GEORGI NADJAKOV INSTITUTE OF SOLID STATE PHYSICS

23rd INTERNATIONAL SCHOOL ON CONDENSED MATTER PHYSICS

P R O G R A M

"Recent Progress in Advanced Materials and Applications"

August 26th - 30th, 2024

Varna, Bulgaria

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БЪЛГАРСКА АКАДЕМИЯ НА НАУКИТЕ 155 BULGARIAN ACADEMY OF SCIENCES

August 25th (Sunday)

17:00-19:00 *Registration*

20:00 ***Get Together Party***

August 26th (Monday)

08:30-09:00 *Registration*

09:10-09:30 **Opening Ceremony**

09:30-11:00 **Chair: E. Iordanova**

09:30-10:15 S. REYNOLDS, "Carrier transport and electronic defects in gallium oxide studied by photoconductivity techniques"
Georgi Nadjakov Memorial Lecture

10:15-11:00 P. MONTGOMERY, "From Rolls Royce engines to butterfly wings, or using photonics for seeing the invisible in advanced materials"
Milko Borisov Memorial Lecture

11:00-11:30 *Coffee break / Collective photo*

11:30-12:30 **Chair: A. Reznik**

11:30-12:10 Ph.VANDERBEMDEN, "Simultaneous partial discharge and current measurements in a needle-plane configuration at different pressures"

12:10-12:30 D. MUKHERJEE, "Finite element simulations for the optical sensing performance of gold gratings"

12:30-16:00 *Lunch break*

16:00-17:30 **Chair: H. Chamati**

16:00-16:40 S. BARANOVSKII, "Fundamental spatial scales for charge transport and recombination in disordered semiconductors"

16:40:17:00 N. GEORGIEVA, "Characterization of unsaturated lipid bilayer properties under different conditions with a Slipids force field"

17:00-17:30 Five minutes' presentations of posters

17:30-18:00 *Coffee break*

August 27th (Tuesday)

08:30-09:00 *Registration*

09:10-10:30 **Chair: Ph.Vanderbemden**

09:10-09:50 H. CHAMATI, "Novel insights into the physics of molecular magnets"

09:50-10:30 M. FABIAN, "Interactions within an advanced glass/copper/bentonite system under simulated geological disposal conditions"

10:30-11:00 *Coffee break*

11:00-12:20 **Chair: T. Koutzarova**

11:00-11:40 P. PETRIK, "Recent progress in ellipsometry at solid-liquid interfaces"

11:40-12:20 A. DINESCU, "Wireless temperature and pressure sensors based on surface acoustic wave resonators – fabrication processes"

12:20-16:00 *Lunch break*

16:20-17:00 **Chair: Z. Danel**

16:20-16:40 G. IVANOV, "Langmuir and Langmuir-Blodgett Nanocomposite Films from Adsorbed Glucose Oxidase Enzymes"

16:40-17:00 K. ESMERYAN, "Effect of commercial cryoprotectants and hybrid "instant" freezing on the outcome of soot-assisted human sperm cryopreservation"

17:00-18:30 **First poster session** / *Coffee break*

August 28th (Wednesday)

08:30-09:00 *Registration*

09:10-10:30 **Chair: A. Dinescu**

09:10-09:50 R. TODOROV, "Engineering of the interband transitions of silver- and gold-based alloys and post-transition metals for preparation of effective substrates for surface-enhanced spectroscopic techniques"

09:50-10:30 A. REZNIK, "Advances in Lead Oxide X-ray technology for application in direct conversion medical imaging detectors"

10:30-11:00 *Coffee break*

11:00-12:20 **Chair: S. Baranovskii**

11:00-11:40 E. ANGELOVA, "Spin-lattice interaction in magnetic materials"

11:40-12:20 T. KOUTZAROVA, "The hexaferrites – structure, magnetic properties, electromagnetic shielding"

12:20-16:00 *Lunch break*

16:00-17:00 **Chair: P. Petrik**

16:00-16:20 V. DONCHEV, "Investigation of GaSb micro-islands deposited on Si substrates"

