

Report on the project of an International Year of Basic Sciences for Development in 2022 (IYBSD 2022)

M. Spiro

IUPAP President Designate

To celebrate the centenary of its creation in 2022 and the centenary of its first General Assembly in Paris in 2023, IUPAP plans to organize big events in Geneva and in Paris which could be part of the events organized in the framework of a much wider project that IUPAP is promoting: **an International Year of Basic Sciences for Development in 2022/2023**.

The rationale for an **International Year of Basic Sciences for Development (IYBSD 2022/2023)** is very strong:

- Although it is generally recognized that science is useful for society, quite often, **basic sciences** are not considered as they should deserve, in the discussions concerning the societal, environmental and economic development.
- After the International Year of Physics, the International Year of Chemistry, the International Year of Mathematics, the International Year of Astronomy, it is time to plan an International Year of Basic Sciences for Development
- **2022** would be a good time to celebrate **Basic Sciences for Development** (fit well with UNESCO and UN agenda, **IUPAP (International Union of Pure and Applied Physics) centenary, 100 years Niels Bohr Nobel award, Stern and Gerlach, Compton scattering, 200 years Brazil independence**)

Example of how much Basic Sciences contribute to development are given below:

- The WEB was born at CERN from the needs of global collaboration for fundamental science.
- The success of Google, the second largest company in the world, comes from a brilliant mathematical idea.
- Artificial intelligence relies on statistical methods and will have an influence on all aspects of society.
- Cellular phones come from the discovery of transistors and WiFi astronomy spin-off developments.
- GPS accuracy is a spin-off of Einstein General Relativity, and the improvement in accuracy of atomic clocks based on quantum technology
- The discovery of DNA has revolutionized Medicine
- The Genome Project has opened the way to gene therapies.
- The development of innovative instrumentation for Basic Sciences has many impacts for Health and Development: PET, MRI, Adaptive Optics.
- The rapid uptake of the generation and storage of renewable energy depends on advances in physics, chemistry and materials science.

- Reduction in pollution and green chemistry rely on basic advances in chemistry
- ...

Tentative list of topics which could be covered are:

- Basic Sciences and Multicultural Dialogue
- Basic Sciences, Education and Human Development
- Basic Sciences and Women (figures, empowering women, role models)
- Basic Sciences, Innovation and Economy
- Basic Sciences and Life Sciences
- Basic Sciences and Global Challenges
- Basic Science as a Global Public Good
- Basic Sciences and the sustainable development goals

Some possible resulting actions are:

- Institutionalize full implementation of open access publishing for all research papers connected to Fundamental Research, i.e. curiosity driven. This will allow free access to Universities to all published material in Basic Sciences
- More generally promote Open Science in all Basic Sciences.
- Promote inclusive collaboration in Fundamental Research (teams from developed countries together with teams from developing countries, gender balance...)
- Organize top level international scientific conferences in developing countries with many side events. International Scientific Unions should be mobilized for that purpose.
- Promote training and education to Basic Sciences in developing countries
- ..

The proposal of 2022 as the International Year of Basic Sciences for Development was well received (see figure 3) and got the oral and then formal support of the representatives of ICSU (International Council for Science), ISSC (International Social Sciences Council) → now ISC, IUPAC (International Union for Pure and Applied Chemistry), IAU, IMU, IUBS, ICTP (Abdus Salam International Center for Theoretical Physics), EPS (European Physical Society), CERN (European Organization for Particle Physics), JINR (Joint Institute for Nuclear Research), IRD (Institut de Recherche et Développement). The proposal was presented to the Jordanian, Nigerian, Palestinian, Russian and Vietnamese ambassadors to UNESCO and received a firm support to bring this project to UNESCO (see below the Draft Resolution presented at the October UNESCO Executive Board agenda). It was also discussed with the director at UNESCO, of Science Policy and Capacity Building, Executive Secretary of IBSP (International Basic Sciences Program at UNESCO), very supportive of the initiative. IBSP is giving its support.

The main steps are now:

- 2018 Formal recommendation by IBSP for 2022 – International Year for Basic Sciences for development (done)
- 2019 Formal approval by the General Conference of UNESCO (November)
- 2020 Approval by the UN General Assembly (December)
- 2021 Detailed Preparation of Regional and International events
- 2022 International Year of Basic Sciences for Development

Your help is welcome to convince your delegations at UNESCO to promote the project and to participate to the project.

The below Proposal and Draft Resolution are presented to the UNESCO Executive Board in October this year, followed by the General Conference in November, by a number of UNESCO member countries, led by Jordan.

The initiative is developed by many national, regional and international scientific societies and other organizations (see Annex in the below DR) led by the International Union of Pure and Applied Physics (IUPAP) in connection with IBSP (International Basic Sciences Program of UNESCO).

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Item ... of the provisional agenda

PROPOSAL FOR THE PROCLAMATION OF AN INTERNATIONAL YEAR OF BASIC SCIENCES FOR DEVELOPMENT IN 2022

SUMMARY

This item has been included in the provisional agenda of the 207th session of the Executive Board at the request of Jordan, Nigeria, Palestine, the Russian Federation and Vietnam.

