CERN Bulletin

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CERN'S COVID SCALE AND MEASURES

On 1 June, a COVID scale and accompanying measures will be introduced at CERN to govern teleworking, site access and other aspects of life at the Laboratory as a function of the prevailing COVID-19 situation in the local area

(Image: CERN)

On 1 June, a new unified system governing teleworking, site access and other aspects of life at CERN will be introduced. It has been developed over recent weeks by a Lab-wide working group and is based on the incidence rate in the local area, along with a qualitative assessment taking into account the number of confirmed cases at CERN, vaccination, the stratified testing campaign and the local presence of new variants of the virus. The level in force at any given time may move up or down the scale and may change at short notice. Normally, the level to be applied will be communicated with 10 days' notice via the weekly COVID-19 email, while the level in force will be displayed on the information panels at the entrances to the CERN sites, on the HSE website and in the main CERN directory. In the event of sudden degradation, any level change will be promptly notified through the COVID-19 email.

CERN's COVID scale has four levels, with level four (red) being the strictest and level one (green) being the most open. In between come level three (orange) and level two (yellow).

(Continued on page 2)

A WORD FROM BENOÎT DELILLE

A PRAGMATIC COVID SCALE SYSTEM

Much work has gone into CERN's COVID scale and accompanying measures, which will be introduced on 1 June. The overriding objective of the new system is to provide better visibility on the measures that will be applicable at CERN in the coming months.

(Continued on page 2)

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A WORD FROM BENOÎT DELILLE

A PRAGMATIC COVID SCALE SYSTEM

These measures will guide several aspects of life at CERN, from telework to restaurant and shuttle services and the activities of the clubs and the Visit service. The applicable COVID-19 risk level will be determined mainly on the basis of the circulation of the virus in the local area. As is already the case today, the measures defined in the new system will be complemented by rules regarding isolation and quarantine for COVID-19 cases, close contacts and persons arriving from high-risk countries or areas. These rules will continue to reflect Host State regulations and recommendations and CERN's need to define a unique set of measures on its sites. Hygiene measures will continue to apply, regardless of the risk level.

While we all hope that with the vaccination campaigns in France and Switzerland advancing well, some kind of return to normality might soon be possible, there remains a great deal of uncertainty – what challenges will new variants bring, and what will be the consequences of the gradual opening up we are now witnessing? We've therefore designed a system in which we can move from looser to tighter restrictions, as well as from tighter to looser, as the situation demands.

For most of us at CERN, access to the CERN sites and the teleworking measures associated with each level will be the most important information to have to hand. But the system also takes into account factors such as when professional and non-professional visitors can come on site and when we can open our exhibitions and visits to the public.

Once the system is in place, the level in force will be regularly evaluated and communicated via the weekly COVID-19 email for the week starting ten days later. The current level will always be displayed on the panels at the entrances to CERN, on the CERN HSE website and in the main CERN directory. The level in force will be based on the weekly virus circulation in the local area, along with a number of qualitative factors relating to life on the CERN site.

The COVID scale system is pragmatic and builds on the knowledge that has accumulated across the Laboratory since the pandemic was declared last year, and I am convinced that it will serve us well and allow us to edge closer to normality. You can find out more about it in this article (*https://home.cern/news/news/cern/cerns-covid-scale-and-measures*), and on this summary table (*https://edms.cern.ch/ui/file/2379299/LAST_RELEASED/CERN_Scale_and_measures_poster_EN.pdf*) dedicated to the system. I look forward to the day when the level is green, but I trust that, with the new system, we'll be able to see each other on site safely even before this is the case.

Benoît Delille
Head of the HSE Unit

CERN'S COVID SCALE AND MEASURES

Level four is applied when the virus is circulating in the local area at a rate of over 100 cases per 100 000 people per week, while level one applies when circulation is negligible. The transition between levels may lead to the relaxation or strengthening of measures, as the prevailing situation demands, and the levels of service offered on the CERN sites will be adapted accordingly.

Teleworking measures vary according to the level in force. When level four or three applies, for example, those who can telework should telework, though one day per week on site is possible under level four, and two days per week under level three. Site access conditions under levels four and three stipulate that members of the personnel may come on site for professional reasons only, and in consultation with their supervisors, while retirees may come on site to access bank safety deposit boxes, the Pension Fund or the CHIS office, only if strictly necessary. Family members are still, in levels four and three, not permitted on site. These conditions are relaxed under levels two and one. Hygiene measures will continue to apply whatever the level.

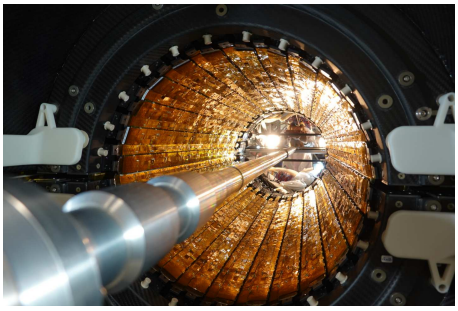
These are the main features of the system, but there is much more detail concerning activities and services on site. Club activities, shop and exhibition opening and on-site visits, for example, are all covered.

As is already the case today, the measures defined in the new system will be complemented by rules regarding isolation and quarantine for COVID-19 cases, close contacts and persons arriving from high-risk countries and areas. These rules will continue to reflect Host State regulations and recommendations and CERN's need to define a unique set of measures on its sites.

A summary of the system is available on the poster above, and full details may be found **here** (*https://edms.cern.ch/ui/file/2379299/LAST_RELEASED/CERN_Scale_and_measures_poster_EN.pdf*). Once the system is in force, a banner at the top of the CERN home page indicating the level currently in force will click through to the full description of the conditions under that level of the scale.

