

Strengthening Basic Sciences and Engineering Through Institutional and Human Capacity Building

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Natural Science Sector

UNESCO HQ; Paris, France



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United Nations
Educational, Scientific
and Cultural Organization

United Nations Educational, Scientific and Cultural Organization

..... Established in 1946, the Organization currently has 194 Member States. The main objective is to contribute to peace and security in the world.

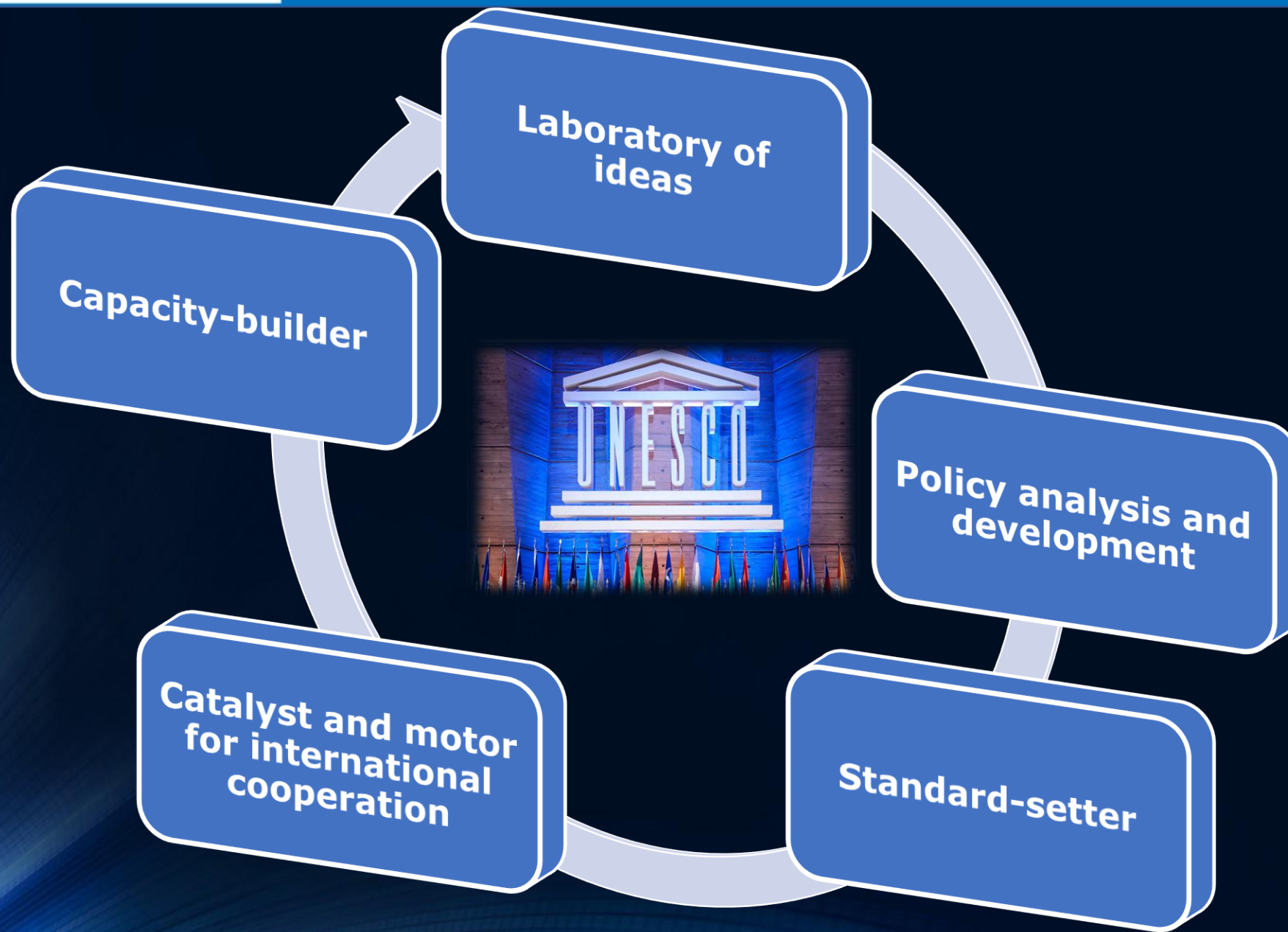
- 75 years experience in promoting international cooperation in science.
- International science programmes for basic sciences, the oceans, freshwater, and biospheres.





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UNESCO; Natural Science Sector

Failure of climate change mitigation and adaptation; extreme weather events;



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Natural disasters, man-made environmental disasters;



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Biodiversity loss and ecosystem collapse **water** crises.



