



Siège Social BP : 8210 YAOUNDE –
CAMEROUN Association reconnue par Arrêté
préfectoral
N° 000156/RDA/J06/BAPP du 08 février 2007

Site web: www.scp-web.org, email: info@scp-web.org

INTERNATIONAL CONFERENCE

On

«HIGH LEVEL PHYSICS AND APPROPRIATE SOLUTIONS TO REAL LIFE PROBLEMS IN DEVELOPING COUNTRIES »

7th Edition (06-10, December 2021)

I. Description

The seventh edition of the International Conference on « **High Level Physics and Appropriate Solutions to Real Life Problems in Developing Countries** » will take place from 06 to 10 December 2021 in Douala (National Polytechnic School) and Yaoundé (University of Yaoundé I) and in both physical and Visio-conference attendances formats. The goal of the seventh edition of the conference is to

- Present the state of the art of the development in nonlinear dynamics applied to engineering (electrical, mechanical, electromechanical and optical engineering), materials sciences and condensed matter physics, atomic and molecular physics,
- Show the special emphasis on applications bringing solutions to real-life-problems encountered in developing countries,
- Focus on some relevant contribution of Physicists related to the COVID-19 pandemics,
- Present the results of the APSA competition on Experimental Physics.

Following the driven idea at the origin of the series of the conferences (see below), emphasis will be put on scientific achievements in physics that fulfil at least two of the following criteria:

- Research topics that can be covered entirely (theory, experiment and hints for application) in developing countries with limited resources,
- High level scientific research topics that have been published or are publishable in good international journals,
- Research topics that have impact on the technological, economic and social development in developing countries.

II. Participation and Funding

II-1- Participation:

Participation is open to any scientists from any country. The contact for information about how to participate can be obtained using the following email addresses: info@scp-web.org and brnana2@gmail.com and tchitnga@yahoo.fr and louodop@yahoo.fr.

II-2- Funding:

APSA (Association Pour la Promotion Scientifique de l'Afrique : www.scienceafrique.fr). Cameroon Academy of Sciences and Cameroon Physical Society (Participation fees) always contribute financially and logistically in various manners. We are still looking for funds from other national and international institutions to support the participation of young physicists from various African countries. Participants are strongly advised to search for their own means of funding.

International advisory board

- **Hilda Cerdeira**, University of Sao Paulo, Sao Paulo, Brazil.
- **François Piuzzi**, CEA Iramis, France.
- **Carlo Iorio**, Université Libre de Bruxelles, Belgium.
- **Yanne Chembo Kouomou**, University of Franche-Comté, Besaço France.
- **Jean Chabi Orou**, Université d'Abomey-Calavi, Cotonou, Bénin
- **Vincent Uchechukwu**, University of Ago-Iwoye, Nigeria.
- **Uwe Dorka**, University of Kassel, Germany.
- **Giovanni Filatrella**, Department of Science and Technologies, University of Sannio, Italy

Local organizing committee: Executive of the Cameroon Physical Society:

- **R. Tchitnga** (President), University of Dschang, Cameroon
- **B.R. Nana Nbandjo** (General Secretary), University of Yaoundé I, Cameroon
- **S. Zekeng** (Treasurer, Head of the section Physics of Materials), University of Yaoundé I, Cameroon
- **P. Louodop** (Substitute Head, section Physics for development), University of Dschang, Dschang, Cameroon
- **P. Wofo** (Head, section Physics and applications of Transducers and Sensors), University

of Yaoundé I, Cameroon

- **A. Tiedeu** (Head, section Medical Physics), University of Yaoundé I, Yaoundé, Cameroon
- **S.G. Nana Engo** (Head, section Atomic Physics, Molecular and Quantum optics), University of Ngaoundéré, Cameroon
- **O. Motapon** (Former president), University of Maroua, Cameroon
- **Nsangou Mama** (section Atomic Physics, Molecular and Quantum optics)
- **A. Kenfack** (Head, section Nonlinear Statistical Physics) University of Yaoundé I, Cameroon
- **G. Tchuen** (Head, section Computational Physics) University of Dschang, Cameroon
- **M. Kamta** (Head, section Solar Energy) University of Ngaoundéré, Cameroon Physical
- **Saidou** (Head, section Nuclear Physics, President of the Cameroon Society of Radioprotection), University of Yaounde I, Cameroon

III. History of the series

III.1- Driving idea

An important problem faced by the majority of Physicists from developing countries is that their research activities are far from developmental goals of their countries. Those of them tackling problems related to some local development objectives will not succeed in publishing their results in good scientific journals. Meanwhile they need publications in good international peer-reviewed journals for their academic promotion and international visibility. Researchers carrying out publishable works in international journals rely mainly on the theoretical aspects with sometimes experimental parts carried out in developed countries laboratories thanks to various funding institutions and individual contacts abroad. The decision-makers in developing countries, either do not have sufficient fund, or do not find the necessity to fund expensive equipment for research topics that have no direct and immediate links to problems suffered by their population. This constitutes a big threat to the development of physics activities and is certainly the most important cause of lack of public and decision-makers awareness on the benefits that come from research in physics. As a consequence, a large number of physicists who want to maintain their scientific standard generally move abroad to work in stimulating environment, so the brain-drain.

