

Communicating the intangible: Wonder, groundbreaking technology and international collaboration

Ana Godinho

Education, Communications and Outreach

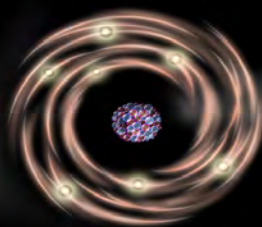
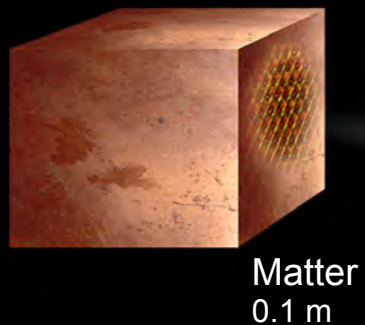
CERN

2021 IDPASC School, Portugal

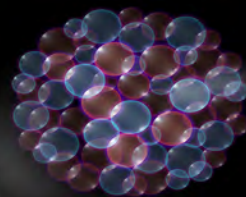
CERN is the European Laboratory for Particle Physics



At CERN we study the elementary building blocks of matter



Atom
 $\sim 10^{-10} \text{ m}$



Nucleus
 $\sim 10^{-14} \text{ m}$



Proton
 $\sim 10^{-15} \text{ m}$

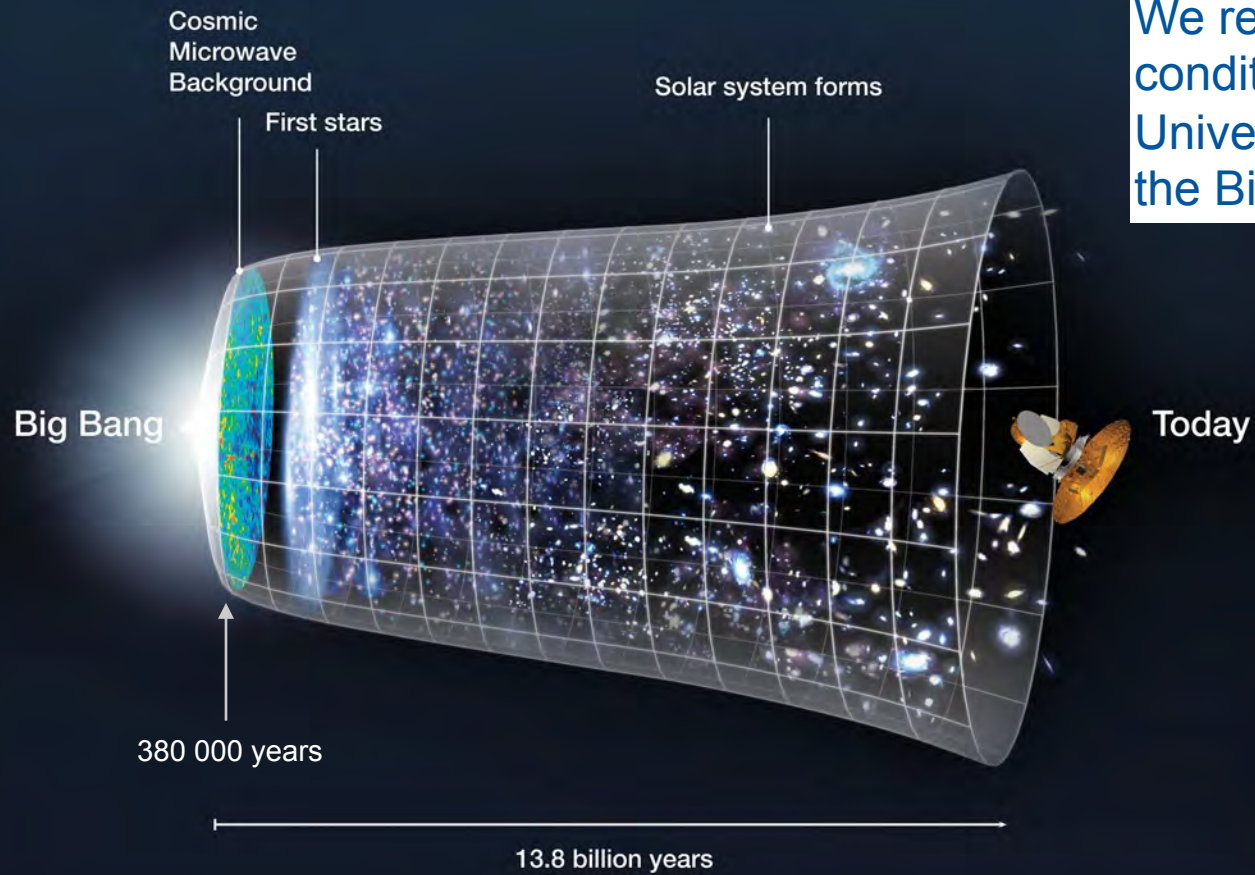


Quark
 $\sim 10^{-18} \text{ m}$

Energy becomes matter
 $E=mc^2$



We reproduce the conditions of the Universe just after the Big Bang



The Higgs boson (2012) is the last missing piece of the Standard Model.
Without it fundamental particles would be massless and atoms could not form.



