EIROforum
Who ?
Why ?
How ?

A short introduction

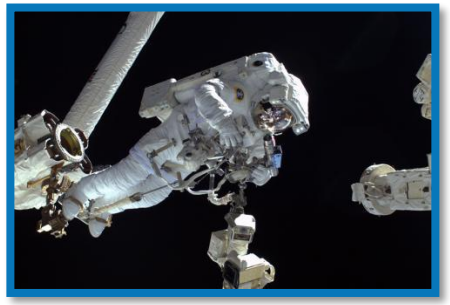
C. Joram / CERN
on behalf of the EIROforum Instrumentation WG

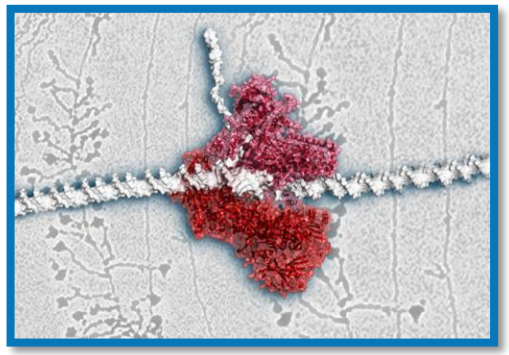
Who ?

European
Intergovernmental
Research
Organisations

8 Members
= 'EIROs'

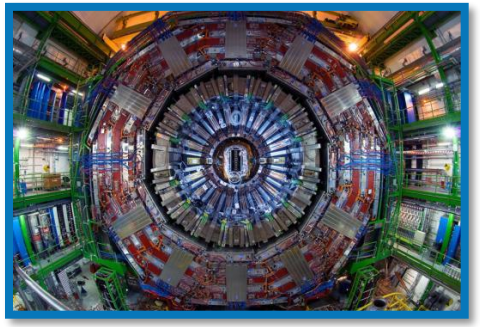
1975





1974

Previously
EFDA
(1999)
2014



1954

1989

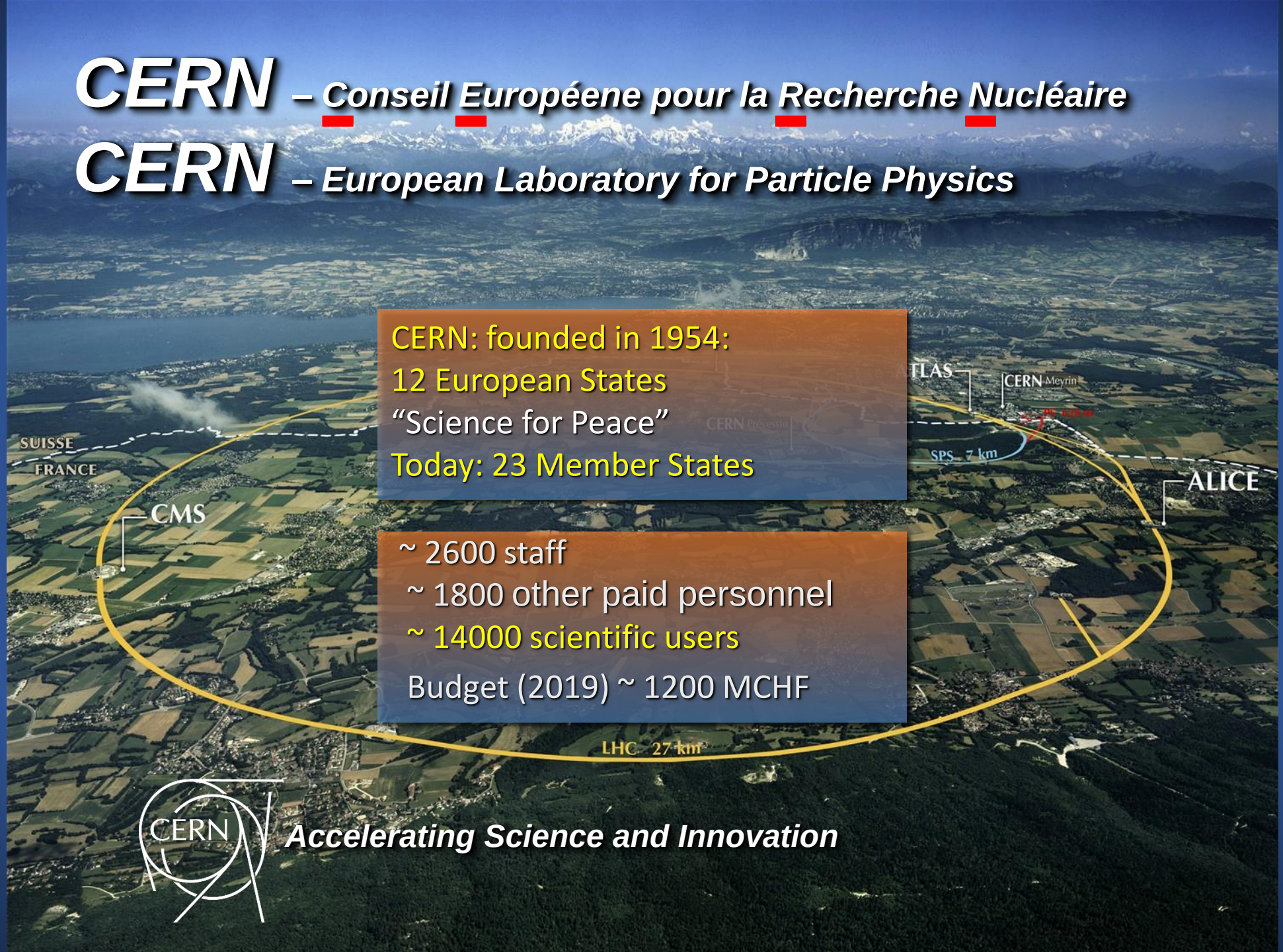
1962

1967

2009

CERN – Conseil Européene pour la Recherche Nucléaire

CERN – European Laboratory for Particle Physics



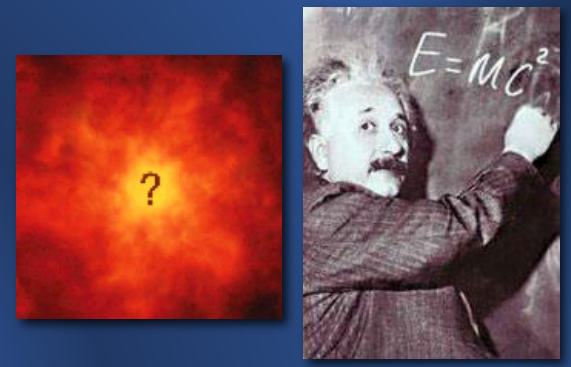
CERN: founded in 1954:
12 European States
"Science for Peace"
Today: 23 Member States

~ 2600 staff
~ 1800 other paid personnel
~ 14000 scientific users
Budget (2019) ~ 1200 MCHF