LS2 REPORT: AN UPGRADED INNER TRACKING SYSTEM JOINS THE ALICE DETECTOR

The two barrels of the largest pixel detector ever built have been successfully lowered into the cavern and stand ready for commissioning



The outer barrel of the Inner Tracking Device was installed in March, two more before the inner barrel which completed it. (Image: CERN)

After two nerve-wracking months dedicated to the installation of the ALICE detector's new Inner Tracking System (ITS), Corrado Gargiulo's mechanical engineering team, in charge of the installation, can relax: the delicate procedure has been successfully completed and ALICE's innermost subdetector is poised to collect its first data in the coming weeks.

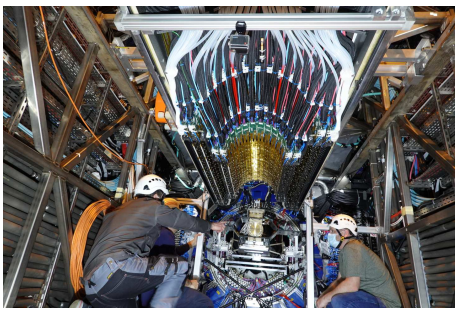
With its 10 m^2 of active silicon area and nearly 13 billion pixels, the new ITS is the largest pixel detector ever built. The detector lies sandwiched between the beam pipe and the Time Projection Chamber, which was installed in 2020, deep in the ALICE detector. By reconstructing primary and secondary particle vertices and improving the momentum and angle resolution for particles reconstructed by the Time Projection Chamber, the ITS is instrumental in identifying the particles born out of the powerful lead–lead collisions in the core of the ALICE detector.

The upgrade of the ITS will significantly increase the resolution of the vertex reconstruction, making the subdetector fit for future runs with higher luminosity, as part of a comprehensive overhaul of ALICE's subdetectors striving for this very objective. The current upgrade relies on new pixel sensors called ALPIDE, which also make up the new Muon Forward Tracker (MFT), installed a few months ago. Each of those chips contains more than half a million pixels in an area of 15 × 30 mm^2 and features an impressive resolution of about 5 µm in both directions – the secret to the subdetector's improved performances. They are organised in seven layers, the innermost three forming the inner barrel, while the outermost four make up the outer barrel. The collected data is then transmitted with a bit rate of up to 1.2 Gb/s to a system of about 200 readout boards located 7 m away from the detector. The data is then aggregated and eventually sent to ALICE's computing farm, where it is sequenced and processed.

The insertion of the heart of the ALICE detector around its beam pipe required surgical-like precision. The installation unfolded in two stages, as the two barrels making up the ITS had to be lowered separately, two months apart. The outer barrel got the ball rolling: it was loaded onto a truck in March and transported from Meyrin to Point 2, where the mating of its two halves and its insertion in the detector were carried out smoothly.

But the outer barrel was the easy part, at least compared to its inner counterpart whose insertion was complicated by its position right by the beam pipe. Luckily, weeks of rehearsals and careful alignment studies using metrological surveys proved their worth, and after an intense week of insertion and mating of the component's two halves, which involved a few late-evening sessions for the experts, the delicate manoeuvre was completed in the late evening of 12 May. Preliminary tests showed no damage occurred during the installation, proving that the teams' hard work paid off.

The ITS is now fully ready for stand-alone tests with cosmic rays, in view of joining the MFT for a common commissioning phase. The final steps before taking data at the LHC are the installation scheduled for next month of the Fast Interaction Trigger, the last of the ALICE subdetectors that has yet to join this formidable machine, and an overarching commissioning phase starting in July. With the milestone of the ITS installation now behind them, the ALICE collaboration is looking ahead to Run 3 with growing confidence and excitement.



Installation of the Outer Barrel of the new silicon Inner Tracking System of ALICE inside the solenoidal magnet. (Image: CERN)

CERN OPPORTUNITIES FOR STEM* STUDENTS WITH DISABILITIES

Accessibility and reasonable accommodations for people with disabilities is a key facet of the CERN Diversity & Inclusion (D&I) policy

(Image: CERN)

Every year, CERN welcomes hundreds of students to embark on a unique journey of growth and discovery, guided and coached by supervisors eager to impart the richness of working here. This gives the students the opportunity to build skills, demonstrate those skills to employers and gain work experience in what is a great start to their future career. CERN's administrative, technical and doctoral student programmes, alongside the short-term internships and flagship summer-student opportunities, make up the vast landscape that demonstrates CERN's commitment to educating the next generation of scientists. And in recent years, this offering has taken on a new dimension.

Accessibility and reasonable accommodations for people with disabilities are a key facet of the CERN Diversity & Inclusion (D&I) policy. In 2017, CERN was awarded a grant from the European Physical Society for a disability-specific internship programme proposed by the Diversity & Inclusion team at the time. The programme aimed to contribute to the academic and professional development of undergraduate and graduate students with visible and non-visible disabilities while helping the high-energy physics community to increase the diversity of its talent pool. The Organization would also benefit by improving its inclusiveness practices. And the momentum has built: since 2018, six interns have joined CERN thanks to this initiative, through either the short-term internship or technical student programmes, and more are set to join in the near future.

The impact of the initiative is best illustrated in the participants' own words. “The CERN programme for students with disabilities was a unique opportunity to demonstrate my abilities, to gain confidence. Thanks to my supervisor, I was able to spread my wings, prove my skills, go beyond my disability,” says Mathias, a student in IT. His supervisor, Pawel, notes: “I truly believe that we should be more open towards people with disabilities. The opportunity created a change in Mathias' life as well as in our lives and in CERN as an Organization. Working together with people with disabilities on common goals requires us to 'look at the world from a new perspective', which I consider beneficial.” Axel, another supervisor who guided a student over the course of several months, underlined that “he integrated so well that people took him as what he was: a productive, smart intern. But for me personally, what I'm most proud of is not that 'we made it', nor that our student credibly conveyed that he really appreciated his time with us, nor that CERN and the diversity office succeeded with this pilot: it's that the team seems to continuously sense team members' needs and reacts appropriately and in a welcoming, inclusive and inspiring way.”

