

COLLABORATION

EDUCATION

FUNDAMENTAL RESEARCH

NEW TECHNOLOGIES

introductory talk about the Laboratory by Konrad Jende

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NEW
| NCIS: Los Angeles Tomorrow 9|8c



CERN

Conseil Européen pour la Recherche Nucléaire

1. History & Organization
2. Fundamental Research
3. Latest Results
4. Technology Transfer

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UNESCO & CERN



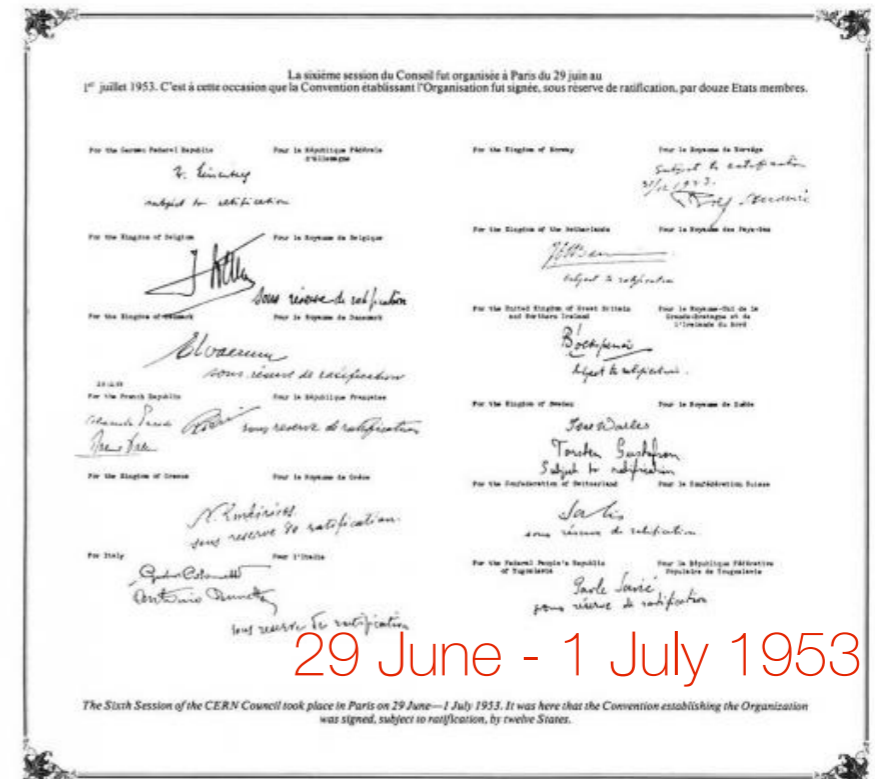
EUROPE in 1949



CERN vs COW



CERN Convention



UNESCO & CERN



EUROPE in 1949



CERN vs COW

Sur le terrain du futur institut nucléaire

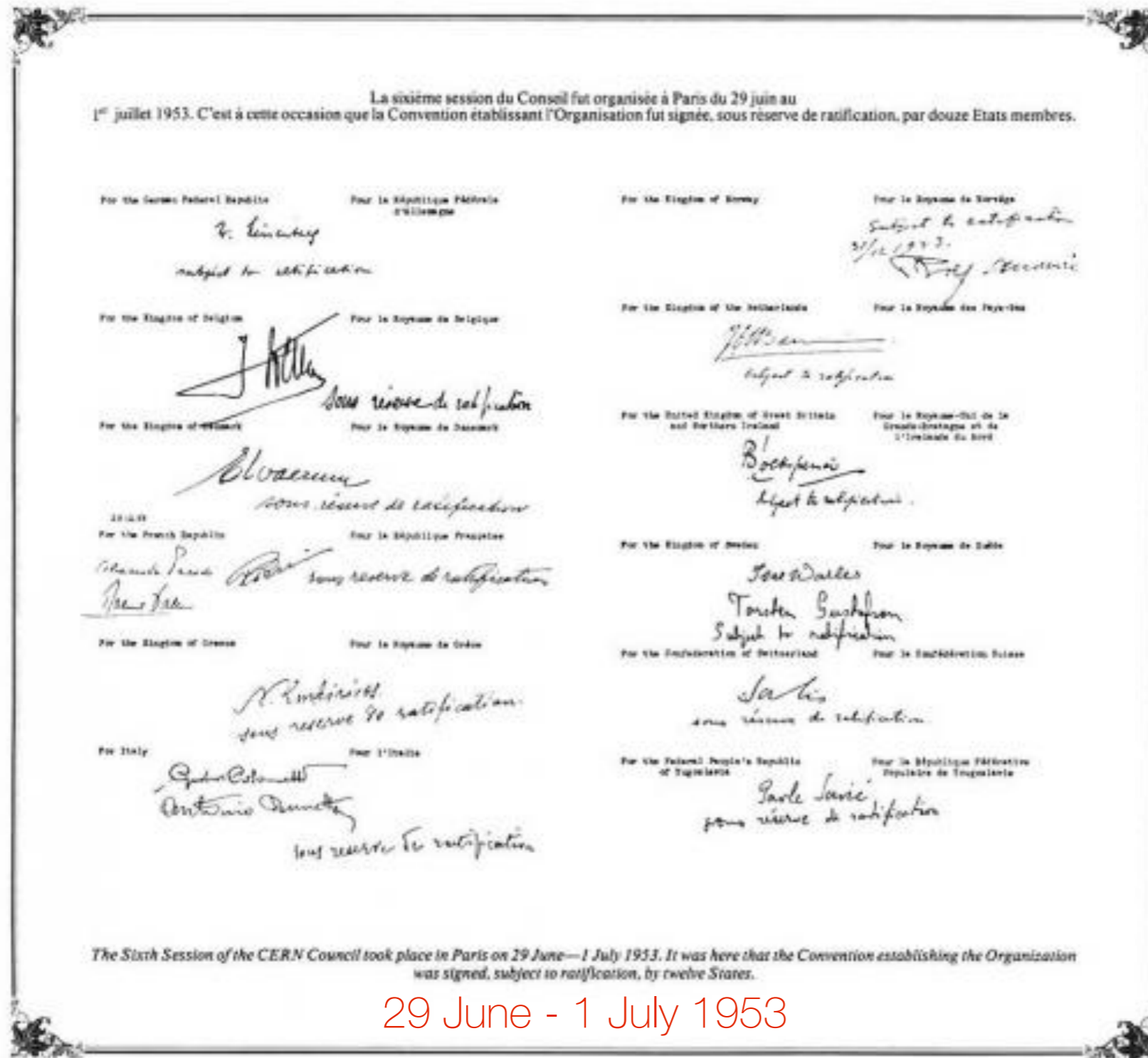


CERN Convention

ARTICLE II: Purposes

The organization shall provide for collaboration among European States in nuclear research of a pure scientific and fundamental character [...]

