

What are we doing here?

CERN as an engine of scientific collaboration;
IdeaSquare as the innovation space at CERN.

October 31st 2022
Catarina Batista





Lila Mabiala
Communications



Laura Wirtavuori
Edu programmes



Ole Werner
Edu programmes



Dina Zimmerman
Prototyping



Markus Nordberg
Cosmic Janitor



Pablo Garcia Tello
Designated in-house Physicist



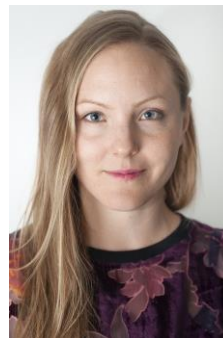
Laëtitia Pedroso
Events



Catarina Batista
Edu programmes



Claudia Marcelloni
Communications



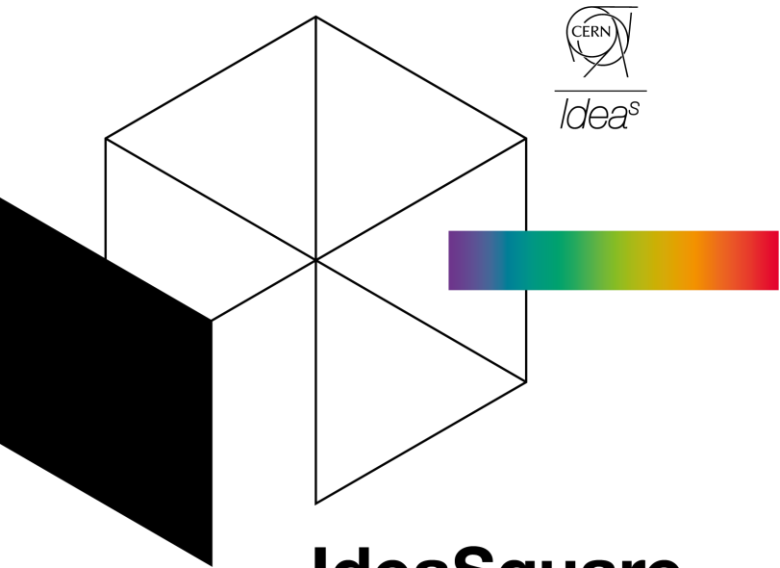
Tuuli Utrainen
Cosmic collaborator

Who am I to talk to you

Catarina Batista

- Mindset Accelerator at CERN IdeaSquare
- BA Organisational Communication, Post-grad Product and Service Innovation, MSc Psychology (getting there).
- Passionate about education.
- European nomad, generalist and animal lover.





IdeaSquare

The innovation space at CERN

General building safety rules

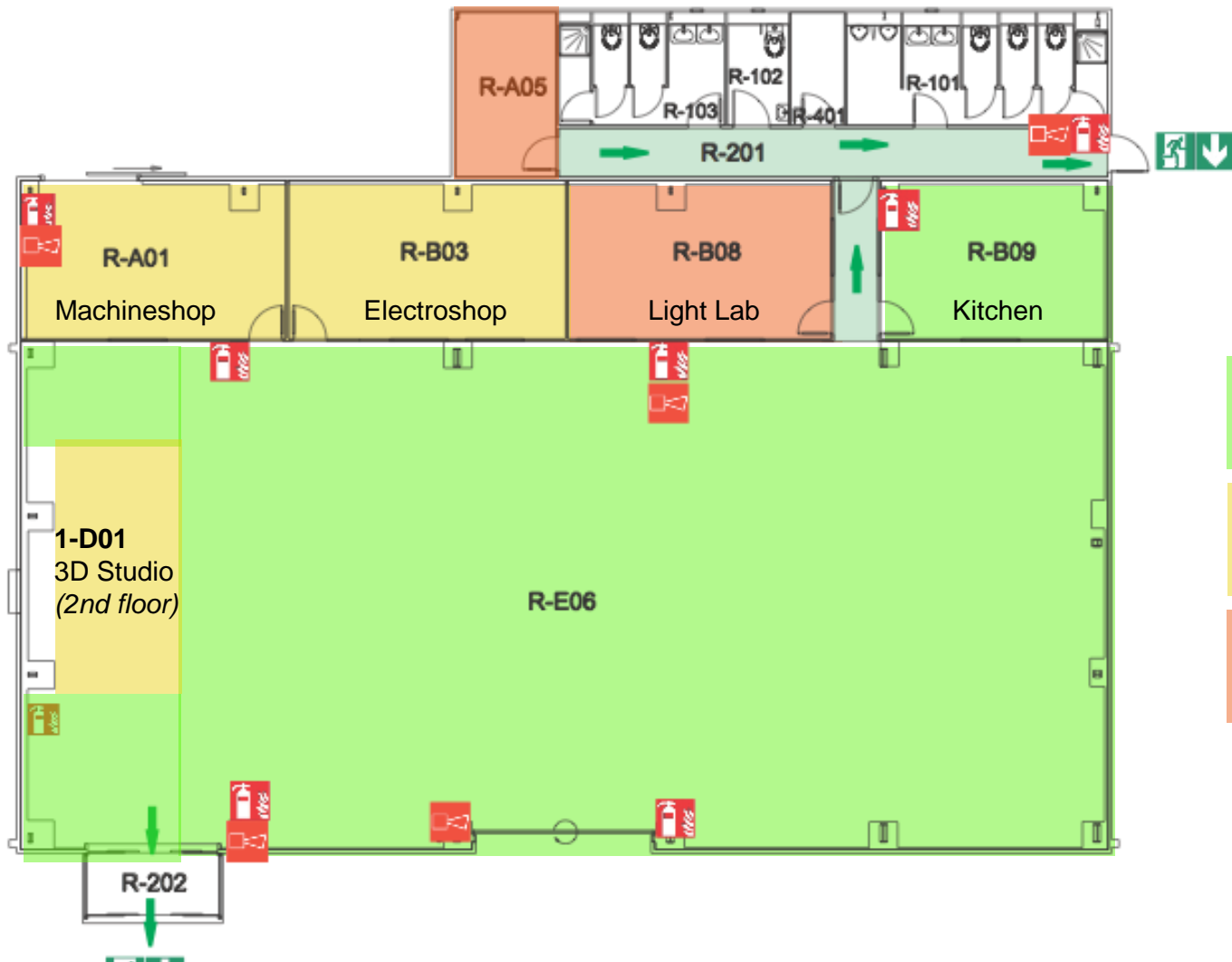


Safety is first priority.

BUILDING SAFETY B3179



- In all inside areas of Building 3179 **smoking & alcoholic beverages is strictly forbidden.**
- Working is possible 24/7 with CERN access card, **sleeping is prohibited in all CERN buildings.**
- Eating, drinking, coffee breaks are encouraged in the kitchen (and open) area. But not in the Red Bus, please!
- Cameras, **photos**, posting in social media **are highly encouraged :)**



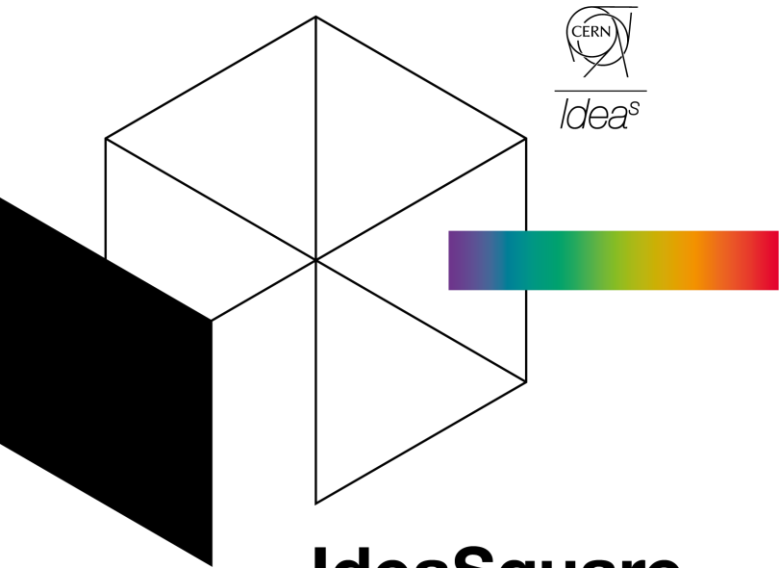
- Free to use
- Work under supervision
- Restricted area



Keep in mind that you are on CERN site



- CERN is a working place. Respect the work of others.
- Do not go to unauthorized areas. You should always be accompanied by an authorized person (with CERN access card).
- No loud music please and keep your workplace tidy. Any help in tidying up is very appreciated (like the Ideasquare kitchen)!
- For CERN ways of working, see [CERN Code of Conduct](#).



IdeaSquare
The innovation space at CERN

Workshops and laboratories safety

WORKING AREA POLICY B3179



In laboratory areas:

- **Machinshop** 3179-R-A01
- **Electroshop** 3179-R-B03 and
- **3D Studio** 3179-1-D01

Eating and drinking are strictly forbidden.