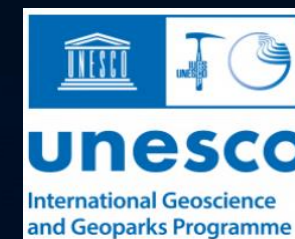
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pressure on natural resources

many conflicts and instances of violent extremism have their source in an uneven distribution of natural resources

people being displaced for lack of water, food and consequently job opportunities





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UNESCO; Natural Science Sector

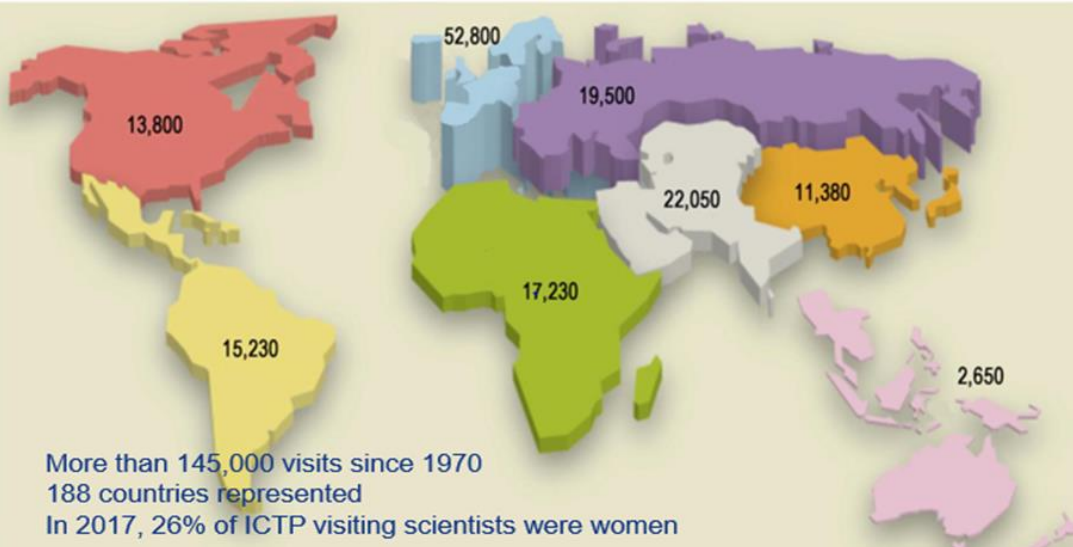


The Abdus Salam
International Centre
for Theoretical Physics



The World Academy of Sciences
for the advancement of science in developing countries

6000 scientists from 145
countries each year.



The World Academy of Sciences
for the advancement of science in developing countries

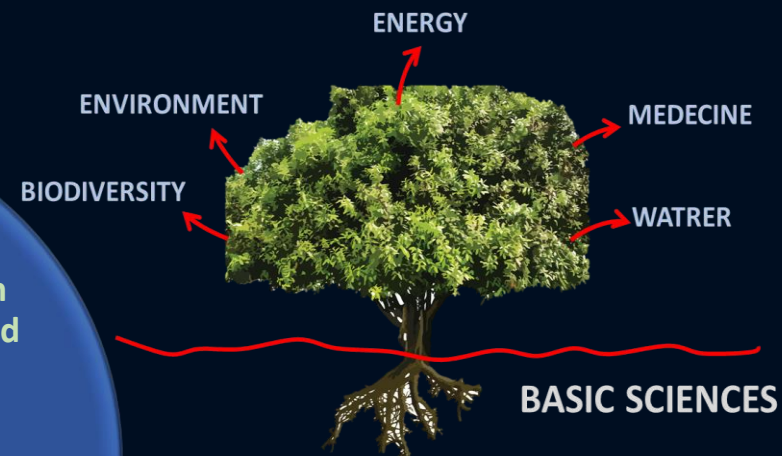
A voice for
science in
the South

- 1,249 elected Fellows
- 165 women
- 103 countries
- 14 Nobel laureates
- 279 Young Affiliates/alumni

Reinforce capacity building in Basic and Applied Sciences and Scientific Research to strengthen innovation and technology development in Member States

Support Member States policy development and enhance Open Science

Strengthening Member States capacities and awareness to protect, safeguard and promote Indigenous knowledge of climate, weather, ecosystems and biodiversity



Work with Member States to:

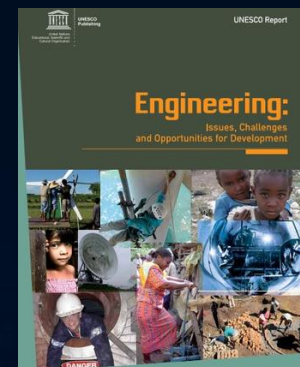
Build scientific, technological and engineering capacities to provide solutions to the sustainable development challenges such as health, agriculture, energy, industrial and infrastructure development,etc.



Creating scientific networks and facilitate access to scientific information



Image created by Tome ai



Invest in building capacity to carry out scientific research which means excellent science education at all levels, effective engineering education and quality universities and research Centres.



