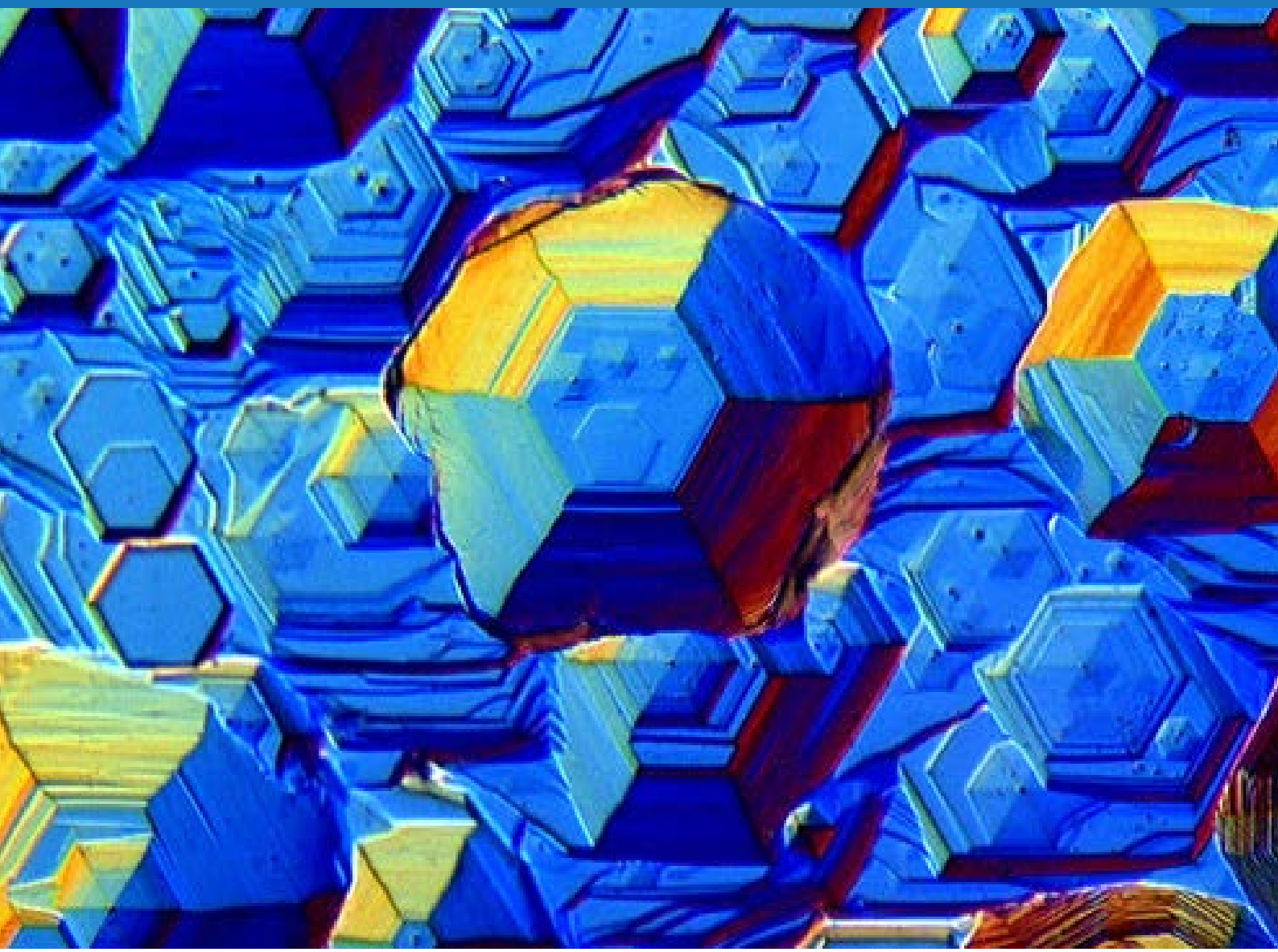
TENTATIVE PROGRAM



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KEYNOTE FOURM

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EPHRAIM SUHIR
USA

SOME CRITICAL PROBLEMS OF THE MECHANICAL BEHAVIOR AND PERFORMANCE OF ELECTRONIC AND OPTICAL MATERIALS, ASSEMBLIES AND SYSTEMS

BIOGRAPHY

Ephraim Suhir is Life Fellow of the Institute of Electrical and Electronics Engineers (IEEE); the American Society of Mechanical Engineers (ASME), the Society of Optical Engineers (SPIE) and the Int. Microelectronics and Packaging Society (IMAPS); Fellow of the American Physical Society (APS), the Institute of Physics (IoP), UK, and the Society of Plastics Engineers (SPE); and Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA). Ephraim has authored about 400+ publications (patents, technical papers, book chapters, books), presented numerous keynote and invited talks worldwide, and received many professional awards, including the 1996 Bell Labs Distinguished Member of Technical Staff Award and the 2004 ASME Worcester Read Warner Medal for outstanding contributions to the permanent literature of engineering. He is the third Russian American, after Stephen Timoshenko and Igor Sikorsky, who received this prestigious award.

Some critical problems of the mechanical behavior and performance of electronic and optical materials, assemblies and systems are addressed and discussed. It is shown that application of analytical modeling (always confirmed in our investigations by finite-element-analyses) enables to reveal and explain the underlying physics associated with such, often non-obvious, always non-trivial and sometime even paradoxical, problems and situations. Most of the problems were encountered by the author during his tenure with Bell Labs (basic research area, Murray Hill, NJ); University-of-California at Santa Cruz; Portland State University, Portland, OR; and small business innovative research (SBIR) ERS Co., CA, USA. The following major problems are addressed: magnitude and distribution of the interfacial thermal stresses in adhesively bonded or soldered assemblies; incentive for using low modulus bonding materials and, in some applications, materials with low yield stress; assemblies bonded at the ends; incentive for using test specimens with transverse grooves in the bonded materials for lower and more uniformly distributed interfacial stresses in the bonding material; thermostatic compensation in temperature-sensitive devices using conventional materials (as opposite, e.g., to ceramics with negative CTE); bow-free (temperature change insensitive) assemblies; thermal and lattice mismatch stresses in semiconductor crystal grown structures; adequate reproducing drop test conditions using shock testers, demonstration that the maximum acceleration is not always the adequate criterion of the dynamic strength of an electronic product, and that a static short-term load could be more damaging than the dynamic one; combined action of tensile and bending deformations of the PCBs subjected to drop tests and ability to obtain closed-form and even exact solutions for highly nonlinear shock-excited vibrations, such as, e.g., those taking place during drop tests on the board level; nonlinear response of the PCB (with surface-mounted devices on it) to the sudden acceleration applied to its support contour; modeling situations, when the dynamic response of a linear or a non-linear electronic system subjected to a short-time loading can be

substituted with an instantaneous impulse; stress relief in solder joints of the second level of interconnections (package to PCB) owing to larger stand-off heights of the solder joints; incentive for using inhomogeneous solder joint systems for lower thermally induced stresses; thermal stress in flexible electronics; ability to predict the threshold of the added transmission losses in jacketed (single coated) optical fibers using mechanical considerations; incentive for mechanical pre-stressing of accelerated test specimens subjected to thermal loading; ability to relieve stress in thermoelectric module designs using thinner and longer legs; reducing bending stress in optical fiber interconnects by properly rotating their ends; low-temperature micro-bending of long-haul dual-coated optical fibers; two-point bending of optical fiber specimens. It is concluded that all the three basic approaches in microelectronics and photonics materials science and engineering - analytical (mathematical) modeling, numerical modeling (simulation) and experimental investigations - are equally important in understanding the physics of the materials behavior and in designing, on this basis, viable and reliable electronic devices and products. As to analytical modeling, it is a powerful tool that enables one to explain critical and often paradoxical situations in the behavior and performance of electronic materials and products, and to make a viable device into a reliable product.

