

CERN

Outreach in the International Context

Dr. Sascha Marc Schmeling

CERN



International Relations

Education, Communication, and Outreach

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Member States

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Partnerships and Fundraising



@CERN – A New Sector is Born

Education, Communication, and Outreach

Activities



INTERNATIONAL JOURNAL OF HIGH-ENERGY PHYSICS

CERN COURIER

VOLUME 56 NUMBER 5 JUNE 2016

Cosmic collisions

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CERN's IT faces the challenges of Run 2
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The kaon factory will take data until 2018
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SIXTY YEARS OF JINR
Celebrating the institute's past, present and future p37

CERN Bulletin

Issue No. 22-23/2016 - Monday 30 May 2016
More articles on <http://bulletin.cern.ch>

LHC REPORT: FOCUS ON LUMINOSITY

The intensity ramp-up of the LHC beams resumed last Friday after the main powering system of the PS accelerator was put back to service.



The graph shows the last twenty four hours of LHC's machine. The LHC operators resumed the beams of the PS accelerator for several hours last week.

Beams are back in the LHC. On Friday, the accelerator resumed the intensity ramp-up, reaching 1752 bunches per beam last week-end. The intensity ramp-up was interrupted on 20 May because of a problem with the PS main power supply bus bars.

A steady increase in the total number of bunches per beam required to check out all aspects of beam operation and make sure the LHC is fully safe before the nominal number of bunches per beam can be brought into collision.

At present, four intensity steps have been completed: 313, 601, 898, and 1177 bunches per beam. The qualification of the next step with 1752 bunches is in progress. At every step, more than 30 hours in stable beams must be accumulated, as required for machine protection qualification. The last step-ups already showed signs of possible electron cloud effects, with the typical signature of blow-up bunches at the end of the train of 72 bunches. The beam and detector systems are however very good: the last LHC fill before the extended stop due to the PS powering system problem was with 1177 bunches per beam and stayed in Stable Beams for 35.5 hours. The peak luminosity at the beginning of Stable Beams was $3.6 \times 10^{31} \text{ cm}^{-2} \text{ s}^{-1}$. The integrated luminosity, 27.7 inverse picobarns, is around a quarter of the total luminosity delivered by the LHC to now 93,000.

Monday, 17 and Tuesday, 18 May were dedicated to measuring the absolute scale of the luminosity at 13 TeV. The luminosity of a



A WORD FROM ECKHARD ELSÉN

WHAT MAKES CERN'S RESEARCH GREAT

As a newcomer to CERN, I find myself both honoured and humbled to have had the role of Research Director conferred in me for five years.

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CERN press office

CERN experiment points to a cloudier pre-industrial climate

Geneva, 25 May 2016. In two papers^{1,2} published today in the journal *Nature*, new results from the CLIC³ experiment at CERN⁴ imply the limiting pre-industrial climate may have been cloudier than presently thought. CLIC³ shows that regions upstream of the beam production tunnel particles in the atmosphere in the absence of sulphuric acid. It is likely that these sulphuric acid - which largely comes from fossil fuels - was essential to initiate aerosol particle formation. CLIC³ finds that these so-called sulphuric regions are also key to the growth of the newly-formed particles up to sizes where they can seed clouds.

"These results are the most important so far by the CLIC³ experiment at CERN", said CLIC³ spokesperson, Diego Hristov. "When the nucleation and growth of pure sulphuric aerosol particles is included in climate models, it should change our understanding of the impact of human activities on clouds and climate."

The Intergovernmental Panel on Climate Change (IPCC) estimates that the increase in aerosols and clouds since pre-industrial times represents one of the largest sources of uncertainty in climate change⁵. CLIC³ is designed to understand how aerosol particles form and grow in the atmosphere, and their effect on clouds and climate.

CLIC³ also finds that ions from galactic cosmic rays strongly enhance the production rate of pure sulphuric particles - by a factor 10-100 compared with particles without ions. This suggests that cosmic rays may have played a more important role in aerosol and cloud formation in pre-industrial times than in today's polluted atmosphere.

