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Joint Meeting on

4th International Conference on

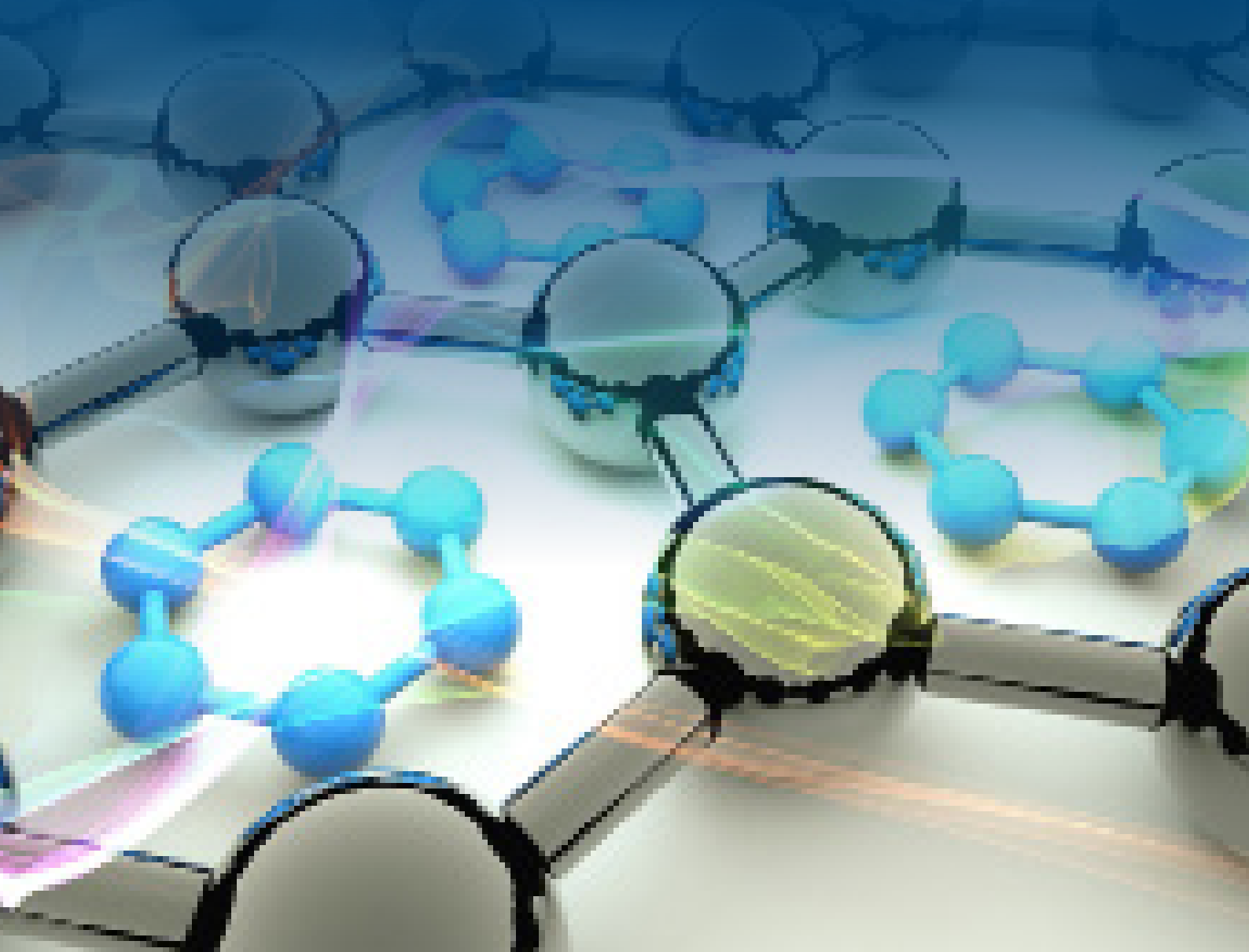
CRYSTALLOGRAPHY & NOVEL MATERIALS

&

9th International Conference on

BIOPOLYMERS & POLYMER SCIENCES

November 19-20, 2018 Bucharest, Romania



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Keynote Forum (Day 1)