For **grey room** (Light Lab 3179-R-B08) and **dark room** (3179-R-A06) areas access is **restricted to authorised personnel only.**

WORKSHOP SAFETY B3179



Safety is first priority! In:

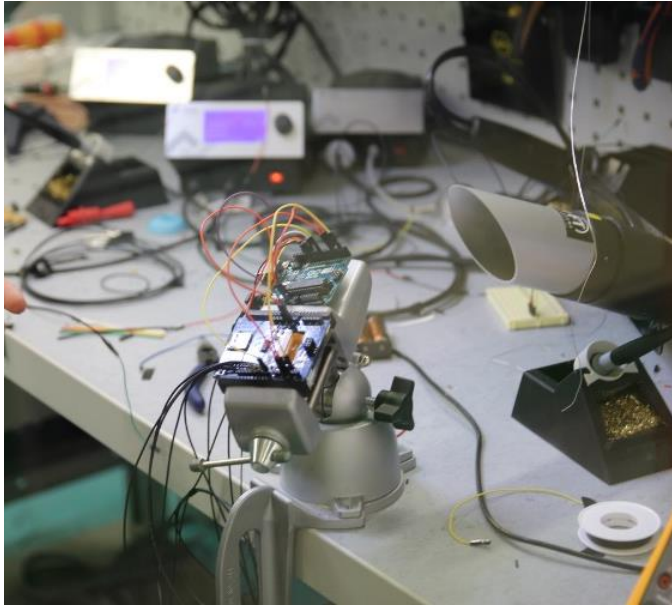
- Machinshop 3179-R-A01,
- Electroshop 3179-R-B03,
- 3D Studio 3179-1-D01

working is conducted “under supervision”.

i.e. When you want to use the workshops:

- Come talk to us (Dina/Markus/Johann) what would you like to do and we'll figure it out together what is the easiest and fastest way to do it safely.

Workshop Safety



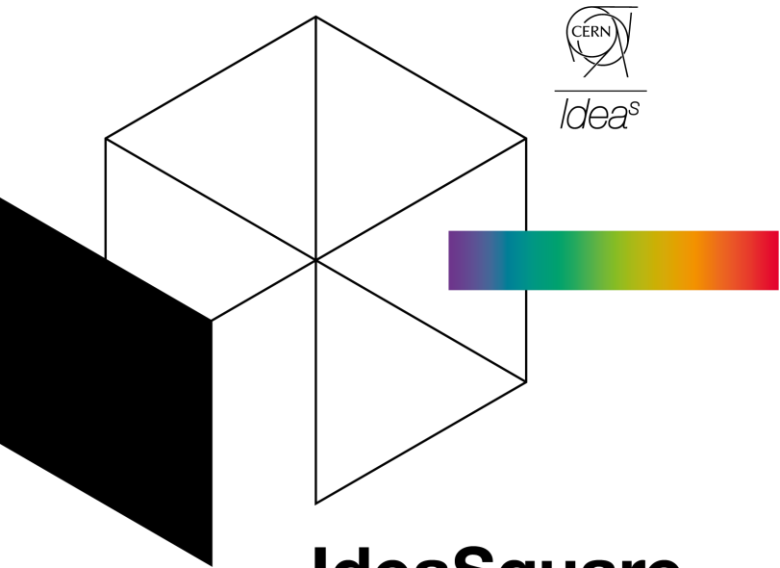
You are allowed to modify things, you are not allowed to modify yourself.

- Jami Sarnikorpi

- Handheld tools? OK
- Electrically powered tools? Check with **Dina**
- Do not work alone

Don't know how something works? Ask!

Make sure to unplug electrical equipment when you are not using it. This is especially important for the glue guns.



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The innovation space at CERN

Emergency evacuation procedure

In case of an emergency

While evacuating, always **go away from the danger!**



Do NOT return
to collect your
belongings



Walk quickly and calmly to your
building's designated **assembly point** or as
advised by an Emergency Guide or Fire
Brigade personnel



**Wait at the assembly
point until counted
and released** by the
TSO/DSO or the Fire
Brigade.

Give to the Fire Brigade all the information they need! **+41 22 767 44 44**



In case of an emergency



- If needed, press **Fire Alarm** (see map on next slide)
- If **electric danger** present, **press Emergency Stop switch** - located in each workshop area right next to the door
- Contact Fire Brigade, tel. +41 22 76 74444 (or internally, 74444)
- Go to the assembly point in front of the Globe, stay there until Fire Brigade gives you permission to leave.
- Notify immediately:
 - TSO Johann Poirot, johann.poirot@cern.ch, tel. +41 75 411 8883 (or internally, 168883)
 - Markus Nordberg, markus.nordberg@cern.ch, tel. +41 75 411 4452 (or internally, 164452)

EVACUATION

-  A l'audition du signal
When the alarm rings
-  Fermez portes et fenêtres
Close doors and windows
-  Suivez le balisage
Follow the signs
-  N'utilisez pas l'ascenseur
Do not use the lift
-  Se rendre au point de rassemblement
Report to the assembly point

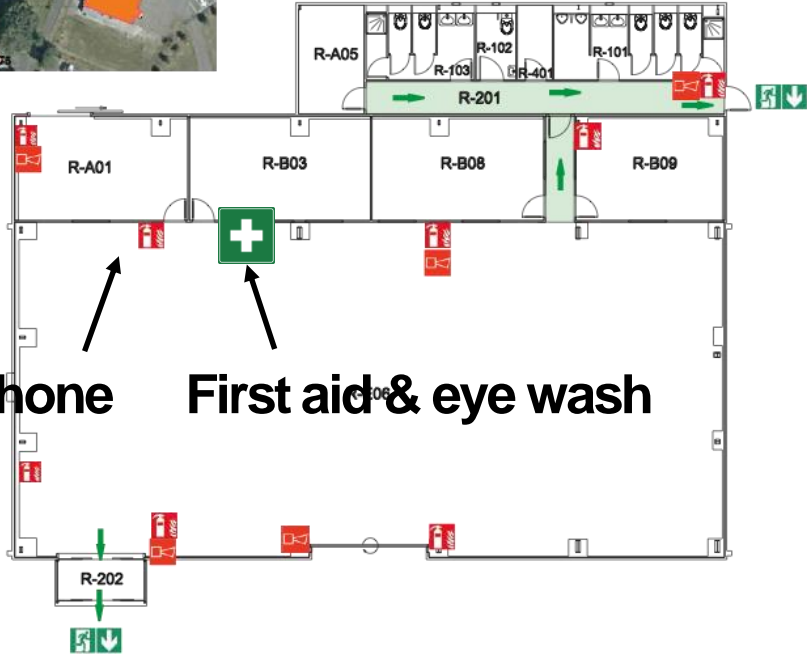


CONSIGNE d'URGENCE / EMERGENCY PROCEDURE





BATIMENT 3179- Etage R / BUILDING 3179 - Floor R



- ### INCENDIE/FIRE
-  112 ou 7 44 44
 -  Donnez l'alarme
Set off the alarm
 -  Prévenez les autres personnes
Inform others
 -  Fermez portes et fenêtres
Close doors and windows
 -  N'utilisez pas l'ascenseur
Do not use the lift
 -  Combattez le feu
Start fighting the fire



Phone **First aid & eye wash**

-  Extincteur / Fire Extinguisher
-  Alarme d'évacuation
Evacuation alarm
-  Voie d'évacuation / Escape route
-  Sortie de secours
Emergency exit



Things you can avoid for these 2 weeks

- ...climbing on top of the containers or the bus
- ...consuming or storing alcohol inside IdeaSquare
- ...entering unauthorised areas
- ...walking around without your visitor card and ID

Keeping places tidy

- Please, Please Me:
 - Bring all coffee cups, plates, dishes to kitchen, and put them inside the dish washer in status “Dirty”.
 - Clean more than you mess, to fight our common enemy called Entropy.
 - Help collaboratively to clean up the space at the end of the day.

Thank you!

Greetings, the IdeaSquare Fairy named Markus



Idea^s
THINK. DO. COLLABORATE.



COVID is still here, unfortunately...

How **NOT** to Wear a Mask



"The Escape Hatch"



"The Earring"



"The Sniffer"



"The Stache"



"The Nose Plug"



"The Neckbeard"

- Masks are highly recommended inside IdeaSquare.
- Try to avoid having too many people in one room.
- Don't come in if you are feeling sick.
- Please do let us know if you get sick.

Room occupancy



Try not to crowd each room or container.

Keeping to 5-6 people each is a good rule of thumb.

Kitchen

6 people max,
please.

Cooking is allowed
provided that the
number of people
inside is not
exceeded.





This is a CO₂ monitoring device, as part of our COVID measures.

