



WIN 2025

9-13 June 2025  
University of Sussex, Brighton, UK



# Shaping Scientific Futures: The Journey of the African School of Physics

**Christine Darve**

European Spallation Source, ERIC  
(incl. Afterwork: ASP, APS/FIP, IUPAP, CERN)  
on behalf of the ASP-IOC

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

**Friday June 13, 2025**

**WIN 2025**

University of Sussex

<https://iop.eventsair.com/win-2025>



# African School of Fundamental Physics and Applications (ASP)

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A proof of concept to build a strategic partnership and collect financial support from Global organizations universities, institutions, and more donations



The aim of the school is to build capacity in African countries, to harvest, interpret, and exploit the results from physics experiments with particle accelerators, and to increase proficiency in related applications and technologies

A non-profit organization created by a small group of worldwide scientists to stimulate and include more African talented physics students in the world scientific community



Contribute to a world w/ equal access to knowledge



Support financially up to 85 African students for 2-3 week classes attendance



Establish a biennial educative program to be hosted across Africa

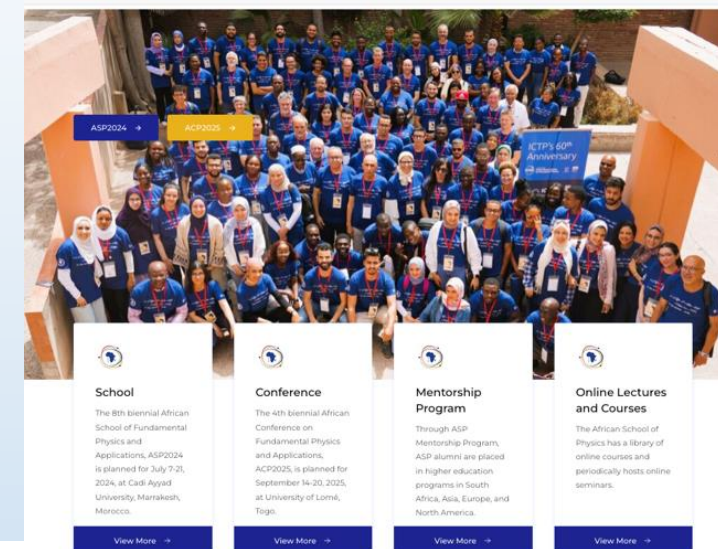


Provide high quality classes by international re-known Scientists



# from ASP2010 until now

- Conceptual thinking by Steve Muanza and John Ellis in 2001 and IN2P3 to trigger.
- International Center for Theoretical Physics (ICTP), Bobby Acharya, as incubator and greatly encouraged by CERN and Fermilab.
- Preparation teams led by Christine Darve ASP2010 and since then by Ketevi Assamagan & Mounia Laassiri



Pr Bobby Acharya  
Physicien à l'ICTP  
et King's College  
London



Dr Christine Darve  
Ingénieur Scientifique  
au Neutron  
Spallation Source à  
Lund Suède



Pr Fernando Ferroni  
Physicien à GSSI-INFN,  
Italie

Dr Kétévi A. Assamagan  
Physicien à Brookhaven  
National Laboratory à  
New York



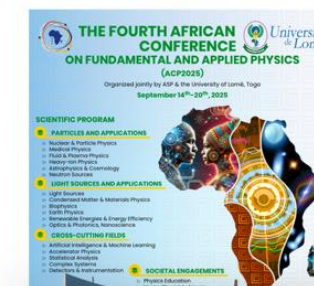
Dr Mounia Laassiri  
Physicienne à  
Brookhaven  
National Laboratory à  
New York



## Government Engagement

The ASP Forum consists of presentations, talks, discussions and debate in one day during ASP. Local and international policy makers in matters of education and research, lecturers, ASP conference participants, students, teachers, industries, research and education institutes, and the media participate in this event. The objective is to discuss and adopt the role of the ASP program to better align with the research and education priorities of African countries. The ASP Forum program includes talks and discussions around the following, with relevant changes for different host countries:

[More →](#)



The 4th African Conference of Fundamental and Applied Physics, ACP2025  
September 14-20, 2025  
University of Lomé,  
Lomé, Togo



# ASP Organization

## Local Organizing Committee (LOC) in the host country

- Local logistics
- Liaise with Education and Research branches of host country government

## Assessment of Impact

- Survey of students
- Survey of their Professors
- Follow academic developments

## International Lecturers (IL)

- Design the scientific Program
- Help with the student selections
- Mentor and Coach students continuously

## International Advisory Committee (IAC)

- Representatives of funding agencies
- Advise on the program
- Advise of the host country selection

## Board of Trustees

- Legal Responsibilities
- Fund raising
- Assess Management's

## Spin-Offs

- ASP Mentorship/ Coaching Program Networking and sharing of information
- Align ASP with educational priorities Improve future editions of ASP
- Promote research collaborations Promote research consortia



### IAC – International Advisory Committee

- Contains representatives of sponsors
- Helps with funding, host country selection, site visits, scientific program,



Dr Latifa Elouadheri  
Physicienne à Jefferson Lab  
Newport News Virginie USA



Dr Horst Severini  
Physicien à l'Université  
d'Oklahoma, USA



Dr Herman B. White Jr.  
Physicien à Fermilab, USA



# ASP - Topics of Interest

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## Particles and related applications

- Nuclear physics,
- Particle physics,
- Medical physics,
- (Particle)astrophysics & cosmology,
- Fluid & plasma physics,
- Complex systems

## Light sources and their applications

- Light sources
- Condensed matter & materials physics
- Atomic & molecular physics
- Optics & photonics
- Earth science

## Cross-cutting fields

- Accelerator physics
- Computing
- Instrumentation & detectors
- Quantum computing & quantum information
- Machine learning & artificial intelligence

## Societal engagement

- Physics education
- Community engagement
- Women in physics
- Early career physicists

*The ASP program is adapted to the interests of the host country, and to the academic majors and levels of the participants!*  
*e.g. South Africa: Light Sources (and Neutron Sources)*



# ASP and Neutrino !



## Course by Mary Bishai (BNL)

Brookhaven National Laboratory

The Little Neutral One: Neutrinos in the 21<sup>st</sup> Century

Mary Bishai  
Brookhaven National Laboratory

The Little Neutral One: Neutrinos in the 21<sup>st</sup> Century

African School of Fundamental Physics and Applications (ASP2022), Gqeberha, South Africa, Dec 2022

Mary Bishai  
Brookhaven National Laboratory

Dec 9<sup>th</sup>, 2022

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Brookhaven National Laboratory

### The Neutrino Experimental Landscape

Examples of Neutrino Experiments ( current, future)

<p><b>Big Bang</b></p> <p><b>PTOLEMY</b></p>	<p><b>Reactors</b></p> <p><b>Daya Bay JUNO</b></p>	<p><b>Sun</b></p> <p><b>BOREXINO SNO+ / JUNO</b></p>	<p><b>SuperNova</b></p> <p><b>SuperK-GD DUNE / HK / JUNO</b></p>
<p><b>Atmosphere</b></p> <p><b>SuperK / IC-DeepCore HyperK / KM3NeT / ORCA</b></p>	<p><b>Accelerators</b></p> <p><b>T2K / NoVA T2HK / DUNE / ESS / SB</b></p>	<p><b>Extragalactic</b></p> <p><b>IceCUBE IceCUBE-Gen2</b></p>	