CERN

Accelerating Science and Innovation

The Mission of CERN



- **Push back** the frontiers of knowledge

  E.g. the secrets of the Big Bang …what was the matter like within the first moments of the Universe's existence?

- **Develop** new technologies for accelerators and detectors

  Information technology - the Web and the GRID

  Medicine - diagnosis and therapy

- **Train** scientists and engineers of tomorrow

ESI

- **Unite** people from different countries and cultures

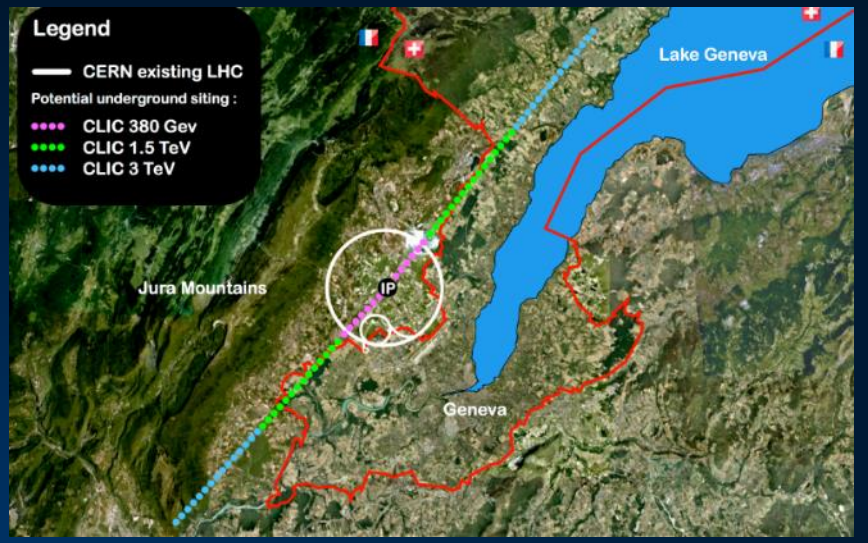
Future of particle physics

High Luminosity LHC until 2035

- Ten times more collisions than the original design

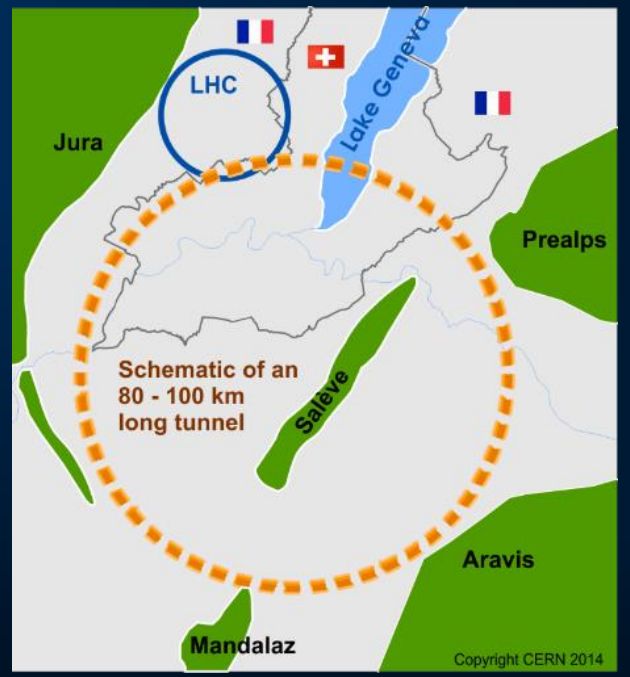
Studies in progress:
Compact Linear Collider (CLIC)