The short-term internship programme coordinator, Laetitia Bréavoine, is in direct contact with supervisors and students alike in this context: “I was deeply touched to see how enthusiastic our supervisors were about participating in this programme. The most rewarding thing for me is to witness the joy of students when they find out they have a chance to come to CERN, and I am proud to have helped make it happen.”

The programme was recently recognised by the OECD in its benchmark study of diversity and inclusion, which compared CERN with seven other international organisations. As it goes from strength to strength, Axel sums it up well: “More of that, please: let's start to actively increase diversity!”

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If you are interested in taking part as a supervisor in the studentships for people with disabilities, contact diversity.inclusion@cern.ch.

To find out more about the D&I framework for people with disabilities, along with other D&I aspects, visit the D&I website (https://diversity-and-inclusion.web.cern.ch/support-structures-people-disabilities).

**STEM: science, technology, engineering and mathematics*

Anna Cook

RADES JOINS THE HUNT FOR DARK MATTER

One of the latest additions to the CAST experiment has set a new limit on the strength of the interaction between photons and hypothetical dark-matter particles called axions

Researcher Sergio Arguedas Cuendis checking the RADES detector set-up at the CAST experiment. (Image: CERN)

Long-hypothesised particles called axions could solve two problems in one strike: they could explain the puzzling symmetry properties of the strong force and they could make up the mysterious dark matter that permeates the cosmos. One of the newest detectors of the CAST experiment at CERN, RADES, has now joined the worldwide hunt for axions, searching for axions from the Milky Way's "halo" of dark matter and setting a limit on the strength of their interaction with photons. The results are described in a paper submitted for publication in the *Journal of High Energy Physics*.

One way of searching for axions from the Milky Way's dark-matter halo is to look for their conversion into photons in a "resonating cavity". If such axions surround and enter a resonating cavity that is placed in a strong magnetic field and resonates at a frequency corresponding to their mass, the chances of detecting them through their conversion into photons are increased.

Many experiments have used this search method and set limits on the interaction strength of axions with two photons in the case of small axion masses, mainly below 25 μeV (for comparison, the proton mass is about 1 GeV). Searching for larger axion masses using this approach requires a smaller cavity resonating at a higher frequency, but the smaller volume of a smaller cavity decreases the chances of spotting the particles.

A workaround involves dividing the cavity into smaller cavities that resonate at a higher frequency and collectively don't result in a loss of cavity volume. This is exactly the concept behind the RADES detector, which was installed inside one of CAST's dipole magnet bores in 2018 and can search for axions from the Milky Way's dark-matter halo that have a mass of around 34.67 μeV.

Researchers are developing complementary approaches to searching for axions, and some have searched for larger-mass axions using new cavity designs and placed limits on their interaction strength with two photons. But the best limit so far for an axion mass of 34.67 μeV was placed by CAST's previous searches for axions from the Sun.

In its latest paper, the CAST team describes the results of the first RADES search for axions. Sifting through data taken for more than 100 hours within a period of 20 days in 2018, the team saw no signs of axions. However, the data places a limit on the interaction strength of axions with two photons in the case of axions with a mass of or close to 34.67 μeV – a limit that is more than 100 times more stringent than CAST's previous best limit for this mass.

"This result is a significant first step in the direct search for axions using dipole magnets," says RADES scientist Sergio Arguedas Cuendis. "And as far as axion searches go, it's one of the most stringent limits ever set for axions with masses above 25 μeV."

Ana Lopes

CHANGE AT THE HELM OF THE CERN & SOCIETY FOUNDATION

Pascale Goy replaces Matteo Castoldi as head of the CERN & Society Foundation

Pascale Goy, new head of the CERN & Society Foundation. (Image: CERN)

After eight successful years as the Head of the Partnerships and Fundraising Section at CERN, it is with deep gratitude and a bittersweet heart that we announce that Matteo Castoldi is stepping down from his position.

During his tenure, Matteo has overseen the creation and consolidation of fundraising from private donors at CERN through the CERN & Society Foundation. He was instrumental in the development and implementation of CERN's first strategy for fundraising, and has spearheaded the fundraising campaigns to successfully launch projects such as the Beamline for Schools Competition, the CERN Entrepreneurship Student Programme, the High School Student Internship Programme, Sparks!, and more. In the last two years, Matteo has also supported the capital fundraising campaign of the CERN Science Gateway which has successfully almost reached its fundraising goals within this very short time span.

"It has been a privilege for me to have had the mandate to set up and run CERN's

fundraising activities for so many years. I would like to thank the former and the present CERN management for giving me this opportunity. I would also like to give my gratitude to the team of amazing colleagues at CERN, the wonderful donors, and of course all the past and present members of the Partnerships & Fundraising team, who helped me greatly in order to succeed in this endeavour."

Matteo has been quintessential to the fact that more than 9,500 high-school students have been engaged with STEM disciplines, more than 190 graduates have been trained and partnerships with more than 80 organisations have been established since the CERN & Society Foundation was born in 2014. We wish Matteo the very best for his next professional adventure.