The organization shall have no concern with work for military requirements and the results of its experimental and theoretical work shall be published or otherwise made generally available.





Happy Birthday!

EN FR

NEWS

EVENTS

MULTIMEDIA ▾

MENU ≡



CERN is celebrating 60 years of science for peace in 2014

CERN milestones

1954 (29 Sep) DOB of CERN

1957 TH Group & first accelerator *Synchrocyclotron* (SC)

1958 *Weak interaction* studies

1968 Invention of the *Multi-wire proportional chamber* by
G. Charpak (NP 1992)

1973 Discovery of *Weak Neutral Currents*

1983 Confirming the existence of the *W* and *Z bosons*

1989 Start-up of the Large Electron Positron Collider (LEP)

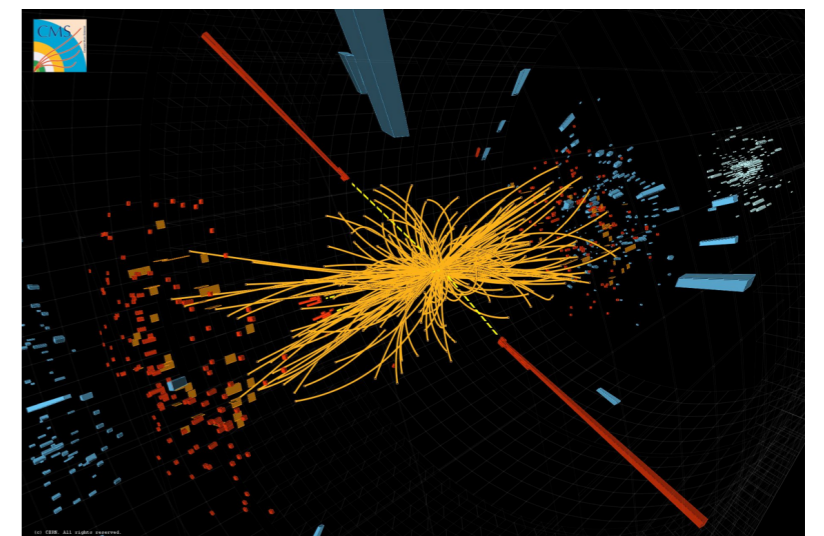
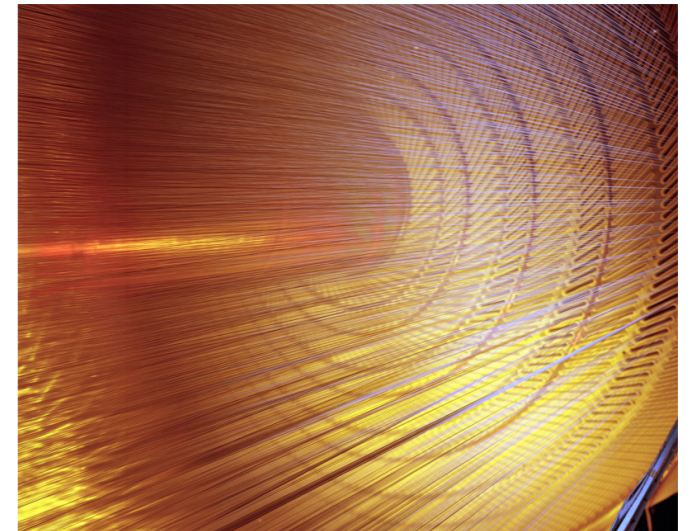
1990 Establishing of the WWW

1995 First production of antimatter atoms

2008 Start-up of the Large Hadron Collider

2012 Confirming the existence of the *Higgs boson*

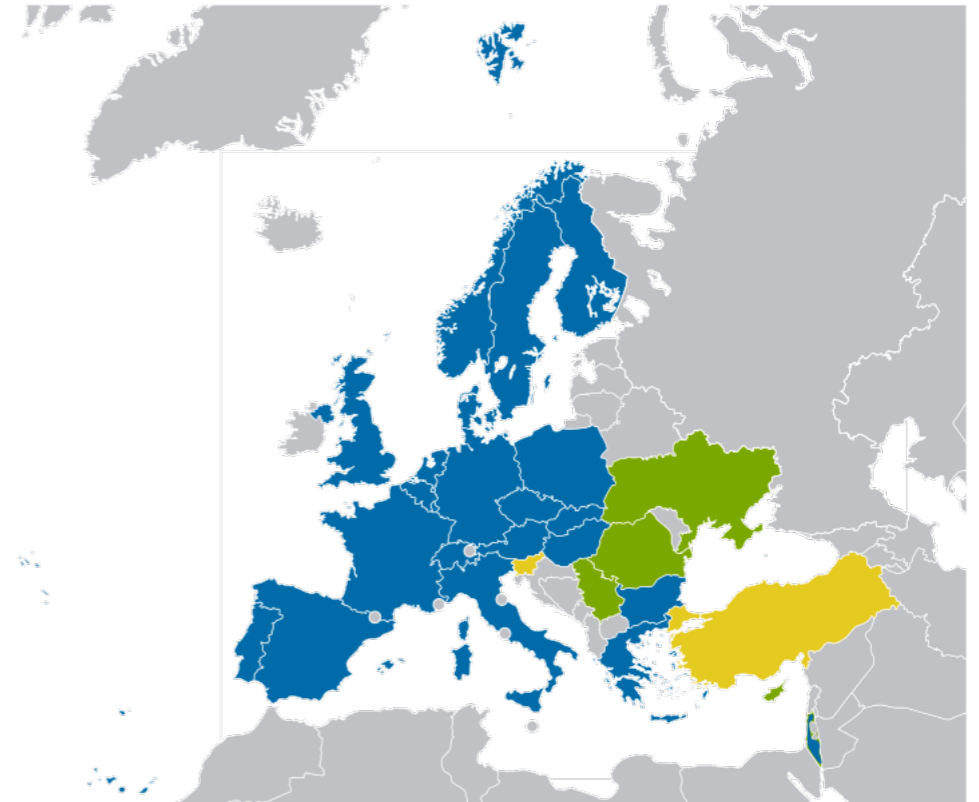
2013 Nobel prize to F. Englert and P. Higgs



