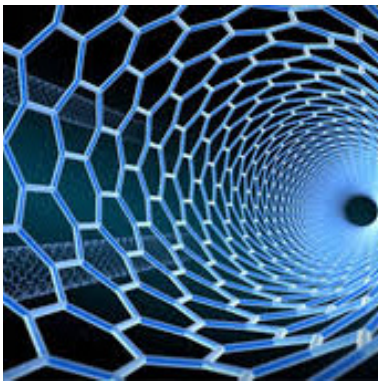
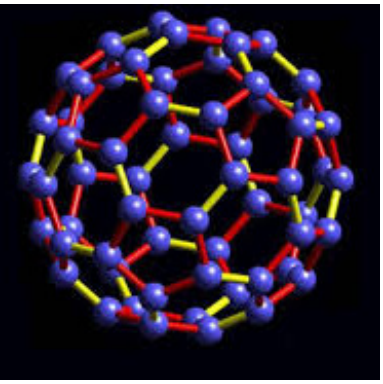
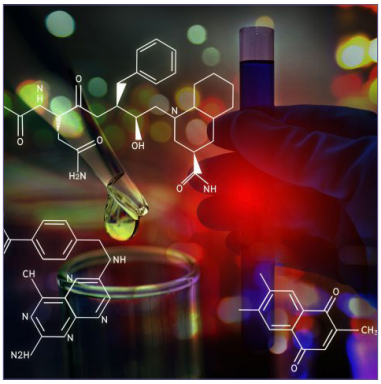
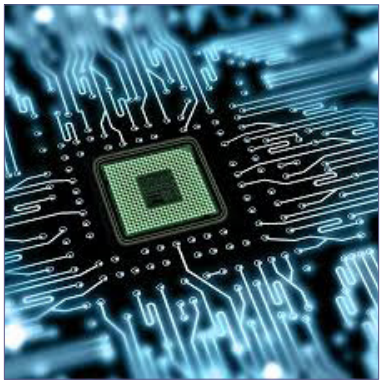
Scientific Tracks & Sessions
August 20, 2018

Materials Chemistry 2018



International Conference on

Materials Science and Materials Chemistry

August 20-21, 2018 | Paris, France

Multifunctional nanoparticle for imaging and targeting cellular delivery

Oara Neumann
Rice University, USA

Multifunctional plasmonic nanostructures have enormous potential in the treatment of solid tumours; however, tracking particles with drug cargo and triggering the release of the cargo in mapped tumours 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 SiO_2 inner-shell and an outer Au shell. The experimental results demonstrate 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 enhanced 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.

Speaker Biography

Oara Neumann is the J. Evans Atwell-Welch research scientist at Rice 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 an MSc in Analytical Chemistry from Bucharest University, Romania. She is the pioneer of nanoparticle-based solar thermal applications. She holds several patents and she has published more than 24 referred articles and has an h-index of 16.

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Magnetic and optical switching properties of Cu-Ni-Zn ferrite thin films via spin-spray deposition method

Hyoung Woo Yang and **Woo-Sung Lee**
Korea Electronics Technology Institute, Republic of Korea

We report relevant magnetic properties and reproducible optical switching performance of typical spinel structures in which the Cu-Ni-Zn ferrite thin films on SiO_2 substrates were fabricated by a spin-spray deposition method. Structure analysis indicates that the crystal structure of Cu-Ni-Zn ferrite film is spinel structure, which also has a columnar structure normal to the surface. The Cu-Ni-Zn ferrite films exhibit high permeabilities that exceed the Snoek limit for bulk ferrites. The ferrite films have relatively high permeability μ' ~ 600 up to 50 MHz and is promising to be used as thin film devices such as magnetic applications. Furthermore, we employed the electrical transport studies to understand the electrical properties by scanning out the resistance difference originated from the light. The result indicated clearly that the electrical transport is consistent with the light showing that uniform optical switching properties in the Cu-Ni-Zn ferrite films can be strongly affected by a subtle interplay between the photon and excited electrons. On the basis of the analysis of current-voltage characteristic and its light dependence, we discuss the origin of this effect and address the possibility of obtaining optical controlled Cu-Ni-Zn ferrite films for practical applications.

