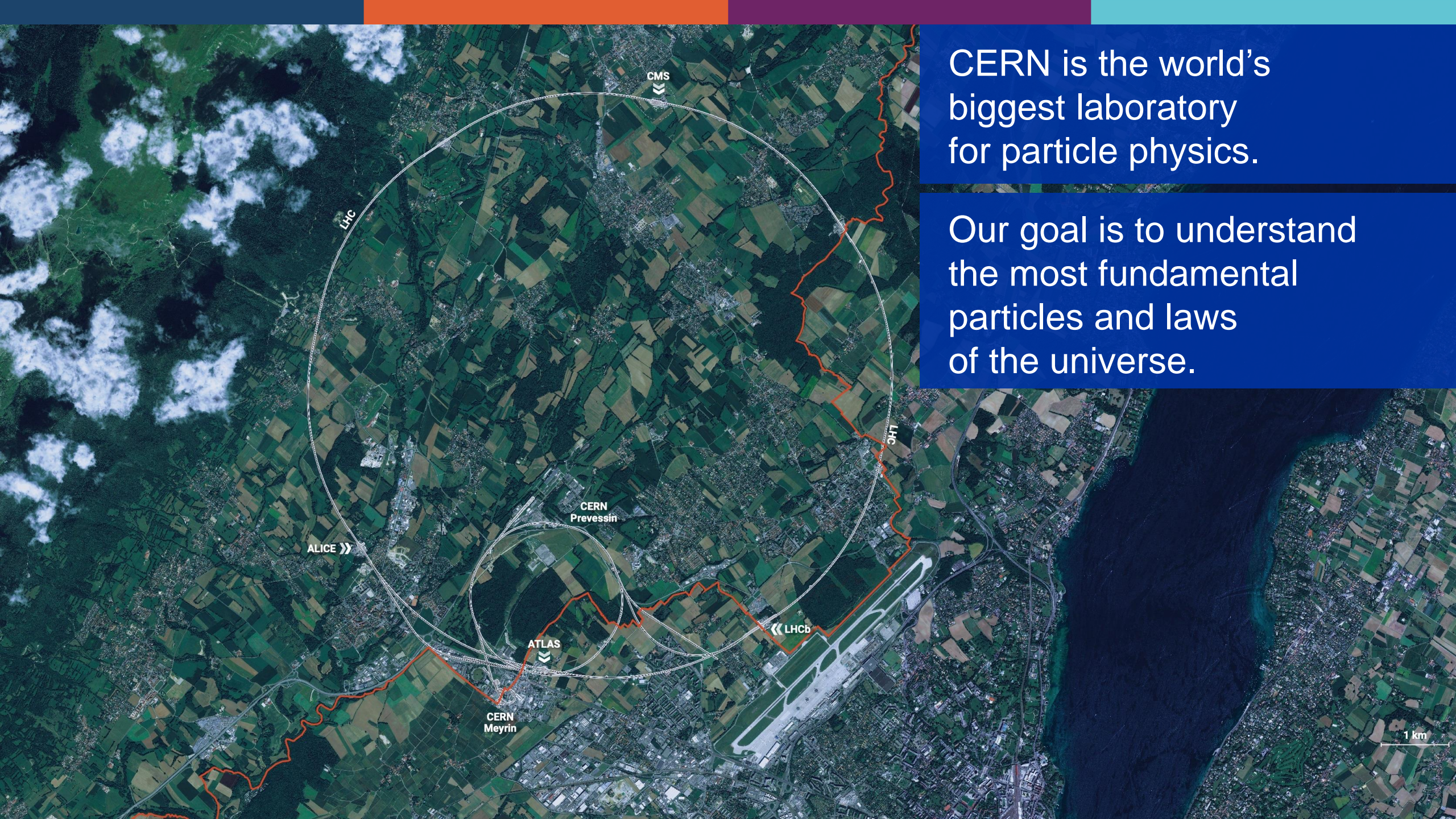


CERN – “Development of particle therapy technologies at CERN”



