CERN Bulletin

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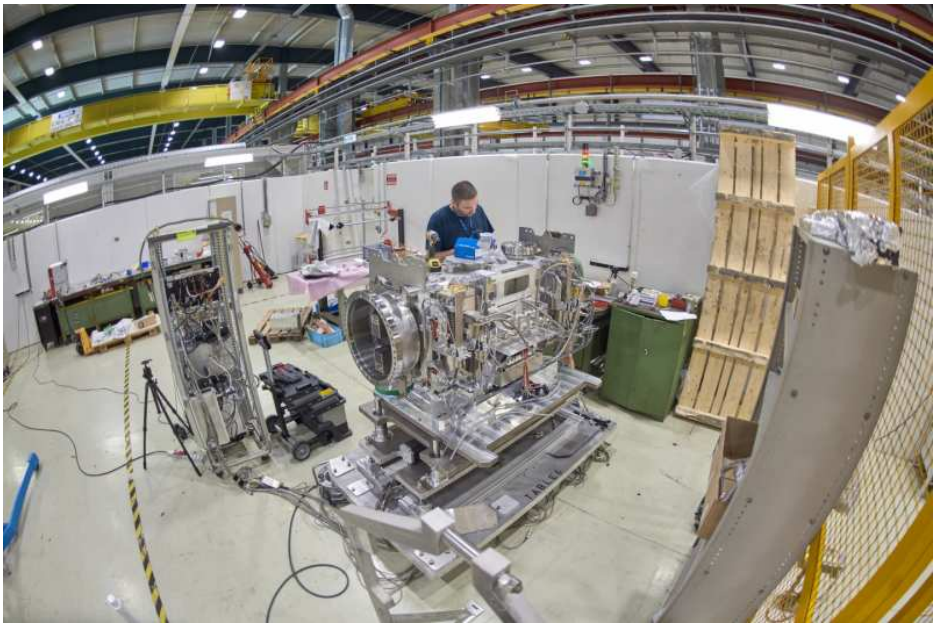
MORE POWERFUL PROTECTORS FOR HIGHER LUMINOSITY

An important protection component for the High-Luminosity LHC has been successfully tested at the HiRadMat facility



Assembly of HRMT-45 experiment: testing one of the modules of a prototype injection protection absorber (TDIS). (Image: CERN)

At the end of August this year, as the summer was taking its time to fade away, a component for the High-Luminosity LHC's army of protectors was successfully tested.

The TDIS (target dump injection segmented) is a machine-protecting device for the LHC equipment, located close to the point at which particles are injected from the Super Proton Synchrotron (SPS). Developed as an upgrade of the current TDI (target dump injection) located at point 2 and point 8 of the accelerator, the TDIS will provide a higher intensity absorption capability for the High-Luminosity LHC.

With a design including a pair of jaws made of several materials with varying densities, the device plays the role of an injection protection absorber. Once the particle beam gets accelerated within the SPS, its trajectory is directed by kicker and septa magnets towards the transfer line to the LHC. If the particle beam is out of the expected trajectory, it will be intercepted by the jaws of the beam absorber, thus protecting the cryogenic magnets and experiment from damage caused by the particle impact. Robust protection of the machine is essential, particularly given the intensity increase of the HL-LHC.

(Continued on page 2)

A WORD FROM FRÉDÉRICK BORDRY

HIGH-LUMINOSITY LHC: WE'RE HALFWAY THERE

The HL-LHC annual meeting, held on 15 October, had a particular significance this year: we're halfway between the beginning of the project in 2010 and the scheduled start-up of the machine for physics in 2026. At this point, the project is exactly where it should be. Civil engineering and technological developments are progressing well and the spending profile remains on course and on budget.

(Continued on page 2)

In this issue

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A WORD FROM FRÉDÉRICK BORDRY

HIGH-LUMINOSITY LHC: WE'RE HALFWAY THERE

The HL-LHC project is a global endeavour with contributions coming not only from the CERN Member and Associate Member States, but also from some 13 other countries around the world. This was highlighted at the annual meeting by the participation of the Directors-General of Japan's high-energy physics laboratory, KEK, and of Spain's CIEMAT. Among non-Member States, the USA is a major partner, while Canada, Japan and China have recently joined and Russia is likely to come on board soon.

