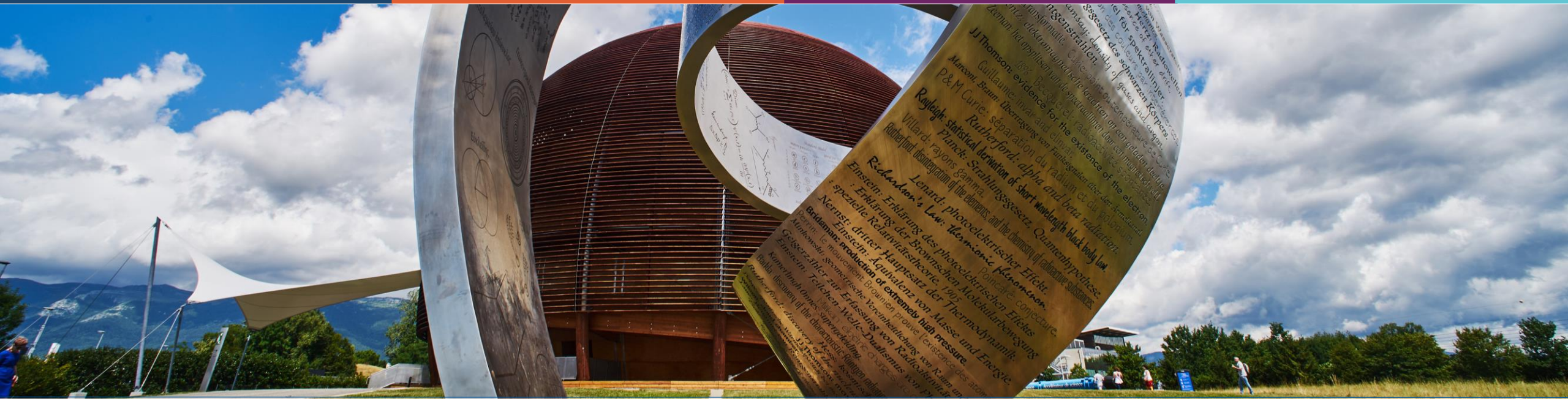
CERN



# Trends and Directions at CERN
# ICRI 2018 – Plenary Session 2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# Particle Physics Landscape Today

CERN now developing towards the High-Luminosity LHC identified as highest priority in 2013 update of European Strategy for Particle Physics (ESPP), while also preparing for the next accelerator after the LHC with R&D and studies (*Compact Linear Collider and Future Circular Collider*)

Neutrino programmes in place largely in the US and Japan → CERN participation via its Neutrino Platform

Aspirations for an International Linear Collider in Japan → looking forward to decision before the end of the year

Discussions for Large Circular Collider in China → CDR for China Electron Positron Collider released on 2 Sept.

Update of the ESPP to be kicked off at CERN Council session later this month – bottom-up process that will set a roadmap for the European (and global) context for coming 5-7 yrs as part of the foundation for the field in 30 years' time