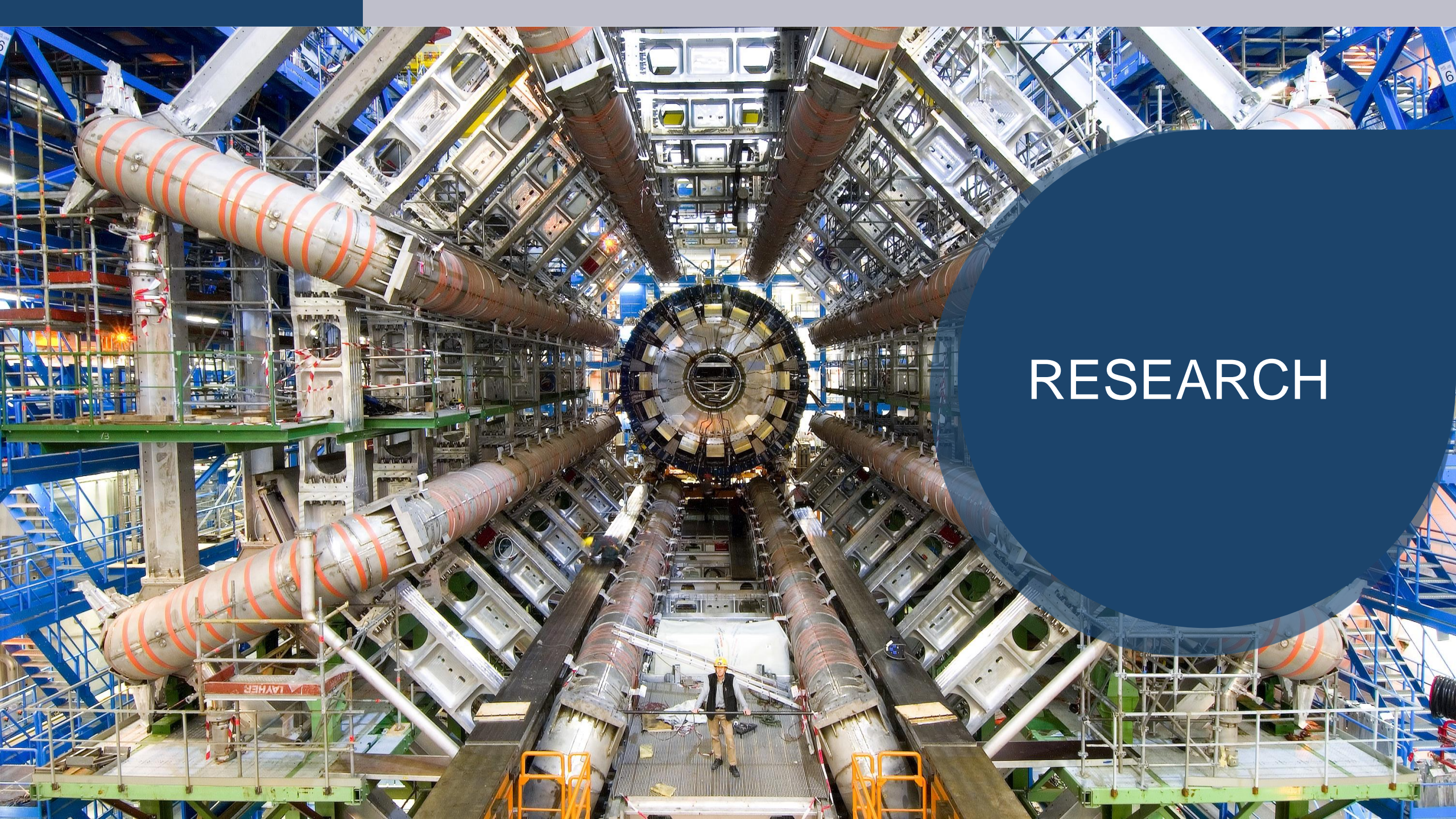
CERN is the world's biggest laboratory for particle physics.