Aware of this fact, the Cameroon Physical Society launched in 2009 a series of biannual conferences on the general topic: “Low Cost High Physics and Appropriate Solutions to Real life Problems in Developing countries”.

III.2- Success of the first edition (2009)

The first conference of the series took place from 8 to 10 December 2009 and two days training on specialized topics (6 and 11 December) with 64 participants coming from Europe, Latin America and Africa and covered many physics disciplines. It was supported by the International Centre for Theoretical Physics, the International Group of Physics for Development at the European Physical Society, Institute for Theoretical Physics of Sao Paulo (Brazil), The Faculty of Science (University of Yaoundé I, Cameroon) and the Cameroon Physical Society. The topics of the conference were:

- Nonlinear Physics and Complex Systems,
- Renewable energies,
- Medical Physics and Water potabilisation,
- Methods for research and innovation for scientific instruments.

The direct funding of the conference came from The International Centre for Theoretical Physics (Trieste, Italy), Physics for Development at the European Physical Society, Faculty of Science (University of Yaoundé I) and Cameroon Physical Society.

III.3- Success of the second edition (2011)

The Second Edition of the CPS International Conference on “*Low Cost High Physics and Appropriate Solutions to Real Life Problems in Developing Countries*” took place from 5 to 9 December 2011, Yaoundé (Cameroon). 65 scientists including famous physicists from Belgium, Brazil, Canada, Cameroon, Congo, France, Germany, Ivory Coast, Nigeria and Spain met to discuss on high level scientific ideas on the following topics:

- Semiconductor lasers and photonic materials,
- Medical and Biological Physics,
- Modeling of ecological and social phenomena,
- Appropriate and low cost instrumentation,
- Appropriate solutions to real-life problems.

The funding of the second edition was supported by the institutions indicated above as well as various universities abroad with the support of their scientists (University of Palma de Mallorca, Instituto de Fisica Interdisciplinar y sistemas complejos (IFISC) UIB-CSIC, Mallorca (Spain) ; Institute for Theoretical Physics, University of Sao Paulo (Brazil); Université de Franche-Comté, Besançon (France); Ecole de Technologie Supérieure, Montréal (Québec, Canada); Université Libre de Bruxelles (Belgium); Free University, Berlin (Germany); CEA Iramis (France).

III.4-Success of the third edition (2013)

The Third Edition of the CPS International Conference on “*High Level Physics and Solutions to Real Life Problems in Developing Countries*” took place from 25-29 November 2013, Yaoundé (Cameroon). More than 100 people came from Belgium, Benin, Central African Republic, Chad, Congo, France, Ivory Coast, Kenya, Uganda, South Africa and Cameroon. One sees the appearance of people from Eastern and Southern Africa, who were not present during the two first editions. The main topics of the 2013 conference were:

- High level research topics in Electromechanics (MaEMS, MEMS and NEMS): fundamental studies and applications based on different types of or on the types of actions,
- High level research topics in Optoelectronics: fundamental studies and applications based on different types of effects,

- State of Physics in Africa (Sub-Saharan Africa, excluding the Republic of South Africa).

However due to the success of the two first editions and following the wish of many members of the Cameroon Physical Society, the 2013 edition was strongly expanded to include the following parallel or satellite conferences and managed by dedicated funding members of the Cameroon Physical Society:

- Chaos in Cameroon and Africa,
- Atomic and Molecular Physics and Quantum Optics,
- Quantum Toolbox in Python-software for Quantum Optics,
- Physics for Medecine,
- Nuclear Physics,
- Computational Physics,
- Solar Energy,
- Miscellaneous contributions for development.

The funding of the third edition was supported by the following institutions; International Union of Pure and Applied Physics (IUPAP), International Centre for Theoretical Physics (ICTP), and Cameroon Physical Society as well as various universities abroad with the support of their scientists; Université de Franche-Comté, Besançon (France), Université Libre de Bruxelles (Belgium).