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MELESE WORKU
Hong Kong

VULNERABILITY AND ADAPTATION STRATEGIES TO CLIMATE CHANGE FOR SUSTAINABLE DEVELOPMENT OF RURAL LIVELIHOOD IN CASE OF LIBO DISTRICT, SOUTH GONDER ZONES, ETHIOPIA

Background: Climate change at the present time one of biggest worldwide agenda. It considered serious threats natural resources, people's livelihood and sustainable-development.

Objective: To evaluate vulnerability and adaptation strategies climate change for sustainable-development rural livelihood. Study was conducted Libo District 2016/17.

Methods: Primary and secondary data were collected through semi-structured questionnaires, field observation, interview, focus group discussion, key informant interviews and National Meteorological Data. randomly selected. Data analyzed by SPSS, Livelihood vulnerability Index and Microsoft-Excel.

Result: There was empirical evidence annual and maximum average annual rainfall is decreasing at the rate of 17.21mm and 7.499mm per last twenty-five year respectively. The rainfall decreasing trend Linear equation (Y=-17.21X-41) R2=0.68,(Y=-7.499X-14574) R2=0.64 with at 5% level of significance. The annual and average annual temperature increase the rate 0.09oc and 0.062 oc per last twenty-five year respectively. The result of Multivariate Probit-Model farmers adaptation different strategies against climate change soil conservation practice, adjusting planting date, crop diversification, using improved crops varieties and irrigation were 37.5%,22.5%,16.67%,13.33% and 10% respectively. Result reveals (42.8%) more vulnerable climate-change due to higher magnitude impact, low adaptive capacity, lack education, weak livelihood strategy and being exposed to extreme climate shock and climate sensitive resources. Result indicated main constrain adaptation strategies lack of information about long-term Climate change, lack of appropriate adaptations strategy, Lack of access timely weather forecast, Lack of irrigation schemes 29%,17%,11.67%,12.5%,37.5% respectively. Multivariate Probit Model results confirm that access information, social capital, access technology, economic wealth, infrastructure have statistically significant impact on climate adaptation strategies.

Conclusion: The government should be developing different climate adaptation strategic practice and raising awareness local population for sustainable development. Researcher recommends that climate vulnerability should be support and intervention government, policy and decision maker to improve existing policies for sustainable development of rural livelihood.

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NADRAS OTHMAN
Malaysia

STRUCTURAL AND VISCOELASTIC BEHAVIOR OF ATTAPULGITE CLAY/NATURAL RUBBER NANOCOMPOSITE

BIOGRAPHY

Dr Nadras Othman is attached to the Polymer Engineering Program, School of Materials and Mineral Resources Engineering, Universiti Sains Malaysia (USM), Engineering Campus which located in Nibong Tebal, Penang, Malaysia. Her research and development work is centered on the utilization of natural resources as an additive in rubber compound, progress in retread tire liner and rubber clay composites. She obtained her Bachelor Degree from University of North London (London Metropolitan University) in 1997. She works as a Quality Assurance Supervisor at STC (M) Plastics Private Limited for 1 year and Quality Assurance Engineer at EP Polymers (M) Private Limited for 1 years. She obtained her PhD in Polymer Composites from USM in 2007 and joined USM in January 2008. She was promoted to Associate Professor two years ago. She has published more than 70 ISI, Scopus Indexed and national journal, 6 book chapters and more than 80 international and national proceeding with more than 750 citation, 17 H-Index and 27 i-10 index (30th January, 2018).

Attapulgite (ATP) clay/natural rubber nanocomposite was prepared by a combination of melt mixing and latex compounding method. In the present work, the structural and viscoelastic behaviour of ATP/NR nanocomposite were investigated. The clay dispersion was formed by variation of mixing time, 30 minutes (M30), 60 minutes (M1) and 120 minutes (M2). The ATP/NR nanocomposite was characterized by X-ray diffraction (XRD, cure characteristics, physical and dynamic mechanical analysis (DMA). The properties were evaluated and compared with control samples, pure NR, and also ATP/NR nanocomposite prepared using a conventional system, called as Insitu 6. It was observed that M1 showed better properties compared with the other two variation mixing time; M30 and M2. M1 showed higher minimum and maximum torque compared to M30 and M2 and highest swelling results compared to NR. It showed that the clay structure was intercalated and partially exfoliated in the natural rubber matrix. From DMA results, the glass transition temperature, Tg of M1 and M2 were shifted by 3°C and 9°C to the left as compared with NR, respectively. The optimum mixing time variation of ATP/NR composite with combination of melt mixing and latex compounding method was found to be at 60 minutes.

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PAVLE RADOVANOVIC
Canada

PLASMONIC In_2O_3 NANOCRYSTALS AS MULTIFUNCTIONAL MATERIALS: THE ROLE OF DOPANT, PHASE, AND ELECTRONIC STRUCTURE

BIOGRAPHY

Pavle Radovanovic received his Ph.D. degree from the University of Washington, Seattle. Following his postdoctoral appointment at Harvard University, and started his independent research career at the University of Waterloo in 2006. At Waterloo he initiated a new research program in physical-inorganic chemistry focusing on the design, synthesis, and fundamental physical and chemical properties of multifunctional low-dimensional materials. His work has been recognized by number of honors and awards, including Canada Research Chair (NSERC), Early Researcher Award (Ontario Ministry of Research and Innovation), Mobility Award (French Ministry of Foreign Affairs), and CNC-IUPAC Award.

Synthesis, properties, and applications of gold and silver nanostructures with tunable localized surface plasmon resonances (LSPRs) have been a subject of intense investigation over the past decade. The focus on these noble metal plasmonic nanomaterials stems from their facile synthesis, relative stability, and the visible-range LSPR. However, among other drawbacks, these nanostructures are also costly for large-scale applications and exhibit high degree of optical losses due to electronic transitions. Consequently, doped transparent semiconductor and metal oxide nanocrystals have emerged as a new class of unconventional plasmonic materials. In this talk I will present the results of our recent work on colloidal indium oxide-based plasmonic nanocrystals, including structure-dependent plasmonic properties. I will also discuss colloidal synthesis and spectroscopic properties of several new plasmonic nanocrystal systems based on In2O3 and comparative investigation of their electronic structure using combined Drude-Lorenz model and density functional theory. Application of these colloidal mid-IR plasmonic nanocrystals will also be discussed. I will specifically focus on our recent results on robust electron polarization in degenerately-doped In2O3 nanocrystals, enabled by non-resonant coupling of cyclotron magnetoplasmonic modes with the nanocrystal exciton.