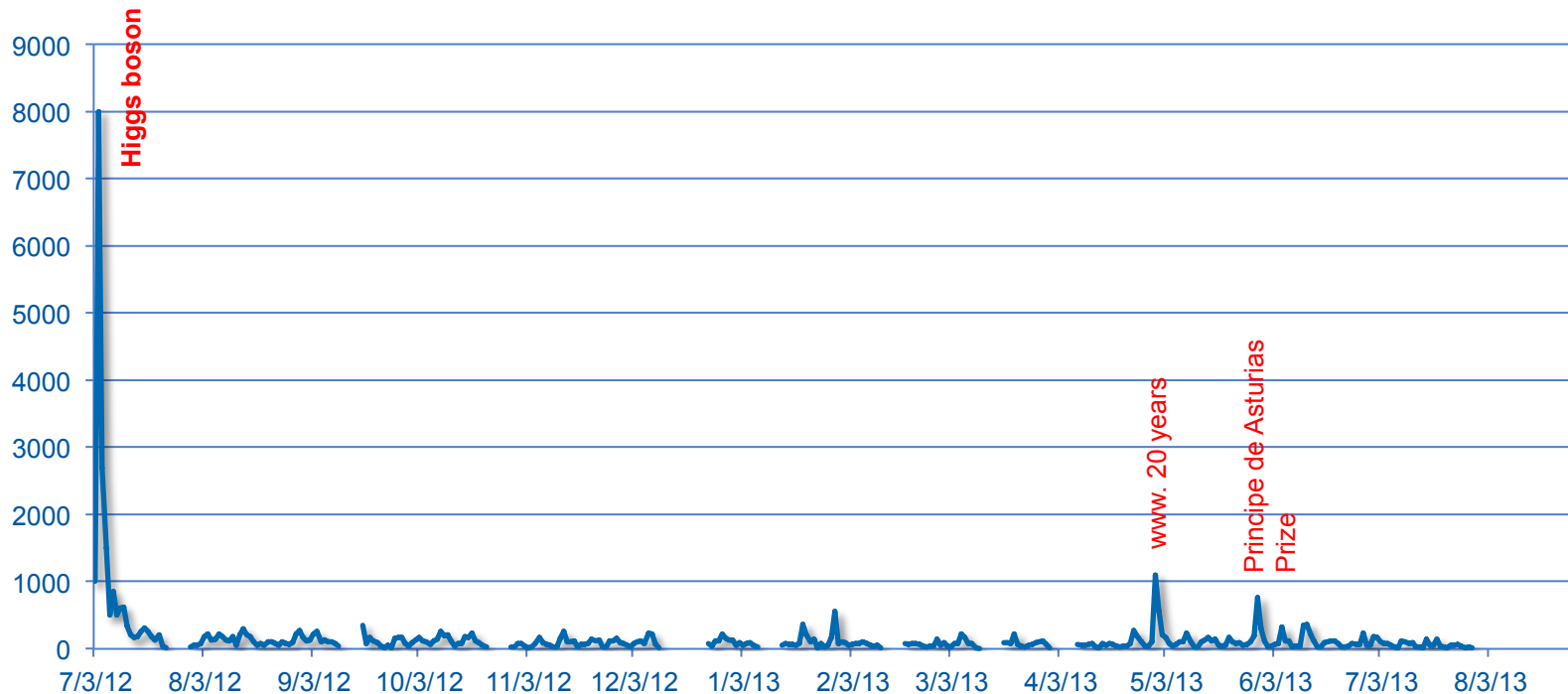
CERN asks the most fundamental scientific questions of all

WHERE DO WE COME FROM ?
DA DOVE VENIAMO ?
QUE SOMMES NOUS ?
WAS SIND WIR ?
CHE COSA SIAMO ?
DOVE ANDIAMO ?
D'OÙ VENONS NOUS ?
WOHER KOMMEN WIR ?
¿ DE DÓNDE VENIMOS ?
¿ QUÉ SOMOS ?
WHAT ARE WE ?
OÙ ALLONS NOUS ?
¿ A DÓNDE VAMOS ?
WHERE ARE WE GOING ?
WOHIN GEHEN WIR ?



And yet...

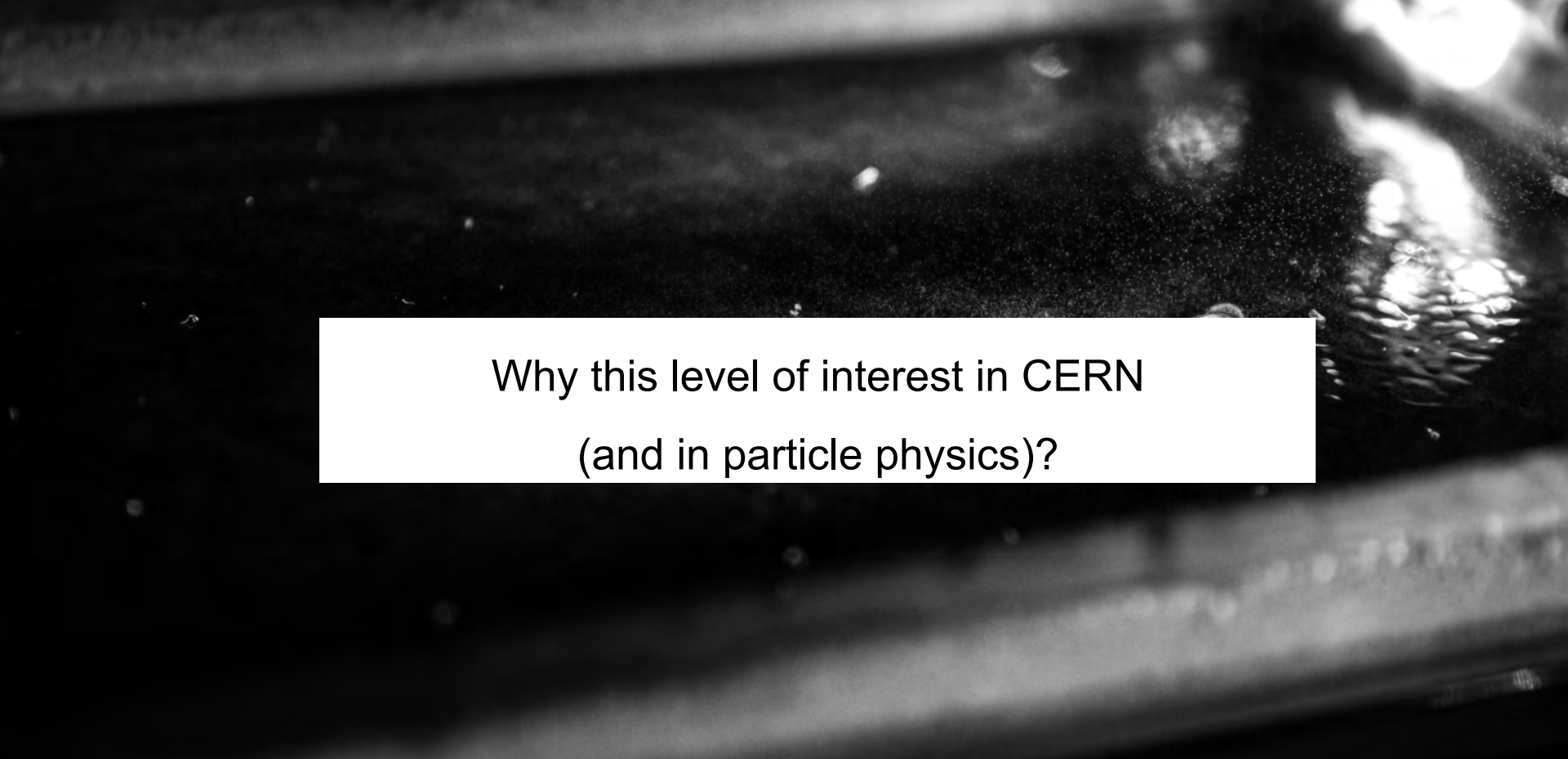
Media coverage of the discovery of the Higgs boson broke records



