
CERN

Welcome - Herzlich willkommen

Besuch des
BRG Bruck and der Leitha
29 März 2018

to CERN *Accelerating Science and Innovation*

CERN

What is it ?

What does « CERN » stand for?

European
Européenne
European for
Européenne pour la
Research
Recherche
Research
Recherche

What does « CERN » stand for?

European
Organization for
Nuclear
Research

Nuclear?

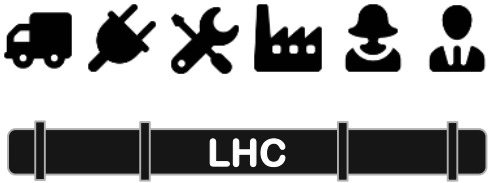
European laboratory for particle physic

CERN

Who is it ?

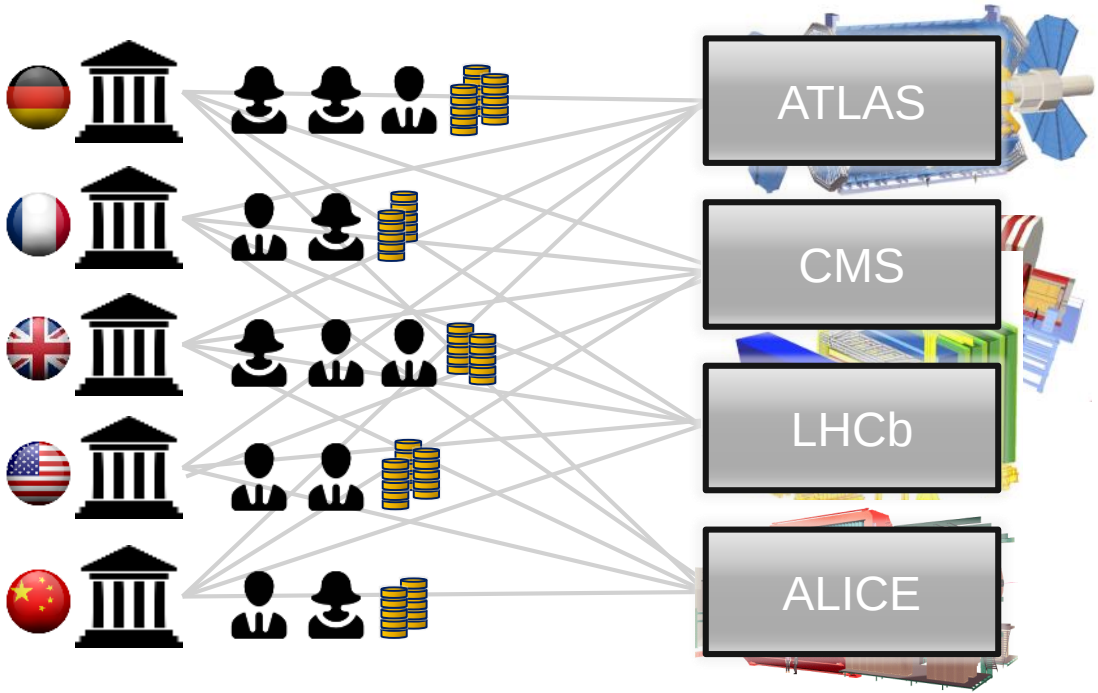
Member states

ca 1 Bn CHF



Germany		20.27%
France		15.39%
United Kingdom		13.88%
Italy		11.48%
Spain		8.28%
Netherlands		4.60%
Switzerland		3.64%
Belgium		2.78%
Poland		2.66%
Sweden		2.61%
Norway		2.55%
Austria		2.22%
Denmark		1.76%
Greece		1.64%
Finland		1.39%
Portugal		1.20%
Israel		1.19%
Czech Republic		1.03%
Hungary		0.65%
Slovakia		0.50%
Bulgaria		0.28%

Collaborations

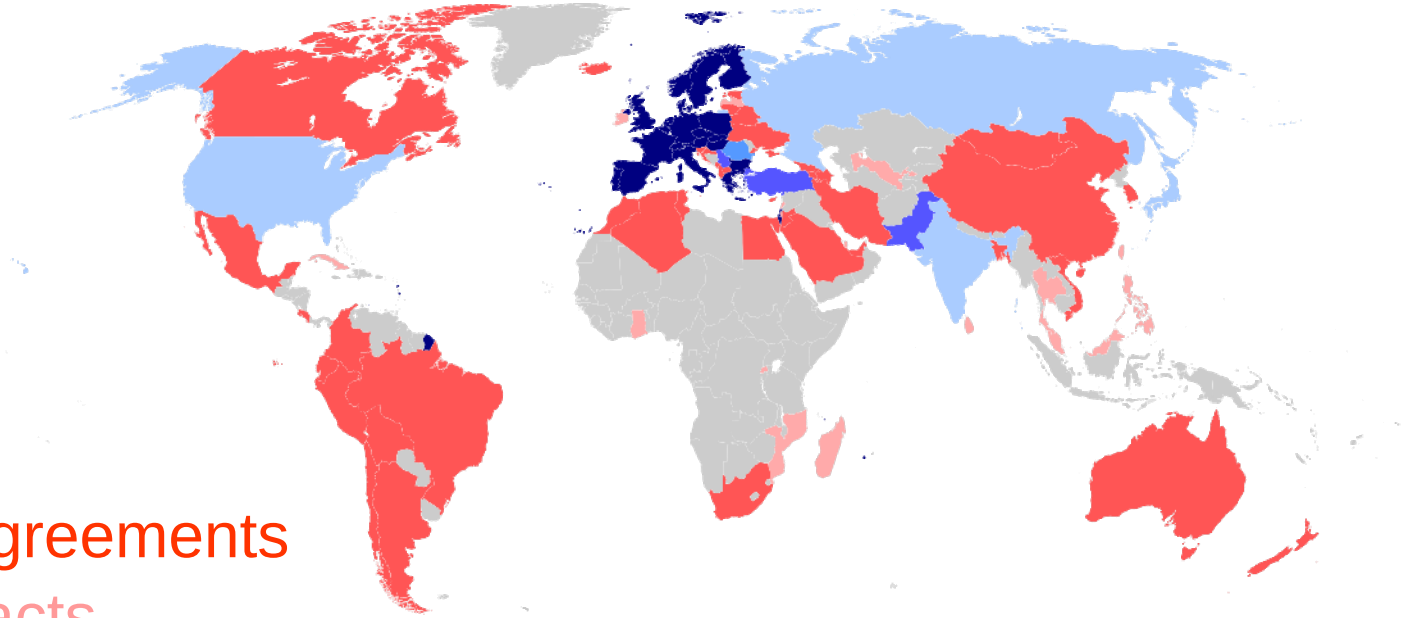


A world collaboration

22 members
2 associates
2 candidate

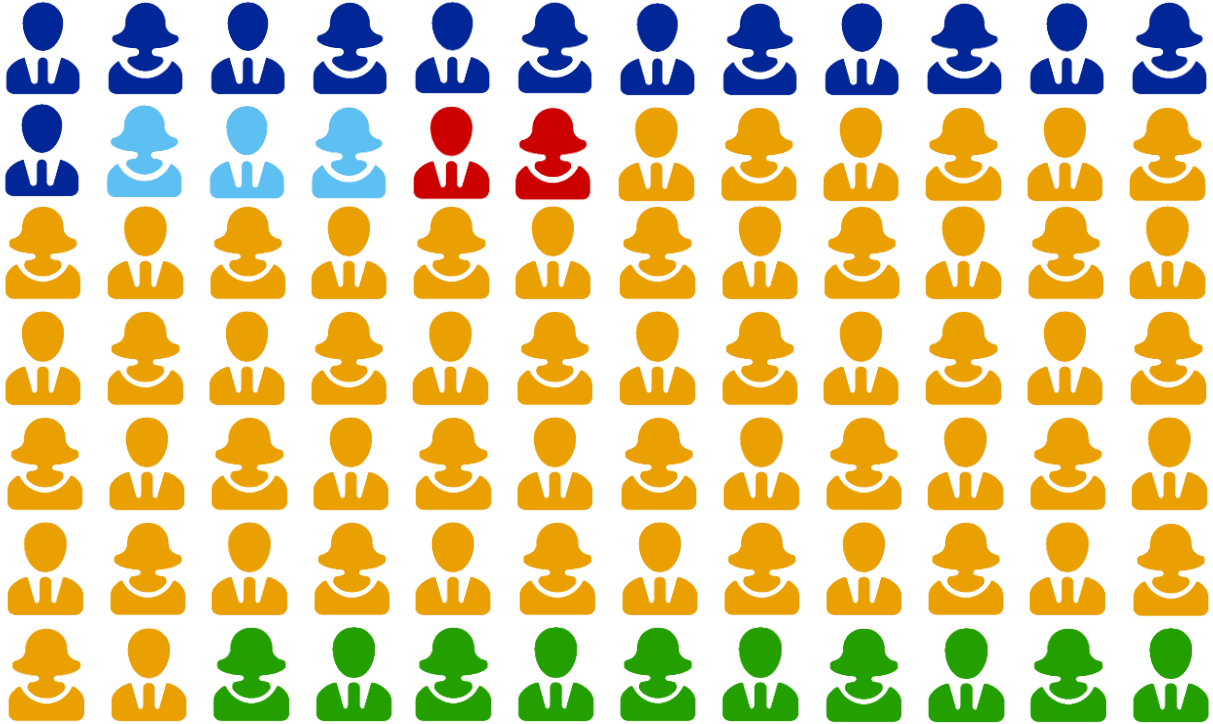
Observers

Cooperation agreements
Scientific contacts



How many persons?

