

## Higgs@10 – save the date!

On 4 July 2012, half a century's wait came to an end as the ATLAS and CMS experiments announced the discovery of the Higgs boson. Ten years on, we mark the occasion and look forward to a bright future for Higgs research.



*Fabiola Gianotti, Rolf Heuer and Joe Incandela on the day of the announcement of the discovery (Image: CERN)*

The centrepiece of the Higgs@10 celebrations is a full-day scientific symposium in CERN's main auditorium on 4 July. This will celebrate the discovery, give an overview of what's been learned since then, and take a look forward at what's still to come. On the eve of the symposium, there will be a public screening of the film *Particle Fever* at the Globe, followed by a discussion with CERN scientists and other symposium speakers. Similar events with local scientists are being organised in communities across the region

from late April to June. Throughout the CERN Member States and at partner laboratories around the world, events ranging from science cafés to lunchtime exhibits for decision-makers are being prepared. Look out too for a series of articles in the Bulletin, a special issue of the CERN Courier and new content on the [home.cern](http://home.cern) website. Full details will be published soon but, in the meantime, save the date of 4 July 2022 and make sure you don't miss out! ...

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## A Word from Fabiola Gianotti

### CERN's response to the invasion of Ukraine: new Council measures

As you know, the CERN Council has been meeting this week. CERN's response to Russia's invasion of Ukraine was among the main topics of discussion.

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# CERN's response to the invasion of Ukraine: new Council measures

**Following the resolutions adopted at the March session of the CERN Council, the Director-General sent the following message to the CERN personnel**

As you know, the CERN Council has been meeting this week. CERN's response to Russia's invasion of Ukraine was among the main topics of discussion.

CERN was born from the ashes of World War II to promote excellence in scientific research and peaceful collaboration across borders. Over seven decades, the Organization has become a powerful symbol of what people can achieve when they put their differences aside and work together in pursuit of common goals for the benefit of all humanity. Our Member States are very conscious of this heritage, and the importance of preserving it into the future. This brutal invasion puts us in an unprecedented situation, requiring strong measures to be taken to preserve this legacy.

Following the adoption of two Resolutions by the Council today, one concerning Russia and Belarus, the other the Joint Institute for Nuclear Research (JINR) based in Dubna, the Council has agreed on a statement, which I am appending to this email, outlining the new measures that were approved today. The full text of the Resolutions will be available shortly in English and French on the CERN Council's webpages ( <https://council.web.cern.ch/en/content/resolutions> ) and also made available through the CERN website ( <https://home.cern/> ) and the 'Solidarity with Ukraine' webpage ( <https://home.cern/solidarity-ukraine> ).

The measures concerning Russia and Belarus reinforce those adopted by the Council at the Extraordinary Session on 8 March. The Council will take a decision in June on whether to suspend all collaborations with Russian and Belarusian institutes and with JINR. In the meantime, CERN management will work through the full implications of such a move, developing a scenario to address the issue in a manner that is the least disruptive to individuals and CERN's scientific activities.

Since the invasion, several actions have been initiated by the Organization to support members of our Ukrainian community and their families, as well as the Ukrainian population more generally. Further measures are under discussion with our Ukrainian colleagues. The collection initiated by the Staff Association and supported by the Management raised a total of 820 000 Swiss francs, consisting of individual donations from CERN personnel, matched by

the CERN Directorate from the CERN budget, with a contribution of 15 000 Swiss francs from the Staff Association. These funds will be transferred to the Red Cross for its humanitarian operations in Ukraine and neighbouring countries. We would like to thank you very much for your generosity, and for all the very moving and practical initiatives that many of you have taken to support our Ukrainian colleagues and the Ukrainian people.

## **CERN Council takes further measures in response to the invasion of Ukraine**

In response to the military invasion of Ukraine by the Russian Federation, the 23 Member States of CERN today decided to:

- suspend the participation of CERN scientists in all scientific committees of institutions located in the Russian Federation and the Republic of Belarus, and vice versa;

- suspend or, failing that, cancel all events jointly arranged between CERN and institutions located in the Russian Federation and the Republic of Belarus;

- suspend the granting of contracts of association as associated members of the CERN personnel to any new individuals affiliated to home institutions in Russia and Belarus.

Regarding relations with the Joint Institute for Nuclear Research (JINR), with which CERN holds reciprocal Observer status, the CERN Council decided:

- to suspend the participation of CERN scientists in all JINR scientific committees, and vice versa;

- to suspend or, failing that, cancel all events jointly arranged between CERN and JINR;

- that CERN will not engage in new collaborations with JINR until further notice;

- that the Observer status of JINR at the Council is suspended and CERN will not exercise the rights resulting from its Observer status at JINR, until further notice.

The CERN Council also decided that, with a view to making a decision at its Session in June 2022 on the suspension of the international cooperation agreements and the related protocols and addenda, as well as any other agreements, including *mutatis mutandis* experiment memoranda of understanding, allowing for the participation of the Russian Federation and the Republic of Belarus, their national institutes and JINR in the CERN scientific programme, the Council will consider additional information and an action plan, and will further analyse the full consequences of such a decision.

