

Macau, 2014

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# **2014 SCIEI Macau CONFERENCES PROGRAM**

**2014 The 4th International Conference on Advanced Materials Research  
(ICAMR 2014)**

**2014 The 2nd International Conference on Scientific Research and Studies  
(ICSRS 2014)**

**2014 International Conference on Physical Science and Technology  
(ICPST 2014)**

## **JANUARY 22-23, 2014**

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## **ANNOUNCEMENT**

**\*ICAMR 2014 conference proceeding will not be available on conference site, and will be post to authors' address after conference.**

**\*ICSRS 2014 conference papers were selected and published in the International Journal of Engineering and Technology (IJET, ISSN: 1793 - 8244). Authors could get the proceeding onsite.**

**\*ICPST 2014 conference papers were selected and published into Journal of Applied Physics and Mathematics (ISSN: 2010-362X, DOI: 10.7763/IJAPM). Authors could get the proceeding onsite.**

**\*One best presentation will be selected from each session, the best one will be announced and awarded the certificate at the end of each session, and the winners' photos will be updated on SCIEI official website: [www.sciei.org](http://www.sciei.org).**

**Best Presentation will be evaluated from: Originality; Applicability; Technical Merit; PPT; English.**

**\*If you didn't put a formal photo in your registration from, please take a formal one inch photo.**



## **INSTRUCTIONS FOR ORAL PRESENTATIONS**

### **Devices Provided by the Conference Organizer:**

**Laptops (with MS-Office & Adobe Reader)**  
**Projectors & Screen**  
**Laser Sticks**

### **Materials Provided by the Presenters:**

**PowerPoint or PDF files**  
**(Files shall be copied to the Conference Computer 10 minutes earlier before each Session)**  
**Duration of each Presentation (Tentatively):**  
**Regular Oral Session: about 10 Minutes of Presentation, including Q&A**

### **Dress code**

**Please wearing formal clothes or national characteristics of clothing**

## Honorary Chair & Keynote Speaker



**Prof. GONG Hao**

**Dept Mat. Sci & Eng, National University of Singapore**

### **About Prof. GONG Hao:**

Dr. Hao GONG is a Full Professor of Materials Science and Engineering at National University of Singapore. He is also the coordinator of the transmission electron microscopy laboratory at Department of Materials Science and Engineering. His research interests include transparent oxide conductors and semiconductors (n-type and p-type), energy storage materials and devices (mainly supercapacitors), energy harvest materials and devices (mainly solar cells), gas sensors, functional thin film and nano-materials, materials characterization (mainly on transmission electron microscopy and electron diffraction). Dr. Gong received his B.S. degree in Physics at Yunnan University in 1982. He passed his M.S. courses in Yunnan University, carried out his M.S. thesis research work at Glasgow University, UK, and received M.S. degree of Electron and Ion Physics at Yunnan University in 1987. He then did his PhD at Materials Laboratory at Delft University of Technology, the Netherlands, and obtained PhD degree there in 1992. He joined National University of Singapore in 1992, and is currently full professor at Department of Materials Science and Engineering. He has published about 200 refereed papers in major international journals and a few US patents. He has delivered several invited talks at international conferences. He has been chairman or committee member of several international conferences, and editor of special issues of some journals.

**Topic:** High energy storage of nickel and cobalt oxides based supercapacitors

**Abstract:** For energy storage, supercapacitors have attracted great attention recently. Different materials have been proposed and used for supercapacitors. Due to the different advantages of Nickel and Cobalt for supercapacitor materials, a combination of both them attracted more and more attention. In this presentation, I will demonstrate the achievement of Ni-Co oxide and carbon materials based supercapacitors with very high energy density. Nickel oxide based nanoparticles are synthesized by using various processes. The energy storage performance of such materials and devices are examined and the reasons for very high energy storage ability are analysed and discussed. Electrochemical performance, microstructure, morphology and BET surface area are found strongly related to Ni and Co concentration for the synthesis. Due to the high specific capacitance and the much lower price of Ni and Co than Ru, a Ni-Co oxide supercapacitor has its unique advantage and may be a very promising candidate for the next generation of commercial high capacitance supercapacitors. Full supercapacitor cell prototypes are built and high energy density is reached, and a small supercapacitor can light a bulb and drive a minifan.

## Keynote Speaker



**Engr. Shauquat Alam-Chartered Engineer**

**Head Facilities, Universal Motors Agencies, Kingdom of Saudi Arabia.**

### **About Engr. Shauquat Alam:**

Engr. Shauquat Alam, a Chartered Engineer, is the Facility Manager, of Universal Motors Agencies, KSA's leading GM Dealership. He is also a certified Consultant by the Saudi Council of Engineers; and holds an Advisor / Consultant KSA residence permit.

Engr. Shauquat is an accomplished leader and a strategic thinker with over 32 years of experience as an Engineering Consultant, Strategist and Facility Management Professional - with an excellent track record in various positions and roles exhibiting outstanding technical knowledge, hand-on approach, in addition to a diverse skill set and expertise in Facility Management. He has a Bachelor in Electrical engineering with post graduate qualification in Plant Engineering.

Mr. Shauquat hails from India and is an ardent presenter of FM horizons in various forums on Facility Management in Europe and Middle-east region. His recent tracking as a speaker are – Innovative & Cost Effective FM [Jeddah, Jan'10]; Risk Assessment & Management [Dubai, Oct'10]; FM Positioning & Strategy – Saudi Arabia's Economic Aspect [Vienna, Austria, May'11]; Chaired Discussion Round: BRICs – Market of the Future? [Vienna, Austria, May'11]; [conducted workshop] - Added Value in FM in an organisation vis-a-vis its CSR [Kuwait, Dec'11]; Added Value in FM in an organisation [Abu Dhabi, Jan'12]; FM-The KSA scenario with specific reference to the Automobile Industry [Riyadh, Oct'12]. O&M -The Road Map into the Facility Management [Riyadh, KSA, Jan'13]; [conducted workshop] - O&M -The Road Map into the Facility Management [Jeddah, KSA, May'13]; and, O&M - Added value to Facility Management - A case study from KSA [The 2nd World Maintenance Forum, 4-6 Sep'13 Lugano, Switzerland].

In his additional activities Mr. Shauquat is the: Middle-East Coordinator for NASA [USA]'s Cassini Scientist for a Day Contest for youths; Founder Member of the Assam United Nations Association; Founder Member of the Workmen's Rural Institute for Science & Trades (WRIST). This institute [A CSR project] was formed to induct into the minds of our younger generation to create "A demand for himself" and many others.

Mr. Shauquat is a member of the BIFM [UK], ISSA [Geneva], IE[India]

**Topic:** Advanced Materials Research: Its role in Facility Management

**Abstract:** Research is the starting point for any economic thinking. Adding value by research and exchange of knowledge enables development and growth. Even as we live within our means, we must invest to win the future. This paper is aimed to contribute to the efforts to bring together industry, universities, and the governments to invest in key areas like: building advanced materials manufacturing capabilities, with industry in innovative technologies that will jumpstart domestic manufacturing capability essential to a nation's security and promote the long-term economic viability for such industries. Investments may include micro high-powered batteries, advanced composites, metal fabrication, bio-manufacturing, and alternative energy, among others. Investing in technologies, such as information technology, biotechnology, and nanotechnology, will support the creation of good jobs by helping manufacturers reduce costs, improve quality, and accelerate product development.

Discover, develop, manufacture, and deploy advanced materials at twice the speed is possible today, at a fraction of the cost. Advanced materials is trending to fuel emerging multi-billion dollar industries aimed at addressing challenges in manufacturing, clean energy, and national security. Today, what we really need is to spark a renaissance in global research and manufacturing of advanced materials and help our manufacturers worldwide to develop the cutting-edge tools they need to comply with the vision of the generation.

This discussion focuses upon the platform mapping for breakthroughs in the next decade in advanced materials' research and technologies, speeding ideas from the laboratory and drawing board to the manufacturing floor, scaling-up first-of-a-kind technologies, and developing the infrastructure and shared facilities to allow entrepreneurs to innovate and compete.

In this synoptic view of materials, we emphasize the crucial, enabling role of materials as a precursor to many major technological innovations forecast for the future. Finally, we discuss briefly the opportunities made available by science and technology for securing the future for materials and as part of a broadly based conservation ethic – through developing products with a high information content, through improvements in materials processing techniques, through subtle tuning of materials properties, computer-aided design with built-in recyclability, improved durability through surface protection technologies and a deliberate drive towards advanced materials with specific functions.

The pace of change in materials technology has broadened and accelerated in recent years. The electronics and computer industries have gained enormously from developing the use of semiconductor materials. There has been a widening of the scope for using new composite materials, polymers and ceramics. Research in conventional materials such as steel and aluminum has enabled their properties to be enhanced to meet new needs and intensifying competition. Advanced materials are often uncompetitive where considerations of price rather than performance affect the choice of what a product should be made from.

## Keynote Speaker



**Prof. Jaroslaw JAKUBOWICZ**

**Institute of Materials Science and Engineering, Poznan University of Technology, Poland**

### **About Prof. Jaroslaw JAKUBOWICZ**

Dr. Jaroslaw Jakubowicz is an Associate Professor of Materials Science and Engineering at Poznan University of Technology (Poland). He works in the Institute of Materials Science and Engineering. His field of interest include nanocrystalline materials, hard magnetic materials, porous silicon, biomaterials and surface engineering.

Dr. Jakubowicz received his M.Sc. eng. in 1997 in materials science and engineering at Poznan University of Technology. PhD finished in 1999 at Warsaw University of Technology (Poland) and D.Sc. finished in 2009 (habilitation) at Military Technical Academy (Poland). From 2010 he has an Associate Professor position at Poznan University of Technology. During his career he was V-ce Dean of the Faculty of Mechanical Engineering and Management and V-ce Head of the Institute of Materials Science and Engineering at Poznan University of Technology. In 2001/2002 and 2004 he works in Division Solar Energy Research, Helmholtz-Zentrum Berlin (formerly Hahn-Meitner-Institut Berlin), Germany.