+15’000!



2’500 staff

600 fellows & apprentices

500 students

11’000 users

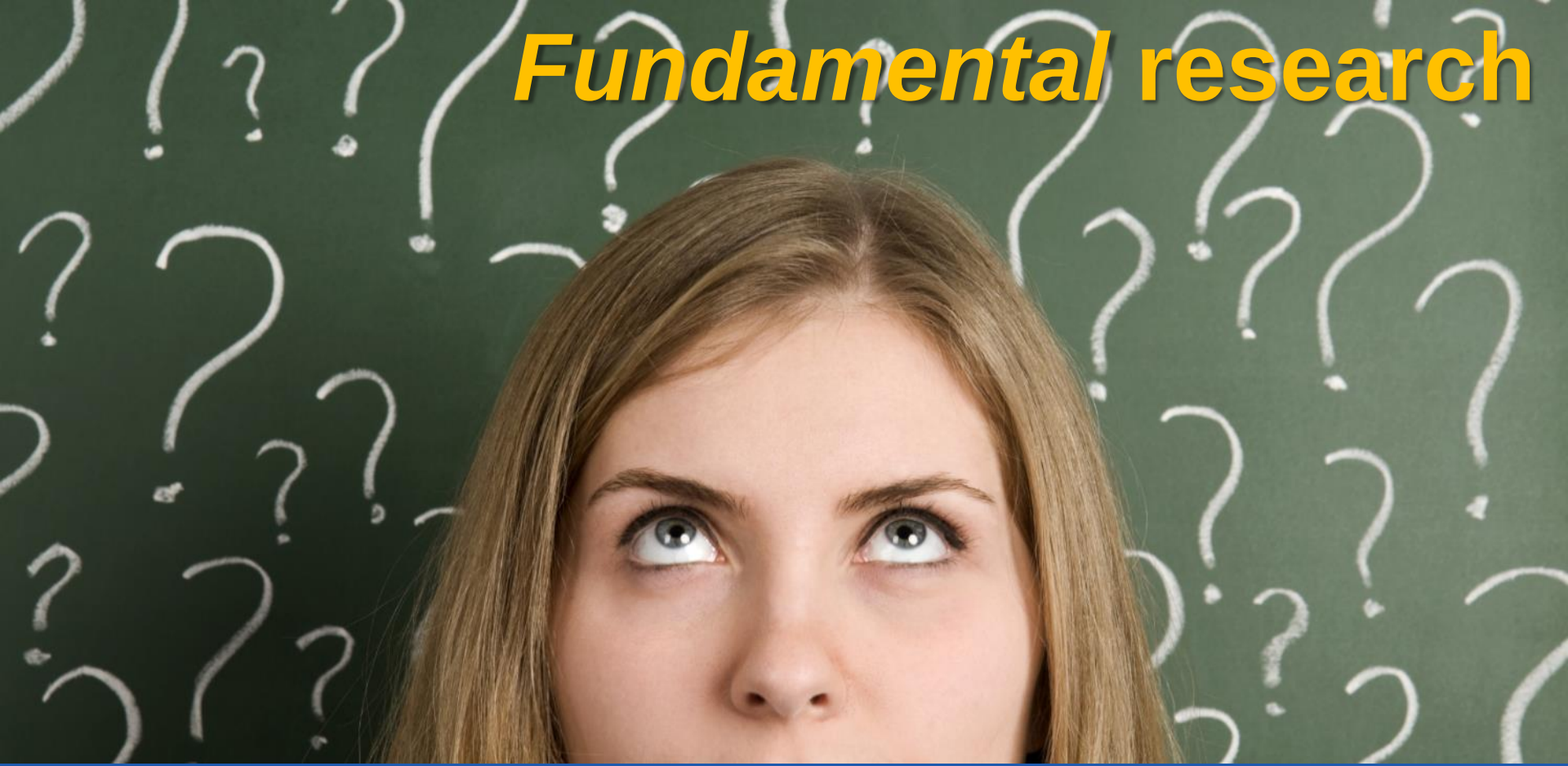
2’000 external companies

Like a small town

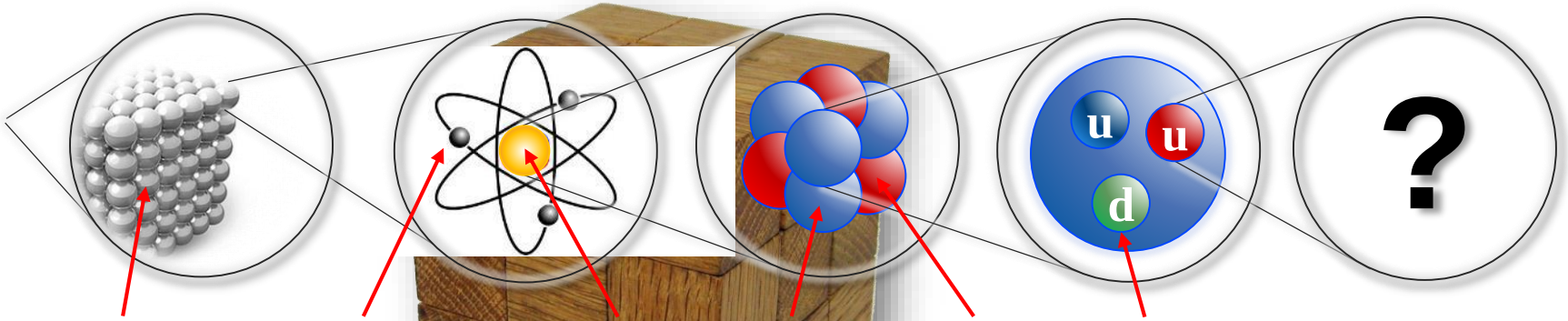
Bank, Post Office,

CERN
What for ?

Fundamental research



What is the matter made of ?



