WEST AFRICAN SOCIETY OF PHYSICS (SOAPHYS)

TERMS OF REFERENCE OF THE 8TH ANNUAL SOAPHYS CONGRESS

Ouagadougou (Burkina Faso), July 29 – August 1, 2026

Theme:

"Supporting Access to Energy, Sustainable Agriculture and Food Security through Applied Physics"

1. Background and Rationale

For nearly a decade, the West African Society of Physics (SOAPHYS) has served as a regional framework for scientific exchange and the promotion of physical sciences in West Africa. The successive themes addressed in relation to endogenous development, collaboration with the diaspora, sustainable development, peace and security, and innovation in response to contemporary challenges have reflected a constant commitment to positioning physics within the transformation dynamics of the continent.

However, the experience accumulated over the years has revealed a structural tension: while the relevance of the themes is unquestionable, their operational implementation remains limited. Congresses have often favored the accumulation of scientific presentations at the expense of in-depth debate, the structuring of collective programs, and the emergence of measurable commitments. In an environment where specialized human resources are scarce, equipment is scattered, and funding is constrained, this approach has now reached its limits.

At the same time, the West African sub-region is facing major systemic challenges, including insufficient sustainable access to energy, weak industrialization, limited transformation of agricultural systems, fragile food security, and the need to strengthen economic resilience and social stability. These issues are interdependent and rely on strong scientific foundations. Applied physics (energy conversion and storage, functional materials, numerical modeling, instrumentation, process thermal

engineering, mechanics, optics, plasma physics, and data science) constitutes an essential cross-cutting foundation for these transformations.

Likewise, in the sub-region, there are no structured technological maturation programs capable of supporting scientific results from the proof-of-concept stage to the industrial sector. This absence represents a missing link between academic production and effective industrialization. The establishment of regional maturation mechanisms therefore appears to be a structuring condition for concretizing the transition from laboratory to factory and strengthening the impact of applied physics on industrial development in West Africa.

In this context, the 8th SOAPHYS Congress, scheduled from July 29 to August 1, 2026, at Joseph KI-ZERBO University in Ouagadougou, adopts as its central theme:

"Supporting access to energy, sustainable agriculture and food security through applied physics."

This choice reflects a desire for strategic focus. It is no longer simply a question of examining the general contribution of physics to development, but rather of identifying priority areas where coordinated scientific actions can produce measurable impact at the international level.

However, this thematic focus cannot ignore the cross-cutting issues that condition the scientific community' s capacity to act effectively. Several other strategic areas deeply structure the reflection of the congress:

- governance of science and innovation (scientific policies, funding, strategic steering);
- digital transformation and artificial intelligence as levers for scientific and industrial performance;
- adaptation of physics teaching and research in a context of massification and limited resources;
- sharing of scientific equipment and effective networking of researchers;
- transition from a logic of juxtaposition to a culture of regional scientific cooperation;
- energy sovereignty and industrial transformation based on research results;

- space physics for understanding the universe, Earth monitoring, and stimulating technological innovation;
- the transition from laboratory to factory, i.e., the industrial valorization of applied physics research.

The West African region has real but fragmented scientific potential. Multiple networks, platforms, and programs coexist, often mobilizing the same researchers without always generating sustainable synergies or structuring projects. For example, in the field of energy, alongside the SOAPHYS Energy and Renewable Energy Group, there are the CAMES Thematic Research Program in Energy (PTRC Energy), the Sub-Regional Renewable Energy Research Network (RESER), the West African Conference on Renewable Energy (WACRE), etc. Initiatives often remain isolated and poorly coordinated. The critical mass by thematic area remains weak in most laboratories, even though similar expertise exists across several countries.

Under these conditions, the central issue is no longer only that of individual scientific production, but rather the collective organization of research. How can we move from a succession of presentations to the construction of coherent regional programs? How can existing equipment be shared to strengthen scientific autonomy? How can transnational thematic communities capable of responding to competitive calls for proposals be structured? How can the productive sector and end users of innovations from physics be more effectively integrated?

The 8th SOAPHYS Congress therefore aims to become a turning point in the current dynamic. Although hosted in Burkina Faso, it is part of a regional and interregional dynamic aimed at strengthening intra-African research and consolidating collaborations beyond national borders.

The objective is to reposition SOAPHYS not only as a space for scientific presentation, but also as a strategic framework for structuring physics research in West Africa. This ambition implies:

- identifying skills and equipment available in the region;
- reflecting on a regional platform for shared scientific resources;
- integrating digital technologies and artificial intelligence into physics research and teaching;

- strengthening links between academic research, industry, and public decision-makers;
- rigorous valorization of scientific results, notably through the consolidation of the SOAPHYS Journal.