He published over 110 scientific papers and he is a Head of 2 scientific (in the field of biomaterials) and 1 educational project (Human Capital) financed by Polish and EU government. He is a member of Editorial board of the Journal of Biomaterials and Tissue Engineering (American Scientific Publishers) and ISRN Biomedical Engineering (Hindawi Publishing Corporation).

**Topic:** Porous Ti-based materials for hard tissue implant applications

**Abstract:** The porous materials based on Ti and its alloys are very attractive for many applications, including hard tissue implants. Both, surface and total porosity are attractive for medical applications, due to low Young modulus, close in magnitude to that of human bone. The porous Ti- based materials, such as: Ti, Ti-alloys, Ti Void Metal Composites (Ti-VMC) has low Young modulus, and very good biocompatibility. Into the pores grows a human tissue forming a strong bonding of the implant with bone.

The porous material in the form of void metal composite (foam/scaffold) are made using powder metallurgical process taking two different powder materials: metallic one (for example titanium) and the second one, which is a space holder material (for example hydrogen carbonate or polymer particles). The space holder material, which is evaporated at elevated temperature, leaving an open spaces – pores and thus way a typical porous Ti implants are produced.

In our new concept we found that it is possible to use a saccharose (table sugar crystals) as a space holder particles. The sugar crystals are easily removed (for example by dissolving in water) from solid Ti + sugar green compact giving a scaffold respective for sintering. The sintering of the scaffold lead to Ti particles bonding and Ti-VMC strength. In this way a Ti-VMC with more than 70% porosity and pore size of 0.7 mm were made.

In the surface porosity formation an electrochemical etching is useful, especially for the case of Ti-type nanomaterials. In the nanomaterials the large volume of grain boundaries supporting etching process. The grains are easily penetrated by electrolyte and surface porosity from macro- to micro- can be achieved.

## Onsite Registration- Jan. 22<sup>nd</sup> (Wednesday)

<b>Date</b>	Jan. 22 <sup>nd</sup> (Wednesday)
<b>Time</b>	10:00a.m-17:00p.m
<b>Venue</b>	SOFITEL MACAUAT PONTE 16 Lobby
<b>Staff</b>	Renne Gao, Amy Hu
<b>Add &amp; Tel</b>	Add: Rua do Visconde Paco de Arcos Macau   +853 8861 7111
<b>Note</b>	<p>*Collecting conference materials</p> <p>**Delegates will get the certificate at the registration desk.</p> <p>***The organizer won't provide accommodation, and we suggest you make an early reservation.</p>

## Oral Presentations-Jan. 23<sup>rd</sup> (Thursday)

Venue Baccara 2 Meeting	Jan. 23 9:00a.m-9:05a.m	Opening Remarks <b>Prof. GONG Hao</b> <b>Dept Mat. Sci &amp; Eng, National University of Singapore</b>	
	Jan. 23 9:05a.m-10:00a.m	Plenary Speech I <b>Engr. Shauquat Alam-Chartered Engineer</b> <b>Head Facilities, Universal Motors Agencies,</b> <b>Kingdom of Saudi Arabia.</b> "Advanced Materials Research: Its role in Facility Management"	
	Jan. 23 10:00a.m-10:55a.m	Plenary Speech II <b>Prof. Jaroslaw JAKUBOWICZ</b> <b>Institute of Materials Science and Engineering</b> <b>Poznan University of Technology, Poland</b> "Porous Ti-based materials for hard tissue implant applications"	
	Jan. 23 10:55a.m-11:15a.m	Coffee Break & Group Photo	
	Jan. 23 11:15a.m-12:10p.m	Plenary Speech III <b>Prof. GONG Hao</b> <b>Dept Mat. Sci &amp; Eng, National University of Singapore</b> "High energy storage of nickel and cobalt oxides based supercapacitors"	
Lunch at Mistral Restaurant 12:00-13:30			
Venue Baccara 1 Meeting	Jan. 23 13:30p.m-18:30p.m	13:30-15:40	Session 1-ICAMR 2014-10
		15:40-16:00	Coffee Break
		16:00-18:30	Session 2-ICAMR 2014-10
Venue Baccara 2 Meeting	Jan. 23 13:30p.m-18:30p.m	13:30-15:40	Session 3-ICAMR 2014-10
		15:40-16:00	Coffee Break
		16:00-18:30	Session 4-ICAMR 2014-10
Venue Baccara 3 Meeting	Jan. 23 13:30p.m-18:30p.m	13:30-15:40	Session 5-ICPST 2014 & ICSRS 2014-9
		15:00-16:00	Coffee Break
		16:00-18:30	Session 6-ICAMR 2014-10
Dinner Buffet at Mistral Restaurant 18:30-20:00			

# January 23<sup>rd</sup> (Thursday Morning)

## Invited Speech

**Venue: Baccara 2 Meeting**

Chair: **Prof. GONG Hao**

**Dept Mat. Sci & Eng, National University of Singapore**

**Time: 9:00 a.m-12:10 p.m**

9:00a.m-9:05a.m	Opening Remarks <b>Prof. GONG Hao</b> <b>Dept Mat. Sci &amp; Eng, National University of Singapore</b>
9:05a.m-10:00a.m	Plenary Speech I <b>Engr. Shauquat Alam-Chartered Engineer</b> <b>Head Facilities, Universal Motors Agencies,</b> <b>Kingdom of Saudi Arabia.</b> "Advanced Materials Research: Its role in Facility Management"
10:00a.m-10:55a.m	Plenary Speech II <b>Prof. Jaroslaw JAKUBOWICZ</b> <b>Institute of Materials Science and Engineering</b> <b>Poznan University of Technology, Poland</b> "Porous Ti-based materials for hard tissue implant applications"
10:55a.m-11:15a.m	<b>Coffee Break &amp; Group Photo</b>
11:15a.m-12:10p.m	Plenary Speech III <b>Prof. GONG Hao</b> <b>Dept Mat. Sci &amp; Eng, National University of Singapore</b> "High energy storage of nickel and cobalt oxides based supercapacitors"
12:10p.m-14:00p.m	<b>Lunch at Mistral Restaurant</b>

\*The Group Photo will be updated on the conference webpages and SCIEI official website: [www.sciei.org](http://www.sciei.org)

\*\*One best presentation will be selected from each session, the best one will be announced and awarded the certificate at the end of each session, and the winners' photos will be updated on SCIEI official website: [www.sciei.org](http://www.sciei.org).

\*\*\*Best Presentation will be evaluated from: Originality; Applicability; Technical Merit; PPT; English.

\*\*\*\* Please arrive at the conference room 10 minutes earlier before the session starts, copy your PPT to the laptop.



# January 23<sup>rd</sup> (Thursday Afternoon)

## Oral Presentations-Schedule


**SESSION – 1-ICAMR 2014**



**Venue: Baccara 1 Meeting**

Session Chair: Engr. Shauquat Alam, CEng.

Head Facilities, Universal Motors Agencies, Kingdom of Saudi Arabia.

**Time: 13:30p.m-15:40p.m**

<p>R022 Mr. Mohd Ridha Bin Muhamad</p>	<p>Magnetic Abrasive Finishing of Internal Surface of Aluminum Pipe using Magnetic Machining Jig <b>Mohd Ridha Bin Muhamad</b>, and Zou Yanhua Utsunomiya University, Precision Laboratory, Japan</p> <p><b>Abstract</b></p> <p>Magnetic abrasive finishing technology has been known very well in finishing of stainless steel SUS304 pipes to mirror finish standard. However, the applications in softer metal such as aluminum A2017 were difficult due to soft metal characteristic itself. In 2002, Zou and Shinmura had developed a new method of magnetic field assisted machining process using magnetic machining jig for SUS304 pipe [1]. The development has since then expanded in many research. This research finds the optimum finishing condition for mirror finish standard in internal surface of aluminum A2017 pipe. We use a 100% polyester fabric that does not cause scratch on the material and found that the optimum pole-pipe gap to be 13mm to achieve the best surface roughness Ra of 0.020µm after finishing, from surface roughness Ra of 0.195µm before finishing.</p>
<p>R042 Assoc. Prof. Seksak Asavavisithchai</p>	<p>Investigation of AC8A Scrap-Recycled Aluminum Foams <b>Seksak Asavavisithchai</b>, Natthida Jareankieathbovorn and Areeya Srichaiyaperk Chulalongkorn University, Thailand</p> <p><b>Abstract</b></p> <p>Open-cell Al foam has outstanding properties which are suitable for functional applications. However, a major drawback for widespread employment of Al foam is its high relative cost which can be several times higher than conventional metals. To reduce the cost, a recycled material waste is constructively used instead of expensive base metal. The present study aims to fabricate economical open-cell Al foams using AC8A alloy scrap from lathe machines. The Al foams were fabricated through pressure infiltration casting process at which the cellular pattern was made from commercial reticulated open-cell polyurethane foams with the pore size of 12 ppi. The compressive strength and microhardness of scrap-recycled Al foams are higher than those of pure Al foam. The increase in foam mechanical properties resulted from the change in foam microstructure as the formation of Si hard phase in Al matrix. The strength and microhardness of the foams increase with increasing scrap contents.</p>
<p>R023 Assoc. Prof. Dr. Mohd Zaki Nuawi</p> 	<p>Comparison of Young's Modulus Property Determination of Metallic Materials under Two Statistical Analysis Methods <b>Mohd Zaki Nuawi</b>, Abdul Rahim Bahari, Shahrum Abdullah, Ahmad Kamal Ariffin Universiti Kebangsaan Malaysia, Malaysia</p> <p><b>Abstract</b></p> <p>This paper presents an alternative statistical signal analysis method to characterise and determine Young's modulus property of metallic materials. For this characterisation purpose, we propose an alternative method called Integrated Kurtosis-based Algorithm for Z-notch filter (I-kaz™) and Mesokurtosis Zonal Nonparametric (M-Z-N). Impulsive excitation test has been performed according to ASTM E1876 on three metallic materials of medium carbon steel S50C, stainless steel AISI 304 and brass to measure the piezoelectric and acoustic signals. The transient acoustic signal has been analysed using M-Z-N analysis while I-kaz™ has been used to analyse the impulsive piezoelectric signal. Correlation expression between Young's modulus property and the calculated statistical parameters has been discussed and the accuracy of these two methods has been identified using cast iron FCD 500 specimen.</p>

