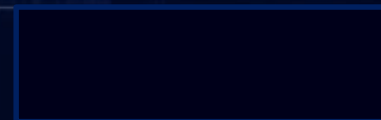


Big Bang & Parallel Worlds: Connecting the Micro and Macro

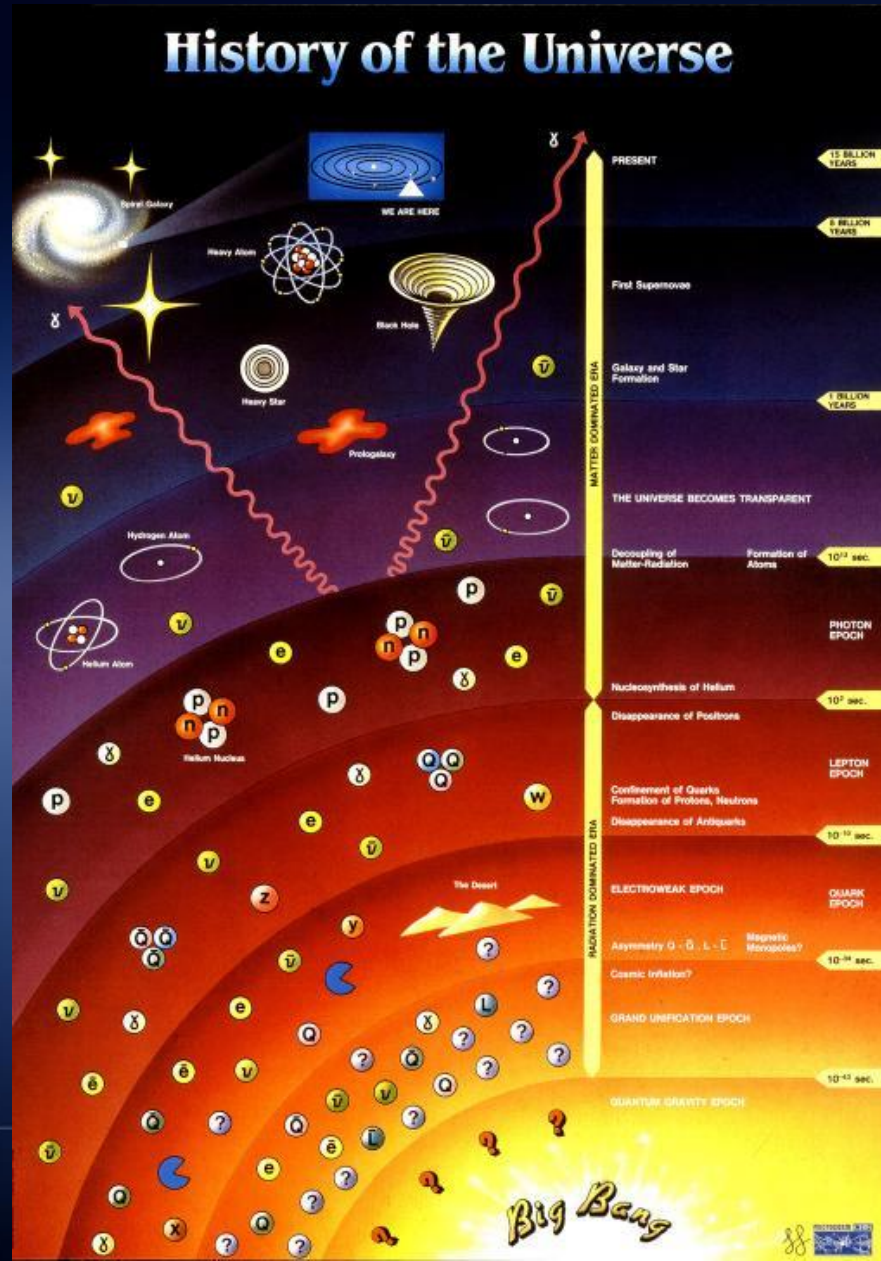
About CERN, Physics, and Innovation

CBI A3, November 26, 2019

Markus Nordberg (CERN)

