Contents

Welcome to Paris Conferences

Welcome to 2016 International Conference on Nanotechnology and Nanomaterials in Energy (ICNNE2016) and 2016 International Conference on Materials and Structural Integrity (ICMSI2016). The aim of these Paris conferences is to present the latest research and results of scientists related to Energy Nanotechnology, Energy Nanomaterials and Structural Integrity topics. These conferences provide opportunities for delegates from different areas to exchange new ideas and application experiences face to face, to establish business or research relations and to find global partners for future collaboration. We hope that the conference results constituted significant contribution to the knowledge in these up to date scientific fields. And wish all respected authors and listeners have a nice trip in Paris, France.

Warm Tips:

- Get your presentation PPT prepared and print out the notification letter before you leave for Paris, France.
- Pick up the conference materials at the reception desk in the Lobby of Timhotel-berthier-paris-17, Paris, France, June 02, 2016.
- Please attend the conference and arrive the Conference Room (Batignolles, Grand Floor) before 9:00 a.m. in formal attire on June 03, 2016.
- There will be a group photo and coffee break between 09:50-10:10, June 03, 2016; every attendee will be invited to come to the platform to take group photo.
- Copy your PPT to the conference computer before your session begins. One best presentation will be selected from each session, and the best one of each session will be announced and awarded the certificate at the end of each session.
- If you didn’t put a formal photo in your registration form, please bring a one-inch photo to the venue.

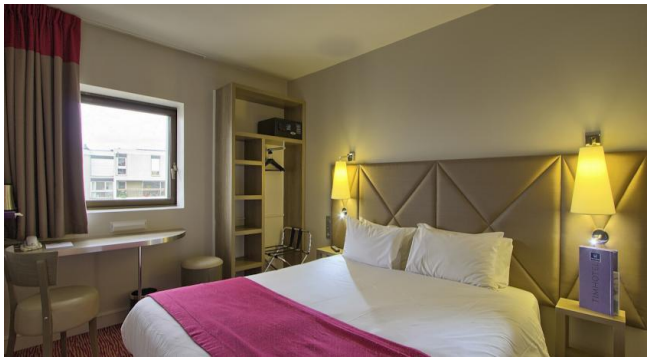
Conference Venue

Timhotel-berthier-paris-17, Paris, France

Website: http://www.timhotel-berthier-paris-17.com

Address: 4, boulevard Berthier, 75017 Paris | France

Phone (+33) 01 46 27 10 00



Located at the corner of Boulevard Berthier and the Avenue de la Porte de Clichy in the 17th district of Paris, the Hôtel Restaurant Timhotel Berthier Paris 17 is ideal for both business and leisure purposes.

Entirely Air-conditioned, the hotel offers a newly refurbished restaurant, an underground car park (22€€/day-depending on availability), three meeting rooms and free WIFI.

Close to the Palais des Congrès, the ringroad (exits Porte de Champerret & Porte de Versailles) and only a stone's throw away from the City's major monuments, the hotel is easy to access by underground (Metro line 13, or RER C – station: Porte de Clichy) or bus (PC3, 74 and 54).

Simple Version of Conference Schedule

June 02 and In the Morning of June 03, 2016		
Dates	Venue	Items
June 02, 2016 (Thursday) 09:00AM-12:00AM 02:00PM-04:00PM	**In the Lobby of** Timhotel-Berthier-Paris-17	Participants Registration and Conference Kits Collection
June 03, 2016 (Friday) (09:00AM-09:10AM)	**Batignolles, Grand Floor** Timhotel-Berthier-Paris-17	Opening Ceremony **Assoc. Prof. Jean-Jacques Delaunay** ***The University of Tokyo, Japan***
June 03, 2016 (Friday) (09:10AM-09:50AM)	**Batignolles, Grand Floor** Timhotel-Berthier-Paris-17	Keynote Speech I: **Prof. Jordi Llorca** ***Technical University of Catalonia, Spain*** Key Speech Title: Nanoengineered Catalysts for Generating Hydrogen from Ethanol
June 03, 2016 (Friday) (09:50AM-10:10AM)	**Batignolles, Grand Floor** Timhotel-Berthier-Paris-17	Coffee Break and Group Photo
June 03, 2016 (Friday) (10:10AM-10:50AM)	**Batignolles, Grand Floor** Timhotel-Berthier-Paris-17	Keynote Speech II **Dr. Salma Barboura** ***University Paris 13, France*** Key Speech Title: New Method for Material Characterization of Solid Nano-Particles Combining SEM Analysis and ImageJ Special Software
June 03, 2016 (Friday) (10:50AM-11:30AM)	**Batignolles, Grand Floor** Timhotel-Berthier-Paris-17	Keynote Speech III: **Assoc. Prof. Jean-Jacques Delaunay** ***The University of Tokyo, Japan*** Key Speech Title: Plasmonic Photocapacitor for Spectrally Selective Detection
June 03, 2016 (Friday) (11:30AM-12:10AM)	**Batignolles, Grand Floor** Timhotel-Berthier-Paris-17	Keynote Speech IV: **Prof. Witold Daniel Dobrowolski** ***Institute of Physics Polish Academy of Sciences, Poland*** Key Speech Title: II-IV-V_2 Diluted Magnetic Semiconductors - Homogeneous vs. Composite System
June 03, 2016 (Friday) (12:10AM-1:00PM)	**La Terasse, Grand Floor** Timhotel-Berthier-Paris-17	Lunch Time

Simple Version of Conference Schedule

In the Afternoon of June 03		
Dates	Venue	Items
June 03, 2016 (Friday) (1:00PM-1:30PM)	**Batignolles, Grand Floor** Timhotel-Berthier-Paris-17	Invited Speech: **Prof. Tatiana Perova** ***The University of Dublin, Ireland*** Invited Speech Title: Borosilicate Glass Nanolayer as a Spin-on Dopant Source for Application in Solar Cells
June 03, 2016 (Friday) (1:30PM-3:35PM)	**Batignolles, Grand Floor** Timhotel-Berthier-Paris-17	Paper Presentation for Session I **Nanomaterials and Nanotechnology** Chair: **Assoc. Prof. Jean-Jacques Delaunay**
June 03, 2016 (Friday) (3:35PM-3:50PM)	**Batignolles, Grand Floor** Timhotel-Berthier-Paris-17	**Coffee Break**
June 03, 2016 (Friday) (3:50PM-7:25PM)	**Batignolles, Grand Floor** Timhotel-Berthier-Paris-17	Paper Presentation for Session II **Materials Processing and Preparation** Chair: **Prof. Witold Daniel Dobrowolski**
June 03, 2016 (Friday) (07:30PM-09:00PM)	**La Terasse, Grand Floor** Timhotel-Berthier-Paris-17	**Dinner Time**

