

Can Science and Foreign Policy synergise?

Is Science Diplomacy for real?

Research Seminar, LKY School, 9 November 2017

Dr. Kostas Glinos

EU Fellow

Lee Kuan Yew School of Public Policy

Context

- Global challenges, national governments
- Multilateralism: necessity and legitimacy
- Locked in conflict
- Complex problems, simple decisions

Can Science help?

Characteristics of the Science enterprise

- Expand what we know and can do: understanding, discovering, inventing
- Universal language, values, ethos
 - Rational discourse
 - Universalism, communalism, systematic skepticism, ethical neutrality, disinterestedness
 - Codes of conduct
- Collaborative
- Global
- Building scientific communities
- An engine of TRUST

Science as rational discourse

- Nothing is given; need of proof
- What I say is what I mean

Does this matter?

- **The escalator of reason** (The better angels of our nature; Pinker)
- **Logic prevailing** (The great convergence; Mahbubani)

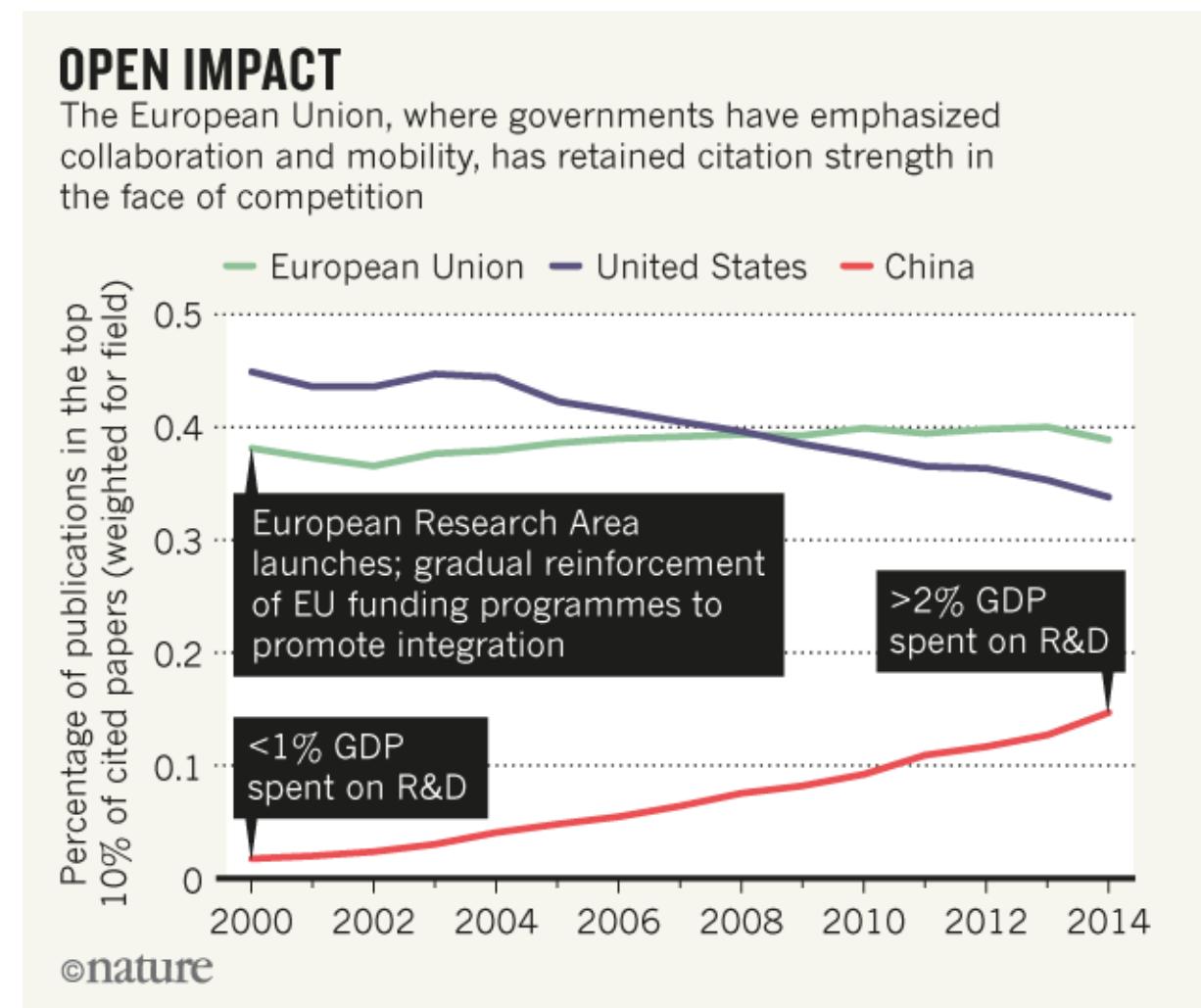
Collaboration

Positive sum games

- Socratic dialectic
 - Search for truth through collaborative logic tests
- Increasing breadth and depth of scientific endeavour
- Research by objective/mission vs. by topic; interdisciplinarity
- Open Science; e-Science; citizen science