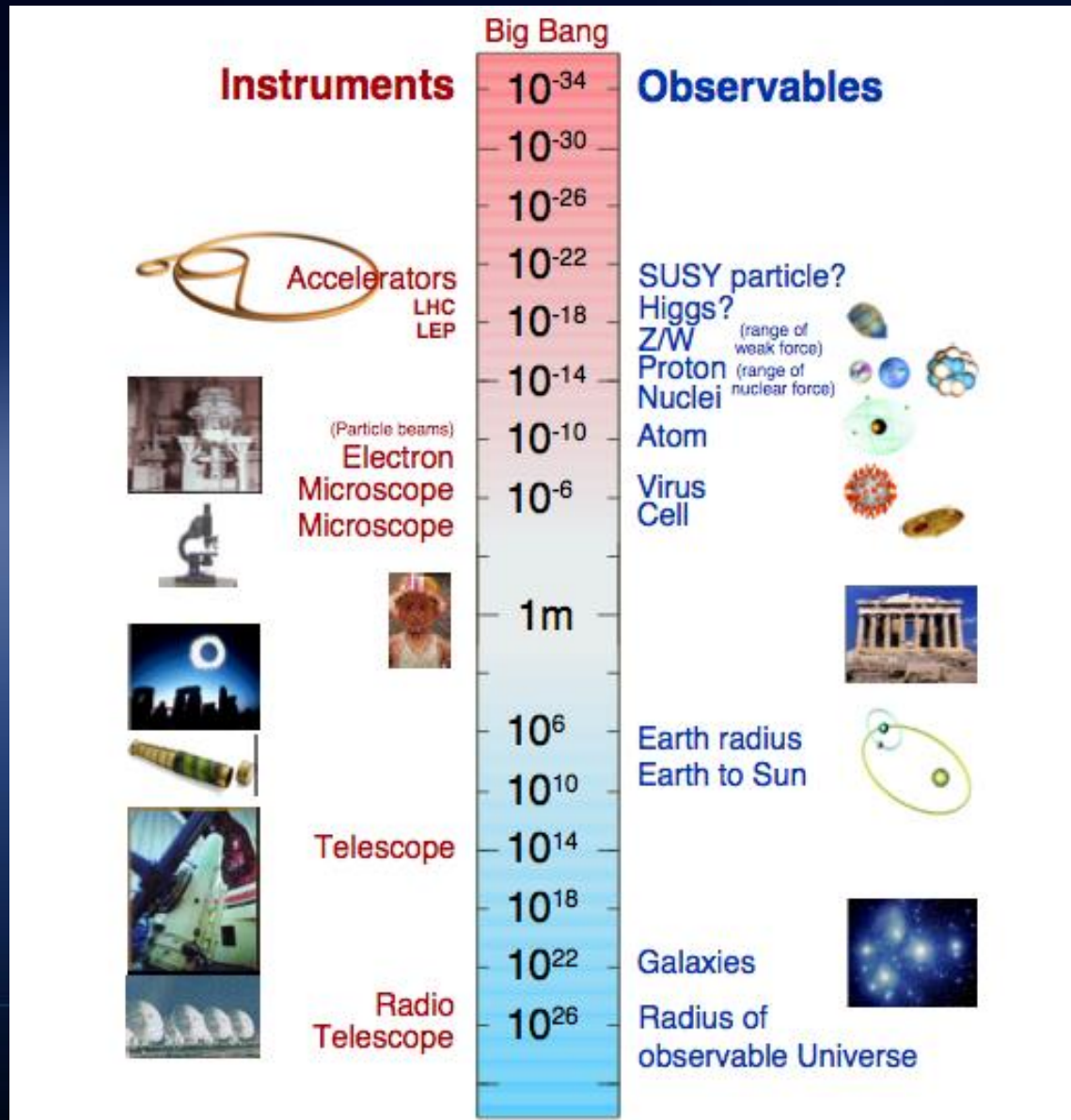


How does CERN Connect?

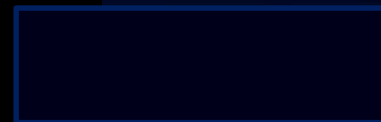
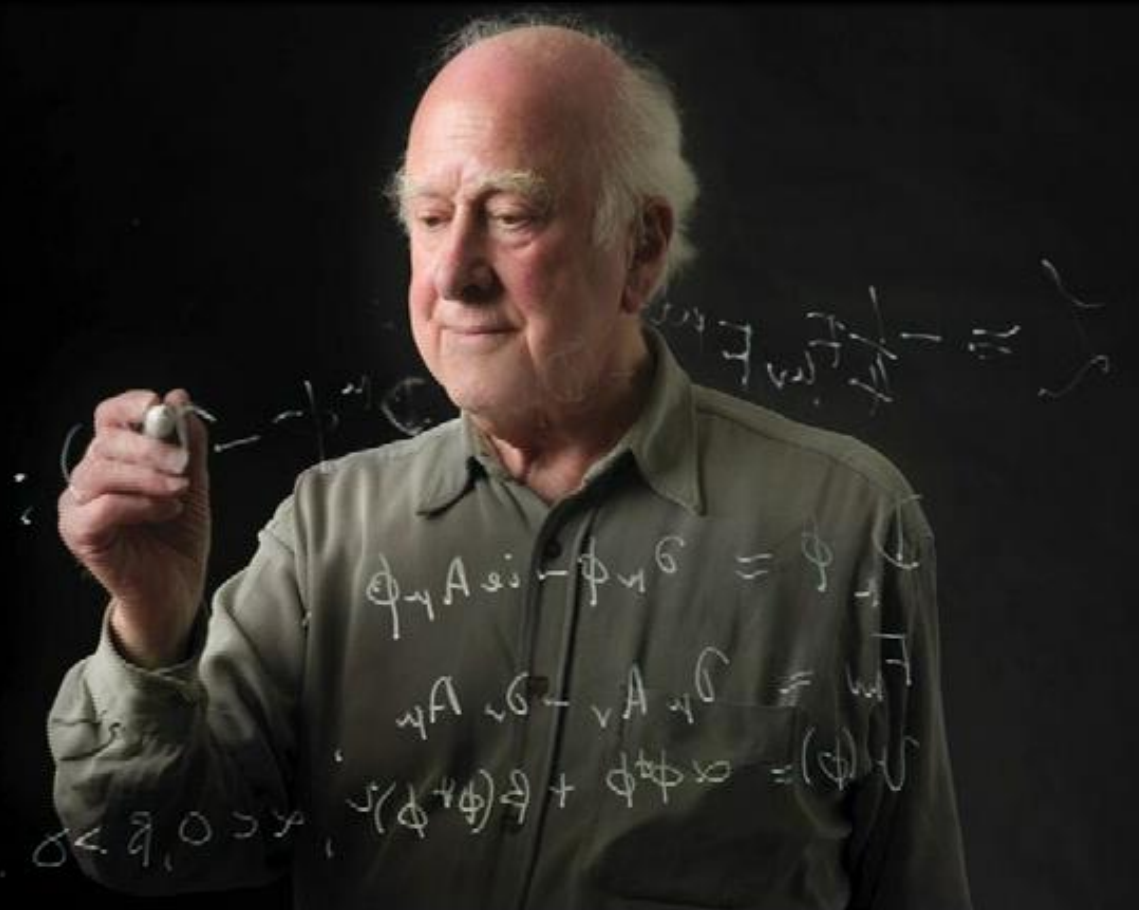


Size of things

How does CERN Measure?



Where do we start?