atom — 4th - 5th century BCE

electron — End of 19th century

nucleus — End of 19th century

proton — Beginning of 20th century

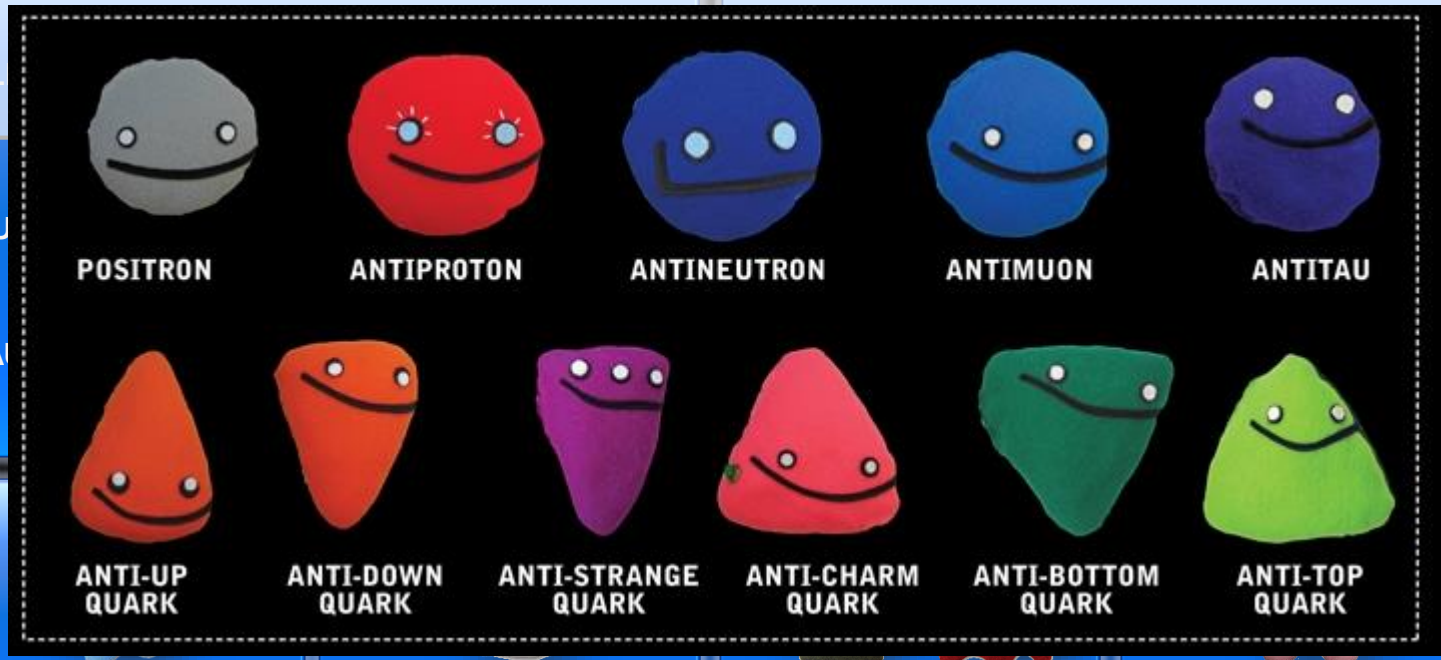
neutron — Beginning of 20th century

quark — 1960s

Standard Model

Images:
www.particlezoo.net

	LEPTONS	QUARKS
ORDINARY MATTER	EL	
	MU	
	TA	



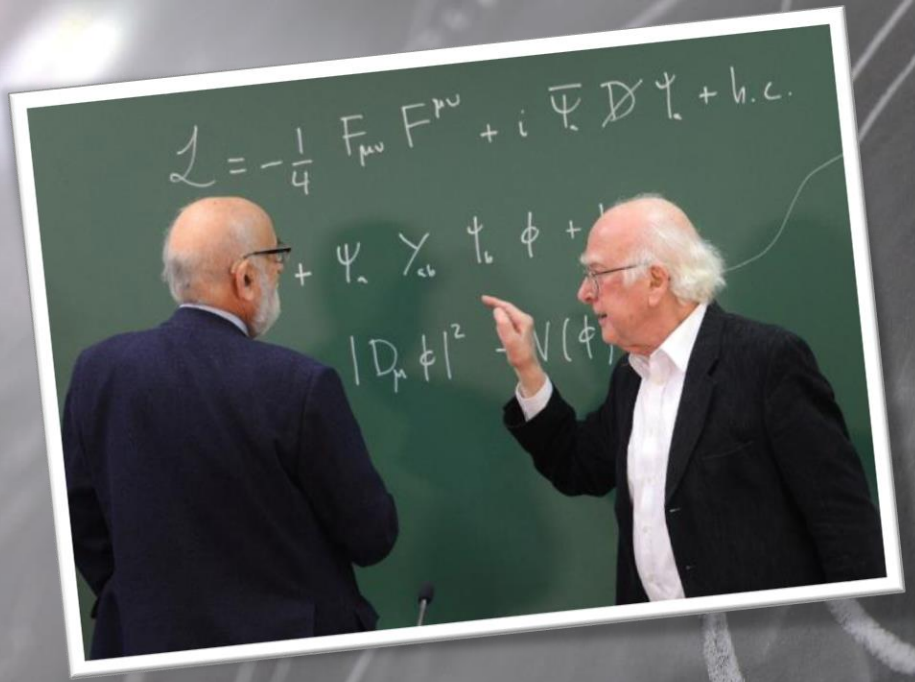
4 forces

Strong force	Electro-magnetic force	Weak force	Gravity

Answering questions…

Antimatter ?

Answering questions…



Higgs ?

Answering questions…

Dark matter ?

Collaborate

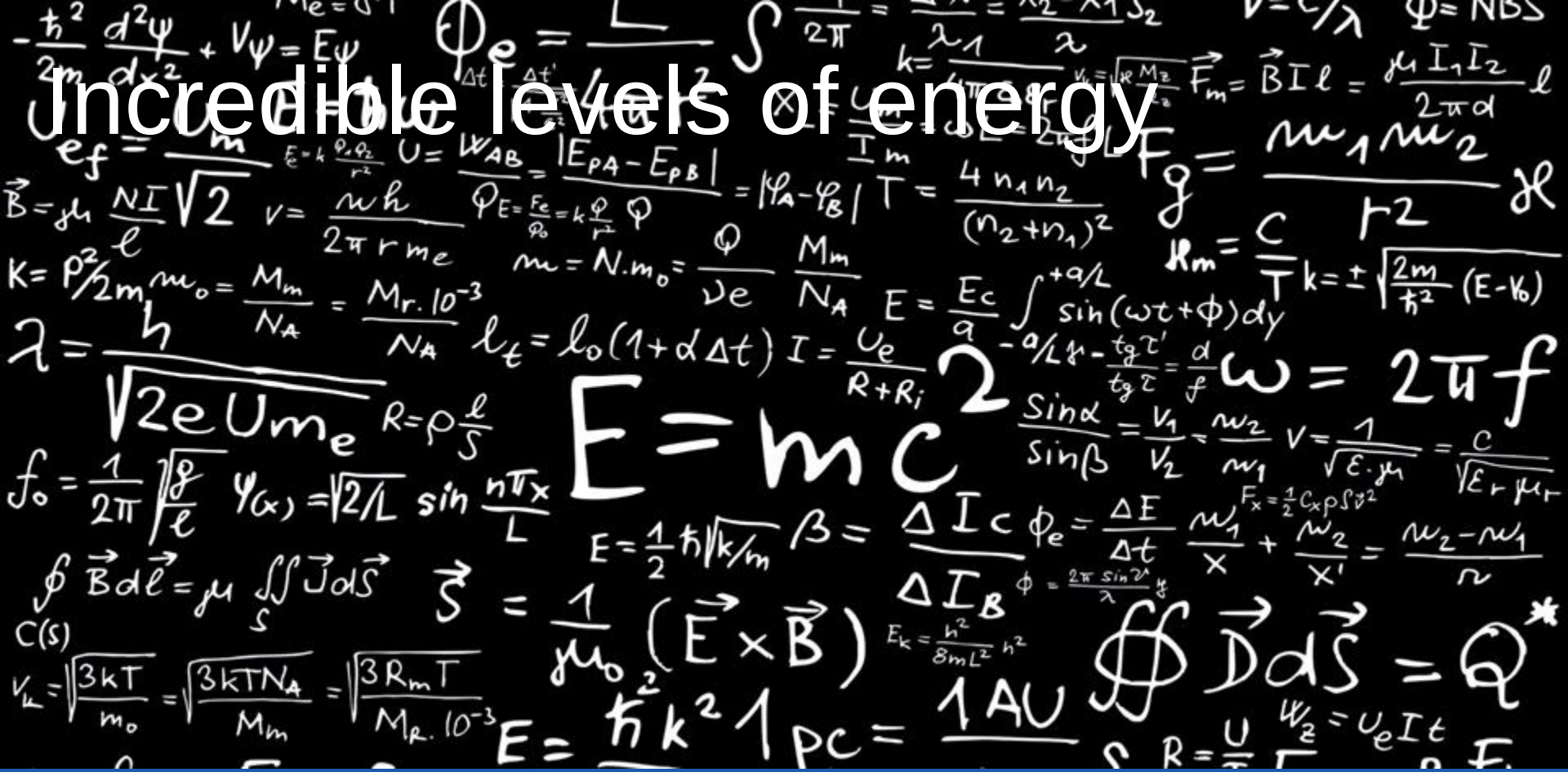
Educate

CERN

How does it work ?