Introduction to Keynote Speakers

Prof. Jordi Llorca

Director, Institute of Energy Technologies and Centre for Research in NanoEngineering
Technical University of Catalonia, Spain

Biography: Born in Barcelona in 1966, Jordi Llorca graduated and earned his PhD in Chemistry at the University of Barcelona, where he was later appointed Associate Professor. In 2005, he joined the Technical University of Catalonia (UPC) as Professor and in 2014 he became Full Professor as Serra Húnter Fellow. He has conducted research at the Univ. of New Mexico (US), CNRS (France) and has been Invited Scholar at the Univ. of Udine (Italy), Univ. of Auckland (New Zealand) and CONICET (Argentina). He has received the Distinction of Generalitat de Catalunya to the Promotion of the University Research in 2003, the Humbert Torres Prize in 2003 and the ICREA Academia in 2009 and in 2014. From 2011 to 2014 he has been Director of the Institute of Energy Technologies (INTE) at UPC and currently he is Director of the Centre for Research in NanoEngineering (CRnE) at UPC. He has published over 220 scholarly articles and authored 9 patents. Prof. Jordi Llorca is working on the design and manufacture of new devices at the nanoscale for conducting chemical and photochemical reactions aimed at the generation, purification and separation of hydrogen for portable fuel cells as well as other processes related to energy and environmental applications.

Dr. Salma Barboura

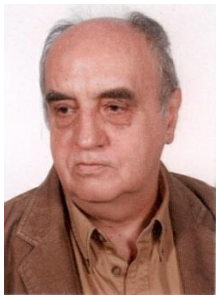
Department of Process and Mechanical Engineering (LSPM), University Paris 13, France

Biography: Dr. Salma Barboura is Associate Professor at University Paris 13 in Process and Mechanical Engineering, in Villetaneuse, France. She received her PhD degree on Mechanics of materials from the University Paris 6 in 2007 and she is working for CNRS and University research institutions in the fields of Mechanics, Nanotechnology and Energy. She is specialized in micro/macro modelling of multiphysic materials. She conducts research on the study of composites based on phase change materials reinforced by nanoparticles as carbon nanotubes (project supportedby CNRS). Also she is working on porous materials characterization for energy purpose. Her objectives consist in estimate the gobal properties of heterogeneous materials knowing the microstructural characterization such as porosity, pore size distribution, porosity of a bed of particles, etc.

Assoc. Prof. Jean-Jacques Delaunay

The University of Tokyo, Japan

Biography: Dr. Jean-Jacques Delaunay (http://scale.t.u-tokyo.ac.jp) is an Associate Professor at School of Engineering, The University of Tokyo. He received his PhD degree from the Strasbourg University. He has worked for research institutions in the fields of nanotechnology and solar energy in France, Germany and Japan. He conducts research on the synthesis of micro/nano materials with controlled structures and functionalities for sensing and energy conversion. He also conceives plasmonic nanostructure arrays to enhance sensitivity of detectors and light collection of solar energy conversion devices. His current research projects include plasmonic nano-cavities for optical sensing and nanostructured photoelectrodes for water splitting with sun light. He has co-authored more than 100 scientific publications.



Prof. Witold Daniel Dobrowolski

Institute of Physics Polish Academy of Sciences, Warsaw, Poland

Biography: Dr. Witold Dobrowolski is a Professor at the Institute of Physics of the Polish Academy of Sciences. He has spent nearly all his academic career at this Institute. He conducted research on narrow gap semiconductors and diluted magnetic semiconductors (called also semimagnetic semiconductors). His principal scientific interests are: (a) Physics of crystal growth and material processing of compound semiconductors, alloys, and semimagnetic crystals;
(b) Electronic transport phenomena, magneto- and quantum transport in semiconductors;
(c) Narrow-gap semiconductors - band structure, impurity levels, transport phenomena;
(d) Semimagnetic semiconductors - electronic and magnetic properties, magnetic phase diagram.
Current research interest covers magnetic interactions in III-V, II-VI, and IV-VI compounds (bulks, thin films, and nanoparticles), mutual interactions between magnetic ions and free carriers.
He has co-authored more than 200 scientific publications and a few book chapters.
He is editor-in-chief of Acta Physica Polonica A.

Introduction to Invited Speaker

Prof. Tatiana Perova

Department of Electronic and Electrical Engineering, Trinity College Dublin, The University of Dublin, Ireland

Biography: Prof. Perova completed her PhD at Leningrad State University in 1979. She joined the staff of Vavilov State Optical Institute (St. Petersburg, Russia) in 1979, where she was involved in the characterization of condensed matter using far-infrared and Raman spectroscopy. In 1998 Prof. Perova took a position of the Research Director of Microelectronic Technology Laboratory (MTL) at Trinity College Dublin and from 2007 she is the Director of MTL. Since 2011 she is a Fellow of Trinity College Dublin and since 2013 she is a Fellow Emeritus. Prof. Perova's research interests are principally related to the optical characterization of condensed matter, with an emphasis on the analysis of the composition, stoichiometry, molecular orientation, stress and strain in amorphous solids, liquid crystals, photonic crystals and semiconductors. She has over 270 publications in books and referred journals. Prof. Perova has given numerous invited talks at Universities and Research Institutes in Europe, Russia, Australia and Mexico and several invited and keynote talks at International Conferences. Prof. Perova is acting as a Reviewer Editor for the journal Frontiers: Frontiers in Materials and is a member of the Editorial Board of Asian Chemistry Letters journal.

Schedule of Sessions

June 03, Morning

Venue: Timhotel-Berthier-Paris-17

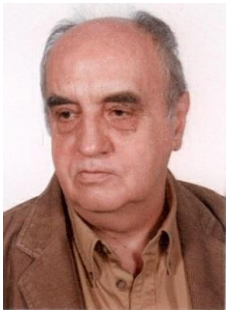
Time: 09:00 a.m.-12:10 a.m.