Global Media coverage
Keywords: "CERN & LHC"

In 2019:

- **150 000 people**, from **95 countries**, took guided tours of CERN
- Around **75 000 visited** CERN during the Open Days
- **904 teachers**, from **63 countries**, took part in dedicated programmes
- **> 6 000 high-school students** in S’Cool LAB
- **> 156 000 media clippings** from all around the world
- **> 1 100 journalists** visited CERN
- Between 136 000 (YouTube) and **2.5 million (Twitter)** followers

A black and white photograph showing particle tracks in a detector, likely a bubble chamber or cloud chamber. The tracks are visible as bright, branching lines against a dark background, with some tracks showing distinct droplets or bubbles. The overall image has a grainy, high-contrast appearance.

Why this level of interest in CERN
(and in particle physics)?

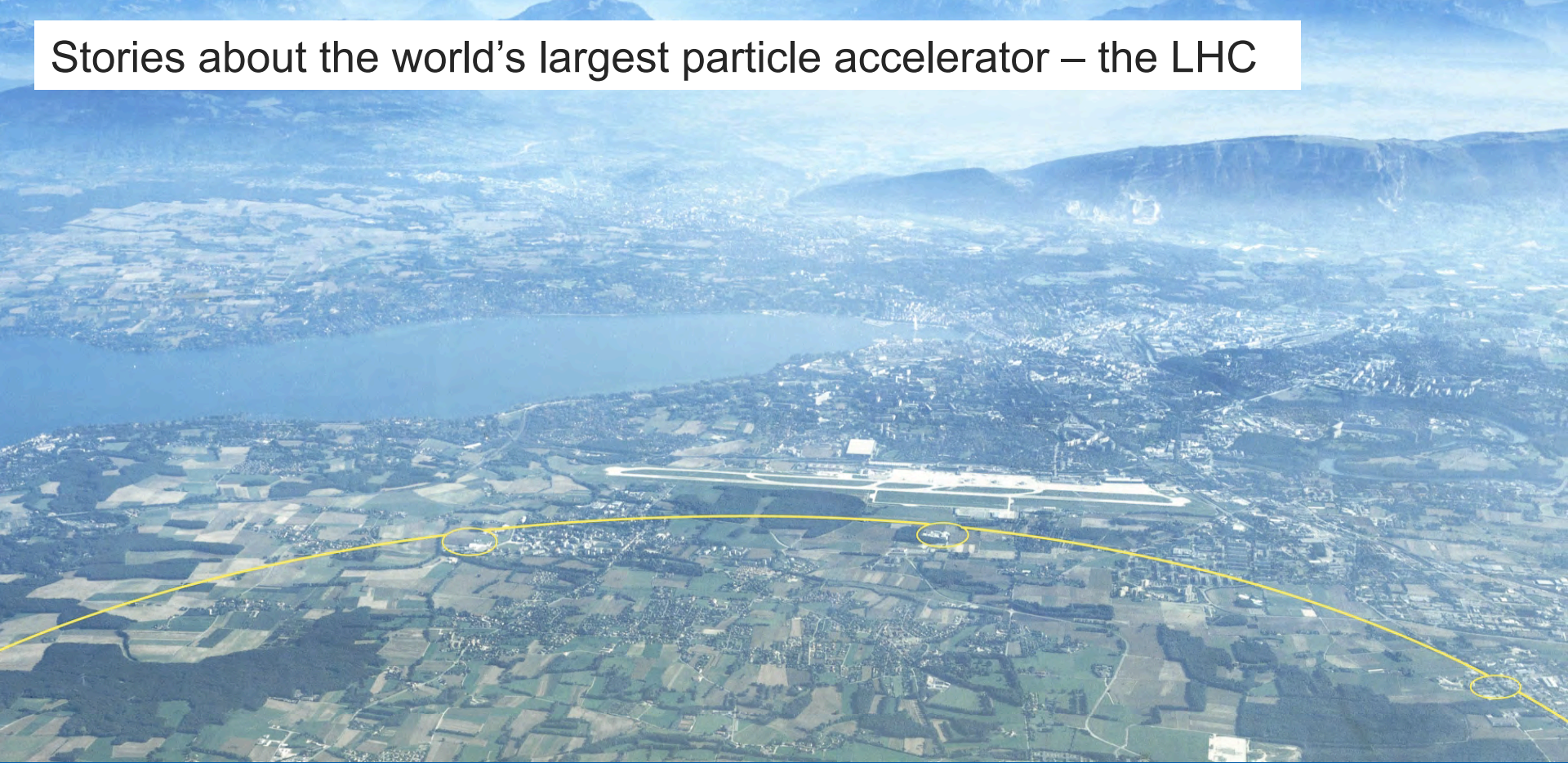


We have great stories to tell.
Science communication is about telling stories

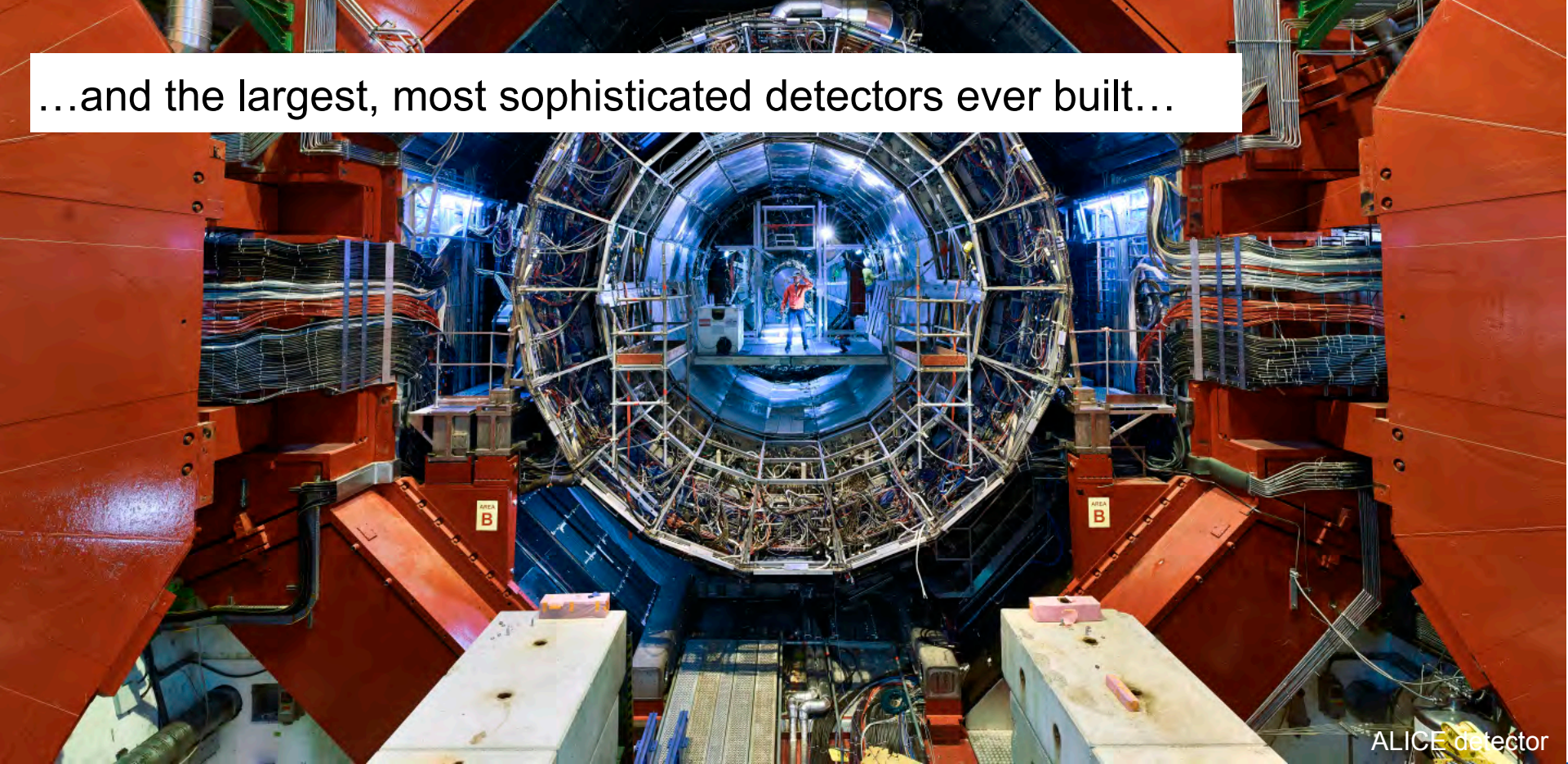
CERN provides answers to questions once thought to only be amenable
to philosophical speculation

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Stories about the world's largest particle accelerator – the LHC



...and the largest, most sophisticated detectors ever built...



ALICE detector

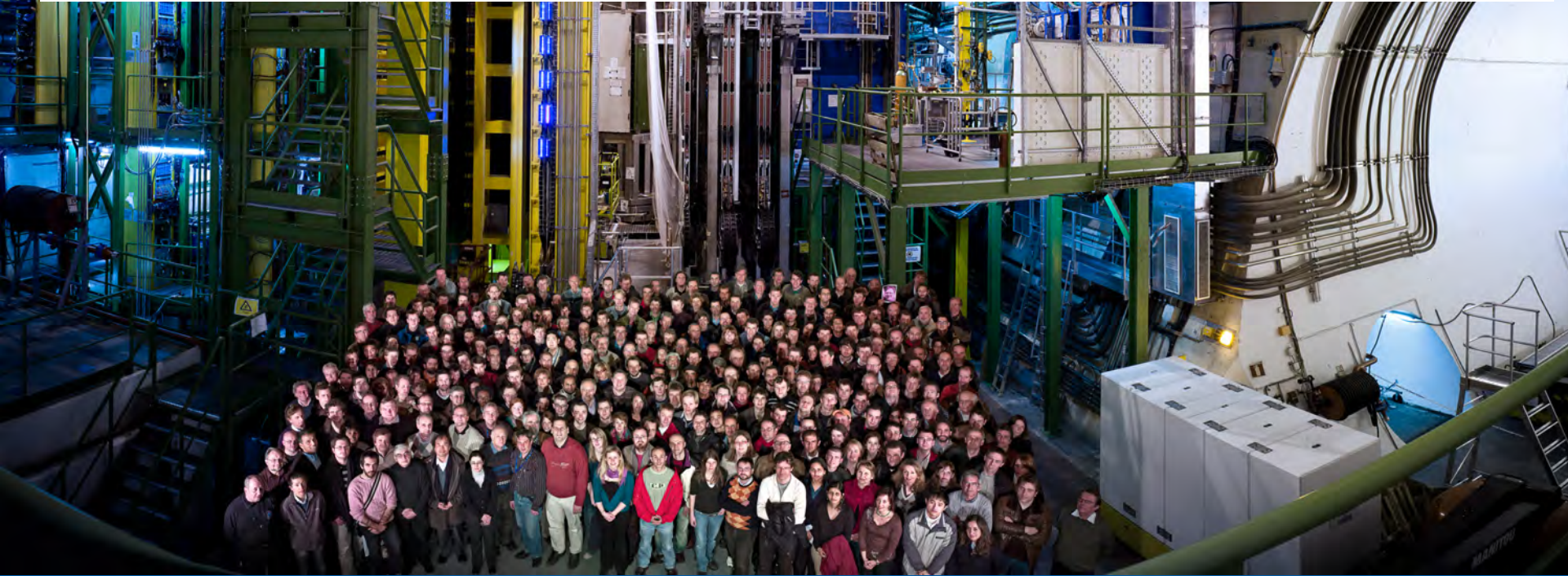
...generating vast quantities (exabytes) of data, that is stored and analysed around the world



