

Cameroon Physical Society



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# PROGRAMME

*5<sup>th</sup> International Conference*  
*on*

**“HIGH LEVEL PHYSICS AND APPROPRIATE SOLUTIONS TO REAL  
LIFE PROBLEMS IN DEVELOPING COUNTRIES”**

***With a special session on the  
APSA competition on Experimental Physics***

**04 – 08 November 2017  
Yaoundé, Cameroon**

Organised by  
**Cameroon Physical Society**

With the support of



*The Abdus Salam  
International Centre  
for Theoretical Physics*



*Association pour la  
Promotion Scientifique  
de l'Afrique*



*Cameroon Academy of  
Sciences*

*Fondation  
Daniel Iagolnitzer*



*European physical  
Society*



**Sci-Tech-Services**



*Société française de  
physique*



**Tuesday 05 December 2017**

## **Training and presentations on the use of microcontrollers and FPGA in Nonlinear Dynamics**

**Part 1: 08:00 – 12 h: Training on the use of microcontrollers and FPGA in nonlinear dynamics.**

**Part 2: Presentations (13 h-17 h)**

**13 h-13 h 30:** FPGA implementation of Voice Encryption using a chaotic system based Random Number Generator, Achile Tchahou Tchendjeu, University of Dschang, Cameroon.

**13h30-14 h:** Controlling pulse-like self-sustained oscillators using analog circuits and microcontrollers, Ulrich Simo Domguia, University of Yaoundé I, Cameroon

**14h-14h30:** Microcontroller Simulation of the dynamics of nonlinear systems in the presence of delay: cases of Minorsky's and Lotka-Volterra equations, Ulrich Ngouabo, University of Dschang, Cameroon

**14h30-15h:** Microcontroller control/synchronization of the dynamics of Van der Pol oscillators submitted to disturbances. Raoul Thepi Siewe, University of Yaoundé I, Cameroon

**Wednesday 06 December 2017**

## **Training and presentations on Optomechanics and Semiconductor Lasers**

**Part 1: 08:00 – 10 h: Modelling Optomechanical systems and applications.**

**Part 2: 10h-12 h: Modelling quantum dots lasers**

**Part 3: Presentations (13 h-17 h)**

**13h-13h30:** Nonlinearity-induced limitations on cooling in optomechanical systems, Philippe Djourwe, Department of Physics (IEMN), Université de Lille 1, Lille, France.

**13h30- 14 h:** Distant entanglement enhanced in P-T symmetric optomechanics, Carole Tchodimou, University of Ngaoundéré, Cameroon

**14h-14h30:** Response of a resonant tunnelling diode optoelectronic oscillator coupled to a nonlinear electrical circuit, Raoul Thepi Siewe, University of Yaoundé I, Cameroon

**14h30-15h:** Powering optoelectronic oscillators with self-sustained electronic oscillators, Mboyo Kouayep, University of Yaoundé I, Cameroon.

**15h-15h30:** Dynamics of an array of micro-beams driven by an electrical line of Josephson junction element, Nadine Kouami Mbeunga, University of Yaoundé I, Cameroon

**15h30-16h:** Coherent dynamic and transitions in an array of Josephson junctions, Gael Simo, University of Dschang, Cameroon.

**16h-16h30:** Bifurcations and Multistability, Coexistence of multiple Hidden attractors and phase synchronization in a New Josephson-junction Based Coupled Oscillators, Calvin Talla, University of Dschang, Cameroon.

Thursday 07 December 2017

## Conference on Nonlinear oscillations, Chaos, and Applications of Transducers

### Part 1: Optoelectronics, optomechanics and electromechanics

#### a-Optoelectronics

**08h30- 8h55:** Fast photonic information processing using quantum well semiconductor lasers, Romain Modeste Nguimdo, Université Libre de Bruxelles, Belgique

**8h55- 09h20:** Simple alternative of generating complex optical waveforms and their applications, Jimmi Hervé Talla Mbé, University of Dschang, Cameroon.

#### b-Optomechanics

**09h 20-09h45:** Engineering mechanical PT-symmetry in optomechanics: phononic frequency comb, Philippe Djourwe, Département de Physique (IEMN), Université de Lille 1, Lille, France.

**9h45- 10h 10:** Theoretical analysis and electronic implementation of an optomechanical system, Sifeu Takougang Kingni, Université de Maroua, Cameroon.

#### c-Electromechanics

**10h10- 10h35:** Analysis of an array of electromechanical devices driven by a new Josephson-junction neuron model mimicking the locomotion of myriapods, Gaétan Fautso Kuiaté, University of Bamenda, Cameroon.

**10h35-11h00:** SALI (Smaller Alignment Index): A fast and efficient tool to characterize dynamics of conservative and non-conservative systems, and applications to some dynamical systems, Murielle Vanessa Tchakui, University of Yaoundé I, Cameroon.