Progress to date has been good across the board. Civil engineering is advancing well, with new access shafts on schedule for completion around the end of the year and new tunnels as near completion as possible while the LHC is running. The underground civil engineering work will be finished in LS2. The HL-LHC requires a good deal of new technology: for magnets, for the innovative crab cavities that will steer the beams to maximise the number of collisions, and for the leads that will carry electrical current into the magnets. The HL-LHC meeting report in this Bulletin gives the full details, so I'll highlight just one aspect here.

A key feature of the new technology is the use of novel forms of superconductor. Some of the new magnets, for example, will use niobium-tin wire. This is a technology that was investigated for the LHC, but deemed at the time to be insufficiently mature. The niobium-tin compound is brittle, which makes it difficult to wind into magnet coils. Its advantage for the HL-LHC, however, is that it is able to withstand higher magnetic fields than the niobium-titanium wire used in the LHC's magnets. This makes it extremely valuable for the HL-LHC, in which high field densities are key to achieving high luminosity. It also means that the HL-LHC will be an important test bed for this emerging technology.

Another example is the magnesium diboride superconductor, which is being tested with a view to using this relatively inexpensive material for the transfer lines that will carry current into the HL-LHC magnets. Magnesium diboride has a high critical temperature for a conventional superconductor, which makes it an interesting potential candidate for commercial electricity transmission. In this area as well, the HL-LHC will be a valuable test bed for industry. All in all, as we pass the halfway point, the HL-LHC is shaping up well as a laboratory not only for fundamental physics, but also for technical innovation.

All in all, the HL-LHC is shaping up to be a worthy successor to the LHC, which is having another spectacular year. As Run 2 proton physics came to an end last week, its mission was accomplished. Over 185 fb^{-1} have been delivered since 2010, comfortably surpassing the target of 150 fb^{-1}. There remain some 24 days of lead ion running this year to end Run 2 in style.

As we go through the long shutdown, coordinated preparations for Run 3 and the HL-LHC will be crucial to the long-term future of CERN. When Run 3 gets under way in 2021, we aim to start confident that we will reach a total integrated luminosity of over 300 fb^{-1} before the end of 2023. The HL-LHC will take over in 2026, with the goal of reaching 3000 fb^{-1} by 2037.

Read also the article about the HL-LHC annual meeting and the LHC Report.

Frédérick Bordry
Director for Accelerators and Technology

MORE POWERFUL PROTECTORS FOR HIGHER LUMINOSITY

As the proton beam passes through the two jaws, it normally doesn't interact with them. But if the beam is deviated out of the nominal trajectory, it will hit the jaws and produce a shower of secondary particles inside the material, which will generate a significant energy deposition in the materials that make up the TDIS. That is why the jaws of the TDIS are installed on a back stiffener made of a special molybdenum alloy, which will not become deformed under the thermal load.

During the summer, the first prototype of one of the three modules making up the TDIS was tested at the HiRadMat facility. The aim of the so-called “HRMT-45” experiment was to reproduce a state of energy deposition comparable to that induced by the most severe failure scenario of the HL-LHC beam. “As it is not yet possible to reproduce the high luminosity beam, the team reproduced an impact even closer to the back stiffener to imitate the future possible load cases”, says Antonio Perillo-Marcone, TDIS project leader within HL-LHC WP14. The test was performed starting with low-intensity beams and going as high as 288 bunches of 1.20E+11 particles. The materials that have been tested vary from low density, such as graphite, to higher density, such as titanium and copper alloys.

The HiRadMat is a unique facility that allows engineers to test the instantaneous impact of a high level of prompt radiation on different materials. This testing facility is used to execute single-shot experiments on assemblies, mostly beam intercepting devices such as beam windows,

collimators, or anything else that intercepts the beam within the accelerator. It was designed to look at the thermal shots that occur a few microseconds after the beam impact, when the temperature may increase by thousands of degrees and create non-homogeneous thermal expansions, causing a stress wave that moves through the material.

The TDIS is being developed within the framework of work package 14 of the HL-LHC project, “Beam Transfer and Kickers”, led by Chiara Bracco. The TDIS, which will enable the HL-LHC to withstand the future beams, will be installed during Long Shutdown 2 and will be one of the first components in place for the LHC's machine upgrade.