Experimental Landscape

- Current Experiments
  - Reactor ✓
  - T2K ✓
  - Telescopes ✓
- Hunt for CPV
  - NOVA ✓
  - LBNE / DUNE ✓
  - Apps ✓
- Conclusions



2024 Distinguished Scientist Fellow

Mary mentored several ASP alumni who have been accepted into Ph.D. programs in the U.S. and Europe

ASP has offered lectures on neutrino oscillations, detectors, and cosmological relevance. Neutrino physics education is expanding in Africa, aligning with global efforts to broaden participation in major neutrino and astroparticle experiments like DUNE, Hyper-Kamiokande, and KM3NeT



# ASP Program Expansion

WIN 2025



Brighton, UK

## Student Program

2-3-week intensive school

- 3<sup>rd</sup> year of University to Ph.D.
- Mostly African Students
- 70-80 Students:  
total > 614 in-person + 200 online

## High School Teachers Program

1-week intensive workshop

- Train High School Teachers for improved physics teaching
- Share learning scenario and tools with teachers

## ASP Conference

1-week International Conference

- Participation of ASP Alumni
- Part. Research Faculties
- Networking & collaborations

## Forum and Outreach

- Involve Regional policy makers
- Promote spin-off activities in Africa
- Introduce students to policy

## Learners Program

1-week learners Outreach

- 10-12<sup>th</sup> grade learners
- Encourage learners to develop and maintain interests in Physics and Applications

## Mentorship/ Coaching Program

- Connect Students w/ Researchers
- Place students at Labs
- Support students & help address their academic needs



# ASP Editions in figures



## Reports:

ASP	Host Country	Applicants	Students	African Countries	Mentorship	Teachers	Pupils	Conf.
<a href="#">ASP2010</a>	South Africa ZA	125	65	17	Continuously, even when there is no formal school			
<a href="#">ASP2012</a>	Ghana GH	138	50	15				
<a href="#">ASP2014</a>	Senegal SN	330	70	21				
<a href="#">ASP2016</a>	Rwanda RW	429	75	28	Program formalized in 2016. Runs continuously	20	150	
<a href="#">ASP2018</a>	Namibia NA	523	85	26		63	> 1200	+60
<a href="#">ASP2021</a>	Morocco MA Online	N/A	94					+649
<a href="#">ASP2022</a> (HYBRID)	South Africa ZA	>416	~82: In person ~97: Online	40		~80	~230	+601 60: In-person
<a href="#">ASP2024</a> (HYBRID)	Morocco MA	534	~93: In person ~102: Online	50		~80	>1000	ACP2025 TG
<a href="#">ACP2025</a> (HYBRID)								
ASP2026	Kenya KE	Coming up!						



# ASP Students

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Provide partial or full financial support to students and create a scientific melting pot of cultural diversity

- Diversity of academic levels
  - Mainly Master and PhD students
- Diversity of education background
  - From theoretical physics to engineering sciences
- Diversity of the countries of origin
  - Priority to Sub-Saharan African students
- Women participation (~32% - 50%)
  - Role of women in LDC.
- Local Universities
  - Involve students and professors





# ASP Forum

One day. Objective:  
*Align ASP with the research and education priorities of African countries*

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ASP 2010

Stellenbosch,  
South Africa



Dedicated to Knowledge and Transfer of Technology  
Dr. D. ADAMS, chief director: Emerging Research areas & Infrastructure, Human Capital and Knowledge Systems.

ASP 2018

Windhoek,  
Namibia



Education and capacity building in Namibia and Africa in general  
Dr. T. TJIVIKUA, Vice-Chancellor, Namibia University of Science and Technology (Namibia),  
Dr. R. ADAM (SKA, SA)

ASP 2012

Kumasi, Ghana



[LINK](#)

AfLS and compact acc.  
Prof. H. WINICK, Prof. Emeritus, SLAC  
and Prof. L. SERAFINI (INFN, IT)

ASP 2014

Sakar, Senegal



UN support  
Dr. H. TOURE, UN ITU Secretary General.  
Prof. A. WAGUE and O. KA M. NGOM - US Embassy rep.

ASP 2016

Kigali, Rwanda



East Afr. Science and New ICTP Center  
Rwandan Ministry of Education

ASP 2022

NMU, SA



Sustainability of ASP and capacity development & retention in Africa, with the participation of policymaker representatives from Morocco, Senegal, Ivory Coast, Burkina Faso, Benin and South Africa (DSI, NRF, SAIP, SANSA, NMU), and international delegates from Africa, Europe and the U.S.

ASP 2024

Marrakesh, Morocco



Strategic engagement with African policymakers in science education and research

2 panel discussions

- "The road to critical skill development for Africa's growth"
  - With pan-African and international panelists
- Physics outreach efforts by ASP alumni
  - Demonstrate the impact of ASP Consolidate outreach efforts and support .



# ASP High School Teachers

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## Objective

*Support teachers' growth in the planning and delivery of physics instructions*



## 1-week intensive workshop:

- ASP2024: 80 teachers
- ASP2022: ~80 teachers
- ASP2018: 63 teachers





# ASP High School Learners

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## Objective

*Motivate high school pupils to develop and maintain interest in Physics.*



## 1-week learners Outreach:

- **ASP2024:** 5 high schools (as venues), 1038 pupils
- **ASP2022:** 10 high schools, 230 pupils
- **ASP2018:** 39 high schools, 1500 pupils

Program designed such that the lecturers that are not lecturing to students can help with the learners' program

## ASP2024

The period of April 15-19, 2024, was chosen to maximize learner attendance while they are still in school.



# Ex. "Introduction to accelerator science:"

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1) Les Particules



2) L'énergie



3) Un control



4) Collision



5) Detection



(Part 1 and Part 2) Sanae SAMSAM -INFN  
Christine DARVE- ESS April 15-19 2024

"ASP2024 Learners program - Summary Report", - [arXiv:2408.01464](https://arxiv.org/abs/2408.01464)

## MOOC: Pedagogical tools



Scientist Stories



Race to Space



Learning Scenarios



by Suzie Sheehy



# Massive Open Online Courses



## [Accelerate your Teaching]

## [Nordic Particle Accelerator Project]

Approaching particle accelerators and new scientific research through online professional development for high school teachers

From 2015, 3 Summer Schools to develop capacity in Northern Europe with emphasize MAX IV and ESS → Tools to reach out across frontiers

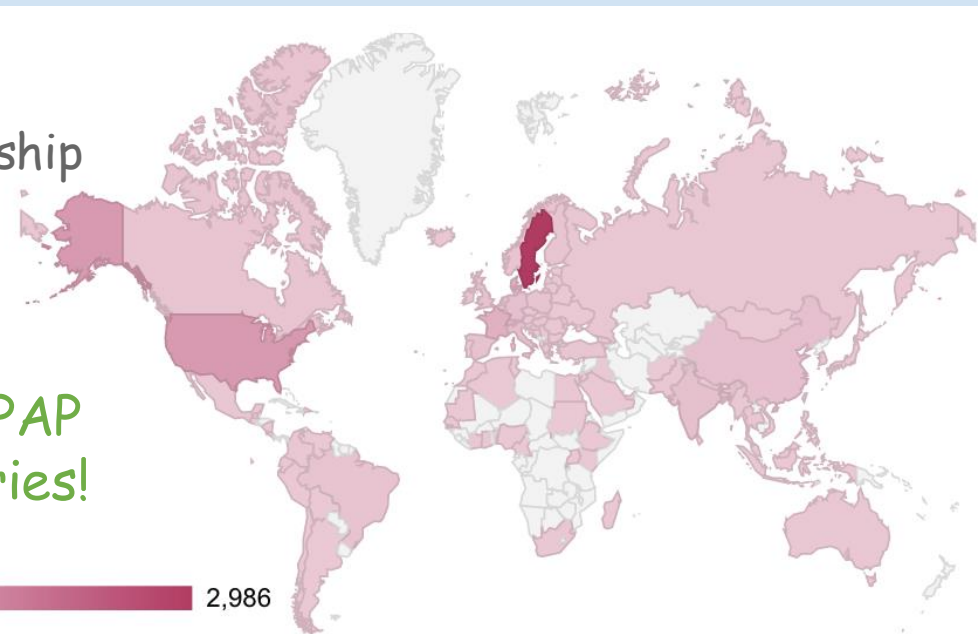
Can Serve as Training and Education Towards an African Synchrotron ?  
→ [AfLS: African Light Source](#) and its Conceptual Design Report ([CDR](#))