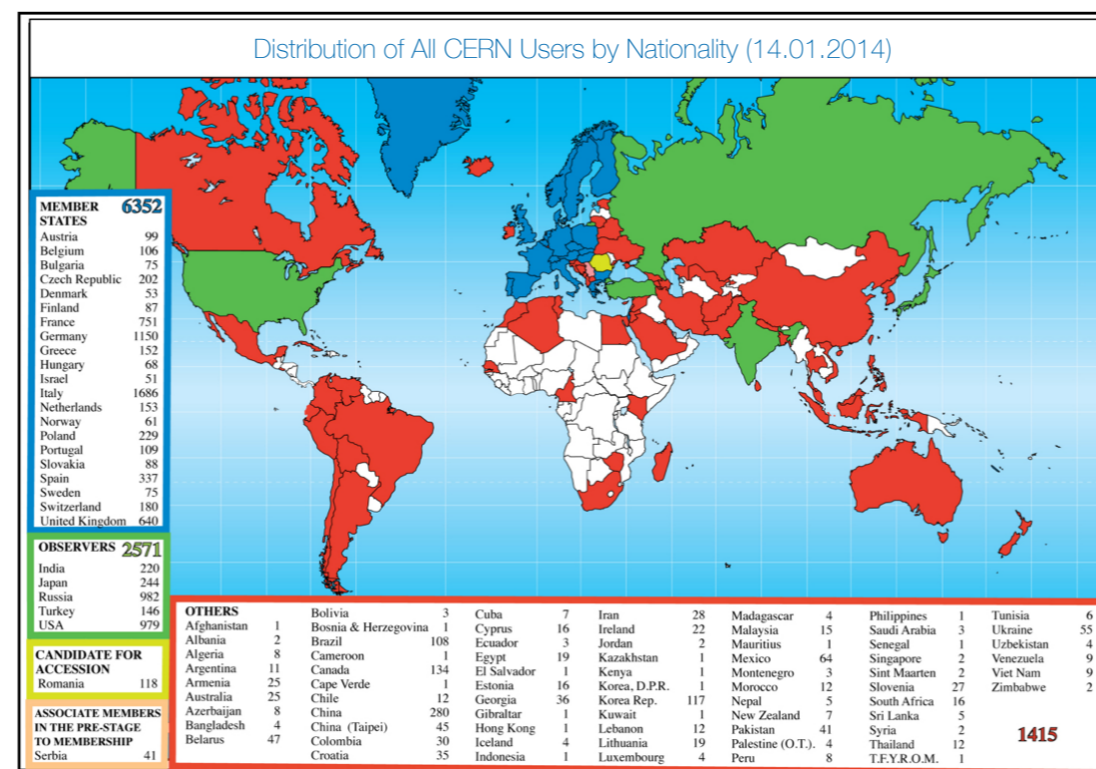
Flags - then and now



CERN Member States



Nationalities





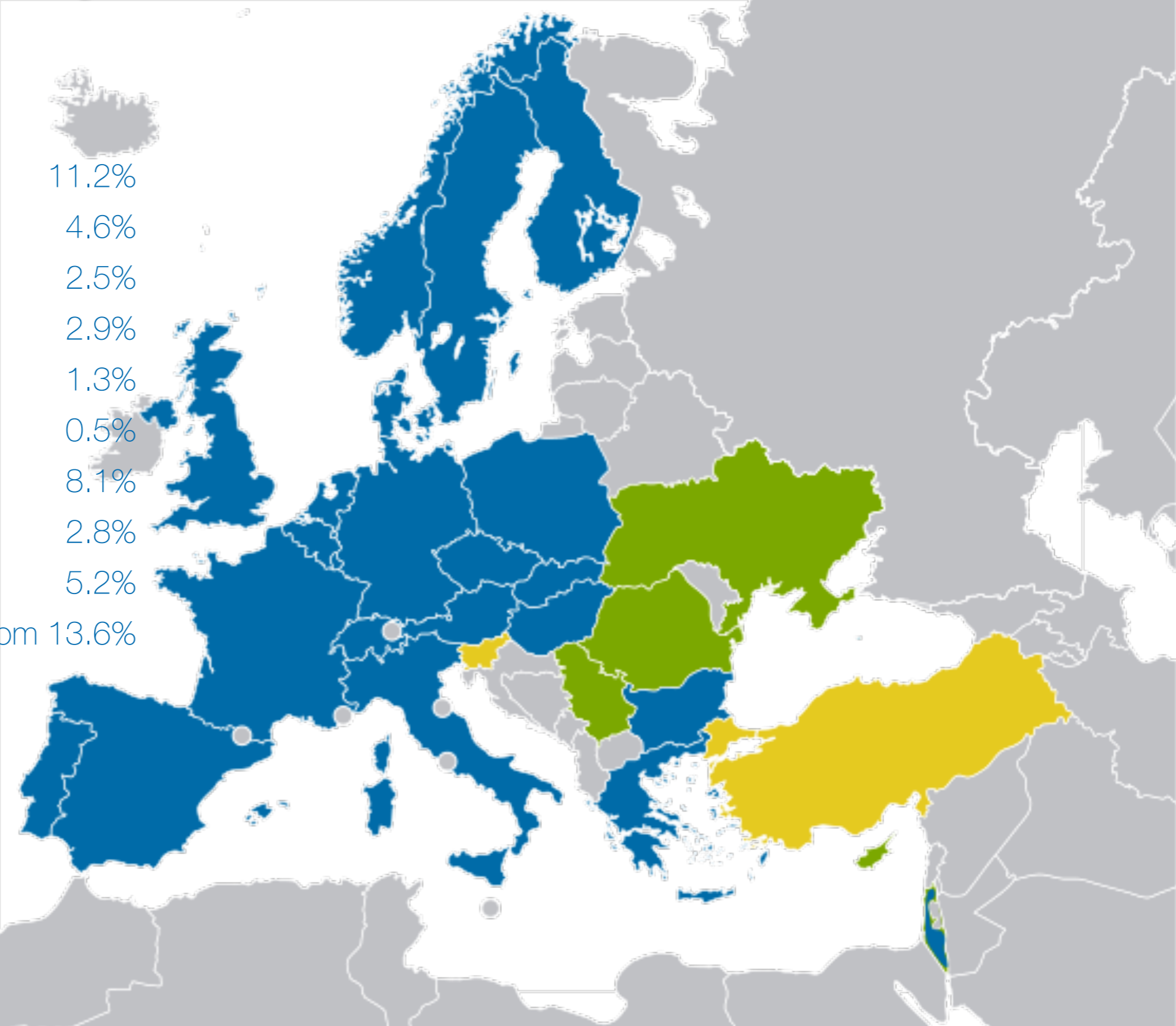
Flags - then and now



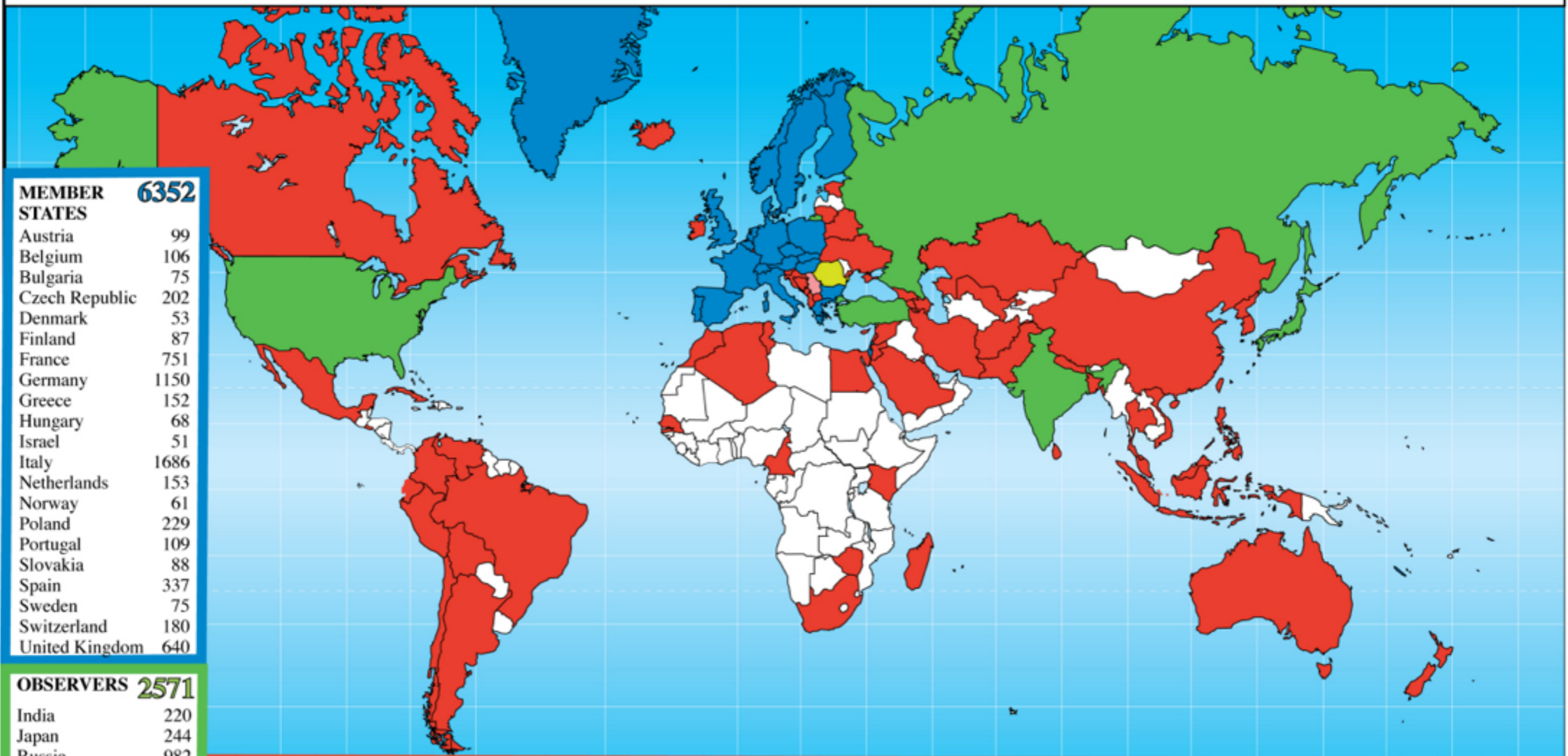
CERN member states

Austria	2.2%	Italy	11.2%
Belgium	2.9%	Netherlands	4.6%
Bulgaria	0.3%	Norway	2.5%
Czech Rep	1.0%	Poland	2.9%
Denmark	1.8%	Portugal	1.3%
Finland	1.4%	Slovak Rep	0.5%
France	15.5%	Spain	8.1%
Germany	20.3%	Sweden	2.8%
Greece	1.6%	Switzerland	5.2%
Hungary	0.6%	United Kingdom	13.6%
Israel	0.3%		

- member state
- candidate
- intendant candidate



Distribution of All CERN Users by Nationality (14.01.2014)