A paper published simultaneously in *Science* (Steinbock, F. et al. *Science*, doi:10.1126/science.1262079, 2016) describes an observation of pure organic nucleation at the Jungfraujoch observatory by the same mechanism reported by CLIC³. The measurements did not involve CLIC³ directly but used the sulphuric acid also measured by the CLIC³ collaboration.

"The observation of pure organic nucleation at the Jungfraujoch is very exciting", said Hristov. "It suggests that the same process observed by CLIC³ in the laboratory also takes place in the atmosphere."

- 1. CLIC³ experiment - Steinbock et al.
- 2. CLIC³ experiment points to a cloudier pre-industrial climate
- 3. CLIC³ experiment points to a cloudier pre-industrial climate
- 4. Particle and astrophysics about CLIC³ experiment
- 5. Available from: <http://www.ipcc.ch/>



Organization · Meyrin, Switzerland
4.6 ★★★★★

527,156 people like this
Elio Tolosa and 99 other friends

66,768 people have been here
Peter Jurcko and 56 other friends

4.6 of 5 stars - 13,149 reviews
View Reviews

1 Located Inside Organisation Européenne pour la Recherche Nucléaire (CERN), Meyrin, Switzerland, 1217

Ask for CERN's phone
Ask for CERN's hours
<http://home.cern/>

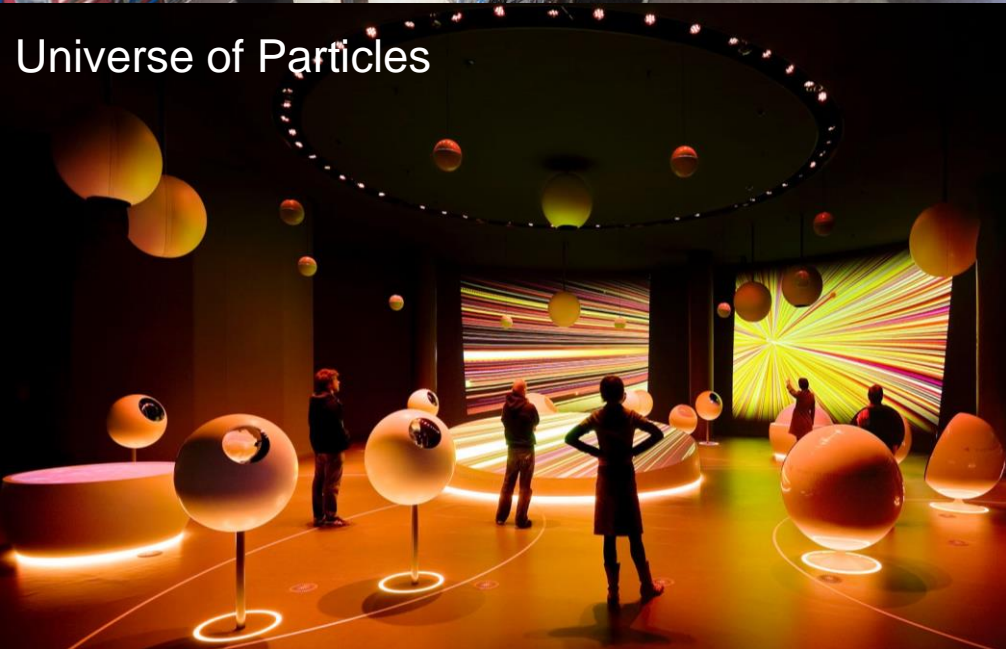
Tweets by @CERNpress

CERNpress Retweeted

CERN @CERN

Intensity rises in the LHC: more protons, more collisions and more data #RestartLHC #13TeV
cern.ch/go/j9mp
pic.twitter.com/CZx29CQkwM