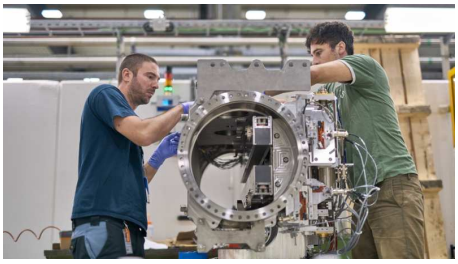
Installation of HRMT-45 at HiRadMat in the SPS tunnel (Image: CERN)

View of the HiRadMat facility (Image: CERN)

Cristina Agrigoroae

HALFWAY TO HIGH LUMINOSITY

Halfway between launch and start-up, what is the status of the High-Luminosity LHC project?



A new beam absorber for the zones where the beams are injected from the SPS was assembled and tested last summer. This is one of the developments presented at the High-Luminosity LHC annual meeting (Image: Julien Ordan/CERN)

The High-Luminosity LHC has reached its halfway point. The second-generation LHC project was launched eight years ago and is scheduled to start up in 2026, eight years from now. From 15 to 18 October, the institutes contributing to this future accelerator came together at CERN to assess the progress of the work as the project moves from prototyping to the series production phase for much of the equipment.

The annual meeting is a chance to conduct a global review of the project – and global is the word, because, as project leader Lucio Rossi observes, “the High-Luminosity LHC is a worldwide project that has been worked on by an international collaboration since the very beginning”. As well as CERN's Member States and Associate Member States, thirteen other countries are contributing to the project. New agreements have been signed recently with Japan and China and an agreement with Canada was announced in June. Representatives of the collaborating countries presented the status of their contributions during the plenary session. Some 1000 people are working on the project.

The civil engineering work has progressed considerably since it began in the spring: excavations have reached 30 metres at Point 1 and 25 metres at Point 5. The two 80-metre shafts should be fully excavated by the beginning of 2019.

As for the accelerator, one of the key tasks is the production of around one hundred magnets of eleven different types. Some of these, notably the main magnets, are made of a novel type of superconductor, niobium-tin, which is particularly difficult to work with. The short prototype phase is coming to an end for the quadrupole magnets that will replace the LHC's triplets and focus the beams very strongly before they collide. The long quadrupole magnets (7.15 metres in length) are being produced at CERN, while those measuring 4.2 metres in length are being developed in the United States in the framework of the US LHC-AUP (LHC Accelerator Upgrade Project) collaboration. Several short prototypes have reached the required intensities on both sides of the Atlantic. Two long prototypes (4.2 metres) have been produced in the United States and the second is currently being tested. At CERN, the assembly of the first 7.15-metre-long prototype has begun.

The dipole magnets at the interaction points, which divert the beams before and after the collision point, are being developed in Japan and Italy. One short model has been successfully tested at KEK in Japan and a second is in the process of being tested. INFN, in Italy, is also assembling a short model. Finally, progress is being made on the development of the corrector magnets at CERN and in Spain (CIEMAT), Italy (INFN) and China (IHEP), with several prototypes already tested. In 2022, a test line will be installed in hall SM18 in order to test a magnet chain at the interaction point.

One of the major successes of 2018 is the installation in the SPS of a test bench with an autonomous cryogenic unit. The test bench houses two DQW (double-quarter wave) crab cavities, one of the two architectures chosen for this ground-breaking equipment. The two cavities rotated the proton bunches as soon as the tests began in May, marking a world first. The construction of the DQW cavities will continue while the second architecture, RFD (radiofrequency dipole), is developed in the United States. The production of this novel equipment is the result of an international endeavour by Germany, the United Kingdom, the United States and Canada.

Many other developments were presented during the symposium: new collimators have been tested in the LHC; a beam absorber for the injection points from the SPS

was tested over the summer and will be installed during the second long shutdown; a demonstrator for a magnesium diboride superconducting link is currently being validated; studies have been undertaken to test and adjust the remote alignment of all the equipment in the interaction region, etc.

