



IUPAP WG14 on Accelerator Science

Christine Darve

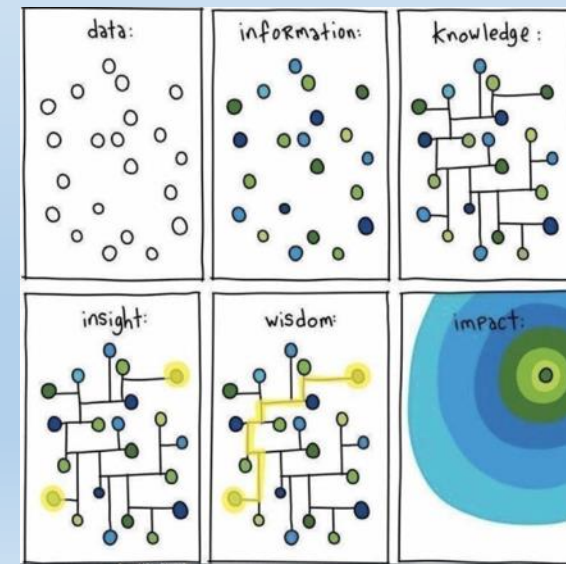
of behalf of the International Union of Pure and Applied Physics (IUPAP)
WG14 on Accelerator Science

&

European Spallation Source, ERIC (ESS)

May 19, 2026

IPAC2026 - CC meeting @ Deauville, FR



International Union of Pure and Applied Physics

<https://iupap.org/>

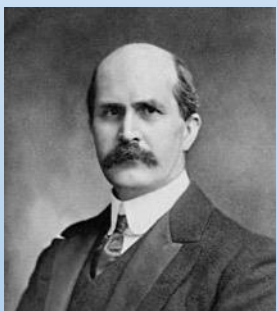
IUPAP is the **only global international Scientific Union** dedicated to **all areas of physics**. Created in **1922** with **13 country members**, it now has about **60 territorial members**.

There are no individual members. Since 2021, there are also Corporate Associate Members, since 2023 a new membership category for territories with very small physics communities and since 2026 new standing committees.



IUPAP is a network of networks, a network of communities

It is organized and run by physicists from all fields and continents



W.H. Bragg (1862-1942)



Mission: To assist in the worldwide development of physics, to foster international cooperation in physics, and to help in the application of physics toward solving problems of concern to humanity

A driver for Peace !

- Sir William Henry Bragg: 1st president of [International Union of Pure and Applied Physics](#) (IUPAP)

- Sir William Lawrence Bragg: 1st president of [International Union of Crystallography](#) (IUCR)

[Introduction Globalizing Physics: One Hundred Years of the International Union of Pure and Applied Physics. An Introductory Essay Roberto Lalli, Jaume Navarro]

Former IUPAP structure & Rejuvenization in progress !

Affiliated Commissions (independent)

- AC1: Intl Commission for Optics
- AC2: Intl Commission on General Relativity and Gravitation
- AC3: Intl Commission for Acoustics
- AC4: Intl Commission on Med Physics
- AC5: Affiliated Commission of Physics Students (IAPS)
- AC6: Affiliated Commission on the History and Philosophy of Physics

Working Group (& new standing committees)

Temporary structures to address specific issues not covered by commissions

- WG1: Intl Committee for Future Accelerators
- WG5: Women in Physics (established in 1999!)
- WG7: Intl Comm on Ultrahigh Intensity Lasers (ICUIL)
- WG9: Intl Cooperation in Nuclear Physics
- WG11: Gravitational Wave Intl Committee
- WG13: Newtonian Constant of Gravitation
- **WG14: Accelerator Science** ←
- WG15: Soft Matter
- WG16: Physics and Industry ←
- WG17: IUPAP's Centenary
- WG18: Ethics
- WG19: Quantum Science and Technology
- WG20: Open Science (not yet set up)
- WG21: Physics for Climate Change Action and Sustainability

Former Chairs :

2015-2021 Lia Meringa

2021-2024: Gianluigi Arduini (CERN)

*Standing Committee on Physics
Outside Academia*

Commissions (mainly organized by subfields)

- C1: Policy & Finance
- C2: Symbols, Units, Nomenclature, Atomic Masses and Fundamental Constants
- C3: Statistical Physics
- C4: Astroparticle Physics
- C5: Low Temperature Physics
- C6: Biological Physics
- C8: Semiconductors
- C9: Magnetism
- C10: Structure and Dyn of Cond Matter
- **C11: Particles and Fields**
- C12: Nuclear Physics
- C13: Physics for Development
- C14: Physics Education
- C15: Atomic, Molecular, and Optical Phys
- C16: Plasma Physics
- C17: Laser Physics and Photonics
- C18: Mathematical Physics
- C19: Astrophysics
- C20: Computational Physics

IUPAP — Building a Global Physics Community



IUPAP connects physics communities worldwide and promotes international scientific collaboration as a driver for peace, innovation, education, and sustainable development.