MEMBER STATES	6352
Austria	99
Belgium	106
Bulgaria	75
Czech Republic	202
Denmark	53
Finland	87
France	751
Germany	1150
Greece	152
Hungary	68
Israel	51
Italy	1686
Netherlands	153
Norway	61
Poland	229
Portugal	109
Slovakia	88
Spain	337
Sweden	75
Switzerland	180
United Kingdom	640

OBSERVERS	2571
India	220
Japan	244
Russia	982
Turkey	146
USA	979

CANDIDATE FOR ACCESSION	
Romania	118

ASSOCIATE MEMBERS IN THE PRE-STAGE TO MEMBERSHIP	
Serbia	41

OTHERS													
Afghanistan	1	Bolivia	3	Cuba	7	Iran	28	Madagascar	4	Philippines	1	Tunisia	6
Albania	2	Bosnia & Herzegovina	1	Cyprus	16	Ireland	22	Malaysia	15	Saudi Arabia	3	Ukraine	55
Algeria	8	Brazil	108	Ecuador	3	Jordan	2	Mauritius	1	Senegal	1	Uzbekistan	4
Argentina	11	Cameroon	1	Egypt	19	Kazakhstan	1	Mexico	64	Singapore	2	Venezuela	9
Armenia	25	Canada	134	El Salvador	1	Kenya	1	Montenegro	3	Sint Maarten	2	Viet Nam	9
Australia	25	Cape Verde	1	Estonia	16	Korea, D.P.R.	1	Morocco	12	Slovenia	27	Zimbabwe	2
Azerbaijan	8	Chile	12	Georgia	36	Korea Rep.	117	Nepal	5	South Africa	16		
Bangladesh	4	China	280	Gibraltar	1	Kuwait	1	New Zealand	7	Sri Lanka	5		
Belarus	47	China (Taipei)	45	Hong Kong	1	Lebanon	12	Pakistan	41	Syria	2		
		Colombia	30	Iceland	4	Lithuania	19	Palestine (O.T.)	4	Thailand	12		
		Croatia	35	Indonesia	1	Luxembourg	4	Peru	8	T.F.Y.R.O.M.	1		

1415

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Fundamental questions of mankind

Where do we come from?

= Big Bang Theory

What are we made of?

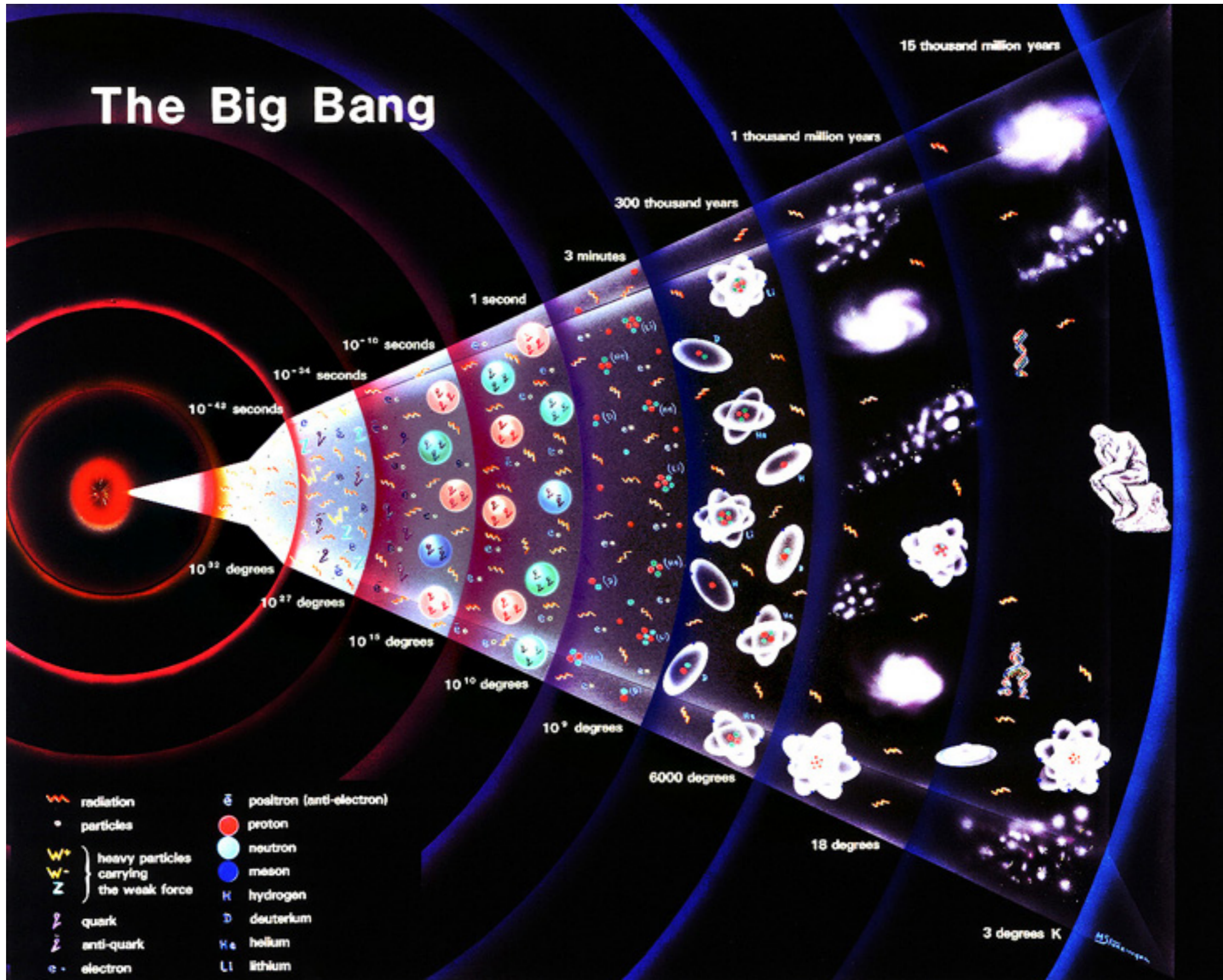
= Particle Physics Research

What are we going?