The 23 Member States of CERN reiterate their condemnation, in the strongest terms, of the military invasion of Ukraine by the Russian Federation and strongly condemn the statements by those Russian institutes that have expressed support for the illegal invasion of Ukraine.

The CERN Council emphasised that the unprovoked and premeditated attack on Ukraine has caused widespread loss of life and a humanitarian crisis. Therefore, the Council stressed that its decisions are taken to express its solidarity with the Ukrainian people and its commitment to science for peace.

The core values of the Organization have always been premised upon scientific collaboration across borders as a driver for peace. Therefore, the aggression of one country by another runs against the values for which the Organization stands.

The measures agreed on today complement those adopted at the CERN Council's Extraordinary Session ( <https://home.web.cern.ch/news/news/cern/cern-council-responds-russian-invasion-ukraine> ) held on 8 March, whereby it supported initiatives in favour of the Ukrainian scientific community, condemned the military invasion of Ukraine by the Russian Federation with the involvement of Belarus, suspended the Observer status of the Russian Federation until further notice, and decided that CERN would not engage in new collaborations with the Russian Federation and its institutions until further notice.

*Fabiola Gianotti*

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CERN)

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On the eve of the symposium, there will be a public screening of the film *Particle Fever* at the Globe, followed by a discussion with CERN scientists and other symposium speakers. Similar events with local scientists are being

organised in communities across the region from late April to June. Throughout the CERN Member States and at partner laboratories around the world, events ranging from science cafés to lunchtime exhibits for decision-makers are being prepared.

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## Environmental awareness: the importance of environmental considerations for future projects

### Pursuing CERN's scientific mission through environmentally responsible research



The Future Circular Collider feasibility study applies the "Avoid, Reduce, Compensate" approach (Image: CERN)

Long-term environmental sustainability is one of the key factors assessed in the authorisation process of future research infrastructures and projects in the realm of particle physics research.

For years, the term "environment" was associated only with nature and the preservation of ecosystems. More recently this definition has expanded to include urban landscapes and the embedded socio-economic activities. This more holistic approach takes into account the relationships between different aspects of the environment when planning the future of particle physics research.

In 2020, the European Strategy for Particle Physics (<https://europeanstrategy.cern/>), the cornerstone of Europe's decision-making process for the long-term future of the field, was updated following almost two years of discussions between particle physicists in Europe and around the world. In the process, a

report from 180 young scientists (<https://arxiv.org/abs/2002.02837>) highlighted the importance of environmentally responsible and sustainable decisions for the future of particle physics.

The updated European Strategy (<https://home.cern/sites/default/files/2020-06/2020%20Update%20European%20Strategy.pdf>) has a dedicated chapter on "environmental and societal impact", stating that the environmental impact of particle physics should continue to be carefully studied while striving to increase the net benefits from the realisation of a new facility. It recommends that major projects integrate sustainability in their design and include a detailed plan for reducing their environmental impact, and that wider environmental applications for technologies developed in particle physics be actively sought.

In the framework of the feasibility study for the Future Circular Collider, a possible future accelerator based at CERN that may succeed the LHC at the end of its lifetime, different working hypotheses are being developed for the placement of the 91-km-circumference tunnel and its eight surface sites. These working hypotheses take into account the geological conditions, surface constraints, infrastructure and resources, and are based on the "Éviter, Réduire, Compenser" (<https://www.cerema.fr/fr/actualites/guide-aide-definition-mesures-eviter-reduire-compenser>) ("Avoid, Reduce, Compensate") principle, a comprehensive approach that integrates environmental and socio-economic aspects.

Given the extent of excavation that would be required to build the FCC accelerator tunnel, a

working group on the management of excavated materials was created in 2018. On this same topic, the Mining the future competition was launched. The competition challenges participants to identify credible solutions for innovative reuse and sustainable management of the estimated large quantities of excavated materials.

Reducing the environmental impact of particle physics research is firmly on the agenda, and is also reflected in CERN's current main objectives for 2021–2025 ([https://home.cern/sites/default/files/2022-01/CERNS%20Main%20Objectives\\_0.pdf](https://home.cern/sites/default/files/2022-01/CERNS%20Main%20Objectives_0.pdf)): to minimise the Laboratory's impact on the environment, pursue actions and technologies aiming at energy saving and reuse and, going further, identify and develop CERN technologies that may contribute to mitigating the impact of society on the environment. Recent initiatives linked to these objectives include a project to assess how to "green" CERN's procurement strategy and the launch of the CERN Innovation Programme for Environmental Applications (CIPEA) (<https://home.cern/news/news/knowledge-sharing/launching-cern-innovation-programme-environmental-applications-cipea>).

These core environmental considerations, which, as required by the approval process for any new project, are linked to clear commitments, ensure that our scientific research is pursued responsibly, for the benefit of all.