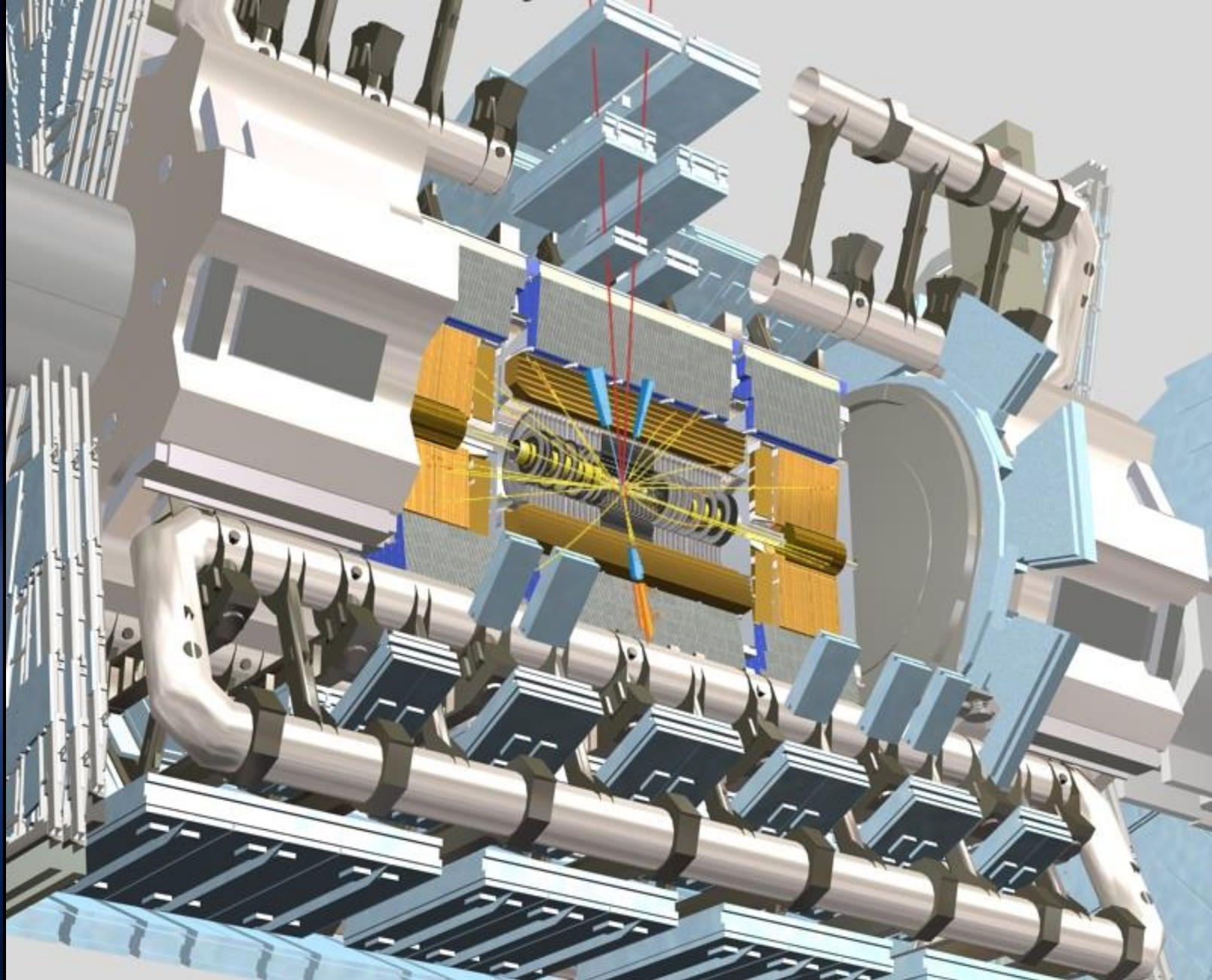


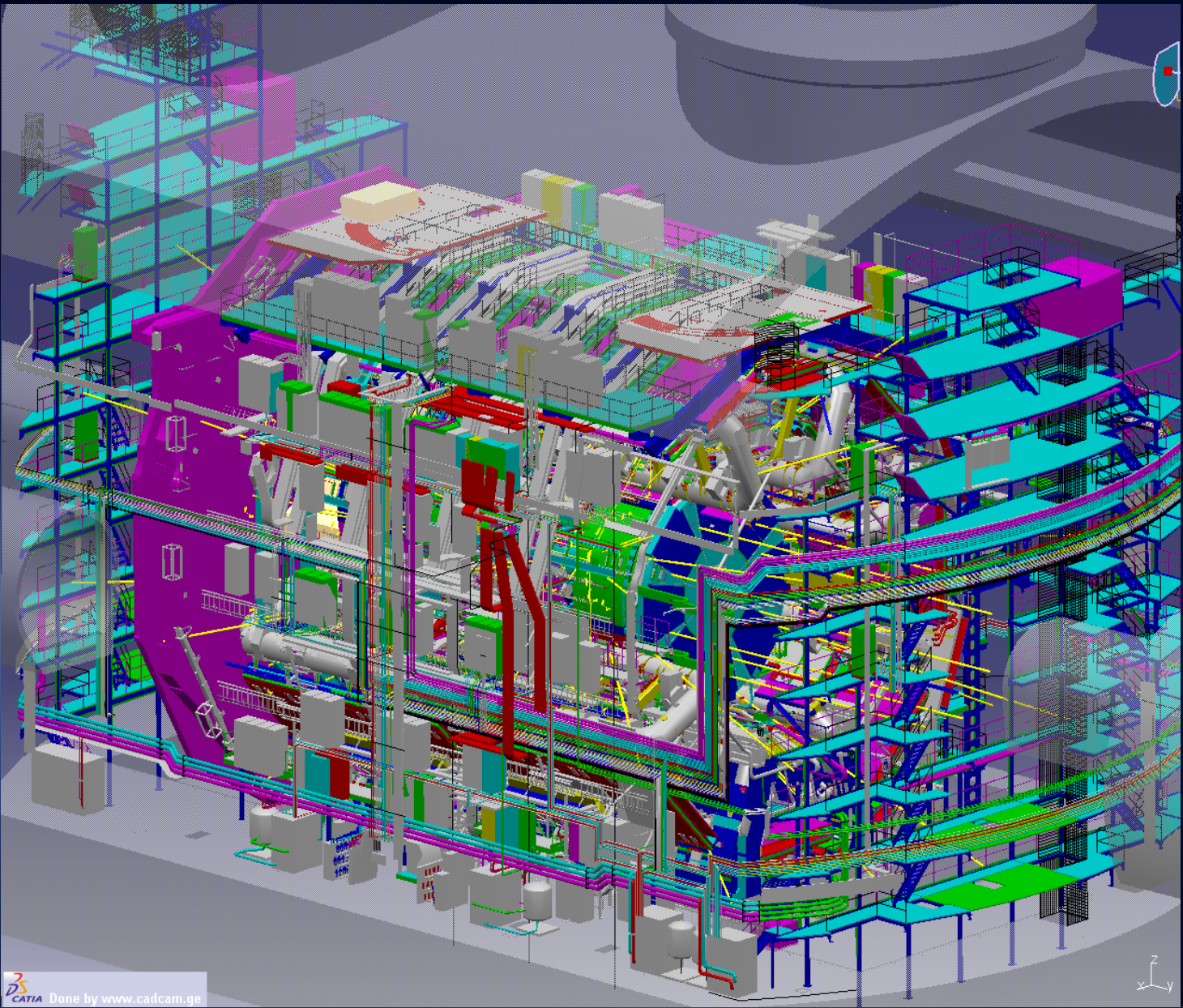


STORAGETEK

