POST-DEADLINE SUBMISSIONS, OμS

Tuesday, 10 September 2019 | Session 4: Imaging and spectroscopy

17:55-18:15 **Exploring human stem cell-derived neuronal network dynamics with multimodal digital holographic microscopy: towards identifying early biomarkers for neurodevelopmental disorders (O40)**

P. Marquet[1,2,3], E. Bélanger[1], É. Rioux-Pellerin[1], P. Lavergne[1], B. de Dorlodot[1], S. A. Lévesque[1], P. Jourdain[3]
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[3] Joint international Research Unit, Université Laval, University of Lausanne, Switzerland
Invited speaker

Quantitative phase microscopy (QPM) has recently emerged as a powerful label-free technique in the field of cell imaging allowing to non-invasively measure various cell parameters and monitor specific cell processes. On the other hand, the recent developments in stem cell biology, especially the generation of induced pluripotent stem cells, have made possible the development of in vitro cellular models of developmental brain disorders (DBD). Within this framework, we will present how quantitative phase digital holographic microscopy (QP-DHM) is able to study such in vitro cellular models and identify disease-specific cellular phenotypes which could represent some promising biomarkers of DBD.

Session 5 (LAB-ON-CHIP DEVICES), previously scheduled on Tuesday 10 September from 17:55, has been moved 20 minutes later.

The oral presentation identification numbers have been increased by 1 starting from O40.

POST-DEADLINE SUBMISSIONS, ONS

Wednesday, 11 September 2019 | Session 4: Special session -Waves in Complex Photonic Media: Fundamentals and Device Applications

Chair: Luca Dal Negro, Boston University, USA

16:40-17:00 **Engineering anti-hyperuniform photonic structures for radiation engineering (O45)**

L. Dal Negro[1,2,3], S. Gorsky[1], W. A. Britton[1,3], Y. Chen[1], J. Montaner[4], A. Lenef[4] and M. Raukas[4]
[1] Department of Electrical and Computer Engineering & Photonics Centre Boston University, USA
[2] Department of Physics, Boston University, USA
[3] Division of Materials Science and Engineering, Boston University, USA
[4] OSRAM Opto Semiconductors, Beverly, USA
Invited speaker

By leveraging the concept of stealthy hyperuniform patterns, in this paper we design and experimentally demonstrate novel scattering arrays of dielectric nanoparticles, here referred to as isotropic scattering arrays (ISAs), which give rise to ring-shaped regions in Fourier space (k-space) with intensity optimized by the collective coordinate control method. These arrays are anti-hyperuniform photonic structures that feature the ideal circular k-space required to achieve enhanced directional light extraction from LEDs, with significantly reduced diffuse scattering compared to both Poisson random point patterns and Vogel spiral arrays. Enhanced directional emission from designed ISA patterns is demonstrated experimentally on large-scale (1mm^2) arrays of TiO_2 nanoparticles fabricated atop white-light LED ceramic converter materials. The enhanced extraction and directional light emission of ISAs of dielectric nanoparticles demonstrated in this work make them a very attractive approach for integration with commercially available LED active materials.

P10 **Raman Microscopy Investigation of Melt-Textured Gd1212 Superconductors in the Normal State.**

S. Managò[1], A. C. De Luca[1], V. Mocella[2], I. Rendina[3], G. Carapella[4], M. Gombos[2]
[1] CNR-IBP UoS Napoli, Italy
[2] CNR-IMM UoS Napoli, Italy
[3] CNR-ISASI UoS Pozzuoli (NA), Italy
[4] Dip. di Fisica "E.R.Caianiello" Università di Salerno and CNR-SPIN UoS Salerno, Fisciano (SA), Italy

Gd1212 is a very interesting Superconductor for developing innovative metamaterials, presenting coexistence of Magnetic Order and Superconductivity in its unit cell. Its features depend severely on fabrication details, due to secondary phases (SP) and to processes dependence on local composition. By Raman Microscopy we observed melt textured Gd1212 samples, to check composition and structure and to study SP formation. Results confirm samples local variability due to initial inhomogeneities.

P11 **The influence of cubic phase mask position upon doublet wavefront coded system.**

Po-Sheng Chiu[1,2]
[1] Dept. of Imaging Physics, Delft University of Technology, Netherlands
[2] Datalogic IP Tech S.r.l., Italy

The influence of different cubic phase mask positions upon wavefront coding technique in the doublet imaging system is studied. We analyze the MTF of the system, and we found that the intermediate image of the front aperture case is more challenge to be reconstructed because it contains more zero points in the PSF.