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Sheet metal forming optimization using finite element methods (FEM)

Alie Wube Dametew

Addis Ababa Institute of Technology, Ethiopia

In this study, the effects of spring back on sheet metal forming process are examined and investigated to develop optimum forming products strategies. Both the finite element analysis as well as the mathematical and numerical analysis and investigations were employed. For the analysis the effects of sheet metal thickness, tooling geometry, friction condition, sheet material property and sheet metal processing parameters were considered. According to this FEM analysis investigations during forming process of spring back on sheet metal bending process is done. Though using both mathematical and numerical methods the influence of sheet metal thickness, sheet metal type, friction condition, tool radius and tool shape on spring back to aluminium, copper, mild steel and the steel sheet metal have been considered for investigations. According to the investigation shows that increasing sheet metal thickness from 1.6mm to 9.0 mm the spring back is reduced 8% and 10.18 % analytical and numerical results respectively. While a thin sheet metal thickness highly affects the formation of spring back on metal forming products. Since to reduce the spring back it is better to use high strength sheet metal components for optimum quality product and performance improvements. Although, when increasing of sheet metal strength spring back increases because spring back of the sheet should depend on the yield strength of the material. As the materials yield strength increase the spring back after un-loading also increases i.e. using Aluminium sheet metal instead of high strength sheet metals spring back is reduced by 56. %. For decreasing of the tool radius leads reducing spring back. Accordingly, the effects of sheet metal die on metal forming quality also instigated. Finally, the result validation and optimization on sheet metal forming process were done. Therefore, FEM analysis were often used to calculate materials deformation behavior and the spring back occurrence of formed sheet metals.

Speaker Biography

Alie Wube Dametew is currently a PhD student in the field of Mechanical and Industrial Engineering. His research interests include manufacturing process improvement, productivity, technology systems, modelling and analysis of manufacturing systems, automation and cloud computing technology, supply chain and industrial logistic improvement analysis, innovation and technology transfers, advanced and smart materials, sustainability and renewable energy improvements. So far, he has worked as lecturer and head of research and community service in Wollo University Kombolcha Institute of Technology. He has also worked as a continuous improvement expert and production supervisor in manufacturing companies and has sufficient experience on industrial plant project studies.

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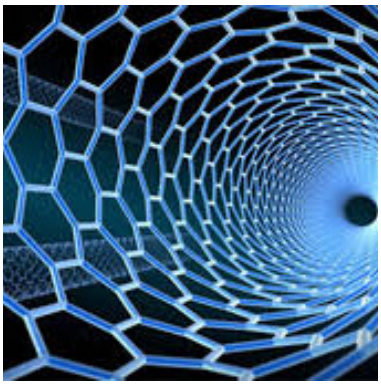

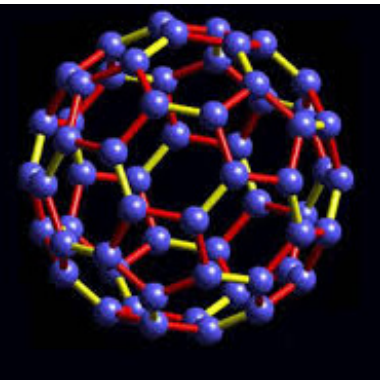
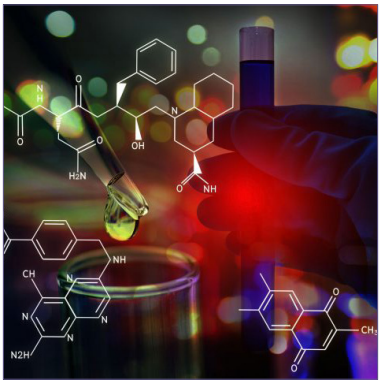
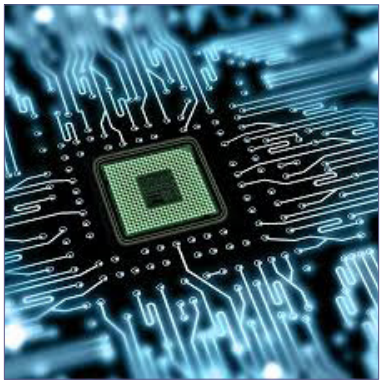