16 October 2023  
Accelerate Your Teaching  
Research facilities to support STEM education

SCAN ME  
Online Course

Erasmus+ / Strategic Partnership  
European Commission grant

NPAP reached ~ 21,000 NPAP learners across 104 countries!





# Online Lectures since the Pandemic

The following series have been captured in [Indico](#)

Series 1 (May7-Nov19, 2020): ASP lecturers, see [the topical version by LINXS](#)

Series 2 (Nov24-Jan02, 2021): [Photons and Neutrons](#), see [LINXS version](#)

Series 3 (since Feb 16, 2021): ASP Alumni

More organizational lectures:

- International Association for Physics Student (**IAPS**)
- ASP **Mentorship Program**

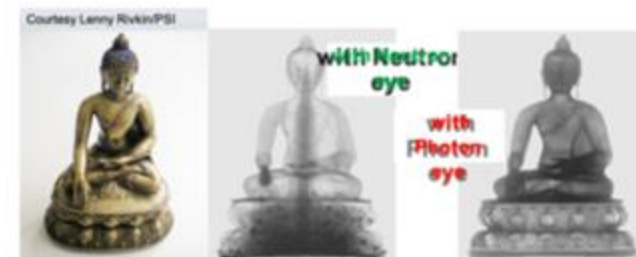
NB: Most videos are available on the given Indico and gathered [in a Video PlayList](#).

## *Photons and Neutrons* in the quest to solve societal challenges

*Research Infrastructures like Light Sources and Neutrons Sources are perfect tools for discoveries, e.g. COVID-19 structure, battery materials.*

*In this second ASP lecture serie, we focus on the description of such infrastructures and the power of photons and neutrons.*

- *Part A: From November 24 to December 15, 2020*
- *Part B: From January 12 to February 2, 2021*



Images of Buddha using a Neutron Source and a Light Source



# ASP2024 Statistics

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UNDER THE HIGH PATRONAGE OF HIS MAJESTY KING MOHAMMED VI

**THE EIGHTH BIENNIAL AFRICAN SCHOOL OF FUNDAMENTAL PHYSICS AND APPLICATIONS (ASP2024)**

Co-organized by Cadi Ayyad University and Mohammed V University at Faculty of Sciences Semlalia, Marrakech, Morocco

April 15<sup>th</sup>-19<sup>th</sup> and July 7<sup>th</sup>-21<sup>st</sup>, 2024

**ASP MISSION**  
To increase capacity development in fundamental physics and related applications in Africa. The ASP has evolved to be much more than a school. It is a program of actions with directed ethos toward physics as an engine for development in Africa.

**SCIENTIFIC PROGRAM**

- TOPICS
  - Nuclear & Particle Physics
  - Medical and Radiation Physics
  - Applied and Industrial Physics
  - Theoretical and Computational Physics
  - Nanoscience, Astrophysics & Cosmology
  - Physics for Sustainable Development
  - Condensed and Materials Physics/Biophysics
  - Capacity Development and Education Discussion
  - Physics Education, Outreach and Communication
- ACTIVITIES
  - Outreach for Secondary Schools April 17<sup>th</sup>-19<sup>th</sup>, and July 17<sup>th</sup>-19<sup>th</sup>, 2024
  - Physics lectures, tutorials and hands-on experimentation for students, July 20<sup>th</sup>-21<sup>st</sup>, 2024
  - Workshop for high school teachers, July 8-12, 2024
  - ASP Forum, July 13<sup>th</sup>, 2024

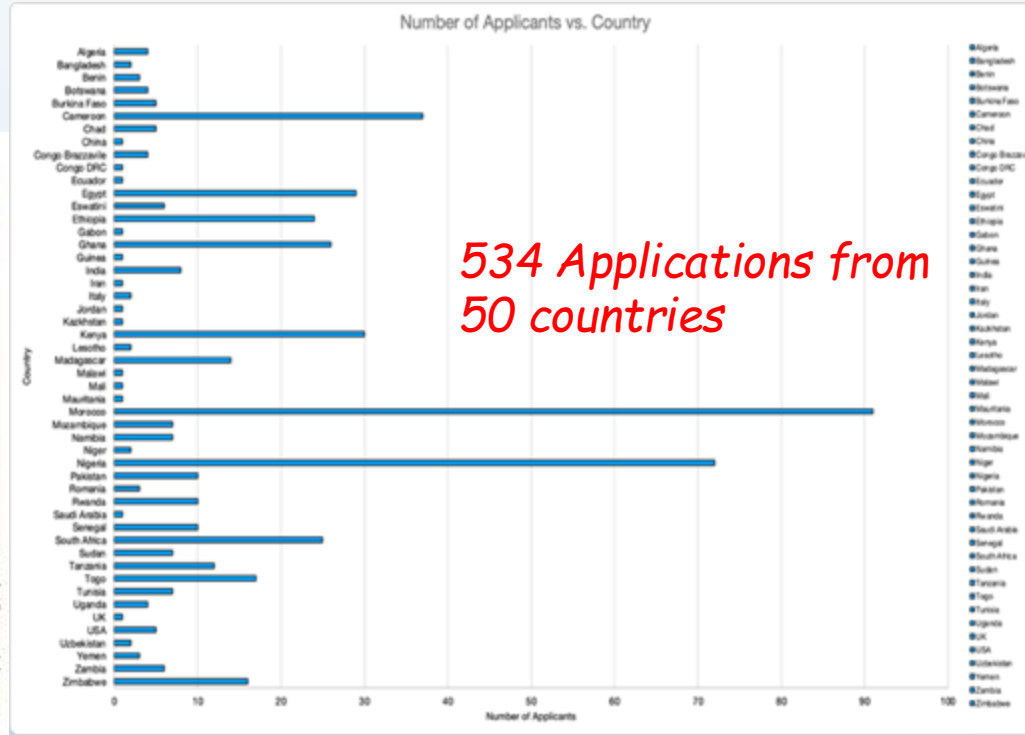
**INTERNATIONAL ORGANIZING COMMITTEE (IOC)**  
B. Acharya (ICTP and King's College London), K. Assamagan (INM), C. Darve (ISS), F. Ferioui (MNF), M. Lozano (INM)