In an international context marked by increasing demands for performance, relevance, and impact, the credibility of a scientific congress can no longer be assessed solely by the number of presentations delivered. It must be measured by its ability to produce strategic orientations, generate collective commitments, and structure sustainable collaborative dynamics. The 8th SOAPHYS Congress therefore seeks to be a space for scientific and strategic convergence: a framework where applied physics contributes to clarifying major regional challenges and concretely organizing the collective responses necessary to address them.

2. General Theme and Scientific Areas

2.1 General Theme

The general theme, **"Supporting Access to Energy, Sustainable Agriculture and Food Security through Applied Physics,"** places applied physics at the heart of the structural transformations needed in West Africa. It aims to mobilize physical science disciplines as the scientific foundation for technological solutions adapted to regional realities, particularly in the fields of:

1. energy production, storage, and efficiency;
2. processing and preservation of agricultural products;
3. optimization of production systems;
4. modeling and decision support;
5. science-based industrialization.

2.2. Major Scientific Areas

Area 1: Energy Physics and Energy Sovereignty	Area 2: Applied Physics for Sustainable Agriculture, Water, and Food Security
• Photovoltaic and solar thermal conversion	• Thermal engineering and drying of agricultural products

• Nuclear energy • Electrochemical and thermal storage • Hydrogen and new energy carriers • Smart grids and mini-grids • Energy efficiency in the building, industrial, and transport sectors • Materials physics for energy • Modeling of energy systems • Physical approaches to regional energy sovereignty	• Physics of preservation processes • Fluid mechanics applied to irrigation • Instrumentation and sensors for agriculture • Modeling and design of agro-energy systems • Soil and water physics • Energy optimization of processing chains
Area 3: Space Science, Modeling, Simulation, and Data Science	**Area 4: Physics, Innovation, and Industrial Transformation**
• Space sciences: Astronomy, Astrophysics, Instrumentation, Geophysics • Physical modeling for the environment • Numerical tools and simulations applied to energy and agro-industry • Artificial intelligence applied to energy systems • Multi-physics optimization	• From laboratory to factory: technology transfer • Advanced materials and industrial processes • Physics for local transformation • Technological innovation and competitiveness • Scientific start-ups and technological entrepreneurship • Research–private sector interaction

2.3 Strategic Cross-Cutting Areas

These cross-cutting areas resulting from the main axes do not constitute isolated themes, but rather structuring dimensions that will permeate the entire congress.

Cross-Cutting Area A: Scientific Governance and Diplomacy	**Cross-Cutting Area B: Education, Massification, and Artificial Intelligence**
• Strategic management of research • Funding and international competitiveness • Sharing of scientific equipment • Regional platform for shared resources • Structuring of regional thematic communities • Transition from a logic of juxtaposition to a culture of cooperation	• Integration of AI into physics teaching • Digital tools for experimental training • Improving the quality of training for the new generation in a context of massification • Hybridization of face-to-face and digital learning • Collaborative regional doctoral training

Cross-Cutting Area C: Digital Technology, AI, Sustainable Development, Safety and Security	**Cross-Cutting Area D: Review and Strategic Perspectives of SOAPHYS**
• Artificial intelligence and energy optimization • Development of data science • Intelligent systems and resilience • Impact of AI on regional industrial transformation • Safety and security	• State of intra-regional collaborations • African interregional perspectives • Role of the SOAPHYS Journal • Post-2026 roadmap

3. Objectives of the Congress

These areas are not isolated themes, but structuring dimensions that will guide all presentations and discussions during the congress. These objectives will structure the congress by serving as a compass for both organizers and participants.

3.1 General Objective

To contribute to the structuring and strengthening of physics in West Africa through integrated regional cooperation in order to support access to energy, sustainable agriculture, and food security, moving from a logic of scientific juxtaposition to a dynamic of effective collaboration.

3.2 Specific Scientific Objectives

SO1 – Consolidate Regional Scientific Capacities in Strategic Areas

Operationally, this will involve:

- identifying existing expertise in energy physics, agro-physics, modeling, and industrial transformation;
- promoting in-depth scientific exchanges focused on priority regional issues;
- encouraging the convergence of research around structuring themes.

SO2 – Promote Modeling, Digital Technologies, and Artificial Intelligence as Accessible Scientific Levers

Operationally, this will involve:

- promoting simulation and data science approaches adapted to low-resource environments;
- exploring the integration of AI into energy and agro-industrial systems;
- encouraging the development of regional digital tools.

SO3 – Strengthen Orientation Toward Valorization and Industrial Transformation

Operationally, this will involve:

- stimulating interactions between researchers and the productive sector;
- identifying scientific results likely to lead to industrial applications through activities such as scientific-results hackathons and technological-results hackathons;
- promoting technological innovation originating from regional laboratories.