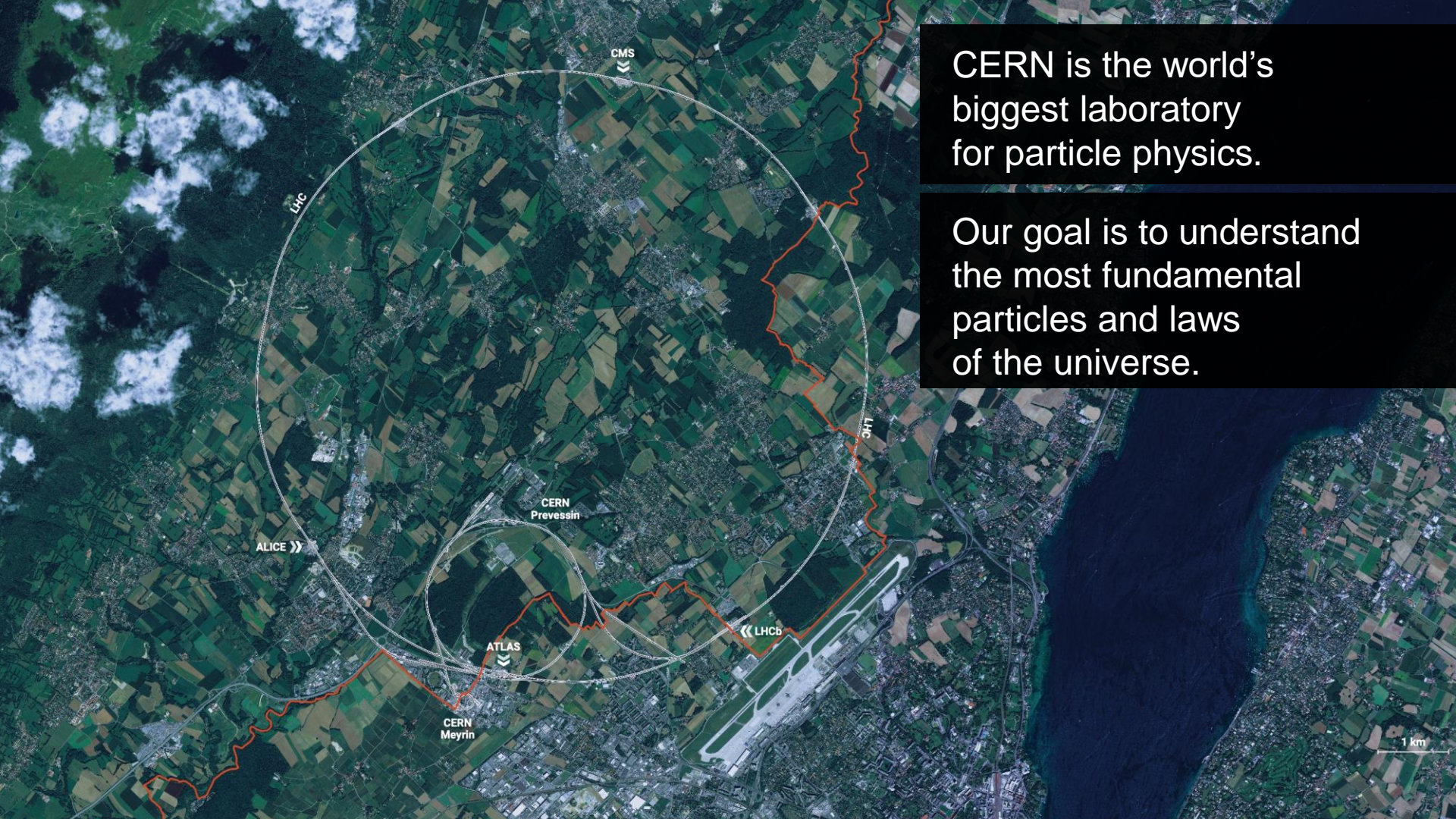
There is one in every room or container inside ID2.

If the value exceeds 900ppm:

- Leave the room you are in to let it ventilate until the CO₂ concentration falls below 600 ppm. ;
- Ask one of the ID2 members to open the main doors to ventilate the entire space.



Where are we...?



CERN is the world's biggest laboratory for particle physics.

Our goal is to understand the most fundamental particles and laws of the universe.

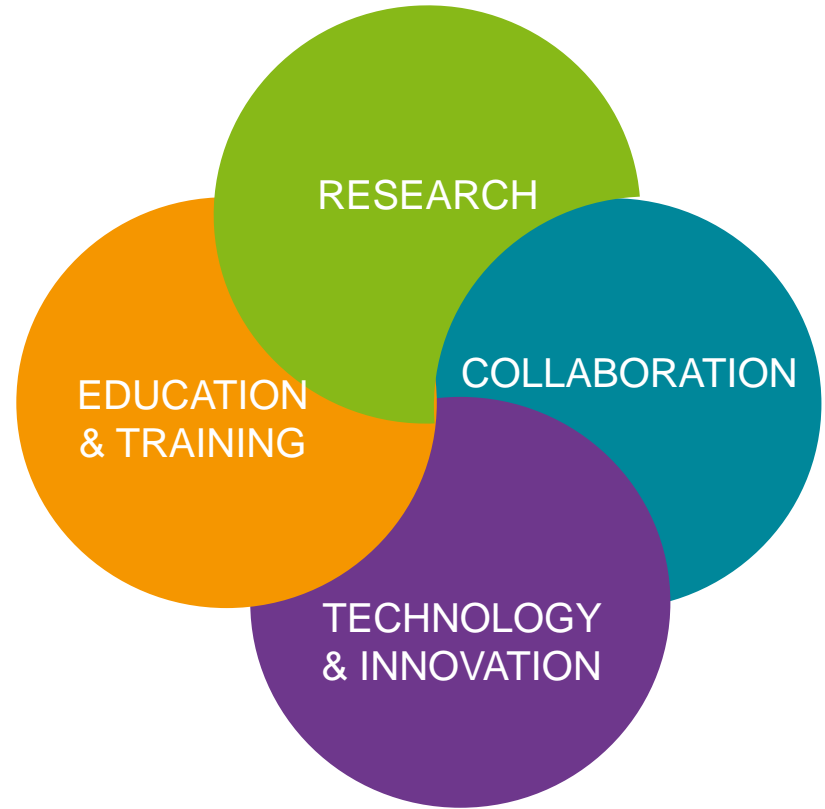
CERN's Mission

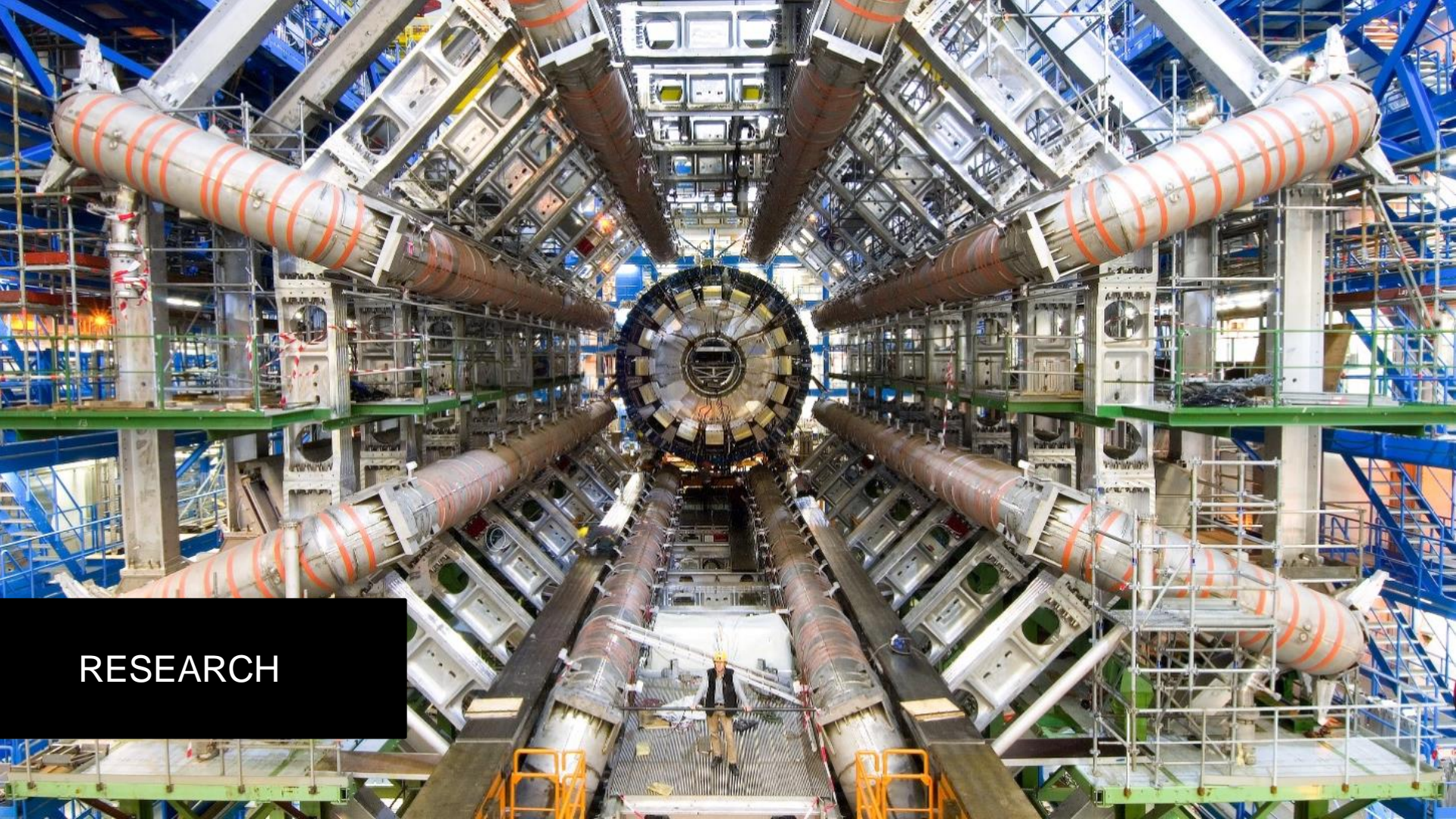
$$\begin{aligned}\mathcal{L} = & -\frac{1}{4} F_{\mu\nu} F^{\mu\nu} \\ & + i\bar{\psi}\not{D}\psi + h.c. \\ & + \chi_i Y_{ij} \chi_j \phi + h.c. \\ & + |D_\mu \phi|^2 - V(\phi)\end{aligned}$$

CERN is a peace project, funded in the wake of the second world war that aims to:

- *Push back the frontiers of knowledge;*
- *Answer questions about the beginning and the nature of the universe;*
- *Unite people from different countries and cultures;*
- *Train scientists and engineers of tomorrow;*
- *Develop new technologies for accelerators and detectors and other new solutions , such as more effective cancer treatment.*