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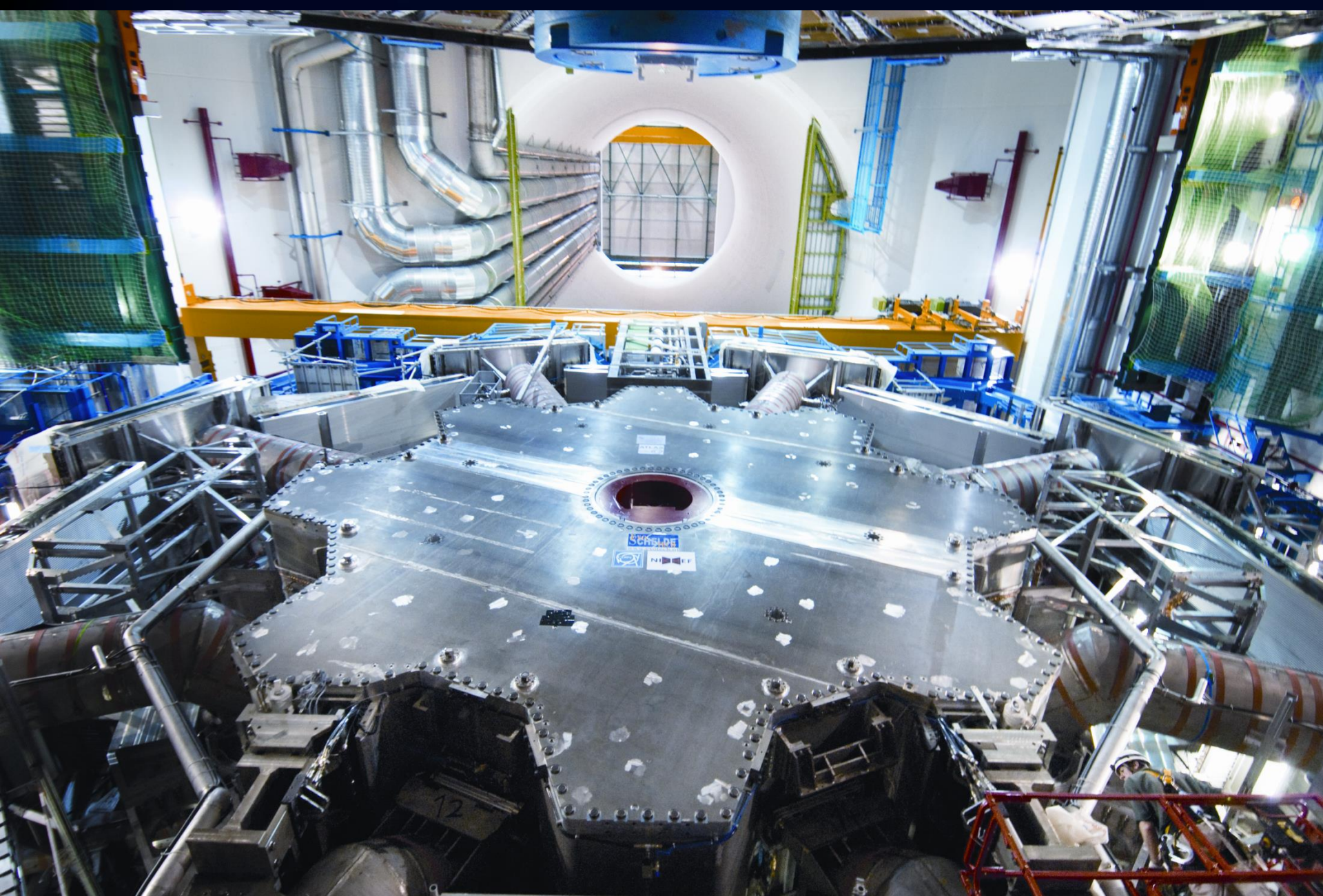
16+





