

LAAAMP-AfLS Africa Workshop

 Thursday 8 September 2022, 14:00–17:00 Africa/Johannesburg

 African Light Source (by Zoom)



Michele Zema

University of Bari, Italy and International Union of Crystallography
Co-founder and Chair of the Executive Committee of *LAAAMP*



<https://laaamp.iucr.org/>

Lightsources for Africa, the Americas, Asia, Middle East and Pacific (*LAAAMP*)

The project was started in 2016 by the International Science Council (ISC) through a € 300K grant awarded to the joint **IUPAP-IUCr** project entitled *Utilisation of Light Source and Crystallographic Sciences to Facilitate the Enhancement of Knowledge and Improve the Economic and Social Conditions in Targeted Regions of the World.*

The **Abdus Salam ICTP** has joined *LAAAMP* as a lead institution in 2020.

[*https://laaamp.iucr.org/calls/jan-dec-2023*](https://laaamp.iucr.org/calls/jan-dec-2023)

CALL FOR APPLICATIONS FOR FACULTY-STUDENT (FAST) TEAMS TO SPEND TWO (2) MONTHS DURING CALENDAR YEAR 2023 AT PARTICIPATING ADVANCED LIGHT SOURCES

DEADLINE: 30 SEPTEMBER 2022

The International Union of Pure and Applied Physics (IUPAP), the International Union of Crystallography (IUCr), and Abdus Salam International Centre for Theoretical Physics (ICTP) will award FAST Team grants to enhance advanced light source (AdLS) and crystallography sciences in seven (7) targeted regions of the world: Africa, the Caribbean, Mexico, Central Asia, Southeast Asia, Middle East, and Pacific. The successful applicants will spend two (2) months during Calendar Year 2023 at LAAAMP's AdLS Collaborative Partners to acquire expertise in accelerator technology or AdLS beamline techniques, including those involving crystallography.

Why LAAAMP?



2016: ~ 50 synchrotrons in the world, mostly in “developed” countries

EXECUTIVE COMMITTEE



Michele Zema (Chair)

University of Pavia, Italy
IUCr Executive Outreach Officer



Marielle Agbahoungbata

Coordinator, X-TechLab, Cotonou, Benin



Sekazi Mtingwa

TriSEED Consultants, LLC, Hillsborough, NC, USA
Chair of the IUPAP C13 Commission for
Development



Özgül Öztürk

University of Siegen, Germany
Chair of SESAME Users' Committee



Sandro Scandolo

Abdus Salam International Centre for Theoretical
Physics (ICTP), Trieste, Italy

Africa

Simon Connell (*Chair*) Univ. of Johannesburg, South Africa

Djamel Bradai UST Houari Boumediene, Algeria

Jean-Pierre Ezin Université d'Abomey-Calabi, Benin

Claude Lecomte Chair of IUCr Crystallography in Africa initiative

Ernie Malamud Fermilab, University of Nevada, USA

Brian Masara SA Inst of Physics, Zimbabwe

Genito Maure Universidade Eduardo Mondlane, Mozambique

Prosper Ngabonziza Dept Solid State Quantum Electronics, Rwanda

Ahmadou Wague University of Cheikh Anta Diop, Senegal

Mexico

Matías Moreno (*Chair*) Universidad Nacional Autónoma de México

Abel Moreno Cárcamo Coordinator of the Red de Usuarios de Luz Sincrotrón (RedTULS) and Instituto de Química, UNAM

Mayra Cuellar Universidad de Guanajuato

José Reyes Gasga President of the Sociedad Mexicana de Cristalografía and Instituto de Física, UNAM

José Ignacio Jiménez Universidad Nacional Autónoma de México

Tomás Viveros Universidad Autónoma Metropolitana-Iztapalapa

Caribbean

Carlos Cabrera (*Chair*) University of Puerto Rico at Río Piedras

Fidel Antonio Castro Smirnov Advisor to the President of the University of Informatics Sciences, Cuba