Four pillars that underpin CERN's mission

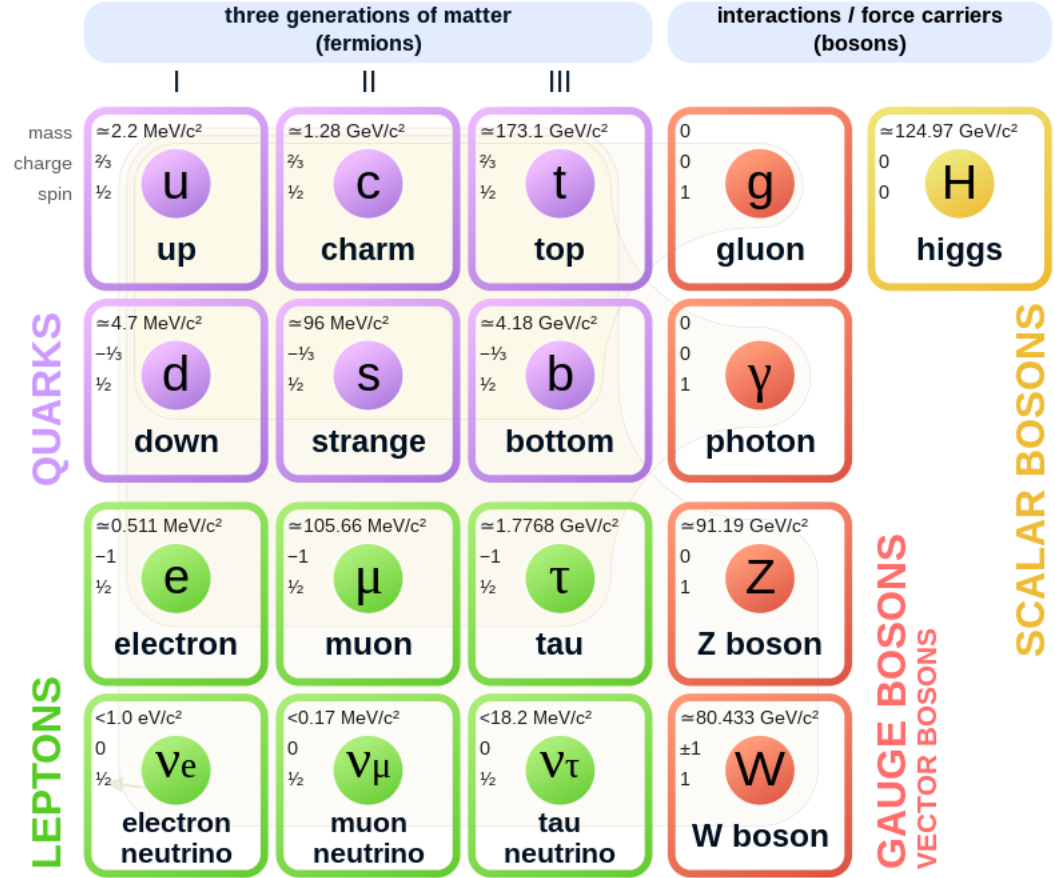




RESEARCH

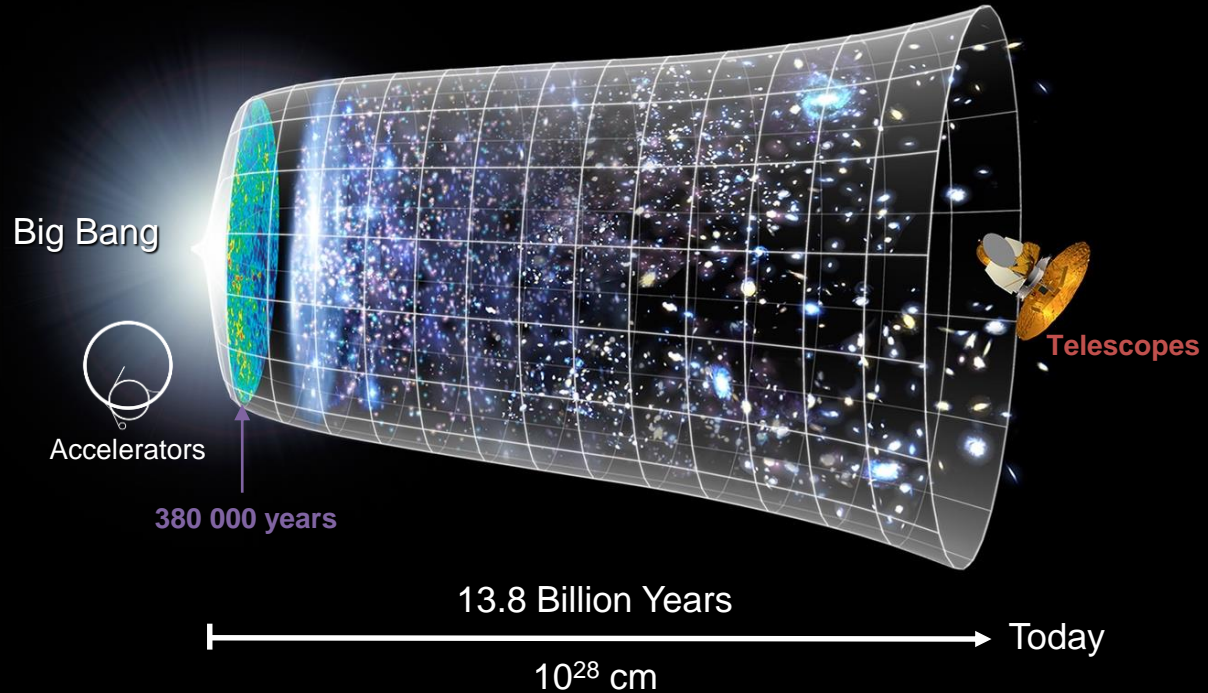
What is the universe made of?

Standard Model of Elementary Particles



How did the universe begin?

We reproduce the conditions a fraction of a second after the Big Bang, to gain insight into the structure and evolution of the universe.

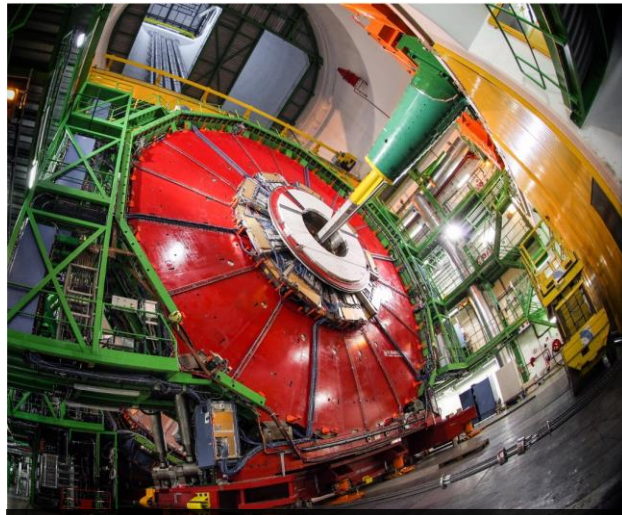


How do we do it?

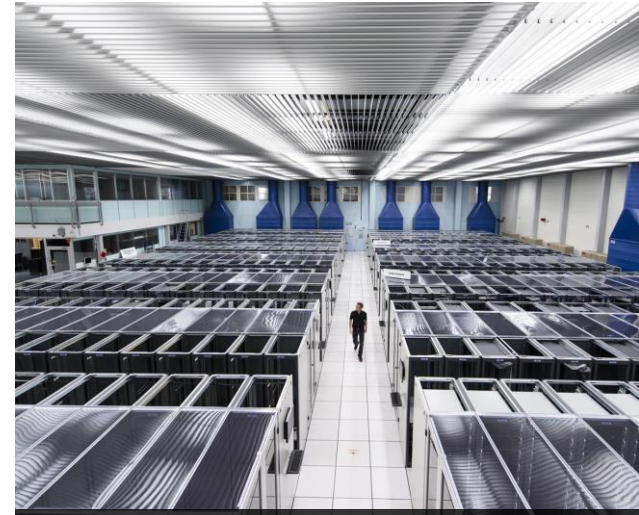
- We build the largest machines to study the smallest particles in the universe.
- We develop technology to advance the limits of what is possible.



