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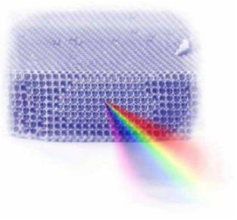
Kopaonik, March 10-14, 2024



Book of Abstracts

17th Photonics Workshop

(Conference)

PHOTONICS
CENTER

17th Photonics Workshop (2024)

Book of abstracts

Kopaonik, Serbia, March 10-14, 2024

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Conference program

Sunday, March 10th

Chairman: Zoran Grujić

16.00 – 16.30	**Registration & opening**
16.30 - 17.00	**Stanko Tomić** *Quantum Dots: Nanotecnology in Quantum Colours*
17.00 - 17.20	**Pedja Mihailović** *Directions in all-optical computing with an emphasis on the Fabry Perot laser-lock-in approach*
17.20 – 17.40	**Bratislav Marinković** *Magical krypton atom: From definition of meter to ultrafast processes*
17.40 – 18.00	**Vladimir Djokovic** *Fabrication of efficient NIR light-driven micromotors using particles with Janus morphology*
18.00 – 18.15	**Jelena Mitric** *Phonon Investigations in Cd1-xFexTe1-ySey Single Crystals*
18.15 – 18.30	**Filip Krajinić** *Optical system for magnetic field spatial distribution measurement using digital holography*
18.30 – 18.45	**Miljana Piljević** *Selective in vitro labeling of cancer cells using NaGd0.8Yb0.17Er0.03F4 nanoparticles*

Monday, March 11th

Chairman: Goran Mashanovich

16.00 - 16.30	***Refreshment & workshop photo***
16.30 - 17.00	**Vladan Vuletic** *Time-Reversal-Based Quantum Metrology beyond the Standard Quantum Limit*
17.00 - 17.20	**Wenlan Chen** *Observation of universal dissipative dynamics in strongly correlated quantum gas*
17.20 – 17.40	**Alessia Burchianti** *Quantum phenomena and novel matter phases in ultracold atomic mixtures*
17.40 – 18.00	**Stanko Nikolić** *Biomedical Applications of two-Foci Cross-Correlation technique in Massively Parallel Fluorescence Correlation Spectroscopy*
18.00 – 18.15	**Jovana Petrović** *Role of optics in multiparameter monitoring of cardiovascular function*
18.15 – 18.30	**Gabriel Cáceres-Aravena** *Topological Properties of Photonic Systems with Interorbital Interactions*

Chairman: Branislav Jelenkovic

20.00 - 20.10	**Branislav Jelenkovic** *BioQantSense project overview*
20.10 - 20.30	**Caterina Dallari** *Evaluating abnormal levels of intracellular cholesterol through Raman and Surface-enhanced Raman spectroscopy*
20.30 - 20.50	**Markus Gräfe** *Nonlinear interferometers for quantum imaging with undetected light*
20.50 - 21.10	**Frank Setzpfandt** *Entanglement generation at the nanoscale*
21.10 – 21.30	**Sara Nocentini** *The hidden value of responsive materials*
21.30 – 21.50	**Dejan Pantelic** *Classical microscope interference-objectives for quantum holography*
21.50 – 22.10	**Josué Ricardo León Torres** *Mid-Infrared Quantum Scanning Microscopy with Visible Light*

Tuesday, March 12th

Chairman: Ivana Drvenica

16.00 - 16.30	***Refreshment***
16.30 - 17.00	**Srdjan Antic** *Photonics Toolkit for Studying Alzheimer's Disease*
17.00 - 17.20	**Pavle Andjus** *Subcellular and ultrastructural changes in astrocytes induced by ALS IgG*
17.20 – 17.35	**Ana Jakovljević** *The role of tenascin-C in the structural plasticity of perineuronal nets and synaptic expression in the murine hippocampus*
17.35 – 17.50	**Biljana Ristić** *Hemocompatibility evaluation of N-doped carbon quantum dots*
17.50 – 18.10	**Vladimir Srdić** *Light-induced magnetization reversal in heterstructured oxide thin films*
18.10 – 18.30	**Lijian Zhang** *Quantum-limited localization and resolution of optical sources*

Chairman: Bratislav Marinković

20.00 - 20.30	**Goran Mashanovich** *Photonics pathways in higher education*
20.30 - 20.50	**Sanja Djurdjić Mijin** *Cost-Efficient Method for Deterministic Creation of Single Photon Emitters in GaSe*
20.50 - 21.10	**Milica Ćurčić** *Vibrational properties of the mechanochemically synthesized Cu2SnS3*

21.10 – 21.25	**Mirjana Stojanović** *Demultiplexers based on waveguide arrays*
21.25 – 21.40	**Duška Popović** *A dressed states analysis of Autler-Townes patterns in the PES at resonant two-photon ionization of hydrogen by short laser pulses*
21.40 – 21.55	**Dragana Jordanov** *Electronic Properties of Predicted Y2O2S using Theoretical Calculations*
21.55 – 22.10	**Edi Bon** *The Enigma of Changing Look Active Galactic Nuclei*