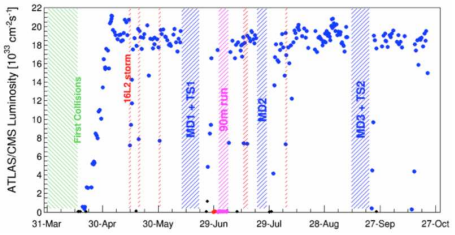
Over the four days, some 180 presentations covered a wide range of technologies developed for the High-Luminosity LHC and beyond.

Some of the participants at the High-Luminosity LHC collaboration's annual meeting during the first day of the symposium, on 15 October 2018 (Image: Maximilien Brice/Rachel Lavy/Julien Ordan/CERN)

Corinne Pralavorio

LHC REPORT: PROTONS: MISSION ACCOMPLISHED

On 24 October, the LHC Operations team flipped the switch in the LHC island of the CCC to dump the last proton production fill of Run 2



The peak luminosity of each fill in 2018, showing that most of the time the fills started with a peak luminosity close to 2x10^34 cm-2 s-1. After each technical stop or MD period, there is a period of intensity ramp up to ensure the machine runs safely.

At 6.01 a.m. on 24 October, the LHC Operations team flipped the switch in the LHC island of the CERN Control Centre to dump the last proton production fill of LHC Run 2 (2015-2018). This 242nd physics fill of 2018 was in collision for about 13.5 hours, producing a final integrated luminosity of 0.46 fb^{-1}, bringing ATLAS and CMS to a total integrated luminosity of 66 fb^{-1} in 2018, more than the 60 fb^{-1} forecasted. This record integrated luminosity was achieved thanks to the high machine availability and the stable beam ratio (beyond 50%).

In addition, the machine and beam performance allowed nearly every fill to run with a peak luminosity of about 2 x $10^{34}cm^{-2}s^{-1}$, which is a factor of two higher than the LHC design luminosity (1 x $10^{34}cm^{-2}s^{-1}$). The total integrated luminosity since the beginning of LHC operation is now 189.3 fb^{-1} for each of ATLAS and CMS, of which 160 fb^{-1} were accumulated during Run 2 alone.

This peak luminosity is not relevant to the LHCb and ALICE experiments, which aim for a low number of collisions per bunch crossing and whose luminosity is therefore deliberately levelled to a much lower value. They are interested in a maximum number of bunches colliding in their experiments and a long stable beams time. Thanks to the high machine availability, they also managed to accumulate more luminosity than anticipated. The 2018 forecast for LHCb was 2 fb^{-1}, but the experiment actually received 2.46 fb^{-1}. ALICE completed its proton run with an integrated luminosity of 27.3 pb^{-1}.

These accomplishments would not have been possible without the excellent performance of the injector chain during the 2018 run. The beams produced in the injectors required continuous attention in order to keep their brightness high, much higher than originally anticipated in the LHC design report, which made a major contribution to the high peak luminosity in the LHC.

Immediately after the 24 October beam dump, the Machine Development (MD) teams were in the starting blocks to take over the machine for a dense and interesting programme of machine and beam studies that will end on 31 October. A short three-day technical stop will then allow the experiments to prepare their detectors for the ion run, for which final preparatory activities will start on 3 November. The beginning of physics with lead-ion collisions is scheduled for 8 November.

The lead-ion injector chain differs slightly from the proton one and is composed of LINAC3, which will make multiple injections into the LEIR, where the ions will be accumulated, cooled and accelerated before being transferred to the PS. The PS will then through RF manipulations create a bunch spacing of 100 ns between 4 bunches and accelerate them further before sending them to the SPS, where up to 12 PS batches (each composed of 4 bunches spaced by 100 ns) will be injected and where the energy will be further boosted before the injection of the beam into the LHC. This means that LINAC2 and the PS Booster are not required for the lead-ion run. They will be stopped on 12 November for the Long Shutdown 2 (LS2) activities in preparation for the connection of LINAC4.

The switch that allows the LHC beams to be dumped manually. Once activated, the extraction system is switched on and both beams are extracted from the LHC at Point 6 in a single turn and dumped on the external beam dumps, which are composed of graphite blocks.