The corresponding explanatory note is included in the document.

Action expected of the Executive Board: Proposed decision in paragraph 14.

EXPLANATORY NOTE

Background

I. INTRODUCTION AND MOTIVATION

1. Basic Sciences, such as mathematics, physics, chemistry, life and social sciences, are curiosity-driven sciences which have also fundamental roles in our lives. They enable the necessary means and tools to address global socio-economic and environmental challenges, such as climate change, the water crisis, biodiversity loss, extreme events, and ocean deoxygenation.
2. Despite this, the crucial role of basic sciences is often poorly appreciated, if at all. Further awareness of the critical function of basic sciences needs to be built amongst relevant stakeholders including policy-makers, business and industry, international organizations, philanthropic foundations, universities, teachers and students, media, and the broader public.
3. Increased awareness of basic sciences is expected to lead to further opportunities for new discoveries which can improve human well-being within the framework of sustainable development.
4. Building upon the achievements of the International Year of Physics, the International Year of Chemistry, the International Year of Mathematics, the International Year of Astronomy, the international year of Light, it is time to plan for an International Year of Basic Sciences for Development (IYBSD).

II. THE IMPORTANCE OF BASIC SCIENCES FOR DEVELOPMENT

1. The 2030 Agenda, with its Sustainable Development Goals (SDGs), is the roadmap to global well-being for current and future generations. The SDGs indicate the directions towards better education opportunities, gender equality, clean water, affordable and clean energy, and a healthy environment, among other things. Basic sciences can help identify mechanisms to correctly use knowledge and carry out technology transfer.
2. Basic Sciences can also enable international research cooperation and dialogue across disciplines and across countries, including developing countries.

III. OUTCOMES OF AN INTERNATIONAL YEAR OF BASIC SCIENCES FOR DEVELOPMENT (IYBSD)

1. The year will be structured around different events addressing, inter alia, the following cross-cutting themes:
 - Basic Sciences for Sustainable Development
 - Women and Basic Sciences
 - Basic Sciences in African, Latin American, Asian and Small Island Developing States
 - Youth and Basic Sciences

2. The IYBSD will promote inclusive collaboration in Fundamental Research by fostering gender-balanced and geographically diverse teams and networks.
3. The IYBSD will promote capacity-development opportunities as well as formal and informal education activities in Basic Sciences. It will organize major conferences and workshops in different parts of the world, and in particular in developing countries. It will advertise existing or new initiatives of all sorts, distributed all over the world. The hope is to catalyse Basic Sciences Renaissance in Developing Countries which could be helped, supported and celebrated regularly even after the year of the International Year of Basic Sciences for Development".

IV. IMPORTANCE OF AN INTERNATIONAL YEAR OF BASIC SCIENCES FOR DEVELOPMENT FOR UNESCO

1. An International Year of Basic Sciences for Development is well in line with the International Basic Sciences Programme of UNESCO, which supports this initiative.
2. Basic Sciences are very much connected to several programmatic areas of UNESCO, and in particular with the work of the Natural Sciences Sector (including the Abdus Salam ICTP and The World Academy of Science [TWAS] for the advancement of science in developing countries), as well with the activities with Education, Social and Human Sciences, Culture and Communication and Information Sectors.
3. Basic Sciences contribute to peace through large collaborations and through a shared ideal: improvement of knowledge.
4. Basic Sciences are essential for sustainable development. As the year 2022 marks a number of benchmarks in history of basic sciences (200 years since the presentation of the « Difference engine », 150 years since the beginning of the first oceanographical expedition, 90 years since the discovery of neutrons, 60 years since the presentation of the first visible light emitting diode, 50 years of the first extraction of the anti plasmodial drug artemisinin, 40 years since the discovery of the first lunar meteorite on Earth, etc.), it will be a very good opportunity to promote, basic sciences for peace, education, youth, women and for developing countries. It is also intended to contribute to give a boost to the second part of the sustainable development agenda (2015 – 2030).
5. Many preparatory activities will take place prior to 2022, and also towards approval of the Year by UN. International Years may only be proclaimed by the United Nations during their annual General Assembly meetings, and only at the request of one (or more) of the United Nations Member States. Jordan, Nigeria, Palestine, the Russian Federation and Vietnam are taking the lead role in bringing this request forward, understanding that a significant number of other United Nations Member States will support this initiative.