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Nikolay Plusnin

FEB RAS-Institute of Automation and Control Processes, Russia

Metal-silicon contact formation and role of the nanophase wetting layer

The result of the initial stages of the formation of a transition metal-silicon contact at room temperature has been analyzed. The contact was formed by physical vapor deposition. At the growth stage preceding the formation of the first bulk phase of the metal/silicide, a Nanophase Wetting Layer (NWL) of a metal/silicide on a silicon substrate was detected and identified. The detection and identification of NWL was made possible by the technique developed by the author for complex analysis of the structural-chemical and phase state of the surface/interface by Auger Electron Spectroscopy (AES) and Electron Energy Loss Spectroscopy (EELS). In addition, this became possible to the development of the low-temperature method of Physical Vapor Deposition (PVD) and the formation of metal-silicon contact by this method without mixing at the interface. The detection of NWL fundamentally changed the approach to the formation of a metal contact with a silicon substrate.

Biography

Nikolay Plusnin is currently the Chief Researcher in the Institute of Automation and Control Processes of FEB of the RAS, Vladivostok, Russia. He has completed his degree in Doctor of Physical-Mathematical Sciences. His research interests are in nanomaterials for electronics and their structure-phase analysis. He was a Visiting Professor in Tohoku University, Sendai, Japan. Also, he is a Member of the Advisory Board of the international journal *e-journal of Surface Science and Nanotechnology*. He has published more than 60 scientific articles. His research was supported by Russian Ministry of Education and Science, Academy of Sciences and Government.

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Lucian Baia, Res. Rev. J Mat. Sci. 2018, Volume 6
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Lucian Baia

Babeș-Bolyai University, Romania

Particularities of the crystalline structures: A critical issue in designing materials for targeted applications

The manipulation of the crystalline structure to get the maximum efficiency for a desired application is one of the most important challenges in the nanotechnology development. On the other hand, the shape and size control of the crystalline nanostructures represents another hot topic in designing novel materials with tuned properties. The presented work is splited in three parts. The first one relates about the influence of morphological particularities of titania and tungstanate crystals on the photocatalytic efficiency to decontaminate the polluted water. It is mainly evidenced the importance of the shape controlled nanostructures on the photocatalytic properties as revealed by the morphological and structural characterization of the investigated materials. The second one presents the tunability of the morphological, structural and optical properties of Graphene Oxide (GO) and reduced graphene oxide (r-GO) membranes that was achieved by using different self-assembly time and heat-treatment temperatures, respectively. The particularities of the GO and r-GO membranes will be discussed and correlated in the context of desired applications. The third part will describe the steps performed to understand the graphitization process, i.e. formation of 2D ordered carbon structures, inside the Bi/Fe doped carbon xerogels. This aspect is of an utmost importance having in view that such porous materials can be applied as electrode materials for energy storage and electrochemical sensing applications. In this respect, an exhaustive morphological and structural characterization of the Bi/Fe doped carbon xerogels was performed in order to identify the parameters that influence the activation of catalyzed graphitization.

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Biography

Lucian Baia is currently an Associate Professor at the Department of Condensed Matter Physics and Advanced Technologies at the Faculty of Physics of the Babes-Bolyai University (BBU) of Cluj-Napoca, Romania. He is also the Head of the Institute of Research-Development-Innovation in Applied Natural Sciences from BBU. He was awarded the Constantin Miculescu Prize of the Romanian Academy (2017) as well as prizes of BBU for Scientific Excellence (2014 and 2017), Comenius Prize (2012) and STAR Advanced Fellowships for Research (2016). He has published more than 130 peer-reviewed papers, three books, five book chapters, 2 patents and 2 patent applications and is serving as Editorial Board Member for several scientific journals.