**INTERNATIONAL ADVISORY COMMITTEE (IAC)**  
R. Bockemuehl (INM), M. Campanelli (IAC), G. Charlton (University of Birmingham), T. Eralp (Loughborough University), J. Ellis (King's College London), L. Ekdahl (LJMU), S. G. Ferreira (USC), H. Gao (INM), J. Gonzalez (IAC), J. Gray (ASP), B. Heisenmann (ICTP), H. Holtkamp (IAC), J. Huston (MNF), G. Iva (IAC), Y. K. Kim (Chungnam), D. Krieger (IAC), S. C. Lee (Academia Sinica), B. Mousa (SAPS), H. Morgan (LJMU), S. Muzina (CMS-ITP), R. Nisutani (Thomas LABS), M. Nomoto (INM), F. Quevedo (University of Cambridge), L. Rulon (INM & EPJ), L. Serechia (INM), H. Severini (Okinawa), F. Skanda (MNF), E. Tassoulas (IAC), L. Vaccaroni (CMS-NDP), Z. Vokac (KITware), H. B. White Jr. (Darmstadt), J. Wu (IAC)

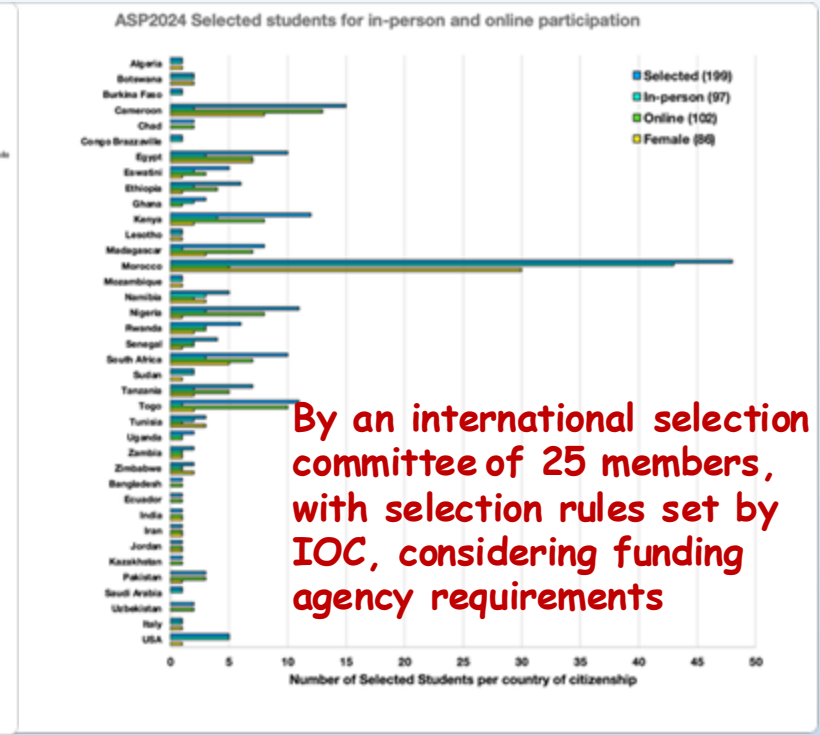
**LOCAL ORGANIZING COMMITTEE (LOC)**  
A. Abdouh (UCA), A. Arino (IAC), A. Belfou (IAC), D. Bencherrouk (IAC), Z. Bencherrouk (UCA), A. Bouni (UCA), H. Boussouf (IAC), M. Deoud (IAC), I. B. Djalil (IAC), M. Gougouli (IAC), Y. Hassoun (IAC), A. Heumada (IAC), A. Jatin (UCA), T. Khato (UCA), Y. Khoulali (IAC), A. Larbaoui (IAC), B. Mankou (IAC), M. Ouqer (IAC), K. Sedou (IAC)

**CHAIRS**  
Mohamed Chabab (UCA)  
Fatima Fassi (UMS)

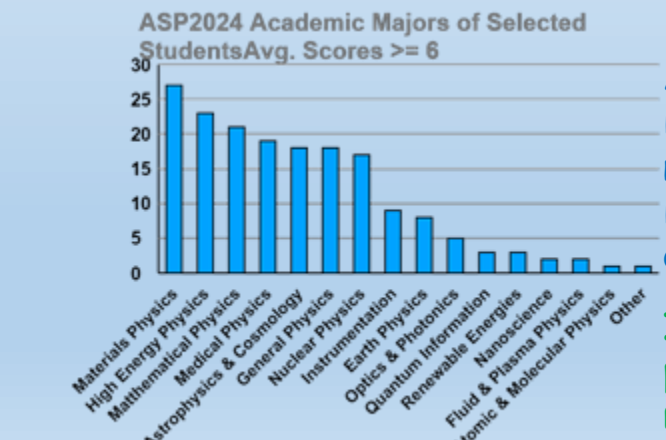
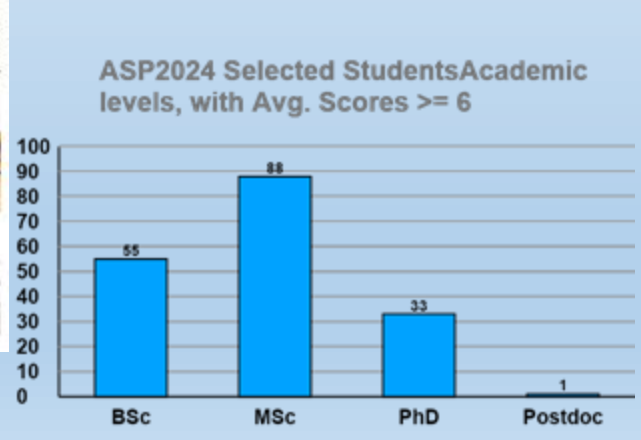
<http://www.african-school-of-physics.org/asp2024/>



534 Applications from 50 countries



By an international selection committee of 25 members, with selection rules set by IOC, considering funding agency requirements



A few students selected for in-person participation did not travel because of visa issues. They ended up online.

In the in-person participants, there were more female students than male students.