ACCELERATORS



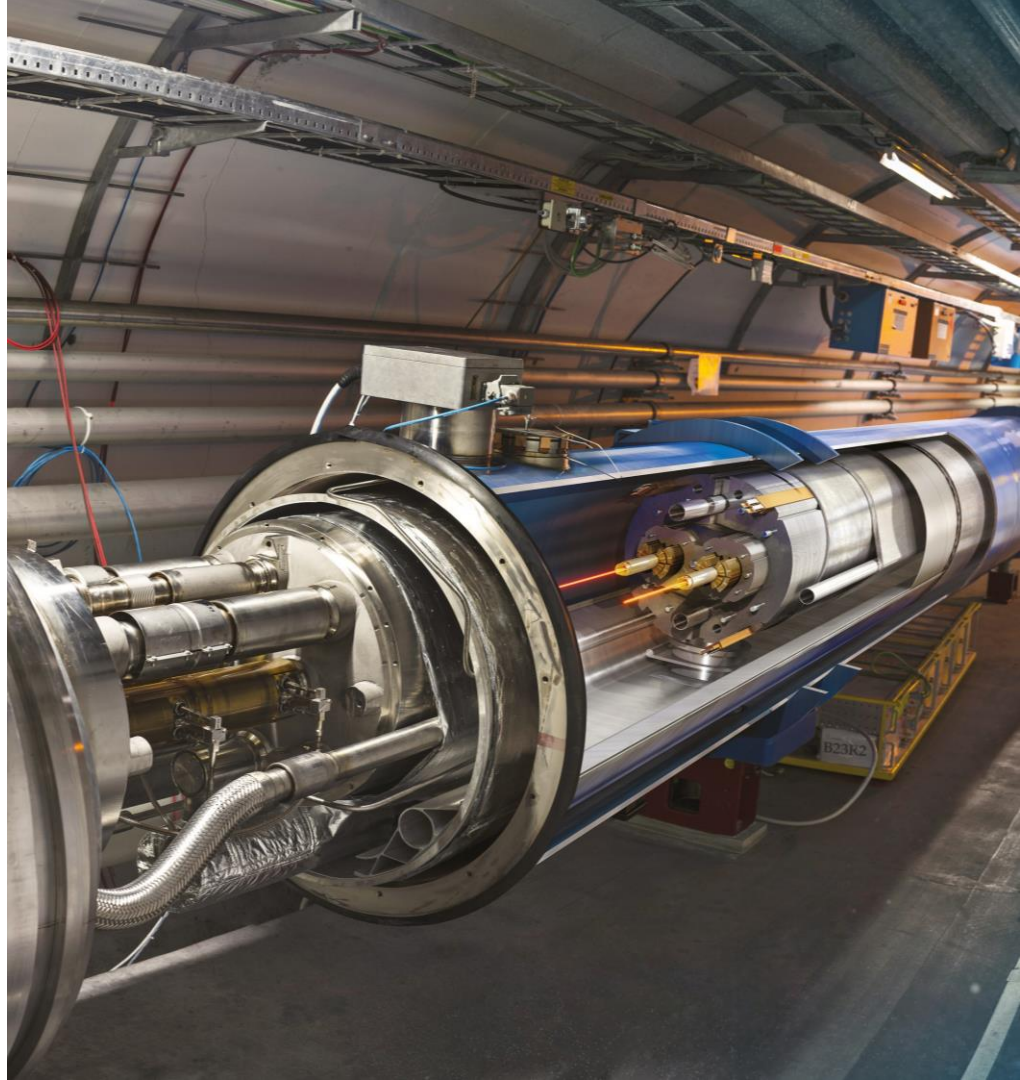
DETECTORS



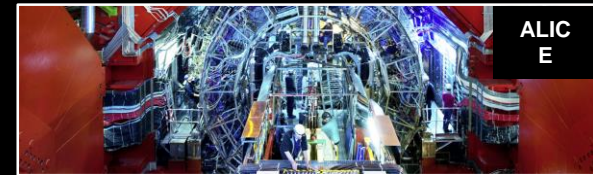
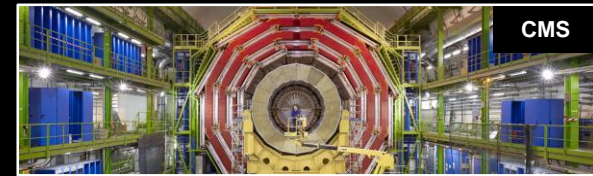
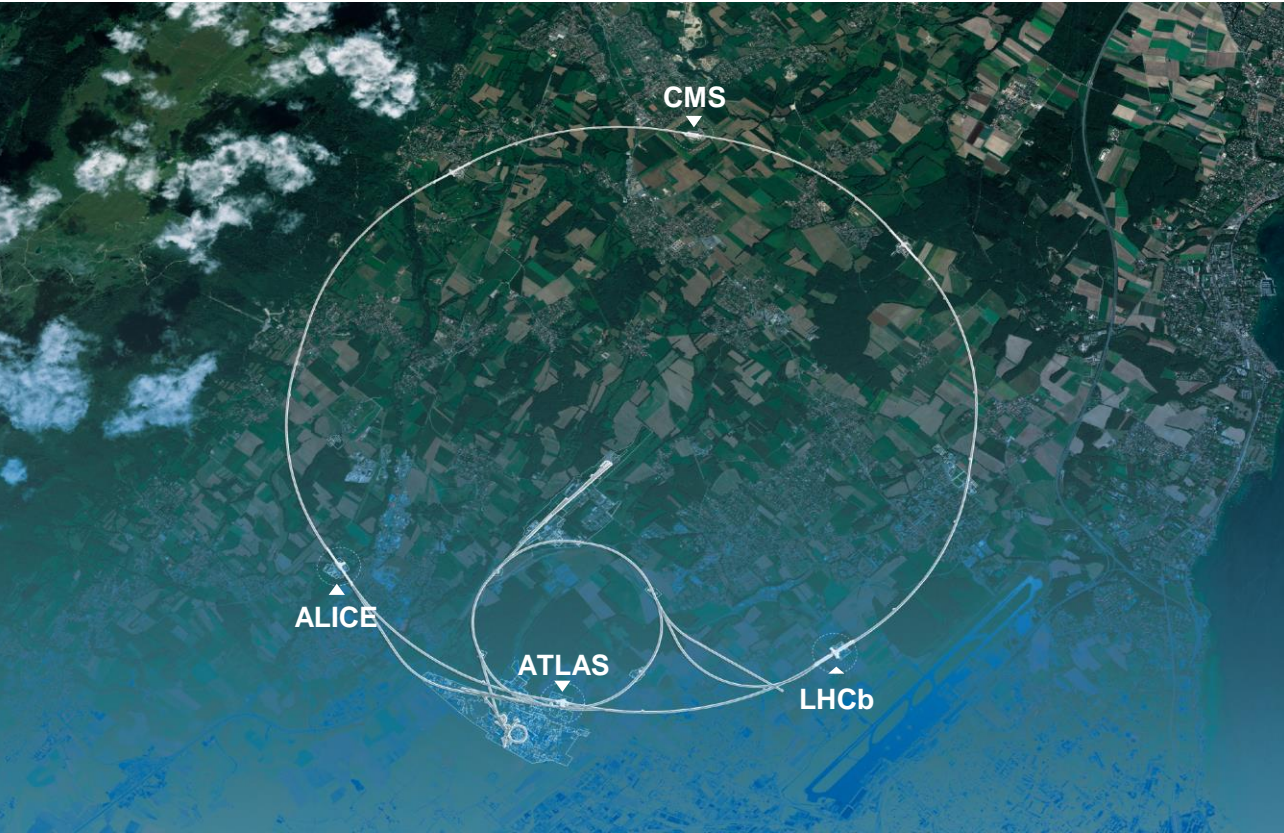
COMPUTING

Large Hadron Collider (LHC)

- 27 km in circumference
- About 100 m underground
- Superconducting magnets steer the particles around the ring
- Particles are accelerated to close to the speed of light



Giant detectors record the particles formed at the four collision points



Are we done? Not quite...

There are many
unanswered
questions
in fundamental
physics

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?



COLLABORATION

A laboratory for people around the world



Geographical & cultural diversity
Users of 110 nationalities
~ 23% women

Member States 6632

Austria 82 – Belgium 122 – Bulgaria 37 – Czech Republic 221
Denmark 35 – Finland 79 – France 794 – Germany 1185
Greece 138 – Hungary 67 – Israel 63 – Italy 1388
Netherlands 166 – Norway 78 – Poland 272 – Portugal 80
Romania 99 – Serbia 35 – Slovakia 66 – Spain 325
Sweden 96 – Switzerland 329 – United Kingdom 875

Associate Member States 27 in the pre-stage to membership

Cyprus 11 – Slovenia 16

Associate Member States 390

Croatia 38 – India 151 – Lithuania 13 – Pakistan 35
Turkey 124 – Ukraine 29

Observers 3071

Japan 211 – Russia 1021 – United States of America 1839

Other countries 1279

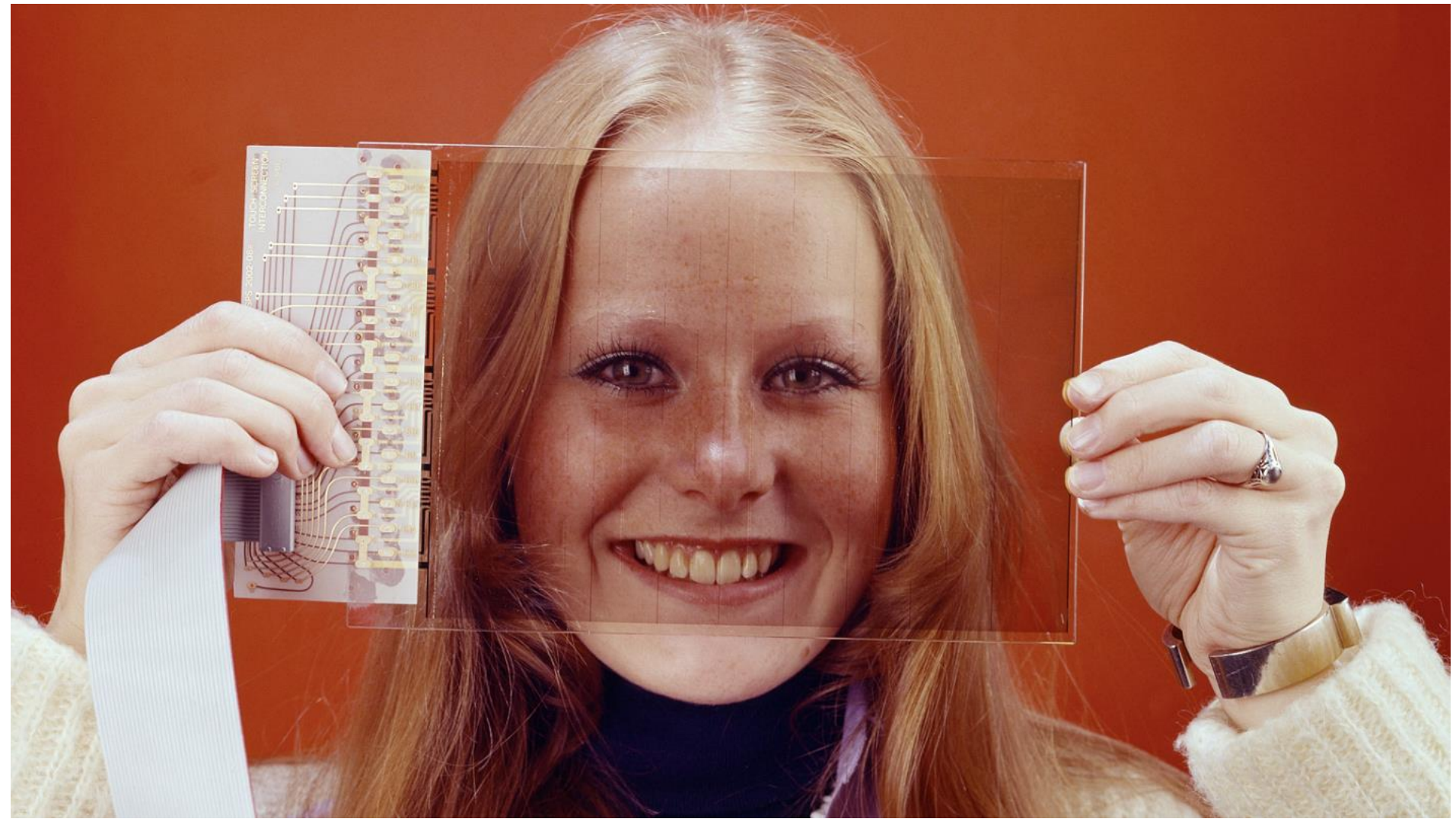
Algeria 2 – Argentina 15 – Armenia 10 – Australia 23 – Azerbaijan 2 – Bahrain 2 – Belarus 26 – Brazil 108 Canada 196 – Chile 22 – Colombia 15 – Cuba 3 – Ecuador 4 – Egypt 14 – Estonia 26 – Georgia 35
Hong Kong 20 – Iceland 3 – Indonesia 7 – Iran 13 – Ireland 6 Kuwait 2 – Latvia 6 – Lebanon 17
Malaysia 4 – Malta 3 – Mexico 49 – Montenegro 5 – Morocco 18 – New Zealand 11 – Oman 1
People's Republic of China 334 – Peru 2 – Puerto Rico 2 – Republic of Korea 132 – Singapore 3
South Africa 57 – Sri Lanka 8 – Taiwan 50 Thailand 16 – United Arab Emirates 2