Noel Blackburn Brookhaven National Laboratory, USA

Eric Sheppard Hampton University, USA

SE Asia

Supagorn Rugmai (*Chair*) Head of Research Facility, Synchrotron Light Research Institute (SLRI), Thailand

Gwo-Huei Luo President of Asia-Oceania Forum on Synchrotron Radiation Research (AOFSSR) and Director, National Synchrotron Radiation Research Center (NSRRC), Taiwan

Chia-Hung Hsu Secretary General and Staff Scientist, NSRRC, Taiwan

Pinit Kidkhunthod Assistant Chief of Research Facility Division of SLRI, Thailand

Michael James Head of Science, Australian Synchrotron

Central Asia

Davron Matrasulov (*Chair*) Head of Laboratory for Advanced Studies, Turin Polytechnic University in Tashkent, Uzbekistan

Members to be appointed

Middle East

Kirsi Lorentz (*Chair*) The Cyprus Institute, Nicosia, Cyprus

Roy Beck-Barkai Tel-Aviv University, Israel

Musa Mutlu Can Istanbul University, Turkey

Ahmed Farghaly National Research Center, Cairo, Egypt

Jamal Ghabboun Bethlehem University, Palestine

Hanan Sa'adeh University of Jordan, Amman

Pacific Islands

Sekazi K. Mtingwa (*Acting Chair*) TriSEED Consultants, USA
Chair and Members to be appointed

UNESCO

ICSU Regional Office for Africa (now ISC)

ICSU Regional Office for Latin America & the Caribbean (now ISC)

International Union of Materials Research Societies (IUMRS)

International Centre for Theoretical Physics (ICTP)

TWAS

SESAME Light Source

African Light Source (AfLS) Steering Committee

Cuban Light Source Initiative

Puerto Rican Light Source Initiative

[Lightsources.org](http://lightsources.org)

Mexican Physical Society

European Physical Society (EPS)

Association of Asia Pacific Physical Societies (AAPPS)

Interdisciplinary Consortium for Research and Educational Access in Science & Engineering

Triangle Science, Education & Economic Development (TriSEED Consultants), LLC

University of California - Los Angeles (UCLA)

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Advanced Light Source (ALS), Lawrence Berkeley National Laboratory (LBNL)

Advanced Photon Source (APS), Argonne National Lab (ANL)

ALBA Light Source

Australian Synchrotron, Australian Nuclear Science and Technology Organization (ANSTO)

Canadian Light Source

DELTA Light Source

Elettra Light Source

European Synchrotron Radiation Facility (ESRF)

MAX IV Laboratory

National Synchrotron Light Source-II (NSLS-II), Brookhaven National Lab (BNL)

Photon Factory, Institute of Materials Structure Science (IMSS) of KEK

Pohang Accelerator Laboratory

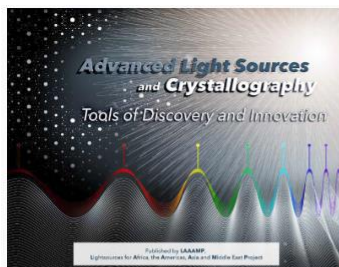
SESAME Light Source

SIAM Photon Source (SPS), Synchrotron Light Research Institute (SLRI)

SLAC National Accelerator Laboratory

Taiwan Photon Source (TPS), National Synchrotron Radiation Research Center (NSRRC)

...



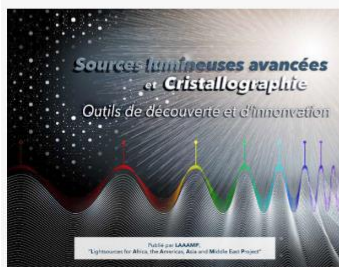
LAAAMP Brochure, Version 2
Language: English

(PDF file, 5.4 MB)



LAAAMP Brochure, Version 2
Language: Spanish

(PDF file, 4.7 MB)



LAAAMP Brochure, Version 2
Language: French

(PDF file, 4.7 MB)



LAAAMP Brochure, Version 2
Language: Arabic

(PDF file, 9.2 MB)



LAAAMP Brochure, Version 2
Language: Portuguese

(PDF file, 5.1 MB)

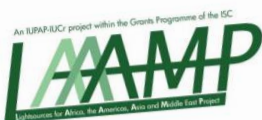
The LAAAMP brochure “Advanced Light Sources and Crystallography: Tools of Discovery and Innovation” is available in **English, Spanish, French, Arabic** and **Portuguese**.