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Platform of tools (AI) to facilitate biomimetic design process in architecture domain

Natasha Heil
MAP-MAACC, France

The project aims to develop an innovative practice of architectural design towards sustainability based on biomimetic approach. Biomimetic architectural design is a difficult activity to implement. Nature presents such a multitude of phenomena that the time of research and maturation of a possible transfer to architecture is necessarily very long and it requires a strong collaboration between biologists and architects. This type of multidisciplinary activity is still not directly applicable in the time and activity of an architectural project neither in its economic and social context. To develop sustainable innovation through biomimetic approach in the sector of architecture and urbanism different levers are identifiable. One of the levers would be to set up a platform of exchange and interdisciplinary cooperation between architects and biologists. The platform would also provide architects along with support tools for the biomimetic design process. To develop the platform we envisage to:

1. Constructing Ontology (AI) for biomimetic architecture knowledge, the ontology helps to bridge the biological knowledge and architectural concept.
2. Developing a decision-making tool (BN) to select the most appropriate strategies within the ontology of biomimetic architecture knowledge according to the characteristics of the project and specific requirements (function, site, requirements in terms of energy saving etc.).
3. Experimenting and testing innovative tools, for example, TRIZ and CK for the biologically inspired design process in the framework of architectural projects carried out with students at ENSAPLV in workshop settings.

Speaker Biography

Natasha Heil has completed her Ph.D. in biomimetic strategy for design and innovation in architecture in 2012 from TUWien, Austria. She is an architect and a researcher at MAP-MAACC, CNRS-MCC UMR 3495, Paris, France. Her research focuses on the exploration of several innovative methods and digital tools to translate principles of nature and implement them in architectural design.

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Order disorder transitions in Fe-based alloys

Boulouma Amor
ESTI of Annaba, Algeria

The order-disorder transition in Fe-rich Fe-Al alloys was first reported in 1932 by Bradley and Jay. Since then, much effort has been put into understanding the order-disorder transformation in different systems, particularly in the Fe-Al, Fe-Si and Fe-Al-Si systems as the typical case of order-disorder transitions. Two ordered structures with stoichiometric compositions- Fe (Al-Si) and Fe_3(Al-Si), can be formed from the bcc phase alloys and these structures exist over a wide range of composition and temperature. The existence of the ordered phases 1 (Fe_3Al and Fe_3Si which have $D0_3$ or BiF_3 type order) and phase 2 (Fe-Al and Fe-Si which have B_2 or Cs-Cl type order) along the Fe_3Al-Fe_3Si section was studied by means of various techniques in order to understand the nature and the existence of this transitions such as high temperature X-ray diffraction and recording the disappearance of $D0_3$ superlattice and reflections as a function of temperature and composition. Further works have been carried out in this field and led to the understanding of these type of transitions.

Speaker Biography

Boulouma Amor is an assistant professor at the ESTI (French abbreviation of College of industrial technologies) of Annaba (Algeria) since 2006, has completed his PhD on "Arc melted Fe-Si-Al alloys'' in 2018 from the University of Annaba (Algeria) and became an associate professor there. He has two published papers about Al-Fe-Si alloys and made over 15 contributions in international conferences on different themes such as Synthesis of advanced materials from Al-Fe-Si and Si-C alloys by arc melting and mechanical alloying; Mechanical and magnetic properties of Fe-Si-Al sendust alloys; Synthesis of composite materials from Al-Fe_2O_3 reactions, etc.

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Design and operation of low energy consumption passive human comfort solutions

Abdeen Mustafa Omer
Energy Research Institute, UK

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.