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

1 km

Four pillars underpin CERN's mission



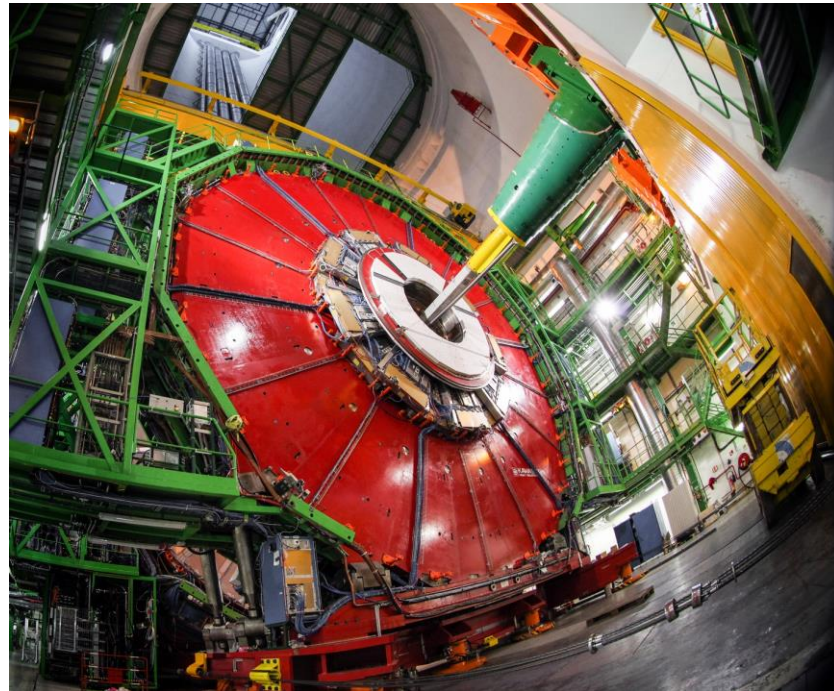


RESEARCH

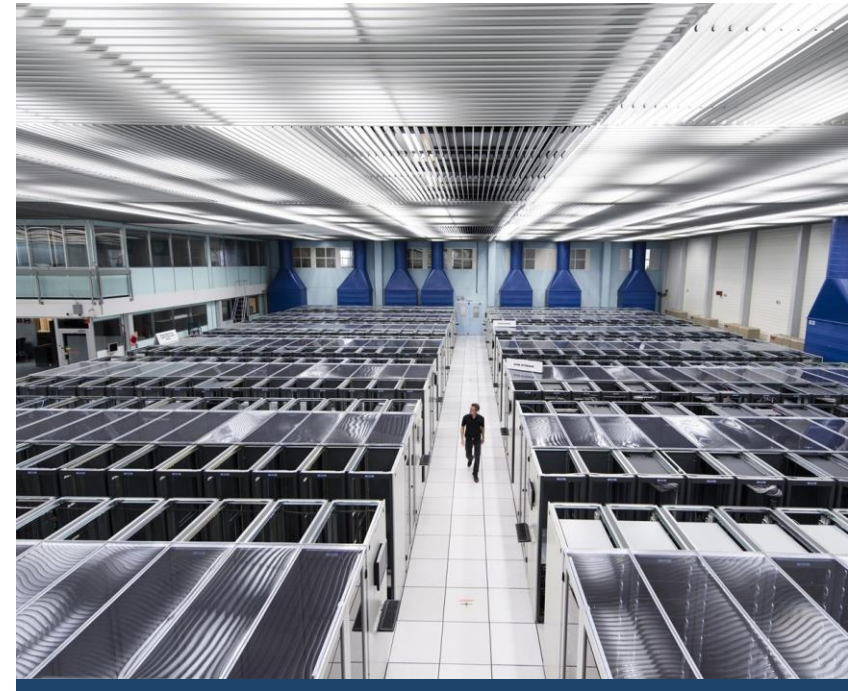
We develop technologies in three key areas