Opposing factors

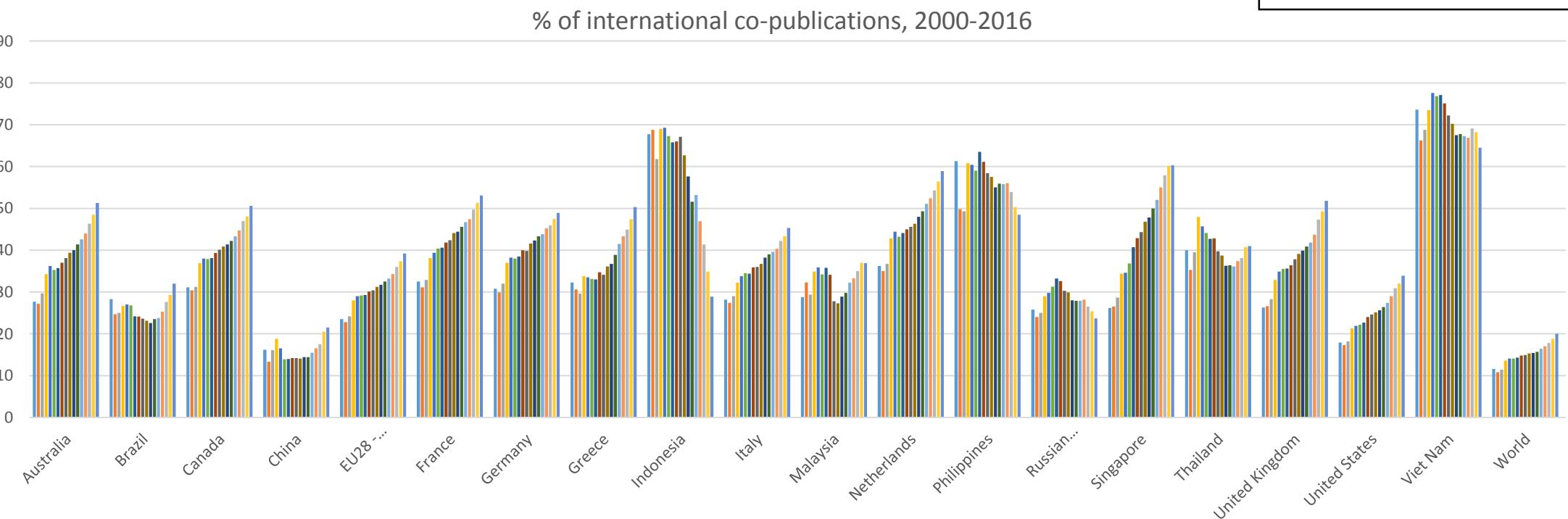
- Competition
- Bureaucracy
- Lack of incentives



Open countries have strong science; Nature, 4 October 2017



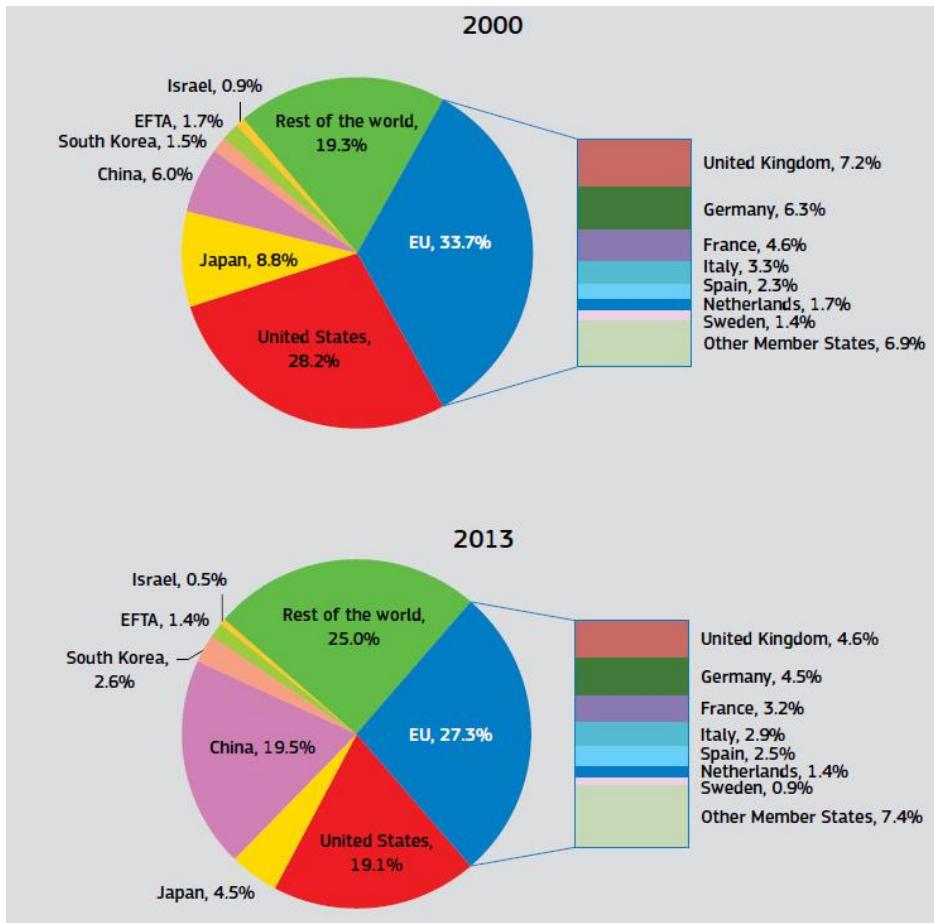
Data extracted from Scopus, Sept 2017, European Commission



