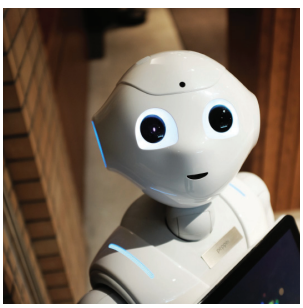
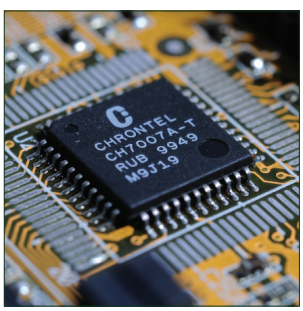
Scientific Tracks & Sessions
April 15, 2019

Physics & Laser Tech 2019



International Conference on

Applied Physics & Laser, Optics and Photonics

April 15-16, 2019 | Frankfurt, Germany

Advanced Materials | Biophysics | Nanophotonics | Optical Materials

Chair
Markus Pollnau
University of Surrey | UK

Session Introduction

Title: Study of mechanical and thermal properties of a polymeric composite with graphite nanoinclusions

Juan Jose Reyes Salgado | Universidad Popular Autonoma del Estado de Puebla | Mexico

Title: Layer-by-layer films for photonics devices: Analysis of birefringence creation and relaxation on azopolymer nanostructures

Maria Raposo | University of Lisbon | Portugal

Title: Breast tumor detection using CMOS radar switches

Afreen Azhari | Hiroshima University | Japan

Title: Sensors of Triclosan on complex solutions

Maria Raposo | University of Lisbon | Portugal

allied academies

International Conference on

Applied Physics & Laser, Optics and Photonics

April 15-16, 2019 | Frankfurt, Germany

Study of mechanical and thermal properties of a polymeric composite with graphite nanoinclusions

Juan Jose Reyes Salgado
Universidad Popular Autonoma del Estado de Puebla, Mexico

The effective mechanical properties of composites are affected by the distribution and formation of agglomerations of graphite nanoparticles in a polyester resin matrix. The samples were made varying the volume concentration of inclusions and their Maximum Tensile Strength, Young Modulus, Heat Capacity and morphology of agglomerations were measured. The morphology of agglomerations was analyzed by measuring their average area, fractal dimension and lacunarity from the micrographs. A predictive model of the effective physics properties based on the Rule-of-Mixtures (ROM) was proposed, the parameters related to the complex microstructure were incorporated to ROM model. These modified models are a good description of the effect of inclusions on effective physics properties.

Speaker Biography

Juan Jose Reyes Salgado has completed his PhD at the age of 35 years from Benemerita Universidad Autonoma de Puebla, Puebla, Mexico. He is the professor of Universidad Popular Autonoma del Estado de Puebla, Puebla, Mexico. He has over 4 publications that have been cited over 6 times, and his publication H-index is 1.

e: juanjose.reyes@upaep.mx

Notes:

allied academies

International Conference on

Applied Physics & Laser, Optics and Photonics

April 15-16, 2019 | Frankfurt, Germany

Layer-by-layer films for photonics devices: Analysis of birefringence creation and relaxation on azopolymer nanostructures

Maria Raposo
University of Lisbon, Portugal

Enhanced optical properties for memories and photonic applications can be focused on the molecular control that can be achieved with some fabrication techniques. One of these is the layer-by-layer technique which is based on the adsorption of oppositely charged materials which allows the development of nanostructured polymer/organic films and consequently is able to produce supramolecular architectures. The most interesting properties of the nanostructures prepared by this technique is the precise control of its thickness and composition. However, also their properties may be tuned synergistically having into account the adsorption variables during the preparation of the nanostructure's layers. Examples of these synergistic activities may be found in layer-by-layer nanostructures of azopolymers, which present their photoinduced properties altered by varying the electrostatic interactions responsible for the nanostructure formation. In this presentation will be presented the achieved conclusions about the properties of layer-by-layer nanostructures of poly(allylamine hydrochloride) (PAH) and poly{1-(4-(3-carboxy-4-hydroxyphenylazo) benzenesulfonamido)-1,2-ethanediyl, sodium salt} (PAZO) when submitted to birefringence creation and relaxation when varying the variables of adsorption(e.g. pH, ionic strength), the number of consecutive cycles of birefringence induction and the power and wavelength of the writing laser beam.

