CERN: Sixty years of science for peace and development

IPU Committee on Middle East Questions
Roundtable on Water
The role of science and technology in projects of peace

Geneva, 1 June 2016
Maurizio Bona, CERN
Maurizio.Bona@cern.ch
“Try to imagine the whole universe beginning to ring and resound. These are no longer human voices, but planets and suns revolving.”

G. M.
• Introduction to CERN

• The world of science

• CERN’s advocacy for science in the international Community

• Science for Peace
• International Geneva:
  
  - 33 international Organization (21 intergovernmental) ; ~ 250 NGOs
  - 173 States with permanent Missions; Diplomatic Club
  - ~ 25000 int. civil servants (21500) and diplomats; ~ $ 5.5 bn spent locally
  - Geneva: the most active center for multilateral diplomacy in the world.

• Multilateralism:
  
  - Historically: humanitarian, social, economical, normative
  - Science is not in the focus of the international debates
  - In the past CERN was not fully profiting of International Geneva (and vice versa)
The birth of CERN

• The CERN “parents”
  A group of farsighted scientists, politicians, diplomats.

• CERN’s main objectives
  . Resume the dialogue after World War II among former belligerent European Countries, and beyond.
  . Carry out excellent scientific programmes.
The first 60 years of CERN

• The CERN Convention (signed in 1953)

“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”

• 30 years later …

“I hope that the scientists at CERN will remember that they have other duties than exploring further into particle physics. They represent the combination of centuries of investigation and study... to show the power of human spirit. So I appeal to them not to consider themselves as technicians... but... as guardians of this flame of European unity so that Europe can help preserve the peace of the world.”

Prof. I. Rabi, US (celebrations for 30th anniversary of CERN, 1984)
CERN in a nutshell

• Personnel and budget
  . ~ 2300 staff + ~ 1400 other paid persons
  . ~ 12500 scientific “users”
  . Budget (2016) ~ 1000 M CHF. It is 100% “regular budget”

• Membership
  . 21 Member States; 3 Associate Member States; 7 Observers
  . Membership enlarged to non-European States in 2010
  . 2 States in accession to membership. Applications from 8 States.
  . Observer status will be phased-out for Countries

• Host States
  . Switzerland (official seat: Geneva) and France
CERN in a nutshell

• **Accelerators and infrastructures**
  . Under the financial & technical responsibility of the Organization.

• **Experimental collaborations**
  . Hundreds (thousands) researchers from Member States and non-Member States.
  . Autonomously organized, including finance; placed under DG’s authority. Top-down and bottom-up approach.

• **The scientific programme**
  . Decided by Council on proposal by the **Scientific Policy Committee**
CERN in a nutshell

• The Director-General
  . Five-years mandate. Successor appointed one year before taking office
  . Directorate consisting of Director-General plus four Directors (2016)

• The Council
  . Meets four times a year. The Director-General serves as the Secretary.

• Council’s subordinate bodies
  . Finance Committee; Scientific Policy Committee.
  . Pension Fund Governing Board; TREF (tripartite).
CERN SCIENTIFIC POLICY COMMITTEE  
(2014)

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NAKADA Tatsuya EPFL, CH

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RUBAKOV Valéry INR, RU  
SPIERING Christian DESY, DE  
TOKUSHUKU Katsuo KEK, JP  
WARK David Imperial College, UK  
WYATT Terry Univ. of Manchester, UK

M. Bona – IPU, June 2016
The world of science

. Inclusive by its nature.

. Individuals are evaluated by peers based on concrete results.

. Results evaluated by the international community; scientific method.

. **Excellence** is required.

. Results are achieved only if all participants share the **same objective**.

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Science at CERN; the CERN model

. A simple but strong Convention, excluding military applications.

. Researchers from everywhere, including from non-Member States.

. International experimental collaborations, where CERN is minority.

. Open access philosophy, in all fields.

. Inclusion: no barriers of nationality, age, religion, gender etc …

. Collaboration and competition: “Co-opetition”.

. Stay away from politics.

and, mainly
. Excellence

. Trust
## RESEARCH PROGRAMME

- LHC
- SPS
- PS
- AD
- ISOLDE Facility
- Irradiation Facility
- Neutrino Platform
- GRADE
- CTF3
- R&D
- Non-accelerator experiments

## RESEARCH ACTIVITIES

- Experiments and Projects under Study
- Recognized Experiments
- Completed Experiments

## RELATED LINKS

- EP Department
- Users' Office
- Scientific Committees
- Conditions for experiments
- Accelerators and Beams
- Machine Schedules