Translations have been made available thanks to a collaboration with the International Atomic Energy Agency (IAEA).

Brochure editor: **Ernie Malamud**

DOWNLOAD FOR FREE at
<https://laaamp.iucr.org/tasks/brochure>

Regional strategic plans



Lightsources for Africa, the Americas, Asia and Middle East Project
An IUPAP-IUCr project within the Grants Programme of the ISC
Executive Committee: Michele Zema (Chair), Sekazi Mtingwa, Sandro Scandolo

Strategic Plan for Africa

The African Light Source I (AfLS1) and AfLS2 Conferences had three major outputs: (1) a set of overarching statements, called the *Grenoble Resolutions*, that provide the *WHY* for an AfLS, (2) a *Roadmap* to guide future activities, and (3) the election of a fully mandated Executive Steering Committee of the AfLS Foundation, a legal nonprofit under South African law.

Committee of the AfLS Foundation, a legal nonprofit under South African law.

For the first output, we have the following AfLS1 **Grenoble Resolutions**:



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Strategic Plan for South East Asia Including the Strategic Plan for the Siam Photon Source II



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Strategic Plan for Mexico

Mexican region endorses the following



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Strategic Plan for the Middle East

The Middle East region endorses the following **Universal Grenoble Resolutions**:

Advanced light sources are the most transformative scientific instruments similar to the invention of conventional lasers and computers.



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<https://laaamp.iucr.org/tasks/strategic-plans>

Strategic Plan for the Caribbean

1. The Caribbean region endorses the following **Universal Grenoble Resolutions**:

1. Advanced light sources are the most transformative scientific instruments similar to the invention of conventional lasers and computers.

2. Advanced light sources are revolutionizing a myriad of fundamental and applied sciences, including agriculture, biology, biomedicine, chemistry, climate and environmental sciences, systems science, cultural heritage studies, energy, engineering, geology, materials science, nanotechnology, palaeontology, pharmaceutical discoveries, and physics, with accompanying impact on sustainable industry.

2. Advanced light sources are revolutionizing a myriad of fundamental and applied sciences, including agriculture, biology, biomedicine, chemistry, climate and environmental sciences, systems science, cultural heritage studies, energy, engineering, geology, materials science, nanotechnology, palaeontology, pharmaceutical discoveries, and physics, with accompanying impact on sustainable industry.

3. The community of researchers around the world are striving collaboratively to develop ever more intense sources of electromagnetic radiation, specifically derived synchrotron light sources and X-ray free-electron lasers (XFELs), to address the challenging questions in living and condensed matter sciences.

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Over 50 FAST (FAculty-STudent) Teams (100 individuals) have been supported by LAAAMP since 2017, including ca 25% repeats (continuing grants)

Eligibility

Faculty members at universities in Africa, the Caribbean, Mexico, SE Asia, Middle East and Pacific region. Interested in using AdLSs to further one's research and training endeavors. Previous experience with using AdLSs is limited to a year or less. Ability to spend 2 months as a full-time visitor in residence at an AdLS that is a *LAAAMP* collaborative partner.

Student registered as full-time Ph.D. student and supervised by the Faculty member.

Categories

Continuing and **New** applications are considered.