Basic science seeks to expand knowledge about the natural world through observations, experimentation, and theoretical reasoning. **It serves as a foundation for applied sciences, which aim to develop practical applications based on this knowledge.**

Engineering is the application of scientific principles to design, develop, test, and improve structures, machines, systems, processes, and devices for practical purposes. **The goal of engineering is to create solutions that are safe, efficient, and effective in meeting the needs of society.**

**BASIC
SCIENCES**

STEM

ENGINEERING

STEM "Science, Technology, Engineering, and Mathematics" is an acronym used to describe an educational and professional focus on these four areas of study. **STEM education often incorporates hands-on learning and problem-solving skills, encouraging students to think critically and creatively to solve real-world problems.**



The programme supports national, regional and global programs in:

- Pure and Applied mathematics
- Physics
- Chemistry
- Biological sciences
- Interdisciplinary Sciences
- Science education (STEM)
- Science Communication - as one of the most important tools to disseminate the value of science



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Category 2 Centres (C2C)

Basic Science (12 Centers):

- 4 @ Europe and N. America
- 3 @ Asia and Pacific
- 2 @ S America
- 3 @ Africa

Biotechnology (5 Centers)

- 4 @ Asia and Pacific
- 1 @ Africa

Engineering (5 Centers)

- 2 @ Europe and N. America
- 2 @ Asia (same country)
- 1 @ Africa

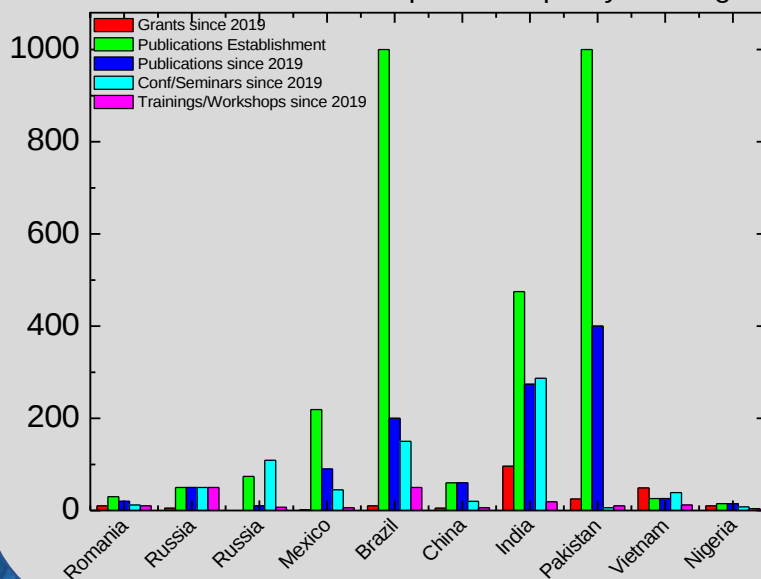
Renewable Energy (2 Centers)

- 1 @ Europe and N. America
- 1 @ Arab Region

Space Technology (1 Center)