### 10h35-11h10: Pause

### Part 2: Electronic circuits, mechanical systems and general formalisms on nonlinear systems.

#### a- Electronic circuits:

**11h10-11h35:** Dynamic analysis, FPGA implementation and application of chaotic systems with hidden attractors, Victor Kamdoum, University of Dschang, Cameroon

**11h35-12h00:** Chaos in simple Jerk circuits and its control, Tekou Nguazon, University of Dschang, Cameroon.

**12h00-12h25:** Nonlinear resonance analysis of RLC circuit subjected to mixed frequency voltage, C. Miwadinou, University of Parakou, Benin

**12h25-12h50:** Coherent motion of chaotic systems and Alternative dynamics in a network of a new chaotic Colpîts circuit, Patrick Louodop, University of Dschang, Cameroon.

#### b- Mechanical systems

**12h50- 13h15:** Stochastic dynamics of cantilever beam under wind flow, J. Mabekou, University of Dschang, Cameroon.

**13h15-13h40:** Pagoda system: a good proposition of structural control device for area suggested to earthquake loads or wind, Raïssa Fankem, University of Yaoundé I, Cameroon.

#### c- General formalisms on nonlinear systems

**13h15-13h40:** Chaotic motions in forced mixed Rayleigh-Lienard oscillator with periodic external and parametric excitations, V. Monwanou, Université d'Abomey-Calavy, Bénin

**13h40-14h05:** Generalized synchronization and deterministic coherence resonance in a system of coupled Duffing-Homes and Van der Pol oscillators, Elie Bertrand Megam Ngouonkadi, University of Dschang, Cameroon

**14h05-14h30:** Hysteresis, Resonant Oscillations and Bifurcation Mode of a plasma oscillations modeled by a Forced Modified Van Der Pol- Duffing Oscillator, L. Hinvi Amoussou, Université d'Abomey-Calavi, Bénin.

**14h05-14 h30:** Stability analysis of phase-locked oscillation states in coupled oscillators under two time-delay feedbacks, Romain Modeste Nguimdo, Université Libre de Bruxelles, Belgique

### Part 3: Structures pour le développement scientifique

**14h35- 15h00 :** Contribution de la fabrication numérique dans l'évolution de la physique expérimentale au Cameroun : Cas d'Ongola Fablab, 1er Fablab au Cameroun, Marius Tchakounang, Ongola Fablab, AUF, Cameroun.

**15h00-15h25:** Sci-Tech Services, Professeur Paul Wofo, Promoteur de Sci-Tech Services.

### Part 4 : Poster session: 15h30-17h30

**5<sup>ème</sup> Conférence Internationale sur****“La Physique et les solutions adaptées aux problèmes concrets des pays en développement”***Session spéciale***Vendredi 08 décembre 2017, Hôtel Franco, Nlongkak, Yaoundé****Cérémonie de remise des prix du concours de Physique Expérimentale (APSA)**

09h- 9h10 : Installation

**Première partie : présentations des différentes institutions impliquées**

9h10-9h25 : APSA (Association pour la Promotion de la Science en Afrique) et Fondation Daniel Iagolnitzer, Annick Suzor-Weiner, Professeur Emérite, Université Paris-Sud, France.

09h25-09h25: Express Union

09h35-09h45 : Présentation de l'Académie des Sciences du Cameroun, Dr. David Mbah, Secrétaire exécutif.

09h45- 10h05: Société Française de Physique, Commission Physique Sans Frontière Prof. Dave Lollman, Université de Marseille, France.

10h05-10h15 : Société Camerounaise de Physique, Prof. O. Motapon, Président Société Camerounaise de Physique

10h15-10h25 : Echanges portant sur les institutions

10h25-10h35 : Pause

**Deuxième partie : le concours : genèse, organisation, remise des prix**

10h35- 10h50 : Genèse, objectifs et suites du concours : APSA, Prof Daniel Hennequin, Université de Lille 1, Lille, France

10h50- 11h : Déroulement du concours: les étapes, le nombre de candidats, Prof. Paul Wofo, Université de Yaoundé I, Cameroun, membre APSA

11h00-11h10 : Jury - principes et composition

Prof. Dave Lollman, Université de Marseille, France.

11h10-11h20 : Echanges portant sur le concours

11h20- 12 h00 : Présentation des vidéos des 4 finalistes

12h00- 12h30 : Résultats et remise des prix.

**3ème Partie:** 12h30-13 h00 : Echanges avec les journalistes. Clôture.**Avec le soutien de :**Association pour la  
Promotion Scientifique  
de l'AfriqueAcadémie des Sciences  
du CamerounFondation  
Daniel IagolnitzerEuropean physical  
Society

Sci-Tech-Services

Société française de  
physique