DS
CATIA Done by www.cadcam.ge

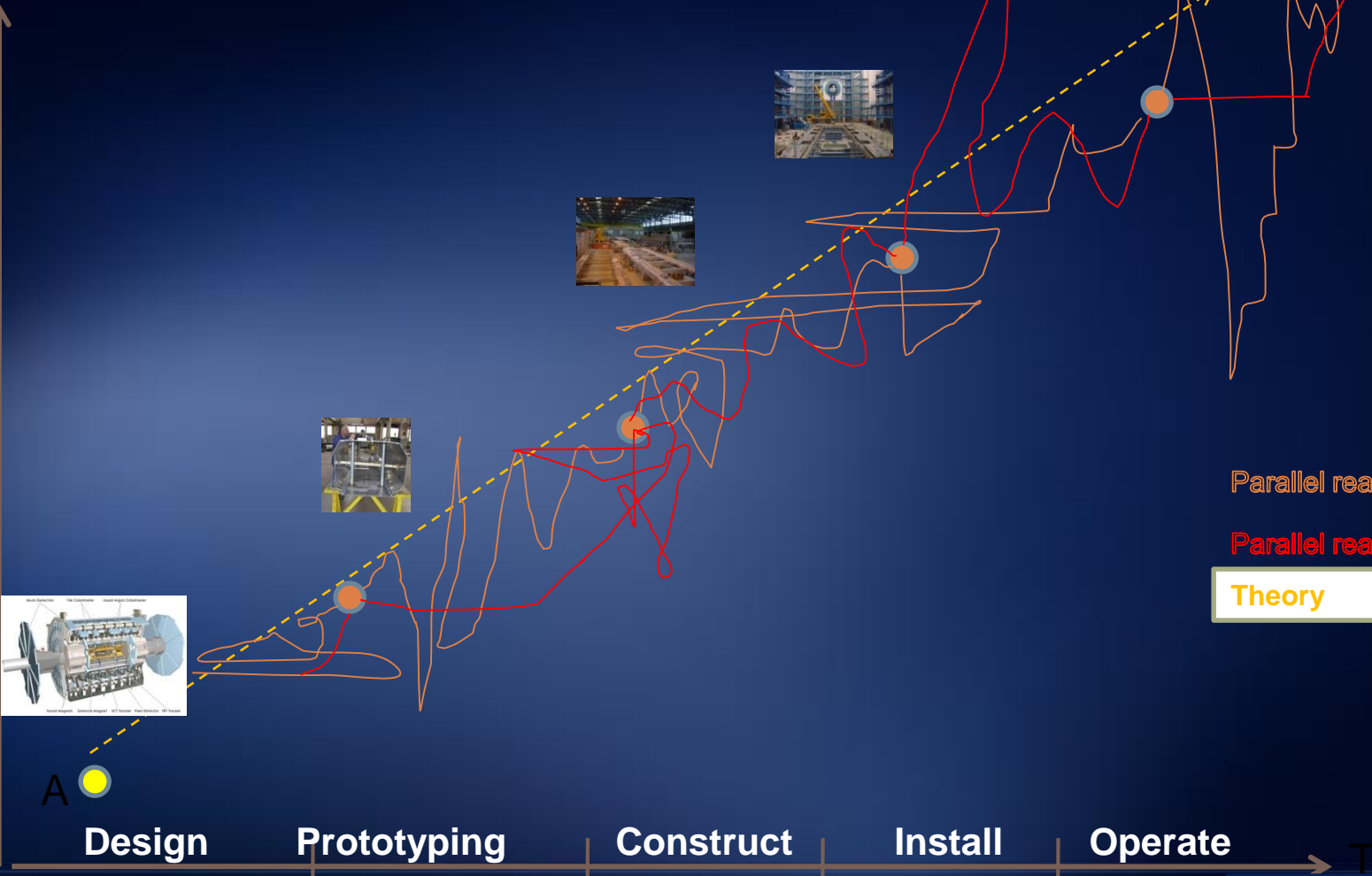




Implementing Strategy is Not Linear



Progress



Parallel reality 1

Parallel reality 2

Theory

Design

Prototyping

Construct

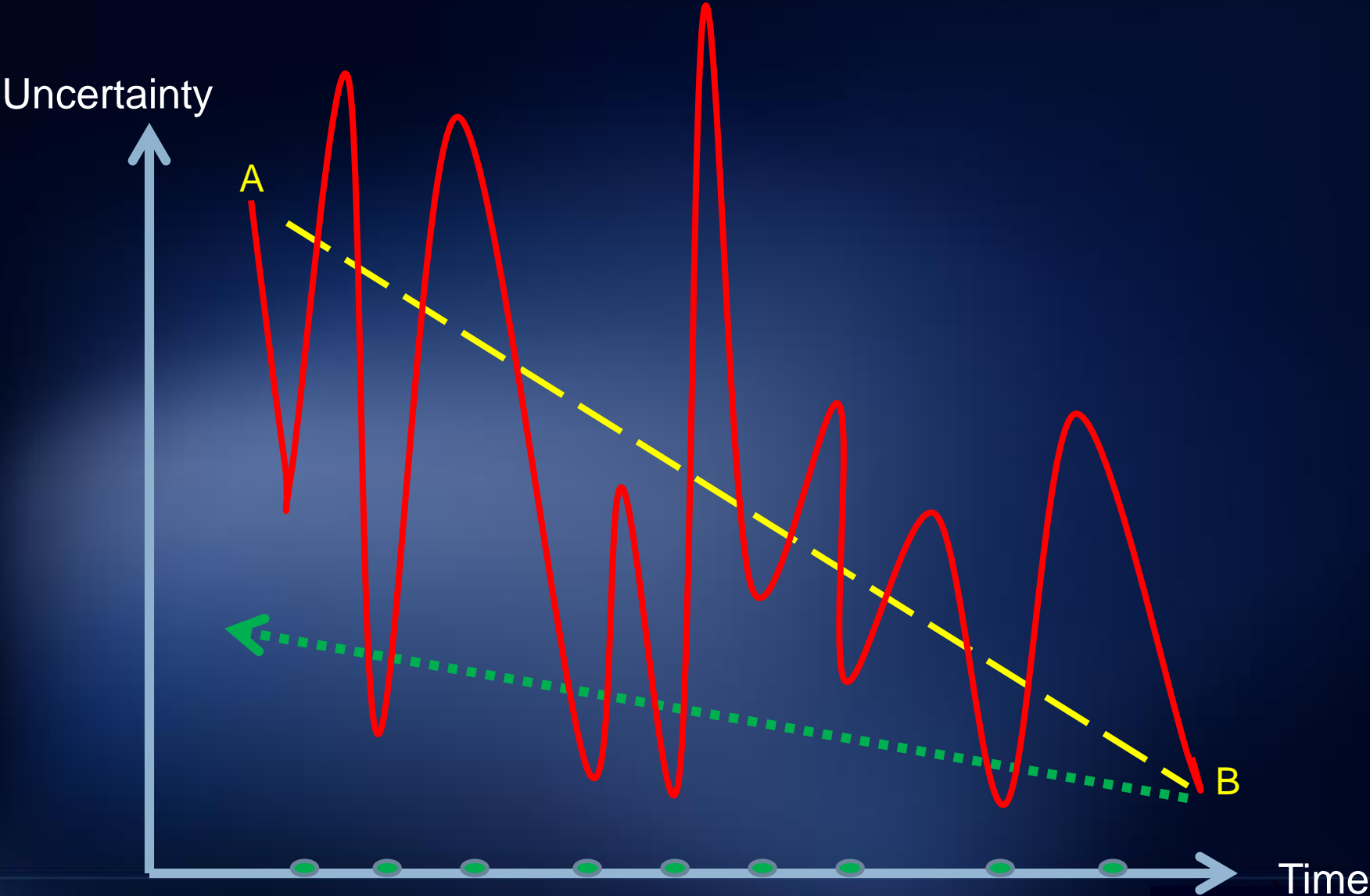
Install

Operate

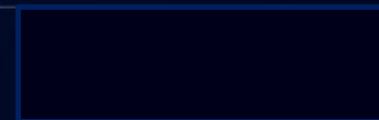
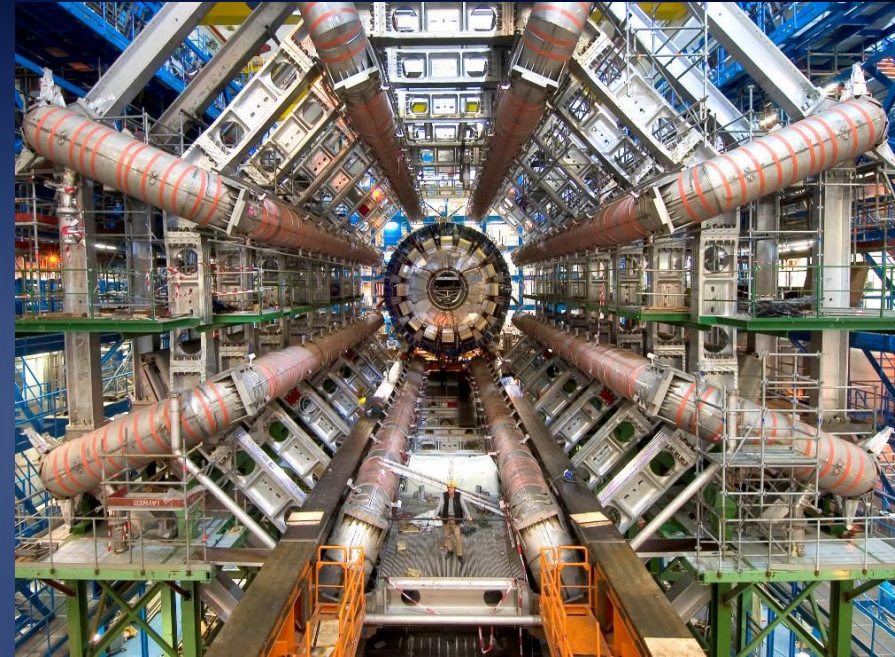
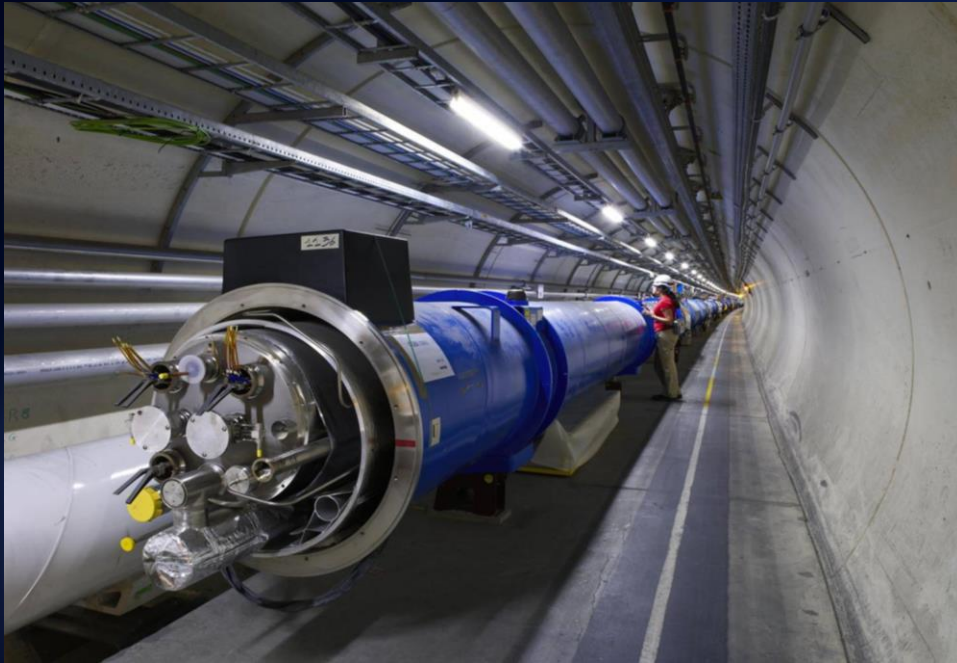
Time

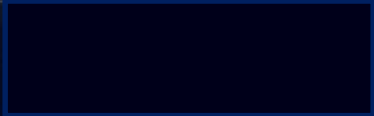


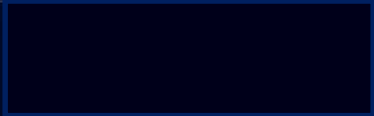
Absorbing vs. Reducing Uncertainty



Seeing the Micro needs the Macro (scopes)