Through its global network, IUPAP: **IPAC Spondor** →

- Connects scientific communities and fosters collaboration
- Promotes openness, integrity, and good scientific practices
- Supports diversity, inclusion, and equal opportunities in physics
- Strengthens links between academia, industry, and society
- Supports students and early-career scientists worldwide
- Advances open science, international exchange, and UN SDGs

IUPAP
International Union of Pure and Applied Physics
To stimulate and facilitate international cooperation in physics and the worldwide development of science.

IUPAP Conference Type of Support

- IUPAP Conferences are supported either by Financial sponsorship, or through Endorsement

<https://www.ipac26.org/iupap/>

IUPAP
IPAC'26 is an IUPAP conference

The International Union of Pure and Applied Physics (IUPAP) is an international physics organization that is organized and run by the physics community itself. Its members are identified physics communities in countries or regions around the world.

The IUPAP was established in 1922 in Brussels with 13 Member countries and the first General Assembly was held in 1923 in Paris. It currently has 60 country members.

See here for [IUPAP conference notice](#).

The support of the conference by IUPAP is subject to agreement of the following Policies:

- Free Circulation of Scientific Information:** The principle of the International Union of Pure and Applied Physics (IUPAP) is to promote the free circulation of scientific information, as well as equitable access to data, information and research materials. In pursuing its objectives with respect to the rights and responsibilities of scientists, the International Union of Pure and Applied Physics (IUPAP) actively solicits the provision, and, in so doing, requires any discrimination on the basis of such factors as ethnic origin, religion, ideology, language, political system, gender, or age. IUPAP should only sponsor conferences and events at institutions and in countries that uphold this principle. If scientists are excluded from attending IUPAP-sponsored international conferences by a host institution or country on the basis of any of these factors, IUPAP should register its concern at the highest level of that institution or country and should not sponsor any future events in that country until such exclusion has been discontinued.
- Measurement at Conferences:** It is the policy of the International Union of Pure and Applied Physics (IUPAP) that all participants at an IUPAP-sponsored Conference will enjoy a comfortable experience, and that they will treat each other with respect at all times. The conference organizers will support the activities of the conference who will consult with those who have suffered from harassment and who will suggest ways of addressing their problems, and an advisor who will counsel those accused of harassment.

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IUPAP also actively supports women and underrepresented groups, inclusive standards, participation from developing countries, and equal access to scientific leadership and activities.

Together, we strengthen physics for science, society, sustainability, and international cooperation !

WG14 - Accelerator Science

Particle Accelerators for Science and Society



Currently: 22 international experts from 18 countries committed to promoting these objectives on a global scale, utilizing local expertise and networks!

Current members list:

Current Chair & co-Chair:
Christine Darve : ESS, SE;
Frank Tecker: CERN, CH

Maher Attal: SESAME, JO
Robert Bingham: STFC, UK
Ceri Brenner: ANSTO, AU
Swapan Chattopadhyay*: US
Simon Connell: UJ, SA
Fulvia Pilat: SNS, US
Oliver Kester: TRIUMF, CA
In Soo Ko: KBSI, KR
Tadashi Koseki: KEK, JP
Lin Liu: BSLL, BR
Michael Moyers: SPHIC, CN
Anke-Susanne Müller: KIT, DE
Simon Mark Mullins: BIUST, BW
Vaishali Naik: VECC, IN

Complementary to WG1 (ICFA) → Standing Committee

Qing Qin: ESRF, FR
Christoph Quitmann: RI, DE
Danas Ridikas: IAEA, AT
Leonid Rivkin*: PSI/EPFL, CH
Suzie Sheehy: Uni. Of M, AU
Liangting Sun: IMP/ CAS, CN
Bridinette Thiodjio Sendja: Uni. of Y, CM

Associate Members (ex-officio) (updated yearly)

Tsuneyuki Ozaki: INRS, CA – Inter. Committee on Ultra-High Intensity Lasers, WG7 Chair
Yuan He: IMPCAS, CN – ICFA Beam Dynamics Panel, Chair
Pierluigi Campana: IT - ICFA Chair
Ursel Fantz: MPI, DE – IUPAP Commission 16 on Plasma Physics, Chair
Peter McIntosh: STFC, UK – IPAC26 Coordination Committee, Chair
Thomas Roser: BNL, US – ICFA Panel on Sustainable Acc. and Colliders, Chair
Marcelo G. Munhoz: Uni. Od SP, BR – C11 Commission on Particles and Fields, Chair

WG14 - Accelerator Science

Particle Accelerators for Science and Society

Meeting online at least three times per year and in hybrid format at IPAC

Proposed Mission and Scope:

- **Knowledge exchange:** *Strengthen the global accelerator community by uniting scientists and lab leaders through collaborative platforms, fostering knowledge exchange and accelerating innovation worldwide.*
- **Promote applications:** *Support accelerator uses in industrial, medical, energy, and environmental sectors.*
- **Sustainability alignment:** *Map and review accelerator applications supporting SDGs, including life sciences, healthcare, research, and technology.*
- **Accelerate progress:** *Facilitate information sharing and the exchange of ideas among laboratories worldwide.*



WG14 - Accelerator Science

Particle Accelerators for Science and Society



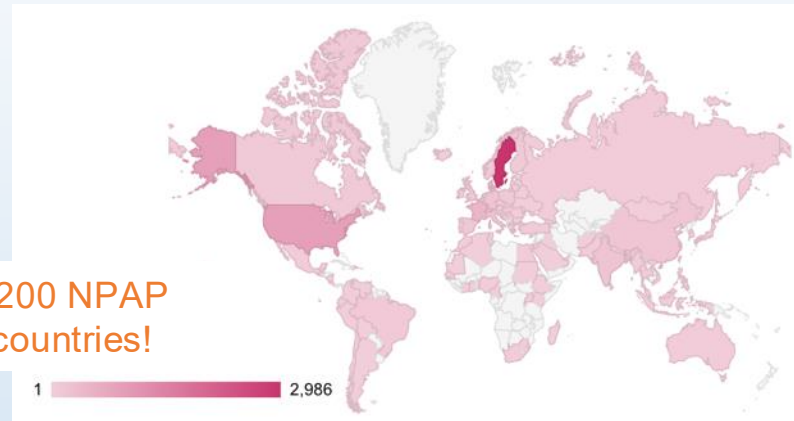
• **Talent development:** Verify feasibility to train early-career scientists through lab-university collaborations, **schools**, **MOOCs**, providing access to leading experts, equipment, and techniques.

• **Resources & communication:** Develop networks (e.g., Ambassadors), webpages, and conference presence to share scientific advancements and societal impacts.

A few Accelerator schools:

- CAS, JUAS @ ESI, Science in School @ EIROforum
- MOOCs: Nordic Particle Accelerator Project (NPAP)
- Accelerator Engagement Ambassadors Initiative

NPAP reached > 22,200 NPAP learners across 104 countries!



Led by Suzie Sheehy and her team



The newly appointed accelerator ambassadors, the first cohort of a new initiative by the International Union of Pure and Applied Physics

Please follow, like and rePost :

[LinkedIn Page – IUPAP Accelerator Science Communication](#)

CERN Accelerating News:

[“Meet the 2026 ambassadors bringing particle accelerators to the public”](#), March 2026

[“Accelerators key to making our lives better”, says chair of physics union working group”](#) Dec. 2025”

➤ IUPAP-WG14 Hackathonino

Timeline

More than 65 participants from 19 countries, and 9 challenges

Proof of concept established during IPAC2026 to strengthen synergies among participants, research mentors, and companies, ensuring meaningful learning and engagement.

Activities are designed to build:

- **Technical problem-solving skills**
- **Teamwork & collaboration**
- **Communication & presentation skills**
- **Insight into accelerator design and professional design tools**

Jury Criteria :

- Innovative/creative solution
- Clarity of the proposal/presentation
- Networking with Companies and individuals

- **Sunday, May 17 (11:00–12:00):** Project introduction & team building
- **Monday–Wednesday:** Meeting @ poster session & Industry area
- **Wednesday, May 20:** Students presentations & Jury evaluation
- **Thursday, May 21:** Award, Follow-up discussions, sponsors and next steps



ARTIFACT team ! [“AISSAI Hackathon on AI for Particle Accelerators”](#) Oct. 11-16, 2026 ; [MORE DETAILS HERE](#)

[2nd international Accelerator Conference for Research and Innovation](#), 22-26 June, 2026 Vienna IAEA

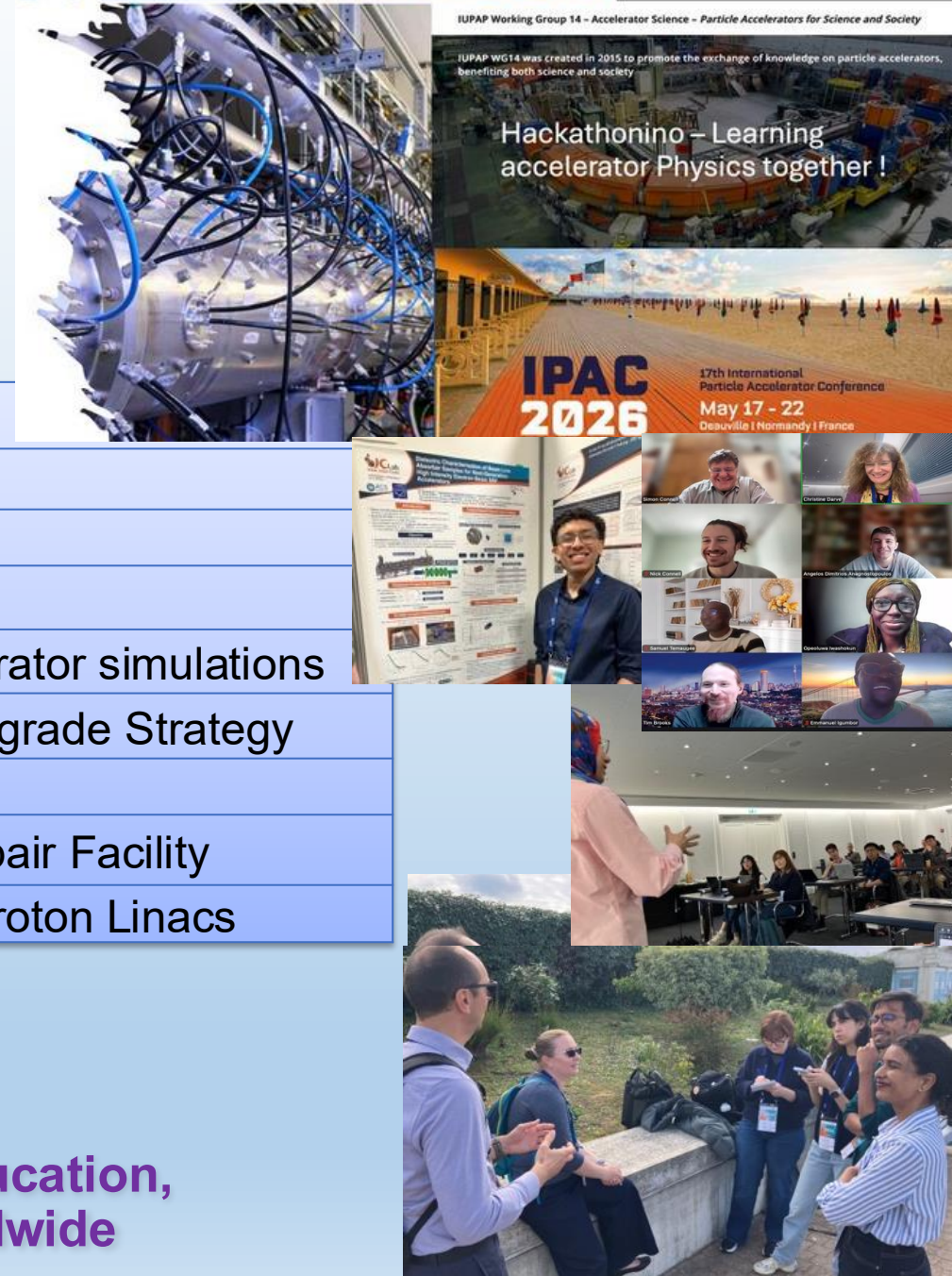
List of Challenges:

Broad topics include fault detection, beam optics, CANS, medical accelerators, infrastructure design, learning scenarios, and quantum computing