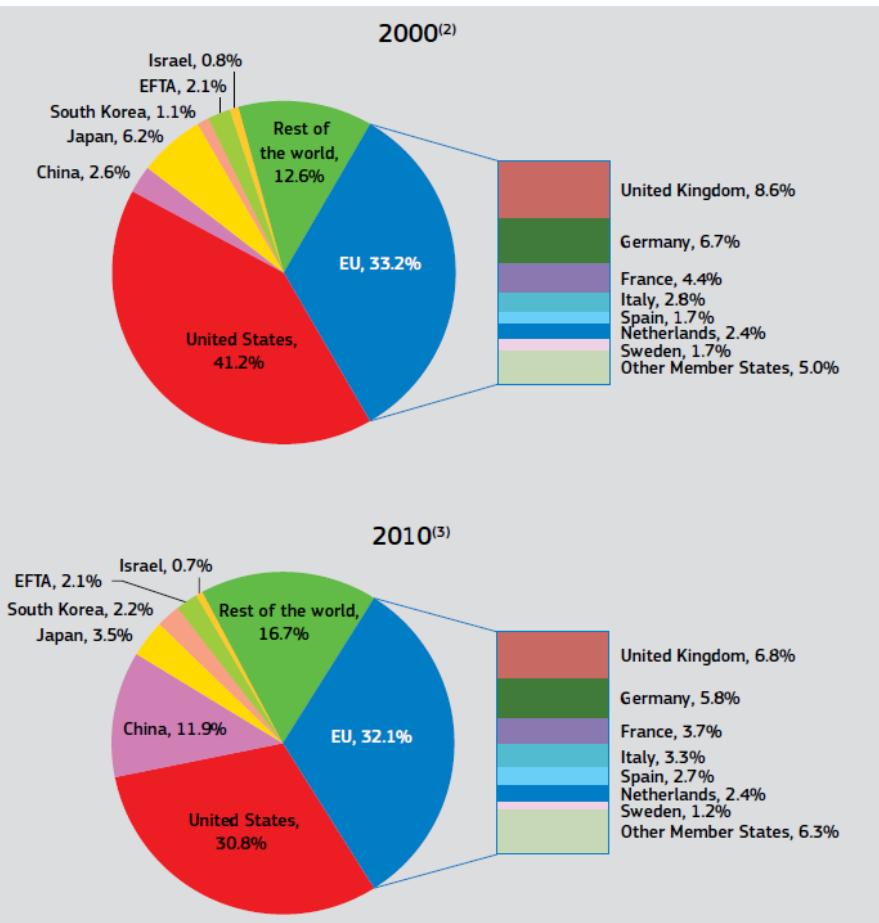
Global

- Multipolar world
- Excellence breeds excellence
- Access is everything
- Sharing costs