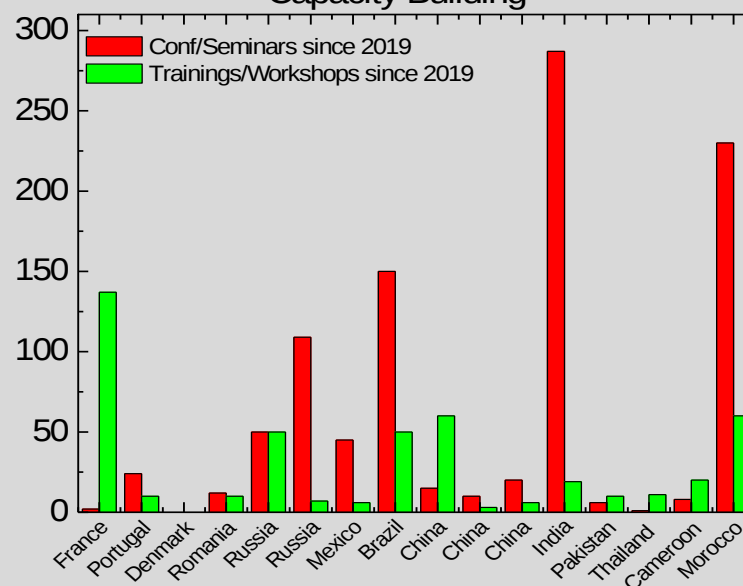
- 1 @ Asia and Pacific

Research and Development/ Capacity Building



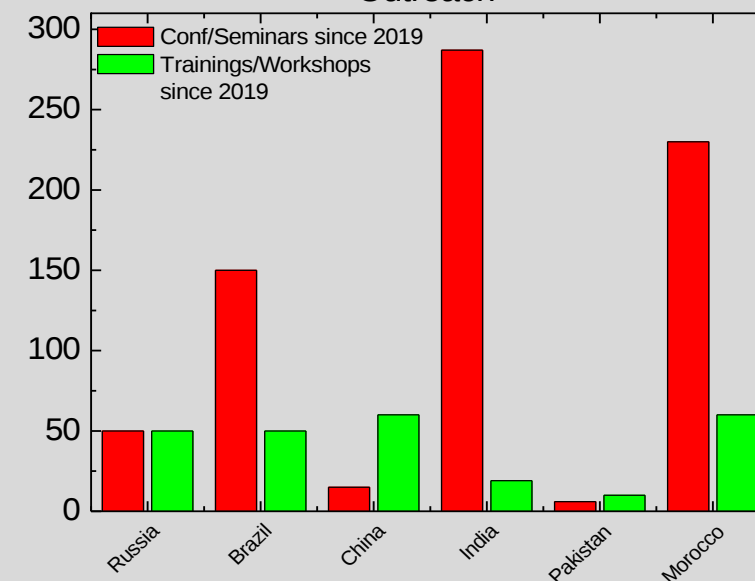
Funded projects sponsored by or conducted by the Centres. Conferences/Workshops/Seminars that are organized by the Centres.

Capacity Building



Long-term and short-term research and education opportunities provided or funded by the Centres and Curriculum development.

Outreach



Outreaches: Events for public engagement such as prizes, competitions, tours, and exhibitions



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UNESCO Chairs





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UNESCO Chairs

About 60 UNESCO Chairs

Africa: 9

Arab States: 3

LAC: 10

Asia and Pacific: 12

Europe-North America: 26

Green Chemistry
Environmental Engineering

Microbiology
Interdisciplinary Research in Diabetes
Health Science
Cryobiology
Seafood biotechnology
Bio-economy
Biochemistry and Biophysics

Earthquake Engineering

Engineering in Agriculture,
Metallurgical, Medical
Higher Engineering Education
and Industries
Energy

Astronomy and Astrophysics

Computer Sciences

STEM

Micorscience

Pure and Applied Mathematics





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UNESCO Science Report 2021



We are in a race against time for smarter development

are we using science to
build the future we want?



Since 1993, six reports have been published. The series monitors the evolution of the support system for science, technology and innovation worldwide over time, through the eyes of an independent team of experts who are each writing about the country or region from which they hail.