Financial Support

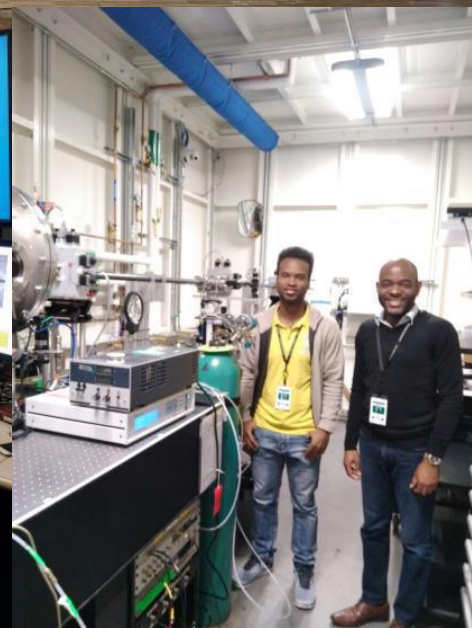
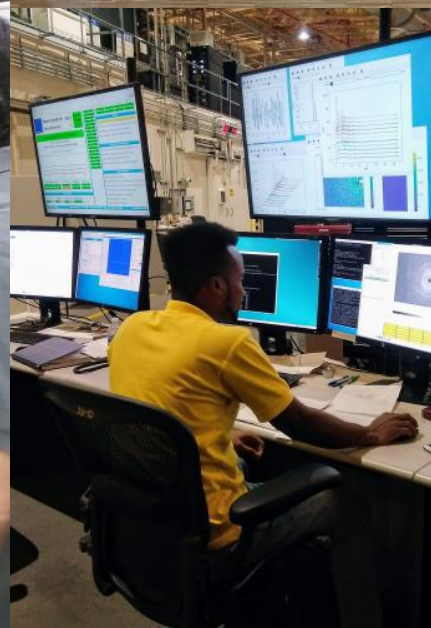
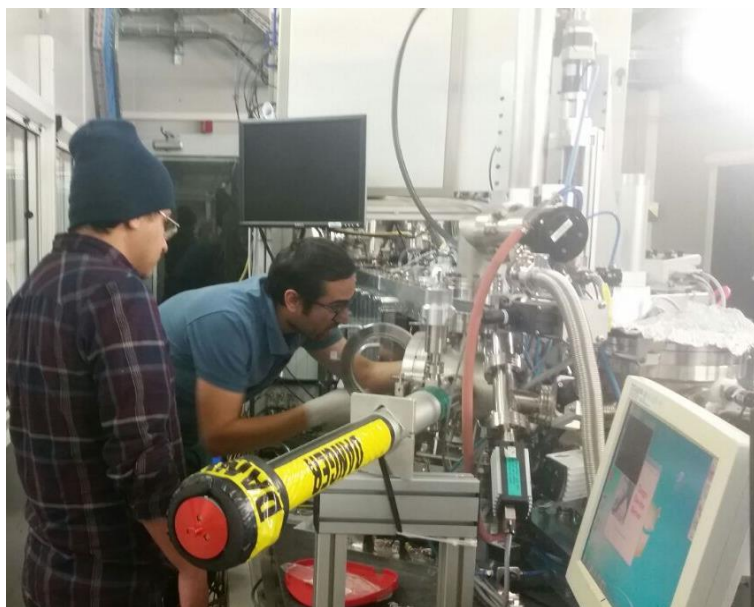
LAAAMP provides ca **2,000 Euros per person** to cover transportation and (partially) accommodation costs. The remainder of accommodation and subsistence should be negotiated with the host AdLS and other sources of support.

Deliverables

<https://laaamp.iucr.org/calls>

- ✓ All publications resulting from the visits must acknowledge the support provided by IUPAP-IUCr-ICTP *LAAAMP* initiative.
- ✓ 3-page report that evaluates the non-scientific aspects of the visit, including positive experiences as well as ways that the visit could be enhanced in the future.

TASK 4: FAculty-STudent (FAST) teams visits at AdLSS



SPARC

SYNCHRONIZING PARTNERS TO ADVANCE RESEARCH CHARACTERIZATION (SPARC)

SPARC initiative provides "a little bit of light" for measuring samples via mail-in to synchrotrons.

WE FACILITATE:

1. understanding sample requirements
2. understanding available techniques
3. help in the beamtime proposal writing process
4. list of mail-in sample programs around the world

SPARC is an ideal way to get an idea of how your project might benefit from synchrotron use.

To find out whether your project would benefit from this program, fill out the application form [here](#).