= Technology Transfer



Big Bang Theory



CERN



LHCb

ATLAS

CERN MoEDAL

CERN Geneva

SPS 7 km

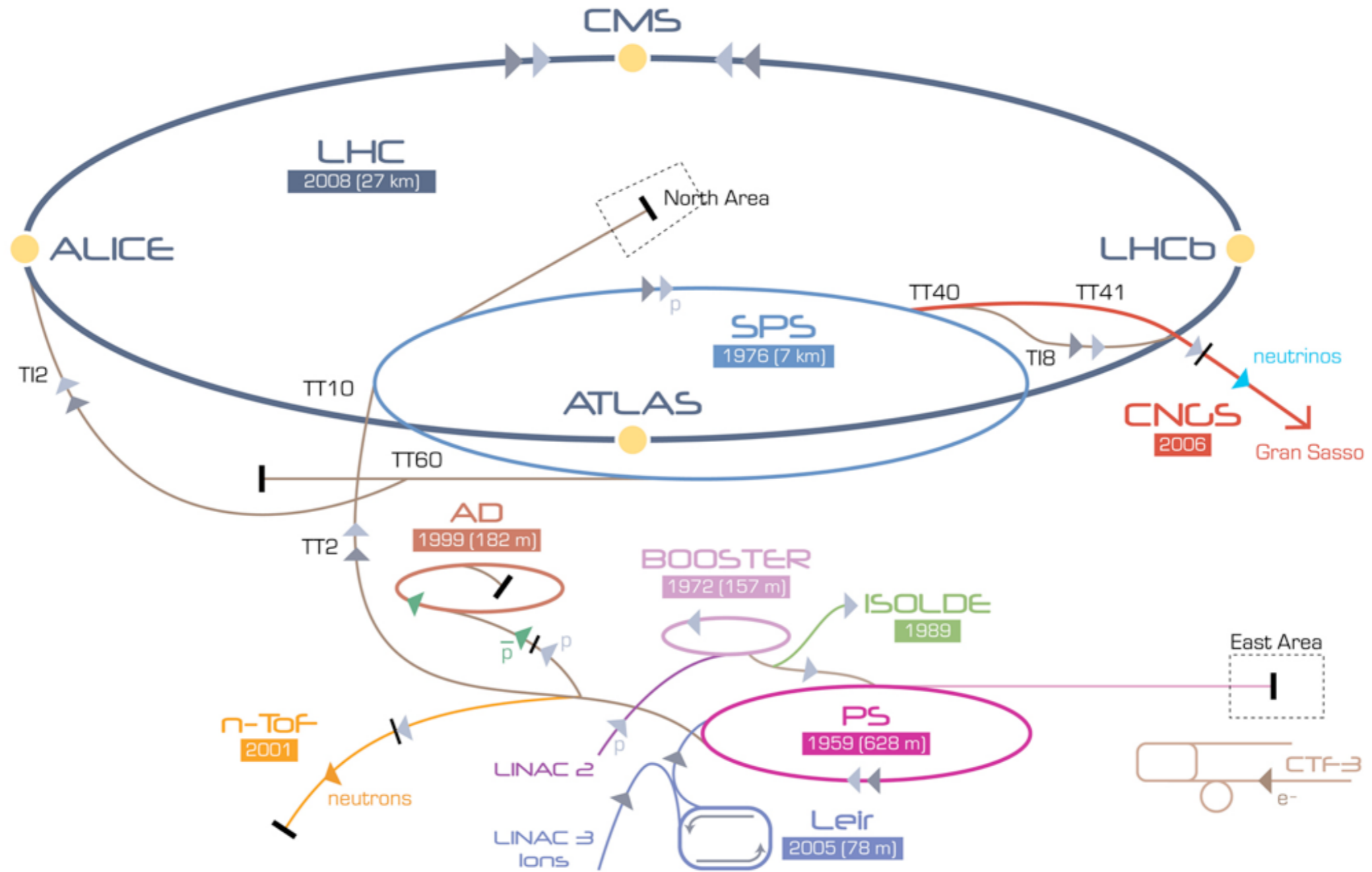
SUISSE
FRANCE

CMS

ALICE

LHC 27 km

CERN accelerator complex



▶ p [proton] ▶ ion ▶ neutrons ▶ \bar{p} [antiproton] $\rightarrow + -$ proton/antiproton conversion ▶ neutrinos ▶ electron

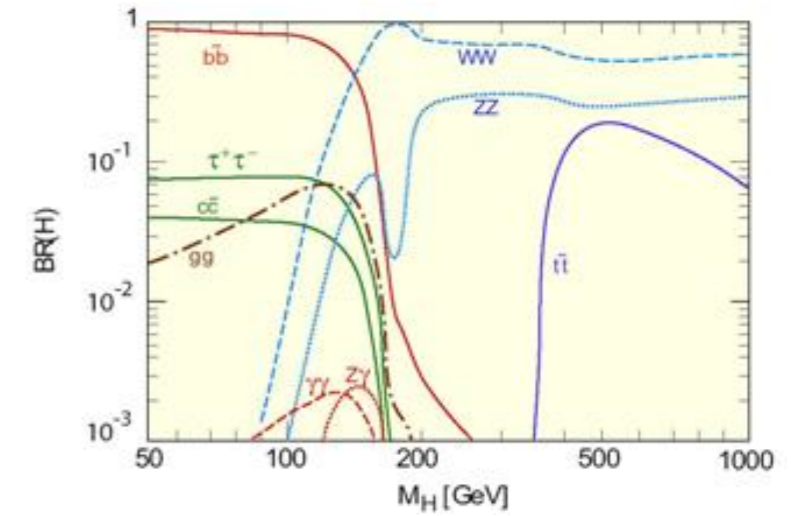
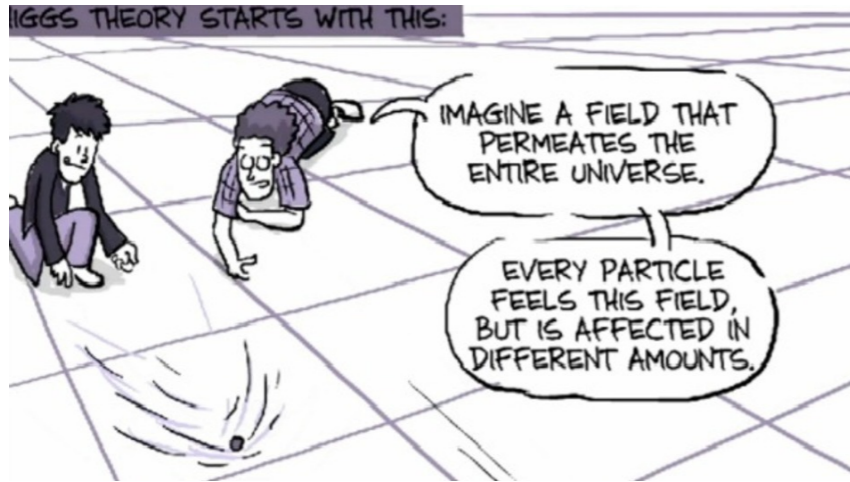
LHC Large Hadron Collider SPS Super Proton Synchrotron PS Proton Synchrotron