III.4- Success of the fourth edition (2015)

From 24-28 November 2015, the Cameroon Physical Society organized the fourth edition of his conference series on “*High Level Physics and Solutions to Real Life Problems in Developing Countries*”. The goal of the fourth edition of the conference was to share the up-to-date high level information in the fields of Transducers/sensors and electromechanical applications, Transducers/sensors and electromechanical applications, optoelectronics, physics for telecommunications, radiation protection, environmental radioactivity, physics of solar energy, quantum information and molecular physics from the fundamental physics perspectives (classical, quantum, statistical physics and complex systems concepts) to applications (with special emphasis on applications bringing solutions to real-life-problems encountered in developing countries). The conference that took place in three (3) locations (Hotel Franco, Centre for Scientific Cooperation between Africa and Germany and Hotel Merina) was attended by more than 100 people. Foreign participants (14) came from Belgium (1), New Zeland (1), Benin (2), Spain (1) Central African Republic (1), Congo (1), France (2), Burkina Faso (1), Nigeria (1), Kenya (1), Japan (2). One sees that the number of people from Africa, are increasing.

The direct funding of the conference came from Association pour la Promotion Scientifique en Afrique (APSA), International Centre for Theoretical Physics (ICTP), Trieste, Italy and Cameroon Physical Society (CPS). The fund received from APSA and ICTP was in its large part used to support foreign African participants for flight tickets and board and lodging.

More than 75 oral presentations (41 form the session IYL, 13 for Atomic Molecular Physics and quantum optics, 17 for computational Physics, and 4 from radiation protection) were given, a large number of which was given by young physicists and PhD

students. Special emphasis was also put on the poster sessions since young participants had many ideas to share. That is why 19 posters were presented and the best posters were awarded prizes.

III.4- Success of the fifth edition (2017)

From 04-08 December 2017, the Cameroon Physical Society organized the fifth edition of his conference series on “High Level Physics and Solutions to Real Life Problems in Developing Countries”. This conference follows the four first editions that took place in 2009, 2011, 2013 and 2015.

The 2017 edition had a special character in that it contained a half-day session for the presentation of the results of the Experimental Physical Challenge organized with the support of the Association for the Scientific Promotion of Africa (APSA). The objective of the competition is to engage and support young Africans in the field of instrumentation innovation for the teaching of experimental sciences, with a view to reducing, through endogenous actions, the deficit in experimentation, both in general education and in technical education.

The main activity of the conference was the following: Nonlinear oscillations, Chaos, and Applications of Transducers, materials physics, medical physics.

The conference that took place in three (3) locations (Hotel Franco, Centre for Scientific Cooperation between Africa and Germany and Polytechnic School Yaounde) was attended by more than 98 peoples. Foreign participants (12) came from Belgium (1), Benin (3), Central African Republic (1), France (4), Burkina Faso (1), Kenya (1) and Japan (1). One sees that the number of people from Africa is increasing.

The direct funding of the conference came from:

- Association pour la Promotion Scientifique en Afrique (APSA)
- International Centre for Theoretical Physics (ICTP), Trieste, Italy,
- Cameroon Physical Society (CPS).

More than 60 oral presentations were given, a large number of which was given by young physicists and PhD students. Special emphasis was also put on the poster sessions since young participants had many ideas to share. That is why 15 posters were presented. The recipients of the poster prizes are the following: All the presentations were followed by a series of interesting questions, indicating the quest of understanding from all the participants.

The experimental physics competitions shows the possibility of the development of low cost innovative devices for didactic and research purpose on experimental physics, but also devices that can bring solutions to problems faced by the populations

The extension of the contents of this 5th edition has proven to be very important for the conference since many people from diverse disciplines had the opportunity to give their presentation. This is the result of our re-organization of the Cameroon Physical Society by adopting a structure based on thematic sections linked to physics fields instead of regional sections linked to Cameroonian universities.

III.4- Success of the sixth edition (2019)

From 25-30 November 2019, the Cameroon Physical Society organized the sixth edition of his conference series on “High Level Physics and Solutions to Real Life Problems in Developing Countries” With a special session on the **APSA competition on Experimental Physics**. This conference follows the five first editions that took place in 2009, 2011, 2013, 2015 and 2017.

The 2019 edition had a special character in that it contained a half-day session for the presentation of the results of the Experimental Physical Challenge organized with the support of the Association for the Scientific Promotion of Africa (APSA). The objective of the competition is to engage and support young Africans in the field of instrumentation innovation for the teaching of experimental sciences, with a view to reducing, through endogenous actions, the deficit in experimentation, both in general education and in technical education.

The main activity of the conference was the following: one session on the Condensed Matter + Material + Science + Computational Physics + Geophysics another session Nonlinear Dynamics and Complex System.