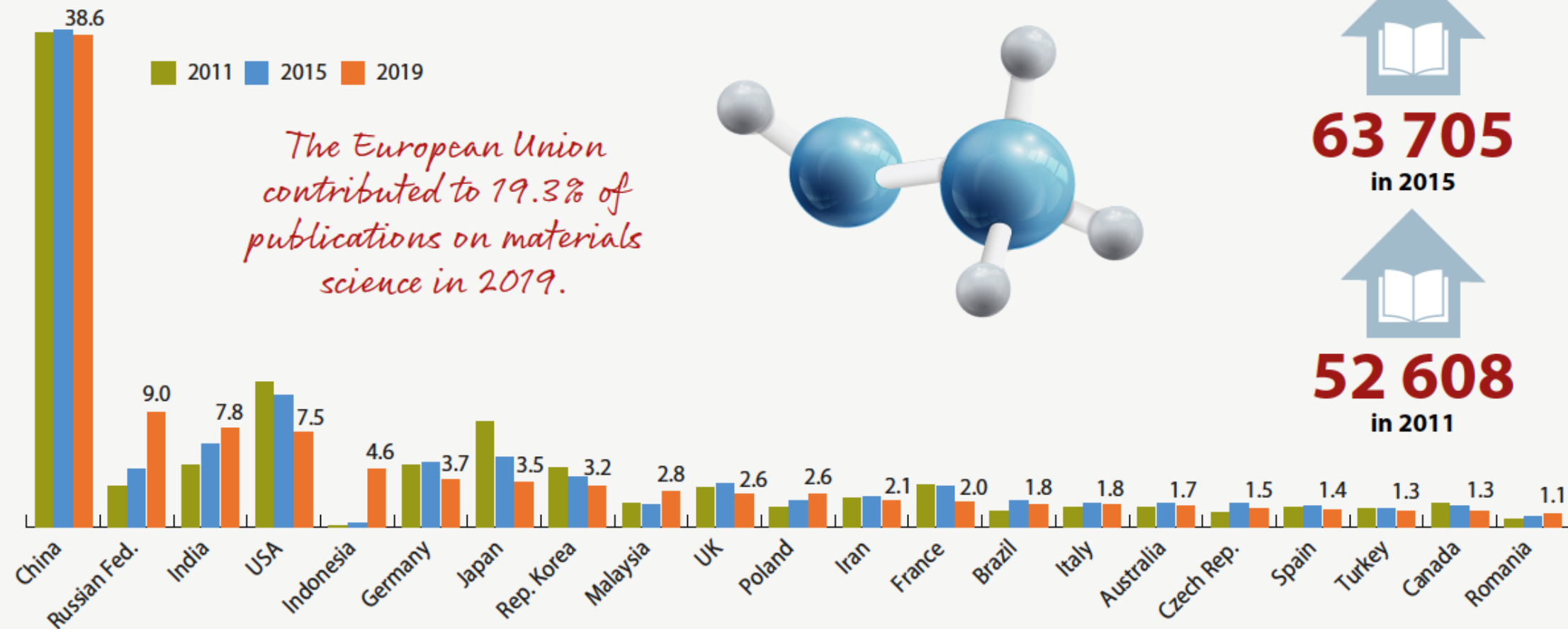


UNESCO SCIENCE REPORT

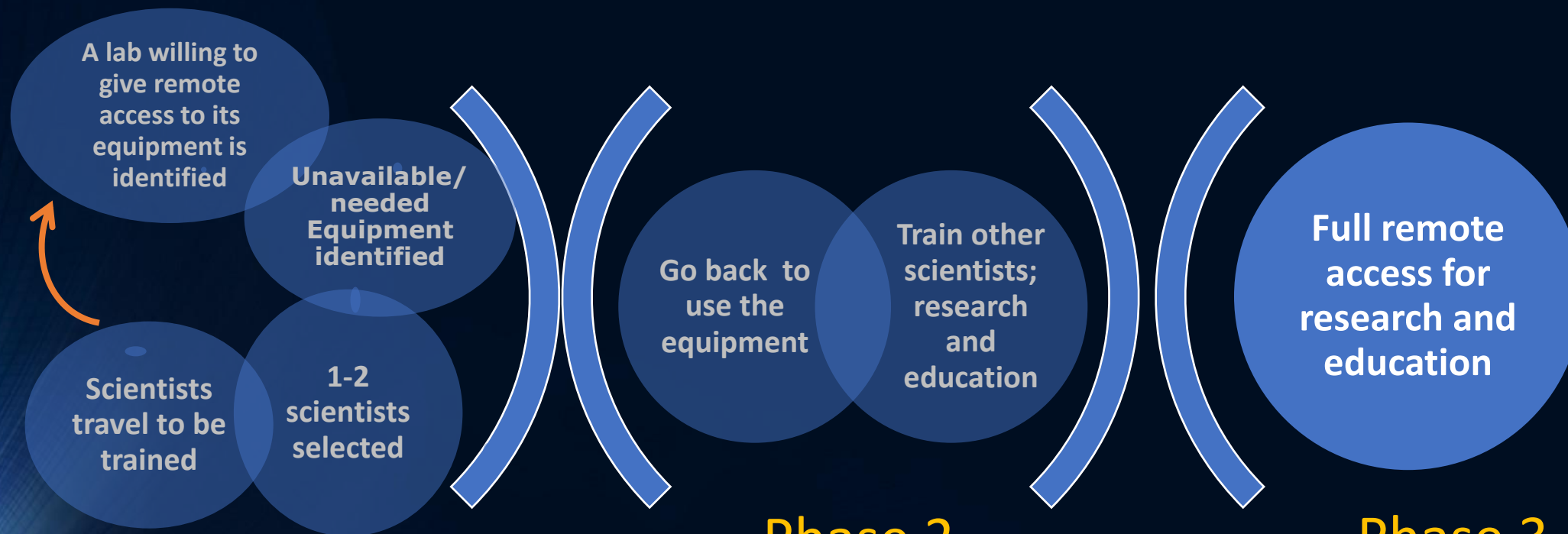
The race against
time for smarter
development



Share of global publications on materials science, 2011, 2015 and 2019 (%)
Among countries contributing to at least 1% in 2019; data labels are for 2019



Phase 1



Phase 2

Phase 3

Single Crystal X-Ray Diffractometer



Only few exist
in Africa....!





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Countries with Full Remote Access to one Equipment in Africa





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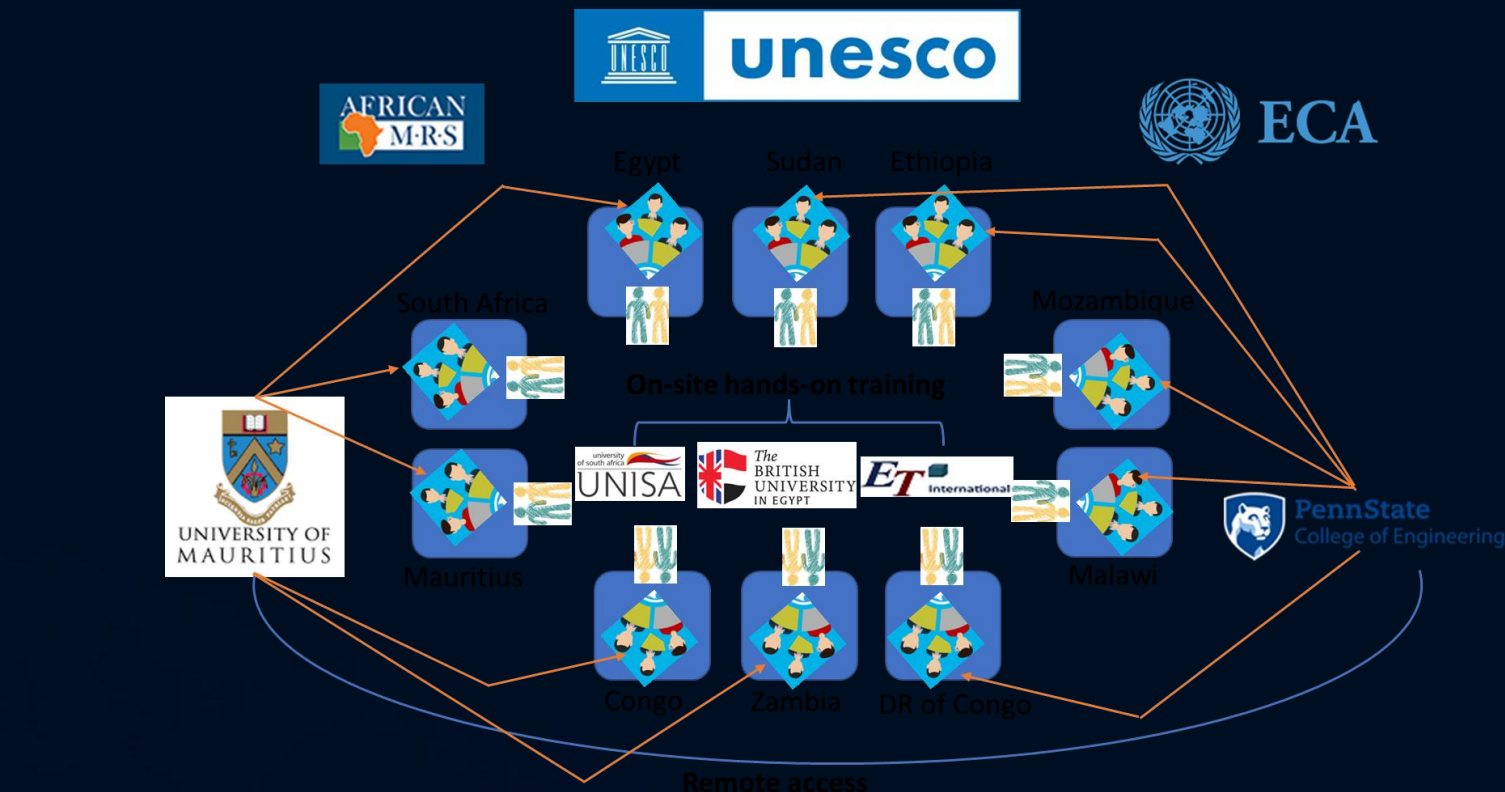
Science & Engineering - Entrepreneurship

NANOTECHNOLOGY ENTERPRNURAHIP BUSINESS BOOTCAMP

Enterprnurahip Business bootcamp for nanotechnology solutions and applications for African Entrepreneurs

The British University in Egypt-BUE - science innovation park
From 29 January to 2 February 2023

PARTNERS





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Science & Engineering - Entrepreneurship

Science & Engineering – Entrepreneurship Bootcamp

Panama; September 2023



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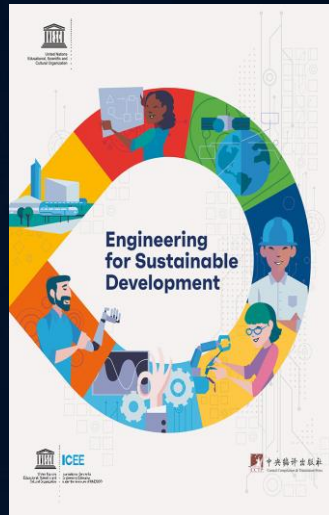


Engineering Programme

Engineering Reports



Space Education through series of discovery workshops



Africa Engineering Week
Hands-on training



World Engineering Day



With WFEO



WomEng in South Africa is cracking the code to get girls into engineering studies

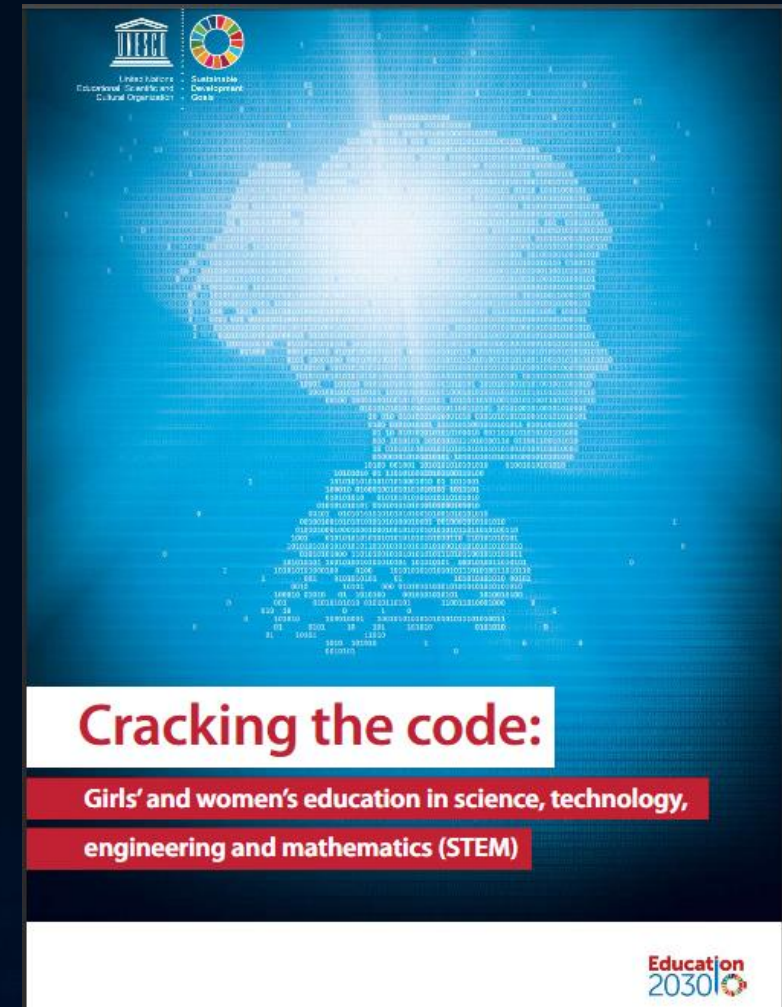
UNESCO is collaborating with WomEng on the One Million Girls in STEM campaign, launched together at the UN Commission on the Status of Women in March 2021.

Women and girls are particularly under-represented in science, technology, engineering and mathematics (STEM) education, and consequently in STEM careers:

- Only 35% of STEM students in higher education globally are women, and differences are observed within STEM disciplines.
- Only 3% of female students in higher education choose information and communication technologies (ICT) studies.

UNESCO is giving special attention to this issue as part of its efforts to promote the empowerment of women and girls through education and encouraging girls and women to be leaders in STEM, including arts and design.

This report was the first to document the drivers of gender disparity in STEM studies globally.



Our MISSION



- To increase the **interest** of young people in **scientific disciplines**, encouraging **girls' enrolment** in science and career in scientific field.
- To promote the inclusion of **hands-on experimentation** in science curricula.



Robotics kits - 3D printing and AI Software



Microscience kits

TOOLS



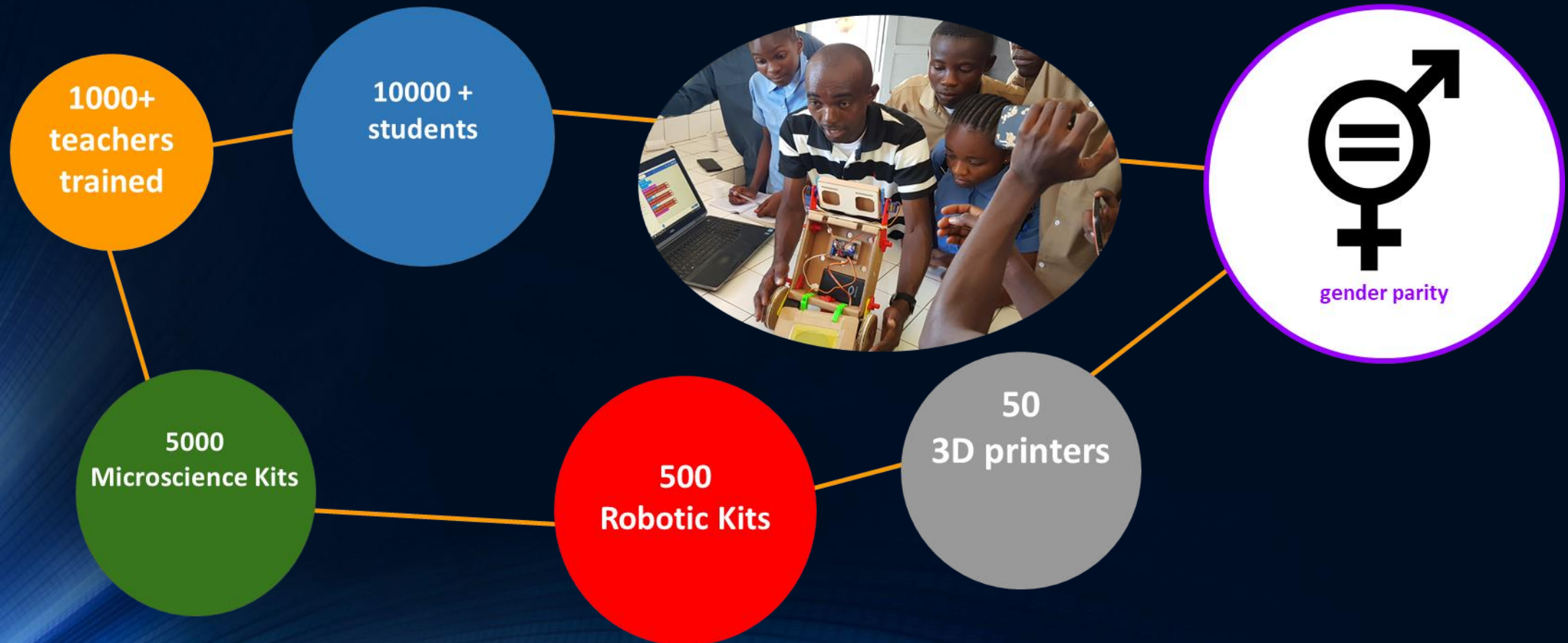
These kits are affordable **3D printed Educational robots**, with an Open source **Microcontroller** and an Upcycled phone. Students can experiment **coding, 3D printing and AI**.



These kits are veritable **mini-laboratory**, reusable, affordable and cost effective. Experiments requires small quantities of chemical substances

UNESCO STEM ACTIVITIES

During the last 5 years, we have been inspiring the next generation of thinkers and makers, with an accessible, hands-on robotics, machine learning and Microscience experience





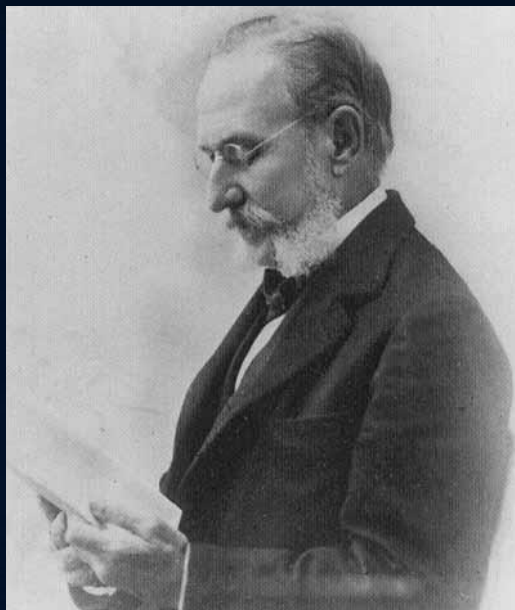
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Prizes and Grant Programmes

The UNESCO-Equatorial Guinea International Prize for Research in the Life Sciences



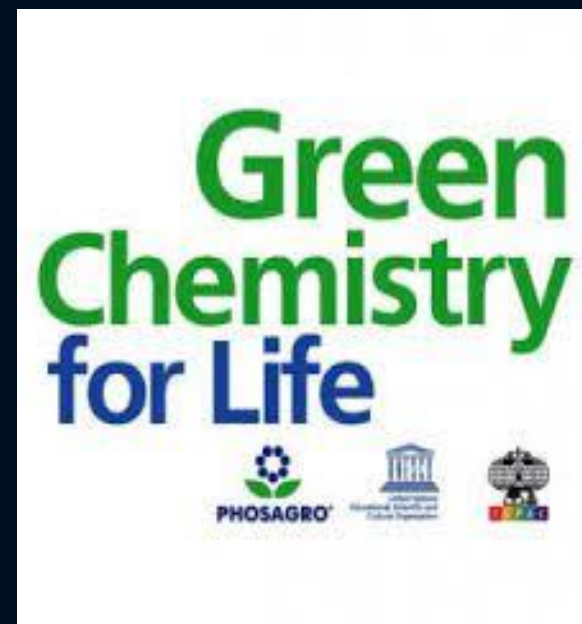
UNESCO-Carlos Finlay Prize for Microbiology



UNESCO - AL FOZAN International Prize for the promotion of Young Scientists in STEM



The PhosAgro/UNESCO/IUPAC Partnership in Green Chemistry for Life



International Decade of Sciences for Sustainable Development

**Anticipated Major Achievements;
Milestones and key activities**



2024 • 2033

International Decade of
Sciences for Sustainable
Development



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Decade of Sciences for Sustainable Development (IDSSD); 2024-2033



2024 • 2033

International Decade of
Sciences for Sustainable
Development

United Nations A/77/L.100

 **General Assembly**

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Seventy-seventh session
Agenda item 13
**Integrated and coordinated implementation of and follow-up
to the outcomes of the major United Nations conferences and
summits in the economic, social and related fields**

Argentina, Cuba, Equatorial Guinea, Guatemala, Honduras, Hungary, Serbia,
South Africa, Spain and Viet Nam:* draft resolution

**International Decade of Sciences for Sustainable
Development, 2024–2033**

..... we seek to drive a transformative era of science that prioritizes sustainability, resilience, and the well-being of our planet and its inhabitants.



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Thank you



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