09:00 a.m-09:10 a.m.	**Opening Remarks** Assoc. Prof. Jean-Jacques Delaunay *The University of Tokyo, Japan*
09:10 a.m.-09:50 a.m.	Keynote Speech I  **Prof. Jordi Llorca** *Technical University of Catalonia, Spain* **Topic of Keynote Speech:** Nanoengineered Catalysts for Generating Hydrogen from Ethanol **Abstract:** In the viewpoint of hydrogen production via reforming processes, compared to the most commonly derived fossil feedstocks used industrially nowadays for producing hydrogen (natural gas, gasoline, etc.), alcohols represent an emerging and alternative source since they can be produced renewably from biomass. Among them, bioethanol constitutes an important source that seems to be particularly suitable due to its easy and broadly implemented production from a variety of plants. The highest hydrogen production is obtained by the steam reforming of ethanol (ESR), formally written as $C_2H_5OH + 3H_2O \rightarrow 6H_2 + 2CO_2$. An efficient catalyst for this reaction has to dissociate the C-C bond, maintain low the CO concentration (involved in the water gas shift equilibrium) and be stable under catalytic operation (avoid coke accumulation). Noble metals fulfill these requirements at high temperature, whereas cobalt-based catalysts are less active and prone to carbon deposition, but they are very selective because the reforming temperature can be significantly lower. Thus, a precise design of catalysts is still required to carry out the ESR. Here I will discuss about the nanoengineering of bimetallic RhPd nanoparticles supported over a reducible oxide (nanoshaped CeO_2) from fundamental structural (HRTEM) and operando studies (Ambient Pressure XPS) as well as layered Co structures for the ESR. The specific role of oxidation states and the development of core-shell structures on catalytic performance will be presented as well as the technical developments towards its implementation in catalytic wall reactors, membrane reactors and microreactors for practical application.

Coffee Break and Group Photo

09:50 a.m.-10:10 a.m.

10:10 a.m.-10:50 a.m.	Keynote Speech II  **Dr. Salma Barboura** *University Paris 13, France* **Title of Keynote Speech:** New Method for Material Characterization of Solid Nano-Particles Combining SEM Analysis and ImageJ Special Software **Abstract:** A new method for a quantitative characterization of porous materials is proposed. The method is based on the results of SEM analysis and their processing by ImageJ software. Specifically is considered the influence of the different parameters on the processing of SEM images using the ImageJ software on AC35 CECA activated porous nanomaterial. Depending on the results of SEM analysis, different characteristics of the samples such as porosity, pore size distribution, porosity of a bed of particles, etc. can be obtained by applying distribution functions (Weibull, Gamma and Lognormal).
10:50 a.m.-11:30 a.m.	Keynote Speech III  **Assoc. Prof. Jean-Jacques Delaunay** *The University of Tokyo, Japan* **Topic of Keynote Speech:** Plasmonic Photocapacitor for Spectrally Selective Detection **Abstract:** The optical response of subwavelength plasmonic structures has been used to monitor changes in their physical, chemical, and biological environments. The detection of this response in the far field is governed by the near-field properties of plasmon resonances. Although the plasmonic structures offer high performance in sensing, their micro integration on chips is difficult

	because of the readout in the far field. As such, structures that form an electrical micro-circuit and directly monitor the optical near-field variation without resorting to far-field optical detection would be more desirable. We present an electronically readable photocapacitor based on a plasmonic nanochannel structure, which offers both high confinement and efficient light collection together with high spectral resolution and a large modulation capability. The proposed structure consists of semiconducting nanochannels sandwiched between plasmonic cavities and monitors the change in incident light wavelength with high spectral resolution and large impedance modulation. In this nanochannel structure, three types of plasmon resonances including localized surface plasmonic resonance, vertical channel surface plasmonic resonance and horizontal surface plasmonic resonance are coupled. Light is thus strongly and selectively trapped in the nanochannels and highly confined at the semiconductor-metal interfaces. Due to the confinement, light is efficiently converted into photocarriers at these interfaces, thus varying the electrical impedance of the structure. The capacitance modulation of the structure in response to light produces a large light-to-dark contrast ratio. As a result of significant capacitance modulation, the spectral selectivity of the electrical response (~20 nm) is as high as that of the reflectance spectrum measured in the far-field.
11:30 a.m.-12:10 a.m.	Keynote Speech IV  **Prof. Witold Daniel Dobrowolski** *Institute of Physics Polish Academy of Sciences, Warsaw, Poland* **Topic of Keynote Speech:** II-IV-V_2 Diluted Magnetic Semiconductors - Homogeneous vs. Composite System **Abstract:** In this paper, we will review our recent studies of the magnetic and transport properties of the AII1-xMnxBIVCV2 diluted magnetic semiconductors (DMS). The non-magnetic equivalents of the studied systems have many interesting properties. The direct energy gap at the Γ point of the Brillouin zone and large nonlinear optical coefficients of this system make this material suitable for applications in nonlinear optics. The nondegenerate top of the valence band makes this compound an efficient source of spin polarized photoelectrons. The energy gaps for three studied compounds are Eg = 0.34 eV for ZnSnAs2, Eg = 0.53 eV for CdGeAs2, and Eg = 1.15 eV for ZnGeAs2, respectively. Moreover, it may be noted that ZnGeAs2 is nearly lattice matched with GaAs what makes it compatible with the existing GaAs-based devices. Recently, we have been studying magnetic properties of quaternary and quinary II IV-V2 DMS with varying concentrations of different magnetic and non-magnetic cations. The limit of alloying of Cd1-xMnxGeAs2 and Zn1-xMnxGeAs2 compounds indicates that the solubility limit of Mn ions inside the chalcopyrite lattice is around a few molar percent. The detailed studies of the magnetic properties of Zn1-xMnxGeAs2 samples show that the Mn distribution is random in the cation sites of the host lattice only for the sample with the lowest Mn-content, x = 0.003. For the samples with higher content of Mn, we observed clusters of different types, from the non-random distribution of

	magnetic ions in the host lattice to precipitates with the crystalline structure different from that of the host. The size of such precipitates varied from 200 nm to 20 μm. Depending on the type and size of clusters, we observed different magnetic properties of the compounds, such as paramagnetic, spin-glass, spin-glass-like, or ferromagnetic states. For example, Zn1-xMnxGeAs2 compounds with x $\leqslant$ 0.053 were paramagnetic with evidence of small short-range magnetic interactions, while in the same material with x $\geqslant$ 0.078 we observed the room-temperature ferromagnetism.

Lunch Time

12:10 a.m.-1:00 p.m.

La Terasse, Grand Floor

Timhotel-berthier-paris-17

Schedule of Afternoon Sessions

June 03, Afternoon

Please check the venue of your session and go to the corresponding room before your session starts.

Time	Venue	Item
1:00 pm- 1:30 pm	Batignolles, Grand Floor Timhotel-Berthier-Paris-17	Invited Speech **Prof. Tatiana Perova** *The University of Dublin, Ireland*
1:30 pm- 3:35 pm	Batignolles, Grand Floor Timhotel-Berthier-Paris-17	Paper Presentation for Session I **Nanomaterials and Nanotechnology** Chair: Assoc. Prof. Jean-Jacques Delaunay
3:35 pm- 3:50 pm	Timhotel-Berthier-Paris-17	Coffee Break
3:50 pm- 7:20 pm	Batignolles, Grand Floor Timhotel-Berthier-Paris-17	Paper Presentation for Session II **Nanomaterials and Nanotechnology and Test** Chair: Prof. Witold Daniel Dobrowolski
7:20 pm- 7:25 pm	Batignolles, Grand Floor Timhotel-Berthier-Paris-17	Conclusion Remark
7:30 pm- 9:00 pm	La Terasse, Grand floor Timhotel-Berthier-Paris-17	Dinner

June 03, Afternoon

Venue: Timhotel-Berthier-Paris-17

Time: 1:00 p.m.-1:30 p.m

Time	Invited Speech
1:00 p.m.-1:30 a.m.	 **Prof. Tatiana Perova** *The University of Dublin, Ireland* **Topic of Invited Speech:** Borosilicate glass nanolayer as a spin-on dopant source for application in solar cells **Abstract:** Borosilicate glass is a potential dopant source for producing shallow boron junctions by the use of proximity rapid thermal diffusion. Interest in this technique has increased recently due to its application to the manufacture of solar cells. A borosilicate gel is spun onto a silicon wafer and the layer is rapidly thermally annealed to convert it to a borosilicate glass (BSG). Fourier transform infrared (FTIR) spectroscopy, spectroscopic ellipsometry and sheet-resistance measurements have been used to understand and subsequently optimise the conversion of the gel to a BSG nanolayer. Physical properties of the thin, spun-on layer, such as thickness, refractive index and porosity, were monitored. The optimum conversion step involved rapid thermal annealing for 45 s at 900 ℃. This avoided any boron loss from the BSG layer during the thermal processing step. The position of the B-O stretching vibration around 1370 cm-1 was found to be sensitive to boron outdiffusion and it is suggested that FTIR spectroscopy provides a simple method for monitoring the outdiffusion of boron from the spin-on dopant nanolayer. Further FTIR studies using p-polarised light at oblique incidence revealed, for the first time, the LO-TO phonon splitting of the B-O stretching vibration band in the glassy layer. Investigation of the stability of BSG layers over long periods showed that unstabilised (or undensified) BSG films demonstrate a dramatic loss of boron over 6 months.

Session I --- Nanomaterials and Nanotechnology

(8papers, 15 minutes for each paper, including Q&A**)**

June 03, Afternoon

Venue: Timhotel-Berthier-Paris-17

Time: 1:30 p.m.-3:35 p.m

Session Chair： Assoc. Prof. Jean-Jacques Delaunay

(The schedule of each presentation is for reference only. There may be some changes on conference day. Authors are required to join the entire of your session)

ICNNE2016_011 (1:30 pm-1:45 pm)	 **Presenter:** Sanat Tolendiuly **From:** Institute of Combustion Problems, Kazakhstan **Title:** Fabrication of Superconducting Nanocomposite Materials based on Magnesium Diboride by SHS Technique in Centrifuge **Authors:** Sanat Tolendiuly, Sergey Fomenko, Anna Baideldinova, Zulkhair Mansurov, Karen Martirosyan **Abstract:** The superconducting nanocomposites based on magnesium diboride were produced by self-propagating high-temperature synthesis (SHS) under the effect of centrifugal force in high-temperature centrifuge.The centrifugal rotational speed shaft was within the limits of 2000 rpm. Thecritical transition temperature (T_c) and current density were determined by magnetometric measurements by the Physical Property Measurement System (PPMS,EverCool-II)Quantum Design.It was found that the critical transition temperature (Tc) of sample is in the range of 37.5K and the critical current density (J_c) is in the range of about $0.8x10^8 A/см^2$.
ICNNE2016_012 (1:45 pm-2:00 pm)	 **Presenter:** Mohamed FATHI **From:** Unité de Développement des Equipements Solaires, UDES / Centre de Développement des Energies Renouvelables, Algérie **Title:** Beneficial Effects of Nano Hydrophobic Coatings for Solar Photovoltaic Modules in Dusty Environment

	Authors: M. Fathi, M. Abderrezek, M. Friedrich and K. Tabani **Abstract:** In this paper, we propose and experiment the application of self-cleaning Nano coating on solar panels. We have measured an important increase of water droplet contact angle on a Nano coated surface. We found beneficial effects on light transmittance and Open Circuit Voltage (Voc) for the photovoltaic modules. Experimentally, we have shown a higher Transmission coefficient (T) in case of treated glass. In addition, from Thermal Camera analysis, we have shown that the Nano coated Photovoltaic module became cooler and cleaner comparatively to untreated module.
ICNNE2016_016 (2:00 pm-2:15 pm)	 **Presenter:** M.A. Akhavan-Behabadi **From:** University of Tehran, Iran **Title:** Effect of Multi-Wall Carbon Nanotubes on Flow Condensation Pressure Drop of R-600a/oil Mixture **Authors:** M.A. Akhavan-Behabadi, Payman Khalili and Meysam Nasr **Abstract:** The influence of multi-wall carbon nanotubes (MWCNTs) on flow condensation pressure drop of R-600a/oil mixture inside a horizontal smooth tube was investigated. For this aim, a well-equipped semi-refrigeration test-rig including a pump, mass flow meter, pre heater, test condenser and evaporator was designed, fabricated and installed in order to measure the experimental data. MWCNT nano oil mixture are prepared using a two-step method and then the nano oil was injected with a syringe into the pure refrigerant through the cycle. The experimental ranges of operating parameters include mass velocities from 140 to 328 kg/m2s, inlet vapor qualities from 0.11 to 0.78, heat fluxes from 10.08 to 26.88 kW/m2 and mass fractions of MWCNTs from 0.1 to 0.4 wt%. The results show that, the presence of MWCNTs at the maximum nano concentration and mass velocity, cause the highest pressure drop increasing of 35% relative to that of R-600a/oil mixture without nanoparticles.
ICNNE2016_027 (2:15 pm-2:30 pm)	 **Presenter:** M.A. Akhavan-Behabadi **From:** University of Tehran, Iran **Title:** On the Mixed Convection of Copper Oxide-Heat Transfer oil Nanofluid in Inclined Microfin Tube

	Authors: Mohammad Ali Akhavan-Behabadi, Farhad Hekmatipour and Behrang Sajadi **Abstract:** In this paper, the combined free and forced convection heat transfer of the CuO -HTO nanofluid flow in horizontal and inclined microfin tubes is studied experimentally. The flow regime is laminar and pipe surface temperature is constant. The effect of nanoparticle and microfin tube on the heat transfer rate is investigated as the Richardson number is between 0.1and 0.7. The results show an increasing nanoparticle concentration between 0% and 1.5% leads to enhance mixed convection heat transfer rate. Moreover, four correlations are suggested to assess the flow Nusselt number based on the Rayleigh number or the Richardson number in horizontal and inclined microfin tubes with the error of less than 15%.
ICNNE2016_019 (2:30 pm-2:45 pm)	 **Presenter:** Djermane Nacerddine **From:** Oum el Bouaghi University, Algeria **Title:** Effect of Nanotechnology on Physical Properties of Concrete **Authors:** Remache Leila and Nacerddine Djermane **Abstract:** Concrete is one of the most common and widely used construction materials. Its mechanical behavior depends to a great extent on structural elements and phenomena which are effective on a micro and nano-scale. Its properties have been well studied at macro or structural level without fully understanding the properties of the cimentitious materials at the micro level. The ability to target material modification at the nano structural level promises to deliver the optimization of material behavior and performance needed to improve significantly the mechanical performance, volume change properties, durability and sustainability of concrete. The focus of this paper is the study of effect of nanotechnology on the concrete (Especially on wet concrete). It shows that: • The control of moisture in buildings is key to their durability, functionality, health and efficiency. • Concrete which is thoroughly soaked with water is less rigid in compression than concrete with is thoroughly dried out. • Use of nanoSiO2 could significantly increase the compressive for concrete, containing large volume fly ash, at early age and improve size distribution. • The self healing polymer could be especially applicable to fix the microcraking in bridge, piers and columns. • With the hycrete waterproofing system, concrete is batched with hycrete liquid admixture to achieve hydrophobic performance. Concrete treated by hycrete shows less than 1% absorption. This product has positive effects on the environment. • Green additive has lower cost than the materials they replace. Finally, two solutions are given to have appropriate material behavior

	nanotechnology and green additive.
ICNNE2016_004E (2:45 pm-3:00 pm)	**Presenter:** Behzad Heibati **From:** Mazandaran University of Medical Sciences, Sari, Iran **Title:** Removal of Toxic Phenol by Single-Walled and Multi-Walled Carbon Nanotubes: Optimisation using Surface Response methodology **Authors:** Behzad Heibati **Abstract:** In this study, two nano-sized adsorbents: multi-walled carbon nanotubes (MWCNTs) and single-walled carbon nanotubes (SWCNTs) were investigated for the removal of toxic phenol. The operating parameters of the preparation process were optimised by a combination of response surface methodology (RSM) and central composite design (CCD).The maximum adsorption capacities of MWCNTs and SWCNTs were determined as 64.60 and 50.51 mg/g, respectively. The optimum conditions using SWCNTs and MWCNTs were pH 6.57 and 4.65, phenol concentration 50 and 50 mg/L, dose 1.97 and 2 g/L and contact time 36 and 56 min, respectively. The rate of adsorption followed the pseudo-second-order kinetic model.The results evidently indicated that MWCNTs and SWCNTs would be suitable adsorbents for toxic phenol removal in wastewater under specific conditions.
ICNNE2016_021 (3:00 pm-3:15 pm)	 **Presenter:** Mohammadmahdi Amiri **From:** Research Institute of Petroleum Industry (RIPI), Islamic Republic of Iran **Title:** Nanotechnology Applications and Potentials in Energy Transmission Technologies **Authors:** Mohammadmahdi Amiri and Majid Kakavand **Abstract:** Numerous nanomaterials and other nano-related applications relevant to electricity transmission and petroleum distillate fuel and gas pipeline transport are in various stages of research, development, and deployment. These applications have the potential to directly or indirectly reduce the environmental impact associated with the construction, operation, and dismantlement of energy transmission technologies. This paper represents examples of nanotechnology applications relevant to transmission of electricity via cables and of fossil fuels (i.e., petroleum distillate fuel and natural gas) through pipelines.
ICNNE2016_022 (3:15 pm-3:30 pm)	

	Presenter: Zohreh Mehri **From:** Research Institute of Petroleum Industry (RIPI), Islamic Republic of Iran **Title:** Nanotechnology Applications and Potentials in Energy Sector **Authors:** Zohre Mehri, Majid Kakavand **Abstract:** Nowadays nanotechnology has a considerable impact on many industries including energy related sectors. For example the use of nano materials in batteries improves the quality and durability of them and in addition constructions made of nano materials have less weight than usual materials while they have similar strength. Furthermore construction materials made of nanoparticles are stronger but require less volume than today's materials, which may decrease the way which is needed for construction and protection of electricity transmission lines and pipelines. This paper describes some new methods in which nanotechnology might step up the development of cleaner, more efficient energy resources and applications, which, consecutively, lessen the need for long-distance transmission of electricity, natural gas and petroleum distillate fuel.

Group Photo & Best Presentation of Session I

Time: 3:30 p.m.-3:35 p.m

Coffee Break

3:35 p.m.-3:50 p.m.

Session II---Nanomaterials and Nanotechnology

(14 papers, 15 minutes for each paper, including Q&A**)**

June 03, Afternoon

Venue: Timhotel-Berthier-Paris-17

Time: 3:50 p.m.-7:25 p.m

Session Chair： Prof. Witold Daniel Dobrowolski

(The schedule of each presentation is for reference only. There may be some changes on conference day. Authors are required to join the entire of your session)

ICNNE2016_005E

(3:50 pm-4:05 pm)

Presenter: Bojan A. Marinkovic

From: Pontifícia Universidade Católica do Rio de Janeiro, Department of Chemical and Materials Engineering, Brazil

Title: Correlation between cationic migration, dealumination and negative thermal expansion in zeolite Y used in FCC catalysts

Authors: Marinkovic, B. A, Dosen A, Morgado E.

Abstract: Due to its high catalytic activity, La^{3+} exchanged zeolite Y (La-Y) is used as the main component of FCC catalysts. Presence of La^{3+} as the extra-framework cations improves the (hydro)thermal stability of zeolite Y. Negative thermal expansion, i.e., contraction is a relatively newly observed phenomenon inherent to ceramics with open crystal structures, such as zeolites [1-4].

Because of the open crystal structure of the faujasite (FAU) framework, thermally induced extra-framework cation migration path is complex, while thermal expansion is negative at higher temperatures. These two properties were already studied separately for Y FAU and FAU with no extra framework cations, respectively, however, no effort was made to understand how the extra-framework cation positions and migration influence thermal expansion of La-Y zeolite.

Two zeolite Y specimens, one rich in La^{3+} (13% at) and another in Na+ (4.1% at) were analyzed in situ in ambient atmosphere over a range of temperatures from 25 to 800 ℃ by means of high-temperature X-ray powder diffraction (HT-XRPD) and the as-acquired data were thoroughly studied by Rietveld refinement method in order to evaluate extra framework cation migration with temperature, dealumination extent and thermal expansion. In order to keep the structure from distorting to unrealistic size, bond length constraints were applied in the calculation.

At the temperatures lower than 400oC and 300oC for La and Na FAU, respectively, thermal expansion is strongly affected by water release and is positive in both specimens. The loss of water causes atomic rearrangement and the expansion of the unit cell. The hydration layer surrounding La^{3+} ions begins to evaporate and the stripped La^{3+} cations migrate from supercage to sodalite cage and hexagonal prism. The unit cell begins to contract slowly and the negative thermal expansion effects become pronounced after 400 ℃ in La FAU. Additionally, dealumination process is taking place in parallel during heating of La FAU.

Our results showed that coefficient of thermal expansion (CTE) vary considerably in La FAU in comparison to Na FAU, evaluated here, and pure siliceous and silico-alumino-phosphate (SAPO) faujasites, previously reported in the literature [5,6]. In Na FAU, and faujasite with no extra framework cations, such as pure siliceous and SAPO, CTEs are equal to – 4 x 10-6 K-1, while in the LaY the negative thermal expansion coefficient significantly increases to – 6 x 10-6 K-1.

	Identical Na FAU CTE value (– 4 x 10-6 K-1) and the 50% CTE increase in the case of La FAU, with respect to faujasites with no extra framework cations, were not expected in accordance to the previously established model of negative thermal expansion in open framework ceramics, which considered the presence of extra framework species as a major impeditive for the occurrence of negative thermal expansion.
ICNNE2016_013 (4:05 pm-4:20 pm)	 **Presenter:** Amanbol Alipbaev **From:** Institute of Combustion Problems, Kazakhstan **Title:** Synthesis of Nanopowders of Magnesium Diboride by Magnesium Thermic Reduction under the Conditions of High Pressure of Argon **Authors:** Amanbol Alipbaev, Sergey Fomenko, Zulkhair Mansurov, Roza Abdulkarimova, Vladimir Zarko **Abstract:** Magnesium diboride obtained from magnesium and boron oxide by magnesium-thermal reduction in SHS mode under the high-pressure inert gas (argon) was investigated. The effect of pressure of inert gas on the temperature of synthesis and the yield of final product (magnesium diboride) was determined. As energy additives were used powerful oxidizers - potassium chlorate salt ($KClO_3$) and ammonium nitrate (KNO_3) to increase the reactivity of the system Mg - B_2O_3. The composite material containing up to 20% of magnesium diboride phase was obtained. The acidic separation of final product from impurities was suggested. The microstructure and characteristic of particle size was defined. The products had a dense grain structure with a particle size 200-500 nm.
ICNNE2016_014 4:20 pm-4:35 pm	**Presenter:** Afzaal Qamar **From:** Griffith University, Australia **Title:** Pseudo-Hall Effect in Single Crystal n-type 3C-SiC(100) Thin Film **Authors:** Afzaal Qamar, Dzung Viet Dao, Jisheng Han, Alan Iacopi, Toan Dinh, Hoang-Phuong Phan, Sima Dimitrijev **Abstract:** This article reports the first results on stress induced pseudo-Hall effect in single crystal n-type 3C-SiC(100) grown by LPCVD process. After the growth process, Hall devices were fabricated by standard photolithography and dry etching processes. The bending beam method was employed to study the stress induced changes in the electrical response of the fabricated Hall devices. It has been observed that when stress is applied to the 3C-SiC(100) Hall devices, the offset voltage of the Hall devices varies linearly with the applied compressive and tensile stresses which is called, the pseudo-Hall effect. The variation of the offset voltage of these Hall devices is also proportional to the applied input current. This variation

	of the offset voltage with the applied compressive and tensile stresses shows that single crystal n-type 3C-SiC(100) can be used for stress sensing applications.
ICNNE2016_015_A 4:35 pm-4:50 pm	 **Presenter:** Stefan Petters **From:** guo - Business Development Consult, Australia **Title:** Captured nanoCarbon as Barrel Oil Equivalent alternative Feedstock **Authors:** Stefan Petters, Klaus Mauthner, Kalvin Tse **Abstract:** Hydrocarbon Use for energy or plastics production today discards unrestrained CO_2 into atmosphere. Since our civilization has 11-folded its Carbon- consumption over the past 50 years Carbon represents 54% of human resource consumption and has reached ecologic overshoot of 1.6. Atmospheric Carbon stock building might be eased in scenarios of Carbon Capture for Sequestration but do not change the current paradigm of squandering Carbon as a resource. Burning Hydrocarbons being a compound of Hydrogen attached to a Carbon skeleton forms water vapor from the Hydrogen content while its Carbon carrier is disposed into CO_2 as if it was a one-way pack. Similar in refining Hydrocarbons mostly in order to platform to a higher Hydrogen-to-Carbon ratio, the lack of Hydrogen in the feedstock is produced from splitting water over Carbon – again disposing one Carbon molecule for every 2 Hydrogen mols. Why not Capture Carbon for Re-Use [CCU] rather than Sequestration? nanoCarbon Capture by "Dry Thermo- Catalytic Chemical Vapor Deposition" [DTCCVD]retains physically storable and logistically manageable Carbon for composite materials or coal chemistry use free of coal typical contaminants when Hydrogen is separated for electrochemical energy use. In doing so adequate catalyst preparation can render morphologies of Carbon allowing to enhance its reactivity. Such co-production of Hydrogen and Carbon from 0.18m ³ Natural Gas would require 0.16kWhel per kWLHV isolated Hydrogen energy if heated electrically. The 8% additional primary Carbon input required however become part of captured Carbon for clean coal chemistry downstream use. In the example of Ethylene synthesis ⅔ of Captured Carbon stay in the product. If refined from crude oil ⅓ more CO2 gets disposed plus the imported fossil Carbon's single use stored over the product life cycle only. If Carbon source was for example captured at a Hydrogen Fuel Cell Utility scale electricity generation its use for Ethylene synthesis would already be a secondary use. Once the Carbon source was from organic waste decomposition gas, 90% of it would usually be biogenic and 10% from fossil derived residues. At a waste derived Carbon Re-Use rate of 50% current overshoot of Carbon Use could be cured. Either by the double use of Hydrocarbons as clean Hydrogen energy plus coal-chemistry refining feedstock or by replacing ~ 2 barrels crude oil per ton of average Municipal Solid Waste [MSW]. In that respect total global Organic Waste processed by CCU refining

	could turn into a 40million barrel oil equivalent reserve per day.
ICNNE2016_023 4:50 pm-5:05 pm	 **Presenter:** Pannipa Tepamatr **From:** The Joint Graduate School of Energy and Environment, King Mongkut's University of Technology Thonburi, Bangkok, Thailand **Title:** Water Gas Shift Reaction over Bimetallic Catalysts Supported by Gd Doped Ceria for Hydrogen Production **Authors:** Pannipa Tepamatr, Sumittra Charojrochkul and Navadol Laosiripojana **Abstract:** The water gas shift activities of Cu on Gd doped ceria were studied for a further enhancement of hydrogen purity after a steam reforming process. It was found that copper on Gd doped ceria is stable for the high temperature reaction, unlike iron-chrome catalysts which are deactivated severely in CO_2-rich gases. The behavior of the bimetallic catalysts was compared with that of the monometallic catalysts. It was found that an addition of Re to Cu/GDC significantly improved the activity of copper catalysts. The effect of Re on enhancing the WGS activity of Cu catalysts was due to Re increases the reducibility of the surface ceria, and facilitates the redox process at the surface. In addition, Re assists Cu in reducing Ce^{4+}, hence giving rise to more Ce^{3+} at the surface of ceria support.
ICNNE2016_028 5:05 pm-5:20 pm	 **Presenter:** Daniel Angelo C. Camacho **From:** University of The Philippines - Diliman **Title:** Viability of Bromine Vapor Doped Crystalline Pentacene as the Hole Transporting Layer in Solid State Dye Sensitized Solar Cell **Authors:** Camacho, Daniel Angelo C. ; De Leon, Rizalinda L **Abstract:** For organic solar cells (OSC) such as dye-sensitized cell (DSSC) to compete with silicon-based cells in terms of stability, there is a need to further improve components which causes degradation. To answer the stability issue with liquid electrolyte, solid state dye-sensitized solar cell (SS-DSSC) was introduced. SS-DSSC promises performance consistency due to less power degradation compared to standard DSSC that uses liquid-based electrolyte. Pentacene (PEN), a semiconductor usually used on field-effect transistors is a material that has a higher hole and electron mobility when compared to amorphous silicon and also has a band gap suitable for solar energy conversion. In this study, pentacene used as hole

	transporting layer in SS-DSSC was fabricated through spin coating and heating using a precursor and through vapour transport using powder. The PEN samples were then doped with bromine through different methods - immersion and vaporization. Characterization of the PEN samples through X-ray Diffraction, Energy Dispersive X-ray Fluorescence, and Atomic Force Microscopy reveal orthorhombic, thin film, and crystalline bulk phases present on different fabricated PEN samples as well as confirmed successful doping. Furthermore, the light harvesting parameters are analysed through Solar™ Light LS1000 Solar Simulator (AM 1.5, 100 mW/cm^2) to confirm the correlation between the increased efficiency, PEN layer growing methods, and bromine doping methods.
ICNNE2016_024 5:20 pm-5:35 pm	 **Presenter:** Edidiong Okon **From:** The Robert Gordon University, River side East, Garthdee Road, Garthdee, Aberdeen, UK **Title:** An Experimental Analysis of Lactic acid Esterification Process using Langmuir-Hinshelwood Model **Authors:** Edidiong Okon, Habiba Shehu and Edward Gobina **Abstract:** In this study, esterification of lactic acid and ethanol to produce ethyl lactate using different cation-exchange resin catalysts was performed at 100 oC. The catalysts used for the esterification process were amberlyst 16 and dowex 50W8x cation-exchange resins. Two simplified mechanisms based on Langmuir-Hinshelwood model were employed to describe the components that adsorbed most on the surface of the catalysts. Fourier Transform Infrared (Nicolet iS10 FTIR) was employed to verify the rationality of the mechanisms. FTIR of the esterification product reflected C=O, H=O and C=C bonds on the spectra confirming water and ethanol as the most adsorbed components. The kinetic study of the retention time and the peak areas of the esterification produced with the different catalysts were compared using an autosampler gas chromatography/mass spectrometry (autosampler GC-MS). The morphological characterization of the catalysts was determined using scanning electron microscopy (The Zeiss EVO LS10 SEM) coupled with energy dispersive x-ray analyser (The Oxford INCA EDXA). The chromatogram of the esterification product catalysed by amberlyst 16 showed a faster elution at 1.503 mins with the peak area of 1229816403 m^2 in contrast to the dowex 50W8x. The BET surface area and BJH pore size distribution of the resin catalysts were determined using liquid nitrogen adsorption (Quantachrome, 2013) at 77 K. The BET surface area results of amberlyst 16 resin catalysts was found to be 1.659m^2/g compared to 0.1m2/g for the dowex 50W8x. The BJH results of the catalysts exhibited a type IV isotherm with hysteresis confirming that the materials were mesoporous with pore size in the region of 2 – 50 nm.

ICNNE2016_025 (5:35 pm-5:50 pm)	**Presenter:** Habiba Shehu **From:** The Robert Gordon University, River side East, Garthdee Road, Garthdee, Aberdeen, UK **Title:** Separation of Methane from Shuttle Tanker Vents Gases by Adsorption on a Polyurethane/Zeolite Membrane **Authors:** Habiba Shehu, Edidiong Okon and Edward Gobina **Abstract:** Shuttle tankers are becoming one of the widely used means of transporting crude oil to storage plants and refineries. The emissions of hydrocarbon vapours from the vents arise mainly during loading and offloading operations. Experimental data from the use of polyurethane/zeolite membrane on an alumina support on the separation of methane from carbon dioxide and oxygen were reported. The physical properties of the membrane were investigated by FTIR. Single gas permeation test with methane, propane, oxygen and carbon dioxide at a temperature of 293 K and pressure ranging from 0.1 to 1.0 Bar was carried out. The molar flux of the gases through the membrane was in the range of 3×10^{-2} to 1×10^{-1} $molm^{-2}s^{-1}$. The highest separation factor of CH_4/CO_2 and CH_4/O_2 and CH_4/C_3H_8 was determined to be 1.7, 1.7 and 1.6 respectively.
MSI2016-102 (5:50 pm-6:05 pm)	 **Presenter:** Chunyu Teng **From:** China Aero-Polytechnology Establishment, China **Title:** Phase Field Simulation of Grain Growth with Particle Pinning **Authors:** Chunyu Teng, Yun Fu, Zhanyong Ren, Yonghong Li, Yun Wang, and Wenli Ouyang **Abstract:** The properties of alloys depend on its microstructure, such as the size of grains. In general, the balanced mechanical properties of alloys can be obtained with small grain size. While the grain size of alloys may increases under heat treatment, thermal mechanical processing and service condition of high temperature, i.e., the grain growth is inevitable. The effort of most research is to control the rate of grain growth and avoid abnormal grain growth. For example, pinning the grain boundary and reduce its mobility with the second phase particles in order to prevent grain growth. Therefore, the properties of the alloys will not decrease dramatically and the structure retains a high degree of integrity. The details of grain growth with particle pinning were investigated by phase field simulations in the present paper. It is found that, with the same size of pinning particles, the pinning effect increases with the increases of the pinning particle number. With the same pinning particle number, the pinning effect increases with the increases of pinning particle size. Under the same total volume of pinning particles while different particle size and number, the pinning effect is complicated and it will be discussed in details. The pinning effect decreases with the increases of grain boundary energy. These findings could shed light on the

	understanding of the grain growth kinetics with particle pinning.
MSI2016-103 (6:05 pm-6:20 pm)	 **Presenter:** Rafay Ali **From:** Shaheed Zulfikar Ali Bhutto Institute of Science and Technogy, Karachi **Title:** Indigenous Design for Automatic Testing of Tensile Strength Using Graphical User Interface **Authors:** Rafay Ali, Faraz Junejo, Rafey Imtiaz and Usama Sultan Shamsi **Abstract:** Tensile Testing is a fundamental material test to measure the tenacity and tensile strength. Tensile strength means ability to take tensile stress. This Universal Testing Machine is designed using Dual Cylinder Technique in order to comply with the maximun load (tensile force) with the reduction of minimum physical effort and minimized losses.It is to provide material testing opportunity to the students of different institutions, locally and globally, at lowest price; so that they can have a comprehensive understanding of the testing procedures and examining material properties on practical grounds with a minimum expenditure. The testing mechanism is automated along with the inclusion of all necessary parameters and the movement of the members. Specimens of different engineering materials were used to carry out the test and their mechanical strength was tested and compared with the actual values.
MSI2016-210 (6:20 pm-6:35 pm)	 **Presenter:** M ªDolores Escalera Rodr ǵuez **From:** Universidad Rey Juan Carlos, Spain **Title:** Laser cladding of in situ Al-AlN composite on light alloys substrate **Authors:** Ainhoa Riquelme, Mar á Dolores Escalera-Rodr ǵuez, Pilar Rodrigo, Joaqu ń Rams **Abstract:** In situ metal matrix composites are novel composites in which the reinforcement is formed within the parent alloy by controlling chemical reactions during the composite fabrication. In recent years, there have been attempts to produce AlN composites utilizing the reactions between molten Al and a reactive gas. However, the conventional processing methods are sub-optimal and result in porosity, interface matrix-reinforcement deterioration, and high processing costs. The aim of this research is to develop a methodology to manufacture good-quality in situ Al-AlN composites in a cost effective way. In situ Al-AlN composite was synthesized with a laser cladding equipment. This composite powder can be

	directly deposited as coating on aluminum alloys conventionally used in the transport sector. The increase in the coatings tribological properties was demonstrated.
MSI2016-214 (6:35 pm-6:50 pm)	 **Presenter:** Kusno Kamil **From:** Universitas Muslim Indonesia, Indonesia **Title:** Sea Water effects on Surface Morphology and Interfacial Bonding of Sugar Palm Fiber to Sago Matrix **Authors:** Mardin H, I.N.G. Wardana, Kusno K, Pratikto, Wahyono S. **Abstract:** Effects of sea water immersion for palm fiber in relation to surface morphology, roughness and bonding among fibers and sago matrix were observed. Duration of soak varied in 1, 2, 3 and 4 weeks, and then dried at room temperature for 3 hours continued by oven at 80 ℃ for 6 hours. SEM and roughness arithmetic tests are applied to see the surface morphology, roughness and bonding among fibers and the matrix. Result shows fibers morphology and roughness varies by the duration of immersion. The surface roughness increases as the immersion continue along with bounding improvement of fiber to the matrix. The maximum duration of 4 weeks fiber immersion resulted in the best interlocking of matrix and fibers, as the slits among them disappear.
MSI2016-214E (6:50 pm-7:05 pm)	 **Presenter:** Fathi Abdelazeem Abdelmgeed Basioni **From:** Menofia University, Egypt **Title:** Deflection of Non-Uniform Beams Resting on a Non-linear Elastic Foundation using (GDQM) **Authors:** Ramzy M. Abumandour, Islam M. Eldesoky, Mohamed A. Safan, R. M. Rizk-Allah and Fathi A. Abdelmgeed **Abstract:** In this study, a method of a new technique of GDQM is presented for determining the deflection of a non-uniform beam resting on a non-linear elastic foundation, subjected to axial and transverse distributed force. The nonlinear subgrade model which describes the foundation includes the linear and nonlinear Winkler (normal) parameters and the linear Pasternak (shear) foundation parameter. The nonlinear 4^{th} order differential equation of beam is solved using a new technique. In construction of numerical scheme a GDQM is used to transform the differential equation into a set of nonlinear algebraic equations. Then, these nonlinear algebraic equations solved by Newton's method. Comparison the present results with the previous solutions proves the accuracy of this combination.

MSI2016-215 (7:05 pm-7:20 pm)	 **Presenter:** Bing Qi **From:** Southeast University, China **Title:** Chloride Resistance of Recycled Aggregate Concrete under Wetting–drying Cycles **Authors:** Bing Qi, Jianming Gao, and Daman Shen **Abstract:** Recycled aggregates concrete (RAC) becomes an important participant in recycled materials. This study was performed in order to evaluate the effect of recycled coarse aggregates (RCA) on the chloride resistance of concretes with different coarse aggregates replacement ratio under wetting–drying cycles. Composition influence on the concrete were studied with different the addition of admixtures. The results indicate that the free chloride content decreased with the increasing of depth, whist it increased with the increasing replacement ratio of RCA at the same depth. Wetting–drying cycles accelerated the process of chloride diffusion. It was also found that the addition of admixtures can improve the ability of chloride resistance of concrete.

Group Photo & Best Presentation of Session II

Conclusion Remark

Time: 7:20 p.m.-7:25 p.m

Dinner Time

07:30 p.m.-09:00 p.m.

La Terasse, Grand floor

Timhotel-Berthier-Paris-17

Note