Filling his shoes is Pascale Goy who has so far spent her career in leadership and human resources management in various international organizations, namely the World Trade Organization and the International Trade Centre, before joining CERN. Pascale took charge of the Learning and Development Group at CERN from its creation, in 2012. She was instrumental in transforming training at CERN into six wide-ranging learning portfolios, from leadership to highly technical fields, with over 500 courses delivered every year to 6000 physicists, engineers, technicians and administrative staff. Her enthusiasm and energy contributed to developing effective and productive partnerships with all departments at CERN over the course of her tenure. Her human touch and strong belief in people's development and growth potential will definitely stand her in good stead as she embraces this new role.

"Helping to spread the CERN spirit of scientific curiosity is a great cause I believe in. I am honoured to take up this challenge at this moment in my career. It is a remarkable new professional trajectory that inspires me to give everything I have and then some, and to make a difference. CERN is unique indeed, and I look forward to the thrilling experience of driving the Partnerships and Fundraising mission. I cannot wait to get started! I would like to give my thanks to Matteo for the very warm welcome."

The CERN Director for International Relations Charlotte Warakaulle thanked Matteo for his achievements and welcomed Pascale to the team:

"We are grateful to Matteo for his essential role in the launch and consolidation of fundraising activities at CERN. With vision and dedication, he has built strong and lasting partnerships in support of science, and helped to enhance our impact on society. Matteo's work provides a firm foundation on which Pascale will build, bringing with her wide-ranging expertise and great passion for inclusive partnerships, learning and education. I look forward to the next exciting chapter for CERN & Society!"

If you wish to know more about the CERN & Society Foundation, the latest Annual Report is now available here (https://cernandsocietyfoundation.cern/sites/cernandsocietyfoundation.web.cern.ch/files/Annual%20Reviews/CERN%20&%20Society%20Foundation%20Annual%20Review%202020.pdf).

Matteo Castoldi. (Image: CERN)

WHY THE LHC MAGNETS ARE BLUE – AND OTHER COLOURFUL ACCELERATOR QUESTIONS ANSWERED

Are all LHC magnets blue? Who decides the colour of a magnet and on what basis? What does the small purple one do? See our answers below

The Large Hadron Collider (LHC), CERN's flagship accelerator. (Image: CERN)

Springtime has arrived in Geneva, where CERN is located, bringing with it colourful blossoms and the whir and buzz of nature awakening. A few dozen metres beneath the fertile soil, another equally buzzing ecosystem is springing back to life: CERN's accelerator system, whose rings are gradually entering their recommissioning phase. Whether the beauty of our metal machines resembles that of mother nature is open to debate, but one thing is certain: when it comes to colourfulness, our accelerators can compete with most blossoming meadows.

Magnets are systematically painted to protect them from rust, except in the case of superconducting magnets (like those of the LHC), where the vacuum vessels containing the equipment are painted instead. Besides the blue of the LHC dipole magnets, which bend particle beams to preserve the particles' circular trajectory, CERN's accelerators are painted in colours ranging from red to green, purple, orange and various shades of silver. How are these colours chosen and why? The short answer is that CERN's top physicists and engineers decide which ones they like the best. Indeed, unlike other pieces of equipment whose colour code is strictly regulated for safety reasons, the teams developing the magnets have free reign over the colour of their creations.

Certain unwritten rules do influence their decision-making, however, as Vittorio Parma, formerly in charge of the LHC cryostats, explains: "Working in accelerator

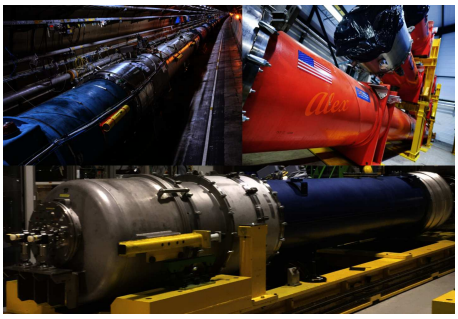
tunnels can be quite gloomy as the lighting is poor. To offset this, we tend to go for the brighter, more luminous colours that make working around the magnets easier." This swayed Vittorio's team towards the choice of a gleaming white for the vacuum vessels containing the LHC's quadrupole magnets, which focus the particles in tighter bunches, when they designed the LHC superconducting magnets in the 1990s. The white alternates with the more familiar blue of the dipoles and the deep red of the triplet quadrupole magnets, which further focus the beam around the collision points. They will be joined in a few years' time by the dark blue of the future High-Luminosity LHC 's 11 Tesla magnets, which are currently undergoing tests. The darker shade is intended to reflect the magnet's stronger magnetic field than that of the regular LHC dipoles, which are lighter in colour.

This gaudy picture is completed by the magnets of CERN's other accelerators (LINAC 4, the Proton Synchrotron (PS) and its Booster (PSB), the Super Proton Synchrotron (SPS) and the antimatter decelerating (AD) rings, to name but a few). "Each machine was built at a different point in time, by different people with different mindsets. Each team chose the hues of their magnets without following any strict code and, as a result, each machine is a unique, colourful artwork. This showcases the diversity and the creativity of the work done here at CERN", explains Davide Tommasini, who led the development of the superconducting magnets for the LHC.

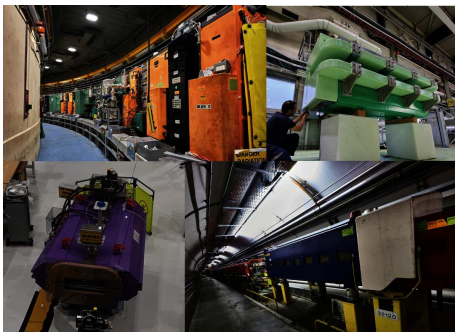
Consequently, a bending dipole magnet in the PS Booster is green, while its SPS counterpart is red, and a blue magnet may be a dipole in the LHC or a quadrupole in the SPS or LEIR. This somewhat messy patchwork contributes to the strong visual identity of CERN's accelerators, from the green and orange of the PS Booster to the red and dark blue of the SPS – not to mention the magnets of the transfer lines, which boast their own specific colours, such as the mint and lavender of the superb dipole magnets we see below.