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Nadir Yildirim, Res. Rev. J Mat. Sci. 2018, Volume 6
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Nadir Yildirim

Bursa Technical University, Turkey

How to transfer bio-composite technology from research to industry using innovation engineering?

The academicians and researchers work hard to perform unique projects at the universities. They complete the projects successfully and publish papers even books. However, just publishing books or articles is not enough to compete against the future. The commercialization of an idea developed at the universities is no longer a fleeting trend but a strategy being adopted by organizations to maintain their competitive positions. The increased awareness in environmental issues makes this reality more critical in bio-products industry with high demand for the green and sustainable replacement for petroleum-based products. The innovation engineering is a culture that guides researchers to take right actions on the right time to develop meaningfully unique products and convert them to benefit. In this study successfully developed bio-composite technology were brought to industry using innovation engineering concept.

Biography

Nadir Yildirim earned his Ph.D. in Forest Resources from the University of Maine, and he is also a graduate of the University of Maine Innovation Engineering Program. He was also a research scholar at Purdue University. He has been working with advanced bio-nanocomposites for over 10 years and also acted as the Program Manager for various development projects in nanocomposites and advanced materials, including studies of fire retardant nanocomposites, water repellent nanocellulose composites, aerogels, bio-based panels and eco-friendly thermal insulation composite foam boards for green buildings. As Co-founder and CEO of Revolution Research Inc., Dr. Yildirim has received grants from the National Science Foundation (NSF), United States Department of Agriculture (USDA), Environmental Protection Agency (EPA) and the Maine Technology Institute (MTI) for development of innovative, eco-friendly, and futurist materials. He has been working at Bursa Technical University since 2017 as the Associate Director of Bursa Technology Transfer Office and also as an Assistant Research Professor of Sustainable Forest Bioproducts.

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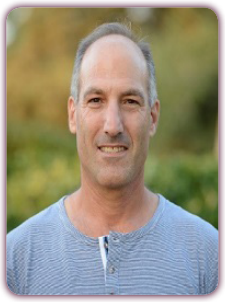

Nimrod Israely

Biofeed Environmentally Friendly Pest Control, Israel

From DDT to emerging eco-technologies; The long journey to green-evolution and green-economy

The industrial revolution that started in the mid 18th century was followed by the green revolution which began in the mid 20th century. DDT symbolizes more than anything the beginning of the green revolution, but also the disillusionment from a dream of a never-ending solution to all human problems. The awakening from the DDT dream as the ultimate solution came in less than 20 years since its discovery as a pesticide. This is when its downsides started to be understood. The European green movements and current public concerns about ecological issues is the outcome of that. However, upto now most of the emerging green economy industries struggle to survive and taking the lead looks like a distant dream. This presentation will have the discussion on the hardship, time and the necessary measures we have to take in order to create a flourishing green economy industry. For this presentation the Pest-control industry will be used as a case study to processes occurring in many other emerging green economy industries, including biopolymers.

Biography

Nimrod Israely has completed his PhD in Entomology and is the CEO of Biofeed. Under his leadership, Biofeed has developed the GCFR technology, which enables pest control without spraying. He is known for his hands-on innovative approach and clear view as to the need for a second green revolution.

