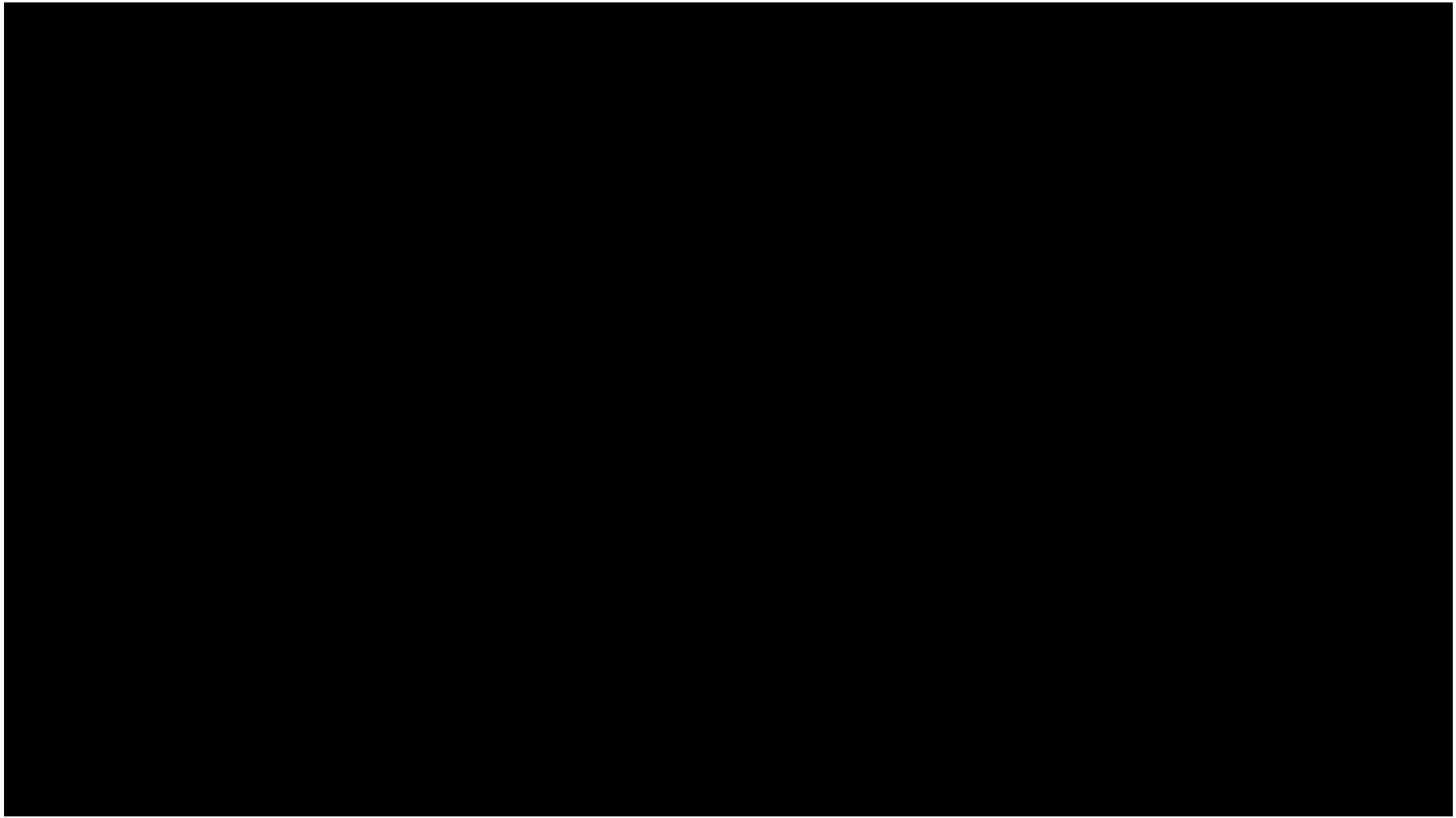
2022 2023
IYBSSD
International Year of Basic Sciences for Sustainable Development

International Year of Basic Sciences for Sustainable Development,

under the auspices of UNESCO

https://www.iybssd2022.org/



Rationale

- **Curiosity-driven sciences** construct the pool of knowledge which future generations will use for their development
- **Basic sciences** are not always and everywhere considered as they deserve, in the discussions concerning the **societal, environmental and economic development**
- **Curiosity-driven sciences** [illegible] h to be sustainable

Opening Ceremony

International Year of Basic Sciences for Sustainable Development

- **Basic sciences explore the soul of the Universe!!**

Rationale (2)

- **Serendipity** plays a role. **Long term funding** is necessary (unpredictable results).
- Source of **disruptive innovations**
- Viewed from the past, basic sciences **are the foundations of sciences and serve education**
- Facilitate open **multicultural dialogue**
- **2022 is mid-term for Agenda 2030**

Support

- 51 International Unions and Organizations
- 120 science academies, scientific networks and learned societies International Advisory Committee
- 31 Nobel laureates and Fields Medalists
- UNESCO, World Science Forum, Club of Rome, Inter Parliamentary Union. These unions, organizations, academies, networks and associations are the foundations for the success of the year and for further initiatives beyond this International Year. A real asset!!