Speaker 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. He has been listed in the book WHO'S WHO in the World 2005, 2006, 2007 and 2010. He has published over 200 papers in peer-reviewed journals, 50 review articles, 5 books and 50 chapters in books.

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The new industrial revolution: Manufacturing with 3D printers and polymer materials in an economy of design, innovation and intellectual property

Lucas Agudiez Roitman
Stanford University, USA

We analysed the function and applications of a 3D printer in the context of a modern economic landscape. While other papers delve into the topic of printers in which users can download 3D models from various websites and replicate them, they do so on a surface level. This paper delves deeply into the potential economic changes that these devices could create. Unlike in regular manufacturing, these objects, made mainly from the plastic material, can have internal gears and pieces that make a fully working mechanical product, without the need to assemble the individual parts into a larger contraption and have been used even for the creation of fire weapons. We discuss the implications in regulation and control of the population and their creations.

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ART chewing gum: A linkage to care

Rahul Hajare
National AIDS Research Institute, India

The oral effects of HIV and AIDS occur because of your weakened immune system and the medicines that kept under control. These effects have also found in other people with weakened immune systems. Dry mouth (xerostomia) because people with HIV have an increased risk of cavities, a dentist will provide a program to reduce the risk. This may include fluoride varnishes applied in the dental office, toothpaste that add minerals to teeth and rinses that contain fluoride or reduce acid (acidity of mouth) in the mouth. Patient education has an essential part of this program. Dry mouth has xerostomia has a symptom of HIV infection but not something that would be used as a diagnostic tool. There are many reasons if you have HIV, changes in the mouth may reflect changes in immune status. Dry mouth (xerostomia) has a common side effect of medicines that may take for HIV/AIDS. Dry mouth can make more prone to tooth decay, gingivitis, thrush (oral yeast infection) and periodontal (gum) disease. That's because have less saliva, and the quality of the saliva is changed exponentially. Besides water, saliva includes electrolytes, mucus, antibacterial compounds, enzymes and other proteins. The amounts of these substances change in people with dry mouth. A decrease in saliva reduces its ability to wash away sugars, food, bacteria and the acids that bacteria produce. These acids cause teeth to decay. A dentist can prescribe a fluoride rinse or gel or a saliva substitute to counteract the increased risk of tooth decay and thrush.

Speaker Biography

Rahul Hajare is a bright student of the renowned immunologist, R.S.Paranjape, retired director & Scientist 'G' National AIDS Research Institute India. He has completed his PhD at the age of 32 from Vinayaka Mission University and postdoctoral studies from Indian Council of Medical Research Delhi. Currently, he is working in the National AIDS Research Institute Pune on transcutaneous DNA vaccination, Nipah drug delivery systems, new cancer drug delivery systems and specific antibodies attached drug delivery systems and DNA vaccination.

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An innovative material of fiber low-cement and cementless composite for building Industry

Chang-Geun Cho
Chosun University, South Korea

The carbon dioxide (CO_2) emission during a manufacturing process of the ordinary Portland cement is up to about 7.0 % of global manmade CO_2. In order to improve the material and mechanical characteristics of concrete and cement-based material, an innovative near-environmental material of fiber-reinforced low-cement and cementless composites has been manufactured. The low-cement or cementless composites were manufactured by replacing 60% of the amount of cement with ground granulated blast-furnace slag with or without using alkali activators or replacing with fly ash. Short synthetic fibers were mixed in the composite binders in order to improve the brittle tensile behaviour after cracks were taken place. In the evaluation of the flow and mechanical characteristics of the composites, a series of experiments has been conducted on slump flow, compressive strength, direct tensile strain, ductile bending, and shear strength test.

Speaker Biography

Chang-Geun Cho has completed his PhD at the age of 30 years from Tokyo Institute of Technology, Japan. He is the director and professor of Chosun University, South Korea. He has over 150 publications that have been cited over 400 times and has been serving as a managing editor of the International Journal of Concrete Structures and Materials.

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