3.3 Structural and Institutional Objectives

SO4 – Structure Regional Scientific Cooperation

Operationally, this will involve:

- facilitating thematic networking among researchers working on similar issues;
- identifying foundations for the sharing of scientific equipment;
- initiating permanent regional working groups.

SO5 – Improve Scientific Governance and Regional Coordination

Operationally, this will involve:

- reflecting on the strategic management of physics research;
- identifying coordination mechanisms among existing networks;
- reducing the fragmentation of regional scientific initiatives.

SO6 – Adapt Teaching and Doctoral Training to Contemporary Challenges

Operationally, this will involve:

- analyzing the impact of massification on the quality of physics education;
- exploring the use of artificial intelligence and digital tools to improve teaching and research;
- encouraging co-supervision and regional inter-university doctoral training.

SO7 – Strengthen the Scientific Visibility of SOAPHYS

Operationally, this will involve:

- pooling West African resources and expertise across different research themes;
- consolidating the SOAPHYS Journal as a regional scientific publication platform;
- encouraging standards of quality and rigorous evaluation;
- positioning SOAPHYS as a strategic platform for West African physics.

3.4 Cross-Cutting Operational Objectives

This congress aims to define a new momentum in its adopted strategies in order to become more operational. It therefore seeks to:

- identify concrete avenues for regional collaborative projects;
- identify measurable institutional commitments in the short and medium term;
- produce structured recommendations accompanied by a monitoring mechanism.

4. Expected Results

At the end of the 8th SOAPHYS Congress, the following results are expected:

4.1 Scientific Results

R1 – A Regional Mapping of Scientific Expertise is Initiated

- Areas of expertise in energy physics, agro-physics, modeling, and industrial transformation are identified;
- Active teams and researchers by thematic area are listed;
- Foundations for regional thematic structuring are established.

R2 – Regional Thematic Communities are Established

- At least three regional working groups (for example energy, agro-physics, modeling/AI) are formally identified;
- A focal point or coordinator is designated for each group;
- A minimum schedule of post-congress exchanges is defined.

R3 – Regional Collaborative Project Opportunities are Identified

- Common priority themes are selected;
- Multi-country project intentions are formulated;
- Inter-institutional teams are outlined for joint responses to calls for proposals.

4.2 Results Related to Resource Sharing and Structuring

R4 – A Preliminary Assessment of Regional Scientific Equipment is Initiated

- The principle of a regional inventory of equipment is validated;
- A methodology for information collection is adopted;
- A coordination group is designated to oversee this initiative.

R5 – Recommendations on Scientific Networking are Formulated

- Concrete proposals to strengthen intra-regional cooperation are established;
- Coordination mechanisms among existing networks are identified;
- A post-2026 strategic roadmap is outlined.

4.3 Results in Innovation and Valorization

R6 – Research–Productive Sector Dialogue is Strengthened

- Structured interactions take place between researchers and private-sector stakeholders;
- Potential areas for technology transfer are identified;
- Prospects for university–industry collaboration are highlighted.

R7 – Scientific Valorization is Consolidated

- A commitment to strengthen the editorial quality of the SOAPHYS Journal is adopted;
- Selected communications are identified for publication;
- Scientific and ethical standards are reaffirmed and strengthened.

4.4 Results in Training and Digital Transformation

R8 – Guidelines for the Integration of Digital Technology and AI are Defined

- A regional assessment of infrastructure capacities (connectivity, equipment, etc.) and teachers' digital skills is carried out;
- Opportunities for integrating AI into physics research and teaching are identified;
- Regional best practices are shared;
- Collaborative initiatives in modeling and simulation are encouraged.

R9 – Recommendations to Improve the Quality of Physics Training are Formulated

- Proposals to strengthen regional doctoral training are discussed;
- Opportunities for co-supervision and regional mobility are explored.

4.5 Institutional and Strategic Results

R10 – A Final Declaration of the 8th Congress is Adopted

- It summarizes scientific and strategic orientations;
- It sets short- and medium-term action priorities;
- It establishes a minimum monitoring mechanism.

R11 – A Post-Congress Monitoring Mechanism is Established

- A monitoring committee or restricted group is identified;
- Intermediate deadlines (6 months – 12 months) are defined;
- An initial progress report is scheduled.

5. Organization of the Congress

The 8th Congress of the West African Society of Physics (SOAPHYS) will be held at Joseph KI-ZERBO University (UJKZ) in Ouagadougou, Burkina Faso. It will take place over four (4) days, from July 29 to August 1, 2026.

The four-day structure aims to:

- ensure a balance between scientific presentations and strategic sessions;
- reserve dedicated spaces for in-depth discussions and thematic meetings;
- avoid excessive concentration of presentations and promote quality exchanges;
- integrate specific workshops on collaboration, resource sharing, and valorization.