The PS Booster very nearly took a different path, recalls Giorgio Brianti, Division Leader at the time the machine was built. "I thought it would be nice to hold a competition for a colour scheme." Coming at the tail end of the flower-power era, though, this was maybe not such a good idea. "The winning entry was kind of psychedelic, with lots of bands of colour all over the place. I didn't like the result at all, so I presented the prize of a few bottles of champagne to the winner, but I chose the colours myself."

So, which is your favourite?



The LHC with its blue dipole magnets and white quadrupole magnets (top left), a red LHC triplet quadrupole magnet before installation (top right) and a prototype of the dark blue 11 Tesla HL-LHC dipole magnet (bottom). (Image: CERN)



The PS Booster with its orange quadrupole and green dipole magnets (top left), dipole magnets used in the PS Booster transfer lines (top right, bottom left), and the Super Proton Synchrotron with its red dipole and blue quadrupole magnets (bottom right). (Image: CERN)

Thomas Hortala

THE TENTH EDITION OF "BE A SCIENTIST" IS OVER

780 budding scientists from schools in the local French and Geneva area set out to identify the content of mysterious boxes

Young scientists share their results during the final virtual conference on 10 May 2021. (Image: CERN)

For the tenth edition of the Be a scientist project, about 780 students from 33 local school classes conducted investigations to discover the content of mysterious boxes.

Launched in 2011, the project is the result of collaboration between educational institutions on both sides of the Franco-Swiss border: the University of Geneva (Physiscope and Laboratory of Didactics and Science Epistemology), the Department of Public Education (Geneva) and the Ministry of Education (France).

For nearly 4 months, pupils aged 7 to 12 from Geneva, Ain and Haute-Savoie were introduced to the scientific research process in order to identify, as precisely as possible, the content of boxes that they were not allowed to open or damage – just like CERN scientists are looking for particles they can't see.

Traditionally, the project includes a visit to CERN or to the PhysiScope of the University of Geneva, but this time, given the constraints of the current pandemic, CERN scientists visited the classes instead, either in person or virtually.

This tenth edition ended on a high note with a virtual conference held on Monday, 10 May at the Globe of Science and Innovation at CERN. From their classrooms, the budding scientists were invited to present their results, discuss their re-

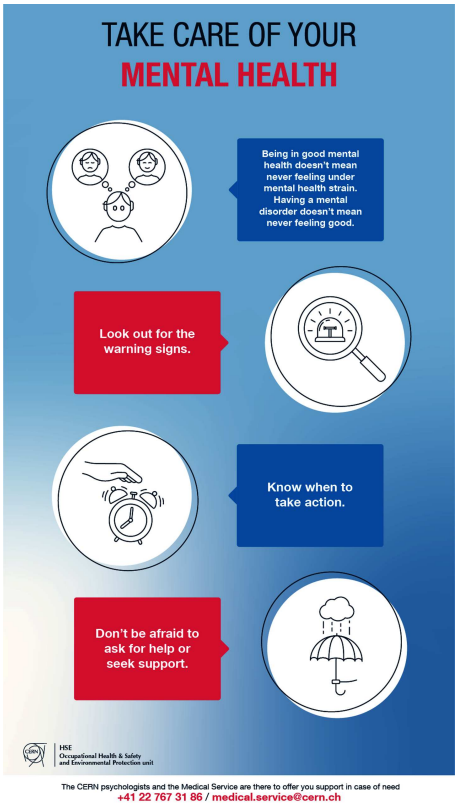
search and, above all, to finally discover the content of the boxes!

If you are a teacher interested in participating in a future edition, please visit https://voisins.cern/be-scientist.

Registration for the 2022 event will open at the end of the summer!

RECOGNISE THE SIGNS OF A MENTAL HEALTH PROBLEM

According to the World Health Organization (WHO), mental disorders affect one in four people in the world



(Image: CERN)

According to the World Health Organization (WHO), mental disorders affect **one in four people in the world**. Our mental health evolves throughout our lifetime and is influenced by many factors, both internal and external. The COVID-19 pandemic is a good example of an external factor that puts our mental health under strain.

We can feel mentally well while suffering from a mental disorder. We can also feel under mental strain without having a mental disorder, for instance when we experience an unsettling event, such as separation or losing a loved one.

So, **when should you take action** ? The signs and symptoms to look out for fall into several categories:

- Emotional: sadness, fear, anxiety, irritability, low self-esteem.
- Behavioural: mood swings, aggression, lack of interest in activities and difficulty performing daily tasks, substance abuse.
- Cognitive: significant difficulties concentrating or reasoning normally, memory problems.
- Physical: headaches, intense fatigue, sleep problems, loss of appetite, rapid heart rate.
- Sensory: visual or auditory perception problems.

The time to take action is when the symptoms do not subside and they stop you going about your daily life.

Some of the symptoms of feeling depressed or “down” and being clinically depressed are the same – fatigue, lack of concentration, sleep problems and feeling sad. But people who are just feeling down have milder symptoms that disappear by themselves with time and social interaction. Feeling down is temporary and is a normal part of life, such as when facing a difficulty; it can sometimes just depend on the time of year or there may even be no apparent reason.

Depression, on the other hand, is an illness. Its symptoms are more intense and are experienced all day long, almost every day, lasting anything from two weeks to several months, and do not depend on the circumstances. The symptoms can interfere with your daily life, making it difficult to communicate, concentrate and retain information, and can therefore have an impact on your social relationships and work. Other possible symptoms are weight gain or loss, somatic problems (e.g. stomach or back pain), despair and dark thoughts.