*This article is part of the series "CERN's year of environmental awareness".*



# Primary schools' challenge: Archana Sharma and Pieter Mattelaer round off the investigations

At a considerable advantage thanks to the previous teams' findings, will Archana and Pieter finally work out what's in the boxes?



Archana and Pieter investigate the mysterious boxes (Image: CERN)

Following several months of investigations, Archana Sharma, an experimental physicist, and Pieter Mattelaer, a civil engineer, were the fifth and final pair to examine the boxes.

In June 2021, to mark the 10th anniversary of the *Be a Scientist* ( <https://voisins.cern/fr/be-scientist> ) project, pupils from Jean de la Fontaine school (Prévessin-Moëns, France) and Cérésole school (Petit-Lancy, Switzerland) set a challenge for CERN's scientists. Their task? To find out what was inside two boxes without opening them!

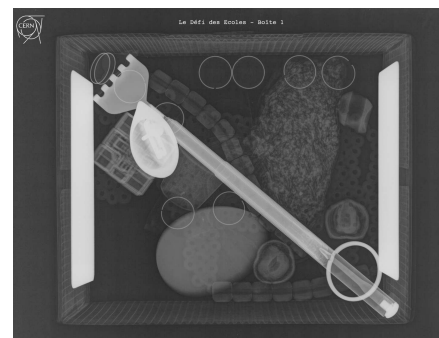
For ten years now, schools in Geneva, the Pays de Gex and Haute-Savoie have been receiving mystery boxes from CERN. The pupils, aged between 8 and 12, produce hypotheses, collect data and use factual information to determine the boxes' contents. This year, the roles were reversed.

Archana and Pieter analyse X-rays of the boxes to try to work out what's inside (Video: CERN)

On the advice of Dorota Grabowska and Alberto Di Meglio, the previous team to take up the ( <https://voisins.cern/fr/another-pair-cern-scientists-tries-identify-contents-two-mystery-boxes-designed-local> ) investigation, the boxes were X-rayed. In the hall of CERN's Building 40, Archana and Pieter were thus able to round off the investigation with a significant advantage. Thanks to these helpful images, the duo made numerous discoveries, validating some of their predecessors' hypotheses. Which of the previous four pairs was right? Is there a metal detector in the French box, or a little bell in the Swiss one?

Watch this space – the boxes will be opened and the contents revealed in the next and final episode of the *Schools Challenge* ( <https://voisins.cern/fr/defi> ) !

Visit [voisins.cern](https://voisins.cern/en/defi) ( <https://voisins.cern/en/defi> ) for regular updates on the challenge and to follow the progress of the investigation by the CERN community.



( <https://cds.cern.ch/images/CERN-HO-MEWEB-PHO-2022-052-3> )

X-ray of the Swiss box designed by the pupils of Cérésole school in Petit-Lancy (Image: CERN)



( <https://cds.cern.ch/images/CERN-HO-MEWEB-PHO-2022-052-2> )

X-ray of the French box designed by the pupils of Jean de la Fontaine school in Prévessin-Moëns (Image: CERN)

## Swiss Ambassador to France visits CERN by bike as part of the “En route avec la Suisse” project

The goal of the “En route avec la Suisse” project is to promote Switzerland in France by showcasing the country's innovative and sustainable credentials



The welcome committee at CERN's Mobility Centre (Image: CERN)

As an international organisation, CERN regularly hosts protocol visits, some of which

are particularly memorable. This was certainly the case when the Swiss Ambassador to France came to CERN on Tuesday, 29 March: Roberto Balzaretti rode through the CERN site on an electric bicycle as part of his unique tour of France.

A proponent of sustainable modes of transport, the Ambassador is criss-crossing France by bicycle in 12 stages. He embarked on the first stage – dedicated to the Auvergne-Rhône-Alpes region – at the end of March. Having set off from Aigle, in the Swiss canton of Vaud, he cycled through Saint-Gingolph, Thonon-les-Bains, Annemasse and Geneva before arriving at CERN.

CERN, which was recently awarded the ecomobility prize ( <https://home.cern/news/news/cern-receives-local-soft-mobility-prize> ) by the Ain Energy and Climate Agency, was keen to welcome the Ambassador. Accompanied by the General Consul for Switzerland in Lyon, Pascal Borno, the Ambassador was greeted at CERN's Mobility Centre by the CERN Director for International Relations, Charlotte Lindberg Warakaulle, and representatives of the Relations with the Host States service, the Site and Civil Engineering department, the Mobility Centre and the CERN cycling club.

The welcome committee escorted the Ambassador and his entourage by bicycle from

Gate A in Switzerland to Gate B in France. Before continuing on their journey to Lyon, the visitors made a symbolic stop at the CERN border crossing.

The visit was an opportunity for the participants to discuss their respective institutions' commitment to sustainable modes of transport and to underline the importance of cross-

border relations for France and Switzerland and for CERN.