ADDITIONAL NOTES

Response times are typically 2-3 weeks.

Access to measured data could take up to 6 months.

SPARC initiative leader: Tabbetha Dobbins, Rowan University, Glassboro, NJ, USA

<https://laaamp.iucr.org/events/high-school-teachers-workshops-list>



SESAME



SESAME Teachers Workshop Online 2022 17th Jan 2022 - 27th Jan 2022

CLS Teachers Workshop Online 2021 21st Jun 2021 - 25th Jun 2021

Next edition: 2023

The Colloquium Programme dispatches experienced AdLS users and crystallographers to universities and other institutions to give presentations on the capabilities of AdLSs and crystallography and engage in discussions on how they can enhance researchers' investigations and offer career opportunities for university students.

While in a given location, the lecturers will visit government officials to inform about the importance of investing into science and AdLS/crystallographic disciplines in particular.

The programme was suspended during the pandemic and is planned to start again in 2023.

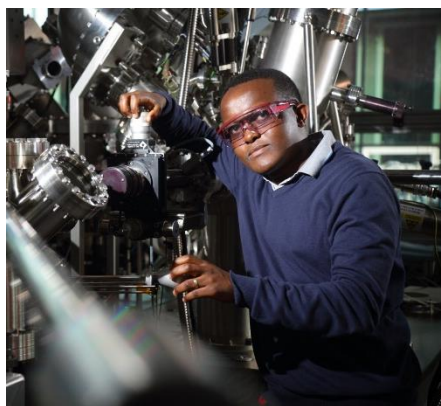


COSTA RICA

4 Dec 2017

Diego G. Lamas

National University of San Martín and and CONICET, National Scientific and Technical Research Council, Argentina; former President of LACA



RWANDA

15-20 Dec 2017

Prosper Ngabonziza

Max-Planck-Institute for Solid State Research, Department of Solid State Quantum Electronics, Stuttgart, Germany



BENIN

4-5 May 2018

Thierry d'Almeida

Senior Research Scientist at CEA, Commissariat à l'Energie Atomique



CIFiesta

1 Sept 2019

James Hester

OPAL neutron source, ANSTO, Australia

X-TechLab AT SÈMÈ CITY, BENIN

X-Ray Techniques for Sustainable Development



Thierry d'Almeida presenting LAAAMP and the X-TechLab project to the Cabinet of the Government of Benin.

X-TechLab is aimed at **training** over a hundred Master and Ph.D. students from Benin and neighbouring countries every year, and at **establishing a permanent user research facility** with experienced, permanent staff to act as a hub for the region.



X-TechLab EQUIPMENT

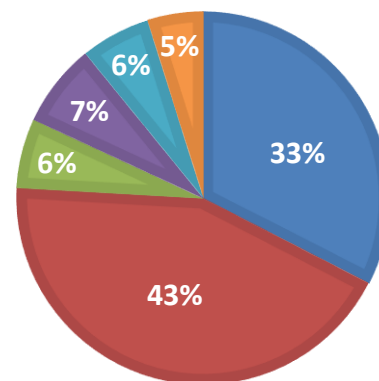
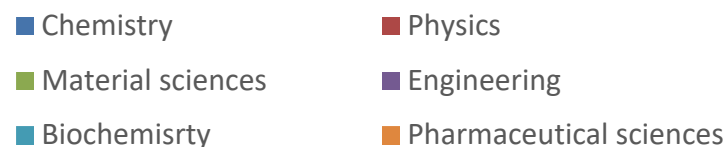
1. **Bruker D8 QUEST ECO single-crystal diffractometer** (moly; PHOTON II detector; APEX software)
2. **Oxford Cryosystems SMARTSREAM** (T range of 170 – 400 K without liquid nitrogen)
3. **PANalytical Empyrean powder diffractometer** (to be installed in November 2022)
4. **Bruker Skyscan 1172 microCT** (used machine donated by CEA; a new CT machine is under commissioning)
5. **Stereo and polarized light microscopes**, lab glassware, crystal mounting tools
6. **Cambridge Structural Database (CSD)** and related software provided by CCDC for free for a period of three years through the FAIRE programme
7. **International Tables for Crystallography** online version available for free during the training sessions thanks to the support of the IUCr
8. **IUCr Journals** – Full access for three years through the IUCr Journal Grants Fund.