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SCIENTIFIC TRACKS & ABSTRACTS

SESSIONS

August 02-03, 2018

Basics of Material Science and Engineering/Properties of Materials Science/ Ceramics and Composites/ Spintronics/ Advancement of Materials/ Aircrafts and Engine / Metal AlloysManufacturing / Mining/ Semi Conducting Materials and Circuits

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Session Chair
Will be announced soon

Session Co-chair
Will be announced soon

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Abdeen Mustafa Omer, United Kingdom

Title: **Resistive Random Access Memories as Next Generation High Performance Computing Systems**
Adnan Younis, Australia

Title: **Characterization of trap centers in gallium sesquisulfide crystals by low temperature thermoluminescence measurements**
N. Hasanlia, Turkey

Title: **Title:Charge transport in two-dimensional DNA tunnel junction diodes**
Minho Yoon, Korea

Title: **Experimental Investigations on Multi-Layer Hard-Facing Chromium on Ferrous Alloys**
Ventakesh begori, India

Title: **Application of metaheuristics on current-voltage curves of superconducting films**
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Title: **Effects of sintering atmospheres on thermoelectric properties, phase,microstructure and lattice parameters c/a ratio of Al, Ga dual dopedZnO ceramics sintered at high temperature**
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Title: **Synthesis of Transparent Amorphous Carbon Thin from Cellulose Powder in Rice Straw by catalytic acid spray method**
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Title: **Energy efficient designs: Cleaner and greener energy technologies, sustainable development and environment**
Abdeen Mustafa Omer, United Kingdom

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Title

DESIGN AND OPERATION OF LOW ENERGY CONSUMPTION PASSIVE HUMAN COMFORT SOLUTIONS

Name & Country

Abdeen Mustafa Omer

United Kingdom

Abstract

The use of renewable energy sources is a fundamental factor for a possible energy policy in the future. Taking into account the sustainable character of the majority of renewable energy technologies, they are able to preserve resources and to provide security, diversity of energy supply and services, virtually without environmental impact. Sustainability has acquired great importance due to the negative impact of various developments on environment. The rapid growth during the last decade has been accompanied by active construction, which in some instances neglected the impact on the environment and human activities. Policies to promote the rational use of electric energy and to preserve natural non-renewable resources are of paramount importance. Low energy design of urban environment and buildings in densely populated areas requires consideration of wide range of factors, including urban setting, transport planning, energy system design and architectural and engineering details. The focus of the world's attention on environmental issues in recent years has stimulated response in many countries, which have led to a closer examination of energy conservation strategies for conventional fossil fuels. One way of reducing building energy consumption is to design buildings, which are more economical in their use of energy for heating, lighting, cooling, ventilation and hot water supply. However, exploitation of renewable energy in buildings and agricultural greenhouses can, also, significantly contribute towards reducing dependency on fossil fuels. This will also contribute to the amelioration of environmental conditions by replacing conventional fuels with renewable energies that produce no air pollution or greenhouse gases. This study describes various designs of low energy buildings. It also, outlines the effect of dense urban building nature on energy consumption, and its contribution to climate change. Measures, which would help to save energy in buildings, are also presented.

Biography

Abdeen Mustafa Omer (BSc, MSc, PhD) is an Associate Researcher at Energy Research Institute (ERI). He obtained both his PhD degree in the Built Environment and Master of Philosophy degree in Renewable Energy Technologies from the University of Nottingham. He is qualified Mechanical Engineer with a proven track record within the water industry and renewable energy technologies. He has been graduated from University of El Menoufia, Egypt, BSc in Mechanical Engineering. His previous experience involved being a member of the research team at the National Council for Research/Energy Research Institute in Sudan. He has been listed in the book WHO'S WHO in the World 2005, 2006, 2007 and 2010.

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Title

RESISTIVE RANDOM ACCESS MEMORIES AS NEXT GENERATION HIGH PERFORMANCE COMPUTING SYSTEMS

Name & Country

Adnan Younis

Australia

Abstract

Resistive switching devices are promising alternative to existing memories which may offer a potential leap beyond the limits of Flash memories (with respect to write speed, write energies) and Dynamic random access memories DRAM (with respect to scalability, retention times). A conventional RRAM cell is composed of an insulating/dielectric layer sandwiched between two metallic layers. In this talk an overview of physical and electrochemical processes which may be the origin of the switching phenomenon in various materials will be discussed. Furthermore novel concepts (strategies) beyond classic doping will be discussed to control device properties like signal to noise ratios and power consumption. In our work as a first strategy we realize the superior bipolar resistive switching characteristics of CeO2:Gd-based resistive memory device by utilizing a unusual mean of UV radiation. This non-conventional tool provides us a new degree of freedom to manipulate the performance of a memory device. Our further investigations revealed that the prototype can deliver short term to long term memory transitions which is analogous to the forgetting process of human brain, which is a key biological synaptic function for information proce- ssing and data storage. In another strategy, a non- conventional and unique “chronoamperometry” approach contrary to classic voltammetry measurements was implemented to examine the bipolar resistive switching characteristics of ceria based memory cell. Configurable device functionalities such as; categorization of minimum threshold potential to prompt switching behaviour, tuneable on/off ratios with accessible multi-level data storage states can be achieved which are hard to realize in conventional measurement setups.

Biography

Adnan Younis received his PhD in Materials Science and Engineering, from University of New South Wales, Sydney Australia in 2014. Dr. Younis is currently leading a research team in the school of Materials Science and Engineering as Research Assistant professor.His group is working on novel nanostructured materials for their applications in functional devices ranging from electronics devices to energy storage and environmental applications. He is author/co-author of more than 42 publications including 4 book chapters and one granted patent (h-index ~ 12). He is recipient of several prestige awards including; Best research student Award in 2015 (UNSW Science), Australian Academy of science Early Career Research fellowship, UNSW Travel Award (2014), UNSW best student performance awards (2013 and 2014).

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Title

CHARACTERIZATION OF TRAP CENTERS IN GALLIUM SESQUISULFIDE CRYSTALS BY LOW TEMPERATURE THERMOLUMINESCENCE MEASUREMENTS

Name & Country

N. Hasanli

Turkey

Abstract

Thermoluminescence (TL) experiments were performed for Ga2S3 crystals to obtain information about trapping parameters. TL measurements were carried out from 10 to 300 K with varying heating rates in the range of 0.2• 0.8 K/s. Two TL glow peaks centered at Tmax = 44 and 91 K were observed at heating rate of β = 0.5 K/s. For low-temperature peak, TL intensity decreased whereas that for high-temperature peak increased with elevating the heating rates, which means anomalous heating rate behavior occurred for high-temperature peak. Distribution of trap centers was investigated using Tmax–Tstop method. TL measurements were conducted with varying illumination temperature (Tstop) from 10 to 60 K. For both peaks, TL intensity values decrease and Tmax values shift to higher temperatures with increase of Tstop, which means that traps are distributedquasi-continuously. For each TL curve for different Tstop values, initial rise method was used to find activation energies of traps. Thermal activation energies increased from 40 to 135 meV by increasing Tstop values from 10 to 30 K for low-temperature peak and those for high-temperature peak increased from 193 to 460 meV by elevating Tstop values from 40 to 60 K. The increase of the activation energies with the rising Tstop values is consistent with the gradual emptying of shallowest trapping levels during each preheating treatment. Moreover, frequency factors and capture cross sections for revealed traps were evaluated.

Biography

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Title

CHARGE TRANSPORT IN TWO-DIMENSIONAL DNA TUNNEL JUNCTION DIODES

Name & Country

Minho Yoon

Korea

Abstract

Recently, DNA has been studied for electronics due to its intrinsic benefits such as its natural plenitude, bio-degradability, bio-functionality and low-cost. However, its applications only limit to passive components because of inherent insulating properties. In this report, the metal-insulator-metal tunnel diode with Au/DNA/NiOx junctions is presented. Through the self-aligning process of DNA molecules, a two dimensional DNA nanosheet is synthesized and used as a tunneling barrier, and semitransparent conducting oxide, NiOx is applied as a top electrode for resolving metal penetration issues. These molecular devices successfully operate as a non-resonant tunneling diode and temperature-variable current-voltage analysis proves that Fowler–Nordheim tunneling is a dominant conduction mechanism in the junctions. The DNA-based tunneling devices appear to be a promising prototype approach to Bio-Nano electronics using DNA nanosheets.