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Leading Union

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Examples

- Vaccines and treatments against COVID-19 are full of basic biology (DNA, RNA, etc.)
- The WEB was born at CERN from the needs of fundamental science
- Google research engine comes from a brilliant mathematical idea
- Artificial intelligence relies on statistical methods
- Cellular phones are full of transistors, integrated circuits, WiFi, code, etc.
- GPS relies on Einstein theory of Relativity and on quantum atomic clocks
- The Genome Project has opened the way to gene therapies
- PET scan and MRI are based on antimatter physics and fundamental atomic magnetism
- 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
- The second quantum revolution is having now applications!!

History for IYBSSD 2022

- Proposal in January 2017 to the **International Basic Sciences Program of UNESCO**
- Resolution adopted by **UNESCO General Assembly** in November 2019
- Welcomed in the final resolution of the **World Science Forum 2019** in Budapest
- Supported by **the Interparliamentary Union (IPU)** and **the Club de Rome**
- Proclaimed by consensus by the **76th United Nations General Assembly** on December 2nd 2021

Tentative list of topics

- Basic Sciences, Multicultural Dialogue and Peace
- Basic Sciences, Education and Human Development
- Basic Sciences and Women and more generally Equity, Diversity and Inclusion, Open Sciences
- Basic Sciences, Innovation, Economy and **Sustainability Science**
- Basic Sciences, Health and Life Sciences
- Basic Sciences and Global Challenges (climate, biodiversity, water…)
- Basic Science as a Global Public Good
- Basic Sciences and hazards
- Basic Sciences and Big Data

Events

Opening ceremony, UNESCO headquarters, Paris - July 8th 2022, delayed due to the late proclamation: wonderful, high-level representatives, large attendance, large audience

and Cultural Organization

Opening Ceremony for the

International Year of Basic Sciences for Sustainable Development

Friday 8 July 2022

UNESCO

Room I — *French/English/Spanish interpretation is available and the event will be webcast*

8:30-10:00	Registration, coffee	90'
10:00-10:35	Introductory session	35'
10:00-10:03	**Video teaser**	3'
10:03-10:05	**Ms Shamila Nair-Bedouelle**, Moderator Assistant Director-General for Natural Sciences, UNESCO	2'
10:05-10:10	**Mr Xing Qu** Deputy Director-General, **UNESCO**	5'
10:10-10:15	**H.E. Dr Luther Castillo Harry,** Minister of Science, Technology Scientific Innovation, Republic of Honduras *On behalf of* **H.E. Iris Xiomara Castro Sarmiento** President of the Republic of Honduras	5'
10:15-10:20	**H.E. Mr Csaba Kőrösi** President-elect of the 77th session of the United Nations General Assembly	5'
10:20-10:25	**Dr Michel Spiro** Chair of Steering Committee, International Year of Basic Sciences for Sustainable Development President of the International Union of Pure and Applied Physics	3'

11:00-12:25 **Roundtable: role of basic sciences in decision-making** 75'

Moderator: Prof. Rolf Heuer, President of the SESAME Council, former Director-General of CERN

- **H.E. Dr Luther Castillo Harry,** Minister of Science, Technology and Scientific Innovation, Republic of Honduras
- **H.E. Mr Wang Zhigang**, Minister of Science and Technology, the People's Republic of China *online*
- **H.E. Dr Bonginkosi Emmanuel Blade Nzimande**, Minister of Higher Education, Science and Innovation, Republic of South Africa
- **H.E. Mr Huynh Thanh Dat**, Minister of Science and Technology, Socialist Republic of Vietnam
- **H.E Ms Elba Rosa Pérez Montoya,** Minister of Science, Technology and Environment, Republic of Cuba, *online*
- **Prof. Serge Haroche,** Physicist, Honorary Professor at Collège de France, 2012 Nobel Laureate in Physics, French Republic
- **Prof. Low Teck Seng,** Chief Executive Officer of the National Research Foundation, Republic of Singapore *online*
- **Prof. Georgio Parisi,** Physicist and 2021 Nobel Laureate in Physics, Republic of Italy

Remarks by Prof. Rolf Heuer, Moderator

3:00-3:45 **Roundtable: the role of basic sciences in developing societies** 45'

Moderator : Ms Dominique Leglu, Editorial Director, Sciences et Avenir la Recherche

- **Dr Rui Bai**, Life Science, Westlake University, the People's Republic of China *online*
- **Dr Karen Hallberg,** Physicist, Research Director at the Bariloche Atomic Center, Argentine Republic
- **H.E. Prof. Hany Helal**, Former Minister of Scientific Research and Higher Education, Engineering Sciences, Arab Republic of Egypt
- **Prof. Barry Barish,** Astronomy, 2017 Nobel Laureate in Physics, United States of America
- **Dr Francine NTOUMI,** Medical Science, President & Director General of the Congolese Foundation for Medical Research, Republic of Congo *online*

Dr Emil Bjerrum-Bohr will conclude the session with a testimony to the legacy of his great grandfather, Niels Bohr.