Stories about the impact of CERN's values, innovation and technology in society



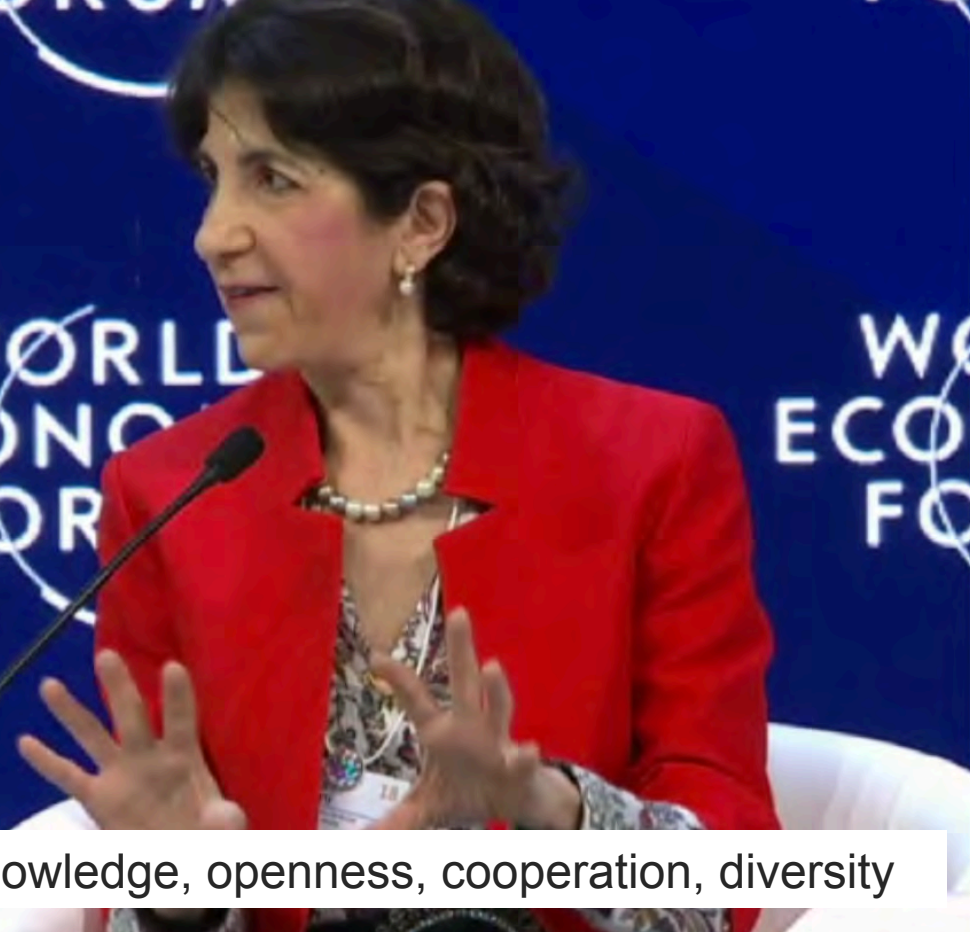
CERN is first and foremost an human endeavor.
17 000 people; >100 nationalities



“Science is universal and unifying:

we are all made of the same elementary particles, and scientific knowledge has no passport, no gender, no race and no political party.”

Fabiola Gianotti, CERN Director-General #WEF18



Stories about the the values of science: knowledge, openness, cooperation, diversity

There are many unanswered questions in fundamental physics

Including

95% of the mass and energy of the universe is unknown.

Is there only one Higgs boson, and does it behave exactly as expected?

Why is the universe made only of matter, with hardly any antimatter?

Why is gravity so weak compared to the other forces?

We will continue to have great stories to tell...



FUTURE
CIRCULAR
COLLIDER

LHC

...and this is a key time for the field and for CERN

CERN's mission is underpinned by four themes



Why do we communicate?

1. To **ensure political and financial support** for CERN's mission
2. To **build consensus** within the international particle physics community and with other research fields
3. To **increase the visibility of CERN** in Member States
4. To maintain **high public awareness and engagement** with CERN's activities
5. To **engage stakeholders in CERN's societal impact**
6. To be an **effective voice for fundamental research** in relevant multilateral debates and with citizens.

Who do we communicate with?

PRIMARY AUDIENCES

- Decision makers
- HEP community
- Local communities
- General public (voters; non-CERN fans / science sceptics; those with low science capital)
- School teachers and students
- Industry
- Donors

VECTORS

- Media
- Influencers
- Scientific community
- CERN Alumni

How do we communicate*?

1. Digital communications
2. Exhibitions and art commissions
3. Teacher and student programmes
4. Events
5. Science Gateway
6. The effect of COVID-19

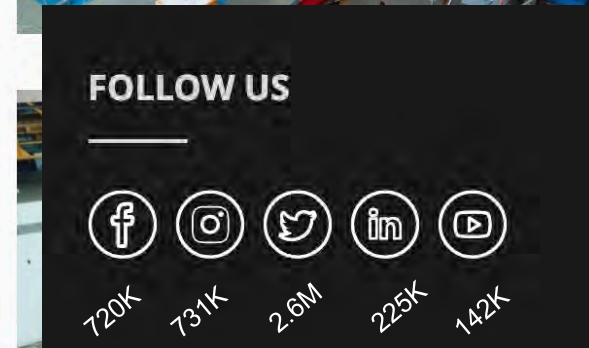
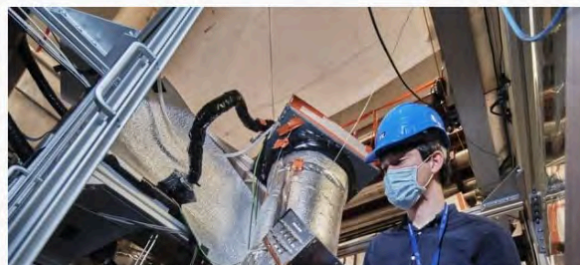
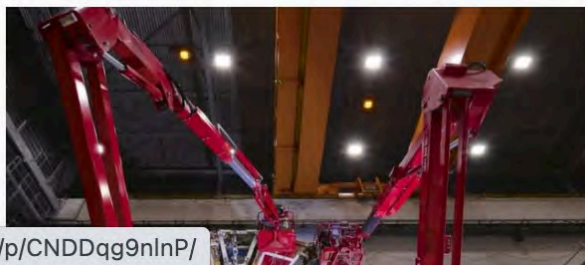
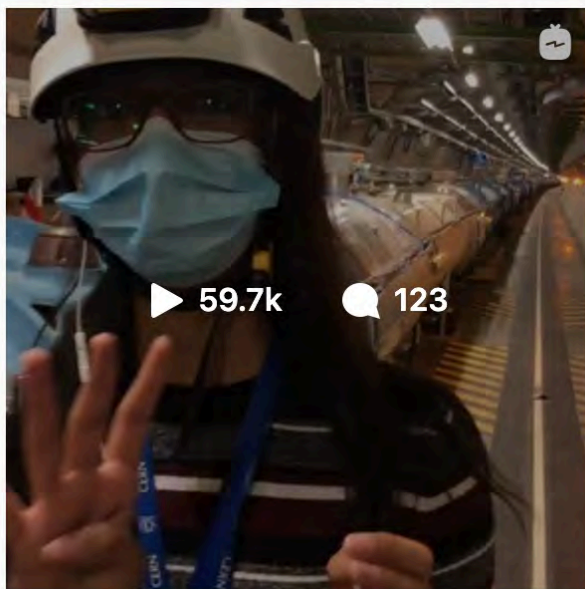
* a non-exhaustive list