Rende Steerenberg

A REVERSE HACKATHON WITH CERN

What if we selected a few CERN technologies and put them in the hands of professionals who help create highly successful start-ups?

Participants at the CERN Hackathon in July (Credit: HighTechXL)

Six high-tech business teams were selected to explore business solutions for CERN technologies within the HighTechXL Accelerator Programme. They presented their winning projects during the CERN Hackathon in the Netherlands, organised jointly by CERN, Nikhef and HighTechXL. The teams will now go on to explore technologies connected to novel lasers, accelerator technology, and cooling systems and their applications for satellite communication, medical technology and high-stability cooling. Participation in the HighTechXL Accelerator Programme gives the participants access to an array of experts in law, funding, design, communication and business. At the end of the programme, they will pitch to an investor audience made up of large companies from the Eindhoven ecosystem in the Netherlands and venture capitalists.

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Read the full article published in Accelerating News *on 8 October.*

Daniela Antonio

SEE HORSE-LOGGING IN ACTION AT CERN

CERN and the Office National des Forêts invite you to visit a forest worksite and discover the technique of horse logging

Logging with horses in CERN woods. (Image : CERN)

The CERN site covers 625 hectares, of which around 90 are forest land, mainly situated in France. These forests are managed by the French National Forestry Office (ONF), which carries out regular work, such as thinning out young shoots, selecting the most vigorous trees and felling mature trees for timber.

For the removal of fallen trees, CERN and the ONF have chosen in recent years to use the technique of horse logging. This alternative method is considered more respectful of forest environments.

From 5 to 20 November, logging work with horses will take place on two of CERN's wooded plots. To encourage you to discover this technique, the ONF and CERN invite you to take a tour of the site with a forest technician.

Tours in French.
Registration and further information on https://indico.cern.ch/event/768276/

ATLAS CELEBRATES DEDICATED & CREATIVE COLLABORATION MEMBERS

On 11 October 2018, ATLAS celebrated the outstanding achievements of its collaboration members with the Outstanding Achievement Awards

Winners of the 2018 ATLAS Outstanding Achievement Awards, together with ATLAS spokesperson Karl Jakobs, Collaboration Board Chair Max Klein and Awards Committee Chair Jim Pilcher (Image: E. Ward/CERN)

On 11 October 2018, ATLAS celebrated the outstanding achievements of 15 of its collaboration members with an awards ceremony. Established in 2014, the

Outstanding Achievement Awards give recognition to excellent contributions made to the collaboration in all areas, excluding physics analysis. This year's awards celebrated remarkable contributions to the measurement of jet energy and missing transverse momentum; the ITK upgrade project; the development, deployment and commissioning of the trigger burst-stopper for the ATLAS level-1 endcap muon system; the online luminosity software; the commissioning of the level-1 Topo trigger; and software development and deployment.

"Within the ATLAS collaboration, huge efforts go into making the detector function seamlessly", says Jim Pilcher, Awards Committee Chair. "We sought to reward the people who have made dramatic improvements to the operation and understanding of our detector, thus improving the quality of our measurements."

Read the full article published in ATLAS News on 15 October.

Katarina Anthony

COMPUTER SECURITY: THE RANCID USB BOX OF CHOCOLATE

How convenient were USB sticks in the past? And how convenient they still are today despite the existence of CERN's free and versatile CERNbox...

How convenient were USB sticks in the past...? And how convenient they still are today despite the fact that with CERN's free and versatile CERNbox service or the commercial "Dropbox" solution there are simpler methods for sharing files and documents between devices. And even more secure and compliant ones!

The basic problem with USB sticks is that they are a black box, a box of chocolates: "You never know what you're gonna get" (Forrest Gump, 1994). And, indeed, how can you know if your USB stick, the one you are about to plug into your computer right now, holds any infected files, viruses, illegal software or software subject to copyright or particular licence conditions. You can't, even if the USB stick is brand new. We have had cases at CERN where USB sticks came already infected from the factory – USB sticks in sealed plastic packaging... The risk for your computer and CERN is non-negligible: depending on the type of infection/virus and how up-to-date your operating system is, your computer might get infected right away. This is a particular risk for devices which cannot be kept up-to-date all times, like some control systems used for running our accelerators, infrastructure or experiments!

