Cameroon Physical Society

Siège Social BP : 8210 YAOUNDE – CAMEROUN
Association reconnue par Arrêté préfectoral
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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 »

4th Edition (24-28 November, 2015)

I- Description

The fourth edition of the International Conference on « HIGH LEVEL PHYSICS AND APPROPRIATE SOLUTIONS TO REAL LIFE PROBLEMS IN DEVELOPING COUNTRIES » will take place from 24 to 28 November 2015 in Yaoundé and Dschang, Cameroon.

The main fields of the third edition are:

- Transducers / sensors and electromechanical applications,
- Optoelectronics,
- Low cost instrumentation and other appropriate solutions to real-life problems,
- Physics for Telecommunications,
- Radiation Protection
- Environmental Radioactivity
- Physics of Solar Energy
- Quantum information
- Molecular Physics

Indeed, one of the most interesting innovation in the CPS is that is his structuration into thematic sections (instead of regional committee) managed by competent and dedicated individuals who are also part of the Executive Office of the CPS. Our last international conference in December 2013 showed the efficiency of the above mentioned structuration. Indeed, several conference sessions on different topics were held at the same time in separate sites.

The goal of the fourth edition of the conference is 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).

From the above indications, the main activities of the conference are the following:

- **Activity 1:** *Light sensors and Transducers: Physical basis and applications*. The goal of the conference is to present high quality theoretical and experimental research results on light sensors/transducers fulfilling at least two of the following criteria: limited budget, high level topic, impact on appropriate technologies. (Yaoundé 25-27 November 2015).
- **Activity 2:** *Active Learning in Optics and Photonics* (Alop-Unesco) (Dschang, 16-20 November 2015).
- **Activity 3:** *Conference on Radiation Protection.* Topics: Radiation Protection, Dosimetry, Environmental Radioactivity, Monte Carlo Simulation in Radiation Physics.

- **Activity 4:** *Presentations on high level research topics in Optoelectronics*. Fundamental studies (theoretical investigations based on classical, quantum, statistical and complex systems approaches, and experimental studies) and applications based on different types of effects (photoelectric, photovoltaic, photoconducting, simulated emission, Lossev, photo-emissivity).
- **Activity 5:** *Presentations on high level research topics on Applications including prototypes at the macro-, micro- and nano- levels.* Particular emphasis on those related to real-life problems in developing countries: automatic control systems, robot arms manipulators, energy harvesting, control of vibrations, bio-inspired robots, telecommunications, medical devices, musical instruments, other services.
- **Activity 6:** Second edition of the special trainings on the main fields of the conference and on *innovation for physics for development*.
- **Activity 7:** Training session in *molecular spectroscopy* and second edition of training session on *quantum information*.

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 number of participants will be limited to 45 for each activity.

a- Distinguished Physicists: As for the three first editions (see below or in www.scp-web.org), distinguished physicists from Europe, America and Africa have been selected and invited for each topic.

b- Participation is open to any scientists from any country. We encourage all the participants to interact by given at least one presentation (oral or poster). Send the title and abstract of your presentation to the contact person of the topic (s).

c- Fees: Participation fees to be paid to the contact person (with a receipt after payment) are as follows (for one topic of the conference)

- CPS Members (with dues paid) and invited participants: FREE
- Nonmembers: 10 000 Fcfa (for students) and 20 000 Fcfa (for others).

The participation fees will contribute to the conference documents, coffee break and lunch.

d- Date line for application: **31 august 2015**.

e- Tourism: details will be given later

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 omotapon@univ-douala.com.

II-2- Funding

We are looking for funds from international institutions (to be named after their agreement and conditions), Cameroonian Universities, Cameroonian enterprises. Cameroon Physical Society always contributes in various manners. Participants are strongly advised to search for their own means of funding.

Organizing Institution: *Cameroon Physical Society*

International advisory board:

- **Annick Suzor-Weiner**, Université Paris-Sud, Paris, France. (Physics for development)
- **Hilda Cerdeira**, University of Sao Paulo, Sao Paulo, Brazil. (statistical physics)
- **François Piuzzi**, CEA Iramis, France. (Innovation for appropriate instrumentation and physics for development)
- **Carlo Iorio**, Université Libre de Bruxelles, (Belgique)
- **Yanne Chembo Kouomou**, University of Franche-Comté, Besaçon, France (Optoelectronics)
- **Jean Chabi Orou**, Université d'Abomey-Calavi, Cotonou, Bénin (electromechanics)
- **Vincent Uchechukwu**, University of Ago-Iwoye, Nigeria (statistical physics).
- **C. Nataraj,** Villanova University, Villanova, USA (Electromechanics).
- **-Giovanni Filatrella**, Department of Science and Technologies, University of Sannio, Italy
- **Fridolin Kwabia Tchana**, Université Paris-Diderot (Molecular Physics)

Local organizing committee

Executive of the Cameroon Physical Society:

- **O. Motapon** (President), University of Douala, Cameroon
- **B.R. Nana Nbendjo** (General Secretary), University of Yaoundé I, Cameroon
- **S. Zekeng** (Treasurer, Head of the section Physics of Materials), University of Yaoundé I, Cameroon
- **R.Tchitnga** (Head, section Physics for development), University of Dschang, Dschang, Cameroon
- **P. Woafo** (Head, section Physical of Sensors and Transducers), University of Yaoundé I, Cameroon
- **A. Tiedeu** (Head, section Medical Physics), University of Yaoundé I, Yaoundé, Cameroon
- **S. Nana Engo** (Head, section Atomic Physics, Molecular and Quantum optics), University of Ngaoundéré, Cameroon
- **D. Njomo** (Head, section Renewable Energy and Energy Management) University of Yaoundé I, Yaoundé, Cameroon.
- **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
- **Y. Chembo Kouomou**,(Head, section Physics for Telecommunication), University of Franche-Comté, Besançon, France.

III- History of the series

II-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".

II-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.

II-3-Success of the second edition

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).

II-4-Success of the third edition

The Third Edition of the CPS International Conference on "High Level Physics and Solutions to Real Life Problems in Developing Countries" took place from 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,
- - Miscellaneaous 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).