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We engage with social media influencers
(also for informal training of CERN physicists and engineers)



Two on-site exhibitions with around 100 000 visitors/year

Microcosm



>10 visit points, with a mix of real objects and multimedia

CERN Data Centre

Artistic Residencies, art
commissions and
exhibitions within the **Arts
at CERN** programme

Alice: Curioser and Curioser exhibition
(Victoria & Albert Museum in London)
Two artworks and a school event inspired by
CERN within the





60% of visitors on guided tours are school students



Close to 1 000 teachers/year in 1-2 week professional development programmes



Internship / shadowing programmes for high-school students of CERN's Member States



Around 6 000 students (with teachers) in enquiry-based learning workshops



— 2021
17-18 September

<https://sparks.cern/>

Podcasts



Ep. 1

Brainy AI
with Stuart Russell and Tomaso Poggio



Ep. 3

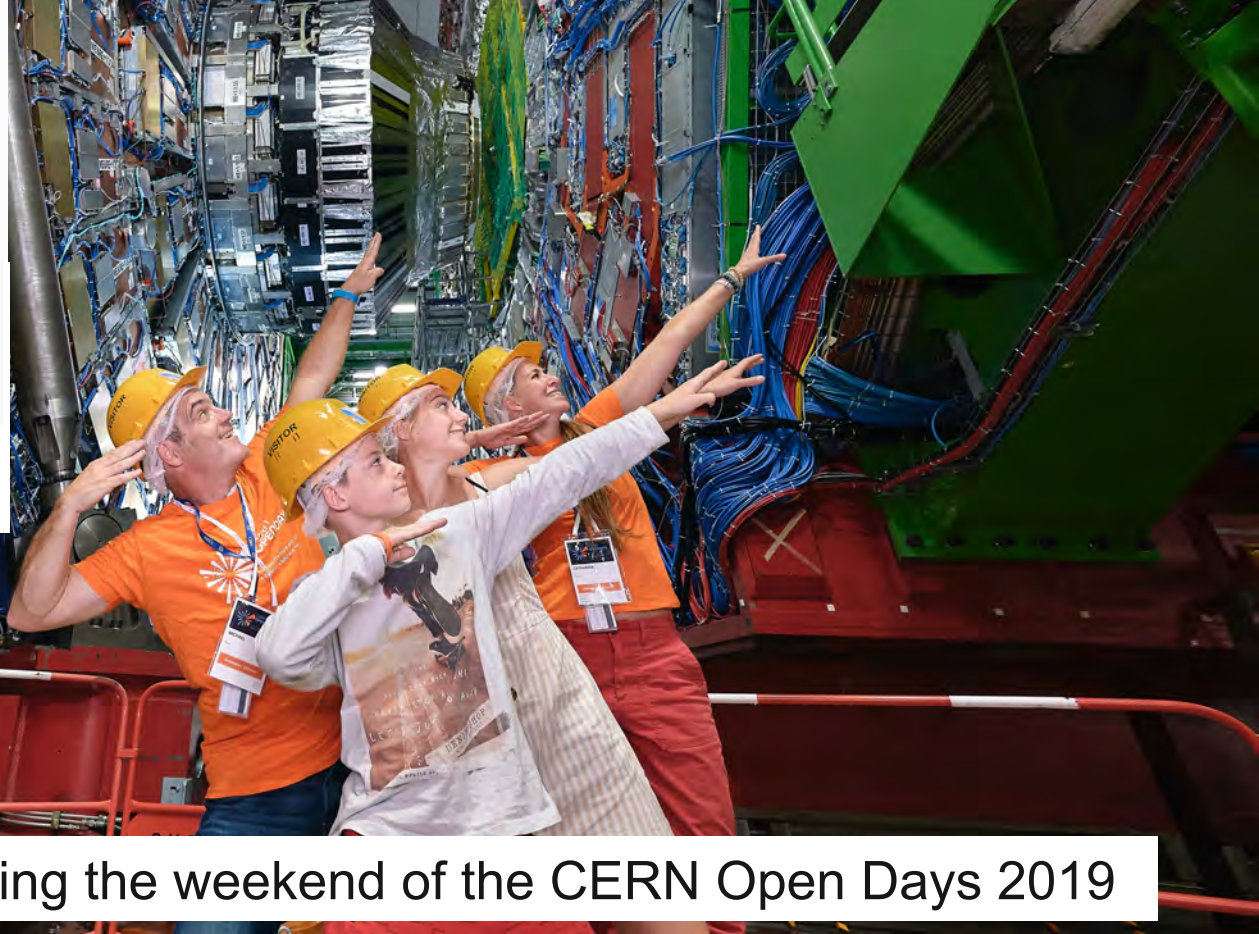
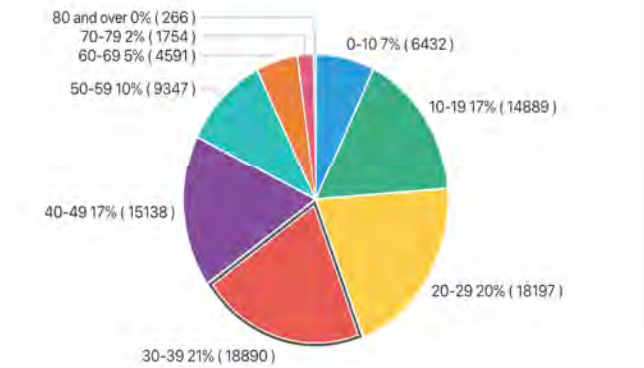
Creative AI
with Anima Anandkumar and John Ellis



Ep. 6

Fast and slow AI
with Francesca Rossi and Daniel Kahneman

Visitors age distribution over the whole event



Around 75 000 visitors during the weekend of the CERN Open Days 2019

Le CERN construit le Portail de la Science

Un grand centre de sensibilisation et d'éducation aux sciences et technologies



Expositions, conférences, activités, expériences,
tout un Univers à explorer.