World share of scientific publications

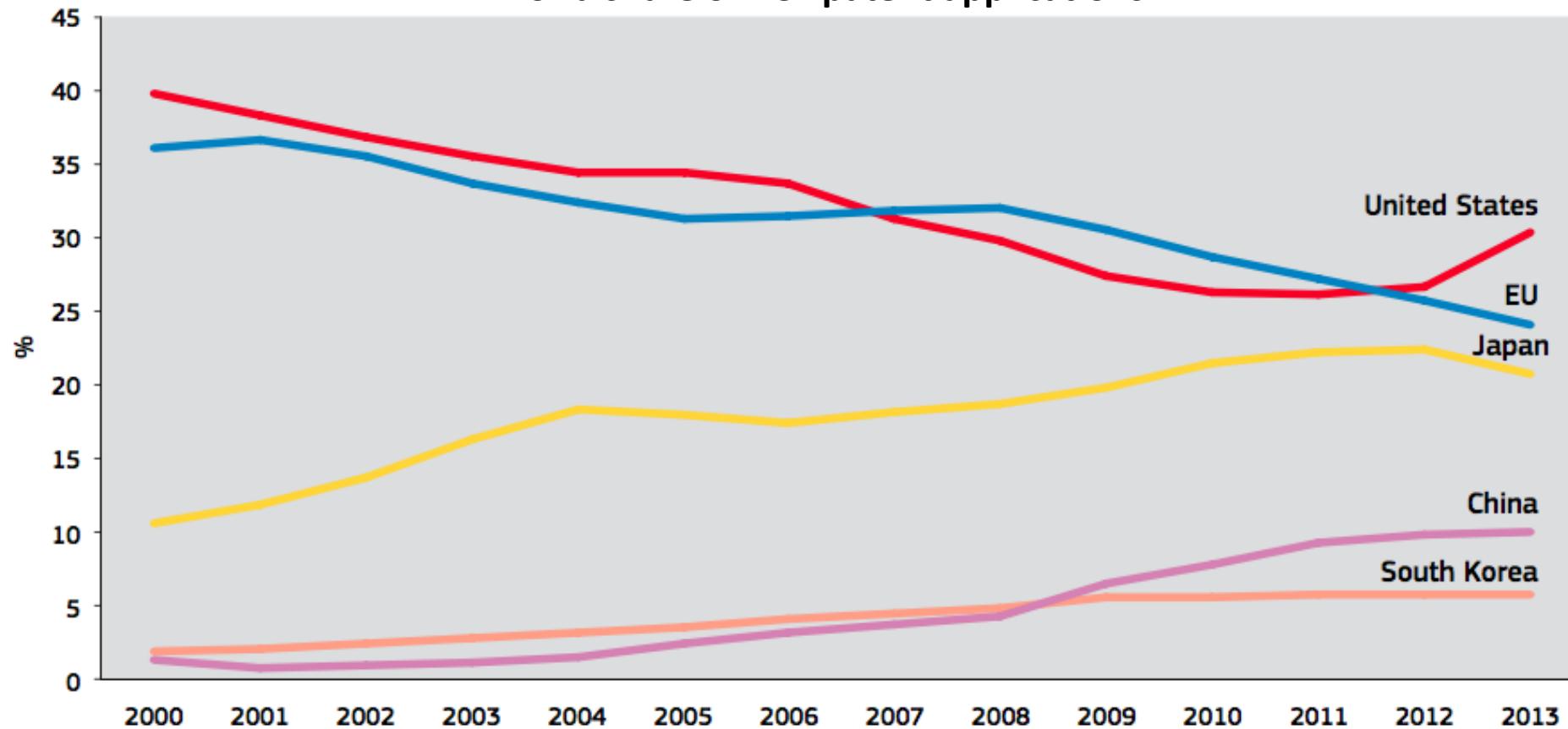


World share of highly cited scientific publications





World share of PCT patent applications

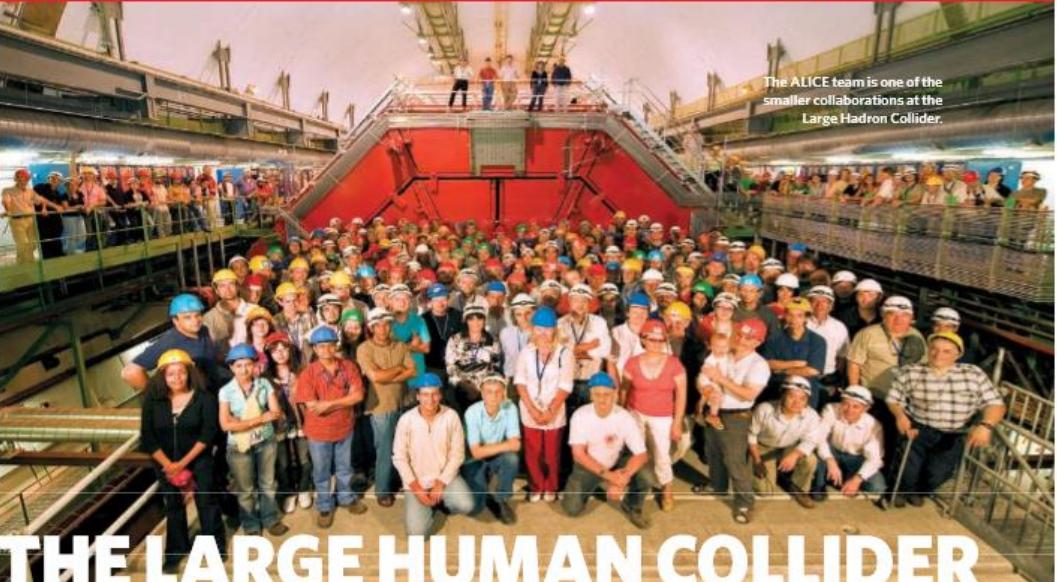


Building communities

"[CERN] is a place for global collaboration, where science exists beyond the politics of nationality"

"The paradox is that science is not democratic; we don't determine who is right by a vote"

"CERN functions as a commune, where particle physicists gladly leave their home and give up their individuality to work for the greater whole"



THE LARGE HUMAN COLLIDER

Social scientists have embedded themselves at CERN to study the world's biggest research collaboration. **Zeeya Merali** reports on a 10,000-person physics project.