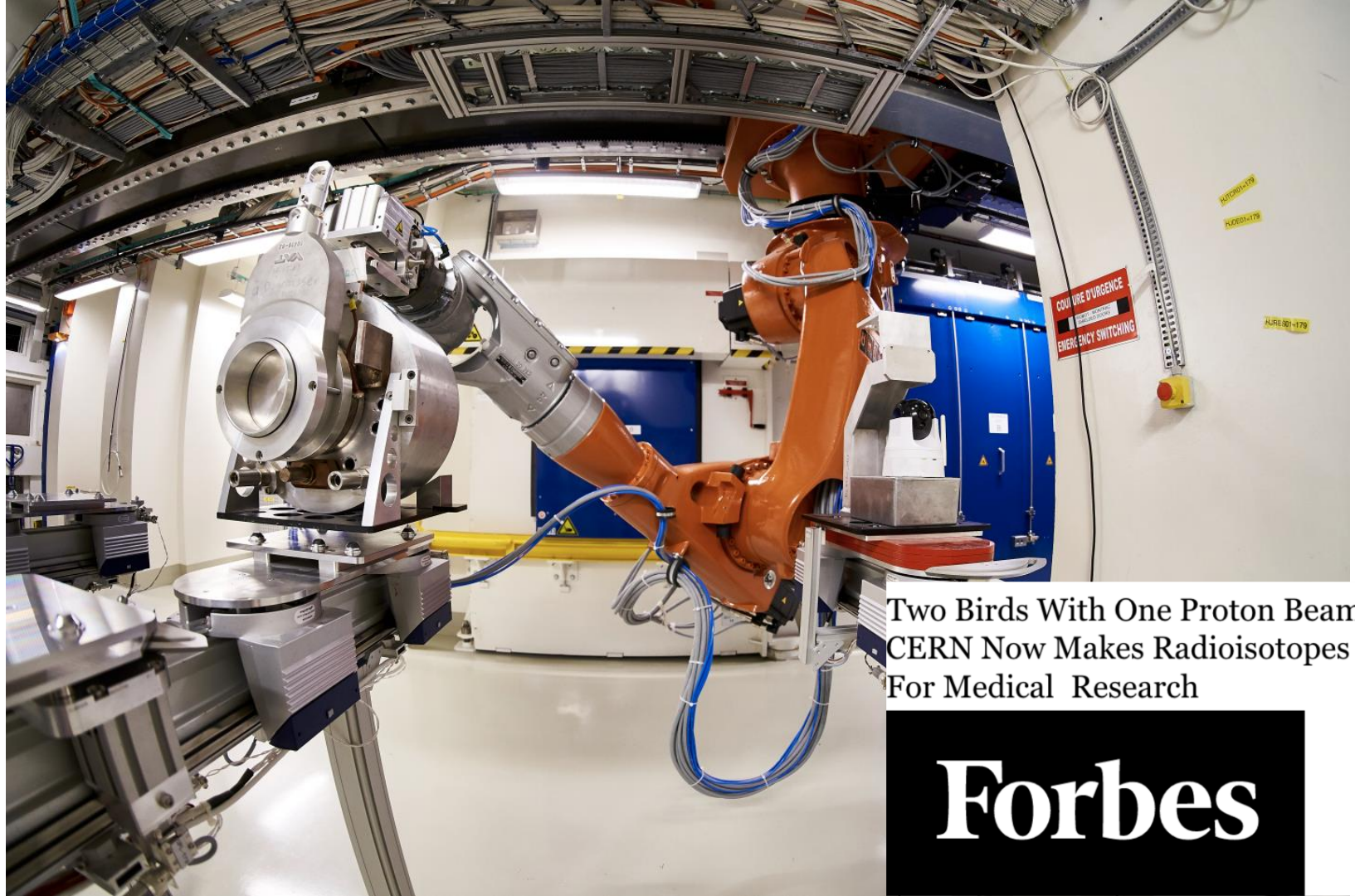




TECHNOLOGY
& INNOVATION







Two Birds With One Proton Beam:
CERN Now Makes Radioisotopes
For Medical Research

Forbes



EDUCATION
& TRAINING

CERN trains the next generation of physicists, engineers and technicians

>3000 PhD students are registered at CERN.

600 PhD theses are completed each year.

300 undergraduate students in Summer programmes.



~800 fellows in research and applied physics, engineering and computing.

~200 Technical and Doctoral Students in applied physics, engineering and computing.

CERN organises schools for undergraduates and postgraduates, in all regions.

An aerial photograph of the CERN campus in Geneva, Switzerland. The central feature is the large, brown, dome-shaped building, the Large Hadron Collider (LHC) tunnel entrance. To the left, there is a large parking lot filled with cars. To the right, there are several white buildings and more parking areas. The background shows a mix of industrial and residential buildings under a clear sky. Two dark grey callout boxes are overlaid on the image. The first box on the left contains the text 'CERN Science Gateway' and 'Aka big noisy construction site outside'. A red arrow points from this box to a large, empty parking lot area. The second box on the right contains the text 'CERN IdeaSquare'. A red arrow points from this box to a white building complex on the right side of the image.

CERN Science Gateway

Aka big noisy construction site outside

CERN IdeaSquare

CERN Science Gateway



- CERN's new education and outreach centre for all publics aged 5-plus.

- Opening beginning of 2023.

- Immersive exhibitions, education labs, events and shows.



Coffee and Space Break

back in 10min

WHERE'S THE INTERNET?!

Registering your device in the CERN network

Go to the following link or scan the QR code



<http://cern.ch/register/VisitorComputer>

1. Fill in your personal details.

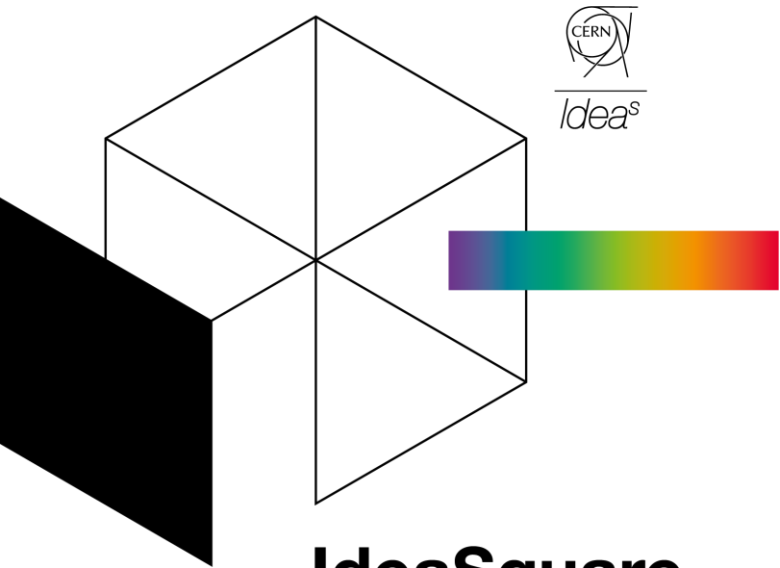
If the MAC address does not show up automatically, please retrieve it from your Phone/Laptop Settings Menu – it should be under hardware details or status. Click Next.