One day may include parallel workshops dedicated to regional structuring and meetings with the productive sector.

The congress organization will rely on the following bodies:

Local Organizing Committee

Based at Joseph KI-ZERBO University, it will be responsible for logistical coordination, registration management, participant reception, technical coordination of sessions, and local relations with institutional partners.

International Scientific Committee

It will consist of senior lecturers, researchers, and scientists from SOAPHYS member countries and external partners. Its main missions will be to define detailed scientific orientations, validate thematic areas, evaluate communication proposals, select oral and poster presentations, guarantee the scientific quality of the congress, and formulate final scientific recommendations.

SOAPHYS Supervisory Committee / Executive Committee

It will ensure the strategic supervision of the congress, consistency with SOAPHYS institutional orientations, validation of partnerships, and post-congress follow-up of adopted recommendations.

The congress will be organized in collaboration with:

- universities and laboratories that are members of SOAPHYS;
- regional research and higher education institutions;
- African and international scientific networks;
- technical and financial partners;
- private-sector actors (energy, agro-industry, instrumentation, digital technology);
- public bodies responsible for energy, agriculture, and innovation.

Particular attention will be paid to:

- strengthening dialogue between universities and the productive sector;
- involving employers of physics graduates;
- mobilizing partners capable of supporting regional collaborative projects.

6. Scientific Format

The SOAPHYS 2026 Congress, which will be held in hybrid mode, will combine plenary lectures, oral presentations, poster sessions, and thematic workshops in order to promote exchanges among researchers, strengthen collaborations, and valorize scientific results.

It will notably include:

- statutory meetings and the SOAPHYS General Assembly;
- plenary lectures on the general theme of the congress and the different thematic areas;
- parallel oral presentation sessions;
- poster sessions;
- thematic workshops focused on key subjects (energy, sustainable agriculture, scientific collaboration, equipment sharing) to develop concrete recommendations and strengthen regional cooperation;
- exhibition stands and demonstrations for institutional and industrial partners, promoting the link between research and practical application;
- sectoral panels;
- tourist visits.

7. Participation and Submission

The congress is intended for a broad audience around physical sciences and their applications:

- lecturers, researchers, and doctoral students;
- experts and decision-makers from the public and private sectors;
- representatives of regional, national, and international institutions;
- economic actors, NGOs, and the scientific diaspora.

Participants wishing to present work must submit a communication proposal (oral or poster) and pay the related fees. Participants not presenting work may attend the sessions without presenting, subject to registration and payment of participation fees. Each participant is responsible for covering their own travel and accommodation expenses.

The submission procedure is as follows:

- submission of proposals via the official congress platform within the indicated deadlines;
- evaluation by the scientific committee in line with the thematic areas of the congress;
- notification to selected authors;
- final registration and payment of fees for accepted communications.

Participation Fees (In-person)

- Lecturers and Researchers: 20,000 FCFA
- Students (doctoral candidates): 10,000 FCFA
- Other participants: 25,000 FCFA

Online Participation Fees

- Online participation: 30,000 FCFA
- Institutional participation: 30,000 FCFA

Exhibition Stands

1. Research Laboratories and SMEs: 100,000 FCFA
2. Public Companies, Private Companies, Others: 200,000 FCFA

8. Timeline

Activity	Period
Validation of the TOR by the SOAPHYS Executive Committee	February 26, 2026
Establishment of committees (organization and scientific)	February 26, 2026
Official launch of the call for papers	March 1, 2026
Preparation and dissemination of invitation letters (speakers, partners, institutions)	March – April 2026
Mobilization of institutional and private partners	March – April – May 2026
Opening of online registration	March 2026
Submission of abstracts	March 1 – May 31, 2026
Second call for papers	May 1, 2026
Evaluation of abstracts by the Scientific Committee	Mid-April – June 20, 2026
Start of notifications to authors regarding evaluation results	Early May 2026
Confirmation of participation	June 2026
Submission of full papers (for proceedings or journal selection)	July 15, 2026
Finalization of the scientific program	July 15, 2026
Publication of the final program	July 20, 2026
Logistical organization (rooms, materials, stands)	March – July 15, 2026
Congress dates	July 29 – August 1, 2026
Adoption of the final declaration and recommendations	July 31, 2026
Establishment of the monitoring	July 31, 2026

Activity	Period
committee	
Publication of proceedings / selection for SOAPHYS Journal	September – December 2026
First progress review of working groups	January 2027

9. Follow-up and Valorization

- A summary report and conference proceedings will be produced and made available to participants after the congress.
- Recommendations resulting from the sessions will be recorded and transmitted to the relevant institutions and partners to facilitate their implementation.
- Scientific results deemed relevant may be published in the SOAPHYS Journal after evaluation by the scientific committee.