Biography

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Title

EXPERIMENTAL INVESTIGATIONS ON MULTI-LAYER HARD-FACING CHROMIUM ON FERROUS ALLOYS

Name & Country

Ventakesh Begori

India

Abstract

Surface coating aims at tailoring the surface dependent engineering properties by applying another layer on the surface of substrate using physical, chemical/electrochemical, thermal and high energy surface modification routes. A Multilayer graded coating refers to the coating consisting of continuously changing composition from substrate to the surface to achieve combinations of toughness and bond strength. The gradients may be continuous change in microstructure, microstructure and composition both or porosity distribution. These graded coatings are purposefully developed with an objective to improve the performance and are superior to homogeneous materials composed of similar constituents. The advantages of graded coating over conventional monolithic coating system include a significant reduction in residual stress level, improved toughness, improved wear resistance and thermal properties.

Present investigation has been undertaken to evaluate the elevated temperature erosion of graded Fe-Cr alloy layers. Towards that purpose, graded Fe-Cr layer was deposited on mild steel using TIG welding process. Hard faced Fe-Cr alloy on mild steel was subjected to solid particle erosion at elevated temperature up to 1073 K. The mechanical properties of these alloys are determined at different temperature. The dependence of erosion rate on impact angle and impact velocity has been evaluated for five different test temperatures. The morphology of the eroded surface is examined with scanning electron microscopy (SEM). The area beneath the eroded area is characterized using SEM and electron probe micro analyser (EPMA). The results show that erosion rate is not related with the mechanical properties of the alloys. In the experimental regime, metal erosion dominates. However, erosion at higher temperature is characterized by formation of a mixed layer containing the metal and the erodent.

Biography

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Title

PRECISION MODELING: APPLICATION OF METAHEURISTICS ON CURRENT-VOLTAGE CURVES OF SUPERCONDUCTING FILMS

Name & Country

Syed Rameez Naqvi

Pakistan

Abstract

Use of Artificial Neural Networks has been recently advocated for modeling of electrical properties of superconducting films. It is widely understood that Artificial Neural Networks' approximation capability is constrained by their two randomly generated coefficients: Weights and biases. In this work we demonstrate that metaheuristics, such as a genetic algorithm, once employed to optimize these coefficients, increases the approximation accuracy significantly. While we make use of a physical properties measurement system for obtaining current-voltage curves, the so called transport measurements, for an Nb film, our simulations are carried out on MATLAB. We have made use of mean-squared error as the metric for comparing our proposed framework with state-of-the-art modeling methods.

Biography

Syed Rameez Naqvi received his MSc and Ph.D. degrees from the University of Sheffield, UK, and Vienna University of Technology, Austria, respectively in the years 2007 and 2013. He is a computer engineer by profession, and is working as Assistant Professor with the Department of Electrical Engineering at COMSATS Institute of Information Technology, Wah Cantonment, Pakistan, since his Ph.D. His research areas include modeling, simulation, and optimization, specifically focused on circuits and systems and VLSI.

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Title

NOVELTIES IN MOLECULAR PROGRAMMING

Name & Country

Ibragim E. Suleimenov

Kazakhstan

Abstract

Molecular programming is one of the most important parts of nanotechnology as such methods allow implementing structures that perform a given sequence of operations at the nanoscale. In this paper, it is shown that programmable nano-automaton can be realized on the based on hydrophilic macromolecules, which is experiencing phase transitions under the influence of environment and temperature changes in the acidity. The recording of information in automata like this, is provided by means of binary memory cells built on macromolecular structures, where the phase transitions in which are accompanied by hysteresis phenomena. A new algorithm for recording information is proposed for systems of this type. Its distinctive feature is the recording of information in the nanoscale structures due to a given sequence of changes in thermodynamic variables (acidity and temperature of the medium), i.e. macroscopic effects. The realization of such an algorithm becomes possible, since macromolecular structures, where the phase transitions in which are accompanied by hysteresis phenomena, form an analogue of the neural network. Accordingly, the resulting state of the system depends not only on the current value of thermodynamic variables, but also on the pre-history of their change. The analog of a neural network has a large set of stable states that can be realized with the same set of thermodynamic variables, which allows to record a given logical sequence in binary memory cells, with help of varying the path on the two-dimensional plane "acidity-temperature".

Biography

Ibragim E. Suleimenov has completed his PhD (physics) at the age of 25 years from Leningrad State University, USSR. He is and his Doctor of Sciences (chemistry), Almaty, 2000, Academician of National Engineering Academy of Kazakhstan. He is the professor of Almaty University of Power Engineering and Telecommunications, Kazakhstan. He has over 400 publications that have been cited over 600 times

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Title

EFFECTS OF SINTERING ATMOSPHERES ON THERMOELECTRIC PROPERTIES, PHASE, MICROSTRUCTURE AND LATTICE PARAMETERS C/A RATIO OF AL, GA DUAL DOPED ZNO CERAMICS SINTERED AT HIGH TEMPERATURE

Name & Country

Matiullah

China

Abstract

Thermoelectric properties, phase and microstructural investigation of (Zn1−x−yAlxGay)O, where x = 0.02, y = 0.04, 0.05 and x = 0.03, y = 0.01, 0.02 are studied at a high temperature of 1450 °C in this article. We have focused on the effects of sintering atmospheres on thermoelectric properties, phase and microstructure in the air as well in the argon atmosphere. The Seebeck coefficient (S) and electrical resistivities (ρ) measured in air and argon atmospheres have an evidential large difference. The air sintered Al, Ga co-doped ZnO has higher power factor (S2σ) of the order 720.9 μW K− 2 m− 1 and lower electrical resistivity (ρ) of 5.803 mΩ cm for the nominal formula (Zn1− x −yAlxGay)O, with x = 0.03, y = 0.01 as compared to the power factor 543.6 μW K− 2 m− 1 and electrical resistivity of the order 1.550 mΩ cm at 692.2°C sintered in the argon atmosphere at the same temperature i.e. 1450°C.The power factor of the air sintered sample with x = 0.03, y = 0.01 is 1.4 times higher than the argon sintered sample with the same composition. The difference in power factors and electrical resistivities are linked to sintering atmospheres. We will investigate the effects of sintering atmosp- heres of the co-doped ZnO and will study thermoelectric propert- ies, phase, and microstructures of the co-doped ZnO.

Biography

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Title

SYNTHESIS OF TRANSPARENT AMORPHOUS CARBON THIN FROM CELLULOSE POWDER IN RICE STRAW BY CATALYTIC ACID SPRAY METHOD

Name & Country

Mahmoud Fathy

Egypt

Abstract

The transparent amorphous carbon thin films (ACTF) were prepared through a batch acid spraying technique in the presence of cobalt silicate as a catalyst at low temperature between 30 and 45 . Hence the catalyst was prepared using silica gel as a basic matrix and supporting material to produce ACTF. The produced active carbon was characterized using XRD, FTIR and Raman spectrum. The high-resolution transmission electron microscope (HR-TEM) and thermogravimetric analysis were used to analyze the surface morphology and thermal stability of cellulose and ACTF whereas the surface area was calculated using the standard iodine method. The results of Raman spectroscopy and TEM show the realization of ACTF suspension with highest constitutional order and the lowest number of layers with confirming of the succeed preparation of thin ACTF layers in thickness and average size of 1 and 100 mm respectively. In addition, under these conditions, the activated carbons' iodine value is 721.64 mg/g, and the yield ratio is 85.71%.