Proposed decision

In light of the above, the Executive Board may wish to adopt the following draft decision:

The Executive Board

1. Having examined document,
2. Recalling 201 EX / Decision 38, on the importance of multilateral scientific cooperation and the leading role of the International Basic Sciences Programme of UNESCO and its promotion.
3. Recalling also that the Ministerial Round Table on The Basic Sciences: The Science Lever for Development, held during the 33rd Session of the General Conference, called upon UNESCO to “place greater emphasis on promoting the basic sciences and science education with a view to the attainment of a science culture as a precursor of a knowledge-based society worldwide, through various means available at UNESCO, and in particular the recently launched flagship International Basic Sciences Programme”. (Document 185 EX/11).
4. Recalling also the United-Nations General Assembly resolutions 70/212 17th February 2016 on the International Day of Women and Girls in Science and 68/220 of 20 December 2013 on science, technology and innovation for development, in which it recognized that full and equal access to and participation in science, technology and innovation for women and girls of all ages is imperative for achieving gender equality and the empowerment of women and girls.
5. Considering the Organization’s Global Priority Africa and recognizing that science, as a universal public good is an important tool for the achievement of the African Union 2063 Agenda.
6. Stressing the need to build on the potential of UNESCO’s International Basic Science Programme,
7. Considering the high value for humankind of Basic Sciences and considering that enhanced global awareness of, and increased education in, the basic sciences is vital to attain sustainable development, and for improving the quality of life for both men and women, all over the world, including developing countries in Africa, Latin America, Asia and Pacific.
8. Stressing that rupture innovations resulting from Basic Sciences are vital for advances in medicine, communications, and culture, and promote peace through collaborations and shared ideal,
9. Noting the broad and significant impact of recent initiatives of UNESCO’s International Basic Science Programme (IBSP) and the support of IBSP to an International Year of Basic Sciences for Development (IYBSD),
10. Recognizing that it is vital to ensure that existing gains from previous initiatives of UNESCO in natural and social sciences, education, culture and information and communication, are effectively followed-up and strengthened,

11. Recommends that the United Nations General Assembly adopts a resolution declaring 2022 as United Nations International Year of Basic Sciences for Development;
12. Recommends that the General Conference at its 40th session adopt a resolution in this regard as provided in the Draft Resolution in the Annex to this document;
13. Invites the Director-General to support all efforts leading the United Nations General Assembly to proclaim 2022 as an “International Year of Basic Sciences for Development”;

ANNEX

DRAFT RESOLUTION FOR THE 40TH SESSION OF THE GENERAL CONFERENCE OF STATES PARTIES TO UNESCO PROCLAMATION OF THE “INTERNATIONAL YEAR OF BASIC SCIENCE FOR DEVELOPMENT”

1. The General Conference,
2. Having examined document
3. Recalling 201 EX / Decision 38, on the importance of multilateral scientific cooperation and the leading role of the International Basic Sciences Programme of UNESCO and its promotion.
4. Recalling also that the Ministerial Round Table on The Basic Sciences: The Science Lever for Development, held during the 33rd Session of the General Conference, called upon UNESCO to “place greater emphasis on promoting the basic sciences and science education with a view to the attainment of a science culture as a precursor of a knowledge-based society worldwide, through various means available at UNESCO, and in particular the recently launched flagship International Basic Sciences Programme”. (Document 185 EX/11)
5. Recalling also the United-Nations General Assembly resolutions 70/212 17th February 2016 on the International Day of Women and Girls in Science and 68/220 of 20 December 2013 on science, technology and innovation for development, in which it recognized that full and equal access to and participation in science, technology and innovation for women and girls of all ages is imperative for achieving gender equality and the empowerment of women and girls.
6. Considering the Organization’s Global Priority Africa and recognizing that science, as a universal public good is an important tool for the achievement of the African Union 2063 Agenda.
7. Stressing the need to build on the potential of UNESCO’s International Basic Science Programme,
8. *Considering* the high value for humankind of Basic Sciences and considering that enhanced global awareness of, and increased education in, the basic sciences is vital to attain sustainable development, and for improving the quality of life for both men and women, all over the world, including developing countries in Africa, Latin America, Asia and Pacific.
9. *Stressing* that the applications of basic sciences are vital for advances in medicine, industry, agriculture, water resources, energy planning, environment, communication, and culture, and that basic sciences rupture technologies respond to the needs of humankind by providing access to information and increasing societal well-being, and promoting peace through improved collaborations,

10. *Noting* the broad and significant impact of recent initiatives of UNESCO's International Basic Science Programme and the enthusiastic support to an International Year of Basic Sciences for Development,
11. *Recognizing* that it is essential to ensure that existing gains from previous initiatives of UNESCO in science and education are effectively followed-up and strengthened.
12. Welcomes 207 EX/Decision???
13. Recommends that the United Nations General Assembly adopts a resolution declaring 2022 as United Nations International Year of Basic Sciences for Development;
14. Invites the Director-General to support all efforts leading the United Nations General Assembly to proclaim 2022 as an "International Year of Basic Sciences for Development";

ANNEX

Supporting Organizations for International Year of Basic Sciences for Development

Organization	Country
CERN	Switzerland
European Physical Society	European Organization
Global Young Academy	International Organization
Institut de Recherche pour le Développement	France
International Centre for Theoretical Physics	Italy
International Mathematical Union	European Organization
International Science Council	International Organization
International Union of Biological Sciences	International Organization
International Union of Pure and Applied Chemistry	International Organization
International Union of Pure and Applied Physics	International Organization
International Astronomical Union	International Organization
Joint Institute for Nuclear Research	Russian Federation
Network of African Science Academies	African Organization
SESAME	Jordan
The World Academy of Science	International Organization