<p>R051 Asst. Prof. Hsiao-Lin Teng</p> 	<p>Predicting BEOL key qualities by Mahalanobis-Taguchi System ? an Example of Taiwan's Semiconductor</p> <p>Shu-Yu Lin and <b>Hsiao-Lin Teng</b></p> <p>Chung Hua University, Taiwan</p> <p><b>Abstract</b></p> <p>Taguchi Gen'ichi introduced Mahalanobis-Taguchi System(MTS) which is in combination with the concepts of quality engineering and Mahalanobis Distance(MD). The MTS is proposed as diagnosis and forecasting method using multivariate measurement scale with its intention to help policy maker as basis for decision making. This study applies MTS approach in a manufacturing process to reduce a set of parameters, at the same time there will be a pattern, which can forecast and identify important parameters, constructed by MTS method. Through this pattern can minimize unimportant inspection in process and save unnecessary time and cost. The primary goal to structure a measuring scale which makes accurate forecasting in multidimensional system. The case study in this paper reviews the planarity of back-end process in 8-inch silicon wafers on the purpose to construct a pattern of reduced set of parameters. In this paper, using thirty-two current variables as reference space and furthermore reducing the variables to seven parameters in order to predict defective items. As a result, it has still good discriminant accuracy. If validation of the reduced-set parameters is reliable with its good discriminant accuracy, it means that the company in this case study can built defective items warning of the pattern parameters in back-end process because this approach of selecting parameters is feasible.</p>
<p>R017 Assoc. Prof. Chaisri Tharasawatpipat</p> 	<p>Modification of Titanium Dioxide Embedded in the Bio-composite film for Photocatalytic Oxidation of Chlorinated Volatile Organic Compound</p> <p><b>Chaisri Tharasawatpipat</b>, Jittiporn Kruenate, Kowit Suwannahong and Torpong Kreetachat</p> <p>School of Energy and Environment, University of Phayao, Thailand</p> <p><b>Abstract</b></p> <p>This research aimed to apply the Blown Film Extrusion technique to synthesize the titanium dioxide (TiO<sub>2</sub>) bio-composite films incorporated on a thin film as a photocatalyst. The biopolymer materials have great recognition via their renewable and biodegradable characteristic and the green composite has been a new challenge path to replace traditional polymer composite. In this work, TiO<sub>2</sub>/Polybutylene succinate (PBS) bio-composite film was developed to be used as a supporter for determining the photocatalytic oxidation activity of the TiO<sub>2</sub> on the chlorinated volatile organic compounds degradation. PBS is a synthetic biopolymer which has a reasonable mechanical strength. The modified-TiO<sub>2</sub>/PBS bio-composite films were studied to evaluate the degradation of dichloromethane. In order to improve the distribution of the developed photocatalyst, the TiO<sub>2</sub> powders were modified by 0.05% mole of ethyl triethoxysilane (ETES) and stearic acid (SA), respectively. The 10% wt. TiO<sub>2</sub>/PBS bio-composite films with thickness of 30 µm were prepared by blown film technique. To evaluate the dispersion efficacy, the modified-TiO<sub>2</sub>/PBS bio-composite films were characterized by Scanning Electron microscopy (SEM). Photocatalytic degradation of dichloromethane in gas phase was determined using an annular closed system photoreactor. The obtained result which was corresponding to the absorption of TiO<sub>2</sub>/PBS bio composites film was investigated in a range of 300-400 nm via UV/VIS spectrophotometry. The energy band gap of TiO<sub>2</sub>, ethyl triethoxysilane-TiO<sub>2</sub> and stearic acid-TiO<sub>2</sub> bio-composite film was found to be 3.18, 3.21, and 3.26 eV, respectively. The SEM shows that the modified-TiO<sub>2</sub> with both ETES and SA exhibit uniform dispersion, while the only TiO<sub>2</sub> shows an evidence of agglomeration in the PBS matrix. For photocatalyst efficiency, the photocatalytic activity of modified-TiO<sub>2</sub>/PBS bio-composite film increased comparing to the TiO<sub>2</sub>/PBS bio-composite film. Moreover, the photocatalytic degradation of dichloromethane by ETES-TiO<sub>2</sub>/PBS bio-composite film yielded degradation efficiency of 47.0%, whereas SA-TiO<sub>2</sub>/PBS bio-composite film yielded the removal efficiency of 41.0% for detention time at 350 min.</p>
<p>R007 Prof. Walter Lindolfo Weingaertner</p>	<p>Wear Monitoring on Microcrystalline Aluminum Oxide Grinding Wheels on Profile Grinding with the Aid of Acoustic Emission</p> <p>Lucas Benini, <b>Walter Lindolfo Weingaertner</b>, and Lucas da Silva Maciel</p> <p>Federal University of Santa Catarina, Brazil</p> <p><b>Abstract</b></p> <p>The localized wear on grinding wheel edges is a common phenomenon on profile grinding since the abrasive grains are less attached to the bond. The grinding wheel wear depends heavily on the process parameters, workpiece and wheel composition, causing changes on the process and profile deviation behaviors. In order to cope with these uncertainties, many natural and synthetic materials have been used in different grinding processes. However, the influence of mixed compositions of</p>

	<p>different types of abrasive grains on external cylindrical grinding is not well known. In order to assess this relation, a methodology procedure was developed providing an overview of the cinematic edges behavior on a progressive wheel wear. The methodology procedure is based on the acoustic emission technology, using a transducer with a 50 <math>\mu\text{m}</math> radius diamond tip. The tip, when in contact with a rotating grinding wheel, enables the evaluation of the cinematic cutting edges. The abrasive grain density was evaluated for different grinding wheel compositions and specific wear removal values. Furthermore, these results were compared to the profile deviation observed on the same tool, allowing the assessment of the influence of different microcrystalline corundum grains on the overall grinding wheel wear behavior.</p>
<p>R010 Asst. Prof. Hogyong Kim</p> 	<p>Temperature-dependent Current-voltage Characteristics in ZnO Based Schottky Diodes <b>Hogyong Kim</b>, Ahrum Sohn and Dong-Wook Kim Seoul National University of Science and Technology, Republic of Korea</p> <p><b>Abstract</b></p> <p>Using current-voltage (I-V) measurements, the temperature-dependent current transport in Ag/Zn-polar ZnO Schottky diodes was investigated. Both the series and shunt resistances of the diode were altered at the different temperatures, which were related to the amount of free carriers and the formation of a vacuum-activated surface conduction path, respectively. The reverse biased current transport was associated with a thermally assisted tunneling field emission of carriers and the Poole-Frenkel effect, for higher and lower voltages, respectively. The average interface state density decreased with increasing temperature, which was due to a result of molecular restructuring and reordering and/or variation of the ideality factor with temperatures across the Ag/ZnO interface.</p>
<p>R013 Asst. Prof. Pani Luisa</p> 	<p>Test on Recycled Concrete: Relationship among Ultrasonic Waves Velocity, Compressive Strength and Elastic Modulus <b>Pani Luisa</b>, and Francesconi Lorena Dicaar -University of Cagliari, Italy</p> <p><b>Abstract</b></p> <p>In this paper an experimental program has been carried out in order to compare compressive strength <math>f_c</math> and elastic static modulus <math>E_c</math> of recycled concrete with ultrasonic waves velocity <math>V_p</math>, to establish the possibility of employing nondestructive ultrasonic tests to qualify recycled concrete. 9 mix of concrete with different substitution percentage of recycled aggregates instead of natural ones and 27 cylindrical samples have been made.</p> <p>At first ultrasonic tests have been carried out on cylindrical samples, later elastic static modulus <math>E_c</math> and compressive strength <math>f_c</math> have been experimentally evaluated.</p> <p>The dynamic elastic modulus <math>E_d</math> has been determined in function of ultrasonic wave velocity <math>V_p</math>; furthermore the correlations among <math>E_d</math>, <math>E_c</math>, <math>f_c</math> e <math>V_p</math> have been determined.</p> <p>It has been demonstrated that ultrasonic tests are suitable for evaluating different deformative and resisting concrete performances even when variations are small.</p>
<p>R044 Assoc. Prof. Kensuke Nishioka</p> 	<p>Low Temperature Formation of Silicon Oxide Thin Film And Modification of Film Quality by Argon Excimer Light <b>Kensuke Nishioka</b>, Kosei Sato, Takuya Ito, and Yasuyuki Ota University of Miyazaki, Japan</p> <p><b>Abstract</b></p> <p>Silicon oxide thin film was formed using reaction of spin-coated dimethyl-silicone-oil and 5% ozone gas at low temperature of 300°C. Silicone oil is used for lubrication, insulation, and so on, and it is inexpensive and easy to deal with owing to its stability. FT-IR spectrum of the formed silicon oxide film was similar to that of the thermally oxidized film, and we hardly observed peaks of Si-CH<sub>3</sub> and C-H bonds originated in silicone oil. The Si-OH bonds in the film were observed. The Si-OH bond causes the degradation of the electric properties of the insulator. In order to remove the Si-OH bonds, the silicon oxide film was treated with an argon excimer light at room temperature. The wavelength of the light was 126 nm. The amount of Si-OH bond was drastically reduced by the UV annealing. The energy of the UV light is high and the value is 9.8 eV. The high energy light may cut the bond of Si-OH. Therefore, the amount of Si-OH bond could be reduced.</p>