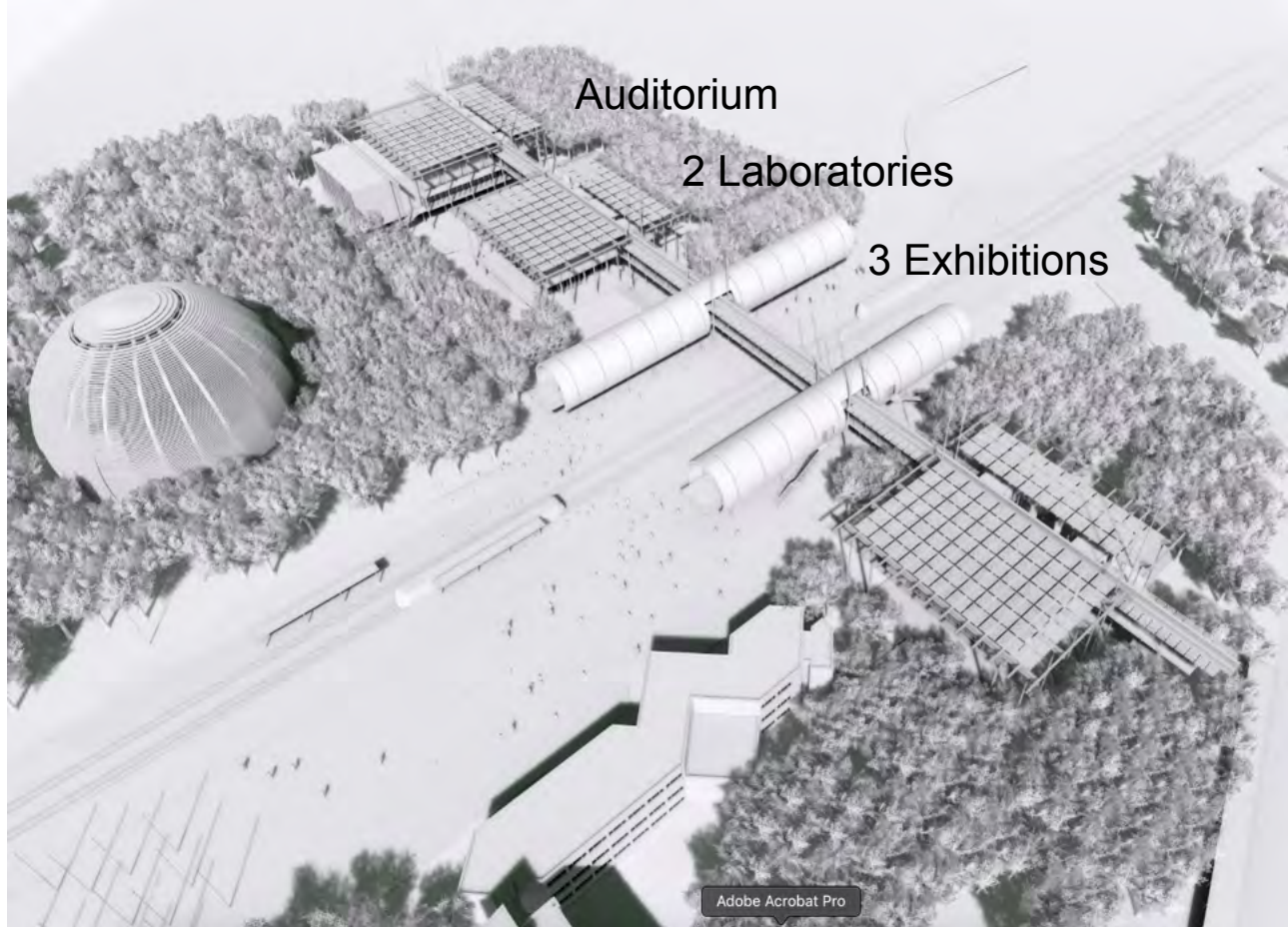
Rendez-vous en 2023
sciencegateway.cern

© Renzo Piano Building Workshop
en collaboration avec Brodbeck Roulet Architectes Associés

CERN Science Gateway

Designed by architect
Renzo Piano (RPBW)

- Expand CERN's outreach offer to ages 5-plus
- Expecting 300 000 visitors / year
- Local and global reach