<https://www.xtechlab.co/>

3 training sessions in 2019-2020: 84 learners from 12 African countries: Benin, Burkina Faso, Burundi, Cameroon, Congo-Brazzaville, the Democratic Republic of Congo, Senegal, Togo, Ghana, Ethiopia, Nigeria and Côte d'Ivoire. 20 invited experts.

In 2020, because of the pandemic, a training programme on crystal symmetry has been developed for students from the Faculty of Science and Technology. **The program has reached over a thousand students.**

Next training session: November 2022





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The African Light Source Foundation
Executive Committee: Simon Connell (Chair), Sekazi Mtingwa, Saphina Biira, Thierry D'Almeida, Tabbetha Dobbins, Seham K. Abdel-Aal, Nkem Khumbah, Brian Masara, Genito Maure, Edward Mitchell, Armino Mussungu, Prosper Ngabonziza, Lawrence Norris, Tshepo Ntsoane, Ahmadou Wague, Herman Winick

<https://www.africanlightsource.org/>

MEMORANDUM OF UNDERSTANDING

between

LAAAMP and the African Light Source Foundation

WHEREAS, the Light Sources for Africa, the Americas, Asia and Middle East Project ([LAAAMP](https://laaamp.iucr.org)) and the [African Light Source](https://www.africanlightsource.org/) Foundation are partnering in order to collaborate on capacity building and fundraising for capacity building related to synchrotron and X-ray training for Africa; and

**THE AFRICAN LIGHT SOURCE
CONFERENCE AND WORKSHOP**

16 - 20 NOVEMBER 2015, ESRF GRENOBLE FRANCE



*Simon H. Connell and Sekazi K. Mtingwa,
Chairs of the AfLS Steering Committee*



M. Zema (right) holding the Speaking stick

The idea of **LAAAMP** starts during the 1st African Light Source Conference and Workshop at the ESRF, Grenoble in 2015 when **LAAAMP** co-founders **Sekazi Mtingwa**, **Sandro Scandolo** and **Michele Zema** meet for the first time and discuss about a joint IUPAP-IUCr proposal to be submitted to the former ICSU (now ISC) Grants Programme 2016-2019.



At the World Science Forum 2017 in Jordan, LAAAMP convened a session on *Light Sources and Crystallographic Sciences for Sustainable Development*. The panel included: **Michele Zema** (LAAAMP and IUCr), **Sekazi Mtingwa** (LAAAMP and IUPAP), **Jean-Paul Ngome Abiaga** (UNESCO), **Maciej Nalecz** (UNESCO), **Giorgio Paolucci** (SESAME), **Simon Connell** (AfLS).