The goal of the "En route avec la Suisse" project is to demonstrate the extremely rich and close ties between France and Switzerland by engaging with the Swiss community in France (prominent figures and people with economic, scientific and cultural links to Switzerland)

while strengthening bilateral and cross-border relations.

The Ambassador chose to ride an electrically assisted bicycle developed by a Swiss company in order to emphasise the country's commitment to sustainable transport, sport and innovation.

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## Research and industry unite at 2022 CERN openlab Technical Workshop

**CERN openlab brings together IT experts from research and industry to address the computing challenges posed by the LHC's ambitious upgrade programme**



Over 200 people attended the workshop, which was held via Zoom (Image: CERN)

Over 200 people attended the 2022 CERN openlab Technical Workshop. The event was run online over three days, from 21 to 23 March. It saw leading computing experts from research and industry come together to discuss the work carried out through 32 joint R&D projects spread across CERN.

CERN openlab ( <https://openlab.cern/> ) is a unique public-private partnership, through which CERN collaborates with leading technology companies. For 20 years, this partnership has been working to accelerate innovation in the computing technologies required by the LHC research community. Today, there are over 20 companies and research organisations working together in CERN openlab. Industry members include Intel, Oracle, Siemens, Micron and Google.

At the 2022 CERN openlab Technical Workshop, project teams shared their progress and discussed upcoming IT challenges related to the LHC's ambitious upgrade programme.

"Through CERN openlab, we are working with industry leaders to tackle tomorrow's IT challenges today," says Enrica Porcari, head of the CERN IT Department. "These challenges are relevant to a growing range of scientific fields, as well as wider society. Through collaboration with CERN's Knowledge Transfer group and dedicated R&D projects focused on sharing knowledge and tools with other communities, CERN openlab plays an important role in contributing to CERN's positive impact on society."

### Exascale, AI, quantum computing and more

A particular highlight from the first day of the workshop, dedicated to exascale computing technologies, was the opening technical presentation, which focused on the Allen project ( <https://home.cern/news/news/computing/allen-initiative-supported-cern-openlab-key-lhcb-trigger-upgrade> ). This project has developed a new, more efficient system that sees the first level of the LHCb experiment's data-filtering 'trigger' system move to running on graphical processing units (GPUs), rather than general-purpose central processing units (CPUs).

The second day of the workshop focused on two separate topics, AI and collaborations with research beyond particle physics, with presentations on both the potential of advanced AI for data analysis at CERN and CERN openlab's impact on various fields such as quantum encryption, climate modelling and satellite imagery to support humanitarian interventions. The third day focused on

quantum technologies, including presentations on the CERN Quantum Technology Initiative ( <https://quantum.cern/> ) (QTI), an exciting new venture that published its first strategic roadmap in October 2021 ( <https://home.cern/news/press-release/knowledge-sharing/cern-quantum-technology-initiative-unveils-strategic-roadmap> ).

### Working together to tackle tomorrow's IT challenges today

During 2022, the CERN openlab team will carry out work to strengthen existing collaborations with industry, finalising plans for a range of exciting R&D projects, as well as establishing new collaborations to address emerging IT challenges.

"CERN openlab has built deep connections between members of CERN's research community and the R&D teams at the leading technology companies participating in this partnership. It is testament to the strength of these connections that we have been able to both grow our collaborations and make important technical progress on projects over the last two years when in-person interaction has been severely limited," says Maria Girone, CERN openlab's Chief Technology Officer. "We are now looking forward to resuming face-to-face meetings with our collaborators and to welcoming the 2022 cohort of CERN openlab summer students to the CERN site in July."

Andrew Purcell

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## MoEDAL gets a new detector

**The new detector, known as MAPP, will increase the physics reach of the MoEDAL experiment and the Large Hadron Collider**



Installation of the support structure for the MAPP detector components. (Image: CERN)

The MoEDAL collaboration at the Large Hadron Collider ( <https://home.cern/science/accelerators/large-hadron-collider> ) (LHC) is adding a new detector to its experiment, in time for the start of the next run of the collider this coming summer. Named as the MoEDAL Apparatus for Penetrating Particles, or MAPP for short, the new detector will expand the physics scope of MoEDAL ( <https://home.cern>

/science/experiments/moedal-mapp ) to include searches for minicharged particles and long-lived particles.

MoEDAL's current portfolio of searches for new unknown particles includes searches for magnetic monopoles, theoretical particles with a magnetic charge, and dyons, theoretical particles with both magnetic and electric charge. These searches are conducted using two detector systems, one consisting of detectors that track particles and measure their charge, and another comprising detectors that trap particles for further investigation.

Using these tracking and trapping detector systems, the MoEDAL team has chalked up several achievements, including narrowing the regions of where to look for point-like magnetic monopoles ( <https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.123.021802> ) , the first search at a particle accelerator for dyons ( <https://home.cern/news/news/physics/moedal-hunts-dyons> ) , and more recently the first search at a particle collider for

Schwinger monopoles ( <https://home.cern/news/news/physics/moedal-bags-first> ) , which have a finite size.