<p>R034 Assoc. Prof. Kenji Yoshino</p>	<p>Growth and Characterization of ZnS Films by Chemical Bath Deposition Akiko Mochihara and <b>Kenji Yoshino</b> Department of Applied Physics and Electronic Engineering, Japan</p> <p><b>Abstract</b></p> <p>ZnS films are formed by chemical bath deposition using variety zinc sources such as zinc acetate (<math>\text{Zn}(\text{CH}_3\text{COO})_2</math>), zinc sulfate (<math>\text{ZnSO}_4</math>), zinc nitrate (<math>\text{Zn}(\text{NO}_3)_2</math>), iodide zinc (<math>\text{ZnI}_2</math>), zinc chloride (<math>\text{ZnCl}_2</math>) and zinc acetyl (<math>\text{Zn}(\text{acac})_2</math>). X-ray diffraction results show all broad spectra of ZnS. It is considered that amorphous ZnS can be grown. All samples show high transmittance. It is deduced that the decrease of transmittance around 3.7 eV is due to the ZnS band gap. Scanning electron microscopy shows that grain size becomes large with decreasing the instability constants of the zinc sources. It is assumed that zinc becomes ionization with decreasing the instability constants. All samples show a signal of O-H bond from fourier transform infrared spectra. It is assumed that the <math>\text{Zn}(\text{OH})_2</math> exists in each sample.</p>
<p><b>15:40p.m-16:00p.m</b> <b>Coffee Break</b></p>	

# January 23<sup>rd</sup> (Thursday Afternoon)

## Oral Presentations- Schedule

**SESSION – 2-ICAMR 2014**

**Venue: Baccara 1 Meeting**




Session Chair: Professor Jaroslaw Jakubowicz


Poznan University of Technology, Poland

**Time: 16:00p.m-18:30p.m**

<p>R3022</p> <p>Prof.</p> <p>R. Micheletto</p> 	<p>Blinking in Photoluminescence of InGaN Devices is Caused by Slow Beating of THz Vibrations of the Quantum Well</p> <p><b>R. Micheletto</b>, K. Oikawa, and C. Feldmeier</p> <p>Nanoscience and Technology, International Graduate School of Art and Sciences, Yokohama City University, Japan</p> <p><b>Abstract</b></p> <p>The photoluminescence from III-V wide band-gap semiconductors as InGaN is characterized by localized large intensity fluctuations, known as 'blinking', that, despite decades of research, is not yet completely understood. In structures where there is a three-dimensional confinement, as for example semiconductors nano-crystals, the phenomena is supposed to be related to temporary quenching due to highly efficient non-radiative recombination processes (for example, Auger). Nevertheless, in typical InGaN devices, the band structure is an infinitely wide quantum well, so the understanding of the blinking phenomenon remains elusive. We present experimental data and a model that suggests that the discussed optical fluctuations are a general phenomena caused by the slow beating between THz thermal vibrations of the Quantum Well. These minuscule displacements are occurring naturally all over the device, the displacements along the growth direction induce a modulation of the matrix elements that drives the optical emission process; this have measurable effect on the device photo-luminescence. In presence of impurities or gradient of concentration, the vibrations have locally slight frequency differences on adjacent domains, this give rise to a band of beats, and we observe the lower frequency tail of this band.</p>
<p>R040</p> <p>Assoc. Prof.</p> <p>Kensuke Nishioka</p> 	<p>Impact of Sandblasting on Fresnel Lens for Concentrator Photovoltaic</p> <p><b>Kensuke Nishioka</b>, Kosei Sato and Yasuyuki Ota</p> <p>University of Miyazaki, Japan</p> <p><b>Abstract</b></p> <p>When installing concentrator photovoltaic (CPV) systems in desert areas, we must consider the impact of sandstorms on the Fresnel lens in CPV modules. CPV systems are much more sensitive to sandstorms than flat-panel PV systems because they can only use the direct beam component of sunlight. In this study, the transmittance of a PMMA substrate after sandblasting was evaluated and the influence of sandblasting on the output of a CPV system was assessed. The transmittance of PMMA decreased with an increase in the momentum of blown sand. The conversion efficiency of a CPV module was determined by equivalent circuit calculation. The conversion efficiency decreased with increasing momentum. The coefficient of degradation was 0.17 point per unit momentum.</p>
<p>R046</p> <p>Assoc. Prof.</p> <p>Kensuke Nishioka</p> 	<p>Temperature Characteristics of Concentrator Photovoltaics Analyzed by Circuit Calculation</p> <p><b>Kensuke Nishioka</b>, Kosei Sato, and Yasuyuki Ota</p> <p>University of Miyazaki, Japan</p> <p><b>Abstract</b></p> <p>Temperature characteristic analysis of the triple-junction solar cell was carried out using circuit simulator under concentration conditions. The temperature exponent of saturation current density for each single-junction solar cell was derived. Extracted temperature exponents were used in the equivalent circuit model for the triple-junction solar cell, and the calculations of solar cell performance were carried out at various temperatures and concentration ratios. The calculation results agreed well with the measured results.</p>
<p>R038</p> <p>Assoc. Prof.</p>	<p>Photoelectrochemical Characterizations of CuInS<sub>2</sub> and Cu(In,Ga)S<sub>2</sub> Thin Films Fabricated by A Spray Pyrolysis Method</p> <p><b>Shigeru Ikeda</b>, Midori Nonogaki, Wilman Septina, Gunawan Gunawan, Takashi Harada and Michio</p>



<p>.Shigeru Ikeda</p>	<p>Matsumura Osaka University, Japan</p> <p><b>Abstract</b></p> <p>Polycrystalline CuInS<sub>2</sub> chalcopyrite thin films were formed on a Mo-coated glass substrate by annealing of a spray deposited precursor film in a sulfur atmosphere at 600 °C. Partial incorporation of Ga in the CuInS<sub>2</sub> film with a Ga/In ratio of ca. 0.2 to form a Cu(In,Ga)S<sub>2</sub> mixed crystal was also prepared. Photoelectrochemical (PEC) analyses revealed that the Ga incorporation was effective to modulate electric and semiconductive properties of the chalcopyrite film. As a result, relatively large cathodic photocurrent responses in PEC analyses as well as high photovoltaic properties of a solar cell based on the Cu(In,Ga)S<sub>2</sub> film were obtained.</p>
<p>R1011 Prof. L. Krishnamurthy</p> 	<p>Machinability Assessment of Aluminium-Graphite-Silicon Carbide Hybrid Composites <b>L. Krishnamurthy</b>, G.L. Shekar, D. Abdul Budan and B.K. Sridhara The National Institute of Engineering, India</p> <p><b>Abstract</b></p> <p>Aluminium silicon carbide particulate composites have wide ranging applications in automobile, aerospace and military industries because of their attractive properties such as high strength-to weight ratio, high wear resistance, high temperature stability etc. From the machining point of view, these are one of the most difficult-to-machine materials, primarily due to the presence of SiC reinforcements causing an excessive wear of cutting tools during machining. On the other hand aluminium- graphite composites are widely used in tribological applications because of their excellent antifriction properties, wear resistance and antiseizure characteristics. Investigations have been carried out in this work to assess the machinability of aluminium matrix composites containing both SiC and graphite particulates as reinforcements. Turning experiments have been conducted on Aluminium-Graphite-Silicon Carbide hybrid composites using Carbide and PCD tool inserts to determine the flank wear. Experiments have been carried out based on Central Composite Design approach.</p>
<p>R2003 Prof. T. N. Shridhar</p> 	<p>Machinability Studies On Aluminium Matrix Hybrid Composites <b>T. N. Shridhar</b>, L. Krishnamurthy, and B. K. Sridhara The National Institute of Engineering, India</p> <p><b>Abstract</b></p> <p>Aluminium metal matrix composites due to their excellent properties like high strength to weight ratio and high wear resistant are becoming new generation of materials useful for various engineering applications. A continuing problem with these composites is that they are difficult to machine. Machining of these composites depends on the relative content of the reinforcement and the matrix material as well as on its response to the machining process. Experimental investigations have been carried out on the machinability aspects of Aluminium hybrid composites reinforced with Graphite and Silicon Carbide particulates. Experiments have been carried out by Design of Experiments approach. Mathematical models which correlate the interactive and higher order influences of cutting parameters on the resultant force have been developed.</p>
<p>R009 Assoc. Prof. Chien Chon Chen</p> 	<p>Fabrication of ZnS Thin Film Buffer Layer in Solar Cell by Radio Frequency Sputtering Method Zue Chin Chang, Yi Chen Lin, Chih Yuan Chen, and <b>Chien Chon Chen</b> Department of Energy Engineering, National United University, Miaoli 36003, Taiwan</p> <p><b>Abstract</b></p> <p>The present study aims to investigate the influence of Coring glass substrate temperature on the topography, deposition rate, crystal structure, optical, and electrical properties of ZnS thin films produced by magnetic radio frequency sputtering method. From plain view SEM micrographs, the pebble structure has shown in all ZnS thin films deposited at various substrate temperatures. Through higher substrate temperature, smaller ZnS grains can be obtained in the present study. From XRD analysis, ZnS thin film exhibits hexagonal Wurtzite structure. When thickness of ZnS thin film arrive 300nm, optical transmission rate can be above 85% regardless of substrate temperature and gets optical energy barrier of 3.9 eV. From electrical measurement, the variation of resistivity with temperature exhibits a linear relationship for ZnS thin film.</p>
<p>R035 Assoc. Prof. Kenji Yoshino</p>	<p>Surface Morphology of Transparent Conductive ZnO Film Akiko Ide and <b>Kenji Yoshino</b> Department of Applied Physics and Electronic Engineering, Japan</p>