Depression can be treated, but proper care and monitoring are essential.

If you feel that you would benefit from talking professional or personal matters through with a professional, don't hesitate to contact us. The Medical Service offers all members of the personnel (MPE and MPA) first-line psychological counselling. Appointments with our psychologists, Katia Schenkel and Sébastien Tubau, are free of charge and strictly confidential: https://hse.cern/content/psychologist

Let's not forget that our mental health is crucial to our overall health.

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For more information:

- *https://www.who.int/en/news-room/fact-sheets/detail/mental-health-strengthening-our-response*
- *https://www.sante.fr/comment-prendre-soin-de-sa-sante-mentale (in French)*

The next article in this series will look at ways of looking after our mental health.

Medical Service

COMPUTER SECURITY: WHAT DO ACCELERATORS AND PIPELINES HAVE IN COMMON?

Ransomware attacks against enterprises and academia are not a new phenomenon...

Ransomware attacks against enterprises (“ Blackmailing Enterprises: You are Patient Zero ”) and academia (“ Blackmailing Academia: Back to pen and paper(?) ”) are not a new phenomenon, and they are a lucrative business for those who couldn't care less about laws, ethics or getting caught. Just recently, a major US fuel pipeline was hit by a ransomware attack.

In this particular attack, the office systems of Colonial Pipeline were successfully infiltrated and the attackers tried to extort at least 100 GB of data. “Extortion” is the next level of ransomware attacks: instead of “just” encrypting the data and asking for money in exchange for the decryption key, the attackers threaten to publish that (presumably confidential or personal) data unless the victim pays a ransom.

What happened to Colonial Pipeline is not unique, new or surprising. Like any other enterprise, university or organisation, they were already under attack before this incident. The attackers eventually succeeded because their hope to gain big bucks gave them enough persistence, drive and motivation to break through. Colonial Pipeline is now in the delicate situation of having to decide whether or not to pay out. Whatever their decision, major damage has already been done to the East Coast's economy.

While the energy transferred through their pipelines is much lower than through those of CERN*, the similarities cannot be ignored: CERN also runs a vast office network that is interconnected with the operating systems (Colonial Pipeline immediately disconnected the latter once they became aware of the attack). And while the attackers in this particular case stated on their webpage “Based on our principles, we will not attack [...] education [and] nonprofit organizations”, other gangs might target CERN.

This is why CERN is currently:

- putting into production a new and more powerful firewall with sophisticated threat protection;
- buying a new antivirus and so-called “endpoint detection and response” (EDR) software for all CERN-owned devices, personal laptops and, eventually, home computers;
- deploying more and more second-factor authentication for remotely logging into CERN services;
- discussing how to even better protect CERN's technical network and the control systems hosted thereon;
- increasing its monitoring and detection capabilities ;
- teaming up ever more closely with our Worldwide LHC Computing Grid partners and the eduGAIN, EGI-ACE and EOSC-hub communities;
- conducting another phishing awareness-raising campaign targeting all of its staff and users; and
- reviewing and providing input on the computer security aspects of more and more new projects.

Even so, we are counting on you to take the following actions to help protect CERN's assets, resources, services and systems:

- Make sure that your devices are always up to date ;
- Use a strong password to protect your assets, both those of CERN and your own;
- Watch out when browsing the web or opening emails;
- Take special care when teleworking ;
- Call on CERN central IT services when in need of a database, virtual machine, webserver and the like;
- Programme and develop code in a secure fashion and avoid automatically downloading external dependencies from the internet;
- Feel free to contact us at Computer.Security@cern.ch if you have questions or need help!

———

** Colonial Pipeline transfers about 2.5 million barrels per day or less than half a litre per turn in the LHC. Ignoring the kinetic energy of the crude oil and considering only its genuine energy density of 41.898 MJ/kg, this corresponds to 16 MJ per turn compared to 300 MJ stored in one LHC beam.*

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

Computer Security Team

Official communications

BRITISH NATIONALS: REMAINING IN FRANCE AT THE END OF A CERN CONTRACT

On 31 December 2020, the transition period following the United Kingdom's withdrawal from the European Union ("Brexit") came to an end. As of 1 January 2021, British nationals no longer enjoy free movement within the European Union and are subject to the rules applicable to third countries (see https://brexit.gouv.fr/sites/brexit/accueil/ce-qui-a-change-au-01-01-2021.html). From 1 October 2021, all British citizens residing in France will be required to hold a residence permit.

Pursuant to the withdrawal agreement between the United Kingdom and the European Union, which entered into force on 1 February 2020, British nationals who were resident in France before 1 January 2021 have the right to continue to reside in France, subject to applying for a "withdrawal agreement" residence permit issued by a Prefecture (*carte de séjour préfectorale* " *accord de retrait* "). The validity of this permit will be either permanent or temporary, depending on the length of their stay in France prior to the above-mentioned transition period.

You are reminded that, for the duration of their contract with CERN, members of the personnel who are neither French nor permanent residents in France are required to hold a special residence permit (*titre de séjour spécial*) issued by the Ministry for Europe and Foreign Affairs and that this permit cannot be exchanged for a residence permit issued by a Prefecture. Members of the personnel who are British nationals are therefore not authorised to apply for a "withdrawal agreement" residence permit (see https://admin-eguide.web.cern.ch/en/procedure/french-cards).