Embed View on Twitter



- Creation of
- immersive exhibitions
 - interactive visits points

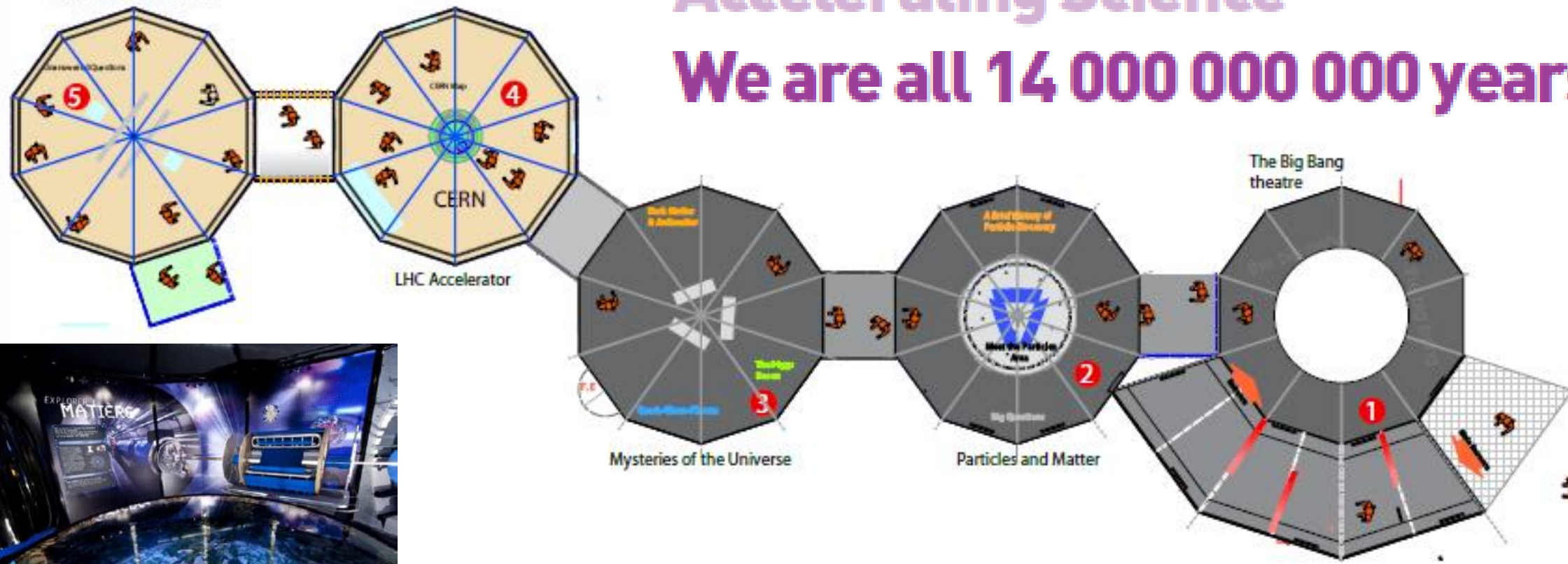


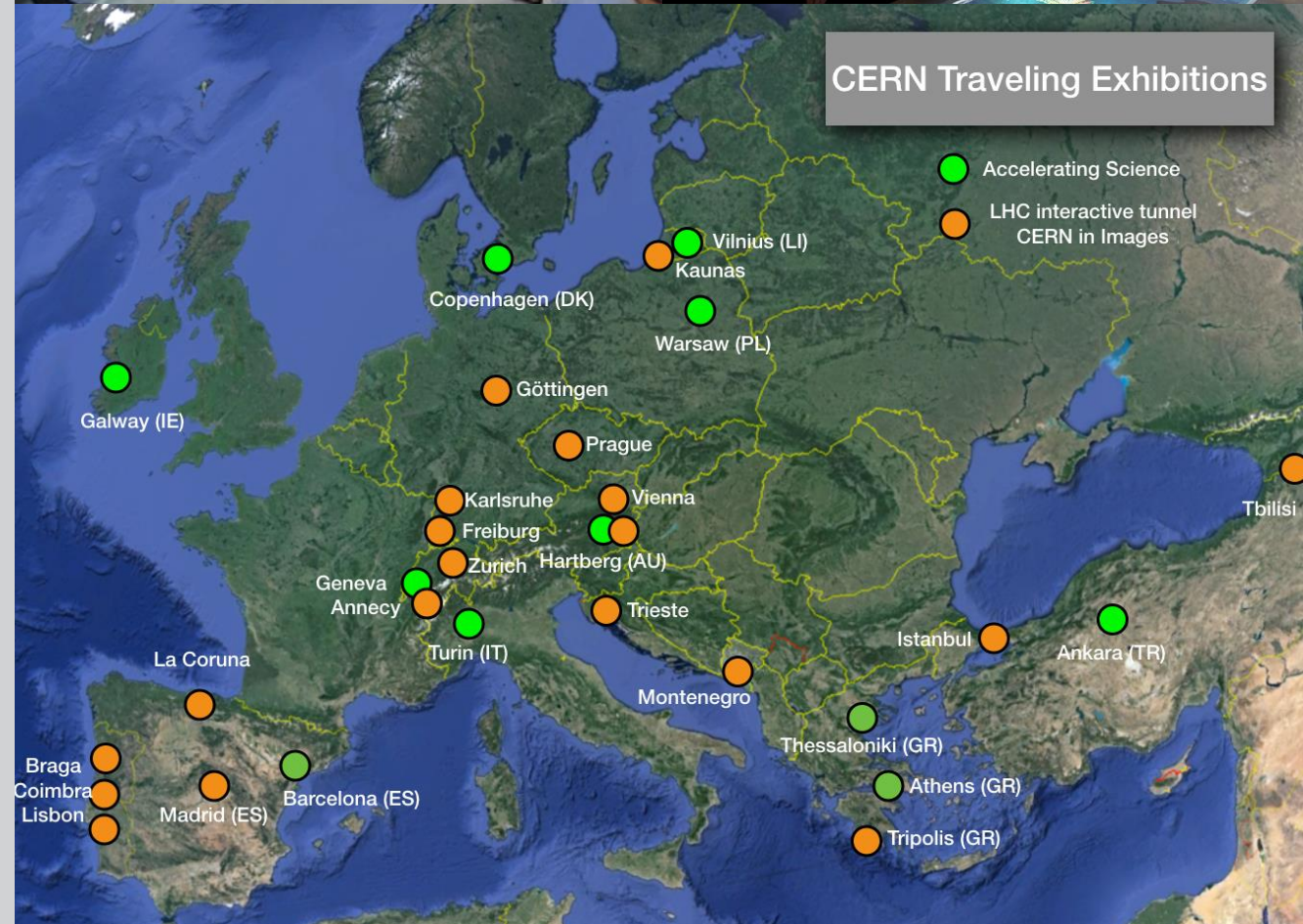