	<p><b>Abstract</b></p> <p>The growth of (0002) orientated polycrystalline undoped and Ga-doped ZnO films by DC sputtering under Ar is described. The (0002) peak intensity decreases with increasing substrate temperature in both doped and undoped samples. The average grain sizes are very small. This indicates that ZnO films with low crystallinity are obtained at high substrate temperatures. It is deduced that surface damage can be increased by high energy plasmas of neutral Ar particles at high substrate temperatures. The average surface roughness for both undoped and Ga-doped ZnO films decreases with increasing substrate temperatures. It is deduced that energies of sputter particles decrease with increasing substrate temperatures due to collisions with Ar particles. The surface roughness corresponds well to the structure model.</p>
<p>R024</p> <p>Dr. J. Chaishome</p>	<p>Thermal Degradation of Flax Fibres as Potential Reinforcement in Thermoplastic Composites</p> <p><b>J. Chaishome</b>, K. A. Brown, R. Brooks and M. J. Clifford King Mongkut's Institute of Technology Ladkrabang, Chalongsong Rd., Thailand</p> <p><b>Abstract</b></p> <p>This work reports on a study of thermal degradation of flax fibres to gain an improved understanding of the use and limitations of flax fibres as reinforcement for thermoplastic composites manufactured by the vacuum forming process. The effect of heating on chemical decomposition and thermal stability was performed, using fourier transform infrared spectrometry (FTIR) and thermogravimetry (TG) techniques. In addition, the characterisation of micro structures of failure surface following tensile testing of the composites was conducted. The results show that the hemicelluloses decomposition of flax fibres during thermal degradation is a factor to have the detrimental effect on the thermal stability of fibres, particularly with low heating rate. The present investigation, A decrease of hemicellulose and pectin content of the fibres, a decrease of consolidation temperature and an increase of heating rate during the manufacturing of flax fibre thermoplastic composites should improve their mechanical performance.</p>
<p>R3012</p> <p>Ms. Waranya Wannalangka</p> 	<p>Comparisons of Chemical and Physical Properties of Hybrid Strains of Pangasianodon Gigas and Pangasianodon Hypothalamus Prepared from Different Extracting Processes</p> <p>Thitiphan Chimsook and <b>Waranya Wannalangka</b> Faculty of Science, Department of Chemistry, Maejo University, Thailand</p> <p><b>Abstract</b></p> <p>Three different catfish oil extraction processes were used to extract oil from catfish viscera: process P1 involved a mixture of ground catfish viscera and water, no heat treatment and centrifugation; process P2 involved ground catfish viscera (no added water), heat treatment and centrifugation; process P3 involved a mix true of ground catfish viscera and water, heat treatment and centrifugation. Chemical and physical properties of the resulting of catfish oils were evaluated. The P3 process recovered significantly higher amounts of crude oil from catfish viscera than the other extraction methods. The P3 oil also contained a higher percent of free fatty acid and peroxide values than P1and P2 oils. Oleic acid in catfish oil was the predominant fatty acid accounting for about 50% of total fatty acids. The apparent viscosity at -5 and 0 °C was significantly higher (<math>P &lt; 0.05</math>) than those at 5, 10, 15, 20, and 30 °C.</p>
<p><b>18:30p.m-20:00p.m</b></p> <p><b>Dinner at Mistral Restaurant</b></p>	

# January 23<sup>rd</sup> (Thursday Afternoon)

## Oral Presentations-Schedule



**SESSION – 3-ICAMR 2014**

**Venue: Baccara 2 Meeting**


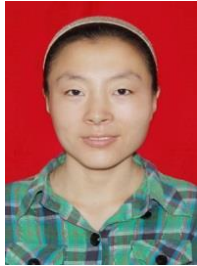
Session Chair: Prof. Walter Lindolfo Weingaertner

Federal University of Santa Catarina, Brazil


**Time: 13:30p.m-15:40p.m**

<p>R018 Assoc. Prof. Dr. Thanit Trisuwannawat</p> 	<p>The Modified Quadruple-Tanks Process: A Flexible Mathematical Model with an Adjustable Simulink Block</p> <p>A. Numsomran, J. Chaoraingern and <b>T. Trisuwannawat</b> King Mongkut's Institute of Technology Ladkrabang, Thailand</p> <p><b>Abstract</b></p> <p>This paper presents the modified quadruple-tanks process, a flexible laboratory process with an adjustable Simulink block, which is multivariable system consisting of four interconnected water tanks included with lower interacting valve. The new general form of modified quadruple-tanks mathematic model and Simulink block is developed for the advantage of control system analysis and design which can make practical use for many styles of multivariable process by adjusting the value of connected valve resistance, inlet and outlet valve ratio. In this paper described clearly about physical properties of modified quadruple-tanks process, mathematical modeling, transformation of modified quadruple-tanks process, analysis of right half-plane zeros characteristic and controller design for multivariable system. By the several models of transformed modified quadruple-tanks, they can be used to teach students in the skills of multivariable control system analysis and design, understanding control limitation due to interactions, model uncertainties, non-minimum phase behavior, and unpredictable time variations, design decentralized controllers, Implementing decouples to reduce the effect of interactions, and understanding their limitations.</p>
<p>R019 Assoc. Prof. Dr. Thanit Trisuwannawat</p> 	<p>A Discrete Time Model Reference Adaptive Control for Hard Disk Drive Ramp Loading Process</p> <p>J. Chaoraingern, <b>T. Trisuwannawat</b>, A. Numsomran King Mongkut's Institute of Technology Ladkrabang, Thailand</p> <p><b>Abstract</b></p> <p>This paper presents a prototype design scheme of discrete-time model reference adaptive controls for hard disk drive ramp loading processes. The proposed scheme, using gradient approach model reference adaptive systems, controls the response of the ramp loading control system to decrease the incidents of head-to-disk striking during servo track writing process. The design procedures were formalized discretely, enabling their implementation as part of a digital system controlled by FPGA. A performance verification of the proposed controls was also conducted using FPGA on a self-servo track writer unit. Results showed that the model reference adaptive controller achieves good performance in hard disk drive head loading and effectively solves the problem of head-to-disk striking.</p>
<p>R048 Ms. Lee Ji-young</p> 	<p>Improvement of Service Quality related to Decent Appearance and Service Attitude of Employees through Standard Service Quality Management Program: Real Application Case in ASIANA AIRLINES</p> <p><b>Lee Ji-young</b> and Choi Seong-Woo Kyonggi University, Seoul, Korea</p> <p><b>Abstract</b></p> <p>In this research, we suggested a SSQM (Standard Service Quality Management) program, and by using the SSQM program, we conducted service training for all the staffs. And then, we evaluated the decent appearance and positive service attitude of employees as part of service quality management based on a suggested assessment checklist format. It was the first time that the assessment was introduced to staffs of either overseas airport service department of Asiana Airlines or its outsourcing companies. This study revealed significant results that the staffs of Manila station displayed obvious improvements in both appearance and attitude. In this paper, we aim to show the practical SSQM Program for service quality improvement executed in real airlines and its effectiveness assessed by their employees.</p>
<p>R037 Assoc. Prof. Jin-A Jeong</p>	<p>Corrosion Test about Interference of Cathodic Protection Systems in Marine Concrete Structure</p> <p><b>Jin-A Jeong</b> Korea Maritime University, South Korea</p>



	<p style="text-align: center;"><b>Abstract</b></p> <p>When unprotected structures are nearby to CP systems, interference problems between unprotected and protected structures may be occurred. The stray current interference can accelerate the corrosion of nearby structures. During a recent few decades the protection technologies against stray current induced corrosion have been significantly improved and a number of techniques have been developed. However, there is very limited information in marine environments. In this study, cathodic protection systems installed both the ICCP with Ti-mesh anode and the SACP with zinc anode has been adopted to verify the current influence through laboratory experiment. CP potential and current have been investigated, moreover, 4 hour depolarization test has been involved to reveal the effectiveness of cathodic protection.</p>
<p>R045 Ms. Hengze Zhao</p> 	<p>Experimental Study of Suppressing Vertical PS Fires Using Water Spray <b>Hengze Zhao</b>, Yongming Zhang, Haibing Hu and Lanming Zhao University of Science and Technology of China</p> <p style="text-align: center;"><b>Abstract</b></p> <p>Water suppression experiments of EPS and XPS are conducted in Standard Combustion Chamber in USTC in Hefei. The 20 cm * 20 cm PSs were held against a 600 mm*600 mm vertical gypsum board fixed by steel frame structures to simulate a building facade. A series of results have been obtained. When the water spray is not applied, the EPS is easier to melt, drip and pyrolyze than XPS under the same fire load, but causes less amount of CO than the amount of XPS without any water application. When the water is applied, neither EPS nor XPS has a trend to drip. The amount of CO caused by EPS or XPS under water spray is much less than that of non-spray. Also the extinguishment time falls fast once the PS applied water. In addition, these experimental results demonstrate the feasibility of the designed rig in studying the fire suppression on vertical PS materials using water spray.</p>
<p>R039 Mr. Rongzhen Chen</p>	<p>Band Structure and Optical Properties of CuInSe<sub>2</sub> <b>Rongzhen Chen</b> and Clas Persson Royal Institute of Technology, Sweden</p> <p style="text-align: center;"><b>Abstract</b></p> <p>In this work, the electronic structure and dielectric function of chalcopyrite CuInSe<sub>2</sub> are presented. The results are based on the full-potential linearized augmented plane wave (FPLAPW) method using the generalized gradient approximation (GGA) plus an onsite Coulomb interaction U of the Cu d states. The dielectric constant, absorption coefficient and refractive index are explored by means of optical response. The spin-orbit coupling effect is considered for the calculations of electronic structure and optical properties. We find that the results based on our calculation method have good agreement compared with experimental and other earlier simulations results.</p>
<p>R047 Ms.Jirutthitikalpong sri Hirunyagird</p>	<p>An Improvement in Tarnish and Corrosion Resistance of 94Ag- 4Zn-Cu Alloys with Sn Addition <b>Jirutthitikalpongsri Hirunyagird</b>, Gobboon Lothongkum and Ekasit Nisaratanaporn Innovation Metal Research Unit, Thailand</p> <p style="text-align: center;"><b>Abstract</b></p> <p>The tarnish and corrosion resistance of 94Ag-4Zn-Cu-Sn alloys and Ag-5.89Sn alloy compared with Ag-5.95Cu alloy were investigated. The tarnish results show that the DE* value of Ag-5.95Cu alloy is higher than those of 94Ag-4Zn-Cu-Sn alloys and Ag-5.89Sn alloy due to the sulfide formations such as Ag<sub>2</sub>S, Cu<sub>2</sub>S and CuS. The DE* value significantly decreases with increasing tin content. This is attributed to the matrix enrichment of tin which protects the sulfur reaction on surface. From corrosion test results, 94Ag-4Zn-Cu-Sn alloys and Ag-5.89Sn alloy provide the noble shift in the corrosion potentials and pitting potentials but the negative shift in the corrosion current density compared with Ag-5.95Cu alloy. Corrosion rate of 94Ag-4Zn-Cu-Sn alloys and Ag-5.89Sn alloy decrease markedly compared with Ag-5.95Cu alloy because it depends on the alloying elements and the microstructural changes. Due to high solubility of zinc and tin, the microstructures of tin-rich alloys consist of the higher portion of single phase and less eutectic structure than that of Ag-5.95Cu alloy.</p>
<p>R3005 Dr. Panyawat Wangyao</p>	<p>Effects of Ni and Ni + Co Additions in P/M Stainless Steel 316L on Sigma Phase and Oxide Formation after Long Term Heating. <b>Panyawat Wangyao</b>, Nantawan Pichaiwong, Patama Visuttipitukul, Nutthita Chuankrerkkul, and Jirutthitikalpongsri Hirunyagird Chulalongkorn University, Thailand</p> <p style="text-align: center;"><b>Abstract</b></p> <p>The effects of various Nickel and Nickel with Cobalt additions in P/M 316L stainless steel on sigma phase and oxide formations were investigated. Various powder mixtures of P/M316L with Ni and both Ni + Co powders as 1, 2, 3 and 4% by wt.%, were compacted using single action press under 498 MPa and sintered at 1300 °C for 30 minutes in hydrogen atmosphere. Then specimens were exposed at</p>