3:45-4:00 COFFEE BREAK

4:00-5.00 pm **Talks: perspectives on basic sciences and the Sustainable Development Goals** 60'

Moderator: Ms Mamphela Ramphele, M.D. Co-Chair, the Club of Rome

- **Prof. Tandong Yao**, Glaciologist, Member of the Chinese Academy of Science, People's Republic of China *online*
- **Prof. Niyazi Serdar Sariciftci,** Chemical Physicist, Johannes Kepler University (JKU), Republic of Austria *video*
- **Prof. Mercedes Bustamante,** Ecologist, University of Brasilia, Federative Republic of Brazil *online*
- **Prof. Mu-ming Pu,** Neuroscientist, Member of the Chinese Academy of Science, People's Republic of China *online*
- **Prof. Mansurah Abdulazeez**, Biochemist, Bayero University, Federal Republic of Nigeria
- **Prof. Luca Marchetti,** Computational Biologist, University of Trento, Republic of Italy
- **Dr Pierre Léna,** Honorary President of the Office for Climate Education, French Republic
- **Dr Luc Aguilar,** Director of Research and Development, L'Oréal

Statement at the Opening ceremony!

Basic sciences are curiosity and inquiry driven They are the foundations of education and the sources of discoveries which turn into applications: they can then serve an inclusive sustainable development (improving global equity and well-being together with a healthy and lively planet). All together (education, discoveries, applications, and inclusive sustainable development) can boost collaborative and open Basic Sciences. This is the virtuous circle that we want to promote during the International Year of Basics Sciences for Sustainable Development and after. To achieve this goal, we shall need you, teachers, scientists, the private sector, decision-makers and society at large to share this vision and act accordingly.

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Global challenges

- Global challenges approaches (from components to system, from local to global, from short term to long-term, involving open science and the society at large) are a unique opportunity to cooperate and build a better world.
- Following further the current international mobilization, laws and treaties should be enacted towards these goals, based on a dialog between all stakeholders, including scientists.

Science, Ethics and Human Development (Quy-Nhon, Vietnam conference)

- Scientific knowledge, technology and innovation shape our lifes, our imagination, our hopes, our fears. But beyond, it is a common universal heritage.
- Business as usual is no more an option. Every scientist through his/her institution, especially when supported by public funds, and even if his research is curiosity and inquiry driven, must try to best connect to the society and should have in mind how his or her activity and findings could impact the world (responsibility), and might be of interest for contributing to make it better and not worse.
- However, scientists must be given the necessary funding and freedom and the right to collaborate with the other scientists in their field to conduct their research (science for peace) and be listened to at all levels of decision making and inspire that way the decision makers and the society at large.
- It is a balancing act to ensure societies trust their scientists and the knowledge they provide

Plead for Basic and Applied Sustainability Science (Serbia, Belgrade conference)

- **Sustainability Science education of young people, which is multidisciplinary and integrative should be implemented in addition to the standard STEM education.**
- Sustainability Science must be multi-disciplinary, integrative, collaborative, co-constructed and open (publishing, data, software, hardware)
- It goes from very basic (understanding the planet habitability, gaiaology) to the 17 **interconnected** SDGs and beyond (interplay between curiosity driven science and applied sciences)
- Reduce poverty. Improve well being beyond just consuming, target global equity and a lively and healthy planet.
- Circular economy fuelled by decarbonated energy could be the application target of Sustainability Science, with a lot of innovations and new practices needed
- It could benefit for their organisation from models of organisation in Big Basic Sciences and from the IPCC and IPBES model of interaction between scientists and decision makers
- A decade of actions might be necessary to implement that!

Possibility: An International Treaty Organisation for Sustainability Science

- Sustainability is a global challenge. A world global response is needed.
- One possibility is the creation of a Treaty Intergovernmental Organization, for sustainability science, inspired from Big Basic Sciences models of organization (for example the visionary CERN model after the second world war), inclusive, collaborative, open, with the mission to conduct, to coordinate, to capitalize all initiatives in that domain (in connection with all researchers of the domain, but also with the private sector and with the society at large in the spirit of co-construction), to promote research, innovation, education and training in that domain, to establish roadmap for sustainability science and for sustainability in general in close connection with the governments following a reinforced model of IPCC and IPBES.
- The key big mutualized infrastructure of this organization could be a co-constructed virtual Twin Model of the Earth.

Possible resulting actions

- Implementation of open access publishing for all basic sciences papers, open data and open software. **Open science** is more important than ever to go faster, to maintain a global approach to science. Basic Sciences can be the advanced front in **Open Scienc**e.
- Promote **equity, diversity and inclusion** into collaboration in basic sciences
- Promote training and education to basic and sustainability sciences in developed and developing countries
- Connect scientists to the actors of Sustainable Development
- **Decade of sciences for sustainable development** using lessons from the models of mobilization of scientists in basic sciences (CERN, IPCC, IPBES…).

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Thank You

We count on you for all that and YES WE CAN!!!