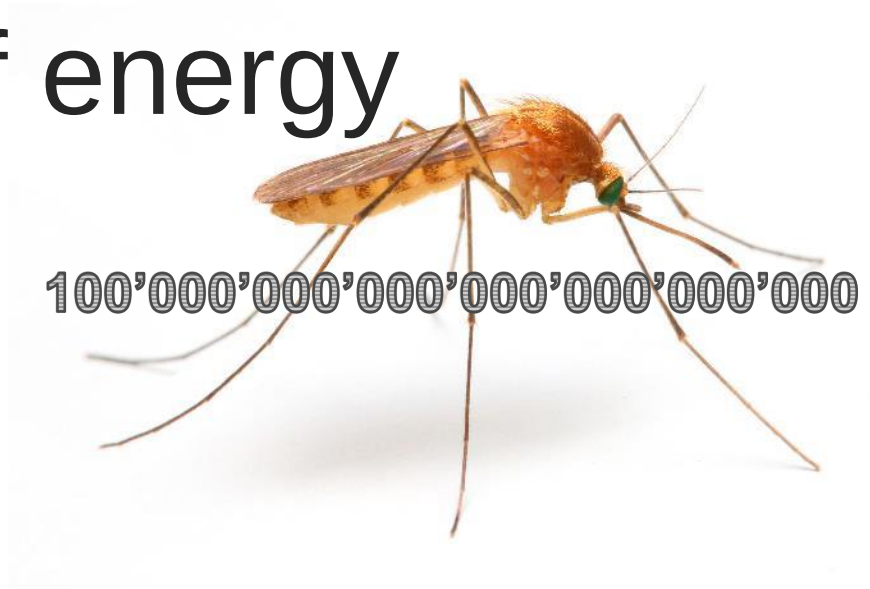
Accelerating and colliding

Incredible levels of energy



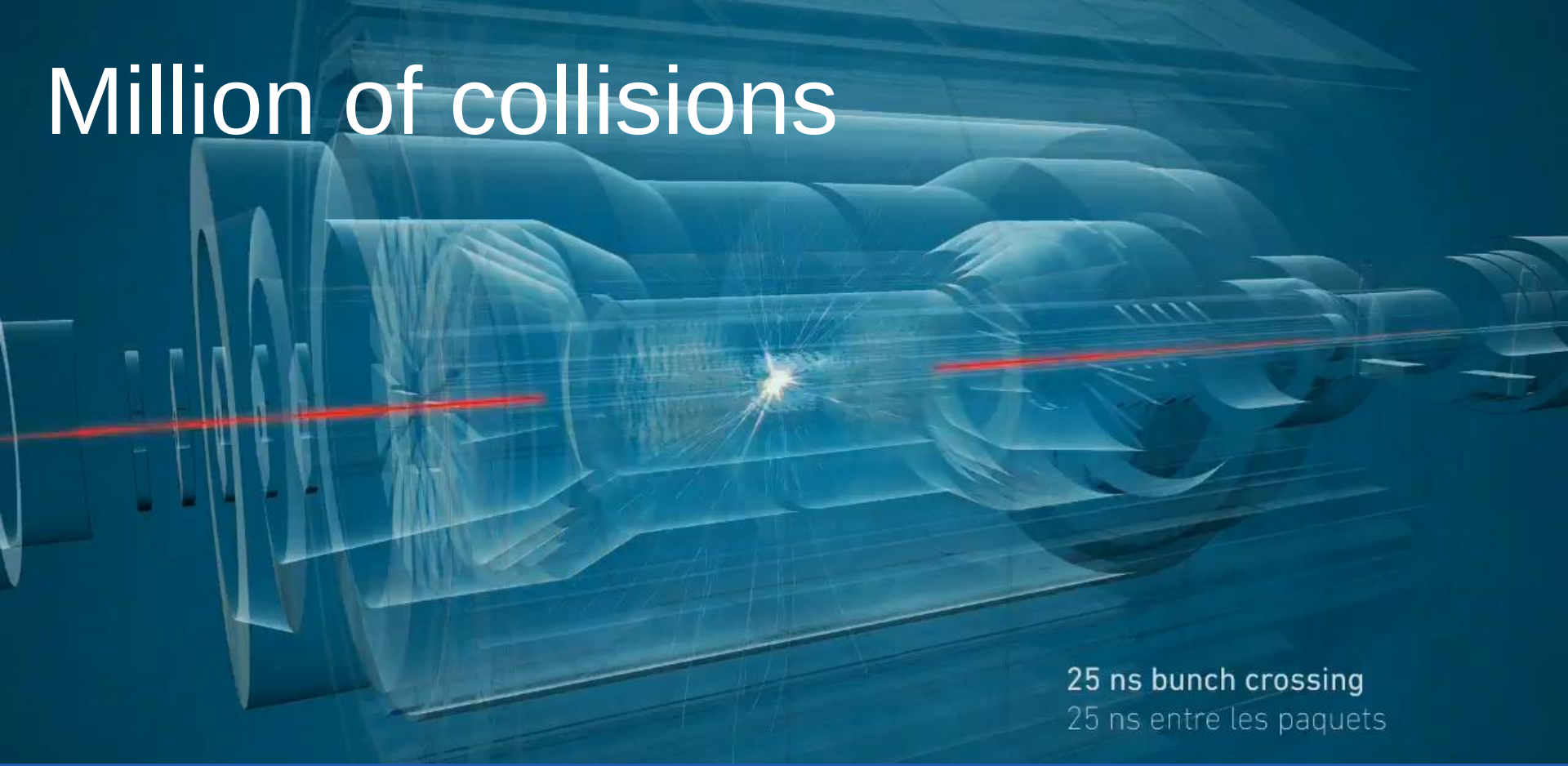
Incredible levels of energy

7 TeV

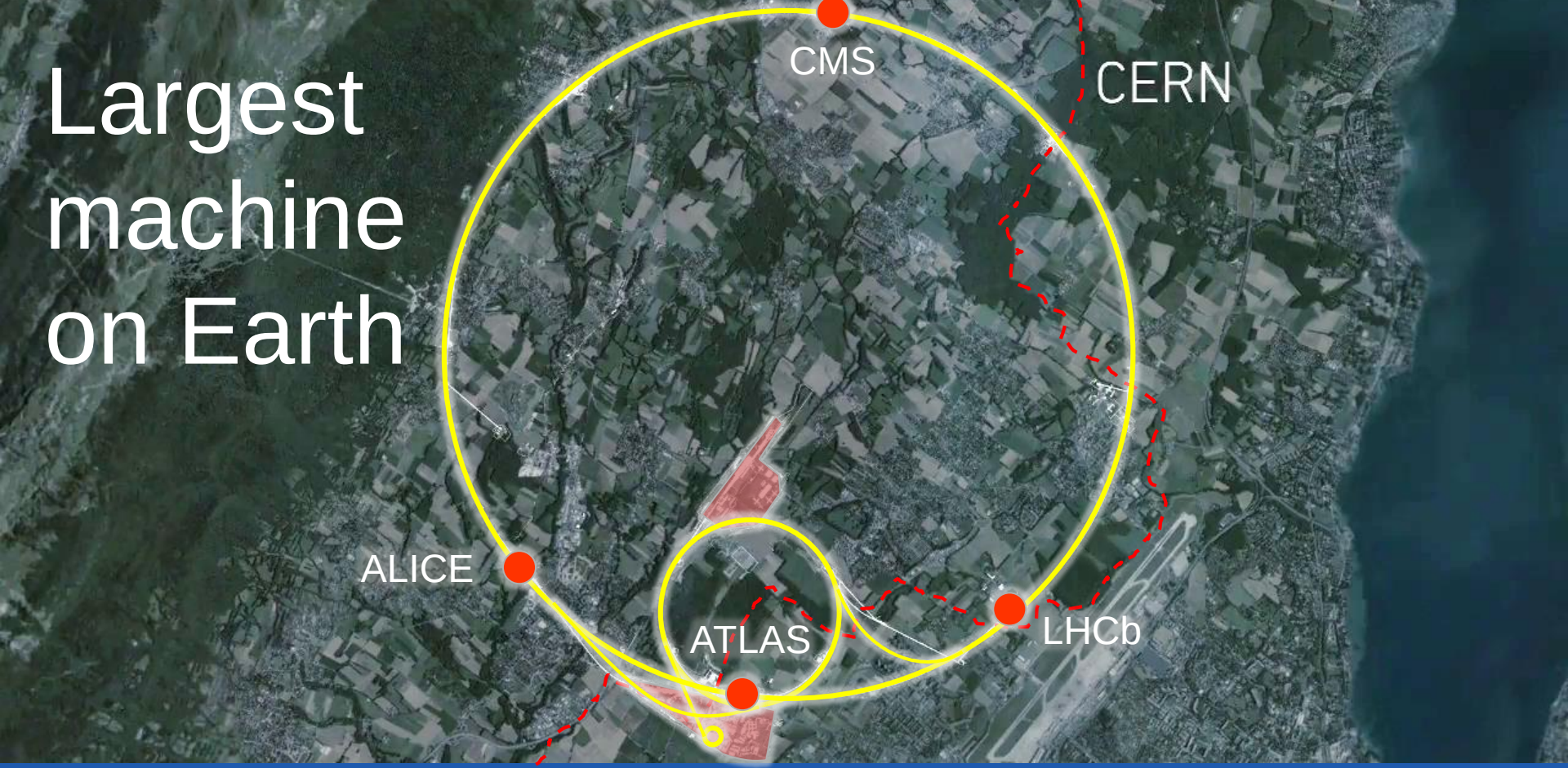


Accelerators chain

Million of collisions

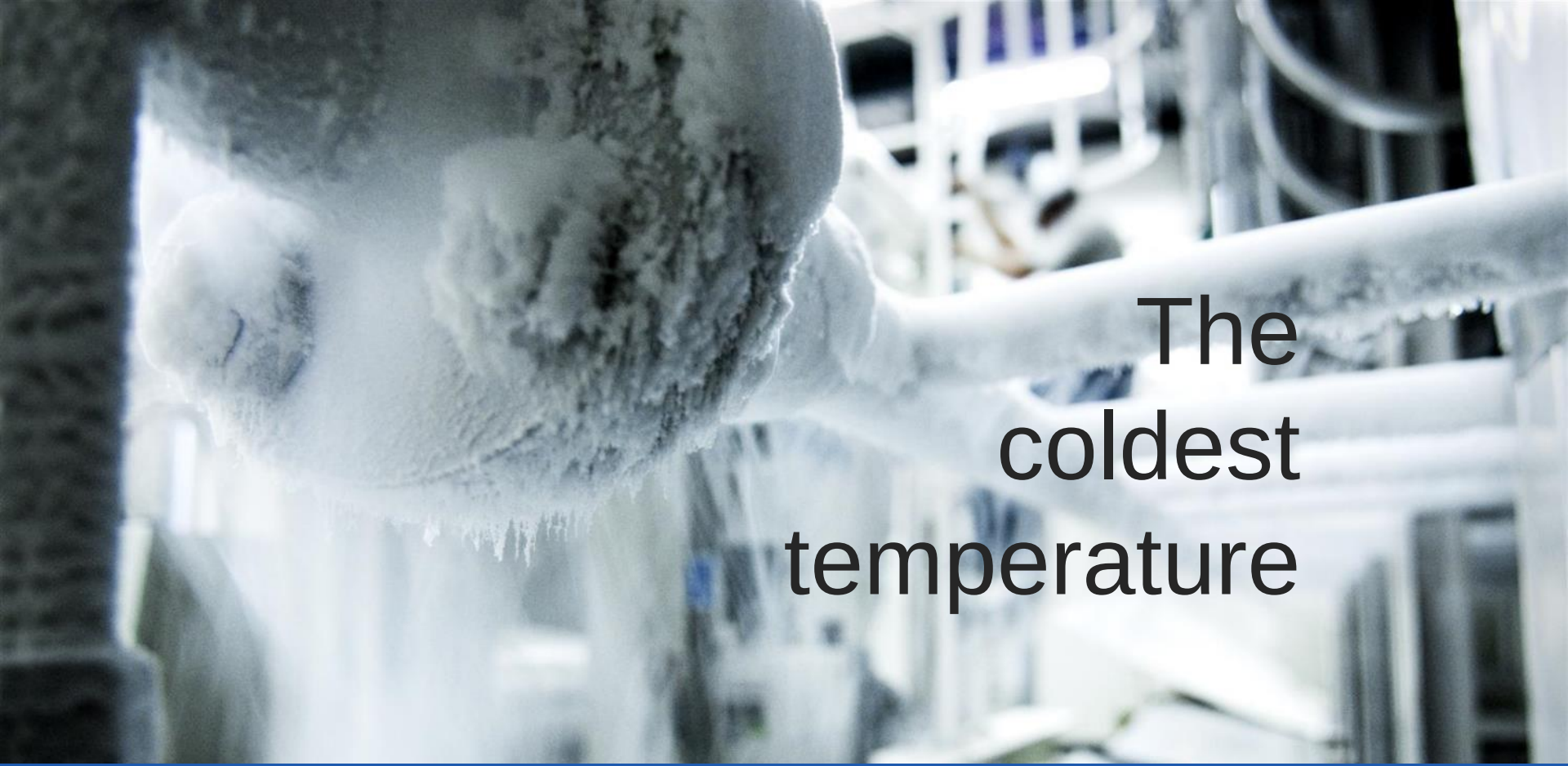


Largest machine on Earth



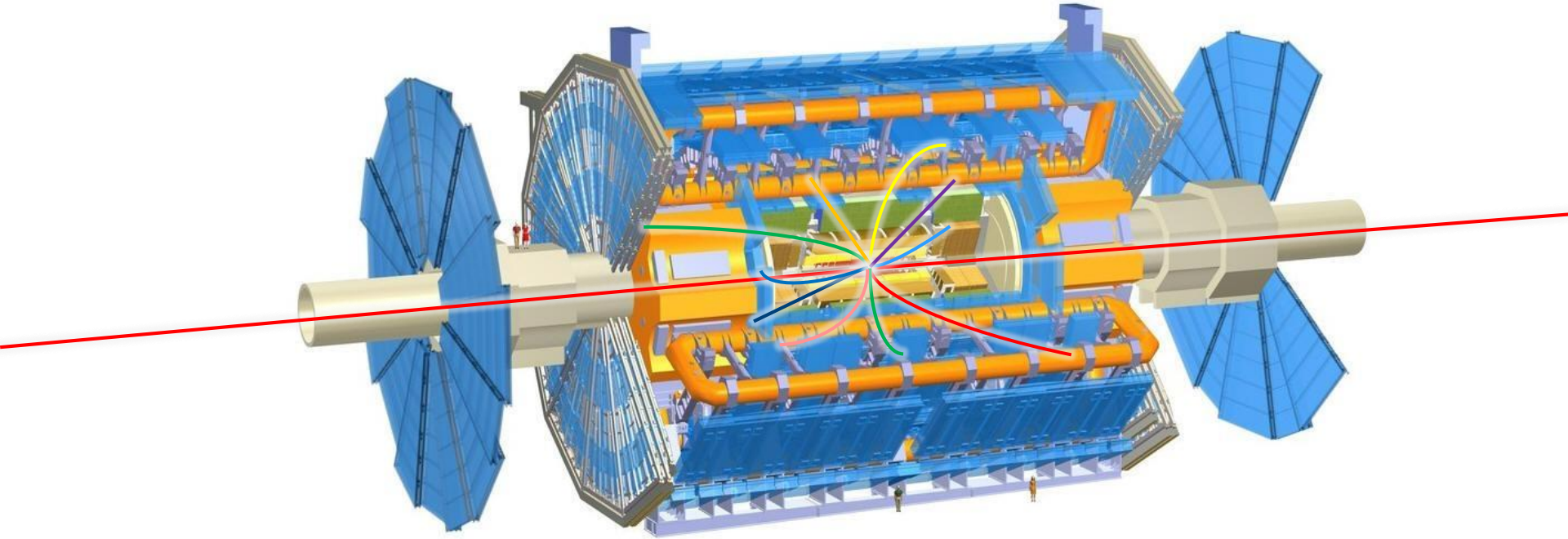
The most powerful magnets