ACCELERATORS

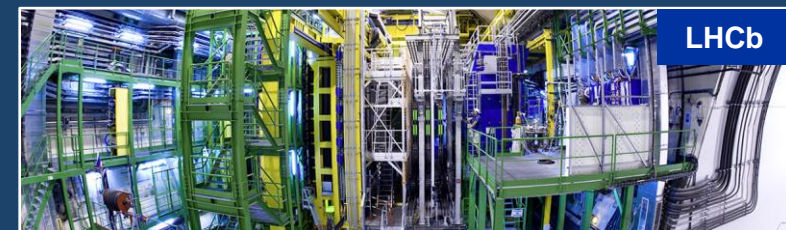
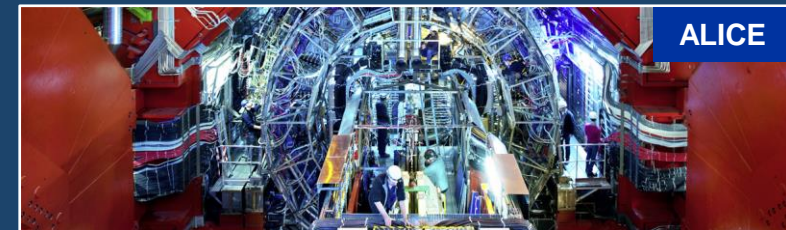
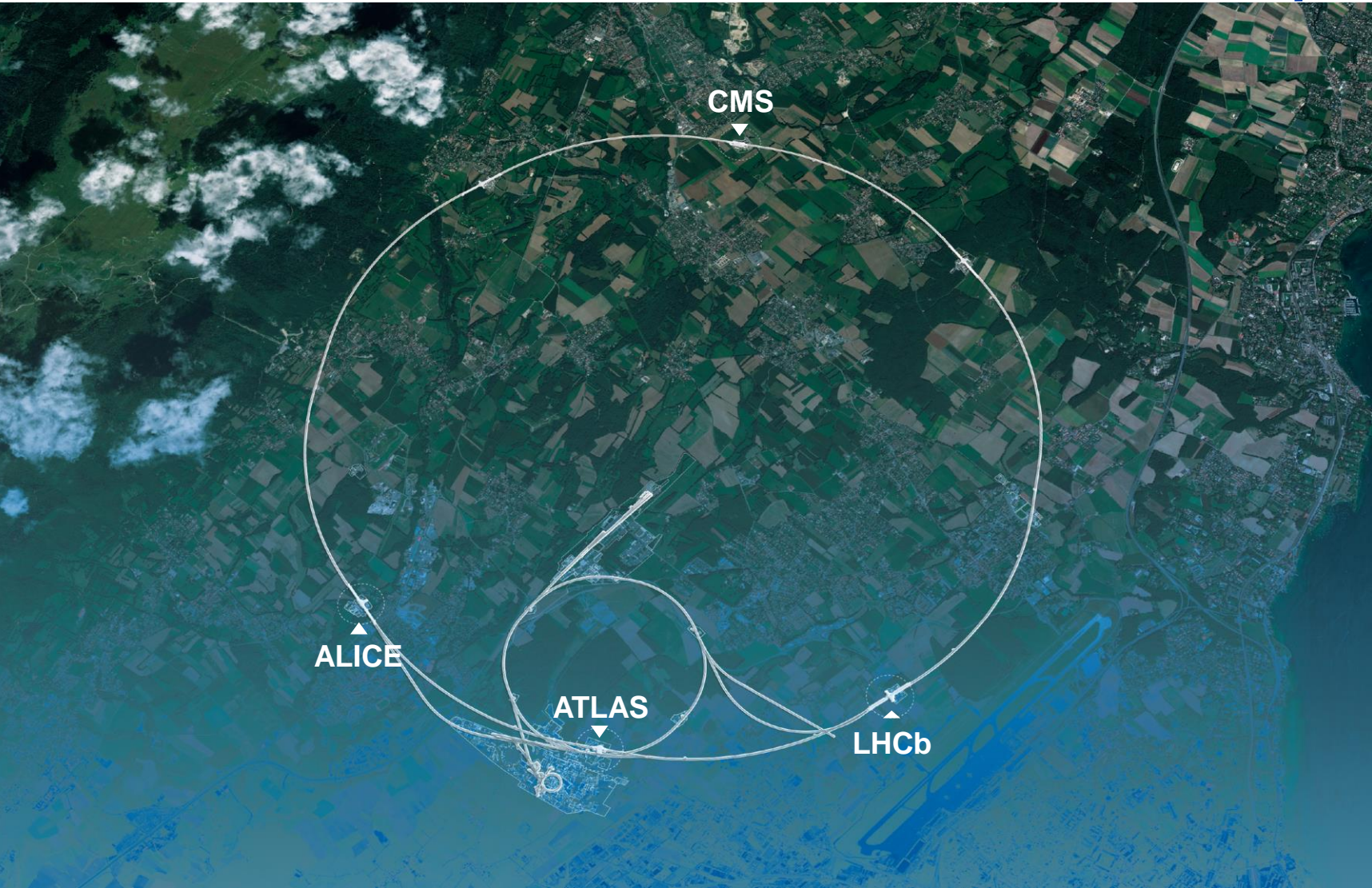


