

CERN: founded in 1954: 12 European States

“Science for Peace”

Today: 21 Member States

~ 2300 staff

~ 1400 other paid personnel

~ 12500 scientific users

Budget (2015) ~1000 MCHF

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

Associate Member States: Pakistan, Turkey

States in accession to Membership: Romania, Serbia

Applications for Membership or Associate Membership:

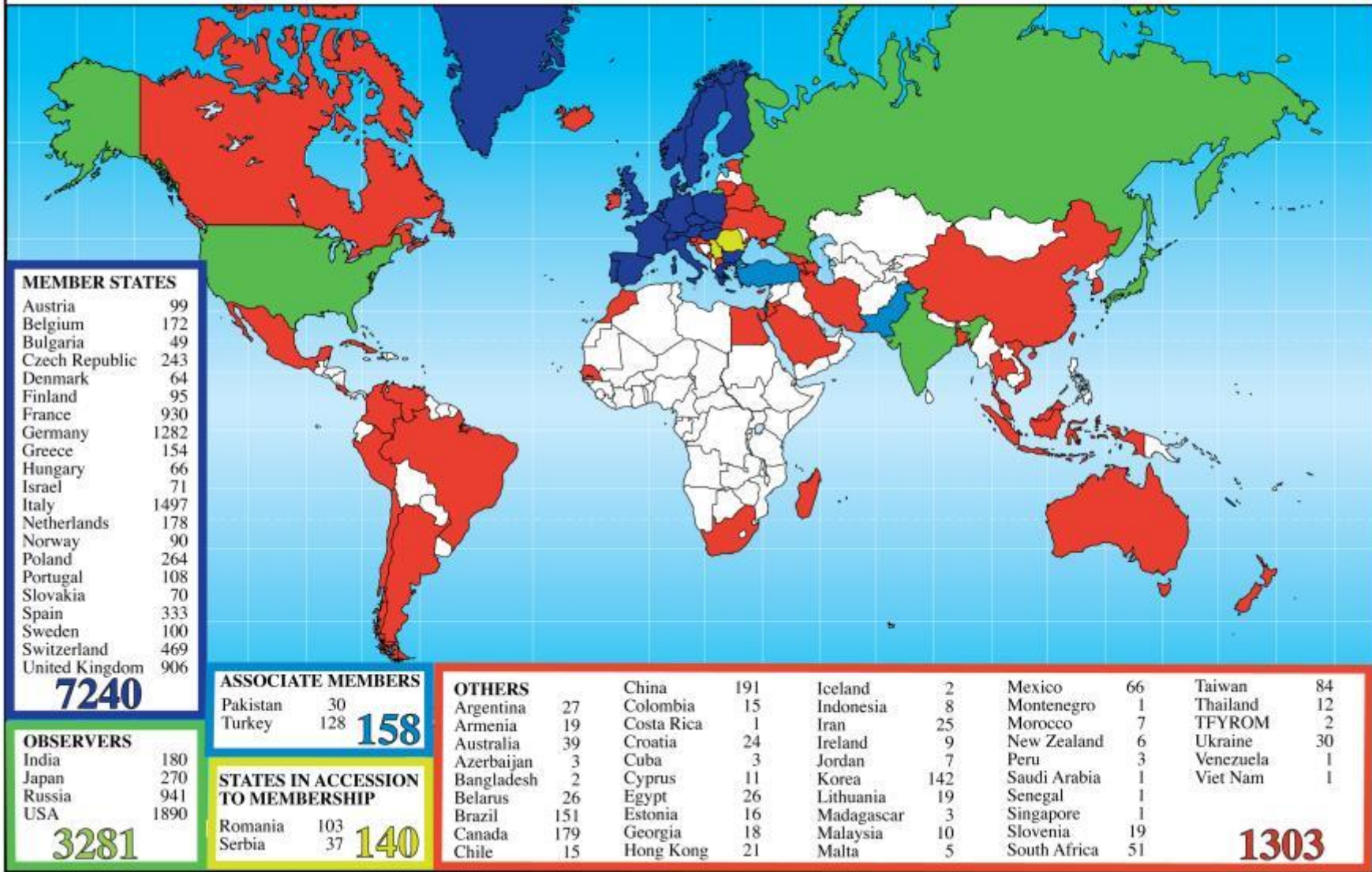
Azerbaijan, Brazil, Croatia, Cyprus, India, Russia, Slovenia, Ukraine