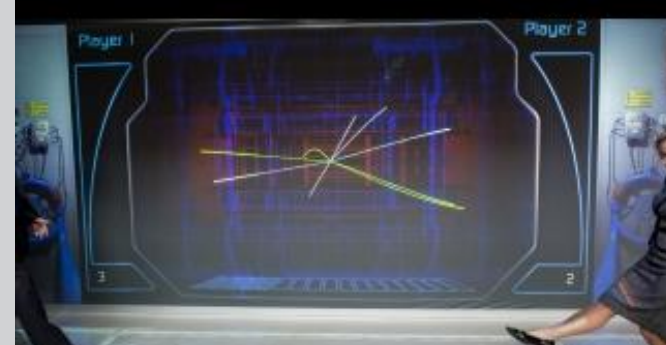
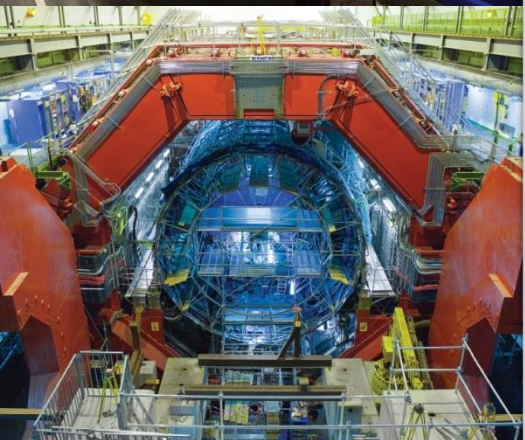
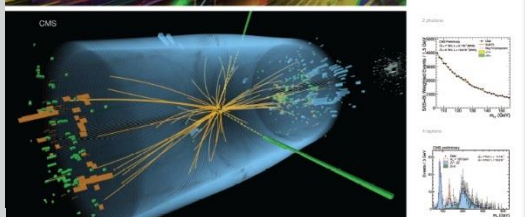
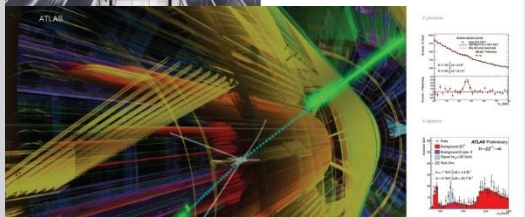
Global Constituency Engagement