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Benny Danilo Belviso

Institute of Crystallography (CNR), Italy

Advanced materials to make easier protein crystallization

Since 60 years, X-ray crystallography provides structural details of protein molecules, information that is crucial to unravel biological mechanisms at molecular level. Crystallography requires that sample is in crystal form. Getting such crystals at acceptable quality for crystallographic analysis is not trivial and strategies to make this process less expensive and time consuming are not available, still now. Advanced materials represent a turning point in this field because they can be exploited to control nucleation and growth step, making more effective the crystallization process. Our group is developing membrane-based materials able to trigger protein crystallization also in conditions that are not fruitful by standard methods. Such materials have a great impact both in industry and academic studies because significantly reduce cost and time of the protein purification and crystallization process. We developed membrane-materials functionalized by hydrogel that proved ability in getting very stress-resistant crystals, which are suitable for structure-based drug design studies that require very harsh soaking conditions. This material, similarly to our metal oxide nanoparticle-functionalized membrane, significantly widens crystallization window and produce crystals having good diffraction quality. Membrane based materials are showing very effective in protein crystallization and to produce crystals having specific features. Our efforts are focusing now in functionalizing such materials by nanotemplate to crystallize very challenging proteins such as intact antibodies, and to develop membrane able to promote bio-mineralization and to enable polymorphs selection.

Biography

Benny Danilo Belviso has completed his PhD from University of Bari Aldo Moro and Postdoctoral studies from Institute of Crystallography (CNR). He has worked at Nottingham University in the MRC project to study ADAMTS13 protein structure and currently he is the Research Fellow at Institute of Crystallography. He is involved in several international projects related to structural biology and materials for crystallization applications. He has published more than 20 papers in reputed journals.

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Ramin Zibaseresht, Res. Rev. J Mat. Sci. 2018, Volume 6
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Synthesis, structural analysis and antibacterial effect of a novel hetero-nuclear Ag(I)-Fe(II) coordination polymer

The synthesis and crystal structure of a novel polymeric silver(I)-iron(II) complex containing bridging ligand 4'-(4-(2,2,2-tris(1H-pyrazol-1-ido)ethoxymethyl)phenyl-2,2':6',2"-terpyridine (TPT) are described. The reaction of TPT with $FeCl_2.6H_2O$ afforded a complex $[Fe(TPT)_2]Cl_2$ which in turn reacted with a range of silver salts such as $AgNO_3$, $AgClO_4$ resulted in the formation of hetero-metal complexes which were characterized using 1H NMR and ES-MS techniques. The reaction solution of the $[Fe(TPT)_2]Cl_2$ complex with molar equivalent of $AgClO_4$ resulted in a solution with face needle-like crystals suitable for single X-ray crystallography. The complex was crystallized the triclinic space group, Pī. The smallest repeating unit of the complex contains an $[Fe(TPT)Ag_2(H_2O)_2](ClO_4)_3$ unit. The Fe atom is coordinated by three nitrogen of terpyridine moiety from one TPT ligand and by three nitrogen of terpyridine moiety from another TPT ligand in an octahedral geometry fashion. While one Ag atom is coordinated by two nitrogen atoms of one pyrazolyl moiety from a TPT ligand and two nitrogen atoms of adjacent pyrazolyl moiety from another TPT ligand to generate a linear coordination polymer in a tetragedral geometry. The third nitrogen atom of the last pyrazolyl part is also coordinated to a silver ion which was itself coordinated to two water molecules through their oxygen atoms in a trigonal planar geometry. The shortest Ag-Ag distance is 5.337(1) Å within a TPT ligand. The Fe-Ag distances are 10.480(1) Å, 15.0637(1) Å within a unit cell. *In vitro* the study of the complex against some bacterial pathogens were also investigated.

Biography

Ramin Zibaseresht is a Professor in Chemistry at Maritime University of Imam Khomeini in Noshahr and Adjunct Professor at Aja University of Medical Sciences in Tehran. He has completed his BSc in Chemistry from Shiraz University and his MSc in Inorganic Chemistry from Pune University. He has completed his PhD in Inorganic Chemistry from the University of Canterbury. He is currently the Head of Biomaterials and Medicinal Chemistry Research Centre in Tehran. He has published more than 50 papers in reputed journals and some international conferences and more than 10 books in the area of chemistry and 4 patents. He has been serving as an Editorial Board Member of some peer-reviewed journals, academic book publishers, member of more than 10 academic committees, organizing committees and academic boards of international conferences.

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