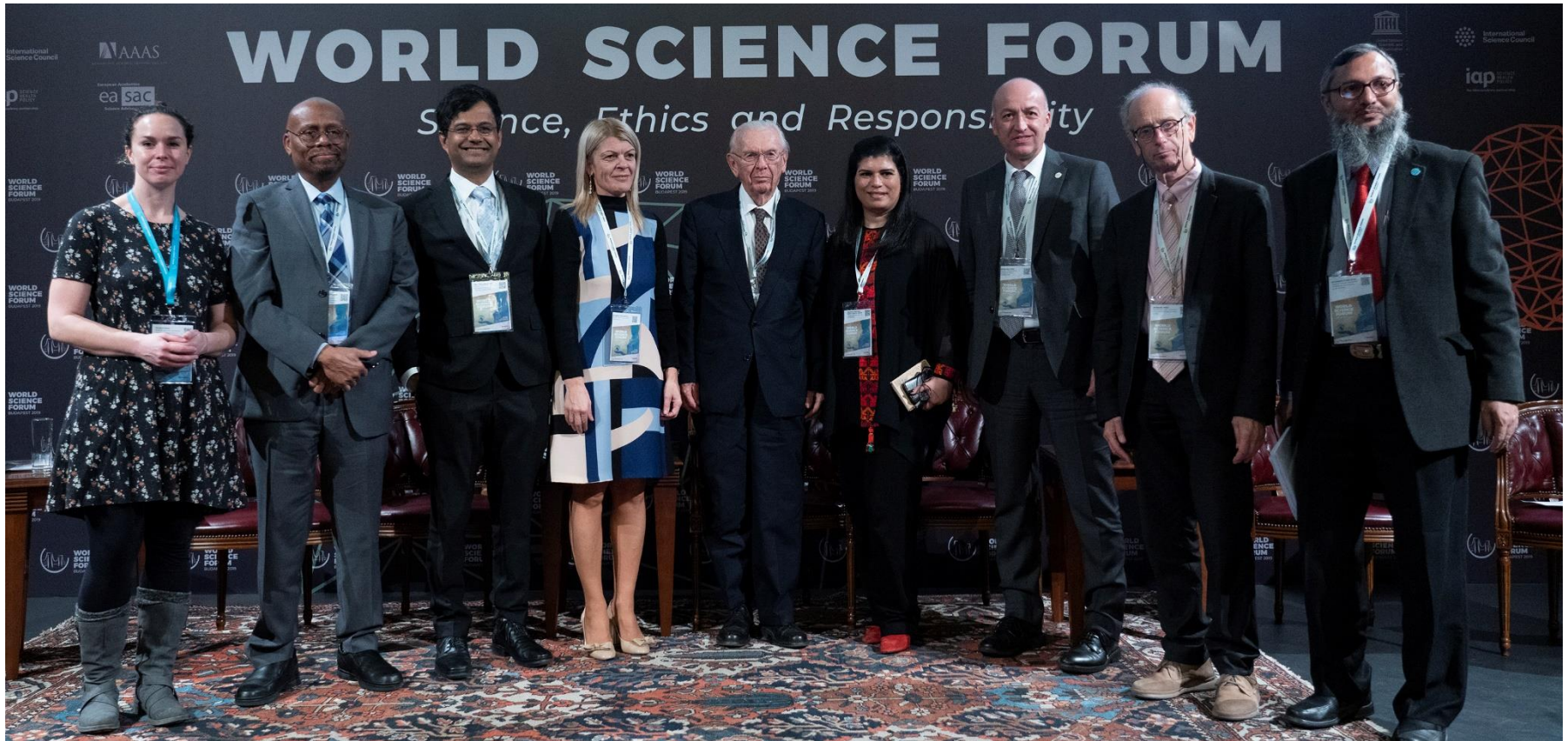
Just after the session, an informal meeting among the panellists and others, including **Herman Winick** and **Romain Murenzi**, put the basis for the agenda towards the African Light Source.



Simon H. Connell (AfLS) and Michele Zema (LAAAMP) discussing with Prof. Kwabena FRIMPONG-BOATENG, Minister of Environment, Science, Technology and Innovation of Ghana, at PCCr2, Accra, Ghana.



The major follow-up of PCCr2 was the formal support given to the African Light Source initiative by the **President of Ghana Nana Addo Dankwa AKUFO-ADDO** and facilitated by Minister Kwabena FRIMPONG-BOATENG. Thanks to the Government of Ghana, AfLS is an official project of the African Union (AU) and ECOWAS.



At the World Science Forum 2019, a thematic session on *Basic Sciences Infrastructures for Ethical and Responsible Collaborative Development* was convened by **Michel Spiro** (IUPAP) and **Michele Zema** (LAAAMP and IUCr) and included a talk about the *African Light Source initiative* by **Sekazi Mtingwa**, AfLS co-Chair and member of LAAAMP Executive Committee. Other panellists included: **Princess Sumaya of Jordan**; **Herwig Shopper** (CERN); **Sanja Damjanovic** (Minister of Science, Montenegro); **Atish Dabholkar** (Director, ICTP).

THANK YOU FOR YOUR ATTENTION



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