However, the French authorities have confirmed that, when their contract with CERN terminates, former members of the personnel and their family members who were resident in France before 1 January 2021 will benefit from the conditions of the withdrawal agreement between the United Kingdom and the European Union. They will thus be able to obtain a "withdrawal agreement" residence permit issued by a Prefecture, subject to supplying an " *attestation de restitution* " issued by the Ministry for Europe and Foreign Affairs. Applications for this permit should be submitted:

- up to and including 30 June 2021: using the online platform https://contacts-demarches.interieur.gouv.fr/brexit/brexit-demande-titre-sejour/
- from 1 July 2021 onwards: to the relevant Prefecture directly.

Applications received by Prefectures after 30 June 2021 may not be processed in time for a residence permit to be issued by the 1 October 2021 deadline. Former members of the personnel are therefore advised to submit applications before this date using the above-mentioned platform.

Members of the personnel and their family members who are British nationals and who took up residence in France after 31 December 2020 are required to obtain a long-stay visa (see https://admin-eguide.web.cern.ch/en/procedure/visas-entry-and-stays-host-states) and will be subject to ordinary law if they wish to continue to reside in France at the end of their contract with CERN (see https://www.service-public.fr/particuliers/vosdroits/N110).

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

Announcements

ONLINE PANIC CONFERENCE ON PARTICLE PHYSICS AND ASTROPHYSICS - 5-10 SEPTEMBER

The 22nd Particles and Nuclei International Conference (PANIC) will take place online between 5 and 10 September 2021. This year's edition of the triennal conference will be hosted by two Portuguese laboratories, namely LIP, (the Laboratory for Instrumentation and Experimental Particle Physics), and FCUL (the Faculty of Sciences of the University of Lisbon).

The weeklong event will consist in a series of plenary talks, parallel sessions and a poster session. The scientific programme addresses a broad range of topics at the interface between particle, nuclear and astrophysics. Special emphasis will be devoted to recent discoveries and results.

Registration is open on Indico until **15 August** for a 45€ fee.

The deadline for **abstract submission** is **20 June** and the decision on the selection of abstracts will be announced on **15 July**.

Please visit the Indico page of the event for further details on the scientific programme, speakers, the call for abstracts and registration.

APPLY NOW TO THE INTERNATIONAL NEUTRINO SUMMER SCHOOL (2-13 AUGUST 2021)

Registration is open until June 30 for the International Neutrino Summer School, a CERN-hosted online school which will take place from 2 to 13 August 2021.

Neutrino experiments have evolved from single-purpose instruments into large, multi-purpose research facilities with a broad and diverse research program. Similarly, theoretical neutrino physics spans a multitude of topics, from theoretical model building, over oscillation phenomenology, all the way to cosmology and astrophysics.

The goal of this school is to prepare the next generation of scientists for work in this vibrant field. Aimed at PhD students and young postdocs in both experimental and theoretical neutrino physics, it will feature lectures by renowned experts spanning the full breadth of modern neutrino physics. Lectures will be complemented by mini-projects on which the students will work in small teams, with guidance from the lecturers and organisers.

The school will be hosted by CERN, but is planned to run fully in virtual mode. There might be options for lecturers and students to visit CERN during the program, depending on sanitary conditions at the time.

The application deadline is June 30. There is no registration fee.

Organisers:

- Albert De Roeck
- Joachim Kopp
- Claire Lee
- Bibhushan Shakya

Apply now on Indico (*https://indico.cern.ch/event/1011452/*).

LE JARDIN DES PARTICULES: REGISTRATION OPEN FOR JULY 2021 SUMMER CAMP AND CRÈCHE

Registration is open for CERN's *Jardin des Particules* summer camp for children aged four to six and the *crèche* (nursery school) for children from four months to four years old.

Children under four years of age on 5 July will be registered at the *crèche*. This year, children from four months to four years can participate on a weekly basis for the four weeks of July under certain conditions.

Full details are available on the *Jardin des Particules* website (*https://nurseryschool.web.cern.ch/summer-care*). Please sign in to read the general terms and conditions. Complete, sign and return the registration form, as well as the medical questionnaire, to Summer.Camp@cern.ch with the follow-

ing subject: *Summer Camp – Child Name – Week numbers*.

The camp will be open on weeks 27, 28, 29 and 30 (from Monday 5 July to Friday 30 July), from 8:30 a.m. to 5:30 p.m. One inscription per week is proposed and lunch is included. Prices are as follows:

- 450 CHF/week for the summer camp
- 480 CHF/week for the *crèche*

Registration is open:

- **From 3 May to 16 May for children already enrolled in the *Jardin des Particules***
- **From 17 May for children of CERN members of personnel (MP)**
- **From 31 May for other children**

Registration closes on 4 June 2021.

Requests will be considered based on the order of payment reception and will be confirmed on 4 June 2021.

For further questions, please contact us by email: Summer.Camp@cern.ch

Le Jardin des Particules

Obituaries

LUC PAPE (1939 – 2021)

(Image: CERN)

It is with great sadness that we announce that our colleague and friend Luc Pape passed away on 9 April 2021 after a brief illness.

Luc's long, rich career covered all aspects of our field, from the early days of bubble chamber (BC) physics in the 1960s and 1970s to the analysis of CMS data at the LHC.

In the former, he contributed to the development of subtle methods of track reconstruction, measurement and event analysis. He participated in important breakthroughs, such as the first evidence for scaling violation in neutrino interactions at the Big European Bubble Chamber (BEBC) in 1978 and early studies of the structure of the weak neutral currents. Luc developed software that made it possible to identify muons by linking the extrapolated BC tracks to the signals of the external BEBC muon identifier.

Luc's very strong mathematical background was instrumental in these developments. He acquired deep expertise in software development and always remained at the cutting edge of this field, exploiting ingenious techniques and rigorous methods that he adapted for new endeavours.

At the end of the BC era, Luc was among the experts studying the computing environment of future experiments. Along with his colleagues, he instigated the PAW (Personal Analysis Workstation) ideas.