"I am here to watch you." So began anthropologist Arpita Roy when introducing herself in 2007 to a roomful of particle physicists. At the time, those scientists were racing to finish work on the world's biggest machine, the Large Hadron Collider (LHC) at CERN, Europe's high-energy physics laboratory near Geneva, Switzerland.

The LHC carries the hopes of generations

of physicists, who have designed it to reach energies never before achieved in a collider and — possibly — to produce a zoo of particles new to science. But the LHC is also a huge human experiment, bringing together an unprecedented number of scientists. So in recent years, sociologists, anthropologists, historians and philosophers have been visiting CERN to see just how these densely packed physicists collide, ricochet and sometimes explode.

"The LHC allows a unique sociological study of how an experiment develops in real time: how scientists form opinions, make technical decisions and circulate knowledge in such a big project," says Arianna Borrelli, a particle physicist and philosopher of physics at the University of Wuppertal in Germany.

Sergio Bertolucci, CERN's research director, is acutely aware of the importance of cohesive collaboration. "This is an incredible social

experiment," he says, noting that roughly 10,000 physicists around the world are taking part in the LHC experiments and 2,250 of them are employed at CERN. Just reflecting on the size of the collaboration he co-manages makes Bertolucci's head ache. "Imagine the organization needed when 3,000 people all want to know in advance if they can go home for Christmas," he says.

Managers at CERN have endured a series of headaches since the LHC powered up in September 2008. A little more than a week after the collider came online, a faulty electrical coupling caused an explosion that brought the project to a halt for 14 months. That setback

demoralized the scientists at CERN, particularly the graduate students, who worried about the fate of their degrees, says Roy. A graduate student herself, from the University of California, Berkeley, Roy has been camped out at CERN on and off for three years to observe the "language, taboos and rituals of this exotic community".

The collider restarted in November 2009 and should gather two years of data before it shuts down for a year of scheduled upgrades in 2012. Next month, the LHC is expected to achieve record energies of 7 teraelectronvolts. The collider will reach such an extreme by accelerating two beams of protons to nearly

"It's a cognitive bubble that you can't escape — that you don't want to escape."

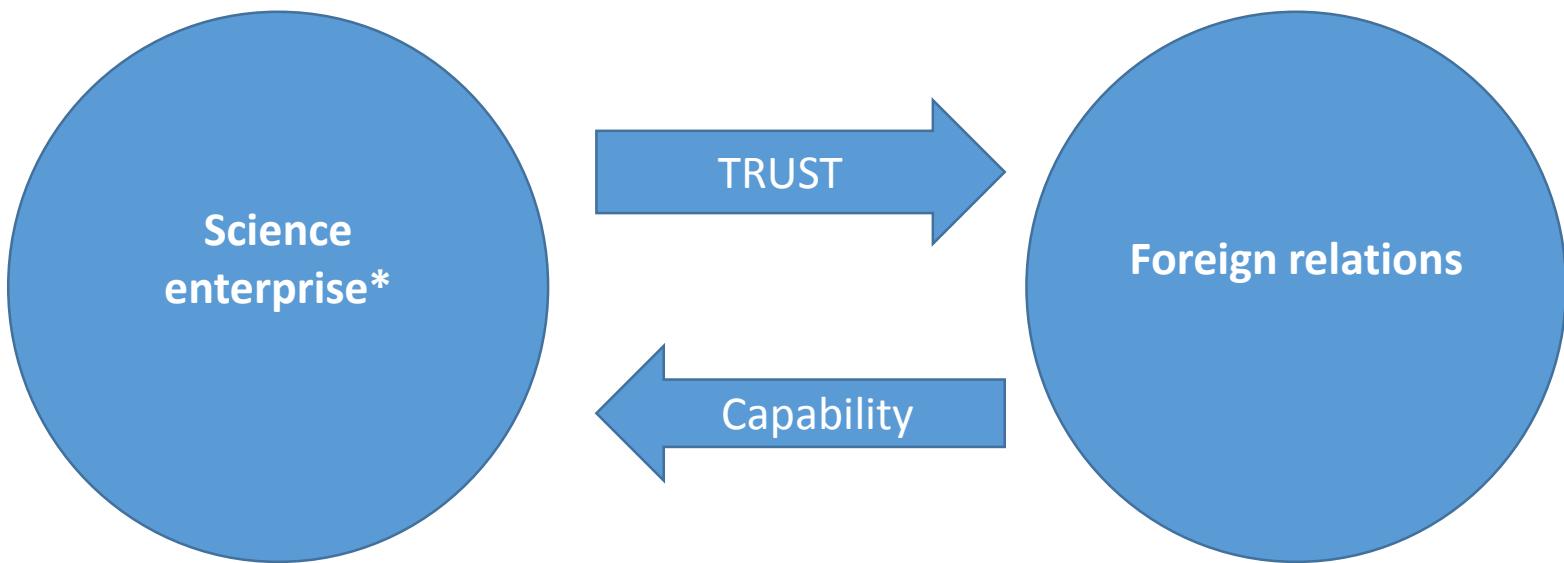
the speed of light and then sending them in opposite directions around a 27-kilometre underground track. The beams cross each other at four spots along the ring, and it is here that the real science happens, within giant detectors surrounding each collision zone. The two biggest particle detectors, A Toroidal LHC Apparatus (ATLAS) and the Compact Muon Solenoid (CMS) experiment, are the size of apartment buildings and each boasts a team of nearly 3,000 people.