Our world is built on
fundamental research

Accelerating Science

We are all 14 000 000 000 years old!





CERN in Images • LHC Interactive Tunnel



**CREATIVE
COLLISIONS
BETWEEN
THE
ARTS
AND
SCIENCE**

Collide@CERN



Collide@CERN

Collide@CERN – 3 months residency • since 2011

- explores elements even more elusive than the Higgs Boson: human ingenuity, creativity, and imagination
- competitive open calls - fully funded residency

Accelerate@CERN – 1 month residency • since 2014

- two artists from two different countries
- in cooperation with partner countries (e.g. Austria, Taiwan, Lithuania, UAE)

Visiting Artists programme – 1-2 days CERN visit

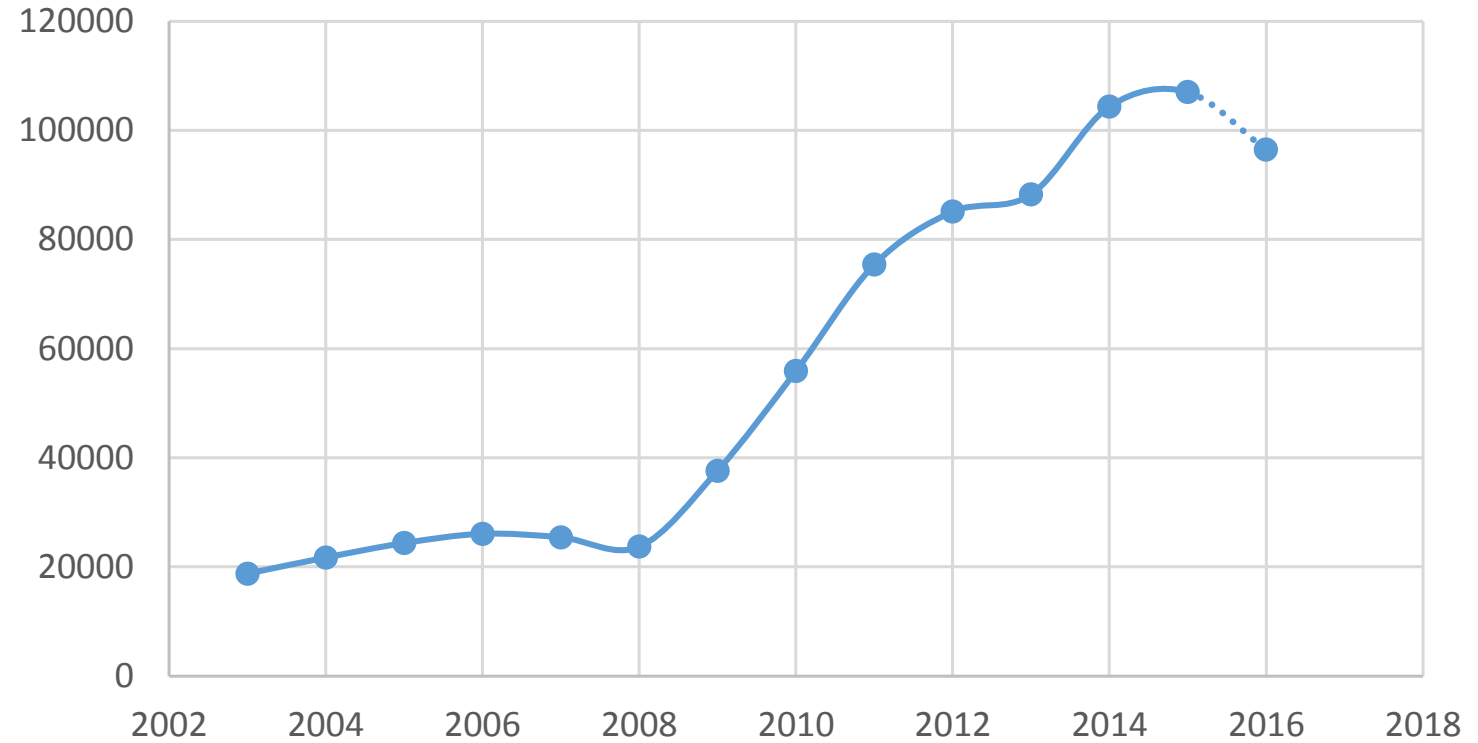
- up to 12 artists are invited on self-funded tours
- programme fully booked until 2017