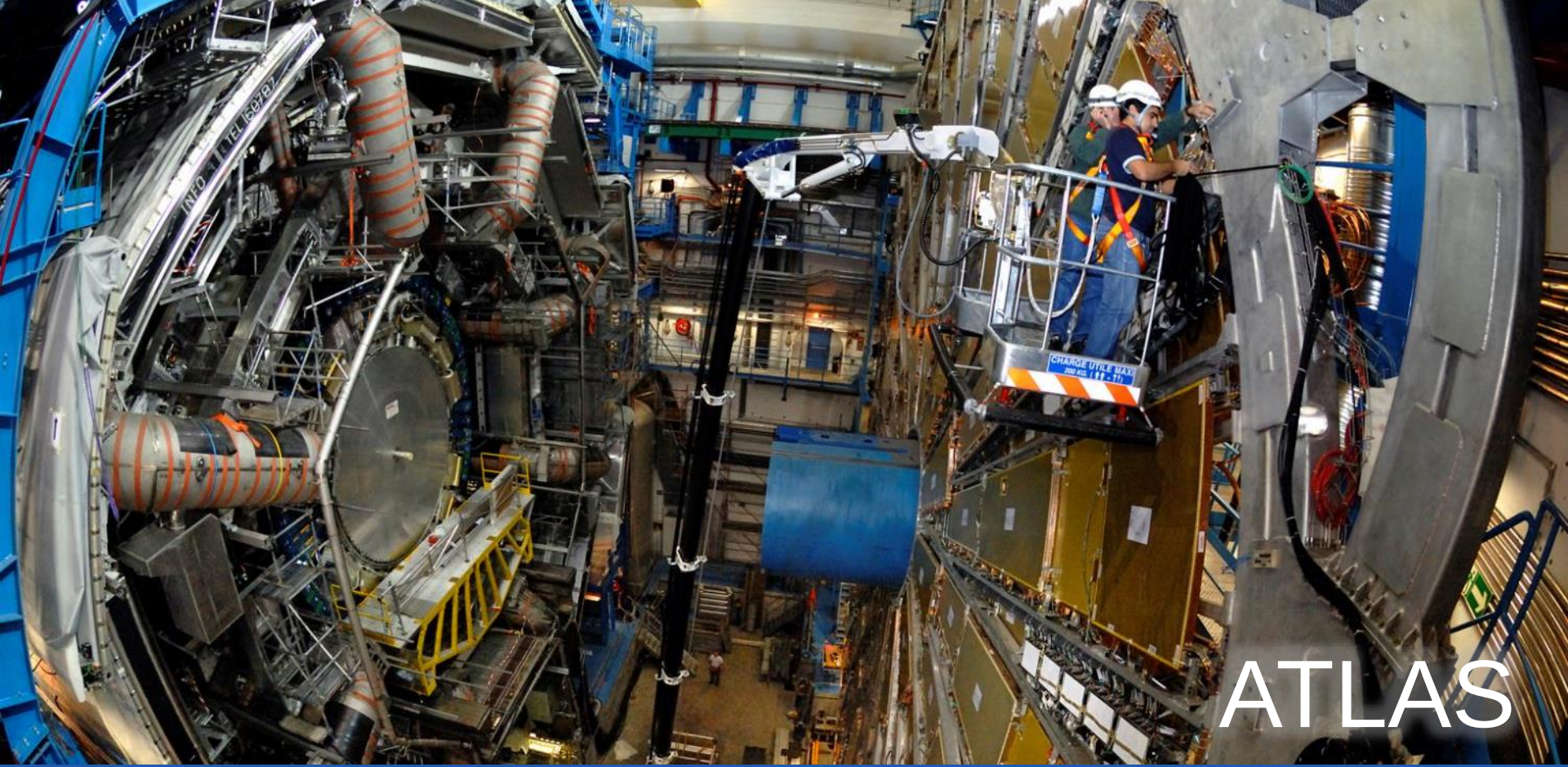
The highest vacuum



The coldest temperature

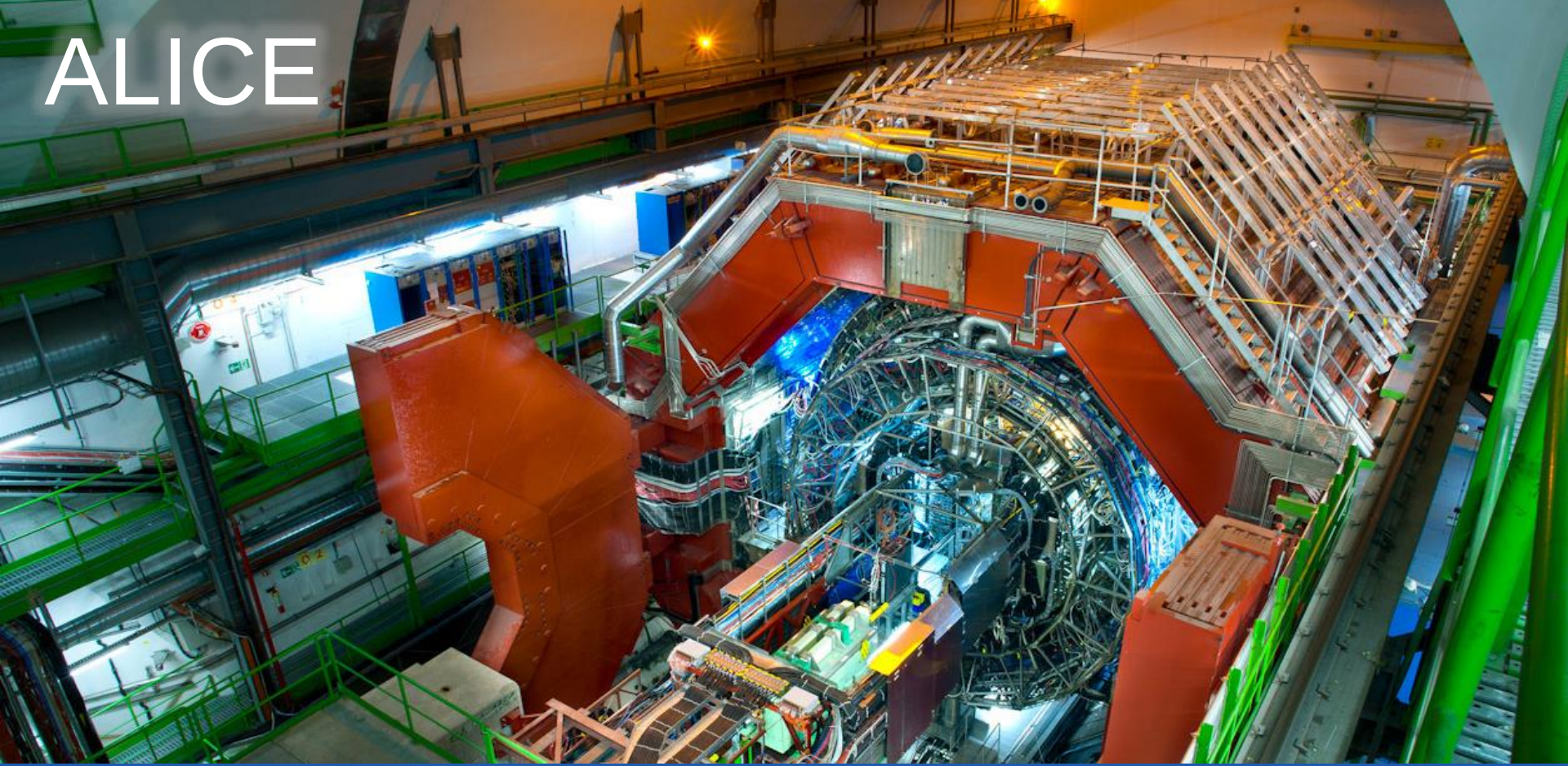
The largest detectors



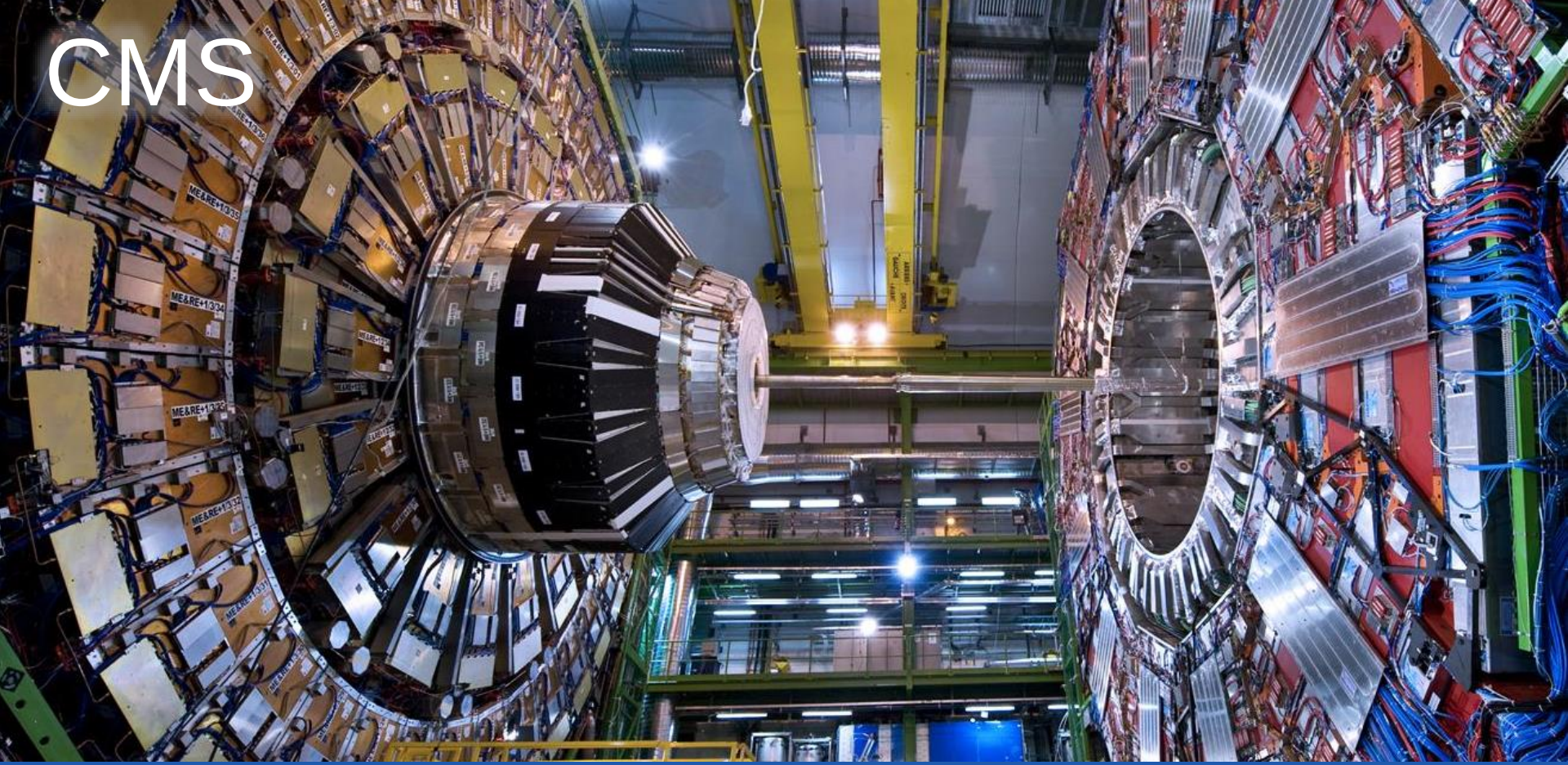


ATLAS

ALICE



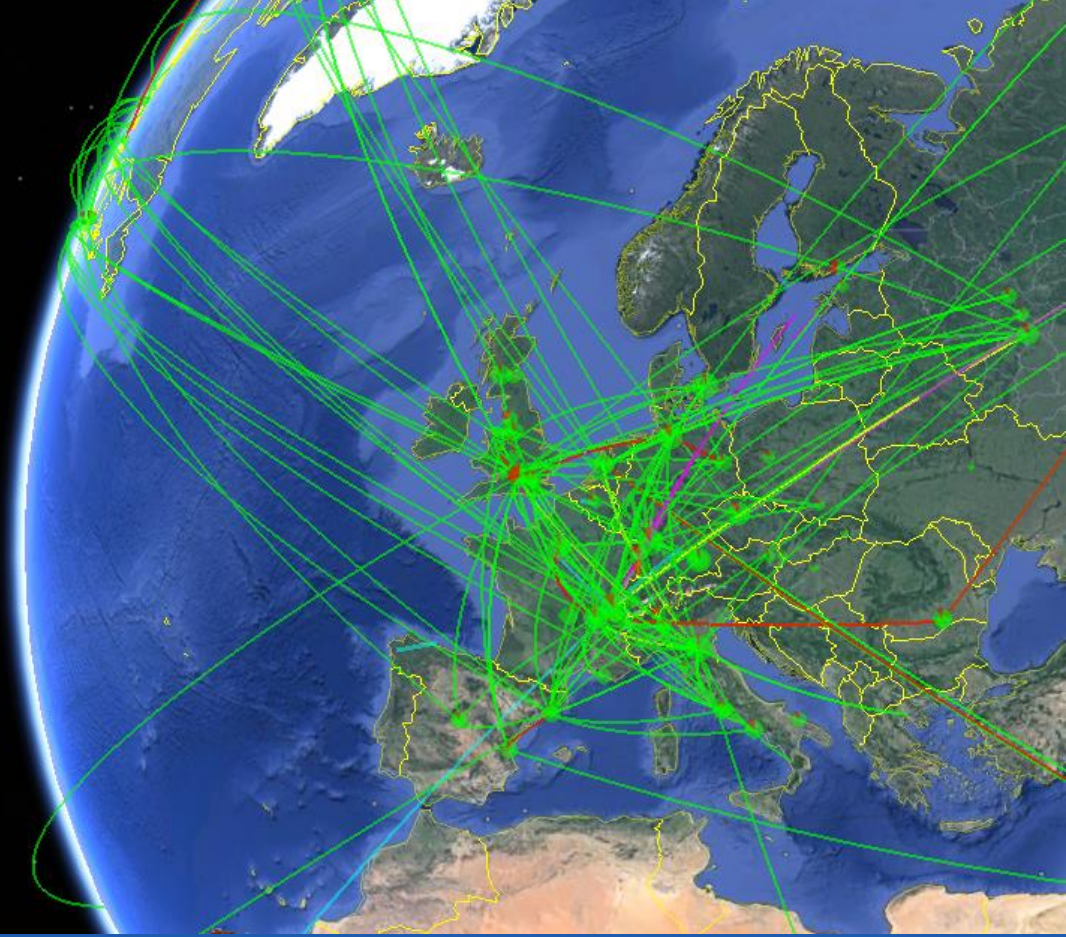
CMS



CERN


LHCb

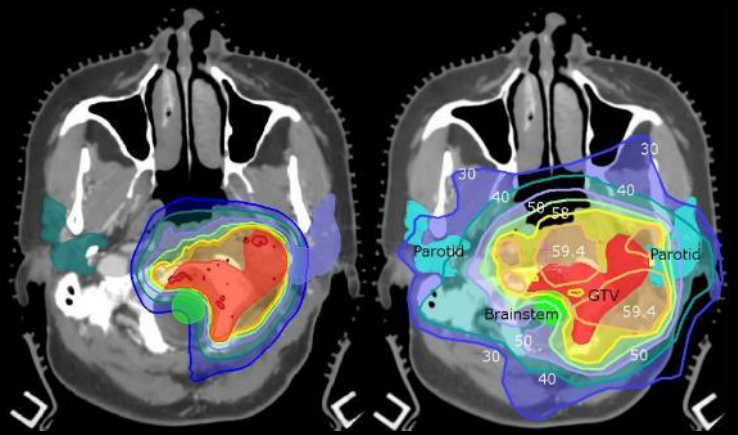
The largest computing grid



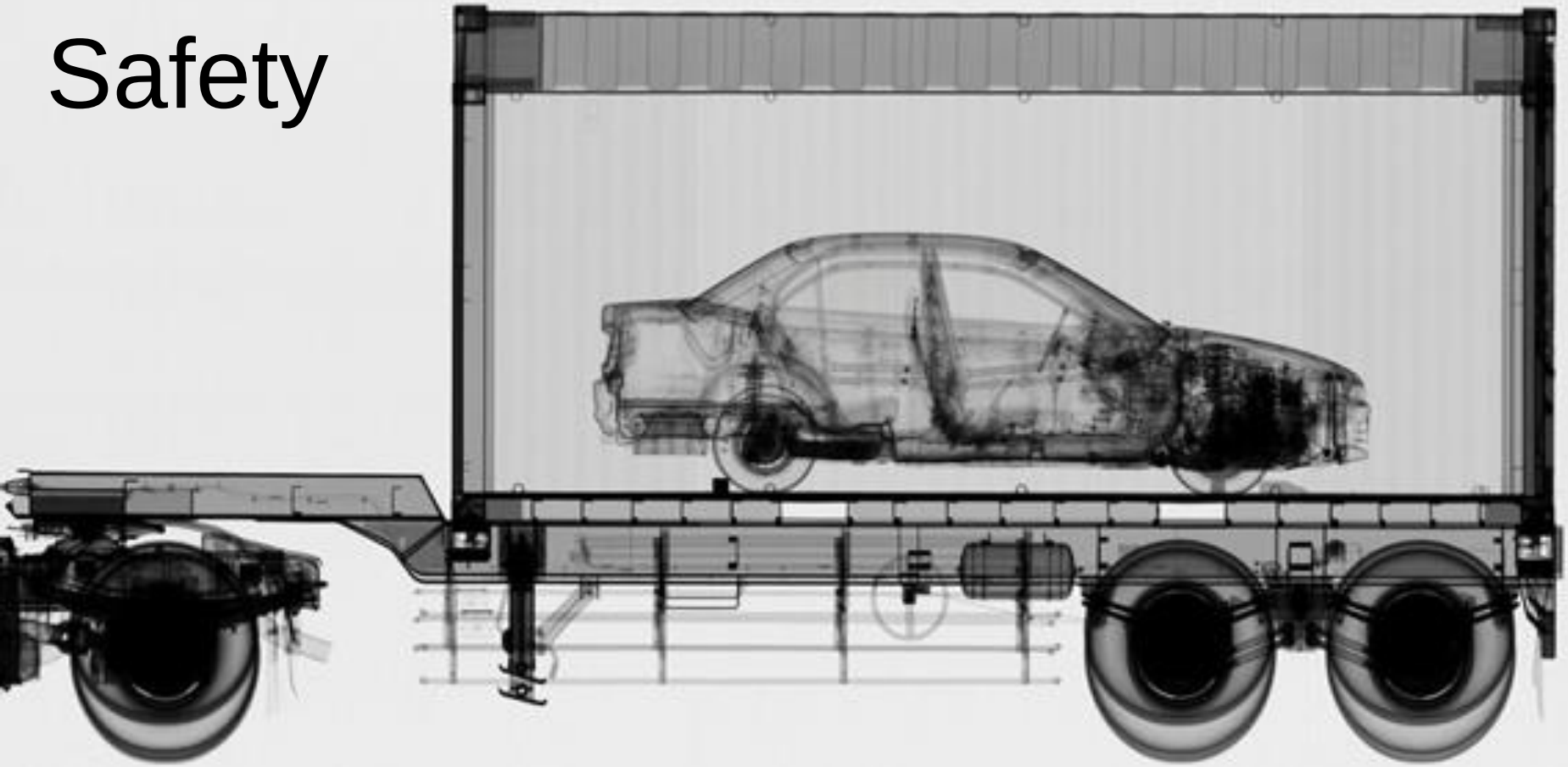
World Wide Web