The conference that took place at the conference Hall call “Amphi 1000” » of the university of Dschang in south Cameroon. Parallel session also took place at two room situated inside this conference hall. This year more than 75 peoples attended the conference. Foreign participants (12) came from Belgium (1), Nigeria (1), Brazil (1), France (3), Germany (3) and USA (2).

The direct funding of the conference came from:

- Association pour la Promotion Scientifique en Afrique (APSA)
- International Centre for Theoretical Physics (ICTP), Trieste, Italy,
- Cameroon Physical Society (CPS). For the special session on

The special session on APSA competition on Experimental Physics was devoted to the presentation of the results of the African competition on experimental physics; competition organized by the Association Pour la Promotion Scientifique de l’Afrique (APSA) with its partners (Fondation Daniel Iagoniltzer, Société Française de Physique, Sci-Tech Services, Société Camerounaise de Physique, Académie des Sciences du Cameroun and AUF). The aim of this competition was the development, by Africans, of low cost innovative instruments for didactic and research purpose on experimental science, but also devices that can bring solutions to problems faced by the populations. This session also be extended some other topics showing some recent contributions on experimental physics made by African scientists. For the result of this completion take a look on the web site.

More than 50 oral presentations were given, a large number of which was given by young physicists and PhD students. Special emphasis was also put on the poster sessions since young participants had many ideas to share. That is why 25 posters were presented. All the presentations were followed by a series of interesting questions, indicating the quest of understanding from all the participants.

The extension of the contents of this 6th edition has proven that, the level of our PhD student are growing all over the country. I appear clearly that the number of PhD defence in Physics of the other university increase every year and that the Cameroonian Physical society is on the right way.

Tentative list of speakers

Cameroon

More than 50 Talks and posters present by the student will be selected. Above are the lists of senior researcher who have already confirm their participations.

1. **Paul Wofo**, University of Yaoundé I, Cameroon
2. **Zekeng serge**, University of Yaounde
3. **Tchitnga Robert**, University of Dschang, Cameroon
4. **Mouangue Ruben**, University of Douala
5. **Nana Nbandjo BR**, University of Yaoundé I, Cameroon
6. **Nana Engo**, University of Yaounde I, Cameroon
7. **Kenfack Aurelien**, University of Yaounde I, Cameroon
8. **Tiedeu Alain**, University of Yaounde I, Cameroon
9. **Kamta Martin**, University of Ngaoundere, Cameroon
10. **Saidou**, University of Yaounde I, Cameroon
11. **Nguiya Severin**, University of Douala, Cameroon
12. **Talla Mbe Jimmy**, University of Yaoundé I, Cameroon
13. **Takougang Sifeu**, University of Yaoundé I, Cameroon
14. **Ngayihi Claude**, University of Douala, Cameroon
15. **Nana Bonaventure**, University of Bamenda, Cameroon **Africa**
16. **Kondji Yvon**, Université de Bangui, Central African Republic
17. **Oumarou Sanda Abbo**, Université de Bangui, Central African Republic
18. **UE Vincent**, Olabisi University, Nigeria
19. **Moulay Ismail**, University, Errachidia, Morocco
20. **Jean Bio Chabi Orou**, University of Abomey-Calavin, Cotonou, Benin
21. **Zakaria Marouf Barka**, Université University of Abéché, Tchad
22. **Yendoube Lare**, University of Lomé, Togo
23. **Choukri Abdelmajid**, University Ibn Tofail, Kenitra, Maroc
24. **Adam Barka**, University of Abéché, Tchad.

Europe and Americas

1. **Yanne Chembo Kouomou**, University of Franche-Comté, France
1. **Giovanni Filatella**, University of Sannio, Italy
2. **Y. Chembo Kouomou**, FEMTO-ST, Besançon, France
3. **Nguimdo Modeste R.**, Vrije Universiteit Brussels, Brussels, Belgium
4. **Cedrick Kitio Kwuimy**, Villanova University, USA
5. **C. Nataraj**, Villanova University, USA
6. **Kraenkel Roberto André**, University of Sao Paulo, Sao Paulo, Brazil
7. **Hilda Cerdeira**, University of Sao Paulo, Sao Paulo, Brazil
8. **Carlo Iorio**, Université Libre de Bruxelles, Brussels, Belgium
9. **Piuzzi François**, Commissariat à l’Energie Atomique, Paris, France
10. **Uwe Dorka**, University of Kassel, Germany
11. **Didier Franck**, Institut de Radioprotection et de Sûreté Nucléaire, Paris, France
12. **Chunlai Li**, Hunan Institute of Science and Technology Yueyang, Hunan, China
13. **Beverly Karplus Hartline**, Montana Tech, Butte MT, USA
14. **Stephane Kenmoe**, University of Duisburg-Essen, Germany