Luc then joined the DELPHI collaboration. Analysing the needs of the LEP experiments in computing, he was among the first physicists to feel the need to move from shared central computing to distributed farms for large experiments.

He thus conceived, pushed for and, with motivated collaborators, built and exploited the DELPHI Farm (DELFARM), making it possible to rapidly analyse DELPHI data and produce Data Summary (DST) files for the whole collaboration. Using his strong expertise in the available software tools, Luc progressively improved track analysis, quality checking and event display. DELPHI users will remember TANAGRA (Track ANAlysis and GRAphic package), the backbone of DELANA (DELPHI ANAlysis program), and DELGRA, for event displays.

Luc's passion for physics never faded. He was open-minded but had a predilection for super-symmetry (SUSY), of which he brilliantly mastered the subtle phenomenology. He became the very active leader of the DELPHI group and later of the whole LEP SUSY group.

After retiring from CERN in 2004, he enjoyed the hospitality of the ETH Zurich group at CMS, to which he brought his expertise on SUSY. Collaborating closely with many young physicists, he introduced the *stransverse* mass (MT2) method for SUSY research at CMS and pioneered several leptonic and hadronic SUSY analyses. He first convened the CMS SUSY/BSM group (2003-2006), then the SUSY Physics Analysis group (2007-2008), preparing various topological experimentations to be performed with the first LHC collisions. As head of SUSY in the Particle Data group (2000-2012), he helped define SUSY benchmark scenarios within reach of present and future hadron colliders. Comforted by the discovery of a light boson, a necessary feature of SUSY (short of being proof of the theory's validity), he continued exploring novel analysis methods and strategies to interpret any potential evidence.

We will remember Luc for the exceptional combination of his genuine enthusiasm for physics, his outstanding competence and rigour in analysis, his understanding of technical matters, and his deep concern for young colleagues with whom he interacted beautifully.

Luc had other domains of strong interest, such as cosmology (he had the opportunity to listen to Georges Lemaître himself) as well as African ethnicities and arts and Mesopotamian civilisations. He undertook some quite demanding Himalayan treks with his wife Christine.

We mourn the loss of a most remarkable and rounded physicist, a man of great integrity, devoid of personal ambition, a rich personality, interested in many aspects of life, and a very dear friend.

Our thoughts and deepest sympathy go to Christine and to all Luc's family and friends.

His friends and colleagues

Ombud's corner

TEN GOOD REASONS TO OPT FOR THE OMBUD

If you're experiencing interpersonal problems at work, if you're mulling over a choice that you need to make, or if a problem is stopping you giving your all, there are several places at CERN where you can turn for advice and support, known as " response channels " or " support structures ".

If you don't know which of these services is right for you, here are **ten good reasons to opt for a conversation with the Ombud**.

1. **Confidential means confidential**

   The Ombud is a person, not a service or unit. Confidentiality is agreed between you and the Ombud, no one else. Confidentiality is one of the four ethical principles enshrined in the code of ethics of the ombud profession, making it comparable to professional privilege.

2. T **he Ombud is independent, neutral and impartial**

   The Ombud doesn't belong to any specific department but instead reports directly to the Director-General. Those who take up the position undertake to leave the Organization at the end of their term of office, meaning that they can't be influenced by internal conflicts of interest or concerns about their future at the Laboratory. As a result, their advice is based on a truly independent position.

3. **An outside, objective perspective is very useful**

   Not participating in any of the Laboratory's operational activities gives the Ombud the necessary distance to tackle any matter. A fresh pair of eyes and an outside perspective may help shed light on aspects or options that you, caught up in the situation, can no longer see.

4. **If you're not sure what kind of problem you're facing**

   The Ombud can also be a sounding board, enabling you to describe a situation in your own words. Through active listening and structured questioning, the Ombud will help you to unravel and understand the problem you're facing, so that you're better equipped to explore solutions and move towards a positive outcome.

5. **You're in control**

   Whatever the problem or concern you come with, the Ombud won't take any action without your explicit consent. A visit to the Ombud does not trigger any processes – you stay in charge. This is down to the informal nature of the role – the fourth principle of the ombud code of ethics.

6. **The Ombud has in-depth knowledge of CERN, its culture and processes**

   After a long career in the Organization, generally in many different roles in various sectors, the Ombud is familiar with its many facets. You get to draw on this well of knowledge when you come to the Ombud.

7. **The Ombud can tap into professional mediation networks**

   Although there is only one Ombud at CERN, the Office of the Ombud is a gateway to an international network of professional, organisational ombuds. With the support of this network, and without compromising your privilege of confidentiality, the Ombud can get you the support you need, regardless of the situation.

8. **The Ombud is available**

   The Ombud pledges to offer you an appointment within a day (i.e. a working day of the Office of the Ombud) of your request. The Ombud has no duties other than being an ombud and therefore has the time to listen to you actively, discuss with you in depth and understand what's at stake for you. You will have the Ombud's full and undivided attention.

9. **The Ombud adapts to you**

   If you're unable to come to the Ombud's office on the Meyrin or the Prévessin site*, an alternative location can be found to meet face-to-face or, of course, on Zoom.

10. **The Ombud can point you in the right direction**

    Lastly, and very importantly, if the Ombud feels that the problem raised does not fall within the Ombud's remit, you will be directed to the right response channel. The Ombud is very familiar with the ins and outs of the other support structures at

CERN and has good ties with them, so is well placed to refer you to one of them, without disclosing anything confidential.

If you're unsure which service to contact, make the Ombud your first port of call!

Laure Esteveny

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

**Find out where the Ombud's offices are located at https://ombuds.web.cern.ch/content/contact.*