The new MAPP detector, which is currently being installed in a tunnel adjacent to the LHC tunnel, consists of two main parts. One part, MAPP-mCP, will search for minicharged particles (mCP) – particles with a fractional charge as small as a thousandth of the electron's charge – using scintillation bars. Another part of the detector, MAPP-LLP, will search for long-lived particles (LLP) employing so-called scintillator hodoscopes arranged in a 'Russian doll' configuration.

"MoEDAL-MAPP will allow us to explore many models of physics phenomena beyond the Standard Model ( <https://home.cern/science/physics/standard-model> ) of particle physics, in ways that are complementary to those of the other LHC detectors," says MoEDAL spokesperson Jim Pinfold.

Ana Lopes

## ORIGIN-CMS exhibition in Seoul – it's a wrap!

An exhibition centre in South Korea was "wrapped" in CMS for six months last year. The innovative science, art and education exhibition is still accessible online.



The 15 m-high exhibition centre of Hanyang University in Seoul has been "wrapped" with an image of CMS for the exhibition (Image: CERN)

From May to October last year, Hanyang University in Seoul, South Korea, housed a cross-disciplinary SciArtEdu (science, art and education) exhibition designed by the South Korean particle physics community and local artists with the support and participation of CMS and members of the local ORIGIN collaboration ( <https://origin-cms.web.cern.ch/> ) \*, which includes ALICE, LIGO and ICEcube. For the six-month duration of the exhibition, the 15 m-high exhibition centre building was wrapped with an image of CMS, creating an eye-catching scene in the centre of the city.

Inside the vast building, curious visitors discovered a unique exhibition created by

ORIGIN-CMS curator Michael Hoch in collaboration with the museum staff, local and international scientific colleagues and artists. The exhibition, entitled "The Cosmonaut", examined humankind's millennia-old quest to understand the mysteries of the cosmos, connecting this quest to current particle physics research using displays of real objects, photos, videos and text, and juxtaposing them with contemporary artistic representations.

Although the exhibition took place during the pandemic, which restricted in-person access, a comprehensive virtual programme was organised, including regular presentations, meetings with scientists and artists, and scientific and artistic educational workshops specifically designed for teachers and students.

Rather than limiting the impact of the exhibition, the pandemic restrictions encouraged and inspired the organisers to reach out to a much wider audience by recording the events and the entire exhibition for virtual access. A 3D "street-view" recording enabled virtual visitors to explore the exhibition while accessing supplementary information at the click of a button.

For example, while wandering through the exhibition, one can "meet" Nobel Prize winner Barry Barish standing in front of a blackboard giving a 20-minute presentation on the history of gravitation and the discovery of gravitational waves in 2015 ( [https://www.youtube.com/watch?v=oi6U8DU-M\\_4&t=576s](https://www.youtube.com/watch?v=oi6U8DU-M_4&t=576s) ) . The blackboard itself is an exhibit, having been used for more than 60 years at CERN and saved from destruction when the CERN Theory department was renovated.

The virtual exhibition is now archived and remains accessible here (science floor ( <https://my.matterport.com/show/?m=nsafzyhGnic> ) , art floor ( <https://my.matterport.com/show/?m=cZF48ZqEyF> ) ), where it may continue to be updated in response to new developments and discoveries. The virtual archive is accessible from any internet-connected device and can be used at any time for education purposes and to inspire different audiences. It is an exciting example of how modern technology, some of it born at CERN more than 30 years ago, can be used to extend the lifetime and enhance the content and geographical reach of previously localised exhibitions.

\*ORIGIN is a consortium of scientific collaborations aiming to understand the origin, composition and evolution of the universe. It supports a variety of scientific and artistic projects, focusing on cross-disciplinary engagement, networking and education on a global scale. Current ORIGIN partners are: ALICE, ATLAS, CMS, LHCb, LIGO, VIRGO, ICEcube, Muographer, the Parameter Institute and the CLS.



# Computer security

## Computer Security: Email equals letters

**When receiving an email, please don't rely on the supposed sender. Rely on the overall package**

The old folks among us might still remember. Taking out a sheet of plain white paper. Or glossy. Handcrafted. With structure. Or elegantly, perfectly white. 80 g. 120 g. 240 g. And a pencil, a ballpoint pen or even a fountain pen. Sharpening it. Filling its reservoir with ink. Also sharpening the mind. Filling it with ideas. A message. To a loved one. Putting those thoughts to paper. Joined-up handwriting. In one flowing line. Right down to the "Yours truly" and the signature. A work of art. With compassion. Finished off with a proper envelope. Tasting the weird flavour of the glue when pasting it shut. Maybe even sealing it with wax. And finalising it with the name and address of its destination. Possibly indicating the sender. The good old days. Writing letters.