Arts@CERN – Science & Art meet in three Ways



CERN Visits



Various activities for locals, regionals, and internationals at the CERN site.
Thanks for your support!



Visiting CERN • Local Engagement

CERN Teacher Programmes

[National Teacher Programmes](#)

[International Teacher Programmes](#)

[Contact](#)

“There is nothing more enriching and gratifying than learning.”

[Fabiola Gianotti, CERN Director-General]

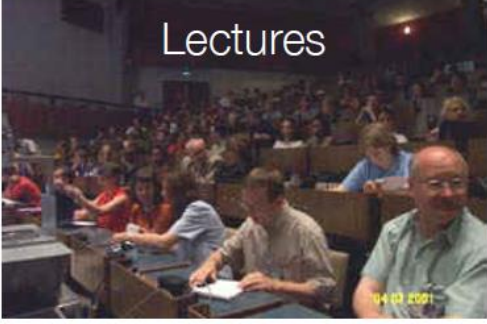
Every year, CERN offers various professional development programmes for teachers to keep up-to-date with the latest developments in particle physics and related areas, and experience a dynamic, international research environment. All programmes are facilitated by experts in the field of high energy physics and include an extensive lecture and visit itinerary.

Furthermore, CERN's teacher programmes enable you to meet with teaching colleagues from your country or from all around the World. We offer teacher programmes in English or in one of the national languages of CERN Member States, lasting between 3 days and 3 weeks. Take part!

[National Teacher Programmes](#) & [International Teacher Programmes](#)



Teacher Programmes



National Teacher Programmes in the language of the country | 4-6 days

focus on visits and lectures

International Teacher Weeks in English | 2 weeks

focus on visits and lectures

*new
starting in 2017*

International Teacher Programme “HST” in English | 3 weeks

focus on collaboration



Teacher Programmes

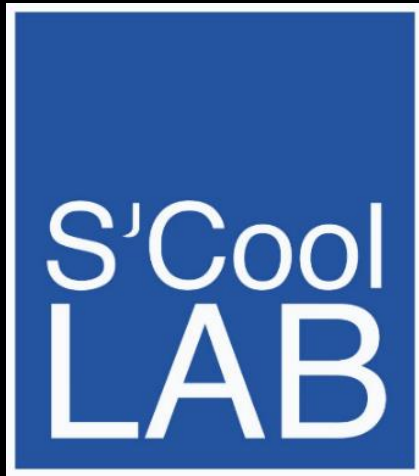
S'Cool LAB

There is always a way to do it better... find it!