16:20-16:40 K. KREZHOV, "Characterization of Ni- and Co-based bifunctional electrocatalysts for application in carbon-free air electrodes for rechargeable Zinc-air batteries"

16:40-17:00 L. MIHAYLOVA & A. TONCHEV, "ZEISS Innovative Research Solutions in Material Science" (Sponsor Presentation)

17:00-18:30 **Second poster session** / *Coffee break*

August 29th (Thursday)

08:30-09:00 *Registration*

09:10-10:30 **Chair: M. Zamfirescu**

09:10-09:50 S. BANERJEE, "Modulating the Energy Positioning of Lone-Pair-Derived States for the Design of Photocatalytic Architectures"

09:50-10:30 V. GUERRA, "CO_2 plasmas for sustainable chemistry"

10:30-11:00 *Coffee break*

11:00-12:20 **Chair: S. Banerjee**

11:00-11:40 E. IORDANOVA, "New methods for acceleration of neutral atoms and nuclei of light elements"

11:40-12:20 Ts. BABEVA, "Soft and hard templated Nb_2O_5 thin films and multilayered structures for sensing applications"

12:20-16:00 *Lunch break*

16:00-17:20 **Chair: A. Iglič**

16:00-16:40 Z. DANEL, "The analytical investigation of star polymers and copolymers in confined geometries"

16:40-17:20 S. KRALJ, "Topologically stable localized distortions in axial fields"

17:20-17:40 *Coffee break*

17:40-18:20 **Chair: M. Fabian**

17:40-18:00 V. GEORGIEVA, "Engineering the mechanical and X-ray attenuation properties of gelatine composite hydrogels with a potential for tissue mimicking materials"

18:00-18:20 S. BOYADJIEV, "ALD and sol-gel grown ZnO, Ni- and Li/Ni-doped ZnO thin films for gas sensors"

20:00 ***Farewell Dinner***

August 30th (Friday)

09:10-10:30 **Chair: S. Kralj**

09:10-09:50 M. ZAMFIRESCU, "Optical microcavities and their applications as quantum sources"

09:50-10:30 A. IGLIČ, "On the role of orientational and lateral distribution of membrane attached proteins and cytoskeleton forces in shape and migration of cells"

10:30-11:00 *Coffee break*

11:00-12:00 **Chair: H. Chamati**

11:00-11:20 V. CHITANOV, "Ti/TiN/AlTiCrN hard coating investigated by Close Field Unbalanced Magnetron Sputtering"

11:20-11:40 L. MAKEDONSKI, "Application of RBF ANN in NIR Spectroscopy for improving the efficiency in Citalopram production"

11:40 **Closing Ceremony**

1. FIRST POSTER SESSION, August 27th (Tuesday)

1.1. S. BARANOVSKI, “Mechanism of photoinduced nucleation in supersaturated metallic vapors”

1.2. M. DANEV, “Dynamics of soliton excitations in inhomogeneous magnetic chains”

1.3. N. GEORGIEVA, “Adsorption of ammonia and hydrazine on a metal oxide layer”

1.4. N. ZAHARIEV, “Zener-Kondo interaction in layered perovskites and the emergence of zero sound”

1.5. V. STRIJKOVA, “Nanomechanical properties of lymphocytes in chronic lymphocytic leukemia: assessment of response to Venetoclax and Obinutuzumab therapy. Case report”

1.6. A. VIRANEVA, “Physicochemical properties of sesame oil blending with sunflower oil”

1.7. M. LAZAROVA, “Concentration of red wine phenolic compounds applying nanofiltration with Alfa Laval NF99HF membrane”

1.8. E. KORUTCHEVA, “Relationship between routes and population within city structures”

1.9. M. DUDEK, “Investigation of the elastic properties of star polymers in semi-infinite space”

1.10. V. GEORGIEV, “Effects of Temporin A analogs on lipid membrane models”

1.11. V. GEORGIEVA, “Effect of different fillers on hydrogels for application as tissue-substitute materials in Computed tomography”