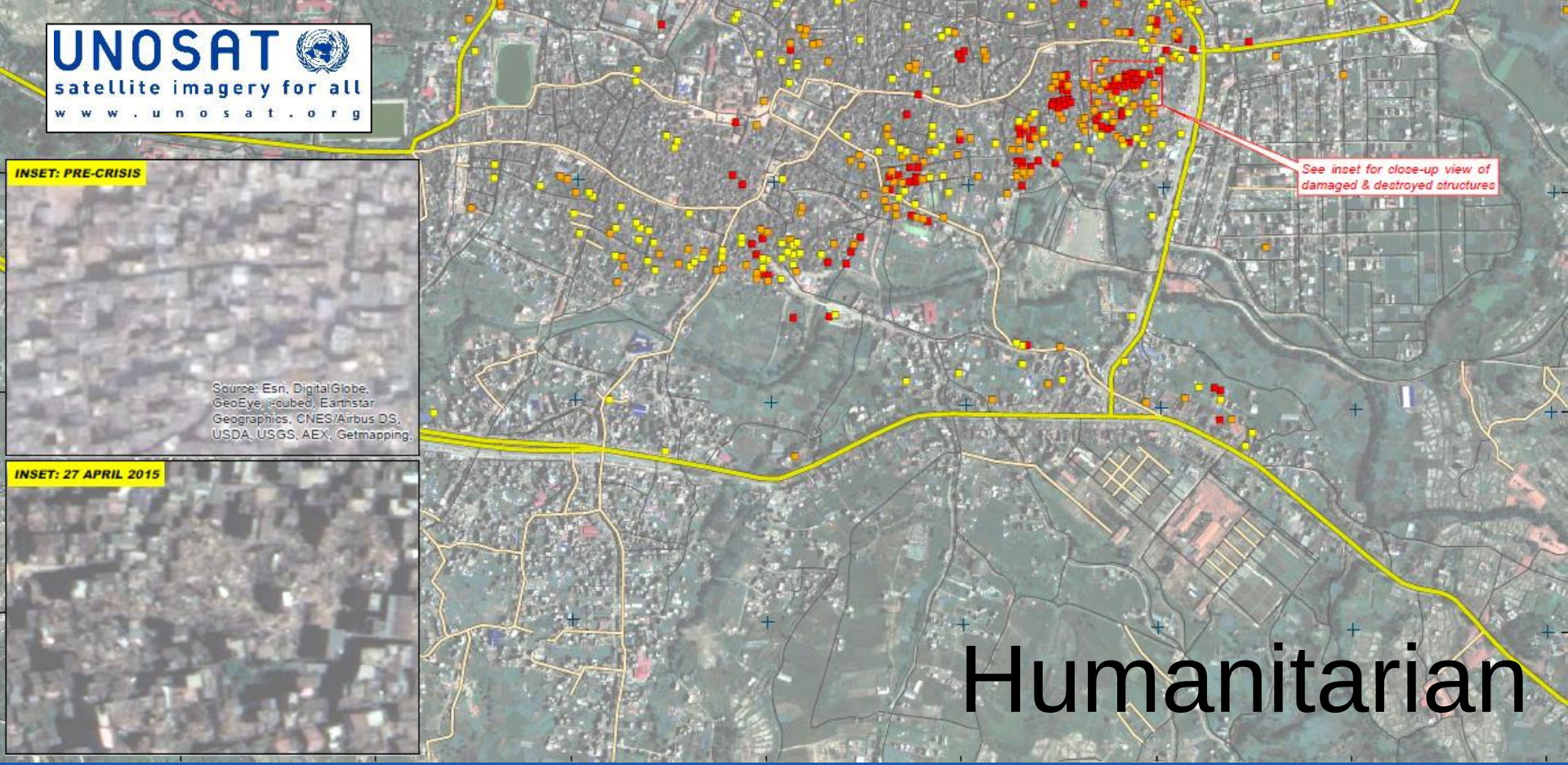
Medical applications: MedAustron collaboration

- Knowledge and technology transfer are central CERN activities.
- Realisation of the MedAustron ion therapy accelerator in Wiener Neustadt



Safety

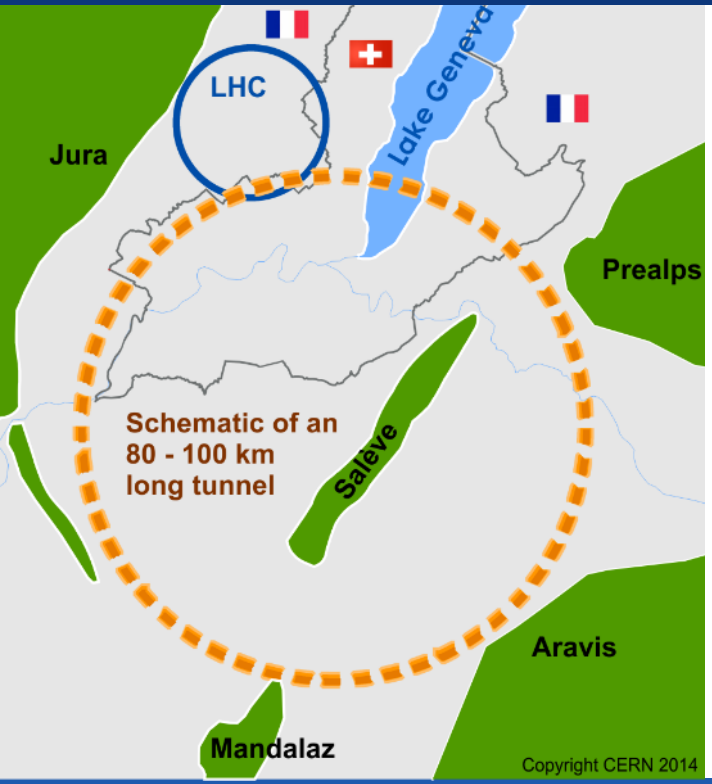



UNOSAT
satellite imagery for all
www.unosat.org
INSET: PRE-CRISIS
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping.