Much of this has been lost when moving to digital letters. Aka emails. No paper. No pencil. And definitely often also a huge lack of sharpness of mind. Thoughts. Devotion. Just a hack on the keyboard. Cold. Emotionless. With only its speed and the lack of a need to lick the envelope as advantages. And the former could even be disputed. It's unfortunate that the romanticism of writing letters got lost in emails.

Even more unfortunate, however, is the fact that emails still follow the technical principles of letters: while the recipient's address must be 100% correct to arrive safely at its destination, the sender can be whomever you fancy. Your name (if you're an honest soul). The name of your neighbour (whom you despise). Donald Duck at Disneyland, Paris (funny, funny!). The same name as the recipient (to confuse them?). That of the tax authorities (to scam). Or just left out (total anonymity if you don't happen

to send it from your standard mail client). In short, email senders can be spoofed. They don't tell you anything about the sender. Nothing. Nichts. Nada. Rien.

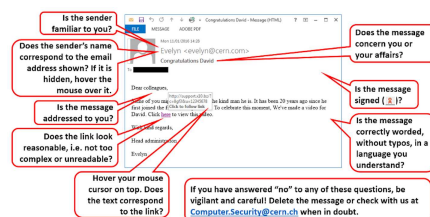
When receiving an email, therefore, please don't rely on the supposed sender. Rely on the overall package. Its contents. The thoughts and romanticism, if any, put into its words. Their meaning. The way they connect to you. Your being. Your personal life. Your professional duties. Is there a resonance? A correspondence? Is it in a language you speak? Or, quite simply, does the email make sense to you? Please note that J. Bieber and B. Spears will not send around nude pictures of themselves. That your ex-spouse is very unlikely to still send you love letters. That no legitimate firm will ask you to reply with your password. That you will never receive a valid invoice from a company with which you do not have any contractual engagement. And if the sender is pressing you hard, asking for money, with tight deadlines ("Please speed up the payment immediately"), or confronting you with embarrassing information ("I know you love watching porn"), you should definitely hold fire!

In all these cases, STOP – THINK – DON'T. DON'T REPLY (in particular don't reply with your password). DON'T OPEN attachments. DON'T CLICK on embedded links. Tame your curiosity. Delete those mails. It's better to be safe than sorry. And if in doubt, just check with us at [Computer.Security@cern.ch](mailto:Computer.Security@cern.ch).

Remember the good old paper letters. Only if they touched your heart did you file them away with your keepsakes. As a souvenir. Forever. All the others were destroyed or went unanswered. Maybe the time has come to take out paper and pen, sharpen your mind and send some romantic words to your beloved?

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](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



( <https://cds.cern.ch/images/CERN-HO-MEWEB-PHO-2022-054-1> )

## Official communications

### Taxation in France

#### Memorandum concerning the internal tax annual certificate and individual annual statement for 2021 (for the 2022 declaration of 2021 income in France)

The Organization would like to remind members of the personnel that they must comply with the national legislation applicable to them (cf. Article S V 2.02 of the Staff Rules).

##### I - Internal tax annual certificate and individual annual statement for 2021

The internal tax annual certificate or the individual annual statement for 2021, issued by the Finance and Administrative Processes Department, is available since 8 February 2022 via HRT (under "My e-Documents and

Self Services"). It is intended exclusively for the tax authorities.

1. If you are currently a member of the CERN personnel, you will have received an e-mail containing a link to your certificate or statement, which you can print if necessary.
2. If you are no longer a member of the CERN personnel or are unable to access your certificate or statement as indicated above, you will find information explaining how to obtain

one on this page ( <https://admin-eguid.e.web.cern.ch/en/procedure/annual-certificates> ) .

In case of difficulty in obtaining your certificate or statement, please send an e-mail explaining the problem to [service-desk@cern.ch](mailto:service-desk@cern.ch).

##### II - 2022 tax declaration form of 2021 income in France

The 2022 tax declaration form for 2021 income must be completed following the general

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## Exchange rate for the tax declaration form of 2021 income: for the attention of members of the personnel and pensioners living in France

For the tax declaration form of 2021 income, the average annual exchange rate to be used

is **EUR 0.95\* for CHF 1.**

HR department

\*Communicated by the French Tax Authorities.

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## Announcements

### Take part in the CERN Innovation Programme on Environmental Applications (CIPEA)

**How could CERN innovation be used to tackle climate change and other environmental challenges? Submit your proposals by 27 May 2022.**

(Video: CERN)

This video is also available on CDS ( <https://vdeos.cern.ch/record/2295734> ) .

The CERN Innovation Programme on Environmental Applications ( <https://kt.cern/environment/CIPEA> ) (CIPEA) is an opportunity for you to explore how your work at CERN and the technologies developed by your team could help build a healthier and more sustainable planet.

Watch the video to learn how you can get involved. To submit your proposal, download

the dedicated CIPEA form ( <https://cernbox.cern.ch/index.php/s/Okig2tmRTFBjOY7> ) and send it to [CIPEA-2022@cern.ch](mailto:CIPEA-2022@cern.ch) by 27 May 2022.