Speaker Biography

Maria Raposo has completed her PhD in 1999 from Sao Paulo University, Brazil. She is professor of University of Lisbon, Portugal. Since 2008, she is head of the Functional Molecular Systems group which research interests include electric and optical properties of ultra-thin films of polymers and biomolecules, interfaces and nanotechnology, colloids, molecular architectures for electronics, photonics and magnetism, biomimetic membranes and radiation effect in biological systems. She has over 100 publications that have been cited over 1000 times, and her publication H-index is 18 and has been serving as an editorial board member of some Journals.

e: mfr@fct.unl.pt

Notes:

allied academies

International Conference on

Applied Physics & Laser, Optics and Photonics

April 15-16, 2019 | Frankfurt, Germany

Breast tumor detection using CMOS radar switches

Afreen Azhari
Hiroshima University, Japan

Radio frequency (RF) single-pole-multiple-throw (SPMT) switch is an important building block in various complementary metal-oxide semiconductor (CMOS) control circuits, such as in radar systems, tumor detection in biomedical applications, phase shifters, multibeam applications, and multiband selection communication systems. Recently, research on microwave radar-based breast tumor detection systems has gained attractions for removing the problems of ionized radiation and painful breast compression of X-ray mammography. In a radar-based microwave tumor detection system, a 3-10.6 GHz ultrawide band (UWB) CMOS-integrated transmitter and receiver are used while controlling antennas by the UWB switching matrix.

In microwave-based breast cancer detection system, a huge double-pole-16-throw (DP16T) mechanical switch is used to control a 16-antenna array. At one time, only one pair of antennas is selected by the switch, where one of the pairs is the transmitting and the other the receiving antenna. If there is any target, the signal reflected from the target or tumor will be received by the receiving antenna, and an image is formed using the confocal algorithm. This conventional mechanical switching matrices, used to control the 16-radar antenna, are large in size, consume huge power of 10 to 100 watts and an obstacle to make a portable compact breast cancer detection system. In this work low power CMOS multi-input-multi-output switches of 1mW have been proposed to replace the conventional mechanical switches in CMOS breast cancer detection device, so that the whole system become compact and portable. The proposed switching matrices are also designed for very large bandwidth from 3 to 20 GHz, for the distortion less communication of UWB Gaussian monocycle pulse.

Speaker Biography

Afreen Azhari has received BSc and MSc in Electrical and Electronics Engineering from Bangladesh University of Engineering and Technology, Dhaka, Bangladesh in 2001 and 2004 respectively. She has a PhD in Integrated Semiconductor Electronics from Hiroshima University, Hiroshima, Japan in 2011. She worked as a researcher in Hiroshima University from 2011–2015 and in the Institute of Scientific and Industrial Research of Osaka University from 2016-2018. Her research interests are Biomedical circuit and system design, CMOS RF integrated circuit and system design.

e: afreen.sanken@gmail.com

Notes:

Sensors of Triclosan on complex solutions

Maria Raposo
University of Lisbon, Portugal

Currently, water supplies, water courses and aquifers are known to be contaminated by pesticides, industrial products and emergent pharmaceuticals and personal care products (PPCPs), with strong impact and inauspicious effects in human and biota. In order to have control over water quality with simple and cheaper methods, it will be necessary to develop sensors that allow the detection of pollutants traces in a fast way. In this talk the achieved results on the detection of Triclosan, a bacteriostatic molecule used in PPCPs such as toothpaste or soaps, on complex matrixes as effluent water, will be presented. Electronic tongue concept based in electrochemical or impedance measurements are the most common methods to classify the presence of molecules on complex solutions, and the experimental results demonstrate that it is possible with these techniques detect Triclosan in aqueous complex solutions with concentrations in the range of 10-15 to 10-6 M. However, optical techniques as optical fibers, surface plasmon resonance and light absorption can also be used to detect Triclosan. A comparison of the results obtained by the different methods will be also presented and discussed.

Speaker Biography

Maria Raposo has completed her PhD in 1999 from Sao Paulo University, Brazil. She is professor of University of Lisbon, Portugal. Since 2008, she is head of the Functional Molecular Systems group which research interests include electric and optical properties of ultra-thin films of polymers and biomolecules, interfaces and nanotechnology, colloids, molecular architectures for electronics, photonics and magnetism, biomimetic membranes and radiation effect in biological systems. She has over 100 publications that have been cited over 1000 times, and her publication H-index is 18 and has been serving as an editorial board member of some Journals.

e: mfr@fct.unl.pt

Notes: