel, forming a kind of black and white image. When spectroscopic detectors are used, the images also contain the "colours" of the incoming X-rays, providing better, clearer images at optimised doses with significant benefits when diagnosing disease. In some circumstances, MRI (magnetic resonance imaging) may even become superfluous. In other cases, where metal contrast agents attached to bio-markers are injected into the body, expensive PET–CT (positron emission tomography – computed tomography) scans, may be avoided.

The concept of using X-ray energy information was first applied in so-called dual-energy CT (DECT) systems. In these systems, two images are taken one after the other at different X-ray tube voltages (kVp). As each image has a different average X-ray energy, these could be combined to produce clearer images compared with single-shot images. However, the decision to use DECT imaging has to be taken before the patient is scanned, and DECT is only used when necessary, as the patient normally receives a higher radiation dose.

Spectroscopic detectors, on the other hand, yield much more information than DECT systems. A single image is taken. No upfront decision is needed and no extra dose is used: the energy information is always available.

If you are interested in a summary of the 2022 workshop, tune in to the webcast of the presentation of Anthony Butler (https://indico.cern.ch/event/1187351/) (MARS Bioimaging) on Friday, 2September at 11.00 a.m. CET. The recording will be available afterwards.

For more information on the workshop or on the Medipix collaborations, contact Michael Campbell at Michael.Campbell@cern.ch.

70 years of theoretical physics at CERN

The provisional CERN Council, during its first session in May 1952, founded the Theory Study Group as one of four study groups tasked with planning a unique laboratory

CERN theorists Prentki, D'Espagnat, and Amati following a seminar in 1962 (Image: CERN)

CERN is quiet during the summer months, but there is one place that breaks that rule: the corridors of the CERN Theoretical Physics department. Here, the finest minds in theoretical physics gather all year round to discuss models and recent findings with colleagues, creating the vibrant atmosphere that has made it so special since its early days, 70 years ago. This environment not only complements the experimental research conducted within the Organization, but the overarching aim – describing nature's laws – is an intellectual pursuit in itself. Physicists leaving the Theoretical Physics department remain connected and carry this mindset wherever they go, as was the intention of the original founders, preserved and cultivated to this day by the department's staff.

The Theory Study Group

During the post-war era, bringing together people from different countries around ambitious scientific projects became one of many ways of preserving and consolidating the newly found peace in Europe. Inspired by this idea, the provisional CERN Council, during its first session in May 1952, founded the Theory Study Group as one of four study groups tasked with planning a unique laboratory. Headed by Niels Bohr and located at the Institute for Theoretical Physics in Copenhagen, the Group set out to turn the vision imagined by the founders of CERN into a reality. Three pillars were envisaged for this Group: conducting studies and research related to high-energy physics, establishing collaborations based on existing instruments in Europe and, finally, planning new collaborations on the continent.

Following this blueprint, the Theory Study Group interacted with its experimental physics counterparts to think up the first CERN accelerators. In parallel, it conducted its own research to provide scientific input to the provisional Council. One of its first activities, preceding the second session of the provisional Council, was to host a conference at the Institute in Copenhagen, where the physicists present shifted the focus from nuclear to elementary particle physics due to the discovery of kaons in cosmic rays a few years earlier – a shift that would shape CERN's identity for the decades to come. Moreover, other conferences, training programmes and visits to European institutes helped the theorists take their open-mindedness out into the world and strengthened relationships and collaborations between scientists, even before the final location for CERN was chosen or its convention was signed.

From Copenhagen to Geneva

After the provisional Council chose Geneva as the location for CERN, the Theory Study Group moved to CERN from 1 October 1957, joining the theorists who had already started working in Geneva three years earlier. Many of the findings they made in this period have entered today's textbooks.

Since 1957, CERN has been the heart of both experimental and theoretical high-energy physics worldwide. Many physicists who shaped the landscape of theoretical high-energy physics were at one time affiliated in some capacity with the CERN Theoretical Physics department, including four former CERN Directors-General.

Ahead of its time

In many regards, the current state of particle physics research is similar to that when the Theoretical Physics department began. In the 1950s, many particles had been discovered and it then took almost two decades of extensive research before that range of particles was organised into a consistent picture – the Standard Model of particle physics.

Nowadays, the Standard Model of particle physics provides that consistency but comes short of describing the physics at higher energy scales, driving theoretical physicists to develop new models explaining this new physics.

"70 years later, theorists in the Theoretical Physics department still share the same ideals that inspired the foundation of the CERN Theory Study Group," says Gian Giudice, head of the Theoretical Physics department. "We want to bring together theorists from all over the world in a research environment where everyone's creativity and talent can flourish, in the name of science, peace and cooperation."

Kristiane Bernhard-Novotny

Change at the helm of the CMS collaboration

The new spokesperson, Patricia McBride, and two deputies, Wolfgang Adam and Lucia Silvestris, will represent the Collaboration for the next two years.

Patricia McBride (centre), the new CMS spokesperson surrounded by her two deputies, Wolfgang Adam and Lucia Silvestris (Image: CERN)

From 1 September 2022 until 31 August 2024, the important role of representing the CMS collaboration will be served by Patricia McBride (spokesperson), Wolfgang Adam (deputy spokesperson) and Lucia Silvestris (deputy spokesperson) – the ninth Spokesperson team of the CMS experiment.

The management team will take charge as the newly upgraded CMS detector collects and selects new physics data extracted from collision events at the LHC at the unprecedented energy of 13.6 TeV.

Read more on the CMS website (https://cms.cern/news/cms-new-management-2022-2024).

Sparks! announces its second edition of the Serendipity Forum

The second edition of Sparks! will be hosted at CERN on 17 and 18 November with the theme "Future Technology for Health"

(Image: CERN)

After a successful launch and first event, Sparks! is happy to announce a second edition of the Serendipity Forum. On 17 and 18 November 2022, CERN will once again host the Sparks! Forum on campus at the Globe of Science and Innovation and IdeaSquare, the innovation space at CERN.

The theme for the second edition will be Future Technology for Health. Whether in the domains of prevention, diagnosis or treatment, the topics for this edition of Sparks! will seek to ask new questions linking medical technologies to fundamental science, ethics, globalisation and more.

This second edition will feature a podcast series, a public event and videos broadcasted on official CERN channels, an academic forum, a yellow report and at least one published article, as well as some behind-the-scenes snippets along the way. Sparks! will bring together up to 50 selected experts and other professionals from around the world to discuss

the future of health and its implications for society. Confirmed podcast guests and forum participants so far include: Dr Soumya Swaminathan (WHO), Jennifer Doudna (Nobel Prize), Sir Jeremy Farrar (Wellcome Trust), Pushmeet Kohli (DeepMind), and Els Torreele (UCL).

The forum will address topics such as accessibility, ethics, research challenges and priorities, and global interdependence. For example, we'll be asking whether the most recent and high-performing prevention, diagnosis and treatment solutions will finally be equally distributed, reaching everyone regardless of their location and socioeconomic status. What will medicine look like if and when data has all the answers? Patients, consumers, doctors and corporations will all have their separate needs – how will these be addressed and what will the consequences be for medical research?

Indeed, CERN has actively pursued medical applications of its technologies since as far back as the 1970s. At that time, knowledge transfer happened – mostly serendipitously – through the initiative of individual researchers. Through a number of collaborations and developments, CERN has continued to build a culture of entrepreneurship ever since. On this subject, another question we plan to discuss is whether the collaborative experience of particle physics could become a model for medical research disciplines.

We invite you to keep an eye – and ear – out for Sparks! content, which we will deliver to both the CERN community and the public at large starting from the end of the summer and culminating in the Forum and public event in November (check our website (https://sparks.cern/) regularly for the updated speaker list). Only a small number of people will be able to attend the public event in person due to limited capacity, but it will also be webcast in full for the broader public. In the meantime, you can enjoy the first series of the podcast (https://sparks.cern/podcast) and view all the talks (https://sparks.cern/)from the previous edition.

Sparks! is part of the CERN & Society programme. CERN & Society activities are only possible thanks to support received from partners, in particular Rolex and its long-standing association with the organisation. The 2022 Sparks! event is also supported by the Didier et Martine Primat Foundation.

Lila Mabiala

Computer security

Computer security: Room at the top

What do "Daniela.Wick@cern.ch", "Kris.Avandal@cern.ch", "Magnus.Fallbaum@cern.ch", "Petra.Kosmanen@cern.ch", "Ron.Waitmal@cern.ch" and "Stephanie.Porasky@cern.ch" have in common? No, they aren't members of the personnel even if they pretend to have a CERN email address and their names sound similar to those of some of our colleagues in the CERN Computer Security team. No, they have no business with CERN at all, even if their email messages claim otherwise. And no, they are not trustworthy, as they tried to steal your password. Welcome to the annual clicking campaign, revised.

22 731 emails were sent out on 1 August purporting to come from one of the made-up email addresses above, presenting you with an important message on your "New voicemail from +41792231243" or the "Update on your invoice", concerning your "Office 365™ Subscription" or your "Signed contract", asking you for "Action Required", or just sending you the latest "COVID 2022 Report". 22 731 emails, one to each CERN email address assigned to a member of the personnel owning a CERN mailbox. Each email trying to lure you to click on the embedded link, which, if clicked, presented you with a login page ready to accept your username. And, for those who made it that far, asking for your CERN password… For those who took that last step, BOOM! Not only did you put your device and your digital life at risk when clicking on the initial link (http://home.cern/news/news/computing/computer-security-truth-lies-url), by handing over your CERN password to a malicious website you opened the door to fraud and sabotage (https://home.cern/news/news/computing/computer-security-banks-and-work). Once again, remember the mantra "STOP – THINK – DON'T CLICK" before opening attachments or unsolicited links – they might bring nasty surprises. And remember that your password is yours and yours alone and should only make it into CERN's old and new single sign-on (SSO) pages (https://home.cern/news/news/computing/computer-security-new-single-sign). Anything else could wreak havoc – on CERN's operations, finances and reputation.

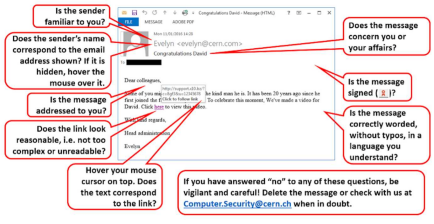
But not this time, fortunately, as the emails were part of our annual campaign on cybersecurity risks and the dangers of (sophisticated or not) unsolicited emails (https://home.cern/news/news/computing/computer-security-wrong-link-wrong-login-and-boom). Still, the reaping was sadly fruitful. More than 1800 people clicked and fell into the trap by entering their username in the fake SSO page and trying to enter their password, too. 1800 accounts. If that had been a real attack, they would now be in the hands of an attacker. 1800 accounts available to spam the world through CERN's email system, abusing CERN's computer centre for cryptocurrency mining, downloading costly journals and scientific papers from CERN's digital library, extracting (confidential!) data or documents from our storage systems, stealing money from the CERN treasury or sabotaging the operations of CERN's accelerators or experiments. There is still room for improvement. There is still some room at the top.

Hence, look out for these things:

- Is the sender familiar to you? Note that email addresses, including those terminating with CERN.CH, can easily be spoofed (https://home.cern/news/news/computing/computer-security-email-equals-letters).
- Do the message contents make sense to you? Is it related to your professional or private life? Is it relevant to you, did you expect it? Is it written in a language you understand, reasonably clearly and understandably? If you don't have a subscription with "Deutsche Telekom", then the invoice is likely not for you; the same goes for the delivery notification for a UPS package when you haven't ordered anything.
- Hover your mouse over any link. Does the link start with HTTP(s)://[SOMETHING].CERN.CH before the next /? (Yes, this is tricky – if the URL confuses you, better check with us at Computer.Security@cern.ch)

And, finally, the silver bullet against account abuse. Complement your password by protecting your account with a so-called second factor: your mobile phone or a hardware token. When logging in (about twice per day), you would be asked as usual for your password but also to provide this second factor. A simple number generated by a smartphone app or hardware token. This two-factor authentication (2FA) is the silver bullet for account protection (https://home.cern/news/news/computing/computer-security-log-click-be-secure), as the attacker now needs to not only phish your password by the aforementioned means, but also steal your smartphone (or hardware token) – and we all know always where our smartphone is, don't we? So, give it a try and check out how to obtain and manage 2FA here (https://cern.service-now.com/service-portal?id=kb_article&n=KB0006587).

In short, please help us reach the top. Enable 2FA for your account, remember STOP – THINK – DON'T CLICK and check for malicious emails using the following tips:



Do you want to learn more about computer security incidents and issues at CERN? Follow our Monthly Report (https://cern.ch/security/reports/en/monthly_reports.shtml). For further information, questions or help, check our website (https://cern.ch/Computer.Security) or contact us at Computer.Security@cern.ch (mailto:Computer.Security@cern.ch).

Computer Security team

Official news

Staff rules and regulations, 11th edition: Modification no. 19

In accordance with the decisions taken by the Finance Committee in June 2022 (CERN/FC/6577) and by the Council in June 2022 (CERN/3647), please find below the pages of the Staff Rules and Regulations which have been updated in the context of the introduction of the new Graduate programmes.

These modifications shall enter into force on 1 September 2022.

Chapter I – General provisions

Section 2 – Categories of members of the personnel (*modification of pages 2 and 3)*

Chapter II – Conditions of Employment and Association

Section 1 – Employment and association (*modification of pages 11 to 15)*

Section 2 – Classification and merit recognition (*modification of pages 16 and 18)*

Section 3 – Learning and development (*modification of pages 19 and 20*)

Section 4 – Leave (*modification of pages 21, 23, 25 and 26)*

Section 5 – Termination of contract (*modification of page 29)*

Chapter III – WORKING CONDITIONS

Section 1 – Working hours *(modification of pages 31 and 32*)

Chapter IV – SOCIAL CONDITIONS

Section 1 – Family and family benefits (*modification of pages 37 and 38)*

Section 2 – Social insurance cover *(modification of pages 39 and 40)*

Chapter V – Financial Conditions

Section 1 – Financial benefits (*modification of pages 41 to 43, addition of pages 42-bis and 43-bis and modification of pages 45 to 47)*

Section 2 – Taxation (*correction of page 48)*

Annex A 1 - (*modification of pages 62 to 65)*

Annex R A 2 - (*modification of page 67)*

Annex R A 3 – (*modification of page 68)*

Annex R A 4 - (*modification of pages 69 and 70)*

Annex R A 6- (*modification of page 72)*

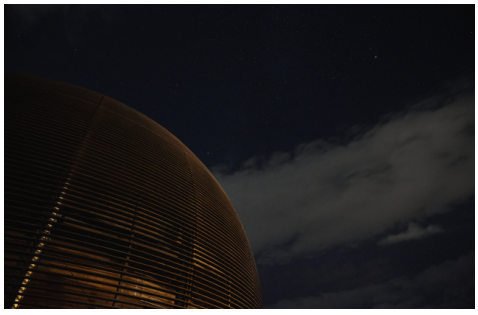
Annex R A 9 - (*modification of page 75)*

The complete updated electronic version of the Staff Rules and Regulations is accessible via CDS.

Announcements

CERN to host Nuclear Physics in Astrophysics conference and public astronomy talk

The public astronomy talk will be held in the Globe of Science and Innovation on 30 August and the Nuclear Physics in Astrophysics conference will be held in the main auditorium from 5 to 9 September



(Image: CERN)

From 5 to 9 September, CERN is hosting the tenth edition of the Nuclear Physics in Astrophysics Conference (NPA-X). While NPA usually occurs every two years in different locations across Europe, this edition of the conference is the first to take place after the Covid-19 pandemic.

NPA is one of the biggest conferences in the field of nuclear astrophysics, attracting around 150 experts from across Europe, Japan, and the USA from a wide range of disciplines. The conference acts as a bridge between nuclear physics and astrophysics, where experimental and theoretical nuclear physicists, astronomers, astrophysicists, and cosmo-chemists can discuss research and current challenges within these fast-developing fields.

NPA-X is being jointly organised by the n_TOF (https://home.cern/science/experiments/n_tof) and ISOLDE (https://home.cern/science/experiments/isolde) collaborations, CERN's hubs for basic nuclear research, which foster many applications in multidisciplinary areas, notably astrophysics and advanced nuclear technologies.

"Nuclear astrophysics is a mixture of nuclear physics and astrophysics. Researchers in

these fields come with very different background expertise," says Alberto Mengoni, conference co-organiser and spokesperson for the n_TOF experiment. "It is important for these two communities to have discussions and points of contact."

The conference will be held in the Main Auditorium of CERN, and is open to all who work within nuclear physics and/or astrophysics. More details of the conference can be found here (https://indico.cern.ch/event/804609/).

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Notes:

The conference series is supported by the Nuclear Physics Division (https://www.eps.org/?page=npd) of the European Physical Society (https://www.eps.org/) and NPA-X is sponsored by the Nuclear Physics European Collaboration Committee (NuPECC (http://www.nupecc.org/)).

Microcosm to close permanently on 18 September

Microcosm, one of CERN's on-site exhibitions, will close permanently on 18 September, in preparation for the installation of the exhibitions in Science Gateway. Feel free to use the coming two weeks to discover the exhibitions if you haven't already, or to pay a last visit. You can continue to visit the Universe of Particles exhibition, in the Globe.

More information on the preparations for Science Gateway will follow in the mid-September issue of the CERN Bulletin.

Town hall event on 15 September - "CERN Year of Environmental Awareness: outcome and future perspectives"

(Image: CERN)

Preparing for retirement – seminars for staff

Retirement marks the end of your professional career and the start of a new chapter in your life. Research shows that this transition is easier if you are well informed and prepared.
If you are a **staff member** and thinking about retiring in the next one or two years, the Human Resources department encourages you to attend **two dedicated seminars**:

1. **Preparation for retirement:** a seminar organised once a year jointly by the International Labour Organization (ILO) and the United Nations Office at Geneva (UNOG) for international civil servants from different organisations in Geneva.

The next seminar will take place virtually via Zoom from **3 to 21 October 2022**, with 11 short sessions each lasting between 60 and 90 minutes The **full programme** (https://cernbox.cern.ch/index.php/s/0Zdwa7AAQbKovHE) is available on CERNbox.
Enrol now (https://lms.cern.ch/ekp/servlet/FORMAT1?CID=EKP000041244&LANGUAGE_TAG=en) (deadline Thursday, 15 September).

2. **Leaving CERN:** a yearly information seminar at CERN, with presentations by and Q&A sessions with in-house experts.
   The next half-day seminar will take place on **Tuesday, 18 October**.

Enrol now (https://lms.cern.ch/ekp/servlet/FORMAT1?CID=EKP000040257&LANGUAGE_TAG=en) (deadline Friday, 14 October).

Spouses and registered partners may also attend these seminars.

For more information, contact your.career@cern.ch (mailto:your.career@cern.ch)

Learning & Development group

HR department

CERN openlab summer students present online “lightning talks”

Students from 19 countries are taking part in this year's in-person openlab Summer Student Programme (Image: CERN)

On Wednesday 14 and Thursday 15 September, the 2022 CERN openlab summer students will present their work at the public “lightning talk” sessions (session 1, (https://indico.cern.ch/event/1191489/) session 2) (https://indico.cern.ch/event/1191490/)

Students will each give a five-minute presentation, introducing the audience to their project, explaining the technical challenges they have faced and describing the results they have found during their projects. Each student will have the opportunity to showcase their progress while also informing the audience about different cutting-edge IT projects they have been working on.

This year marked the first in-person openlab Summer Student programme since the start of the pandemic, with students returning to the openlab corridor once again. Since some of the students will not physically be at CERN at the time of the Lightning Talks, the decision for the presentations to remain online was to ensure that all students have an equal opportunity to present in front of their peers and the wider CERN community.

Over nine weeks (June-September) the CERN openlab summer students have been working with some of the latest hardware and software technologies. 32 students representing 19 nationalities were part of this year's openlab Summer Student Programme. During their time at CERN, the summer students, alongside working on their projects, attended a series of lectures given by IT experts on advanced CERN-related computing topics.

Join us on 14 and 15 September to discover more about the exciting projects the students have been working on. The presentations are free and open to everyone at CERN. Enrica Porcari, Head of IT, will give an introductory talk at the start of the first session. On both days, the presentations will start at 15:00 and finish by 17:15 CEST.

You can follow the live webcasts by following the links below:

Session 1 (https://indico.cern.ch/event/1191489/)
Session 2 (https://indico.cern.ch/event/1191490/)

Science Gateway: traffic disruption on the Route de Meyrin expected at night from 29 August to 6 September

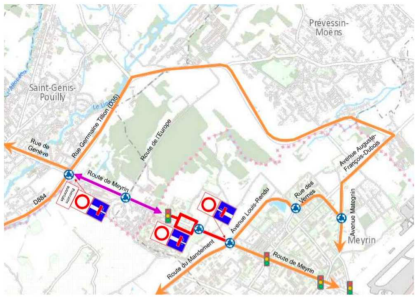
Scaffolding around the bridge linking the two tubular structures of the Science Gateway will be installed between 10:00 p.m. and 5:00 a.m. on 29, 30 and 31 August and 1 and 5 September

Drone photograph of the Science Gateway - August 2022 (Image: CERN)

CERN's new flagship building for science, education and outreach, designed by the Renzo Piano Building Workshop and Brodbeck-Roulet architectes associés, is entering its final construction phase.

The tubular structures that will soon house CERN's exhibitions are connected by a bridge that passes over the Route de Meyrin at a height of 6 metres. The final phase of the work will require the installation of scaffolding around the bridge. To minimise traffic disruption, the scaffolding will be installed during the nights of 29, 30 and 31 August and 1 and 5 September between 10 p.m. and 5 a.m.

All motor vehicles will be deviated via the Rue Germaine Trillon (D35), which passes throughthe communes of Prévessin-Moens and Ferney-Voltaire in France, or via the Avenue Auguste-François-Dubois in the town of Meyrin in Switzerland. Public transport (i.e. the tram stops of lines 18 and 68) will remain accessible at all times, except from 1.00 to 4.40 a.m. Cyclists and pedestrians will not be impacted. Traffic officers will be present throughout the duration of the work.



Planned deviations. (Image: GE-Transports)

Although every step is being taken to limit the impact of the work as much as possible, CERN wishes to apologise in advance for the inconvenience caused and to thank local residents for their understanding. Users are encouraged to drive with caution and to comply with the roadsigns that will be put in place.

CERN's Science Gateway (https://sciencegateway.cern/) will be an emblematic education and outreach facility. Through immersive exhibitions and hands-on educational activities, it will enable people of all ages and backgrounds to engage in the Laboratory's discoveries, science and technologies.

The Science Gateway's buildings will host inspirational exhibition spaces, laboratories for hands-on scientific experiments for students of all ages and a large auditorium hosting events.

Next blood donation session on 13 September

Contribute to this essential act of solidarity that benefits us all

(Image: CERN)

The campaign on 30 May was a great success: 111 donors came along to give blood, including 33 first-timers, and 80 donations were collected.

On 13 September, from 8.30 a.m. to 3.30 p.m. in Restaurant 2, CERN will hold another blood donation session, in collaboration with the *Hôpitaux universitaires de Genève* (HUG (https ://www.hug.ch/en/giving-blood)). Due to logistic constraints, the session organised together with the *Établissement français du sang* (EFS (https://dondesang.efs.sante.fr/)) will not take place this year.

Before coming to the Restaurant 2 donation point, 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_sheetinfo0222_41fo0231v60.pdf) and complete this questionnaire (https://www.hug.ch/sites/interhug/files/structures/don_du_sang/cts_gb_qmedicalblood_v0222.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.

The Geneva blood barometer (https://www.hug.ch/don-du-sang/barometre-don-du-sang-geneve), which is regularly updated, shows that blood stocks are currently running extremely low. We therefore hope to see many of you at the donation point!

Give blood, save lives (https://hse.cern/blooddonation).

Medical Service

Symposium on 15 September – 30th anniversary of the TERA foundation

Join the audience in the CERN Council Chamber, or virtually, for a full-day symposium celebrating 30 years of hadron therapy research at the TERA (*TErapia con Radiazioni Adroniche*, or "Therapy with Hadronic Radiation") foundation on 15 September – registration (https://indico.cern.ch/event/1184432/registrations/85897/) is open in the Indico event.

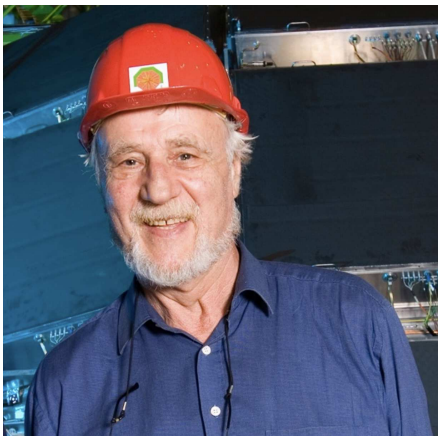
Since its founding in 1992 by Ugo Amaldi (CERN), Elio Borgonovi (Bocconi University), Giampiero Tosi (Niguarda Hospital) and Gaudenzio Vanolo (Secretary-General of the TERA foundation) – joined a few years later by Roberto Orecchia (Scientific Director of the European Institute of Oncology, Milan) – the foundation has been active in research and development in hadron therapy, a technique aimed at treating solid tumours with beams of hadrons, in particular protons and carbon ions. With strong links to CERN (most activities have been performed in collaboration with CERN physicists and engineers), the foundation has given rise to successful offspring, including the ion therapy centre CNAO in Pavia, which, to date, has treated more than 3000 patients.

Throughout the day, the technical directors of the TERA foundation will walk attendees through thirty years of TERA history. In the afternoon, four keynote speakers will present a review of the status of the field.

For more information and to register, visit the Indico event (https://indico.cern.ch/event/1184432/).

Obituaries

François Piuz (1937 – 2022)



François Piuz, a very talented and passionate CERN physicist since 1968 and the former leader of several projects, passed away on Thursday, 21 July 2022 at the age of 85. Throughout his distinguished career, François worked at the forefront of particle detectors. With his many talents, he made significant contributions to research on topics ranging from the fundamental principles of detector operation to the innovative technologies required to deploy the detectors in large experiments. He began his scientific journey in the early 1970s as a notable member of the team that transformed the invention of the Nobel Prize-winning multi-wire proportional chamber (MWPC) into the system of 50 000 wires for the Split-Field Magnet facility at the CERN Intersecting Storage Rings (ISR). At this time, he wanted to understand the functioning of these new detectors at the fundamental, microscopic level. His work on the concept of "ionisation clusters" in the MWPC became a classic and was crucial to the development of particle identification based on multiple measurements of ionisation, which was subsequently exploited to a large extent in many experiments. One spectacular use of this approach would be the X-ray photon detection system of the ALICE experiment's Transition Radiation Detector (TRD) at the Large Hadron Collider (LHC).

Another highlight that came from his insightful understanding was the development of a novel drift chamber topology capable of measuring particles with exceptional spatial resolution and multi-track separation, as required for the SPS experiments in the 1980s. During this time, he renewed his interest in particle identification and contributed to pioneering studies demonstrating the outstanding potential of solid cesium iodide (CsI) photocathodes for the detection of Cherenkov photons, which would prove so fruitful in the ALICE experiment's HMPID (High Momentum Particle Identification Detector) Ring Imaging Cherenkov (RICH) detector.

In 1992, François was one of the main proponents, and the co-spokesperson, of the RD26 project, which, in six years, had successfully developed the technology to produce large-area (up to 0.3 m^2) CsI-based gaseous photon detectors for use in RICH systems operated in heavy-ion collision experiments. This project represented the summit of his outstanding scientific career, in which he coupled his unique expertise in gaseous detectors, developed while working with Charpak, with his passion for photography and, therefore, photon detection. Such technology allowed the construction of the largest CsI-RICH detector ever built and rapidly found applications in other experiments, including the Threshold Imaging Cherenkov detector in NA44 and COMPASS RICH at the SPS, the HADES RICH at GSI, and the RICH detector for the Hall A experiment at JLAB.

François was a member of the ALICE collaboration from its first days and led the HMPID project until 2000. After his retirement in 2002, François continued to actively participate in the construction, installation and operation of the HMPID, a detector that performed very well during the first ten years of ALICE's physics campaign. Nearly two decades after its construction, the HMPID continues to operate at higher rates for Run 3. François also contributed to ALICE by coordinating the test-beam activities, which were instrumental to the R&D for all ALICE detectors.

François's remarkable knowledge and ability to envision solutions to complex problems were key to the success of the many detector projects that he worked on. He was always interested in new ideas and ready to provide help and support to his colleagues. These qualities, combined with a playful sense of humour, made François a very friendly and charismatic personality. He will be missed by many, but will always be remembered for his great qualities, both as a physicist and as a person, by those who were fortunate enough to have worked close to him.

We express our deepest condolences to his family and to his close collaborators and friends.

His friends and colleagues

Ombud's corner

Quiet quitting

Although I am very much aware of inter-generational differences, I had not realised how the millennial and Gen Z (https://www.beresfordresearch.com/age-range-by-generation/) attitude to work could be, in general, so different from the mindset of Baby Boomers (my generation).

The subject of attitudes towards work came up naturally during a recent conversation I had with two young, highly qualified millennials at the beginning of their careers:

"When I chat with my university friends, I realise that I'm working much more than they are and I wonder if it's worth my working so hard", and

"My friend B. told us last time that this was the last job he'd accept to do at 100% and that he had much more important things to do than working".

Surprised by their obvious disorientation faced with the dilemma of how to build their relationship with their work and career, I tried to explain that, when I started to work, and throughout my career, I gave 200% of my energy to my job and it would never have occurred to me to question this.

I also shared with them my view that going "above and beyond your work" was the only way to continue learning and developing in the workplace and that it would pay off eventually … but I realised that I did not convince them at all.

As it so happened, the day after, I read an interesting Korn Ferry article (https://www.kornferry.com/insights/this-week-in-leadership/quiet-quitting) on the term that the newest entrants to the workforce have for not going "above and beyond" their specific work duties: they call it quiet quitting.

This concept is illustrated by a video that has gone viral on social media. "You are still performing your duties but you're no longer subscribing to the hustle culture mentality that work has to be your life," the young man in the video says.

What could drive young workers, initially eager to make a big impact for themselves and their organisations, to quiet quit only a few years after starting their job?

Scrutinising on the web the many comments linked to the hashtag #QuietQuitting, I found the following answers to that question:

- "*Going above and beyond your work doesn't get you any further or any happier.*"
- "*The only thing hard work gets you is more work.*"
- "*Doing the bare minimum is getting paid the same as someone going above and beyond.*"
- "*I realise the things I'm doing are above my pay grade.*"
- "*I quiet quitted when my bosses constantly made me feel like a failure whether I worked well or not.*"
- "*You get the same pay, same recognition, same everything but less stress.*"

- "*For me this was the answer after suffering severe anxiety and a mid-life mental breakdown.*"

Loss of purpose, **lack of fair recognition** and the need to **preserve work–life balance** seem to be the main motives of the younger generations for quiet quitting.

What also comes into play is the fact that young people will probably not have their career in one company, but will have multiple employers. With this in mind, they expect their employer to strive to keep their skills and talents and they are not prepared to bend themselves over backwards for them.

Even with the economy cooling now, organisations are short of skills in critical areas and cannot afford to have quiet quitters. Employers need to be competitive in the benefits and work–life balance that they offer as well as the quality of the work environment.

Experts also say that it is up to the organisations to connect with employees frequently and help them connect their work to a greater purpose. The good news is that older work generations have an essential role to play in transferring their know-how and experience and helping their younger colleagues to build a strong sense of purpose with their work.

From the Ombud's watch post, I confirm that giving fair recognition and appreciation and providing support for a healthy work–life balance is key to turning them away from quiet quitting.

The quiet quitting wave may be short-lived when the economy slows down, and the sense of loss of purpose might not be so acute in a research laboratory, but we need to be aware of the phenomenon. We also need to be aware of the impact of a lack of recognition or a feeling of injustice, or unrealistic demands on a generation that is a priori tempted by quiet quitting, but on which CERN depends for its future.

Laure Esteveny

I want to hear from you – feel free to email ombud@cern.ch with any feedback or suggestions for topics you'd like me to address.

<u>NB:</u> If you would like to be notified about posts, news and other communications from the CERN Ombud, please register to receive the CERN Ombud news (https://e-groups.cern.ch/e-groups/EgroupsSubscription.do?egroupName=cern-ombud-news).