Find out more:

- Kick-off event (held 8 March 2022) – Indico page ( <https://indico.cern.ch/event/1132085/> ) and event recordings ( [https://cds.cern.ch/search?f=490\\_\\_a&p=CERN%20Innovation%20Programme%20on%20Environmental%20Applicati](https://cds.cern.ch/search?f=490__a&p=CERN%20Innovation%20Programme%20on%20Environmental%20Applicati)

[ons%20%28CIPEA%29%20-%20Kick-Off%20Event](https://kt.cern/environment/CIPEA) )

- CIPEA page ( <https://kt.cern/environment/CIPEA> )
- Knowledge Transfer page dedicated to environmental applications ( <https://kt.cern/environment> )

Contact us if you have questions: [CIPEA-2022@cern.ch](mailto:CIPEA-2022@cern.ch)

CERN Knowledge Transfer group

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## Courier webinar on 28 April: Toward a diffraction limited storage-ring-based X-ray source

Join the audience ( <https://register.gotowebinar.com/register/4081017048809224717> ) for a live webinar at 5 p.m. CET on 28 April 2022 to learn about the latest progress towards an ultimate X-ray source based on hybrid multi-bend achromats. The webinar will be presented by Pantaleo Raimondi, professor at the Stanford Linear Accelerator Center and research technical manager at the SLAC National Accelerator Laboratory.

Multi-bend achromat (MBA) lattices have initiated a fourth generation for storage-ring light sources with orders of magnitude increase in brightness and transverse coherence. A few MBA rings have been built, and many others are in design or construction worldwide, including upgrades of APS and ALS in the US.

The HMBA (hybrid MBA), developed for the successful ESRF-EBS MBA upgrade has proven to be very effective in addressing the nonlinear dynamics challenges associated

with pushing the emittance toward the diffraction limit. The evolution of the HMBA ring designs will be described in this seminar. The new designs are consistent with the breaking of the lattice periodicity found in traditional circular light sources, inserting dedicated sections for efficient injection and additional emittance damping.

Techniques developed for high-energy physics rings to mitigate nonlinear dynamics challenges associated with breaking



periodicity at collision points were applied in the HMBA designs for the injection and damping sections. These techniques were also used to optimise the individual HMBA cell nonlinear dynamics. The resulting HMBA can deliver the long-sought diffraction limited

source while maintaining the temporal and transverse stability of third-generation light sources due to the long lifetime and traditional off-axis injection enabled by nonlinear dynamics optimisation, thus improving upon

the performance of rings now under construction.

## CERN School of Computing 2022: Apply now!



(Image: CERN)

Applications are now open for the 43<sup>rd</sup> CERN School of Computing. The CSC 2022 ( <https://indico.cern.ch/e/CSC-2022> ) will take place from 4 to 17 September in the beautiful city of Krakow, Poland. Initially planned for 2020 but postponed due to the pandemic, this School is organised in collaboration with the AGH

University of Science and Technology (AGH ( <https://www.agh.edu.pl/en> ) ), together with the Institute of Nuclear Physics of the Polish Academy of Sciences (IFJ PAN ( <https://www.ifj.edu.pl/en> ) ).

The CSC is not a conference but a true summer university. The two-week programme ( <https://indico.cern.ch/event/1125271/program> ) consists of more than 50 hours of lectures and hands-on exercises, covering three main themes: physics computing, software engineering and data technologies. As with every CSC, the programme is audited by the hosting universities, and students that pass the final optional exam will receive a diploma from CSC, as well as 6 ECTS credits from AGH.

However, the School is about more than studies: the social and sport programme is also a vital part of it. We will have ample

opportunities to explore and experience some of the great cultural, historical and natural attractions of Krakow and its region.

The CSC 2022 is aimed at postgraduate (i.e. minimum of Bachelor degree or equivalent) students, engineers and scientists with a few years of experience in particle physics, computing or related fields. We welcome applications from all countries and nationalities. Limited financial support may be available.

**The deadline for applications is 8 May – places are limited!**

For more details and to apply, please visit this link: <https://indico.cern.ch/e/CSC-2022> ( <https://indico.cern.ch/e/CSC-2022> )

Sebastian Lopiński

## Radiation protection congress in Annecy-le-Vieux, 20–22 September 2022

The *Association pour les Techniques et les Sciences de Radioprotection* (French Association for Radiation Protection Techniques and Science) will be holding its 27th radiation protection congress, in Annecy-le-Vieux, from 20 to 22 September 2022, with

the support of CERN. The agenda of the two-day congress will include the radiation protection challenges involved in building high-energy accelerators, their industrial and medical applications and environmental monitoring.

You can register to attend or submit your abstract on the event's website ( <https://www.alphavisa.com/atsr/2022/index.php> ) until 2 May. All the presentations and lectures will be in French.