Population explosion

Each generation of collider has brought a jump in the size of the experimental collaborations (see graph, opposite), a trend that provides ample opportunities for researchers interested in human interactions. Karin Knorr Cetina, a sociologist at the University of Constance in Germany, is one of the few social scientists to have witnessed this growth directly over multiple generations. She has been studying CERN's collaborations for almost 30 years.

When Knorr Cetina first arrived, physicists there were working on a smaller collider and their detector teams were less than one-tenth the size of today's. "In those days 100 people in a team was considered huge," she says. Knorr Cetina says she was met with friendly bemusement by particle physicists, who were helpful, but thought of a sociologist "as a poor cousin of real scientists".

What does all this mean?



*Organised and growing communities totalling 60 million people the world over, who speak the same language of reason, have the same values of universality, openness and sharing, non-dogma and ethical neutrality; and know how to cooperate

Some definitions

- Science in Diplomacy
- Science for Diplomacy
- Diplomacy for Science

The EU Global Strategy



“...science diplomacy is becoming integral part of our external action, as highlighted by our communication on cultural diplomacy: the “universal language of science” can build bridges across borders, beyond cultural, ethnic or religious differences”

*Federica Mogherini
High Representative of the EU for Foreign Affairs and Security*

Shared Vision, Common Action: A Stronger Europe

A Global Strategy for the
European Union's Foreign And Security Policy



Science Diplomacy in practice (1)

Science as a bridge

- Networks and trusted communities
 - The SALT Treaty (1972)
 - The Iran nuclear deal (2016)
 - Ernest Moniz and Ali Akbar Salehi



Science Diplomacy in practice (2)

Science-based multilateralism

- The Montreal protocol (1987)
- The IPCC (1988)
- 2030 Agenda for Sustainable Development (2015)
- The Belmont Forum (2009)
- GEO (2005)
- Global Health: GACD, Glopid-R, Zika, ...
- ...

Science Diplomacy in practice (3)