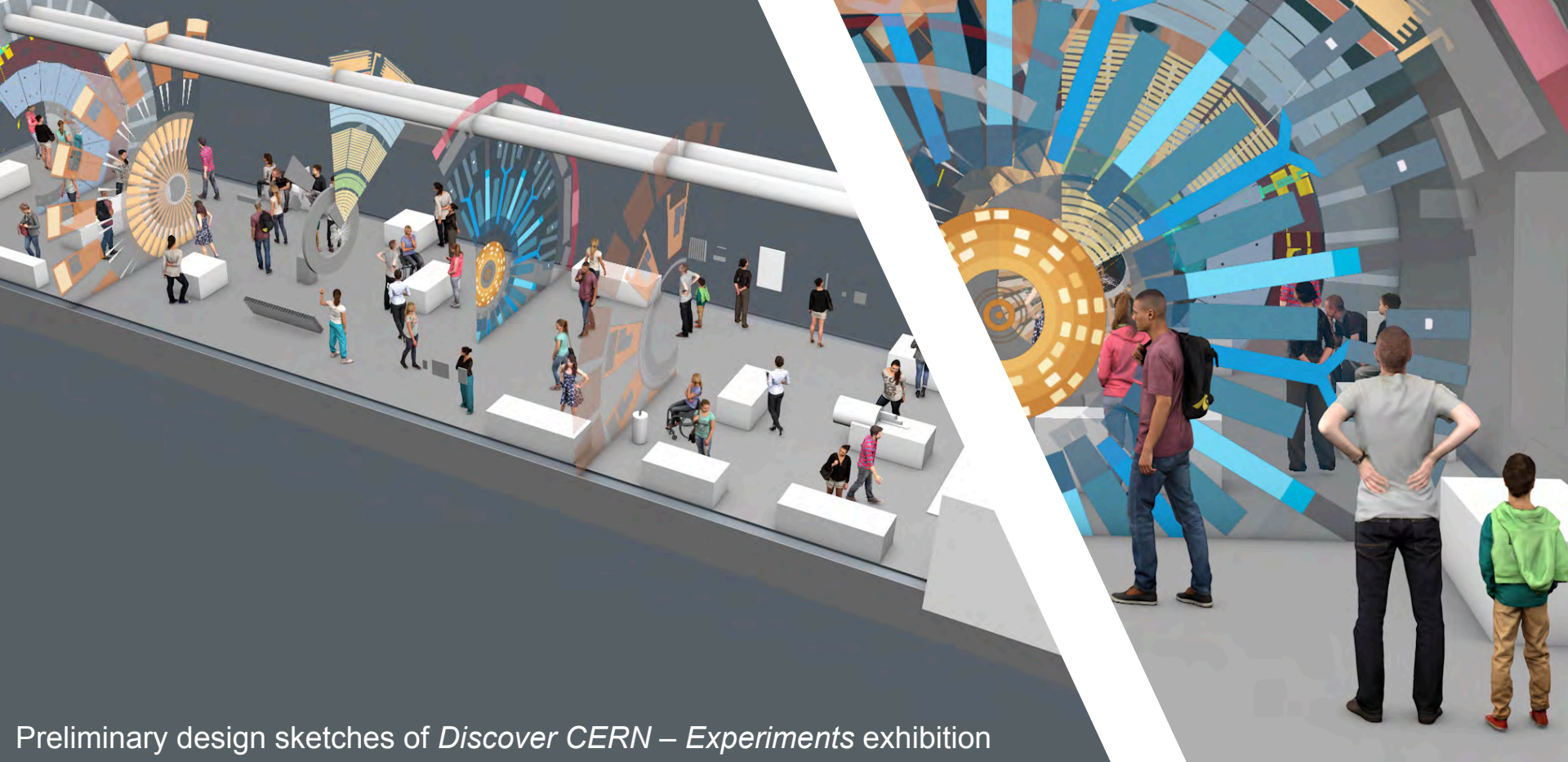




CERN Science Gateway auditorium



CERN Science Gateway *piazza*



Preliminary design sketches of *Discover CERN – Experiments* exhibition

2020...and 2021

COVID
Cancellations
Creativity
Change

Due to the COVID-19 outbreak,
we regret to inform you that public visits of CERN
are cancelled until further notice

- Exhibitions and shop will be closed until further notice
- All guided tours are cancelled until further notice
- More information on visit.cern/covid-19

We thank you for your understanding

*En raison de l'épidémie de COVID-19, nous sommes au
regret de vous informer que les visites publiques du CERN
sont annulées jusqu'à nouvel ordre*

- Les expositions et la boutique sont fermées jusqu'à nouvel ordre
- Toutes les visites guidées sont annulées jusqu'à nouvel ordre
- Plus d'information sur visit.cern/fr/covid-19

Nous vous remercions de votre compréhension



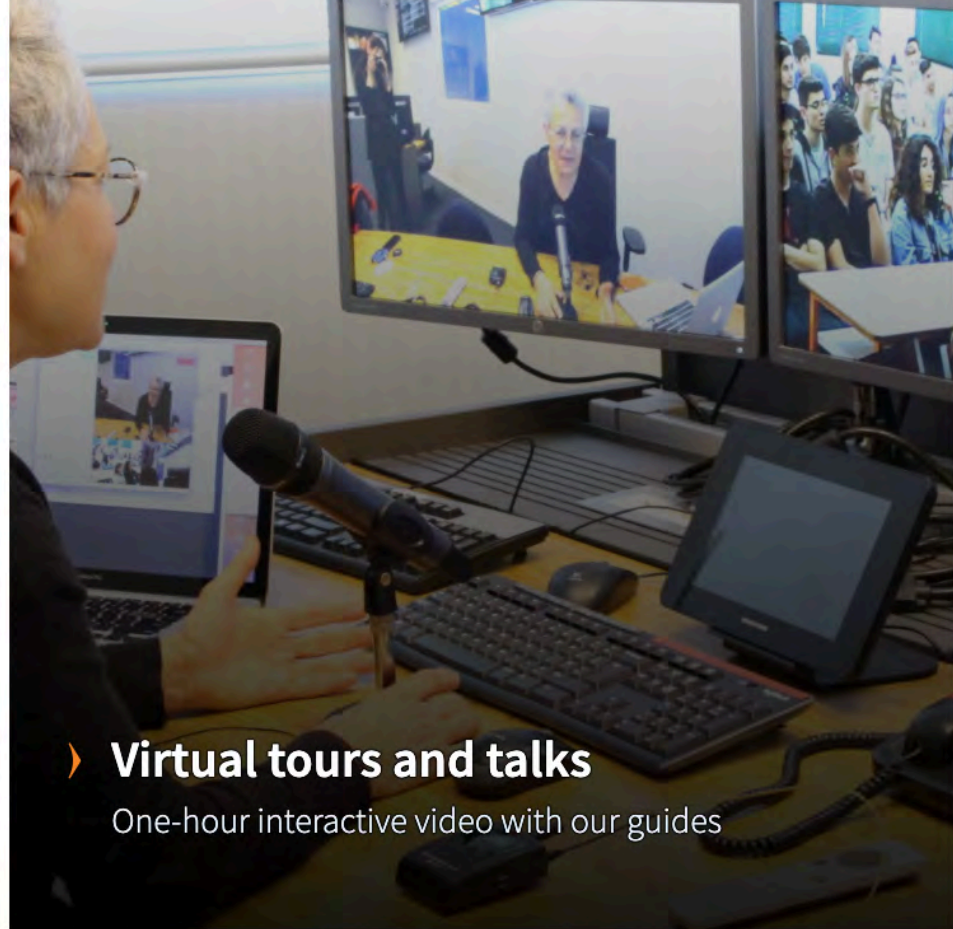
► visit.cern



› Discover CERN online

Virtual tours, videos, games, etc.

<https://visit.cern/discover>



› Virtual tours and talks

One-hour interactive video with our guides

6000

5000

4000

3000

2000

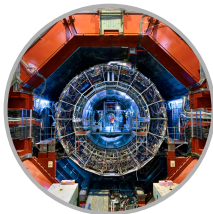
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S'Cool LAB website visits

04/03/2020 11/03/2020 18/03/2020 25/03/2020 01/04/2020 08/04/2020 15/04/2020 22/04/2020 29/04/2020 06/05/2020 13/05/2020 20/05/2020 27/05/2020 03/06/2020 10/06/2020 17/06/2020 24/06/2020 01/07/2020 08/07/2020 15/07/2020 22/07/2020 29/07/2020





Transparency



Knowing our
audiences



Balancing
local and
global



Through
partnerships

Education, Communications and Outreach

For discussion

Many of the activities described in these slides are opportunities for science communication experience **for you**

1. Which? How?
2. What benefits do you see in taking part in these activities?
3. What obstacles would there be to you taking part?



Thank you
See you soon...at CERN!

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