# Strategizing for the future: driven by science

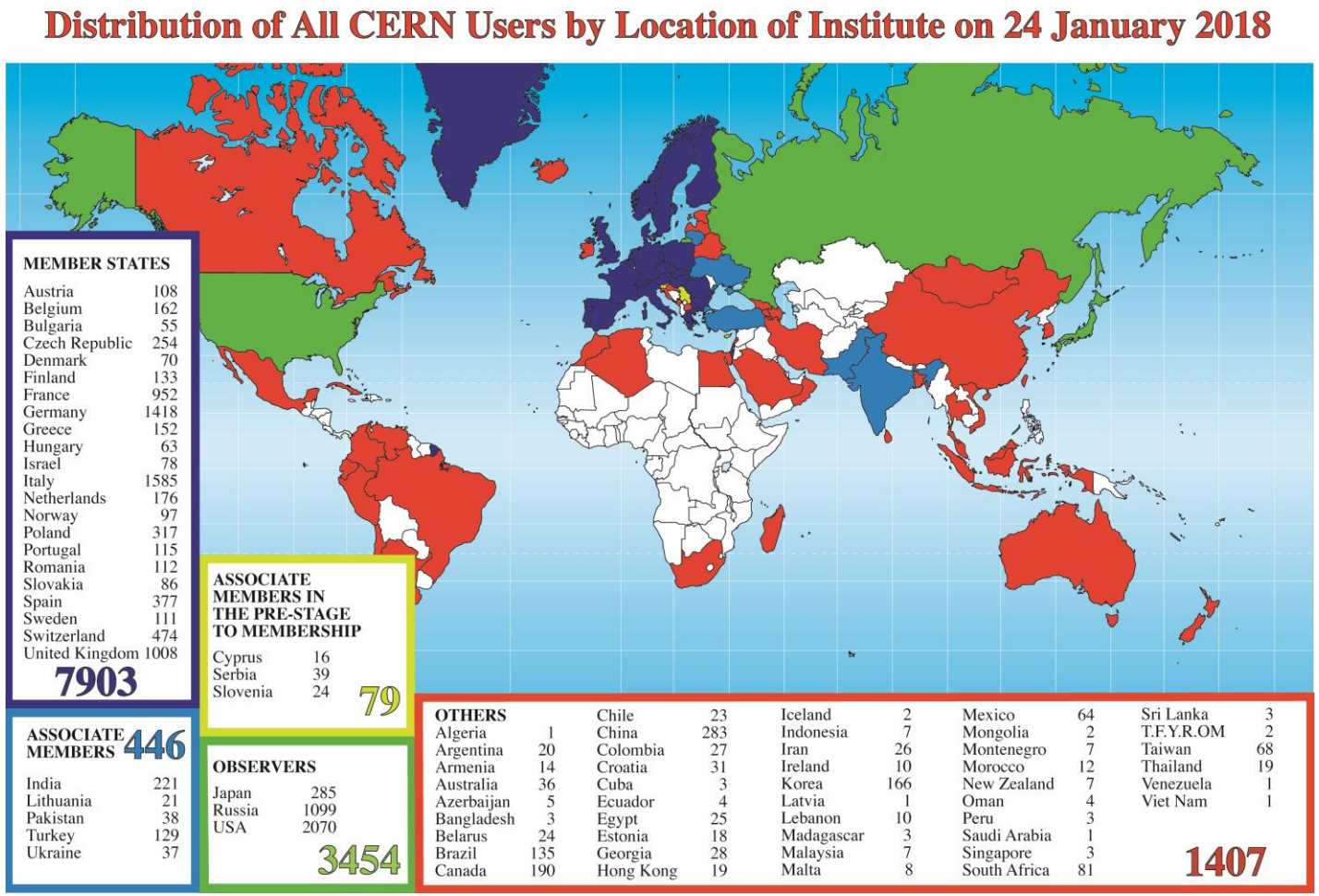
European Strategy Update

- **The European Strategy for Participle Physics (ESPP) is a process through which European particle physics community regularly updates the priorities and strategy of the field, resynchronizing with developments and emphases → first ESPP in 2006; updated in 2013; next update to be finalized by May 2020.**

- **Bottom-up process that involves the community, driven by physics, with awareness of financial and technical feasibility.**

- **ESPP produces the European roadmap in a worldwide context to feed into, and facilitate, coherent global thinking→ physics requires global coordination, given the number, size and complexity, with increasing alignment of the European, US and Japanese roadmaps in recent years to optimize the use of resources.**

# Continuing trend: globalization of particle physics




**22** **Member States**: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Israel, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Spain, Sweden, Switzerland and United Kingdom