Worse, our automatic detection tools regularly detect pirated software or copyrighted material arriving via personal USB sticks used previously at home. Of course, what you do at home is your private business and only subject to your local national laws, but once the USB stick is connected at CERN, the use of pirated software or copyrighted material can have significant consequences for the Organization (see our *Bulletin* articles on the subject: "Do you have 30kCHF pocket money?" and "Music, videos and the risk for CERN").

So, help us to protect your devices, CERN's reputation and the operation of CERN's accelerators, infrastructure and experiments! Please do not bring your USB sticks from home to CERN (and if you need to, please format them beforehand). Take additional care when plugging in USB sticks from third parties. It is better just to refrain from using USB sticks unless you have a good idea of what is stored on them – in particular for USB sticks found "on the road" (e.g. USB sticks lost by someone, dropped on the floor, handed to you by some stranger). Instead use CERNbox as an alternative. It has sufficient space for big files, synchronises with your CERN home folders, is remotely accessible (even from mobile devices) and provides anonymous access for sharing material with third parties. And please apply the utmost care when using USB sticks to transfer data to production control systems hosted on the Technical Network (TN) or any experiment networks (EN). The corresponding policy, the CNIC Security Policy for Controls (section 6.2.1), stipulates that the "usage of USB sticks being connected to devices on the TN/EN must be avoided by any means and alternative methods for file transfer [...] must be used whenever possible. Failure to adhere to this rule will be considered as professional fault putting a risk to the TN/EN." And, finally, it goes without a saying that always keeping your operating systems up-to-date and using decent antivirus software (you can get it for free from CERN) will definitely provide you additional protection.

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

The Computer Security Team

Announcements

13-14 NOVEMBER: SPAIN@CERN INDUSTRIAL EXHIBITION

The second Spain@CERN industrial exhibition will be held on 13 and 14 November 2018. This event is organised by CDTI, the Spanish Innovation Agency, and will allow 56 Spanish companies to share their expertise and know-how with CERN technicians.

The opening ceremony will take place on Tuesday, 13 November in the Council Chamber, in the presence of Fabiola Gianotti, CERN Director-General, and Pedro Duque, Spanish Minister of Science.

Since no booths will be installed, the event will be focused on one-to-one meetings between the industrial participants and CERN staff. Those meetings will be held in rooms around the Main Building on Tuesday afternoon and Wednesday morning.

The list of participants is available at: https://spain-at-cern.web.cern.ch/. Please contact ILO.Spain@cern.ch if you are interested in meeting them.

COURSES GEANT4: BEGINNERS & GEANT4: ADVANCED

Geant4: Beginners : 22-23/01/19 (Training requests need to be received before 08/01/19)

Duration: 16 hours

Pre-requisites:

- Basic knowledge of the C++ language
- Basic knowledge of MC simulation techniques
- Availability of a laptop with Virtual Machine pre-installed (instructions for VM installation will be provided in due time)

Objectives:

- Acquire basic understanding of particle transport Monte Carlo
- Acquire basic knowledge and experience in using the Geant4 simulation toolkit

Course Price: CHF 100

Organisers : John Apostolakis & Gabriele Cosmo (EP-SFT) - Technical Training (HR-LD)

Geant4: Advanced : 26-27/03/19 (Training requests need to be received before 12/03/19)

Duration: 12 hours

Pre-requisites:

- Basic knowledge of the C++ language
- Knowledge and basic experience in using the Geant4 simulation toolkit
- Having followed the Geant4 beginners course or equivalent knowledge
- Availability of a laptop with Virtual Machine pre-installed (instructions for VM installation will be provided in due time)

Objectives:

- Acquire in depth knowledge in using the Geant4 simulation toolkit

Course Price: CHF 100

Organisers : John Apostolakis & Gabriele Cosmo (EP-SFT) - Technical Training (HR-LD)

26-31.10: CLOSURE OF THE CAFETERIA (36-S-003)

As a result of renovation work in Building 36, please note that the cafeteria located at 36-S-003 will be closed from Friday, 26 October to Wednesday, 31 October. We apologise for the inconvenience.

CLOSURE OF MEETING ROOM 36-S-013 UNTIL THE END OF 2018

As a result of renovation work in Building 36, please note that the meeting room 36-S-013 will be closed until the end of 2018. A new meeting room in room 36-S-014 will be available early next year. We apologise for the inconvenience.

WRIGHT COLLOQUIUM: GRAVITY, THE UNIVERSAL ATTRACTION

The 2018 edition of the Wright Colloquium will explore gravitation in all its aspects. Our speakers will discuss its use for interplanetary journeys, to the comet Churyumov-Gerasimenko for example, on which a probe was successfully landed in 2014. Gravitational extremes like black holes and gravitational waves will be discussed, as will the measurement of gravitational waves in detectors for which the boldest superlatives do not suffice. And we will explore the complex links between gravitation and the quantum world.

These themes will be the topics of five lectures given every evening of the week **from 5 to 9 November**, at Uni Dufour, (underground auditorium), rue Général-Dufour 24, 1204 Genève - Free entry.

- **Monday 5 November -** Gravitational Waves and Binary Black Holes Thibault Damour, Professor at the *Institut des Hautes Études Scientifiques* (IHES) (FR)
- **Tuesday 6 November -** Rosetta, mission zero gravity Andrea Accomazzo, European Spatial Agency (ESA) (FR)
- **Wednesday 7 November -** The dark side of the Universe Claudia de Rham, Professor at Imperial College London Faculty of natural sciences, Department of Physics (UK)
- **Thursday 8 November -** Einstein, gravitational waves, black holes and other matters Gabriela González, Professor at Louisiana State University Department of Physics & Astronomy (USA)
- **Friday 9 November -** A bridge between the infinitely large and the infinitely small Andrew Strominger, Professor at Harvard University Department of Physics (USA)

Conferences are in French or English with simultaneous translation to both languages.

Sound and light show

A sound and light show will be organised in Parc des Bastions in addition to the public conferences. **Every evening from 29 October to 21 November**, three shows of 20 minutes at 18:00, 19:00 and 20:00. Uni Bastions, park side.

Ombud's corner

A YEAR ALREADY!

It's now been a year since I took on the role of Ombud at CERN and I'd like to thank all those who've come to see me for the trust they've placed in me. I hope I've been able to help them.

My last article summarised activities in 2017 and I'd now like to share with you the daily routine of my consultations over the last year. A lot of situations come up time and time again and many conflicts have a misunderstanding at their root. Be that as it may, every story's unique and every consultation's different, as the following examples show.

Felix*: *"My supervisor's becoming more and more aggressive."* This obviously isn't acceptable, but is it due to an excessive workload, or are there other reasons?

David*: *"My hierarchy wants to get rid of me."* In fact, they're very keen to keep David and simply need to iron out a few issues with him.

Ester*: *"My supervisor breaks his promises, makes decisions seemingly at random and is too controlling: it doesn't inspire confidence."* What steps could you take as a supervisee to improve your relationship?

Michael*: *"I've just arrived at CERN and one of my colleagues, who's been here for several years, looks down on me and ignores me."* If that's the case, you should remember that, whatever your status, respect is one of the key principles of our organisation.

In most of the above examples, the key to solving the conflict lies in communication.

Maria*: *"I'm not sure my situation complies with CERN's rules and principles, but I don't dare talk to anyone about it."* Although that's actually the case, my status as Ombud prevents me from taking action. My conversations with Maria stay between the two of us; I give her advice on what she can do and it's up to her to take the necessary steps to resolve her situation.

Finally, some problems relate to sexist behaviour and sexual harassment of varying degrees of severity. Hostility and, often, abuse of power make communication fraught or even impossible. If you're a victim of harassment and your attempts to solve the problem have been unsuccessful, come to see me. As a last resort, you can always file a harassment complaint, which will be duly investigated by the Harassment Investigation Panel.

Generally, my role is to ask the questions that lead you to the solution. Indeed, in 80% of cases, you already have the answer but just don't realise it. I'm here to help you find it, respecting the four basic principles of the Ombud: confidentiality, neutrality, independence and informality.

Pierre Gildemyn

If you'd like to comment on any of my articles or suggest a topic that I could write about, please don't hesitate to e-mail me at Ombuds@cern.ch .

**Names have been changed*