If you can't explain it simply, you don't understand it well enough.



What is S'Cool LAB?



HANDS-ON PARTICLE PHYSICS LEARNING LABORATORY

For high-school students and teachers
International audience from more than 20 countries
Independent experimentation in small groups



200 m² MODULAR LABORATORY SPACE AT CERN

State-of-the-art IT equipment incl. videoconferencing
Showcase for experiments for schools linked to CERN's
scientific programme and technologies



TEST BED FOR PHYSICS EDUCATION RESEARCH

Development and evaluation of student activities
accompanied by research in physics education



Aims of S'Cool LAB



Make CERN's physics and technologies understandable to students through hands-on experimentation

Give insights into the working methods, technologies, and research of the world's largest particle physics laboratory

Experiments

Particle Acceleration



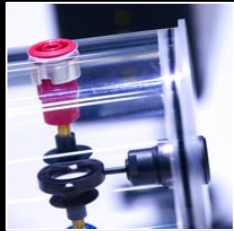
electrons &
electric
fields



supercon-
ductivity



electrons &
magnetic
fields

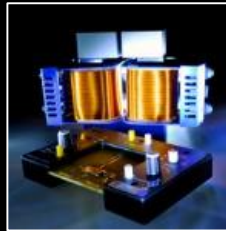


particle
traps

Basics & Applications



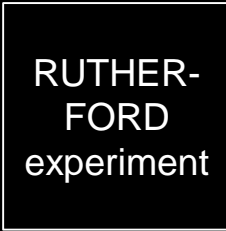
HALL effect



FRANCK-
HERTZ
experiment



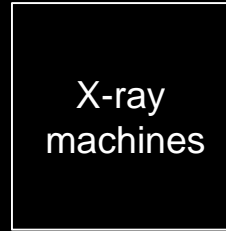
PET



RUTHER-
FORD
experiment



PLANCK's
constant



X-ray
machines

Particle Detection



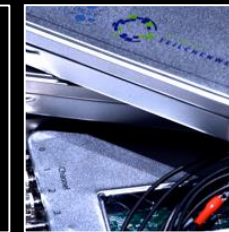
scintillation
detectors



cloud
chambers



pixel
detectors
(MEDIPIX)



ionisation
chambers



... and many more to come

Education, Communication, and Outreach

Services



Contacts

Audiovisual Productions Service
audiovisual-requests@cern.ch ✉
Location: 510/R-035
Postbox: J19200

Catalog navigation

- SA Knowledge, Scientific Information, Text and Media
- CS CERN Official Communication
- SE **Audiovisual Production Service**
- SE CERN Core Website and Social Media Services
- SE CERN Graphic Design Guidelines Service
- SE CERN Writing Guidelines Service
- SE Special Event Coordination

SE Audiovisual Production Service

The Audio Visual Production Service is part of the Education, Communications and Outreach Group (ECO) within the International Relations Sector (IR).

Its main mission is to produce engaging visual products (photos, videos, Video News Releases VNR, film, slideshows, photo-stories, live broadcasts....) in line with CERN's education, communication and outreach priorities for a variety of target audiences (general and specialized).

Another important mission of the Service is to document milestones of CERN's life, people and history with photography and video, for archival purposes.

The Service also supports other Sectors with professional expertise in video/photo production.

Actions

[Request](#) Audiovisual Production request form



International Relations

Protocol

... a very special visits service ...