**3** **Associate Member States in the pre-stage to membership**: Cyprus, Serbia and Slovenia

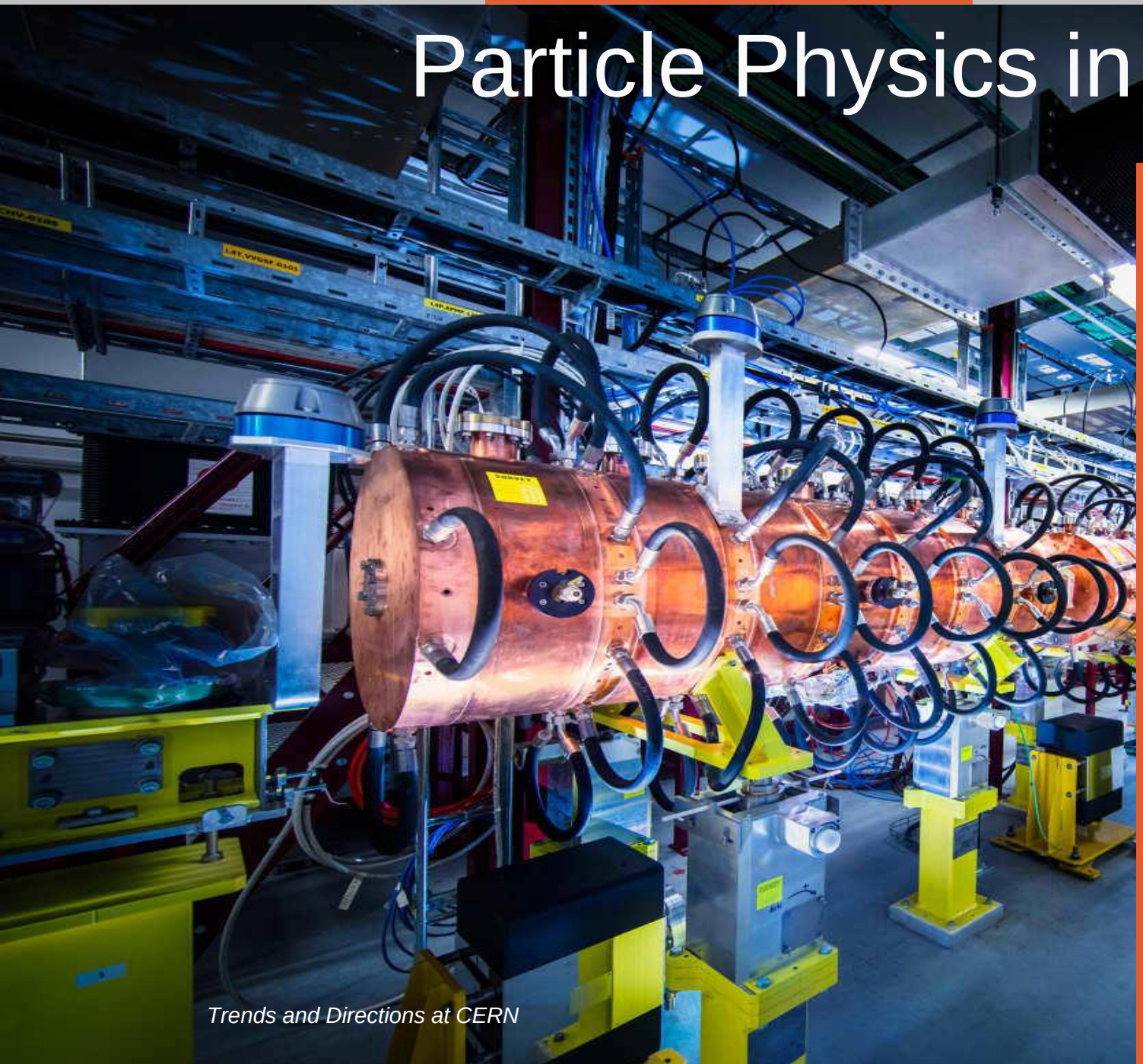
**5** **Associate Member States**: India, Lithuania, Pakistan, Turkey and Ukraine

**3** **Observers**: Japan, Russia and the United States of America

**50+** Non-Member States Collaborating with CERN through Cooperation Agreements

- Number of users is a KPI of the attractiveness of research infrastructures → European leadership in the field of high-energy particle physics
- Growth in reach and depth of global community complemented by contributions to infrastructure

# Particle Physics in 30 years?



- Particle physics is inherently long-term – the High-Luminosity LHC is a 20-year programme that is now being put in place, while some of the studies underway project some 50 years into the future
- Long-range planning needs to go hand-in-hand with reactivity to developments in the field and in the global context
- Important to maintain diversity and a global approach to ensure continued excellence
- Sustained support of Member States over decades essential

# Research infrastructures in 30 years?

**Evolution will be necessary, to adapt to the challenges of time and developments in the science, while excellence, diversity and an open global approach will remain the cornerstones of world-leading Ris in their respective fields**

Research selection and operation models must remain driven by **scientific excellence**

Access models will vary across fields – but important to keep in mind that progress is accelerated in **unrestricted collaboration**, with balance and reciprocity

Important to continuously develop and implement **cutting-edge technologies and serve as motors of innovation** → significant knowledge transfer to society and socio-economic impact

Training of **future scientists, engineers** to remain a core mission, to ensure sustainability and optimise on societal impact

Interconnection across Ris will be determined by **needs of research**, as experts develop networks as they identify needs for expertise, depending on the field

RIs need to be drivers of **open science**, with open access publishing, open software and open hardware → increasingly important for policymakers and public

Thank you