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### CMS

**CMS - The Compact Muon Solenoid**

**SYNONYM:**
- RESEARCH PROGRAMME: LHC
- APPROVED: 31-01-1996
- BEAM: 
- STATUS: Data Taking

<table>
<thead>
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<tr>
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<td>Chinese Academy of Sciences</td>
<td>Beijing</td>
<td>China</td>
<td>(TL) CHEN, HESHENG (DTL) JIANG, CHUNHUA (DTL) CHEN, GUOMING</td>
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<td></td>
<td>Beijing</td>
<td>China</td>
<td>(TL) MAO, YAIUN (DTL) QIAN, SUIN (DTL) BAN, YONG</td>
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| Department of Physics | National Central University | Jhongli City | Taiwan | (TL) Kuo, Chia-Ming  
                       |                    |            |         | (DTL) Yu, Shin-Shan |
| National Taiwan University (NTU) |                | Taipei | Taiwan | (TL) Hou, George Wei-Shu  
                       |                    |            |         | (DTL) Lu, Rong-Shyang  
                       |                    |            |         | (DTL) Chen, Kai-Feng |

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<td>India</td>
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<td>India</td>
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The CERN Experimental Programme
Grey Book database

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M. Bona – IPU, June 2016
Science for peace and development

CERN is actively engaged to promoting:

. The role of science for the sustainable development of society: knowledge; technology and innovation; education.

. Science as enabler for dialogue and peace.
Observer status at the UN, Dec 2012

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CERN and the UN 2030 Agenda on Sustainable Development

Preparation of the 2030 Agenda

- Input on science via ECOSOC and UN High Level Political Forum
- Main messages: . Support to research, including basic research
  . STEM education

Implementation of the 2030 Agenda

- Contribution to the “Technology Facilitation Mechanism”.
- Offer to the UN: . CERN knowledge on science, technol., innovation
  . CERN IT infrastruct. for pilot projects (Big Data).
- Description and discussion of the “CERN model”.

M. Bona – IPU, June 2016
CERN (and science) for Peace

In the recent years CERN organized:

- Various initiatives like conferences, workshops, with other partners (Governments, Academies, other international organizations).

- Event with the UN in Geneva on the CERN model for global public goods, including science for peace (Geneva, Nov. 2015).


M. Bona – IPU, June 2016
SESAME - SYNCHROTRON-LIGHT FOR EXPERIMENTAL SCIENCE AND APPLICATIONS IN THE MIDDLE EAST

Amman, Jordan
Teacher Training Schools

. Target: high school teachers.

. Goal: stimulate vocation of young people, in particular females, to invest in scientific university studies.

. Modules originally developed for Member States teachers, progressively extended also to teachers from non-Member States.

. Particular attention to specific regions, i.e. Africa with UNESCO.

. Cost of a school ~ 60 k$ (~2 k$/teacher: travel, lodging, subsistence)
CERN Teacher Programmes

National Teacher Programmes in the language of the country
focus on visits and lectures

International Teacher Programmes in English
new starting in 2017
focus on visits and lectures

International Teacher Programmes in English
focus on collaboration
CERN-UNESCO Schools for Teachers from SESAME Member States

- One School for Teachers (and students) from SESAME Member States was held at CERN in September-October 2015.

- Great interest to repeat the experience: discussions with Switzerland and UNESCO for funding. Are others possibly interested to finance?

- Should money become available, 36 teachers/School could be trained.

- Should money become available, the next School could be held at the beginning of 2017.

- CERN-UNESCO-IPU School: a dream?

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Great, but finally:

What is the concrete contribution of science, and of CERN in particular, to peace?
Science for peace

. In its 60 years of life CERN, with its model, was a positive example of a worldwide platform for dialogue and peace through science.

. SESAME, based on the same model, is profiling itself as a platform in the Middle East for excellent science as well as for dialogue and peaceful cooperation.

Questions:

. Can these examples be exported to fields other than science?

. Can such models and platforms be used to tackle and solve basic societal needs, like ensuring water, energy, food etc ... ?
Some characteristics of science

. Science is by its nature neutral.

. Science promotes and requires trustful cooperation.

. Science is one of the few real universal languages.

Question:

. Does science bring peace?
West-Eastern Divan Orchestra
founded by Daniel Barenboim - Edward Said, 1999

Musicians from:

- Syria
- Turkey
- Egypt
- Israel
- Palestine
- Jordan
- Lebanon
- Spain

Excellence
Sharing the same objective

M. Bona – IPU, June 2016
“The West-Eastern Divan Orchestra ….. has been sometimes described in a very flattering way for us as an “orchestra for peace”. Let me tell you something: this is not going to bring peace. What it can bring is understanding, the patience, the courage, and the curiosity to listen to the narrative of the other”

Daniel Barenboim, Ramallah concert, August 2005.
Question:

Does science bring peace?
Question:

Does science bring peace?

My personal answer:

Science itself cannot bring peace.

What it can bring is understanding, the patience, the courage, and the curiosity to listen to the narrative of the other.
THANK YOU FOR YOUR ATTENTION!