DETECTORS



COMPUTING

Giant detectors record the particles formed at the four collision points

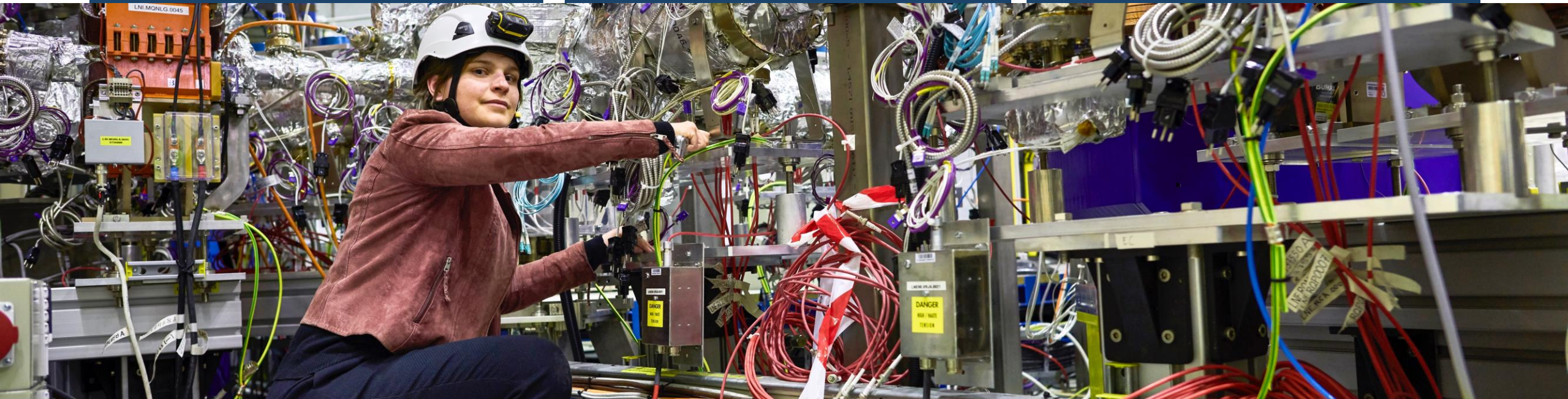


CERN has a diverse scientific programme

Nuclear Physics
(ISOLDE, n_TOF)

Antimatter Research
(Antiproton Decelerator)

Cosmic rays and cloud formation
(CLOUD)



Fixed-target experiments,
which include searches for rare phenomena

Contribution to the Long Baseline
Neutrino Facility in the USA (LBNF)



COLLABORATION

A laboratory for people around the world

Distribution of all CERN Users by the country of their home institutes as of 31 December 2022



Geographical & cultural diversity
Users of **110 nationalities**
19.4% women



Member States 7147

Austria 85 – Belgium 129 – Bulgaria 43 – Czech Republic 244
Denmark 49 – Finland 90 – France 844 – Germany 1225
Greece 119 – Hungary 73 – Israel 64 – Italy 1527
Netherlands 169 – Norway 79 – Poland 305 – Portugal 100
Romania 109 – Serbia 33 – Slovakia 70 – Spain 383
Sweden 103 – Switzerland 406 – United Kingdom 898

Associate Member States in the pre-stage to membership 69

Cyprus 15 – Estonia 30 – Slovenia 24

Associate Member States 382

Croatia 38 – India 132 – Latvia 16 – Lithuania 14 – Pakistan 35
Türkiye 122 – Ukraine 25