- Linear e^+e^- collider $\sqrt{s}$ up to 3 TeV



Future Circular Collider (FCC)

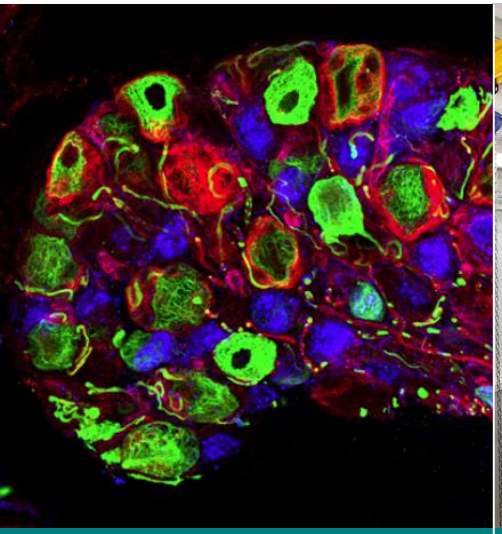
- New technology magnets → 100 TeV pp collisions in 100km ring
- e^+e^- collider (FCC-ee) as 1st step?
- HE-LHC in the present LHC tunnel with FCC-hh technology?



European Strategy for Particle Physics

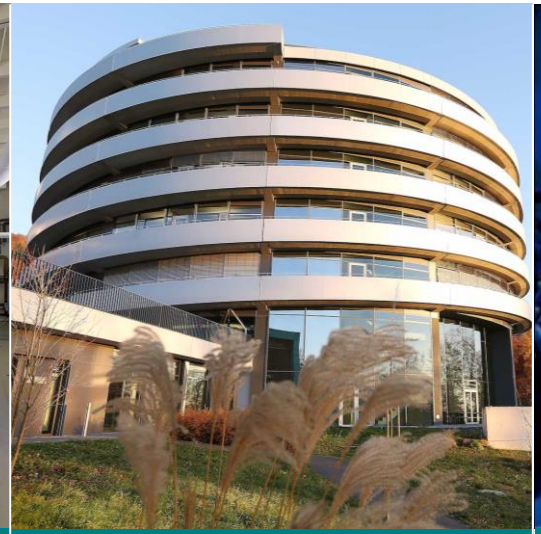
- Preparing next update in 2020

European Molecular Biology Laboratory (EMBL) - Missions



Basic research

Services



Advanced training

Technology development & transfer

Integration of life science research

EMBL

EMBL member states (1974-2019)

Member states (26)

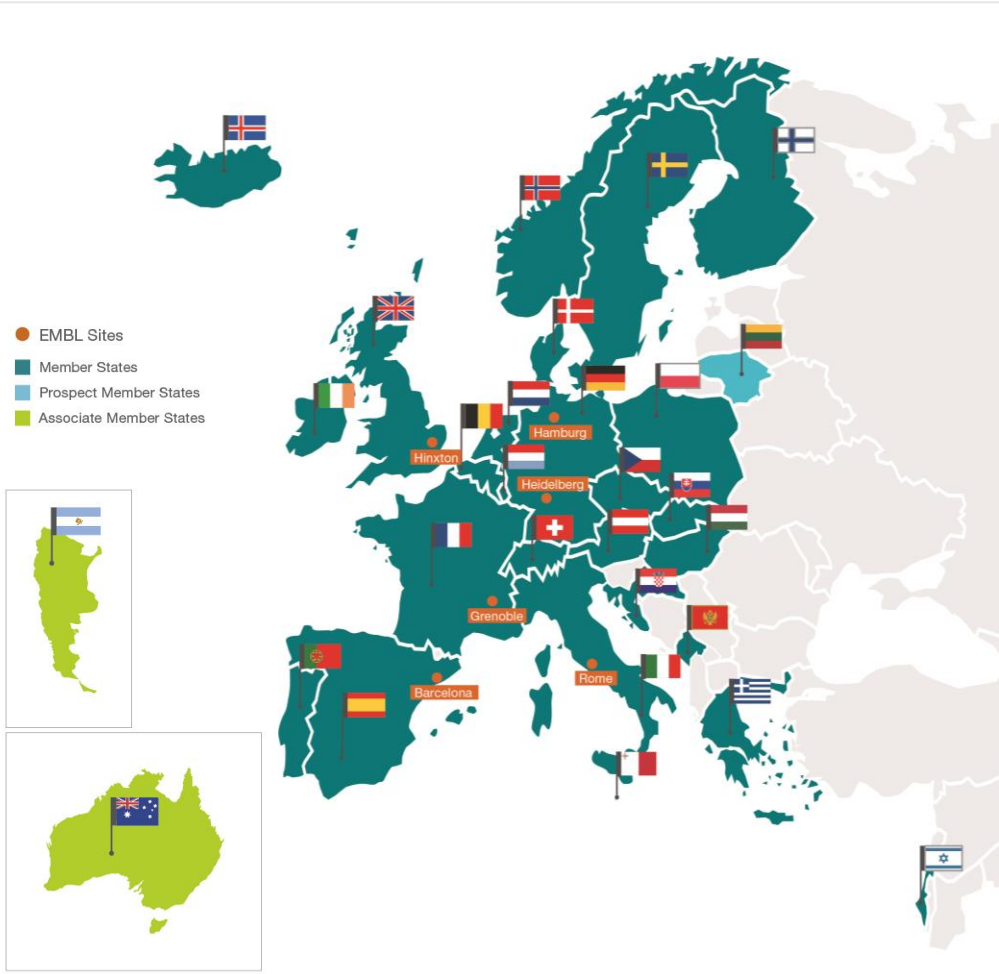
Austria 1974
Denmark 1974
France 1974
Germany 1974
Israel 1974
Italy 1974
Netherlands1974
Sweden 1974
Switzerland 1974
United Kingdom 1974
Finland 1984
Greece 1984
Norway 1985
Spain 1986
Belgium 1990
Portugal 1998
Ireland 2003
Iceland 2005
Croatia 2006
Luxembourg 2007
Czech Republic 2014
Malta 2016
Hungary 2017
Slovakia 2018
Montenegro 2018
Poland 2019

Associate member states

Australia 2008
Argentina 2014

Prospect member states

Lithuania 2015



Annual Budget ~ 240 m€, ~1700 staff

EMBL

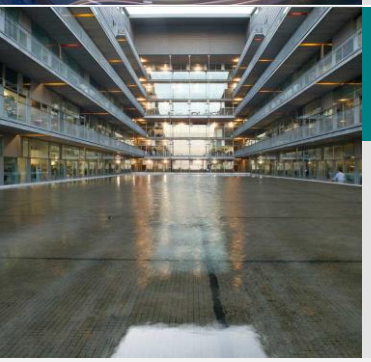
EMBL sites – over 1700 people and more than 80 nationalities

Hinxton
EMBL-EBI

Bioinformatics

Grenoble

Structural biology



Barcelona

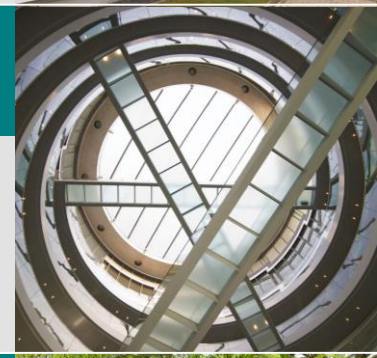
Tissue biology and disease modelling

Hamburg

Structural biology

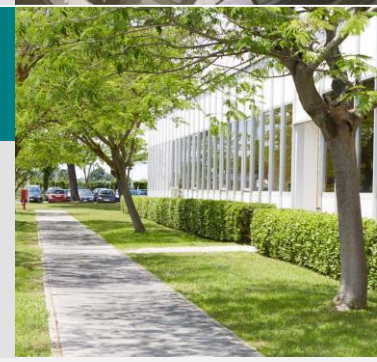
Heidelberg

Life sciences



Rome

Epigenetics and neurobiology



EMBL

THE EUROPEAN SPACE AGENCY

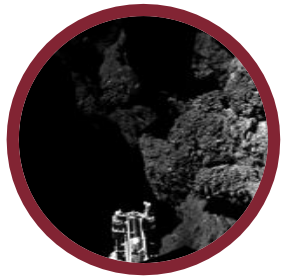
UNITED SPACE IN EUROPE

ESA facts and figures

- Over 50 years of experience
- 22 Member States
- Eight sites/facilities in Europe, about 2300 staff
- 5.72 billion Euro budget (2019)
- Over 80 satellites designed, tested and operated in flight

Activities

ESA is one of the few space agencies in the world to combine responsibility in nearly all areas of space activity.


space science


human spaceflight


exploration


earth observation


launchers


navigation


operations

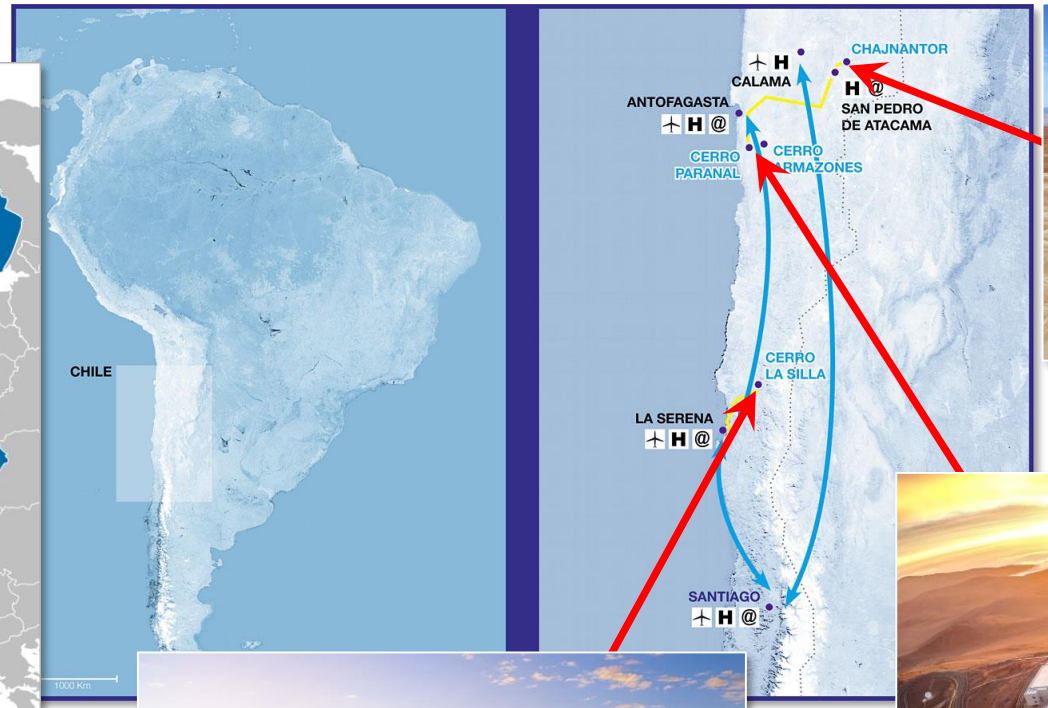

technology

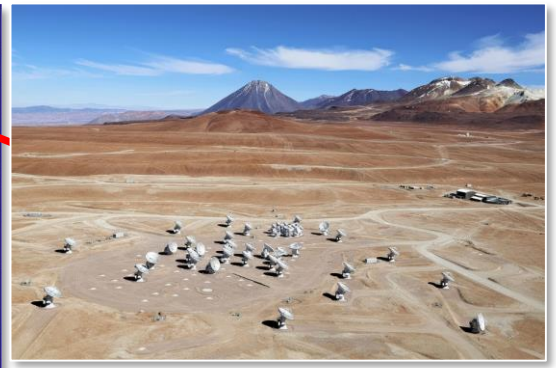

telecommunications

ESO

- “European Southern Observatory”
- Intergovernmental research organization for ground-based astronomy.
- Mission: “Provide state-of-the-art research facilities to astronomers and astrophysicists”.
- Founded: 1962
- Member States in 2019: 16
- Annual budget: ~160 M€
- Staff members: ~700

ESO – Sites





ALMA on Chajnantor (5100m)

Headquarters (482m)

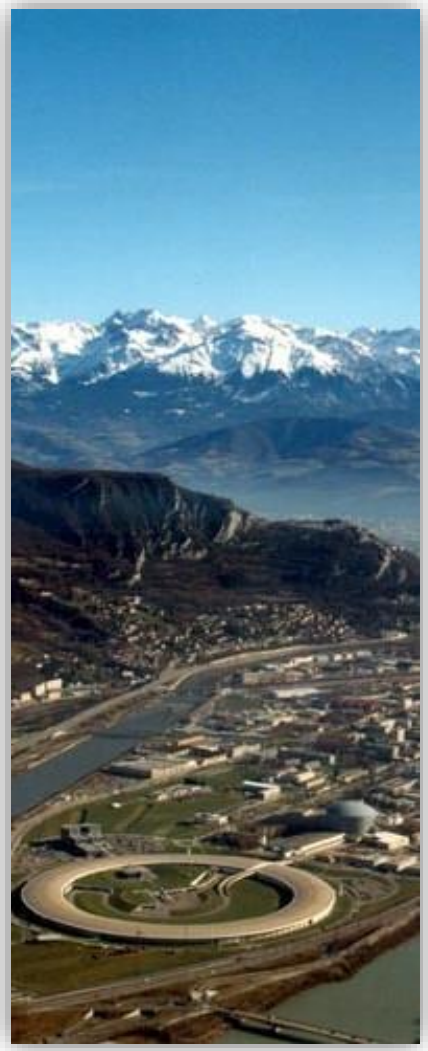
La Silla (2400m)

VLT on Cerro Paranal (2635m)

Observatories in Chile

ESRF: European Synchrotron Radiation Facility

A user facility for cutting-edge science with X-rays



Synchrotron with 800 m circumference

Exploration of the structure and dynamics of our complex world, down to the single atom.