Observers to Council: India, Japan, Russia, United States of America; European Union, JINR and UNESCO



Science is getting more and more global

Distribution of All CERN Users by Location of Institute on 21 September 2015



'Science for Peace'

Two organisations created under the umbrella of UNESCO:

CERN

Conceived late 1940s - two aims:

- Enable construction of a facility beyond means of individual members
- Foster cooperation between peoples recently in conflict



SESAME

Conceived late 1990s with the same aims:

- Members: Bahrain, Cyprus, Egypt, Iran, Israel, Jordan, Pakistan, Palestinian Authority, Turkey
- Hope start commissioning mid 2016

It will work politically **provided** science is first class



SESAME is a 3rd generation light-source ('very powerful flash lamp → microscope') under construction near Amman

SESAME will foster

- science and technology in the Middle East and neighbouring countries (from biology and medical sciences through materials science, chemistry, and physics to archaeology)
- cooperation across political divides



Observers: Brazil, China, EU, France, Germany, Greece, Italy, Japan, Kuwait, Portugal, Russian Federation, Spain, Sweden, Switzerland, UK, USA

Experimental Hall May 2012



Booster
November 2013

Beam stored &
brought to full energy
(800 MeV)

September 2014

The highest energy
accelerator in the
Middle East

First of 16 sectors of the main storage ring at CERN 31 March 2015

Collaboration between CERN, SESAME Members and Observers

Spain :
quadrupoles

France :
sextupole
coils

UK :
dipoles

Germany:
vacuum
chambers

Turkey :
quadrupole
coils

In Addition

Italy : Dipoles power supply

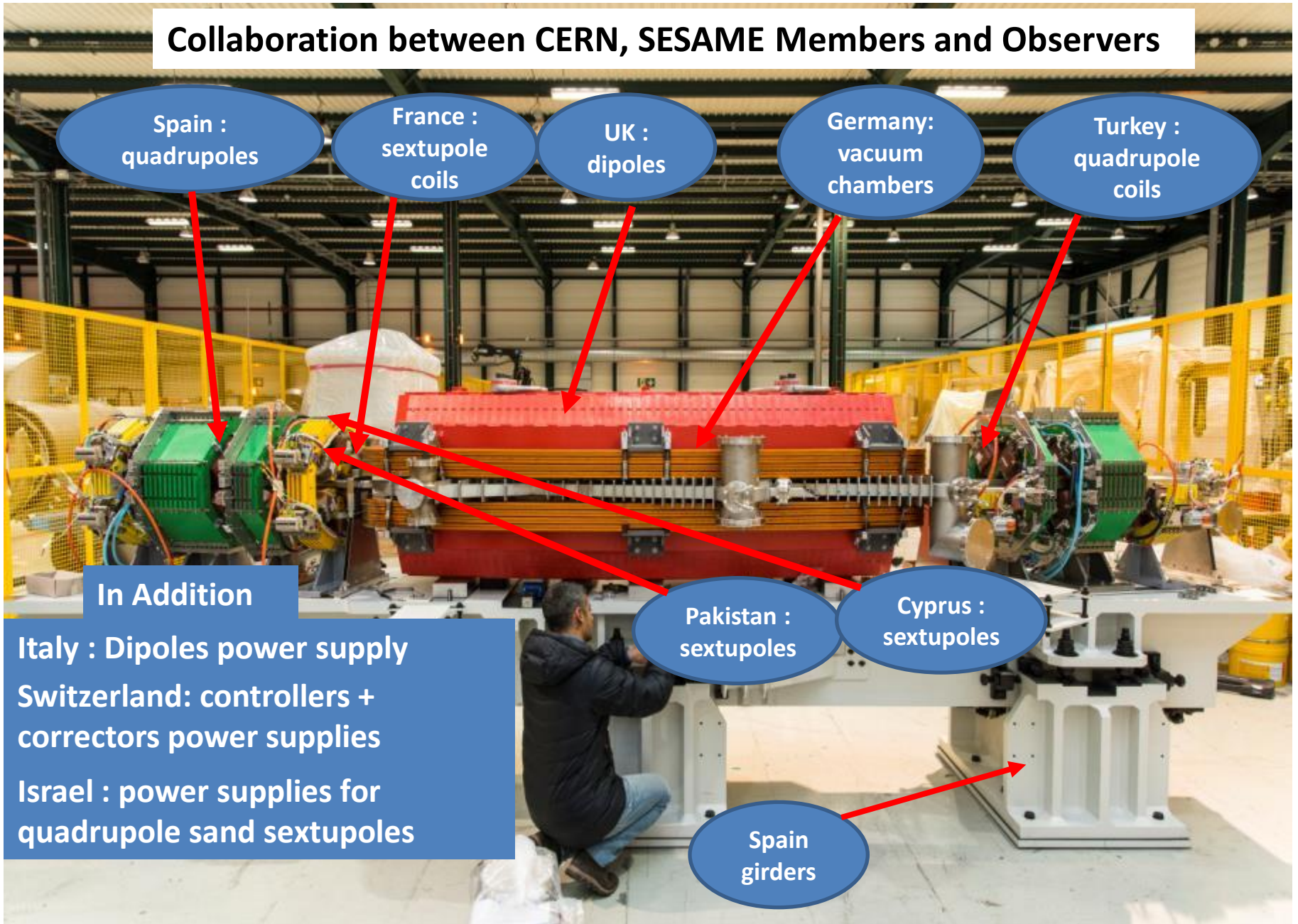
Switzerland: controllers +
correctors power supplies