INSET: 27 APRIL 2015
See inset for close-up view of damaged & destroyed structures
Humanitarian

CERN

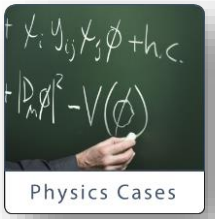
What's next ?

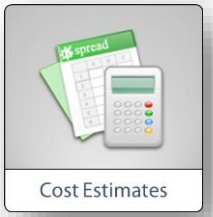
Future Circular Collider Study



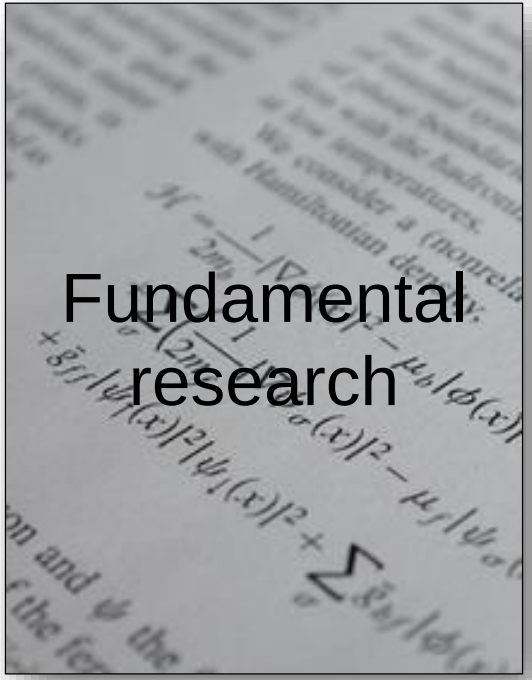
International FCC collaboration (CERN as host lab) to study:

- ***pp*-collider (*FCC-hh*)**
  → main emphasis, defining infrastructure requirements
- **~16 T ⇒ 100 TeV *pp* in 100 km**
  in Geneva area, site specific
- **e^+e^- collider (*FCC-ee*),**
  as potential first step
- ***p-e* (*FCC-he*) option,**
  integration one IP, e from ERL
- **HE-LHC** with *FCC-hh* technology
- **CDR for end 2018**





In a nutshell…



Some links…

Information :	www.cern.ch
CERN TV :	youtube.com/cern
Recruitment :	www.cern.ch/jobs

www.cern.ch