2. Select the correct dates.

3. Put Catarina Batista as contact person.

4. Click Register and wait for approval

5. Let the page refresh by itself



IdeaSquare
The innovation space at CERN

IdeaSquare

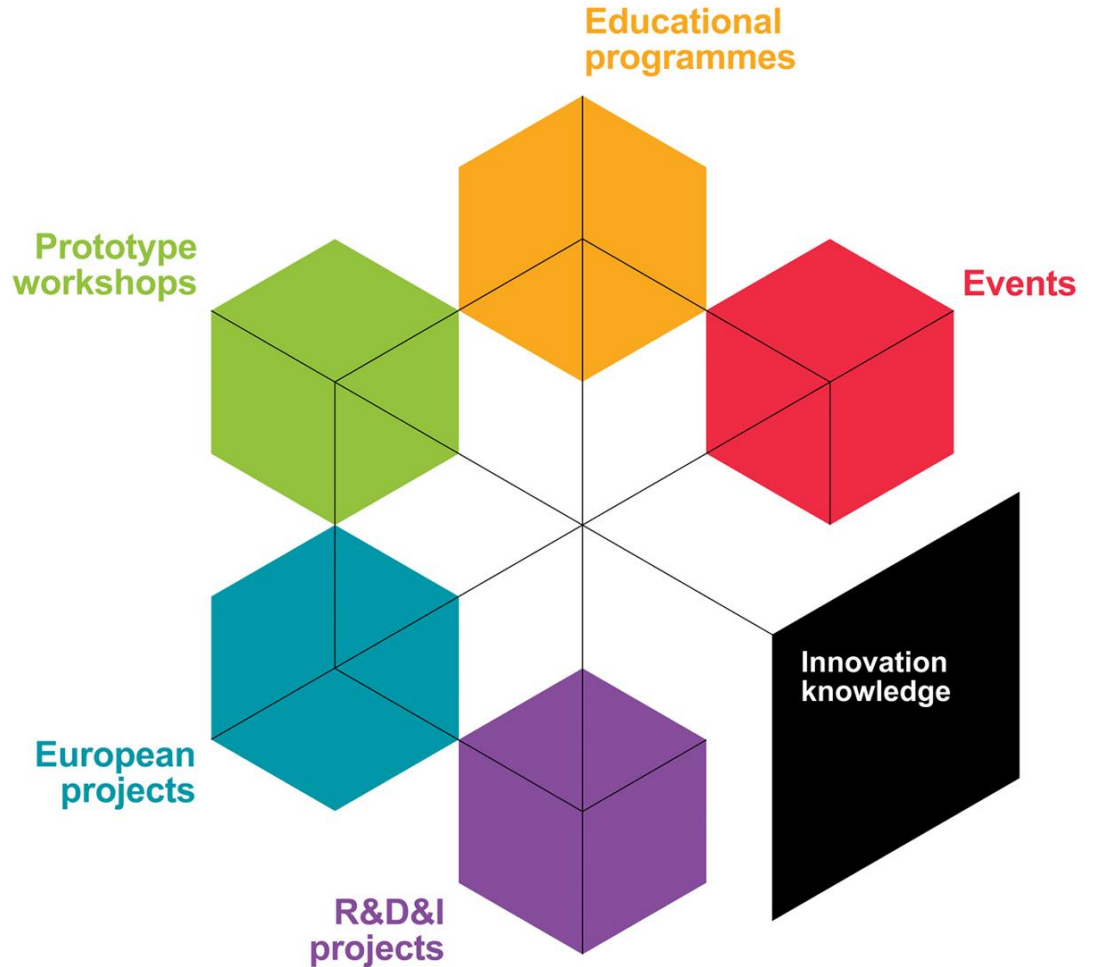
Why and How?

IdeaSquare

The Innovation Space at CERN

- collaborative methodologies
- access to CERN expertise
- cross-connectivity

To ideate solutions for the
future of humankind.





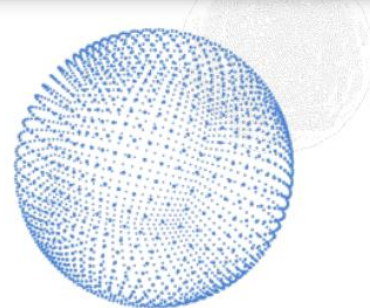
Why IdeaSquare?

We believe that for **fundamental change** to be made, we need **more than traditional** innovation **methods and mindsets.**

We enable students and innovators to **imagine a future** worth fighting for, and we give them the **tools and confidence** to start building that future.



Linking science innovation and the SDGs



Absorbing and reducing the risk to the market

Public funding

Private investment



**From ideas to
prototypes**

ATTRACT phase 1
Risk absorption

From prototypes to pre-market products

ATTRACT phase 2
Risk mitigation

**From pre-market
products to solutions**



**Connecting
curious minds**

Events, workshops and hackatons

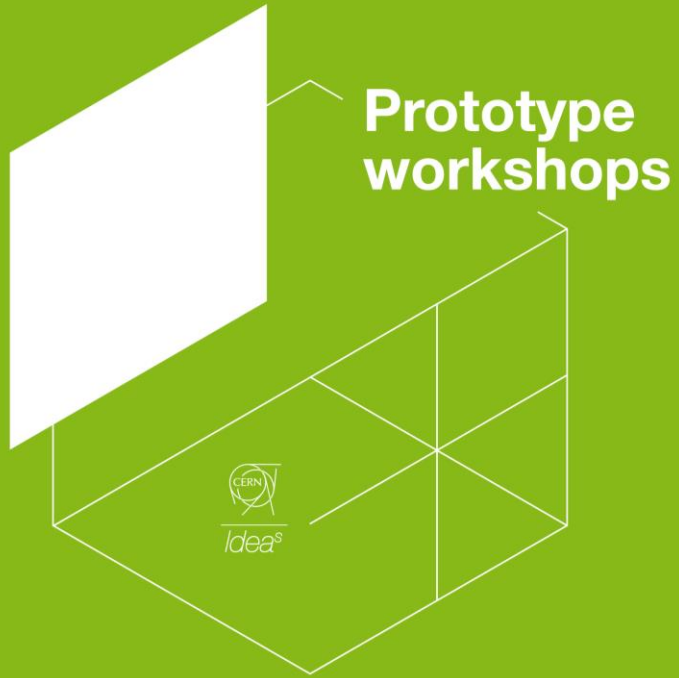


When the building is not in full use, Ideasquare can offer access to its open work areas, rapid prototyping facilities and its meeting rooms for short, deadline driven Challenge Events, such as :

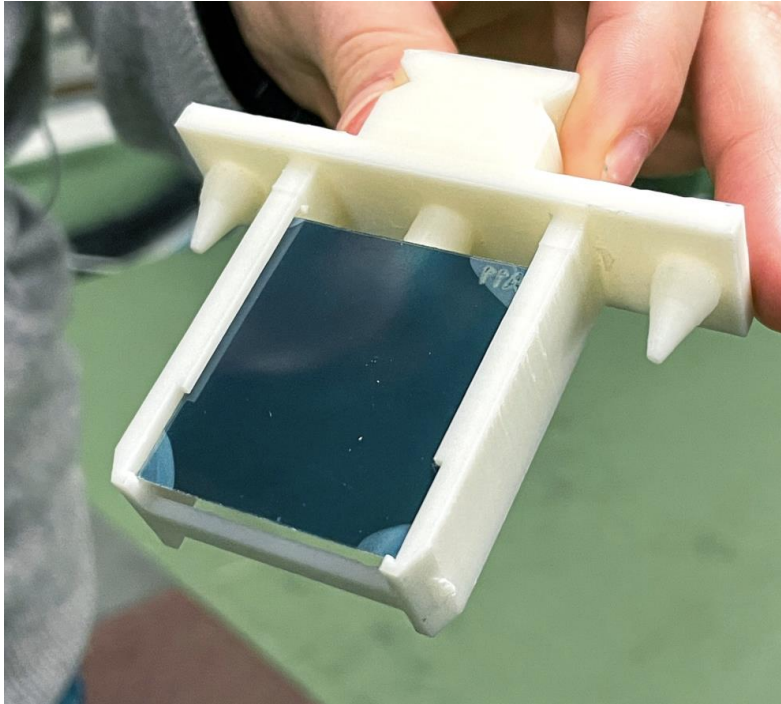
- Innovation Events,
- Workshops
- Hackathons (an event compressed into a short number of days where participants work towards a concept prototype).



Hackathon for the visually impaired for the development of the CERN Exhibitions



**Fast forward
through
prototyping**



- CLEAR primary focus is on general accelerator R&D and component studies for existing and possible future machines
- Prototyping and validation of accelerator components, and studies of high-gradient acceleration methods.
- Radiation hardness of electronic components for space and high-energy physics;
- Dosimetry for medical applications (cancer therapy).



Idea^s



**R&D&I
projects**

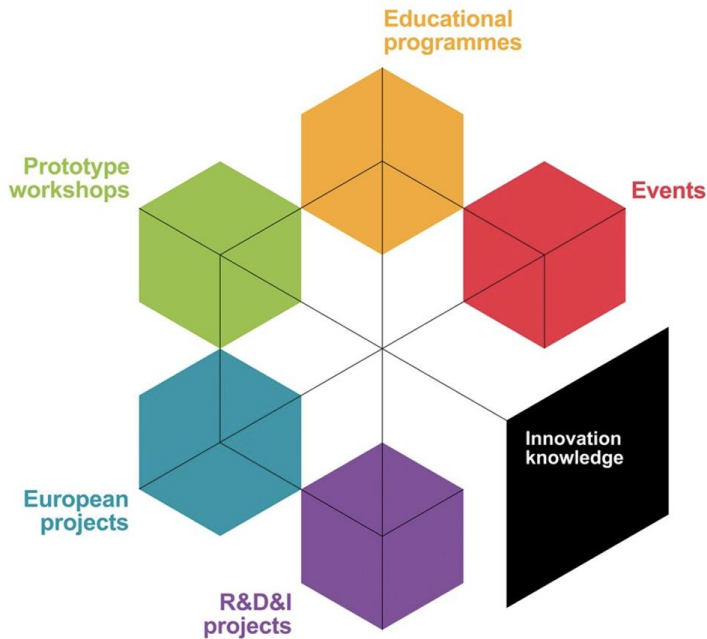
**Stimulating
instrumentation
in research**

Neutrino Platform



- Neutrino Platform (CENF) fosters fundamental research in the field of Neutrino Accelerator Physics
- CENF supports generic detector, neutrino beams R&D and large detector prototypes or demonstrators. It gives technical, financial and logistics support to approved projects
- Currently includes seven projects, including significant involvement in (Proto) DUNE
- CERN & IdeaSquare provides a facility for R&D on future technologies (HW and SW) and partner in several neutrino research programs

Innovation Knowledge



- IdeaSquare is uniquely positioned to collect knowledge on innovation practices.
- To collect and share this knowledge, we established CIJ – an open journal for experimental innovation.
- Additionally, our blogs and videos from the innovation café aim to harvest the success (or experimentations) stories of those at CERN that use our space or collaborate with us in any of our activities.

CIJ is only in its 5th edition and has already become a publication of reference for thought-provoking, contemporary and experimental innovation research. It has published 46 original papers and counted with the contribution of more than 250 authors from 20 countries around the world.

**Educational
programmes**



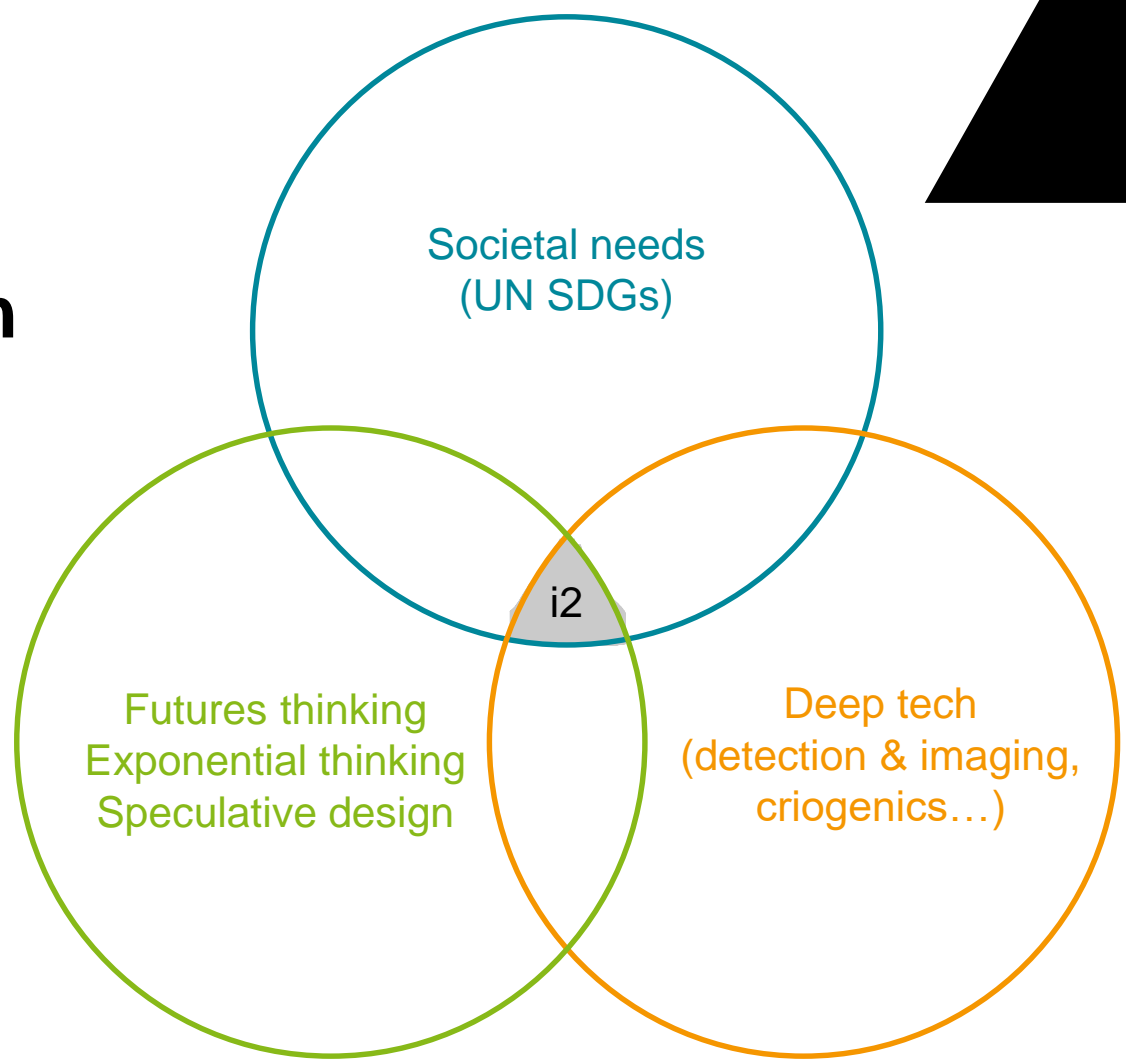
**Training and
experimenting
with the
innovators of the
future**

Challenge Based Innovation (CBI)



- **+22** active program collaborations;
- Universities from **8 different countries**;
- **Design Thinking** methods to solve global challenges, intersected with **deep tech**;
- **UN Sustainable Development Goals** as a lens in the process;
- **Multidisciplinary teams** of students: business, design, engineering, social sciences...
- CERN researchers who act as technological coaches.

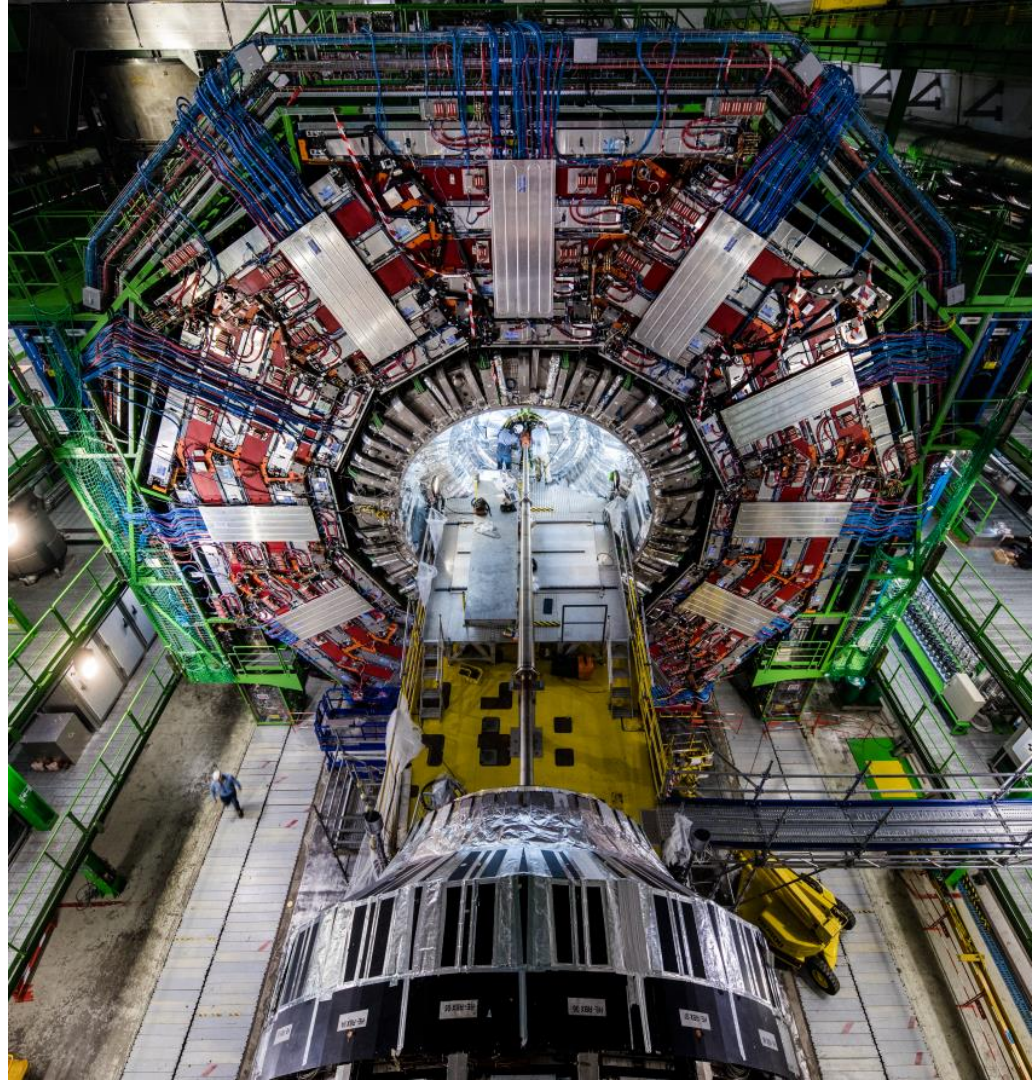
Intersecting societal challenges with deep tech



**Business as usual
is not in our DNA,
but we also don't
want any "magic"...**

Ideas should be disruptive, without:

- Breaking the laws of physics;
- Causing more harm than good.





Our specialties



- **Order of magnitude thinking (+ estimations!)**
 - Ideas should be disruptive enough to generate excitement
 - While also having a substantial basis behind - “Do the math”
- **Systemic and Exponential thinking**
 - Going for exponential ideas
 - Thinking in planetary levels
 - Nothing is so great that there is nothing bad: what are the implications of your solution?





**Join our
Alumni group!**





Contact us!
#CERNIdeaSquare
ideasquare.cern