Governance templates

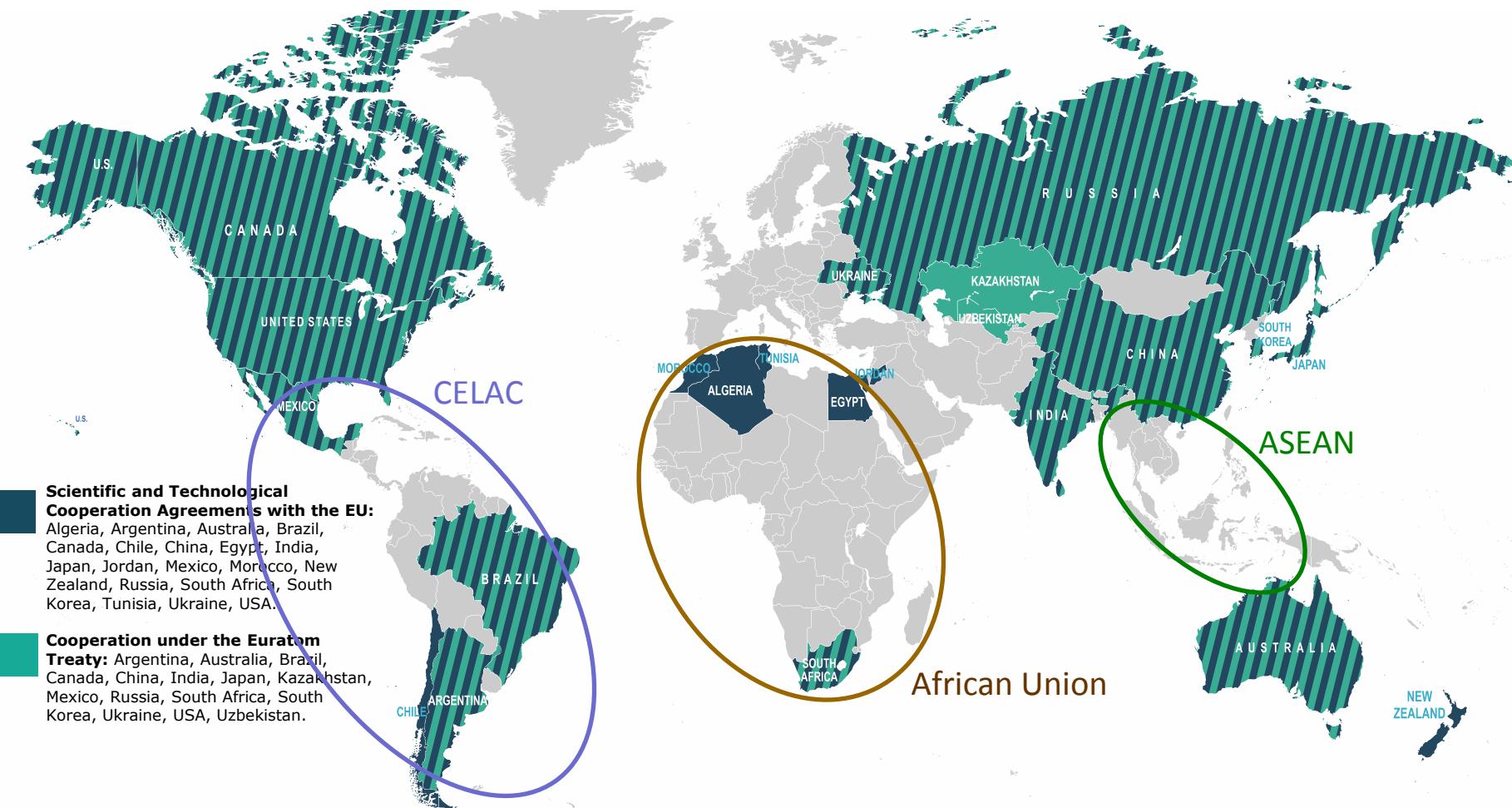
- Euratom, CERN, ESA
 - Foundations of European integration
- Research infrastructures and large facilities
 - SESAME
- Governing ungoverned spaces
 - Peaceful Antarctic
 - Signing of the Antarctic Treaty in 1959 despite the Cold War and unresolved territorial disputes: the Parties agreed that the benefits of scientific cooperation outweighed individual national interests. Over 60 years, a lot of important scientific research has occurred without interference
 - The internet
 - “The genius of the Internet is that nobody owns it. The underlying system looks more secure – and is probably best protected by ICANN's global alliance of geeks, rather than any government or agency.”
David Ignatius, Washington Post
 - Oceans?

Science Diplomacy in practice (4)

Other EU tools

- Associations to Horizon 2020
- International agreements (bilateral, bi-regional)
- Launching/participation in international initiatives
- Science counsellors in EU embassies
- ...