CERN was founded 1954: 12 European States Today: 23 Member States

- ~ 2600 staff
- ~ 1800 other paid personnel
- ~ 13 600 users
- Budget (2019) ~1200 MCHF

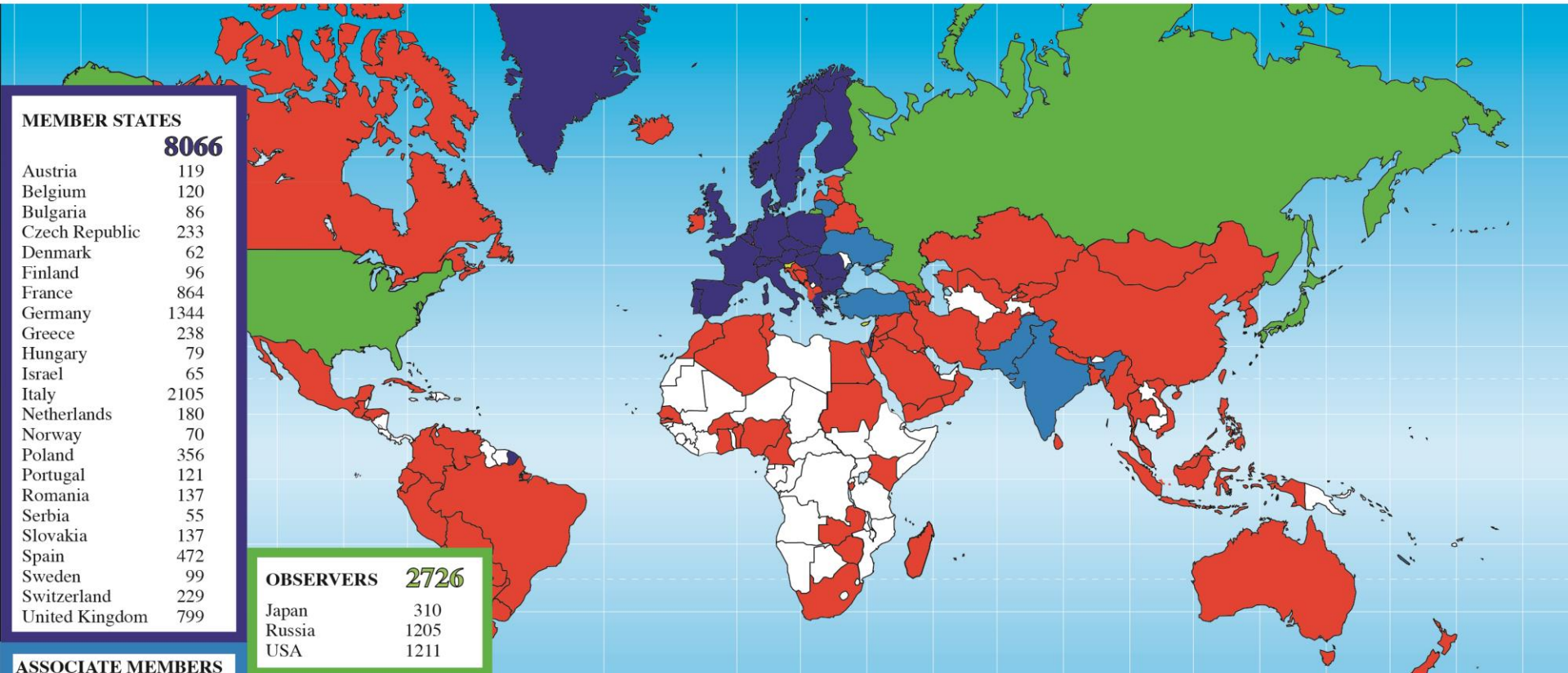
- **23 Member States:** Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Israel, Italy, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.
- **7 Associate Members:** Cyprus, , India, Lithuania, Pakistan, Slovenia, Turkey, Ukraine.
- **6 Observers to Council:** Japan, the Russian Federation, the United States of America, Turkey, the European Commission and Unesco