1.12. A. GRIGOROV, “Composite porous biopolymer multilayer films as potential controlled delivery systems for tolfenamic acid”

1.13. S. MILENKOVA, “Poly(Lactic Acid)-based active packages loaded with polyphenolic compounds”

1.14. S. MINKOVSKA, “Photoswitchable molecular systems based on spironaphthoxazines for detection of metal ions”

1.15. Y. MARINOV, “Combining gravimetric with electrical transduction methods for the detection of volatile organic compounds (VOCs) by Langmuir-Blodgett films from metal-organic framework (MOF) MIL-101(Cr)”

1.16. Y. MARINOV, “Ion-conducting nematic nanocomposites from nematic liquid crystals and single-walled carbon nanotubes: enhancement by nanodoping”

1.17. Y. FEDCHENKO, “Studying the impact of physicochemical profile of metal-phenolic films on the sensitivity and selectivity of QCM-based alcohol sensors”

1.18. B. GEORGIEVA, “Petroleum vapors sensor with polyvinyl trimethylsilane sensitive coating”

1.19. B. GEORGIEVA, “Investigation of partial Al^{3+} substitution on the properties of Y-type $Ba_{0.5}Sr_{1.5}MgNiFe_{12-x}Al_xO_{22}$ hexaferrites”

1.20. P. NEDYALKOVA, “Inertial sensor to determine the ballistic resistance state and traumatic effect of multilayer lightweight armor made of (UHMWPE), polyvinyl botyral and nanoparticles SiC”

2. SECOND POSTER SESSION, August 28th (Wednesday)

2.1. A. BENKOVSKI, “Titanium dioxide thin films prepared on different substrates by sol-gel process: optical and morphological properties”

2.2. E. ZLATAREVA, “Development and research of a graded AlTiN hard coating”

2.3. V. DULEV, “Chemical bath deposition of tin sulphide thin films”

2.4. G. YANKOV, “Study of the nonlinear optical properties of glasses doped with gold nanoparticles using the z-scan method”

2.5. Ch. GHELEV, “Low temperature investigation of nanosized $BaFe_{12}O_{19}$ powders”

2.6. M. GORANOVA, “Optical materials for the electronic industry from fluorite”

2.7. M. GORANOVA, “Optical spectra in SWIR based on data from Icelandic spar measurements in Bulgaria”

2.8. A. PAL, “Spin-induced strongly correlated magnetodielectricity, magnetostriction effect and spin-phonon coupling in helical magnet $Fe_3(PO_4)O_3$”

2.9. H. SOLUNOV, “Metallic glass from the point of view of the molecular entropy theory”

2.10. I. AVRAMOVA, “Preparation and spectroscopic characterization of nano-sized glass-ceramics obtained from a sodium silicate glass with high Fe and Mn concentrations”

2.11. A. PASKALEVA, “XPS study of ALD HfO_2/Al_2O_3 stacks on Si”

2.12. T. STANCHEV, “Evaluation of write/erase operations performance in HfO_2/Al_2O_3 based flash memory stacks”

2.13. T. TENEV, “A study to determine the optical constants of PVD ZrO_2 layers”

2.14. E. STOYANOVA, “Ion irradiation assistance alters the microstructure and optical constants of vacuum deposited ZrO_2 thin layers”

2.15. P. KUTERBA, “Physical properties of fermions obeying exclusion and superexclusion principles”

2.16. T. HRISTOVA-VASILEVA, “Functionalization of metallic polycrystalline thin films with tryptophan for surface enhanced Raman spectroscopy (SERS) applications”

2.17. Ch. ANGELOV, “On-ground observations of solar over-irradiance effects and their influence on low-voltage electric power grid”

2.18. T. ARSOV, “Comparative gamma background measurements, spectrum horizontal mapping and vertical profile in Sofia, Beli Iskar and at high mountain station BEO Moussala”

2.19. V. ATANASSOVA, “Femtosecond laser modification of optical thin films”

2.20. M. ZID, “Criticality controlling mechanisms in nematic liquid crystals”