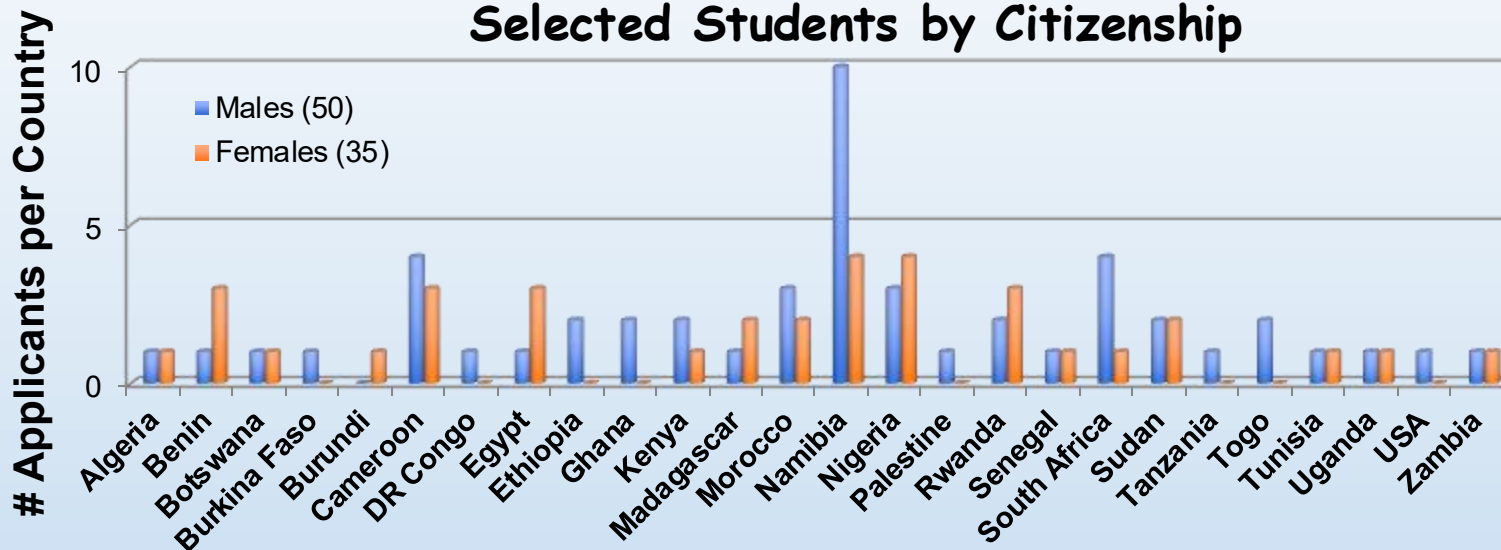
# ASP2018 Statistics

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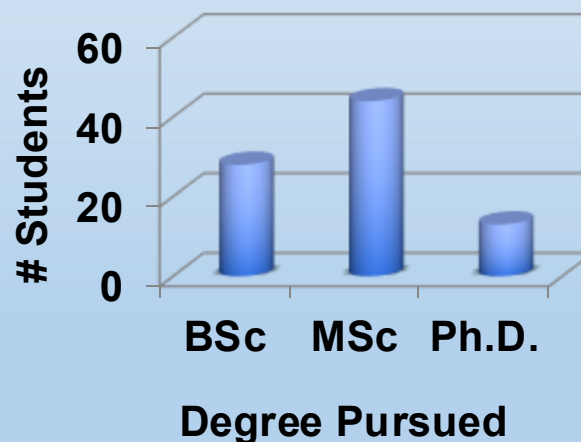
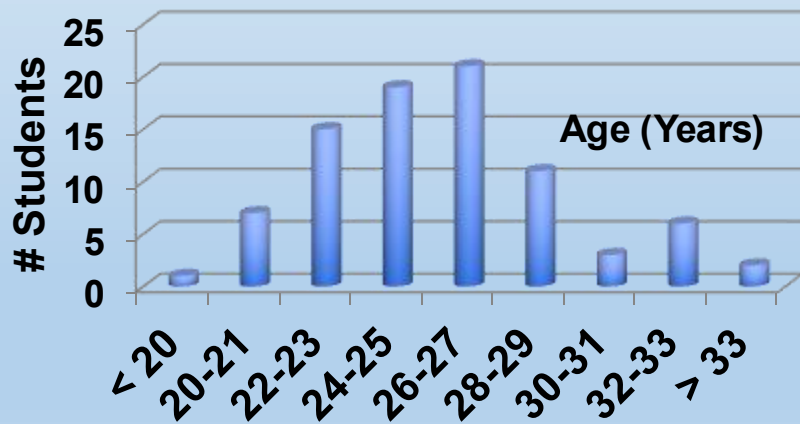
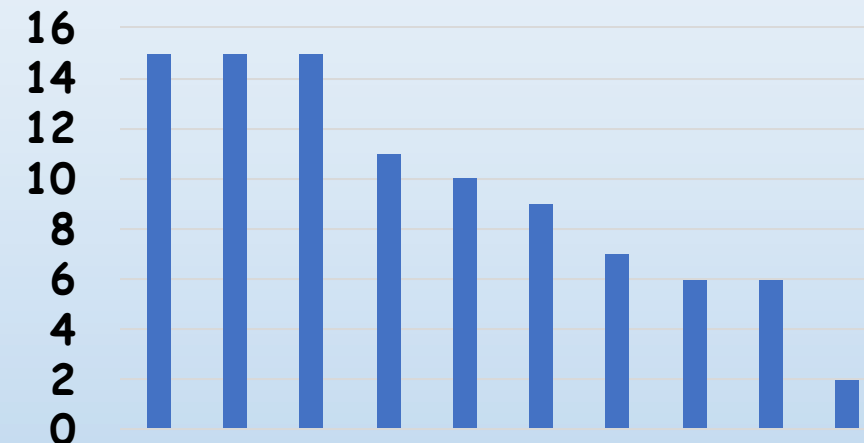
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## Selected Students by Citizenship



## Statistics for all ASP students



Astro. & Cosmology  
Theory & Math. Physics  
Materials & Cond. ....  
Nuclear Physics  
General Physics  
Renewable Energy & ...  
Medical Physics & ...  
Particle Physics  
Data science and Art ...  
Sciences & Policy



# ASP Mentorship

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## At all times:

- It runs continuously even when there is no school;
- Open to ASP student alumni in Ph.D. programs;
- Pairing of students to lecturers. Lecturers to mentor and coach them;
  - Not a replacement of academic advisors, rather in addition to / in collaboration with it
- Helps IOC track students after the school;
- Helps answer the questions, "Where are they now?", "What happens to them after they've attended ASP?"
  - These are legitimate questions
  - Mentorship program supplemented by periodic of surveys
- Program formalized soon after ASP2016;
- Through this program, we place ASP alumni in high education programs in South Africa, Asia, Europe and North America.



Participants in the 2018 African School of Physics, which took place in Namibia. Credit: Glibert Tékouté



# ACP Conference

## One week:

The physics topics taught at the school form the core of the ASP conference.

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## Objectives

- Attract ASP alumni
- Attract African research faculties
- Attract international participants not part of ASP
- Foster new research collaborations



Peer-reviewed conference proceedings published by the African Review of Physics.



## ACP2023 @ George Campus, SA

- Number of registrants: 601
- Number of in-person participants: 60
- Peak Zoom connections: ~50
- The ratio Female : Male in the registration is 4:10



<http://aphysrev.ictp.it/index.php/aphysrev/issue/view/35>

## ACP2021, Online

- Participants from Africa: 563
- Participants from outside Africa: 86



# Next : ACP2025

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## THE FOURTH AFRICAN CONFERENCE ON FUNDAMENTAL AND APPLIED PHYSICS (ACP2025)



Organized jointly by ASP & the University of Lomé, Togo

September 14<sup>th</sup>-20<sup>th</sup>, 2025

### SCIENTIFIC PROGRAM

#### PARTICLES AND APPLICATIONS

- ▷ Nuclear & Particle Physics
- ▷ Medical Physics
- ▷ Fluid & Plasma Physics
- ▷ Heavy-Ion Physics
- ▷ Astrophysics & Cosmology
- ▷ Neutron Sources

#### LIGHT SOURCES AND APPLICATIONS

- ▷ Light Sources
- ▷ Condensed Matter & Materials Physics
- ▷ Biophysics
- ▷ Earth Physics
- ▷ Renewable Energies & Energy Efficiency
- ▷ Optics & Photonics, Nanoscience

#### CROSS-CUTTING FIELDS

- ▷ Artificial Intelligence & Machine Learning
- ▷ Accelerator Physics
- ▷ Statistical Analysis
- ▷ Complex Systems
- ▷ Detectors & Instrumentation

#### SOCIETAL ENGAGEMENTS

- ▷ Physics Education
- ▷ Young Physicists Forum
- ▷ Women in Physics
- ▷ Community Engagement



https://indico.cern.ch/event/1458227/

## Registration and abstract submission : <https://indico.cern.ch/event/1458227/>





# More ASP / APS



2024 Satellite Meeting: The Tale of 2 organizations: APS, ASP & beyond..using MOOC as a prototype



**APS** April Meeting

As part of  
The American Physical Society's April Meeting  
2024: Quarks to Cosmos