## EIROforum conference on 28 April: Grand challenges in artificial intelligence and data science

On 28 April 2022, the EIROforum alliance of eight European scientific infrastructures, including CERN\*, will hold a conference ( <https://www.eiroforum.org/news/eiroforum-hosts-conference-on-grand-challenges-in-ai-and-data-science/> ) focusing on the challenges posed by artificial intelligence and data science.

The conference, which will be hosted at the European Molecular Biology Laboratory

(EMBL) in Heidelberg and streamed for an online audience, will include workshops and talks presenting leading data science and artificial intelligence from the EIROforum members, and explore how they can contribute to scientific progress with societal and economic impact. The conference is aimed at scientists across EIROforum disciplines, science policymakers and science journalists.

Register ( <https://www.embl.org/about/info/course-and-conference-office/events/eir22-01>

/ ) by 20 April to watch the conference online.

\* Besides CERN, EIROforum comprises the following: the European Southern Observatory (ESO), the European Space Agency (ESA), the European Molecular Biology Laboratory (EMBL), the European Synchrotron Radiation Facility (ESRF), the Institut Laue-Langevin (ILL), the European X-Ray Free-Electron Laser facility (European XFEL) and the European Consortium for the Development of Fusion Energy (EUROfusion)

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## Ombud's corner

### Values and principles of the Ombud's profession: what are they for?

You may know that the CERN Ombud is a member of the International Ombuds Association (IOA). Originally founded in the USA, the IOA ( <https://www.ombudsassociation.org/> ) promotes the profession of ombud all over the world.

One pillar of the IOA's mission is the establishment of a set of standards for the profession. These standards are more than simply aspirational, setting precise expectations as to the values and working principles that ombuds are requested to respect and follow.

Recently, on 17 March 2022, the IOA Board of Directors approved the Association's final, revised Standards of Practice ( [https://ioa.memberclicks.net/assets/docs/docs\\_2022/IOA\\_Standards\\_of\\_Practice\\_Approved\\_2022-03-17.pdf](https://ioa.memberclicks.net/assets/docs/docs_2022/IOA_Standards_of_Practice_Approved_2022-03-17.pdf) ) (SOP) and Code of Ethics ( [https://ioa.memberclicks.net/assets/docs/docs\\_2022/IOA\\_Code\\_of\\_Ethics\\_Approved\\_2022-03-17.pdf](https://ioa.memberclicks.net/assets/docs/docs_2022/IOA_Code_of_Ethics_Approved_2022-03-17.pdf) ) (COE). You will find both texts on the Ombud's website and I would like to place a spotlight today on the Code of Ethics.

The mandate ( <https://ombuds.web.cern.ch/sites/default/files/reports/CERN%20Ombudsman's%20mandate.pdf> ) of the CERN Ombud allows the latter to work according to the fundamental principles of the profession: independence, impartiality, informality, confidentiality. In particular, the direct reporting line to the Director-General and the full independence that the latter grants to the

Ombud enable this role to be truly external, impartial and free from conflicts of interests. In addition to these fundamental working principles, the Code of Ethics lays out the core values of the profession and requires that ombuds:

- act with honesty and integrity;
- promote fairness and support fair process;
- remain non-judgmental, with empathy and respect for individual differences;
- promote dignity, diversity, equity, inclusion and belonging;
- communicate accurate understanding through active listening;
- promote individual empowerment, self-determination and collaborative problem-solving; and
- endeavour to be an accessible, trusted and respected informal resource.

In line with the work of my predecessors, I am particularly attached to these core values of the profession and work consistently to put them into practice in the Ombud's Office. I have frequent contact with the ombuds of other organisations in the public and private sectors, as well as with those of other international organisations. All of them have a genuine attachment to these core values.

The 17th international conference of the IOA, a key milestone of the Ombud's year, is taking

place between 4 and 6 April 2022, and ombuds from all over the world will meet – virtually again this year – to explore the theme of “belonging together reimagined”. I will take part and will undoubtedly come away with a wealth of ideas, connections and knowledge, which will empower me to serve the CERN community better.

***The combination of the core values and the fundamental working principles makes the CERN Ombud unique among all the response channels ( [https://cds.cern.ch/record/2725731/files/Inappropriate%20Behaviour%20and%20harassment-%201-pager%20\(Version%2025%20Feb%2020%20HR%20page\).jpg](https://cds.cern.ch/record/2725731/files/Inappropriate%20Behaviour%20and%20harassment-%201-pager%20(Version%2025%20Feb%2020%20HR%20page).jpg) ) that are available to you when you are facing a challenging issue, whether it is an interpersonal conflict or any situation of inappropriate behaviour or misconduct that is affecting your work environment.***

Laure Esteveny

*I want to hear from you – feel free to email [ombud@cern.ch](mailto:ombud@cern.ch) with any feedback or suggestions for topics you'd like me to address.*

*NB: 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?egroup Name=cern-ombud-news> ) .*