Scientific excellence. Access to experiment time is **competitive**, and selection of experiments is guided by external review.

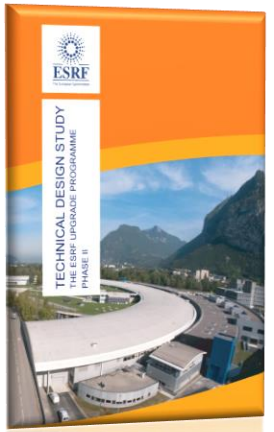
Accessibility. The **use** of the ESRF is **free of charge** for all academic research. Close to a quarter of the academic research at the ESRF involves industrial partners. Industrial use of our facilities and expertise, including full intellectual property protection, is possible.

Openness. The results of **academic research** at the ESRF are **always published**, and the **knowledge, skills and technologies** developed at the ESRF are **shared** with the member countries and associates.

Grenoble, EPN campus, founded in 1989, 600 staff, 50 beam lines, 13 member states

ESRF UPGRADE PROGRAMME: AN AMBITIOUS PROGRAMME TO PREPARE THE FUTURE

Purple Book January 2008



Orange Book January 2015

ESRF UPGRADE PHASE I
180 M€ (2009-2015):
ESFRI ROADMAP 2006-2016
IN TIME – WITHIN BUDGET

- 19 new beamlines, many specialised on *nano*-beam science
- Upgrade and renewal of facilities and support laboratories

ESRF-EBS
Extremely Brilliant Source
150 M€ (2015-2022)
ESFRI LANDMARK (2016)

- a new revolutionary low-emittance storage ring
- New beamlines
- Data (analysis) as a service
- Instrumentation programme

ESFRI

European Commission

European XFEL—a leading new research facility

Schenefeld research campus on 31 May 2018

- The European XFEL is a new research facility that uses high-intensity X-ray light to study the structure of matter.
  - User facility with 400 employees (+250 from DESY)
  - Location: Hamburg and Schenefeld, Germany
  - September 2017 start of user operation

About European XFEL

- Organized as a non-profit corporation in 2009 with the mission of design, construction, operation, and development of the free-electron laser
- Supported by 12 partner countries
- Germany (federal government, city-state of Hamburg, and state of Schleswig-Holstein) covers 57% of the costs; Russia contributes 26%; each of the other international shareholders 1–3%
- Total budget for construction (including commissioning)
  - 1.25 billion € at 2005 prices, about 118 M€ operating budget
  - 600 M€ contributed in cash, over 550 M€ as in-kind contributions (mainly manufacture of parts for the facility)

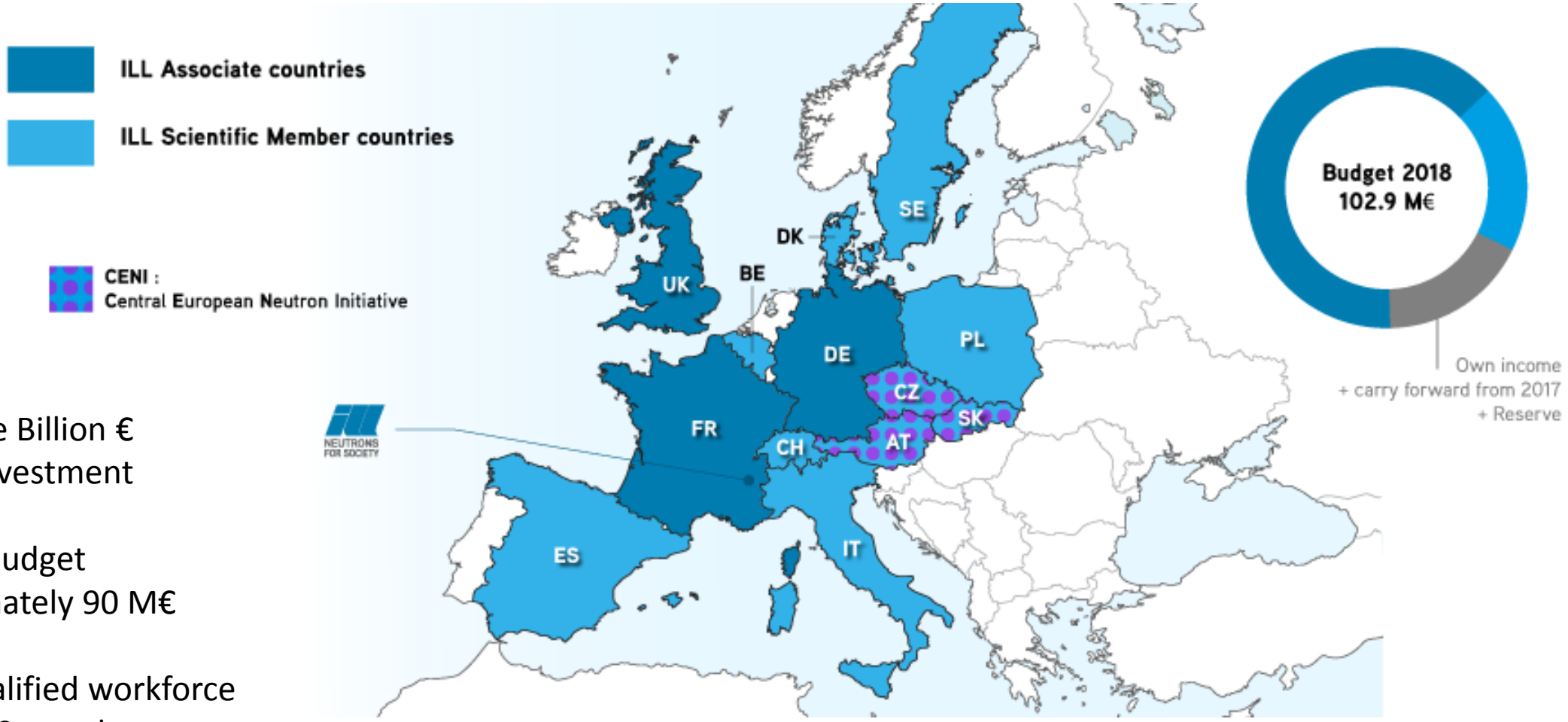
Institut Laue-Langevin – founded in 1967
World leader in neutron science and technology

The neutron is a unique and irreplaceable probe, with characteristics that cannot be supplanted by other methods

The ILL is the most intense neutron source in the world, at the service of international scientists, to carry out scientific research at the frontiers' of modern science

ILL's Second Mission is to Help Building Europe

The advent of the scientific members continues the process.



- Close to one Billion € of capital investment
- An annual budget of approximately 90 M€
- A highly qualified workforce of about 500 people

Key figures about the ILL

1400 users from an active community of 12 000 scientists

850 experiments/year

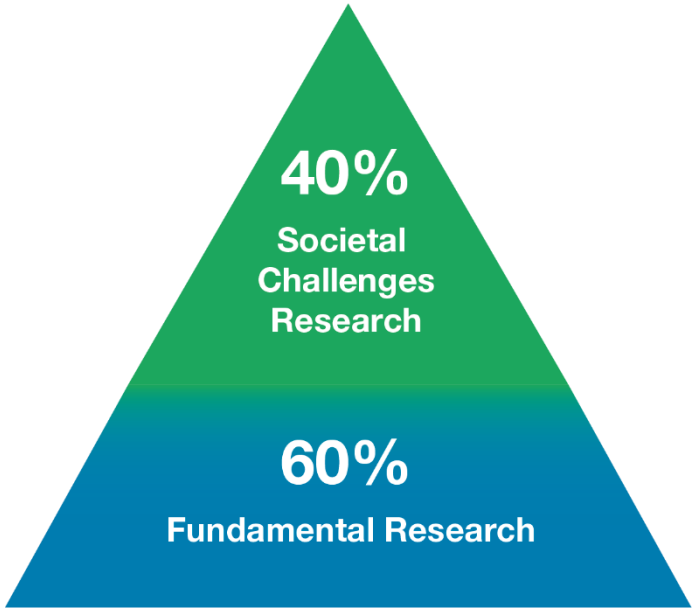
650 publications/year

65 countries

28 instruments + 10 CRGs

(collab. Res. Group instruments)

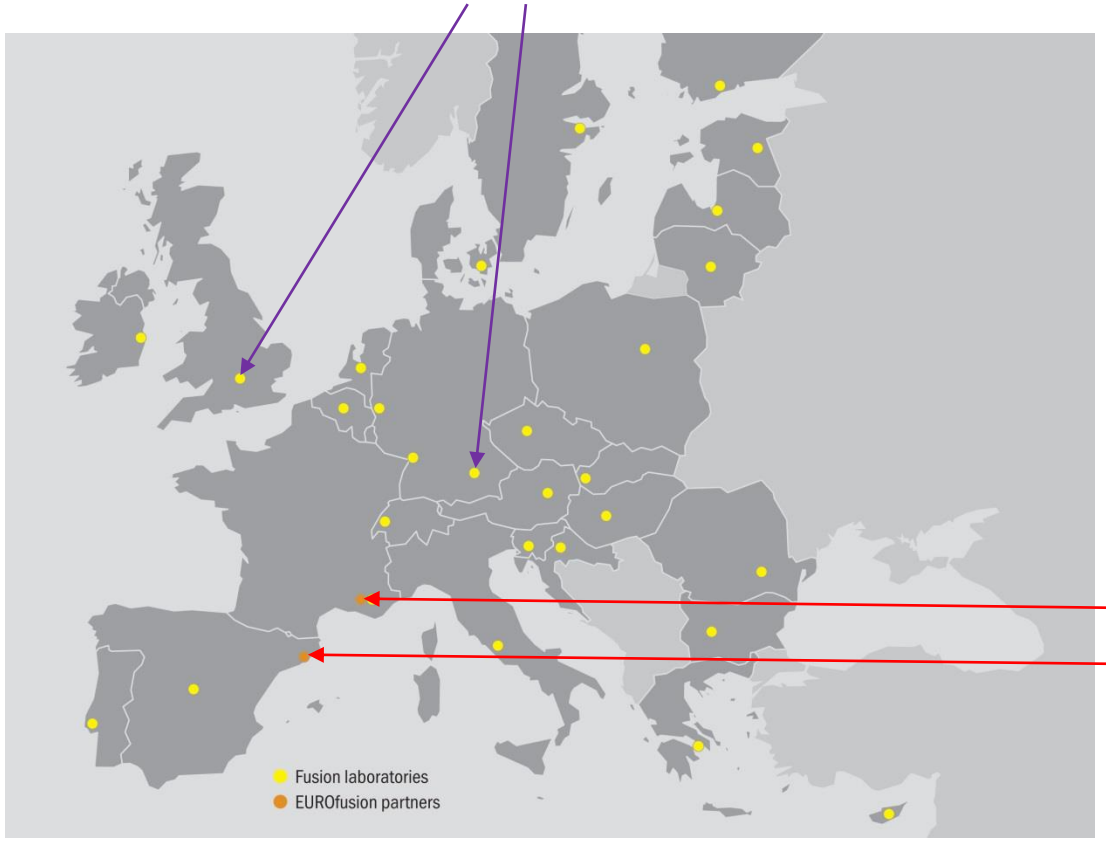
4 cycles of 50 days/year



EUROfusion

- EUROfusion supports and funds fusion research activities on behalf of the European Commission's Euratom programme.
- All EU Member States plus Switzerland have joined the EUROfusion agreement involving 29 fusion laboratories and numerous Third Parties.
- Their combined effort will achieve the ultimate goal: fusion electricity by 2050

Programme Management Unit



ITER
Fusion for Energy (F4E)

EUROfusion

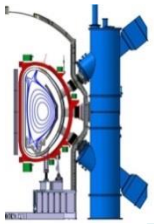
Roadmap towards fusion electricity

Power Plant

Fusion is practical, attractive

Fusion is feasible

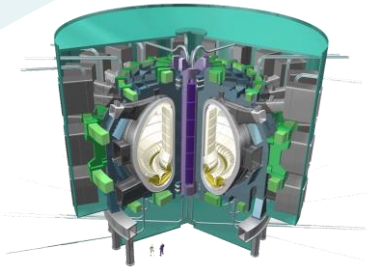
Fusion is plausible

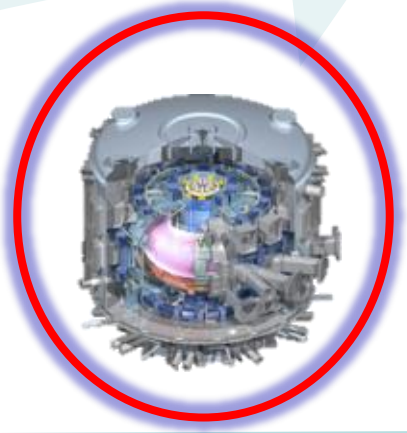


DEMO

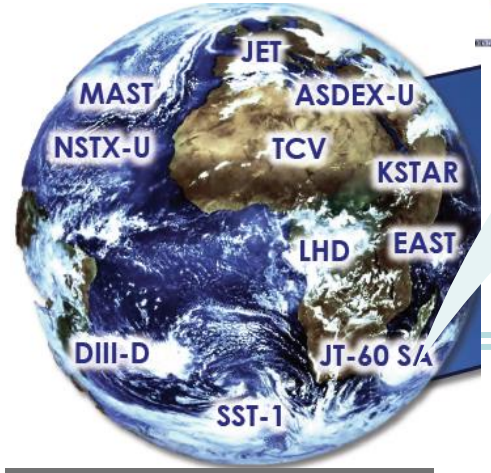
Fusion is commercially exploited

ITER





JT-60SA



Fusion facilities around the world

~2020
Operation

~2025

~2050

Why ?

- The eight EIROs have extensive expertise in the areas of basic research and the management of large, international infrastructures, facilities and research programmes.
- There is limited thematic overlap, however the EIROs share similar principles and methodologies, use similar methods and tools, face similar challenges and needs.
- It therefore makes sense to form a relatively ‘loose’ configuration (forum) in order to combine the resources, facilities and expertise of its member organisations to support European science in reaching its full potential.

How ?

Our DGs meet twice a year and agree on joint actions, statements, policies, best practices …

Within EIROforum, the organisations form joint working groups, e.g. on information technology, **instrumentation**, outreach, technology transfer, …

→ Expertise within the organisations is identified and shared in common projects and events.

- The EIROforum School on Instrumentation (ESI) is one of the main activities of the Instrumentation WG.
- Even though the goals and approaches are very different in the 8 EIROs, instrumentation is based on the same principles and often on similar technical solutions.
- A school seems like an ideal event to learn from each other and build new relations, between students … and teachers.