A Global Reach

Distribution of All CERN Users by Nationality as of mid-April 2019



MEMBER STATES **8066**

Austria	119
Belgium	120
Bulgaria	86
Czech Republic	233
Denmark	62
Finland	96
France	864
Germany	1344
Greece	238
Hungary	79
Israel	65
Italy	2105
Netherlands	180
Norway	70
Poland	356
Portugal	121
Romania	137
Serbia	55
Slovakia	137
Spain	472
Sweden	99
Switzerland	229
United Kingdom	799

OBSERVERS **2726**

Japan	310
Russia	1205
USA	1211

ASSOCIATE MEMBERS **778**

India	387
Lithuania	39
Pakistan	71
Turkey	165
Ukraine	116

ASSOCIATE MEMBERS IN THE PRE-STAGE TO MEMBERSHIP **59**

Cyprus	26
Slovenia	33

OTHERS **1999**

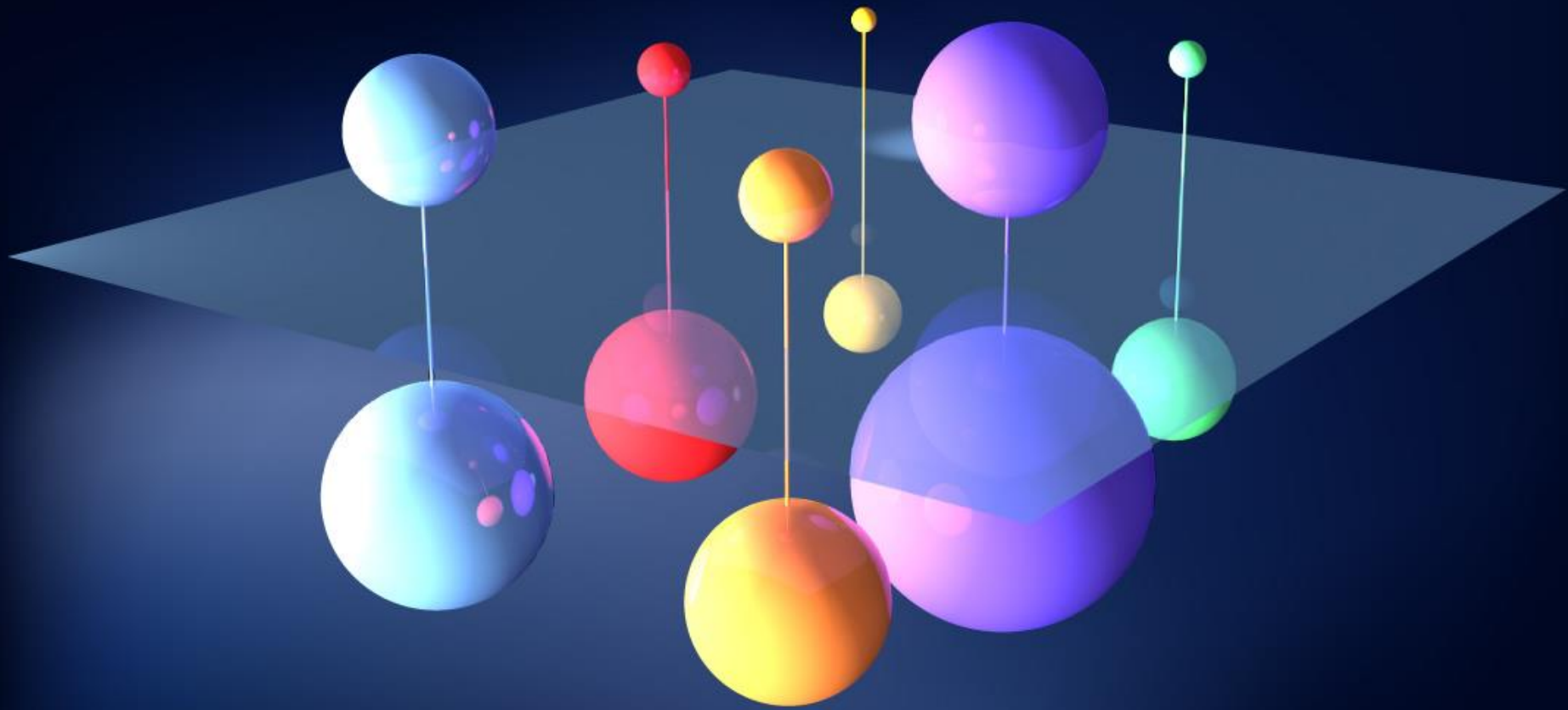
Albania	4	Bolivia	3	Ecuador	10	Iraq	1	Malta	9	Palestine	7	Sudan	1
Argentina	26	Bosnia & Herzegovina	3	Egypt	27	Ireland	13	Mexico	85	Paraguay	1	Syria	1
Armenia	22	Brazil	127	El Salvador	1	Jordan	2	Mongolia	2	Peru	6	Taiwan	56
Australia	36	Burkina Faso	1	Estonia	15	Kazakhstan	10	Montenegro	11	Philippines	3	Thailand	26
Azerbaijan	10	Burundi	1	Georgia	51	Kenya	1	Morocco	24	Saint Kitts and Nevis	1	Tunisia	4
Bahrain	1	Cameroon	1	Ghana	1	Korea	183	Myanmar	2	San Marino	1	Uruguay	1
Bangladesh	8	Canada	170	Guatemala	1	Kyrgyzstan	1	Nepal	7	San Marino	1	Uzbekistan	3
Belarus	45	Chile	21	Hong Kong	1	Latvia	4	New Zealand	5	Saudi Arabia	4	Venezuela	9
Benin	1	China	576	Honduras	1	Lebanon	27	Nigeria	4	Senegal	4	Viet Nam	11
		Colombia	44	Iceland	4	Luxembourg	4	North Korea	4	Singapore	5	Zambia	1
		Croatia	50	Indonesia	11	Madagascar	1	North Macedonia	3	South Africa	56	Zimbabwe	2
		Cuba	16	Iran	58	Malaysia	22	Oman	3	Sri Lanka	10		