Wednesday, March 13th

Chairman: Jovana Petrović

16.00 - 16.30	***Refreshment***
16.30 - 17.00	**Vlatko Vedral** *Observing ghost entanglement beyond scattering amplitudes in quantum electrodynamics*
17.00 - 17.20	**Miroslav Dramićanin** *Mn5+: a source of near-infrared photons for LEDs, optical temperature sensors and bioimaging*
17.20 – 17.35	**Vesna Đorđević** *Microwave-Assisted Solvothermal method for synthesis of CsY2F7 and RbY2F7 nanophosphors*
17.35 – 17.55	**Suzana Petrović** *Laser surface patterning of Ti/Zr thin films for biomedical application*
17.55 – 18.15	**Dusan Božanić** *Photoelectron circular dichroism in isolated hybrid nanosystems*
18.15 – 18.30	**Radovan Dojčilović** *Probing cell-nanomaterial interaction with bioimaging of cancer liver cells*

Chairman: Pedja Mihailović

20.00 - 20.20	**Robert Loew** *Precision cw-spectroscopy of Rydberg states of nitric-oxide molecules*
20.20 - 20.40	**Theo Scholtes** *Recent developments in optical magnetometry*
20.40 - 20.55	**Zoran Grujić** *On prospects of the free alignment precession based optically pumped magnetometer*
20.55 - 21.10	**Tim Kügler** *Structured indium tin oxide heating layers on microfabricated alkali vapor cells for optical magnetometry*
21.10 – 21.25	**Marija Ćurčić** *Experimental and theoretical study of the dynamic phase projection error of Mx magnetometer – Progress report*

21.25 – 21.40	**Miloš Subotić** *Lock-in Frequency Estimation Algorithm for Optically Pumped Magnetometer*
21.40 – 21.55	**Milovan Stoiljković** *Hydrogen Balmer-α isotope analysis in aqueous aerosol using LIBS*
21.55 – 22.10	**Nikola Vuković** *Optical and transport properties of THz quantum cascade heterostructures*

Thursday, March 14th

Chairman: Ljupčo Hadžievski

16.00 - 16.30	***Refreshment***
16.30 - 17.00	**Caslav Brukner** *Quantum causal structures: from fundamentals to applications*
17.00 - 17.15	**Milica Vinić** *Diagnostics of laser-induced plasma from a thin oil film*
17.15 – 17.30	**Danijela Danilović** *Ag-Bi-I rudorffite nanoparticles as a new material for photovoltaics*
17.30 – 17.45	**Đorđe Trpkov** *Non-covalent interactions of nitrogen-doped carbon quantum dots and aromatic amino acids, an experimental and DFT study*
17.45 – 18.00	**Dragana Tošić** *Optical Properties of Natural Anthocyanin Dyes Encapsulated in Biopolymers*
18.00 – 18.15	**Danka Stojanović** *Atmospheric aerosols monitoring by scanning mobility and optical particle sizers in an urban area*
18.15 – 18.35	**Robert Loew** *Johannes Kepler, more than an astronomer*

Table of content

Abstracts

Hemocompatibility evaluation of N-doped carbon quantum dots

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Abstract. Nitrogen-doped carbon quantum dots (N-CQDs) are promising next generation nanomaterials for potential biomedical applications such as bioimaging, biosensing, and drug/gene delivery. However, N-CQDs biocompatibility has not been extensively investigated. Here, we report physico-chemical characteristics of newly synthetized N-CQDs and their effects on red blood cells (RBC), by analyzing their hemolytic activity, impact on RBC rheology/morphology, and oxidative stress induction. N-CQDs were prepared by hydrothermal method using citric acid and urea as precursors. Structural analyses of as prepared N-GQDs, observed by HRTEM/EDS, showed that the lateral dimensions of the particles are in the 10 to 20 nm range, as well as that the carbon, oxygen, and nitrogen are present in the nanosystem. Based on AFM measurements, the average height of N-CQDs was 3.9±0.08 Å. Photoluminescence emission (PLE) spectrum demonstrated that N-CQDs exhibit stable and strong fluorescence in green (520 nm) region, upon 410 nm excitation. FTIR spectroscopy indicated vibrational bands, characteristic for carbon structures and primary amines (N-doping). N-CQDs were negatively charged with an average Zeta potential of -15.3
mV as confirmed by DLS. To investigate hemocompatibility of N-CQDs, the RBC, the most abundant cells in blood, were treated with different concentration of N-CQDs (10-400 ug/ml) for 2h. Obtained results showed that there was no hemolytic activity. Moreover, ektacytometry analysis demonstrated that N-CQDs did not affect deformability of RBC. Fluorescent microscopy analyses revealed that treatment with N-CQDs did not induce significant morphological aberrant forms of RBC which was also confirmed by SEM analyses. Flow cytometry confirmed only slight RBC morphological changes based on FSC/SSC analysis. Furthermore, using ROS sensitive dye flow cytometry analyses suggested that N-CQDs did not induce oxidative stress in RBC. Taken together, our findings highlighted that exposure of RBC to N-CQDs only led to the attachment of N-CQDs on RBC membranes, but there is no other evidence of their nanotoxicity. These findings suggested that N-CQDs synthetized from eco-friendly precursors are potentially biocompatible and safe for biomedical application.