AD Antiproton Decelerator CTF-3 Clic Test Facility CNCS Cern Neutrinos to Gran Sasso ISOLDE Isotope Separator OnLine DEvice
 LEIR Low Energy Ion Ring LINAC LINear ACcelerator n-ToF Neutrons Time Of Flight

CERN

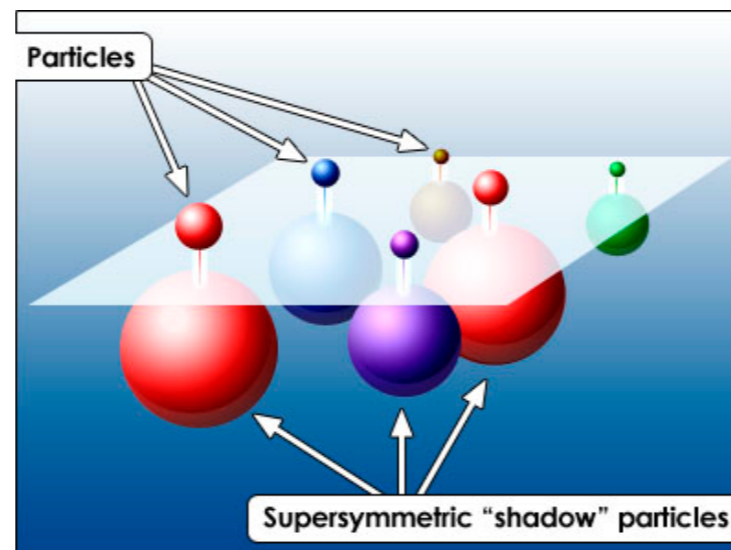
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current results

- 2012 (Jul) Confirmation of existence of the Higgs boson
- 2013 (Jul) Top quark properties refined (e.g. mass)
- 2013 (Nov) Evidence of the Higgs boson decaying into fermions
- now studies on supersymmetric models and particles