Regular S&T cooperation dialogues



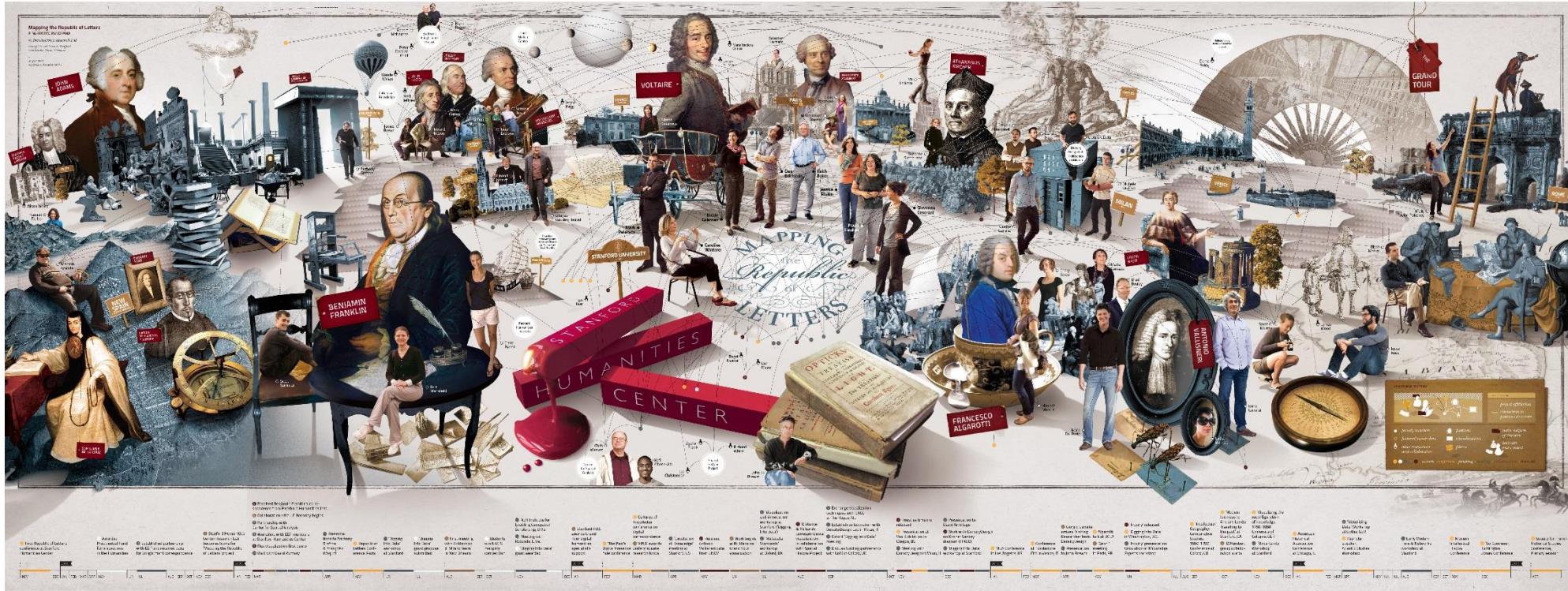
+ 16 countries associated to Horizon 2020

A variety of forms...

- Scientists as diplomats and science-enabled diplomats
- Scientific networks, exchanges, research collaboration
 - creating communities and trust
- Scientific advice, data for policy, science for policy
- Science-based organisations for commons governance
 - templates for and opening up international governance

A new Republic of Letters?

Carlos Moedas, EU Commissioner (October 2016)



From Republicofletters.stanford.edu

*A global community of 60 million scientists with win-win cooperation encoded in their DNA:
what relevance to international relations?*

Thank you!

Further reading

- HRVP Mogherini editorial, December 2016: <https://erc.europa.eu/sites/default/files/publication/files/ERC-Newsletter-Winter-2016.pdf>
- Commissioner Moedas speech, October 2016: http://ec.europa.eu/commission/2014-2019/moedas/announcements/science-diplomacy-driver-excellence_en
- EU Global Strategy, June 2016: http://europa.eu/globalstrategy/sites/globalstrategy/files/pages/files/eugs_review_web_13.pdf
- Commissioner Moedas article, March 2016: <http://www.sciediplomacy.org/perspective/2016/science-diplomacy-in-european-union>
- Commissioner Moedas speech, June 2015: http://ec.europa.eu/commission/2014-2019/moedas/announcements/eu-approach-science-diplomacy_en
- EL-CSID project: <https://www.el-csid.eu/>
- 'Tools for an EU Science Diplomacy': <https://publications.europa.eu/en/publication-detail/-/publication/e668f8cf-e395-11e6-ad7c-01aa75ed71a1/language-en/format-PDF/source-36799391>
- 'Global Science Diplomacy for Multilateralism 2.0': <http://www.sciediplomacy.org/article/2016/global-science-diplomacy-for-multilateralism-20>
- 'How 'alternative facts' could be tackled with science diplomacy': https://horizon-magazine.eu/article/how-alternative-facts-could-be-tackled-science-diplomacy_en.html?utm_source=HORIZON&utm_campaign=35a5749907-News_Alert_20170418&utm_medium=email&utm_term=0_bdcf6f64ca-35a5749907-105633409&mc_cid=35a5749907&mc_eid=9931d3d57b
- UK Royal Society: "New frontiers in science diplomacy": https://royalsociety.org/~media/Royal_Society_Content/policy/publications/2010/4294969468.pdf
- Spanish science diplomacy: <http://www.sciediplomacy.org/article/2017/spanish-science-diplomacy-global-and-collaborative-bottom-approach>
- Science diplomacy for France: http://www.diplomatie.gouv.fr/IMG/pdf/science-diplomacy-for-france-2013_cle83c9d2.pdf
- Pierre-Bruno Ruffini: 'Science and Diplomacy 2017 : A New Dimension of International Relations': <https://www.bookdepository.com/Science-Diplomacy-2017-Pierre-Bruno-Ruffini/9783319551036>
- Swiss science diplomacy: <http://www.sciediplomacy.org/perspective/2014/swiss-science-diplomacy>
- AAAS Center for Science Diplomacy: <https://www.aaas.org/program/center-science-diplomacy>