**APS Follow up Session**

Thu. April 18, 2024  
LPHEA, Faculty of Science Semlalia, UCA, Marrakech

**Chair:**  
Pr. Mohamed Chabab  
(FGSM, Cadi Ayyad University, Marrakech)

**Christine Darve**  
(European Spallation Source ERIC)

**Farida Fassi**  
(Mohammed VI University, Rabat)

**Latifa El Ouedrhiri**  
(Jefferson Laboratory, USA)

**SCIENTIFIC PROGRAM:**

- Introduction of the Event
- A Tale of Two Organizations: APS and ASP and beyond
- Coffee and Poster
- The African Strategy of Fundamental and Applied Physics (ASFAP)
- APS Nobel's Video
- Q & A
- Vote of Thanks
- Peer Instruction: Teaching physics to teachers

More info



# More ASP / APS

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2023: International Perspective for Young Physicists from Particle to Materials

→ "African Physics Strategy" by Mounia Laassiri

2024: Partnership for Education Across Continents:

→ "Building International partnership for Africa" by Ketevi Assamagan

2025: The Global University: Expanding the Reach of Science Education through Satellite Campuses Across the World  
→ "Beyond the African School of Physics (ASP): a model of Global University in Africa" by Christine Darve



2012 : Science Diplomacy: Africa and the Middle East  
→ "Fundamental Physics and Accelerator Sciences in Africa" by Christine Darve

**Building capacity—the African School of Physics (ASP)**

3-6 months US research visits

High School teachers

High School Outreach

Student Mentorship

Online lectures

African School of Physics

- South Africa, 2010, 2022
- Ghana 2012
- Senegal 2014
- Rwanda 2016
- Namibia 2018
- Morocco 2020-online, 2024

Over 2k student applicants;  
Selection rate: 1 in 5

- ★ ASP is much more than a school; it's a system of physics activities for education & research development
- ★ Engagement with Policy makers



# More EDI for Physics in Africa...

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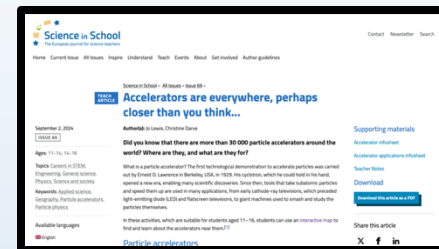


✓ Reminder: "Diversity and Outreach in High Energy Physics" by Kate Shaw

• Digital learning:

➤ Science in School - EIROForum e.g. "Accelerators are everywhere, perhaps closer than you think..)"

➤ "Forum to accelerate a global digital world", by Christine Darve, Stephane Kenmoe - **PHYSICS MATTERS**



• International Union of Pure and Applied Physics (IUPAP) WG14-Accelerator Science

• IUPAP/UNESCO International Colloquia on Physics For Society

○ "Celebrate World Quantum Day with Prof. Anne L'Huillier - April 14! "

○ "Illuminating Innovation: Synchrotron Science, Quantum Frontiers, and Africa's Scientific Future", May 27

○ "Quantum mechanics with patterns of light by Prof. Andrew Forbes, (SA) June 16

[Info and Register Here](#)





# Synergy EDI "PHYSICS MATTERS"

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University of Sussex, Brighton, UK



Colloquium series for development @ Forum on International Physics (FIP) at APS

❖ > 50 popular science events since Nov.2020!

❖ Connect up to 35 countries at once!

❖ Audience: from 70 to 477 persons

❖ 20-40 min colloquium

❖ Q&A session engaging w/ esteemed speakers

This series is open to everyone!

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

Examples: Health & Life Science



[Watch trailer](#)

[YouTube webinars](#)



→ [Sept '22: Momentum grows for the African Light Source](#) by S. Connell

→ [Oct ' 22: Physics for Development and International Cooperation](#) by Kate Shaw

→ [Feb. '24: Roadshow on synchrotron science and X-ray imaging techniques in Zimbabwe](#) by Kudakwashe Jakata

**Stay tuned for more colloquia !**

→ [July 31: "Materials science and socioeconomic challenges in Africa"](#) by Thierry d'Almeida ([REGISTER HERE](#))

→ **Oct. 2025: The African Strategy on Fundamental Physics and Applications - Forum**

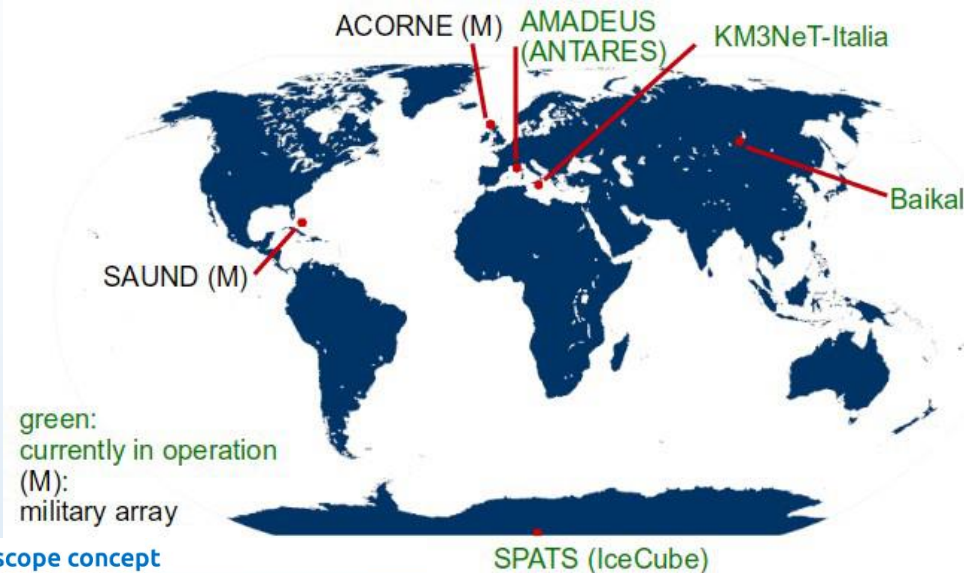
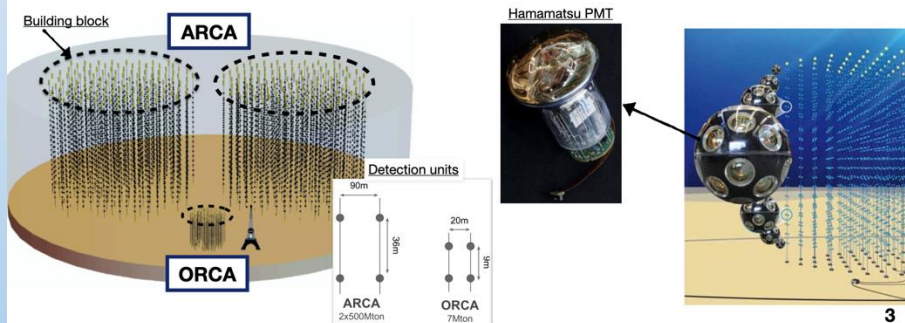


# More potential for Neutrino ?

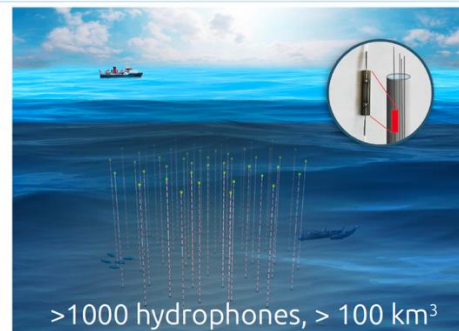
Reminder: "Detection of an Ultra-High-Energy Neutrino Event with KM3NeT" by Meriem Bendahman

## KM3NeT Neutrino Telescope

- KM3NeT is a deep-sea neutrino telescope located in the Mediterranean Sea.
- It consists of two Cherenkov detectors:
  - **ORCA** (off Toulon): optimised for neutrino oscillations at GeV energies.
  - **ARCA** (off Sicily): optimised for astrophysical neutrinos at TeV–PeV.
- Each Digital Optical Module (DOM) is equipped with 31 Photomultipliers (PMTs), allowing for excellent angular resolution.
- At the time of the event, **21 ARCA detection units** were operational.