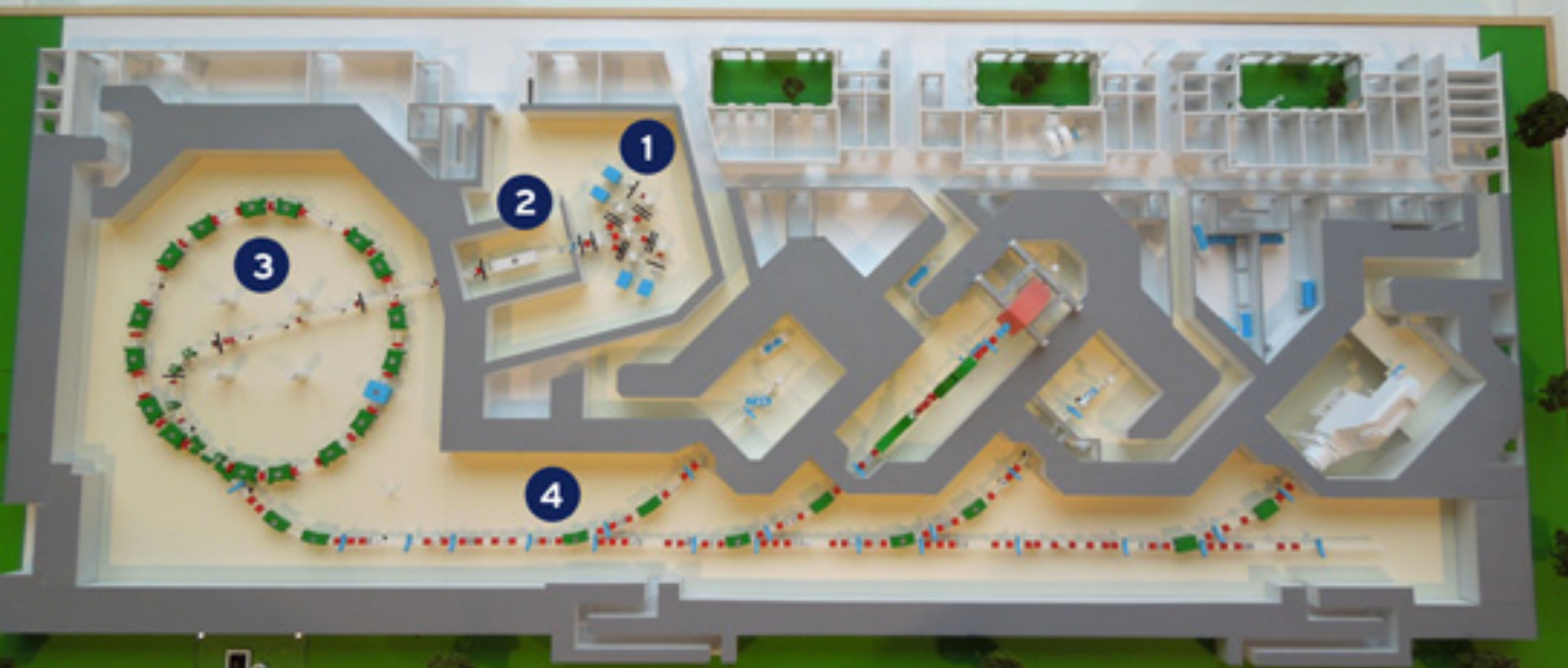
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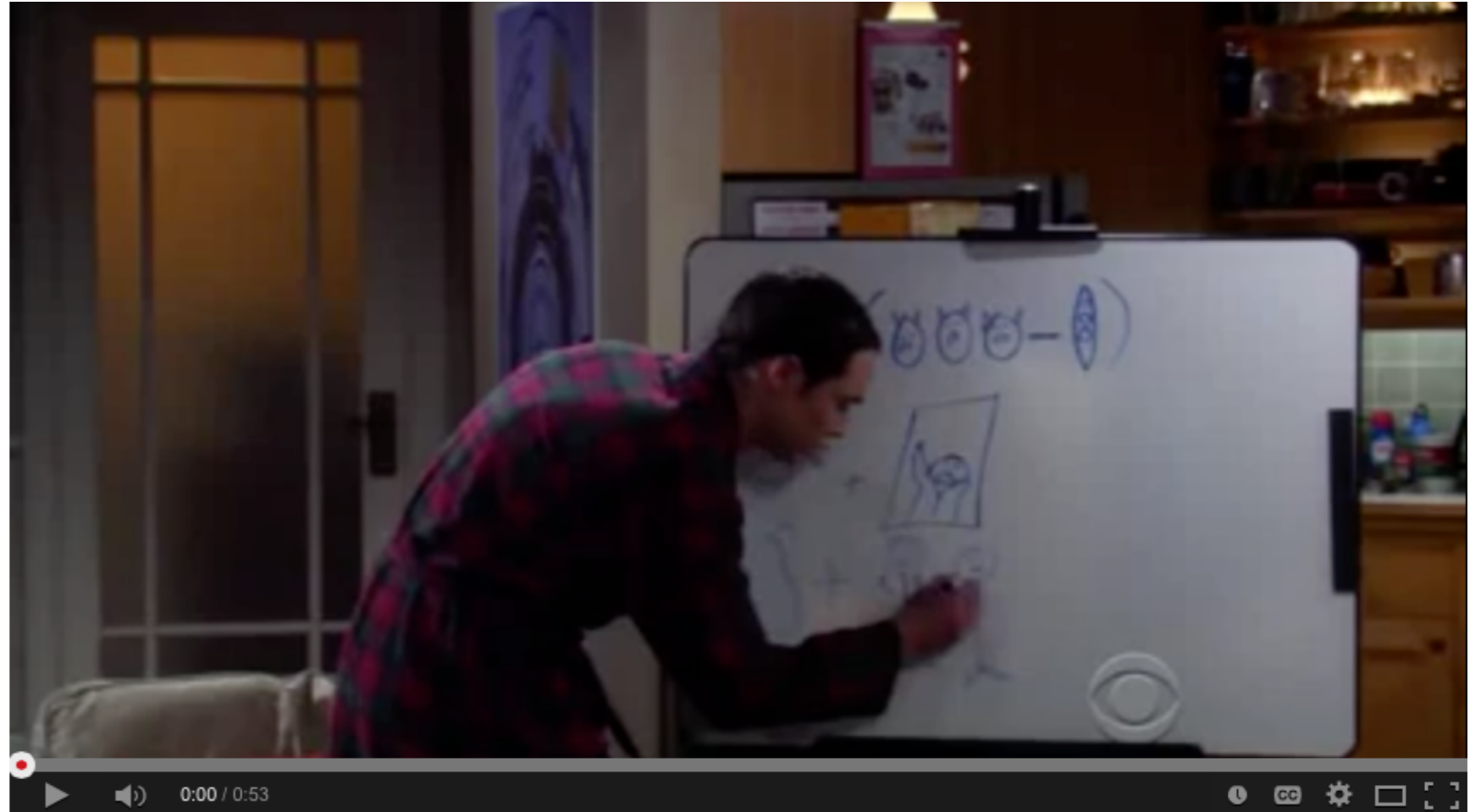
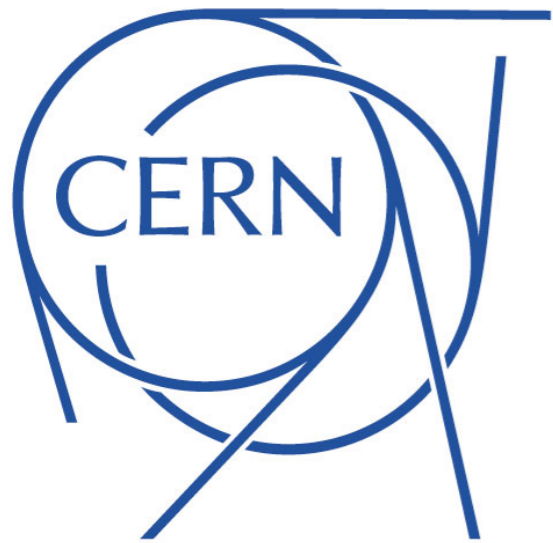
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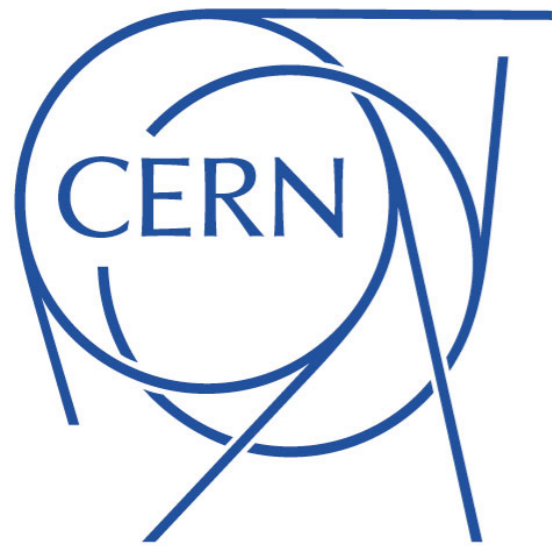








Thank you!



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Thank you!