Israel : power supplies for
quadrupole and sextupoles

Pakistan :
sextupoles

Cyprus :
sextupoles

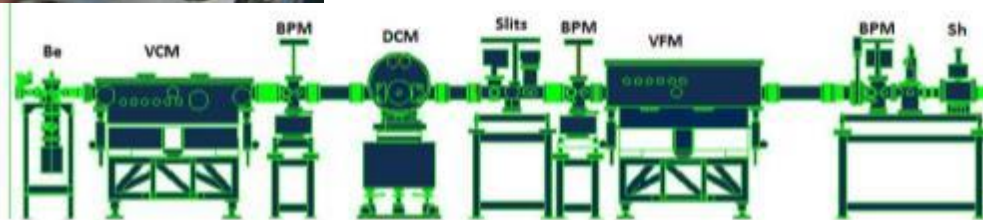
Spain
girders



X-RAY ABSORPTION BEAMLINE (BASEMA)

Energy range: 3-30 keV. Main components from ROBL-ESRF

Beamline Components set up in lab
Under Test with ESRF experts



Applications: in basic materials science, life sciences and environmental science on the nano- and micro-meter scale.

Examples: designing new materials and improving catalysts , e.g. for the petrochemical industries, determining bonding structure and identification of the chemical composition of fossils and of valuable paintings in a non-invasive manner

Note: IAEA CRP on: “Absorption and Mobility of Heavy Metals in Soils in Vicinity of Jordan and Yarmouk Rivers” + “Synchrotron Based XRF/XAFS Techniques in Tracking Pollution (Air/Soil) in some Arab Countries” – involves SESAME, Egypt & Jordan; provides access to ELETTRA synchrotron in Italy.

Training Programme (benefits for world-wide support)

Users' Meetings, Schools, Workshops, Fellowships, visits to operating light-sources,... are building technical and scientific capacity in the region

1st Users' Meeting Amman 2002



10th Users' Meeting Amman 2012



SESAME-JSPS School Cairo 2008



Began training accelerator experts who returned to the Middle East



Members of SESAME Accelerator Group, 2007

Now Training Scientists
Left @ Advanced Light Source
Users' Meeting, Right @ NSLS