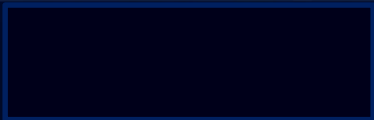
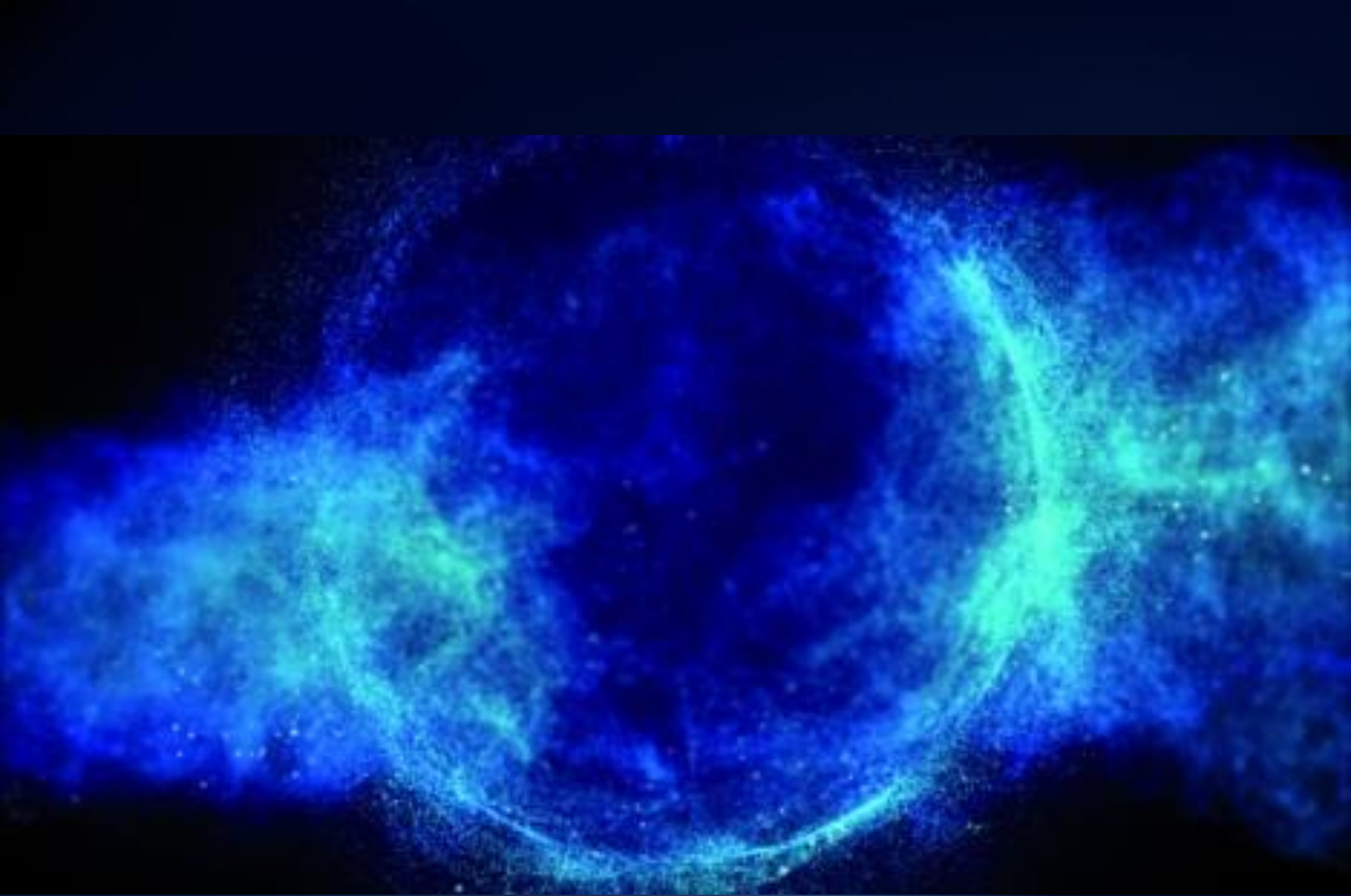
(How) Do We Manage This?

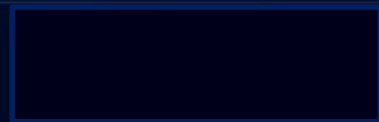
1. Vision
2. Commitment
3. Tolerance

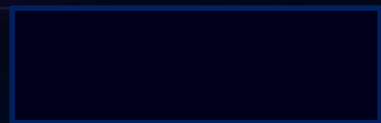
What is Wrong with this Picture?

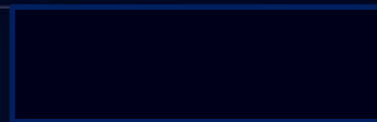
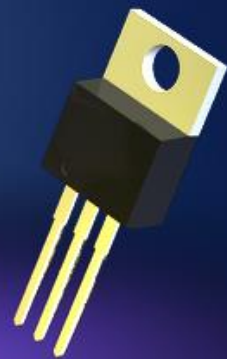














What do you see differently?