## Future telescope concept



TNO NIKHEF Ernst-Jan Buis, "Acoustic neutrino detection", Seminar Krakow 14/3/2025

- Northern hemisphere:
  - Mediterranean Sea

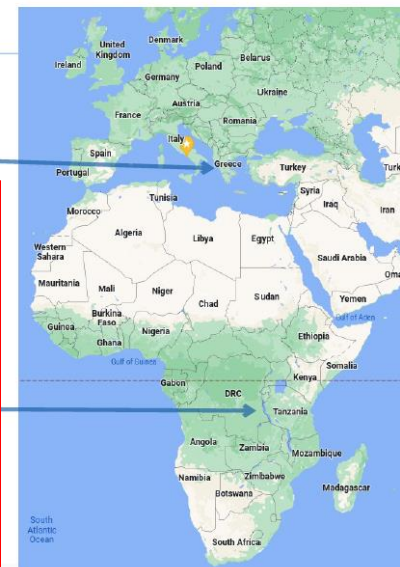
Courtesy: Ernst-Jan Buis

"Acoustic detection of ultra-high energy neutrinos"

- Southern hemisphere:
  - Lake Tanganyika

TNO, Delft

Nikhef, Amsterdam



Next: "Fiber optic hydrophones for acoustic neutrino detection" by Ernst-Jan Buis (TNO / NIKHEF)

➔ Monday June 16, at 11:15 - [Zoom access to Lund University Science cafe](#)



# Eco-System



ABOUT US   USERS & SCIENCE   INDUSTRY   EDUCATION & OUTREACH   JOBS

Home → News → General News → Research with synchrotron...

## Research with synchrotron X-rays boosts industrial innovation

News

GENERAL NEWS

Users with collaborations with industrial R&D centres: 46%

Use of ESRF with applications for industrial R&D: 39%

Users with funding from industry: 33%

12-04-2013

In February the ESRF carried out a survey of its academic users to ask about their links with industry. Replies have confirmed what we already believed, that research carried out using synchrotron X-rays is becoming increasingly beneficial to industry.

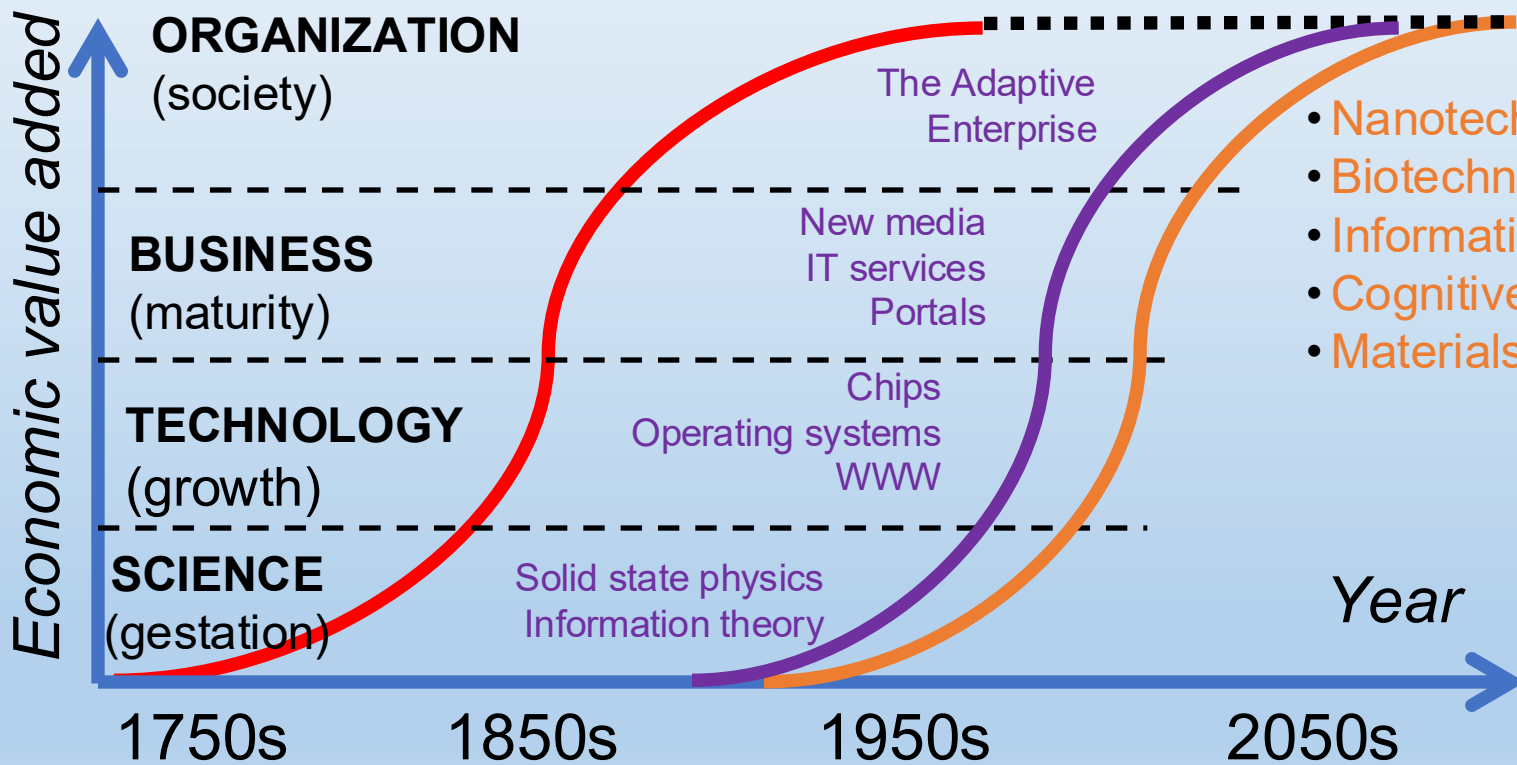
Share [in](#) [twitter](#) [facebook](#)