Biography

He completed his B.Sc at Banha University, Cairo, Egypt in the Year 2012, Bachelors degree in chemistry and bio chemistry at beni Sueif University in 2009. Now he is working as research assistant at Egyptian Petroleum Research Institute.

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Title

STEADY VISCOELASTIC MATERIAL FLOW AROUND SQUARE OBSTACLE

Name & Country

Guler Bengusu Tezel

Turkey

Abstract

In the case of non-Newtonian fluid flow around confined obstacles, the literature is dominated by the studies with generalized Newtonian model to capture shear thinning or thickening effects. On the other hand, investigating the effects of viscoelasticity on the hydrodynamics of the flow around the obstacles has potentially crucial implications on many industrial applications. Therefore it is important to study the hydrodynamics of such industrially important flows to reveal both microscopic and macroscopic flow quantities. Hence, the objective of this study is to investigate flow of a viscoelastic fluid, a linear PTT fluid and Oldroyd-B fluid around a confined square obstacle computationally. Finite volume method is employed to solve coupled equations of continuity, motion and constitutive model along with appropriate boundary conditions. Effects of inertia in terms of Re, elasticity in terms of Weissenberg number, We, and constitutive equation parameters on the recirculation length, drag and on the flow field in terms of stress and velocity fields were examined. A detail examination of velocity profiles around the obstacle of PTT and Oldroyd-B flow reveal that streamwise velocity at high We flow delay recover undisturbed bulk velocity in the wake region for both flow at constant Re number. On the other hand, for PTT flow, required length to achieve the fully developed is nearly same for Newtonian flow at all We. But for Oldroyd-B flow with increased of We , elasticity of fluid leads to increase required length to achive the fully developed region in the wake compared to Newtonian flow. Another important feature and design parameter, drag coefficient, Cd, shows that viscoelastic wake behind the square obstacle was longer than the Newtonian wake. This also supplied larger drag or drag enhancement in viscoelastic medium compared Newtonian results.With an increase in We, Cd values get smaller due to stronger shear thinning effects for PTT fluid, whereas Cd continues slightly to enhance for Oldroyd-B fluid.

Biography

Guler Bengusu Tezel is working as Professor in the Department of Chemical Engineering, at Abant Izzet Baysal University, Turkey.

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Title

COMPETITIVE TO RPV STEEL RADIATION EMBRITTLEMENT PROCESS APPEARANCE AT NEUTRON DOSE RATE DECREASING

Name & Country

Evgenii Krasikoy

Russia

Abstract

Influence of neutron irradiation on reactor pressure vessel (RPV) steel degradation are examined with reference to the possible reasons of the substantial experimental data scatter and furthermore – nonstandard (non-monotonous) and oscillatory embrittlement behavior. In our glance this phenomenon may be explained by presence of the wavelike recovering component in the embrittlement kinetics. We suppose that the main factor affecting steel anomalous embrittlement is fast neutron intensity (dose rate or flux), flux effect manifestation depends on state-of-the-art fluence level.

In our opinion controversy in the estimation on neutron flux on radiation degradation impact may be explained by presence of the wavelike component in the embrittlement kinetics. Therefore flux effect manifestation depends on fluence level. At low fluencies radiation degradation has to exceed normative value, then approaches to normative meaning and finally became sub normative. As a result of dose rate effect manifestation peripheral RPV's zones in some range of fluencies have to be damaged to a large extent than situated closely to core. Moreover as a hypothesis we suppose that at some stages of irradiation damaged metal have to be partially restored by irradiation i.e. neutron bombardment. Nascent during irradiation structure undergo occurring once or periodically transformation in a direction both degradation and recovery of the initial properties. According to our hypothesis at some stage(s) of metal structure degradation neutron bombardment owing to competitive to steel radiation embrittlement mechanism appearance became recovering factor. Self-recovering section of RPV steel radiation embrittlement kinetics is an indication of material intelligent behavior. As a result oscillation arise that in tern lead to enhanced data scatter.

For the sake of correctness it is necessary to remember that there are examples when contrary to the famous radiation embrittlement in metals neutron irradiation at some range of fast neutron doses improves both the strength and ductility of unirradiated steel.

Biography

Education: Moscow Power Engineering Institute. Degrees or Diplomas obtained: Master's Degree in Material Science – 1970, Ph.D. – 1974, D.Sc. -2005. Membership of professional bodies: member of Scientific Council of RAS on Radiation Damage Physics of Solids. Years within the firm: since 1974. Key qualification: responsible executor in Radiation Damage Physics of Solids. Professional experience record: since 1974 till now, Moscow, National Research Centre "Kurchatov Institute", Department: Reactor Materials and Technologies Institute.

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Title

PREPARATION OF NANOTECHNOLOGY AS MAGNETICALLY-RESONANT CONTRASTING MEANS DURING VISUALIZATION OF MALIGNANT TUMOUR

Name & Country

Andrey Belousov

Ukraine

Abstract

The task was set in an experiment on animals to check possibility of the use of the before worked out and studied methodology of intravenous insert of the standardized form water solution magnetite of nanoparticles (preparation of ICNB) for contrasting of malignant tumour at MRI research. The main purpose to change the indexes of relaxation of T1 and T2 in area of malignant tumour during realization MRI by means nanoparticles of ICNB. In investigation on animals (Vistar rats) was proof that magnetite of nanoparticles (ICNB) are contrast means for malignant tumour visualization. Was been shown that magnetite of nanoparticles have contrast effect when performing magnetic resonance imaging (MRI). Was established, that after intravenous inject preparation of nanotechnology (ICNB) the magnetite of nanoparticles have selective accumulate in tumour and alter brightness of picture in 24- hours. On 4-th day investigation was established significant decries of dynamic brightness of the picture of tumour and muscles. This fact is connected with elimination the ICNB out of rat's organism.

Biography

Andrey Nikolaevych Belousov graduate from Kharkov Medical Institute in 1988. Belousov is author new method of extracorporal hemocorrection using magnet-controlled sor¬bent (MCS-B). Author of the scientific film which focuses on the elaboration of artificial liver device and the development of a new direction in medicine – Nanotechnology. Andrey Belousov was awarded Medical Diploma of Europe "An Honorary Scholar Europe" and R. Koch medal for the scientific achievements, development of a new direction in medicine and elaboration of new method of treatment by means preparations of nanotechnology in 2008.

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Title

ELECTROCHEMICAL AND BIOLOGICAL RESPONSE OF TITANIUM (CP-TI) AFTER SILICON ION IMPLANTATION

Name & Country

Akhlaq Ahmad

Pakistan

Abstract

The cp-Ti surface was modified with silicon (Si) ions beam at 0.5MeV in a Pelletron accelerator. Three different ion doses were induced over the polished samples and investigated through XRD and AFM for structure and roughness measurement. At moderate ion dose (6.54 × 1012 ions.cm−2) level, the shift in potential towards more noble direction, lower 'icorr' (1.22 µA/cm2) and higher charge transfer resistance (43.548 Ω-cm 2) was observed in ringer's lactate (RL) solution during Potentiodynamic polarization and Impedance Spectroscopic analysis. Compared to un-implanted and other low and high ion doses the effective mesenchymal stem cells proliferation at this moderate dose also confirmed its proficient biological response.

Biography

Akhlaq Ahmad has completed his PhD at the age of 31 years from University of Birmingham, UK. After completion of PhD studies, he resumed his duties as Assistant Professor in the department of Metallurgical and Materials Engineering, UET, Lahore. Later on he completed one year Commonwealth postdoctoral studies from University of Birmingham UK in 1999-2000. He did 9 months Fulbright Postdoctoral studies from University of Delaware, USA in 2005. Currently he is working as Professor and Chairman of the department of Metallurgical and Materials Engineering, University of Engineering and Technology, Lahore, Pakistan. He has published more than 50 papers in reputed journals/ conference proceedings.