Create an Emotion



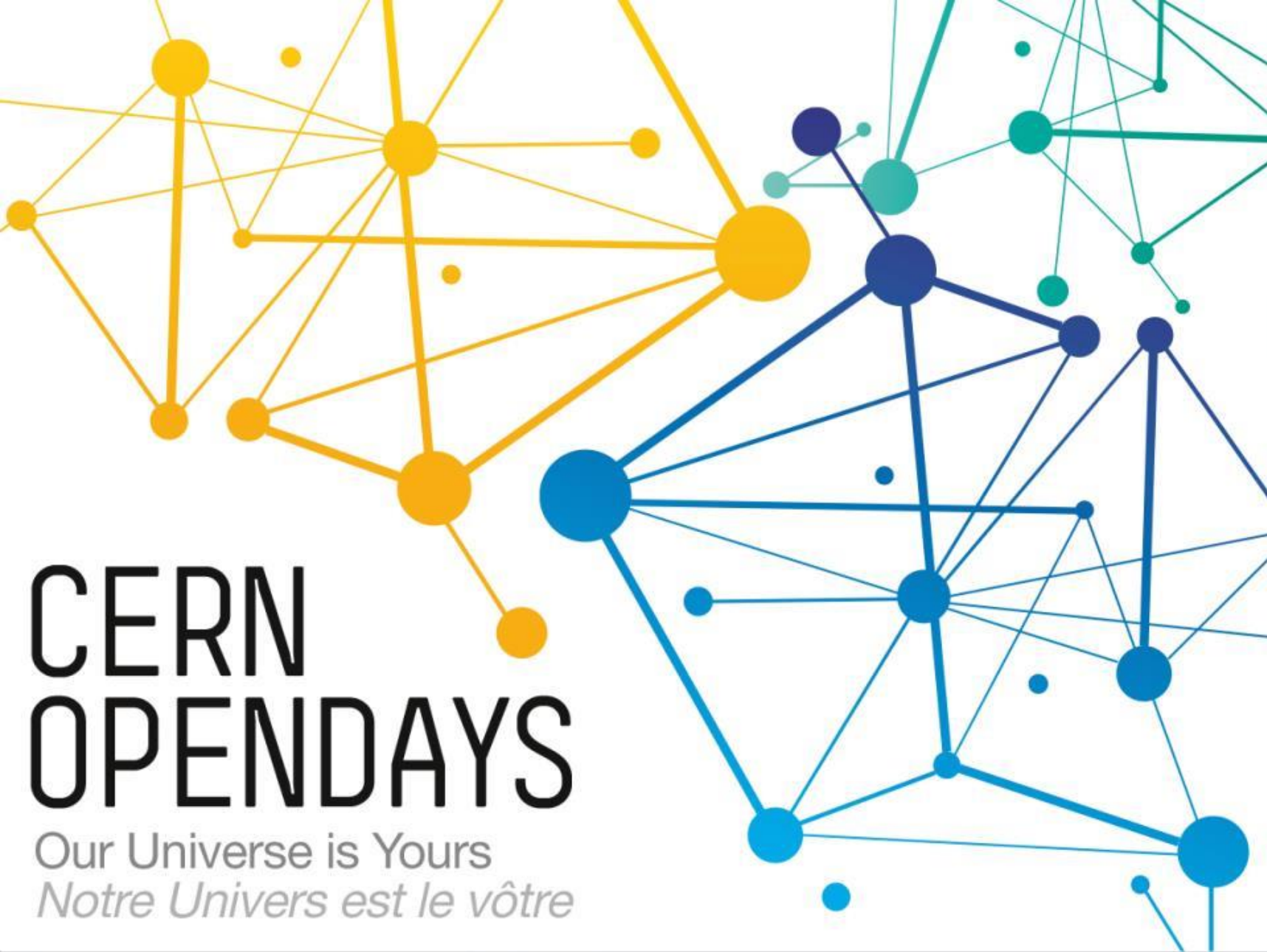
sometimes
acrobatic



Create a
memorable
moment



Protocol – A very special Challenge



CERN OPENDAYS

Our Universe is Yours
Notre Univers est le vôtre

- two “big” outreach events coming up these years
- OpenDays in 2019 during LS2 (May or October)
- one new event format in 2017 *stay tuned!*



Big Outreach Events ... on the Horizon



www.cern.ch