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	<p>temperature of 800 °C and 900 °C for 25, 50, 75 and 100 hours in order to investigate the microstructural stability. It was found that specimens with both Co and Ni additions could reduce amount of sigma phase formation especially at heating of 900 °C. After all heat treatments, oxide scales had grown in closed pores during heating, therefore, the amount and size of internal porosity were decreased. It was also observed that the amount and size of porosity of heated specimens still have the same tendency as sintered specimens. The oxide scale in the matrix is mainly composed of Fe<sub>3</sub>O<sub>4</sub> and Cr<sub>2</sub>O<sub>3</sub> in the closed pores.</p>
<p>R066</p> <p>Mr. Dharmendra kumar Rai</p>	<p>Ultra Thin SiN<sub>x</sub> on a-Si in-situ Hot-wire CVD by Decomposing NH<sub>3</sub> Gas</p> <p><b>Dharmendra Kumar R. Rai</b>, Dayanand S. Sutar, Chetan Singh Solanki and K. R. Balasubramaniam Department of Energy Science and Engineering, Indian Institute of Technology Bombay, Powai, Mumbai- 400 076, India.</p> <p style="text-align: center;"><b>Abstract.</b></p> <p>The fabrication of ultra thin silicon nitride (SiN<sub>x</sub>) layer (&lt; 2 nm) on amorphous silicon (a-Si) in-situ hot-wire CVD by decomposing ammonia (NH<sub>3</sub>) gas is reported. Approximately 1.5 nm thin SiN<sub>x</sub> is formed by nitridation of ~ 40 nm thick a-Si for 10 min at substrate temperature of 250 °C. The amorphous phase of SiN<sub>x</sub> formed on a-Si and a-Si layer deposited on c-Si wafer is identified by Raman spectroscopy. The formation of ultra thin SiN<sub>x</sub> by nitridation of a-Si at 250 °C is confirmed by X-ray photoelectron spectroscopy (XPS) depth profile measurement of SiN<sub>x</sub>/a-Si structured film. The report indicates that the HWCVD method can be used for fabricating superlattice structures consisting of ultra thin SiN<sub>x</sub> layers (&lt; 2 nm).</p>
<p>R3020</p> <p>Dr. Masoud Al-Gahtani</p> 	<p>Mechanical Properties of Dendritic and Inter-dendritic Regions in As-Cast Medium Carbon Steel</p> <p><b>Masoud Al-Gahtani</b> and Rian Dippenaar University of Wollongong, Australia</p> <p style="text-align: center;"><b>Abstract</b></p> <p>During solidification of steel, dendrite nucleation and growth leads to the segregation of alloying elements in the inter-dendritic regions. The dendrite arms are low in carbon while alloying elements segregate to the inter-dendritic regions. During subsequent hot-rolling, this variation in alloying element content leads to the formation of regions of high and low solute content, which in turn, leads to the formation of microstructural banding during heat treatment. In the present study, the respective mechanical properties of these dendritic and inter-dendritic regions were studied in medium carbon steel in order to investigate the rotation of dendrites during hot rolling.</p>
<p><b>15:40p.m-16:00p.m</b></p> <p><b>Coffee Break</b></p>	

# January 23<sup>rd</sup> (Thursday Afternoon)


## Oral Presentations-Schedule

**SESSION – 4-ICAMR 2014**

**Venue: Baccara 2 Meeting**

Session Chair:

**Time: 16:00p.m-18:30p.m**

<p>R052</p> <p>Ms. Siti Zairyn Fakurool Rodzi</p> 	<p>Synthesis of NiO Electrochromic Films via Two-step Method</p> <p><b>Siti Zairyn Fakurool Rodzi</b> and Yusairie Mohd</p> <p>Faculty of Applied Sciences, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia</p> <p><b>Abstract.</b></p> <p>Nickel oxide thin films were electrodeposited onto ITO glass substrates by a two-step method: i) electrodeposition of nickel and ii) further thermal oxidation at 300 °C. The surface morphology of the NiO thin films was characterized by atomic force microscopy (AFM) and the transmittance in the coloured and bleached states were analysed using UV-Visible (UV-Vis) spectroscopy. The electrochemical properties of NiO films were measured in 1 M KOH electrolyte by cyclic voltammetry (CV). A good optical quality and highly improved electrochromic performances NiO film was successfully synthesized.</p>
<p>R014</p> <p>Dr. Nitinkumar Maheshchandra Shah</p>	<p>Growth of Cadmium Sulphide Nanorods using Chemical Bath Deposition Technique By Varying Cd/S concentration</p> <p><b>N. M. Shah</b></p> <p>Shri JSB and Shri KMB Arts, Shri ANS Science and Shri NFS Commerce College At and Post Kamrej Char rasta, Sist. Surat-394185, Gujarat, India.</p> <p><b>Abstract.</b></p> <p>Cadmium sulfide (CdS) thin films were prepared using the chemical bath deposition method onto glass substrates at constant reaction temperature of 85 °C. Cadmium sulphate and thiourea were used as sources of Cd<sup>2+</sup> and S<sup>2-</sup> ions respectively. Films were prepared by varying cadmium concentration (viz. 1, 5 and 10 mM) keeping thiourea concentration constant (20 mM). These films were examined for their structural and surface morphologies by X-ray diffraction analysis (XRD) and atomic force microscopy (AFM). Analysis of results suggests that CdS nanorods grow with cadmium sulphate concentration of 10 mM. The optical properties were investigated using UV-VIS spectrophotometer. The values of optical band gaps as-calculated from optical transmission measurements suggests that films have energy band gap in the range of 2.38-2.32eV decreases with increase of cadmium concentration.</p>
<p>R074</p> <p>Dr. Runglawan Somsunan</p>	<p>Synthesis and Characterization of Sodium AMPS-Based Interpenetrating Network Hydrogels for Use as Temporary Wound Dressing</p> <p>Juraiporn Porkaew, <b>Runglawan Somsunan</b>, Kanarat Nalampang and Robert Molloy</p> <p>Department of Chemistry, Faculty of Science, Chiang Mai University, Thailand</p> <p><b>Abstract</b></p> <p>Hydrogel is one of the most interesting materials for use as wound dressing. In this study, interpenetrating network (IPN) hydrogels were synthesized by free radical copolymerization of sodium salt of 2-acrylamido-2-methylpropane sulfonic acid (AMPS) and N-vinylpyrrolidone (NVP), in the presence of poly(vinyl alcohol) (PVOH). The incorporation of PVOH offered the hydrophilicity to the hydrogel. The polymerization was carried out using <i>N,N'</i>-methylene-bis-acrylamide and 4,4'-azo-bis(4-cyanopentanoic acid) as a crosslinker and UV-photoinitiator, respectively. The successful of polymerization was indicated by gel content which was in the range of 86 – 90%. The structure of prepared hydrogels was confirmed by Fourier Transform Infrared Spectroscopy. In addition, the hydrogel-water interaction was investigated by mean of water content and water retention. Manipulation of the AMPS/NVP ratio significantly altered the properties of the hydrogels. As expected, the interaction of hydrogel and water decreased as increasing of NVP contents due to this monomer provides more hydrophobic functional groups. In conclusion, it is believed that the prepared AMPS/NVP/PVOH interpenetrating network hydrogels show the potential for use as temporary wound dressing.</p>

<p>R065 Mr. Kosei Sato</p> 	<p>Proposition of a New Valid Utilization for Shirasu Volcanic Ash using Renewable Energy <b>Kosei Sato</b>, Kouji Maeda and Kensuke Nishioka University of Miyazaki, Japan</p> <p><b>Abstract</b></p> <p>SiC was prepared from Shirasu volcanic ash using solar furnace. The solar furnace is composed by two parts; Fresnel lens and reacting furnace. Fresnel lens is used to concentrate sunlight onto the reacting furnace where the sample was put on. The sample was made from the mixture of SiO<sub>2</sub> formed using Shirasu volcanic ash and graphite, and placed in the carbon crucible inside the reacting furnace. By using light of sun concentrated with Fresnel lens, the sample was irradiated for 15 minutes and the furnace was left until it cooled down to room temperature. Both irradiated and cooling processes were done under Ar atmosphere. After the experiment, the sample was evaluated by XRD and Raman spectroscopy and the result indicated that β-SiC was formed.</p>
<p>R067 Ms. Sujitra Ruengdechawiwat</p> 	<p>Controlled Synthesis and Processing of a Poly(L-lactide-co-ε-caprolactone) Copolymer for Biomedical Use as an Absorbable Monofilament Surgical Suture <b>Sujitra Ruengdechawiwat</b>, Runglawan Somsunan, Robert Molloy, Jintana Siripitayananon, Valerie J. Franklin, Paul D. Topham and Brian J. Tighe Chiang Mai University, Chiang Mai, Thailand</p> <p><b>Abstract</b></p> <p>Poly(L-lactide-co-ε-caprolactone) 75:25 % mol, P(LL-co-CL), was synthesized via bulk ring-opening polymerisation (ROP) using a novel tin(II) alkoxide initiator, [Sn(Oct)]<sub>2</sub>DEG, at 130 °C for 48 hrs. The effectiveness of this initiator was compared with the well-known conventional tin(II) octoate initiator, Sn(Oct)<sub>2</sub>. The P(LL-co-CL) copolymers obtained were characterized using a combination of analytical technique including: nuclear magnetic resonance spectroscopy (NMR), differential scanning calorimetry (DSC), thermogravimetry (TG) and gel permeation chromatography (GPC). The P(LL-co-CL) was melt-spun into monofilament fibres of uniform diameter and smooth surface appearance. Modification of the matrix morphology was then built into the as-spun fibres via a series of controlled off-line annealing and hot-drawing steps.</p>
<p>R063 Mr. Abdulrahman Aljabri</p> 	<p>Analysis of Thin Strip Profile during Asymmetrical Cold Rolling with Roll Crossing and Shifting Mill <b>Abdulrahman Aljabri</b>, Zhengyi Jiang and Dongbin Wei University of Wollongong, Australia</p> <p><b>Abstract</b></p> <p>Strip profile control during rolling is required to assure the dimensional quality of rolled thin strip is acceptable for customers. Throughout rolling, the strip profile is controlled by using the advanced shape control rolling mill, such as the combination of work roll crossing and shifting during asymmetrical rolling, the one of the valuable methods to control the strip profile quality in rolling process. In this paper, the influences of cold rolling parameters such as the crossing angle and axial shifting value of work rolls on the strip profile are analysed. The strip shape control is discussed under both symmetrical and asymmetrical rolling conditions. The obtained results are appropriate to control the rolled thin strip profile in practice.</p>
<p>R3023 Dr. Triyono</p> 	<p>Effect of Stretching During Welding Process on the Weldability of Dissimilar Metals Resistance Spot Welded between Carbon Steel and Low Nickel Stainless Steel <b>Triyono</b>, Heru Sukanto, Nurul Muhayat, and Sutiyono Sebelas Maret University, Indonesia</p> <p><b>Abstract</b></p> <p>Due to the local heating of welding, deformation will occur on the welding structure. To mitigate this deformation, the method called stretching technology was proposed by previous study. In this method, plate was stretched to certain pre-strain, kept in this condition and then welded to another sheet. It can reduce the welding deformation significantly. However, pre-strain will change the properties of joined materials and lead different behavior of welded materials. It will be complicated if dissimilar metals are welded due to different physical and metallurgical properties. Carbon steel SS400 with the thickness of 3.0 mm and 1.0 mm thick-low nickel stainless steel were welded using resistance spot welding (RSW) process with constant electrode pressure and weld time of 6 kN and 5 second respectively. During welding process, low nickel stainless steel was stretched in four different levels pre-strain of 0%, 1%, 1.5% and 2%. Welding current were varied in the range from 3.02 to 4.20 kA. Microstructure investigations and tensile-shear tests were conducted to evaluate the weldability of RSW joint. Generally, stretching during welding process decreased the fusion zone area of RSW joint. In the low welding current, there is no fusion in the interface of stretched plate, but fusion still occurred in the interface of unstretched plate. In all levels of welding current, stretching during welding decreased fusion zone area and led to decrease tensile-shear load bearing capacity of RSW joint.</p>

<p>R3025</p> <p>Dr.</p> <p>Punnee Sittidech</p> 	<p>Birth Asphyxia Classification Using AdaBoost Ensemble Method</p> <p><b>Punnee Sittidech</b>, Nipaporn Chanamarn, and Kanokwan Arunrudchadarom</p> <p>Naresuan University, Phitsanulok, Thailand</p> <p><b>Abstract</b></p> <p>Birth asphyxia is a major public health problem in the maternal and child health. It is the cause of illness, death or disability of a newborn baby. If doctors and staff have awareness to provide the proper treatments in timely manner, it will help to improve the quality of life of children in the long-term. The purpose of this research is to predict birth asphyxia occurring using three base classifiers; Backpropagation Neural Network (BPNN), Support Vector Machines (SVMs), and Decision Tree (DT). Moreover, the popular ensemble learning, AdaBoost, was also applied with the three base classifiers to improve their performances. The data used in this research were birth asphyxia data collected from Chaoprayayomraj Hospital of Thailand during 2006 – 2011. The results showed that DT model gave the best performance in all evaluation measures. However, AdaBoost with BPNN base classifier (AdaBoostBPNN) model, instead, gave the best improvement with the accuracy of 87.80%. This model can be used to guide doctors and staff for preparing intensive care in special cases to prevent birth asphyxia occurring and reduce the rate of death and disability of the newborn.</p>
<p>R3013</p> <p>Mr.</p> <p>Viacheslav Trukhin</p>	<p>Spectrum Processing of Positron Annihilation Lifetime Spectroscopy based on the Model of Traps</p> <p>Valerii Razov, and <b>Viacheslav Trukhin</b></p> <p>Far Eastern Federal University, Russia</p> <p><b>Abstract</b></p> <p>It is known that positron annihilation lifetime spectroscopy (PALS) maintains a strong position among the matter's structure research methods. This method is based on the positron lifetime registration implanted into the test substance. One of the models describing the positron behavior in the given medium is a model of "traps". Developed by Brandt, Berko and Walker in the 1960s, this model is still relevant in the present times. The basis of this model is the system of kinetic equations describing the various options of positron annihilation in the medium.</p> <p>The objective of the current research was to relate these equations with the parameters obtained while processing the PALS spectrum. In the given article it is presented a program for processing the time spectrum using the model "traps", comparative analysis using different ways of processing and some data on the mentioned analysis respectively.</p>
<p>R064</p> <p>Prof.</p> <p>Sung-Hoon Kim</p> 	<p>The Formation of the Carbon Microcoils without the Catalyst on the Mesh-Type Stainless Steel Substrate</p> <p>Young-Chul Jeon, and <b>Sung-Hoon Kim</b></p> <p>Department of engineering in Engergy and Applided Chemistry, Republic of Korea</p> <p><b>Abstract</b></p> <p>Carbon coils could be synthesized using <math>C_2H_2/H_2</math> as source gases and <math>SF_6</math> as an incorporated additive gas under the thermal chemical vapor deposition system. The 304 stainless steel plates and the 100 and/or 300-sized stainless steel meshes were used as the substrates. The characteristics of the deposited carbon nanomaterials without the catalyst on the different substrates were investigated according to the injection time of the <math>SF_6</math> flow. In case of the mesh-type stainless steel substrate, the carbon microcoils could be formed without the Ni catalyst. However the plate-type stainless steel substrate could not give rise to the formation of the carbon microcoils without the catalyst, regardless of the injection time of the <math>SF_6</math> flow. The cause for the formation of the carbon microcoils without the catalyst on the mesh-type substrate was discussed in association with the surface energies for the interaction between the as-growing carbon elements and the surface of the substrate.</p>
<p><b>18:30p.m-20:00p.m</b></p> <p><b>Dinner at Mistral Restaurant</b></p>	



# January 23<sup>rd</sup> (Thursday Afternoon)



## Oral Presentations-Schedule

**SESSION – 5- ICPST 2014 & ICSRS 2014**

**Venue: Baccara 3 Meeting**

Session Chair:

**Time: 13:30p.m-15:40p.m**

<p>P0001 Mr. Ilija Barukčić</p> 	<p>The Equivalence Of Commutativity and Independence</p> <p><b>Ilija Barukčić</b> GP Jever, Germany</p> <p><b>Abstract</b></p> <p>The concept of mutual independence is related to basic topics of science as such and especially to relativity and quantum theory. Under which circumstances can something be treated as being free from any influence, guidance or control of another? In fact, can something be 'absolutely' independent of another or of itself at all? Is the concept of independence reference-frame dependent? While the probability based concept of independence is solved in a logically consistent way, the relationship between independence and commutativity is still a matter of dispute. This publication will make the proof that commutativity and independence are equivalent.</p>
<p>P0002 Mr. Ilija Barukčić</p> 	<p>The Relativistic Wave Equation</p> <p><b>Ilija Barukčić</b> GP Jever, Germany</p> <p><b>Abstract</b></p> <p>In general, it is well known that the Schrödinger equation is not compatible with special relativity theory to a necessary extent. Thus far, there are already several trials to formulate versions of the Schrödinger equation to ensure compatibility with special relativity theory, the Klein-Gordon-equation or the Dirac equation are some of these attempts.</p> <p>Material and Methods.</p> <p>In this paper, Einstein's relativistic energy momentum relation is re-analyzed, a normalized relativistic energy momentum relation is derived. The derived normalized relativistic energy momentum relation together with the known Schrödinger equation is used as a starting point to establish a wave equation consistent with special relativity theory.</p> <p>Results.</p> <p>In this publication, based on Einstein's relativistic energy momentum relation, the historical problem of the "particle-wave-duality" is solved. Furthermore, a special relativity theory consistent wave equation is derived.</p>
<p>P10001 Prof. H. Choutri</p>	<p>Ab Initio Calculation of Fundamental Properties of <math>\text{CaMg}_{1-x}\text{A}</math> (<math>\text{A} = \text{Se}</math> and <math>\text{Te}</math>) Alloys in the Rock-salt Structure</p> <p>M. A. Ghebouli, <b>H. Choutri</b>, and B. Ghebouli Laboratory of Materials and Electronic Systems (LMSE), Bordj Bou Arreridj University, Algeria</p> <p><b>Abstract</b></p> <p>We employed the density-functional perturbation theory (DFPT) within the generalized gradient approximation (GGA), the local density approximation (LDA) and the virtual-crystal approximation (VCA) to study the effect of composition on the structure, stability, energy gaps, electron effective mass, dynamic effective charge, optical and acoustical phonon frequencies and static and high dielectric constants of the rock-salt <math>\text{CaMg}_{1-x}\text{Se}</math> and <math>\text{CaMg}_{1-x}\text{Te}</math> alloys. The computed equilibrium lattice constant and bulk modulus show an important deviation from the linear concentration. From the Voigt-Reuss-Hill approximation, <math>\text{CaMg}_{1-x}\text{Se}</math> and <math>\text{CaMg}_{1-x}\text{Te}</math> present lower stiffness and lateral expansion. For Ca content ranging between 0.25 - 0.75, the elastic constants, energy gaps, electron effective mass and dynamic effective charge are predictions. The elastic constants and computed phonon dispersion curves indicate that these alloys are mechanically stable.</p>
<p>P30003 Mr. Po-Yao Chang</p>	<p>A Novel Optimization System Applied in Injection Molding of a LED Lighting Module</p> <p>Wen-Chin Chen, <b>Po-Yao Chang</b>, and Yi-Chia-Tai Chung Hua University, Taiwan</p>