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Title

ENERGY EFFICIENT DESIGNS: CLEANER AND GREENER ENERGY TECHNOLOGIES, SUSTAINABLE DEVELOPMENT AND ENVIRONMENT

Name & Country

Abdeen Mustafa Omer

United Kingdom

Abstract

The move towards a de-carbonised world, driven partly by climate science and partly by the business opportunities it offers, will need the promotion of environmentally friendly alternatives, if an acceptable stabilisation level of atmospheric carbon dioxide is to be achieved. This requires the harnessing and use of natural resources that produce no air pollution or greenhouse gases and provides comfortable coexistence of human, livestock, and plants. This article presents a comprehensive review of energy sources, and the development of sustainable technologies to explore these energy sources. It also includes potential renewable energy technologies, efficient energy systems, energy savings techniques and other mitigation measures necessary to reduce climate changes. This article presents a comprehensive review of energy sources, the development of sustainable technologies to explore these energy sources. It also includes potential renewable energy technologies, energy efficiency systems, energy savings techniques and other mitigation measures necessary to reduce climate change. The article concludes with the technical status of the GSHP technologies.

Biography

Abdeen Mustafa Omer (BSc, MSc, PhD) is an Associate Researcher at Energy Research Institute (ERI). He obtained both his PhD degree in the Built Environment and Master of Philosophy degree in Renewable Energy Technologies from the University of Nottingham. He is qualified Mechanical Engineer with a proven track record within the water industry and renewable energy technologies. He has been graduated from University of El Menoufia, Egypt, BSc in Mechanical Engineering. His previous experience involved being a member of the research team at the National Council for Research/Energy Research Institute in Sudan and working director of research and development for National Water Equipment Manufacturing Co. Ltd., Sudan.

SESSIONS

August 02-03, 2018

Diamonds and Jewellery/ Graphene properties of Metals/ Photonics and Advancement/ Nano Materials and Nano Technology/ Future Applications of Nanotechnologies / and Bio-Nanomaterials/ Future Applications of Nanotechnologies and Bio-Nanomaterials/ Health, Medicine and Medical devices

Session Introduction

Session Chair
Will be announced soon

Session Co-chair
Will be announced soon

Title: **Fluorescent and T1 MRI active Multilayer Nanoparticle for Imaging and Targeting Cellular Delivery**
Oara Neumann, USA

Title: **Science and technology of multifunctional ultrananocrystalline diamond (UNCDTM) coatings and applications to a new generation of implantable medical devices**
Orlando Auciello, USA

Title: **Nano-engineering materials that convert waste heat into electricity boosts their efficiency: same examples**
Marisol Martin-Gonzalez, Spain

Title: **Smart micromagneticSensors 4.0 : Nanochemistry & Bio-physics devices**
Ferial Terki, France

Title: **Challenges to Nanoscience and Nanotechnology**
Zhu X. F, China

Title: **Characterization of Impurities in semiconductor Quantum Dots using Laser Spectroscopy**
Walid Tawfik, Egypt

Title: **Biogenic synthesis of Silver nanoparticles from Avicenna marina seeds and its antimicrobial potential**
K Suresh Babu Naidu, South Africa

Title: **Nanoengineered plasma polymer films for biomedical applications**
Krasimir Vasilev, Australia

Title: **Efficient non-platinum based electrocatalysts for energy conversion and storage applications**
Vellaichamy Ganesan, India

Title: **New generation nano-adsorbent for water treatment: Need of this century**
Imran Ali, Saudi Arabia

Title: **Nonlinear Optical Studies of Sn doped CuO Nano-Colloids under pulsed laser excitation**
G. G. Muleya, India

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Title

FLUORESCENT AND T1 MRI ACTIVE MULTILAYER NANOPARTICLE FOR IMAGING AND TARGETING CELLULAR DELIVERY

Name & Country

Oara Neumann

USA

Abstract

Multifunctional plasmonic nanostructures have enormous potential in the treatment of solid tumors; however, tracking particles with drug cargo and triggering the release of the cargo in mapped tumors is still impossible. To overcome this challenge we have developed an MRI and fluorescent active nanostructure nanomatryoshka. This new nanostructure with IR plasmonic signatures is composed of a 50 nm Au core surrounded by dye molecules and Gd(III)-DOTA chelate doped SiO2 inner-shell and an outer Au shell. The experimental results demonstrates an enhanced T1 relaxation (r1 ~ 24 mM-1 s-1 at 4.7 T) compared to the clinical Gd(III)-DOTA chelating agents (r1 ~ 4 mM-1 s-1). Further, this design preserves the fluorescence signal (65%) after 24 hours of exposure, leading to enahanced fluorescence photostability (23x). This dual-imaging functionality nanosystem increases MRI sensitivity by concentrating Gd(III) ions into the Gd-NMs, reduces the potential toxicity of Gd(III) ions and dye molecules by preventing their release in vivo through the outer Au shell protection, and the terminal gold layer surface can then be functionalized to increase cellular uptake, circulation time, or thermal drug-release properties.

Biography

Oara Neumann is the J. Evans Atwell-Welch Research Scientist at Rice University (a fully funded, endowed research scientist position at the university). She has completed her PhD and Postdoctoral study in Applied Physics at Rice University, an MSc in Chemical Physics from Weizmann Institute of Science, Israel and a MSc in Analytical Chemistry from Bucharest University, Romania. She is the pioneer of nanoparticle-based solar thermal applications. She holds 12 patents and she has published more than 24 refereed articles and has an h-index of 16.

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Title

NANO-ENGINEERING MATERIALS THAT CONVERT WASTE HEAT INTO ELECTRICITY BOOSTS THEIR EFFICIENCY: SAME EXAMPLES

Name & Country

Martin-Gonzalez

Spain

Abstract

Nowadays, it seems to be clear for a great majority of people that energy needs to be generated, conserved, and recycled in better ways. We need to prevent as much as possible to waste it, since every joule saved means less fossil fuel burnt. Because of that harvesting waste energy are becoming a popular among the scientific community. And, one of the most promising approaches is nano-engineering thermoelectric materials to produce devices. Thermoelectrics are a class of materials able to convert wasted heat energy into electricity. By controlling nano-structuration properly, their efficiency increase and, since the devices have no moving parts, they are extremely reliable. In this talk, different approaches to nanostructure different materials will be shown and how those approaches help to increase the final efficiency of the material and the final device.

Biography

Marisol Martin-Gonzalez holds her Ph.D. degree since 2000. Afterwards, she did her postdoc at U.C. Berkeley. Nowadays, she is a permanent researcher at the Institute of Micro and Nanotechnology, – CSIC-. She became the leader of the research group FINDER after achieving a ERC Starting grant. Over the past years, her research activity has been focused on materials nanostructuration applied in different research areas like: hard drives, spintronic, and more recently to thermoelectrics. She is the author of more than 100 papers with more than 3000 citations. She is an elected member of the European thermoelectrics Society. She has organized several international conferences.