Observers 2991

Japan 216 – Russia (suspended) 873 – United States of America 1902

Non-Member States and Territories 1271

Algeria 2 – Argentina 13 – Armenia 8 – Australia 21 – Azerbaijan 2 – Bahrain 4 – Belarus 18 – Brazil 122
Canada 199 – Chile 34 – Colombia 21 – Costa Rica 2 – Cuba 3 – Ecuador 4 – Egypt 20 – Georgia 32
Hong Kong 15 – Iceland 3 – Indonesia 5 – Iran 11 – Ireland 5 – Jordan 5 – Kuwait 4 – Lebanon 13 – Madagascar 1
Malaysia 4 – Malta 1 – Mexico 49 – Montenegro 4 – Morocco 19 – New Zealand 5 – Nigeria 1 – Oman 1
Palestine 1 – People's Republic of China 333 – Peru 2 – Philippines 1 – Republic of Korea 147 – Singapore 2
South Africa 52 – Sri Lanka 10 – Taiwan 45 – Thailand 17 – Tunisia 2 – United Arab Emirates 7 – Viet Nam 1



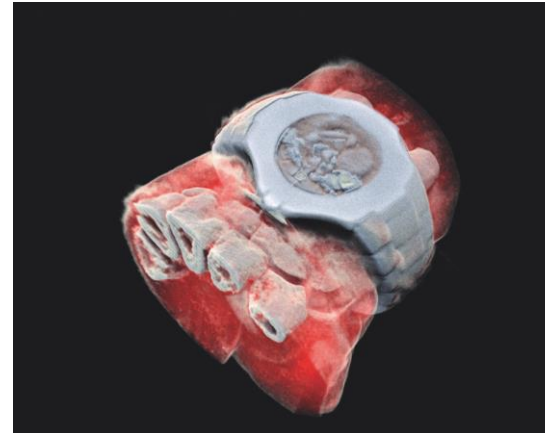
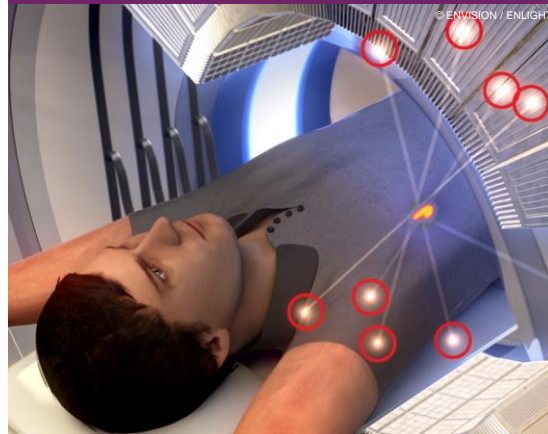
TECHNOLOGY & INNOVATION

CERN's technological innovations have important applications in medicine and healthcare



Accelerator technologies are applied in cancer radiotherapy with protons, ions and electrons.

Technologies applied at CERN are also used in PET, for medical imaging and diagnostics.



Pixel detector technologies are used for high resolution 3D colour X-ray imaging.

CERN produces innovative radioisotopes for nuclear medicine research.



A group of students, both male and female, are wearing hard hats (yellow and blue) and are focused on a large, dark, cylindrical piece of equipment mounted on a metal frame. They appear to be in a laboratory or workshop setting. One student in the foreground is adjusting the equipment. In the background, there are other students and a green exit sign with a white arrow pointing down. A teal circular graphic is overlaid on the left side of the image, containing the text 'EDUCATION & TRAINING'.

EDUCATION & TRAINING

CERN's training, education and outreach programmes

900 graduates
(including Research Fellows)

3 000 PhD students

300 Undergraduate students in
Summer programmes



>14 000 teachers participating in
dedicated programmes, since 1998

Around 150 000 visitors on guided
tours of CERN, from >50 countries

4.7M followers on social media,
from around the globe

Development of particle therapy technologies with CERN

- MEDICIS and PRISMAP project
- Medipix, Timepix3
- CLIC and CLEAR facilities at CERN are working with FLASH
- CERN, the Centre Hospitalier Universitaire Vaudois (CHUV) and THERYQ (ALCEN group) are on development of a revolutionary FLASH radiotherapy device
 - CERN greatly contributed to:
 - CNAO - Italy
 - MedAustrom - Austria
- NIMMS
- HITRIplus project - Heavy Ion Therapy Research Integration

There is a lot going on!