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WIN 25

## INDUSTRIAL (Economy - Revolution)



## INFORMATION

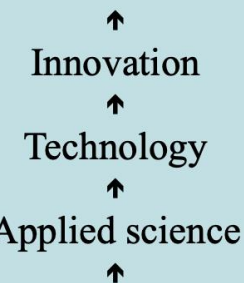
## MOLECULAR

### (NBIC)

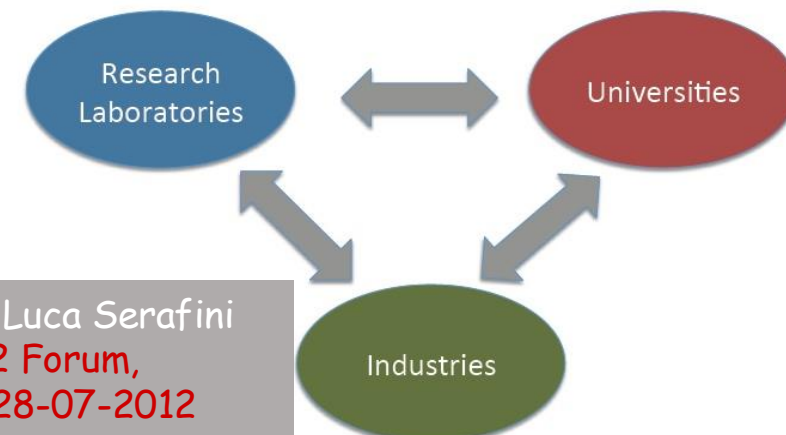
- Nanotechnology
- Biotechnology
- Information technology
- Cognitive science
- Materials

## 2022: UN International Year of Basic Sciences for Development

Economic & human development



### TRIANGLE OF KNOWLEDGE – UE “PARADIGM”



Courtesy Luca Serafini  
ASP-2012 Forum,  
(Ghana), 28-07-2012

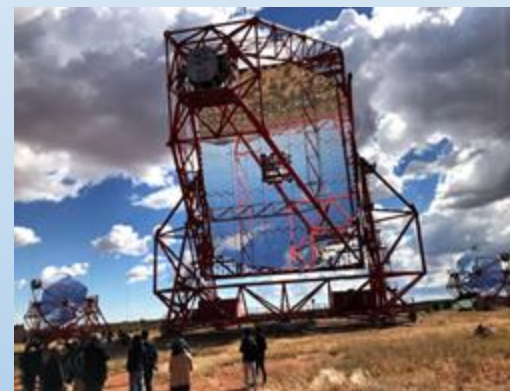
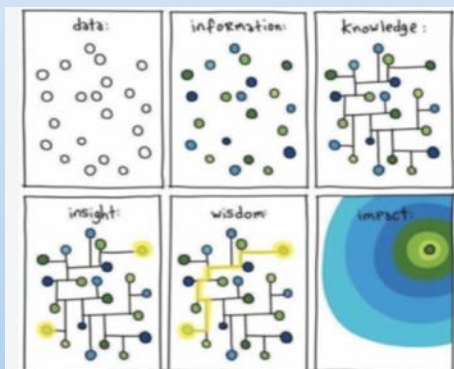


# Concluding comments

## Thanks for listening

- ASP empowers the next generation of African physicists through top-tier training and **global collaboration!**
- ASP lays the groundwork for Africa's sustained contribution to global neutrino and **frontier science!**

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**Back-up slides**



# Scattering Community

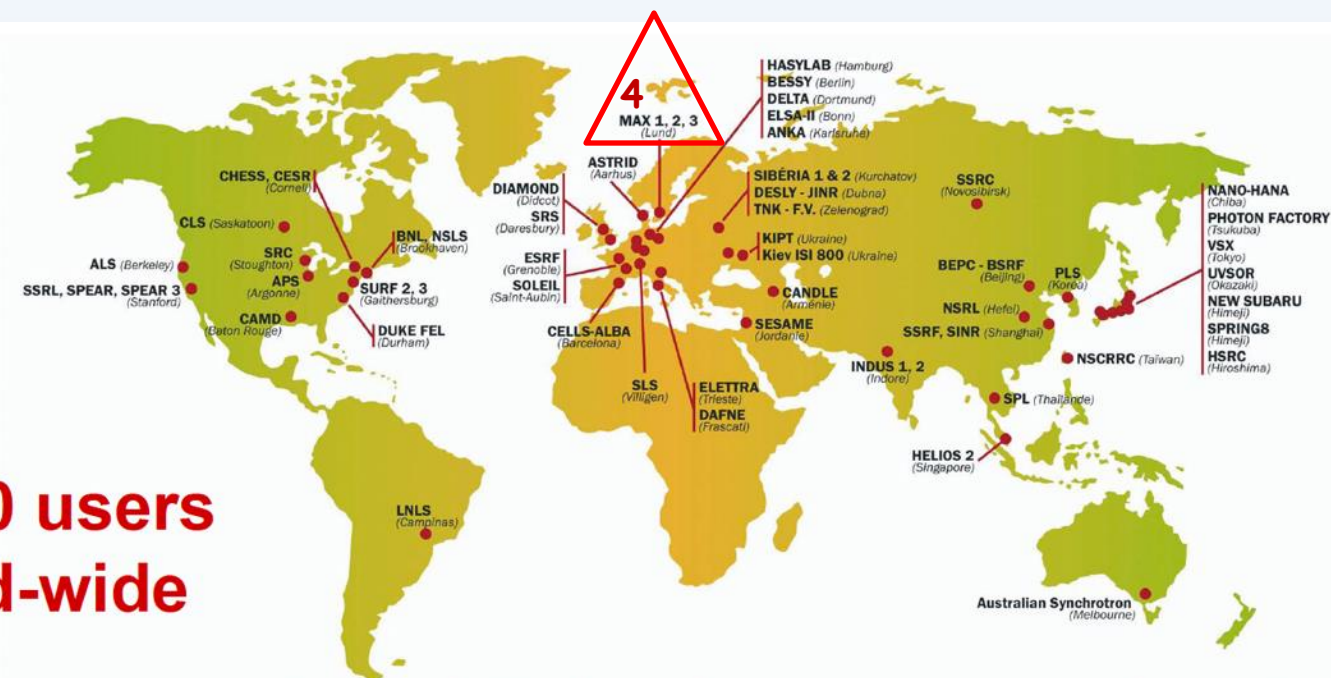


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Global University to prepare the African Light Source ?

AfLS: African Light Source and its Conceptual Design Report (CDR)

> 60'000 users world-wide



Established, mature technology

Lightsources for Africa, the Americas, Asia, Middle-east and Pacific (LAAAMP)

LAAAMP brochure: "Advanced Light Sources and Crystallography: Tools of Discovery and Innovation". → 5 languages

e.g. X-Tech Lab and Seme City in Benin



# [International Union of Pure and Applied Physics (IUPAP) WG14-Accelerator Science]

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## Scope Summary

- Global collaboration and knowledge sharing.
- Resources and content to inspire and inform.
- Mapping accelerator impacts on SDGs.
- Promoting sustainable accelerator facilities.
- Supporting workshops and professional events.

## Current activities:

IPAC sponsoring & endorsement

Call for Ambassadors

Short recordings



# [International Union of Pure and Applied Physics (IUPAP) WG14-Accelerator Science] [IUPAP]

Union of **22 international experts from 18 countries** committed to promoting these objectives on a global scale, utilizing local expertise and networks.

Mandate - Advancing Particle Accelerators for Science & Society in key areas:

- Applications: Industrial, medical, energy, environmental.
- Science: Light sources, neutron sources, HEP, heavy ion research.
- Future Facilities: Laser, plasma, compact neutron sources.
- Innovation: Accelerator principles, sustainability.
- Engagement: Education, workshops, global collaboration.



IUPAP Rejuvenation:  
Include scope for Major  
Neutron Research  
Facilities