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Title

SMART MICROMAGNETICSENSORS 4.0: NANOCHEMISTRY AND BIO-PHYSICS DEVICES

Name & Country

Ferial Terki

France

Abstract

Promising generation of room temperature micro/nano-sensor «sensor 4.0» based on micromagnetometry devices for indirect detection of hysteresis switching loops in addressable nanoparticle1 named Spin Cross-Over Materials (SCO) will be presented. An ensemble of [Fe(hptrz)3](OTs)2 nanoparticles with a volume of ca. 3×10-3 mm3 has been investigated and given rise to 100 nV detection signal1-6. Further improvements to the device have been achieved for the enhancement of the sensitivity, reducing noise, and the implementation of a new concept based on a differential method3 for a more accurate detection. These advances permit the increase of the sensitivity by 4 order magnitude of the magnetization detection3, 4 (10-14 emu) in comparison to the SQUID (10-10 emu). This optimization provide us an original microdevice, portable, flexible and easily integrated in electronics for detecting at room-temperature very few amount of nanoparticles. The ultimate target will be the study of a single object. In order to understand the mechanism of the magnetic behaviour at nanoscale. The goals are: What is the interplay between the volume to surface due to the minimisation of the nanoparticle size? What are the relative impact of inter-particle interactions in the ligand matrix? This original and ultrasensitive experimental developments represent significant breakthroughs within the field of molecular magnetism and bio detection (femtomole). Efforts towards detecting SCO in single objects at room temperature using this powerful method are really promising to answer to the still open questions.

Biography

She is a teacher-researcher in MC, Team IMNO. She is a member of MNO team Charles Gerhardt Institute Montpellier UMR 5253. University of Montpellier 2 Place E Battalion CC1701 34095 Montpellier Cedex 5 - FRANCE.

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Title

CHALLENGES TO NANOSCIENCE AND NANOTECHNOLOGY

Name & Country

Zhu X. F

China

Abstract

In this talk, we first introduce a novel nanosize concept and a novel "nanotime" concept along with reviewing a series of novel phenomena and novel techniques related to nanosize effect and ultrafast process, which were recently discovered in our lab or were reported in the international journals. In these concepts, we demonstrate that the structure instabilities of materials occur when a material system is limited to a space within a scale that is comparable to atomic distance. We also reveal that the structure instabilities of materials occur as well when the exchange of external energy with materials is limited to a time within a scale that is comparable to atomic vibration period. We address that the new nanosize and nanotime concepts could offer an immediate prediction for fast sintering and surperplasticity of nanoceramics, especially these under ultrafast beam irradiation. We also address that the new concepts are very meaningful for future control over fabrication and beam processing of next generation of low dimensional nanostructures and nanoscale devices, especially for several potential applications related to nanocavities in Si, carbon nanotubes and nanowires. We further address that the new concepts have similarly important implications for chemistry, biology and medicine as demonstrated by immerging new findings about nanocavities and nanolaser irradiation. Especially in biology and medicine, there are widespread research interests either in using nanocavity (shell-core) structure to design and build biology composites, biosensors, drug deliverer and protein structures or in nano surgery via ultrafast nanolaser processing, both being operative at the molecular level dealing with the concepts put forward in this talk.

Biography

Prof. Xianfang Zhu is one of the earliest scientists who initialized nanoresearch in China with over 30 years of research, teaching, and industrial experience in materials science and engineering areas. He received PhD at the Australian National University and a postdoc experience at University of Illinois at Urbana-Champaign. He is presently the Director of the China-Australia, an adjunct professor at the University of Queensland and a full-time professor at Xiamen University, as well as the chief scientist for the AMAC International Inc., USA. His current research interests are focused on nanoinstabilities, nanoprocessing, and nanofabrication. Prof. Zhu has (co-) authored over 100 publications, chaired, co-chaired or served as committee or advisory board member at over 40 international or national conferences, and presented over 90 invited lectures and talks at universities, research institutes and major international conferences worldwide.

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Title

CHARACTERIZATION OF IMPURITIES IN SEMICONDUCTOR QUANTUM DOTS USING LASER SPECTROSCOPY

Name & Country

Walid Tawfik

Egypt

Abstract

Quantum dots (QDs) represent semiconductor 3D nano crystals with electronic and optical characteristics controlled by their morphology, size and coating. Typically created semiconductor group II–VI materials such as Titanium oxide TiO3, cadmium selenide (CdSe), cadmium telluride (CdTe), Cadmium Sulphide CdS etc. QDs have numerous applications such as Solar Cells, medicine and, and fabrication of LEDs. The fluorescence of the QD optical can be altered by the strong quantum confinement ranges from few to 10 nm nano crystals which allow for tuning of the fluorescence emission bands. Nevertheless, the QD efficiency affected by many parameters such as; type and quantity of impurities in QDs which will fluctuate the electronic traps, especially the dangling bonds, in the interface between the core and the coating of the QDs.

In this work, the fundamental wavelength of Nd:YAG laser at repetition rate 10 Hz to analysis the impurities in the QDs using laser induced plasma spectroscopy LIPS. The plasma parameters were controlled to adapt the local thermodynamic equilibrium conditions (LTE) for optically thin plasma. The observed results gave a qualitative LIPS analysis investigation for the available impurities in the semiconductor QDs. The obtained results gave a precise detail of the semiconductor sample compositions including the types of these impurities. Consequently, these results can be applied in prospective work in which to control the impurities contents in such QDs samples which could be used to control the electrical, optical and physical properties of the semiconductor QDs in future.

Biography

Walid Tawfik is Egyptian professor, in laser spectroscopy and ultrafast lasers at the National Institute of Laser (NILES), Cairo University, Cairo, Egypt. In 1994 he joined NILES as staff member and promoted as assistant lecturer, assistant professor and associate Professor in 1996, 2000, and 2008, respectively. He received the B.SC, Master and Ph.D degrees in physics, laser physics, and laser spectroscopy in 1992, 1996, 2000, respectively, from Cairo University, Egypt. His interested in the field of ultrafast lasers and ultrafast phenomenon. He has built Fewcycle ultrafast system of 5-fs pulse duration and 0.6 mJ at 1 kHz and published 46 papers. He have collaborated with different international groups in USA, Japan, South Korea and Germany.

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Title

BIOGENIC SYNTHESIS OF SILVER NANOPARTICLES FROM AVICENNA MARINA SEEDS AND ITS ANTIMICROBIAL POTENTIAL

Name & Country

K Suresh Babu Naidu

South Africa

Abstract

This research was aimed at synthesizing silver nanoparticles (AgNPs) using aqueous seed extract of Avicennia marina. The progress of the reaction was studies using UV-visible spectroscopy. The biosynthesized nanoparticles were characterized using UV–visible spectrophotometer, laser diffraction method for particle size analysis, TEM for morphology studies, X-ray diffraction analysis for crystallographic determination, FTIR spectroscopy analysis and energy dispersive X-ray analysis for element determination. The antimicrobial activities of silver nanoparticles were evaluated against different pathogenic bacterium and fungi. The characteristics of the synthesized silver nanoparticles suggest their application as a potential antimicrobial agent.

Biography

K Suresh Babu Naidu completed his Ph.D. at the SriKrishnaDevaraya University (India) in 2008 from faculty of Biochemistry. During 2011, he joined Durban University of Technology as Post-Doctoral Fellow under research supervision of Prof Jamila Adam in Dept. of Biomedical & Clinical Technology and continued his research on Gut Probiotics. He worked as senior Post-Doctoral fellow in Dept. of Biochemistry, University of KwaZulu-Natal, Durban. His research was focussed on biotyping, characterization of Yeast mannoproteins and analysis of silver nanoparticles using plant extracts for biomedical applications. Currently, he is Co-Supervising Masters students, assisting faculty with publications and has good publication record in International journals of repute.