A	SE_ESS	Accelerator Beam Performance and First-fault Analysis
B	US_SNS	RF window failure detection
C	SA_UJ	Introduction to LLM for Topic Modelling
D	SA_UJ	Radiation Therapy Treatment Plan for cancer
E	MAXIV	Develop an educational idea to introduce students to accelerator simulations
F	DE_FZJ	Decision-Making for a Compact Neutron Source (CANS) Upgrade Strategy
G	US_MIT	Quantum Computing for Particle detection simulation
H	SE_ESS	Integrated Design Study for ESS Acc. Maintenance and Repair Facility
I	SE_ESS	AI-Driven Beam Dynamics Optimisation for High-Intensity Proton Linacs

- [Call for Corporate Engagement](#)
- [Expression of Interest to support IUPAP- WG14](#)

Together, we strengthen international collaboration, education, sustainability, and accelerator-enabled innovation worldwide



See also : “PHYSICS MATTERS” Colloquium series @ Forum on International Physics (FIP) at APS



Nov 2022: “PHYSICS MATTERS to celebrate the 100 years of existence of the IUPAP”

May 2023: "Entering the new century of IUPAP with a renovated vision"

Speaker: Prof. Silvina Ponce Dawson, Physics Department, FCEN-UBA and IFIE Designate, IUPAP



November 2023: "Accelerating Science and Society"



Dec 2022: “ALBA and the science for sustainability”



August 2023: "Accelerator driven systems – a solution to multiple problems of society"



Accelerating Sciences is a Matter of Facts !

SESAME Light Source (members and observers) and Developing Communities

➤ Matters for Users: Scientific Cases using Photon and Neutron Sources

➤ Particle Accelerator and large Research Infrastructure

➤ Outreach & Education

➤ Organizations & Collaborations

➤ Forums and Topical colloquia:

- ❖ Environment & Sustainable developments
- ❖ Health & Life Science

Feb. 2023: “The I.FAST CBI”

April 2024: "Forum to accelerate a global digital world"

April 2025: “Accelerating Innovation: Industry & Research Creating Value Together”



Playlist !





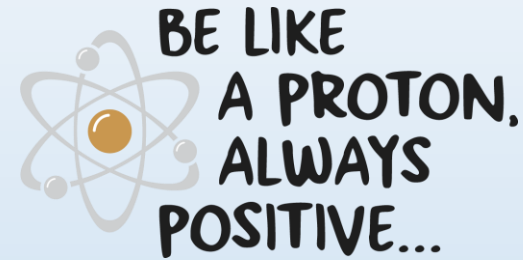
Conclusion



WG14 connects the global accelerator community to accelerate collaboration, innovation, and impact.

What we do

- Share knowledge and strengthen global networks
- Enable accelerator applications for society (health, industry, energy, environment)
- Support sustainability and UN SDGs
- Foster talent and early-career development
- Increase visibility and global outreach



A driver for Peace !

Accelerator Science Transcending Boundaries at every levels !

WG14 is a catalyst for a more connected, inclusive, and impactful accelerator ecosystem worldwide.

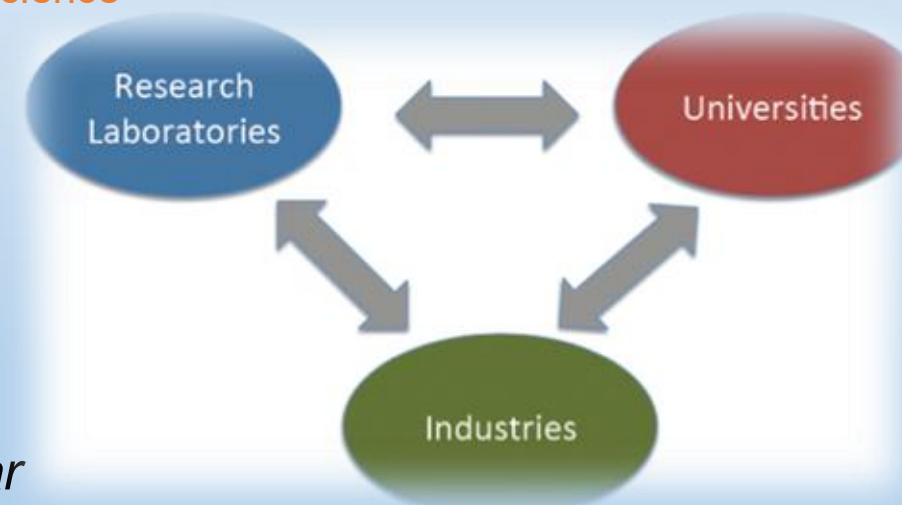
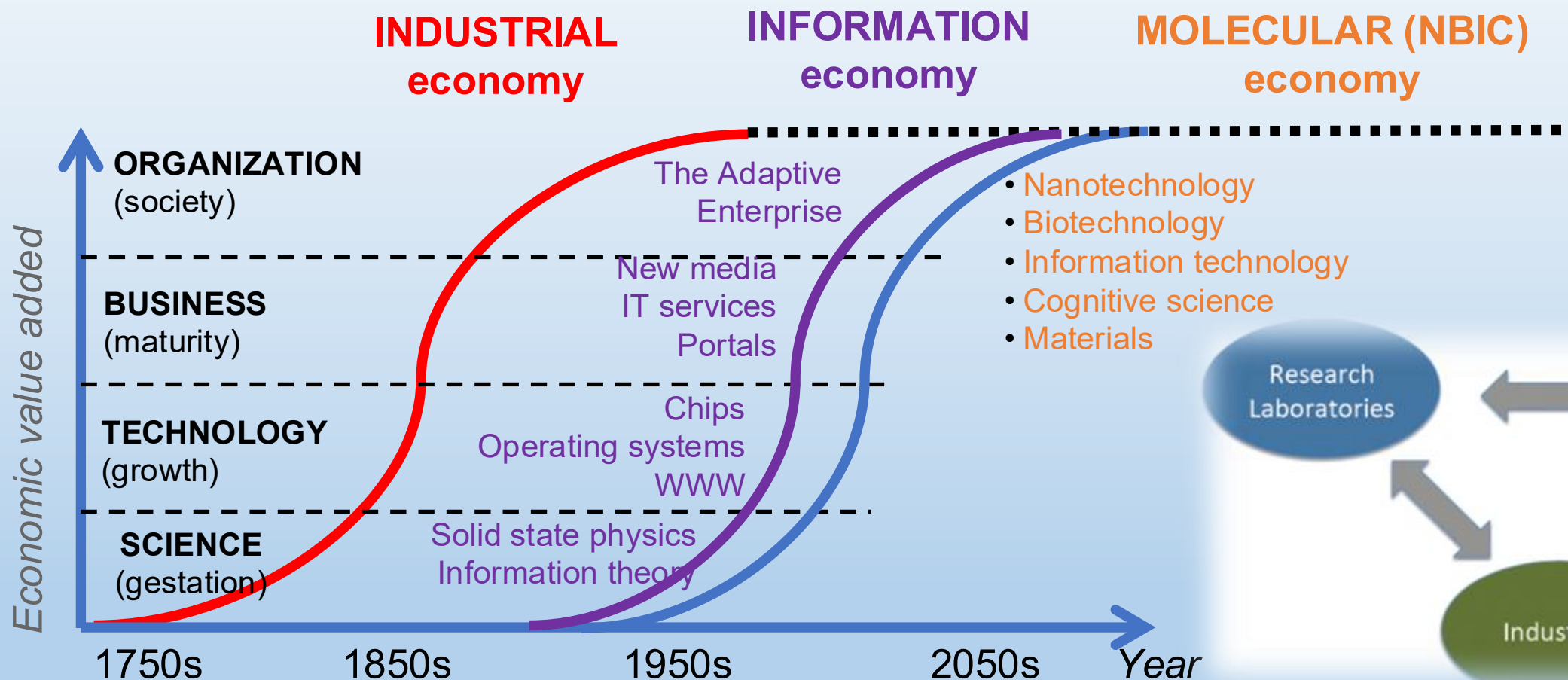
<https://cdarve.web.cern.ch/>



Context of Paradigm Evolution

Triangle of knowledge – The Ecosystem

Materials & life science facilities are keys to new economy



See also : IUPAP & UNESCO initiatives

International Colloquia on Physics For Society

IUPAP and UNESCO launched this initiative within the International Year of Quantum Science and Technology (IYQ 2025), under the broader framework of the International Decade of Sciences for Sustainable Development (IDSSD 2024–2033)

- "Celebrate World Quantum Day with Prof. Anne L'Huillier - April 14!"
- "Illuminating Innovation: Synchrotron Science, Quantum Frontiers, and Africa's Scientific Future"
- "Quantum mechanics with patterns of light" by Andrew Forbes
- "Explore the intersection of **industry** and the quantum world"
- "With Nobel laureates in physics: "Quantum views" by Alain Aspect and William D. Phillips"

STAY TUNED !