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Title

NANOENGINEERED PLASMA POLYMER FILMS FOR BIOMEDICAL APPLICATIONS

Name & Country

Krasimir Vasilev

Australia

Abstract

In my talk, I will present recent developments from my lab on various biomaterial coatings that are facilitated by plasma deposition. These include antibacterial coatings, drug release platforms and cell guidance/capture surfaces.
Undesired bacterial adhesion and subsequent colonisation of medical devices is a substantial medical problem causing complex and sometime fatal infections. We have developed various strategies for generation of antibacterial coatings that can be applied to medical device surfaces. These involve means such as silver nanoparticles, antibiotics, nitric oxide, quaternary ammonium compounds (QACs) or simply coatings that have intrinsic low fouling properties. All these coatings are facilitated by plasma deposition, a technique that provides functional films placed to the surface of any type of material. Important for applications, we not only extensively test our coating for their antibacterial efficacy against medically relevant pathogens but also assess their potential cytotoxicity to mammalian cell and inflammatory consequences. We have also developed methods for the synthesis and surface immobilisation of hybrid antibacterial nanocapsules and nanoparticles, including such capable of triggered release.
In a second part of my talk I outline our work on developing advanced nanoengineered plasma polymer coatings capable of directing cellular behaviour including adhesion, proliferation, differentiation and migration. We have developed unique capabilities to control and tailor entire spectrum of surface properties such as chemistry, wettability, ligand densities, nanomechanics and nanotopography in a substrate independent fashion. We can tailor all these surface properties in a gradient manner too. I will demonstrate how we use surface gradients of nanoparticles density to study the influence of surface nanotopography on the behavior of various cell types, including immune cells and I will outline how we guide the differentiation of stem cells by tailoring surface chemistry, nanotopography or density of signalling molecules.
I will also briefly present drug delivery and release platforms that we have developed including a method for solvent free encapsulation of drug particles. A recently developed device for selective cancer cell capture for complex liquids and how it is used for diagnostic of bladder cancer will also be presented.

Biography

He completed his PhD at the Max-Planck Institute for Polymer Research in Mainz, Germany in 2004. After a short postdoctoral stay as a Marie Curie Fellow at the Institute of Genomics and Molecular and Cellular Biology in Strasbourg, France, in 2005, He accepted a research position at the University of South Australia. He was appointed as a Senior Lecturer in March 2009. In 2010, He was awarded the prestigious Future Fellowship from the Australian Research Council. He was promoted to Associate Professor in January 2012. He has held positions such as Associate Head of School-Research (2012-2013) and Research Education Portfolio Leader (2014-2015). In 2016, He was awarded two prestigious fellowships i.e. the Humboldt Fellowship for Experienced Researchers from the Humboldt Foundation and a Research Fellowship from National Health and Medical Research Council. He was promoted to Full Professor on 1st of January 2017.

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Title

EFFICIENT NON-PLATINUM BASED ELECTROCATALYSTS FOR ENERGY CONVERSION AND STORAGE APPLICATIONS

Name & Country

Vellaichamy Ganesan

India

Abstract

In fuel cells, electricity is produced by the electrochemical oxidation of a fuel (generally hydrogen) with concomitant reduction of oxygen. Fuel cells are quiet (no or low noise) and green and exhibit high fuel conversion efficiency. Accordingly, researchers are urged to develop high efficient and cost-effective electrocatalysts for the oxygen reduction reaction (ORR) and hydrogen evolution reactions (HER). Similarly, CO2 reduction reaction is emerged as a promising route to produce sustainable fuels. Despite the fact that the electrochemical routes for the above reactions are generally considered to be efficient, unfortunately these reactions involve in multi-electron transfer process which can be realized only with suitable electrocatalysts. In addition, electrocatalysts decrease the overpotential of these reactions and maximize the efficiency. At present the commercially available catalysts (mainly based on platinum) are used to realize these reactions effectively. The high cost and rare availability of platinum increase the cost of the catalysts. Hence, the development of high-performance and cost-effective non-platinum based electrocatalysts to enhance the reaction kinetics and to control product distribution is highly important. In the presentation, the recent attempts made from our laboratory for the development of non-platinum based electrocatalysts will be summarized. Composites of metal complexes with ordered mesoporous silica, carbon nanotubes, reduced graphene oxide, metal organic frame works, etc., are used for this purpose. Incorporation of metal nanoparticles to the composites synergistically enhances the reaction rate.

Biography

Dr. Vellaichamy Ganesan currently working as a Asssistant Professor in the Department of Chemistry in Banaras Hindu University .He received his PhD degree from Madurai Kamaraj University, Madurai, Tamil Nadu in 2000 and completed his MSc from Bharathidasan University, Trichy, Tamil Nadu in 1994 and BSc in 1992 from Madurai Kamaraj University, Madurai, Tamil Nadu.

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Title

NEW GENERATION NANO-ADSORBENT FOR WATER TREATMENT: NEED OF THIS CENTURY

Name & Country

Imran Ali

Saudi Arabia

Abstract

Nanoparticles called as new generation nano-adsorbents have emerged as novel adsorbents for water treatment in adsorption technology due to their unique features. The most important characteristics of these adsorbents are fast removal capacity i.e. within 5-15 minutes only. These particles are capable to remove pollutants even of low concentration i.e. µg/L uhder natural conditions of pH and temperature. The data followed both Langmuir and Freundlich models well; indicating quite good efficiencies of nanoparticles in adsorption technology. These properties of generation nano-adsorbents made them ideal candidates for fast and inexpensive water treatment technology. The proposed lecture will highlight the role of generation nano-adsorbents in water treatment by adsorption technology; with special emphasis on preparation, regeneration, separation and mechanism of adsorption. Besides, the applications of generation nano-adsorbents in removing inorganic (toxic metal ions and anions), organic (pesticides, dyes, hydrocarbons & phenolics) and biological pollutants (virus and bacteria) from water will also discussed. Furthermore, the future perspectives such as their environmental issues, health aspects and applications at laboratory, pilot and industrial scale columns will be covered.

Biography

Prof. Imran Ali, PhD, FRSC, C Chem, London (UK) is a world recognized and highly cited academician and researcher. He completed his Ph.D. from Indian Institute of Technology Roorkee, Roorkee, India. Prof. Ali is known globally due his great contribution in separation science; especially water treatment using nano materials. He has published more than 380 papers in reputed journals including papers in Nature and Chemical Reviews of more than 41 impact factors. He has also written five books published by Marcel Dekker, Inc., USA; Taylor & Francis, USA; John Wiley & Sons, USA; John Wiley & Sons, UK; Elsevier, The Netherlands. His citation is 13,500 with H index 49 and i10-index 175.

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Title

NONLINEAR OPTICAL STUDIES OF SN DOPED CUO NANO-COLLOIDS UNDER PULSED LASER EXCITATION

Name & Country

G. G. Muley

India

Abstract

We report synthesis, structural and nonlinear optical properties of L-valine capped undoped and Sn doped CuO nanoparticles (NPs) under pulsed laser excitation. Sn doped (1, 2 and 5 wt%) CuO NPs were obtained by chemical co-precipitation method and were calcinated at 500oC for 2h. X-ray diffraction (XRD) shows formation of crystalline CuO having monoclinic phase with average particle size of 10nm. Ultraviolet-visible (UV-vis) spectroscopic studies show broad excitonic absorption in the wavelength range 351-654nm. This broad range of absorption may be due to inter band surface states transitions in CuO NPs. Transmission electron microscopy (TEM) confirms uniform morphology and particle size.Nonlinear optical properties of these nano-colloids have been studied using open and closed aperture Z-scan technique employing the fundamental at 1064nm of a 7ns mode-locked Nd-YAG laser operating at 10Hz. 5wt% Sn doped CuO nano-colloids show enhanced nonliear coefficients.

Biography