	<p><b>Abstract</b></p> <p>This study presents a novel optimization approach for injection molding with multiple performance characteristics through data mining and analysis to effectively determine the optimal process parameter settings. The quality characteristics of the LED lighting modulus can be categorized into the beam angle and the luminous intensity. The control factors for the process are mold temperature, melt temperature, injection velocity, packing pressure and VP switch. The Taguchi method is employed to conduct signal-to-noise (S/N) ratio optimization. Taguchi orthogonal array experiments are performed, and then the experimental data are trained and tested by back-propagation neural networks to create a S/N ratio predictor. In addition, the S/N ratio predictor is combined with genetic algorithms (GA) to obtain the process parameter combination on maximum S/N ratio for both beam angle and luminous intensity. As a result, the proposed novel optimization approach can create the better process parameter settings which can not only be more robust and meet the dimension specification, but also enhance the stability of injection process.</p>
<p>P30004 Mr. Shi-Bo Lin</p> 	<p>Process Parameters Optimization of Multiple Quality Characteristics in Plastic Injection Molding Using BPNN and GA</p> <p>Wen-Chin Chen and <b>Shi-Bo Lin</b></p> <p>Chung Hua University, Taiwan</p> <p><b>Abstract</b></p> <p>This paper presents an optimization approach to find optimal process parameters of multiple quality characteristics in plastic injection molding (PIM). Melt temperature, injection velocity, packing pressure, packing time, and cooling time are selected as process parameters in the experiment. Besides, product length and warpage are chosen as multiple quality characteristics. Taguchi orthogonal array is firstly conducted in the experiment and the experimental data are employed to calculate the signal-to-noise (S/N) ratio. Analysis of variance (ANOVA) is then used to find the best combination of parameter settings for product length and warpage. In addition, BPNN is used to construct an S/N ratio predictor. Then, the S/N ratio predictor is associated with GA to obtain the optimal process parameter. Finally, two confirmation experiments are taken to exam the effectiveness of proposed approach. Experimental results show that the proposed optimization approach not only can satisfy the quality characteristics, but also can improve process stability</p>
<p>C015 Prof. Juei Hsin Wang</p> 	<p>A Case Study on Psychological Capital and Teaching Effectiveness in Elementary Schools</p> <p><b>Wang, J. H.</b>, Chen, Y. Ting., and Hsu, M. H.</p> <p>National Chiayi University, Taiwan</p> <p><b>Abstract</b></p> <p>This research purpose is to study the current status of the psychological capital of elementary schools' teachers. By analyzing all aspects of situations caused by background variables, this research concludes the relationship from all aspects of factors which could affect the psychological capital and the teaching effectiveness. The survey is done by questionnaire, and sampling from elementary schools' teachers in the Chiayi County in Taiwan and using stratified sampling from schools with teachers. In the end, based on the research, specific proposes are recommended as references for executives of education, related educators, and subsequent researchers.</p>
<p>C039 Assoc. Wu Zhixin</p>	<p>Fixed Index Annuity Return and Risk Analysis with an Enhanced Model</p> <p><b>Wu Zhixin</b></p> <p>De Pauw University, China</p> <p><b>Abstract</b></p> <p>This paper examines the risk and return of fixed index annuity (FIA) with an enhanced model framework which takes into account correlations among market variables and a changing participation rate fluctuating with the market moves.</p> <p>The FIA business model is discussed to explain the participation rate model</p> <p>Sensitivity analysis of FIA returns is performed for key model assumptions.</p> <p>The risk and return profile of the mix (30/70, 40/60, 50/50, 100/0) of the S&amp;P 500 Index and the 1-year Treasury bills is compared with that of the FIAs.</p> <p>This study focuses on 2 hypothetical contracts: (10-year) annual reset Point-to-Point (PTP) and Monthly-Averaging (MA) contracts with participation rate but no cap or yield spread.</p> <p>PTPs outperformed MAs. They together outperformed the mixes of stock/treasury with comparable risk. Simulated stock index shows higher returns than FIAs most of the time, but FIAs has much less volatilities and much lower tail risk.</p>

## Macau, 2014

<p>C20013</p> <p>Mr. Usman Ahmad Usmani</p> 	<p>Future Market Trends and Opportunities for Wearable Sensor Technology</p> <p><b>Usman Ahmad Usmani</b>, Mohammed Umar Usmani</p> <p>India</p> <p style="text-align: center;"><b>Abstract</b></p> <p>Wearable sensors enable long term continuous psychological monitoring, which is important for the treatment and management of many chronic illnesses, such as neurological disorders and mental health issues. Examples include diabetes, problems with social skills to some extent, empathy, communication, depression, drug addiction, and anxiety disorders. In the current paper we present a few mobile health technologies developed by our group and shall also discuss future market trends and opportunities for wearable sensor technology. Technologies presented include wearable sensors for electro-dermal activity (EDA), mobile plethysmography and the supporting wireless network architecture. The companies that are recently in the market and are putting great emphasis on wearable sensors are gradually changing the level of technology to a significant high level.</p>
<p>C040</p> <p>Mr. Hyun Sung Joo</p> 	<p>Rotational Capacity of Beam-column with High Strength Steel</p> <p><b>H. S. Joo</b>, J. Moon, J. K. Kim, and H. E. Lee</p> <p>School of Civil, Environmental and Architectural Engineering, Korea University, Seoul 136-713, South Korea</p> <p style="text-align: center;"><b>Abstract</b></p> <p>Application of high strength steel to stiffened girder of cable stayed bridge has the advantage of saving steel. However, it is generally known that the rotational capacity (ductility) of the high strength steel is smaller than that of conventional steel, and application of high strength steel can cause ductility problems in bridge. The rotational capacity of Beam-column is a crucial design parameter in stiffened girder of cable stayed bridge. In this study, high strength steel with yield stress of 690MPa was used. The rotational capacity of the beam-column with high strength steel was derived based on the stress-strain curve of high strength steel. The theoretical model was verified through a series of experimental results and parametric study.</p>
<p><b>15:40p.m-16:00p.m</b></p> <p><b>Coffee Break</b></p>	



# January 23<sup>rd</sup> (Thursday Afternoon)

## Oral Presentations-Schedule


**SESSION – 6-ICAMR 2014**

**Venue: Baccara 3 Meeting**

Session Chair: Prof. L. Krishnamurthy

The National Institute of Engineering, India

**Time: 16:00p.m-18:30p.m**

<p>R3011</p> <p>Ms. Thitiphan Chimsook</p> 	<p>Preparation and Characterization of Nanostructured Lipid Carriers Loaded Spirogyra spp. Extract</p> <p><b>Thitiphan Chimsook</b></p> <p>Faculty of Science, Department of Chemistry, Maejo University, Chiang Mai, Thailand</p> <p><b>Abstract</b></p> <p>Many compounds with high lipophilic character incorporated into nanostructured lipid carriers (NLC) have been reported. However, hydrophilic compounds have not been completely investigated. In this paper, we investigated the potential of lipid nanoparticles as carriers for aqueous extract of Spirogyra spp. using hot high-pressure homogenization method. The aqueous extract of Spirogyra spp. (AS-NLC) showed spherical morphology with smooth surface under transmission electron microscope (TEM). The encapsulation efficiency was <math>61.23 \pm 6.25\%</math>. The crystallization of AS in NLC was investigated by X-ray diffraction. AS was in an amorphous state in the NLC matrix. The in vitro release experiments of NLC exhibited biphasic release pattern with burst release at the initial 3 h and prolonged release afterwards.</p>
<p>R3010</p> <p>Dr. Apiwat Chompoosor</p>	<p>Preparation of Poly(vinyl alcohol)/polyoxalate Composite Nanofibers by Electrospinning and Drug Release Profiles</p> <p>Nutthakritta Phromviyo, Ekaphan Swatsitang, and <b>Apiwat Chompoosor</b></p> <p>KhonKaen University, Thailand</p> <p><b>Abstract</b></p> <p>This study investigated the use of a biodegradable polyoxalate blended with poly(vinyl alcohol) nanofibers to tailor properties of nanofibers and to control release of Rhodamine B from nanofibers. Nanofibers were prepared using an electrospinning technique. The morphology and average diameter of electrospun nanofibers were investigated using scanning electron microscopy. It was found that poly(vinyl alcohol) to polyoxalate ratio had a significant effect on the size of nanofibers (<math>\sim 175</math>-<math>403</math> nm). An in vitro release study showed that rate of Rhodamine B release increased with increasing poly(vinyl alcohol)/polyoxalate ratios yielding rate of release in the range of <math>0.198</math>-<math>0.469</math> mg%/min. The mechanism of rhodamine B release can be explained by a two-stage process of diffusion and degradation. The results suggested that a water-insoluble polyoxalate could govern the rate of drug release. The ability to tune the release of chemicals from nanofibers has significant implications for controlled release of drugs.</p>
<p>R3003</p> <p>Ms. Ho Mui Yen</p> 	<p>Heat-treated Fe<sub>3</sub>O<sub>4</sub> - Activated Carbon Nanocomposite for High Performance Electrochemical Capacitor</p> <p><b>M. Y. Ho</b> and P. S. Khiew</p> <p>Department of Materials Engineering, Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia.</p> <p><b>Abstract</b></p> <p>The impact of heat treatment temperature on the electrochemical performance of Fe<sub>3</sub>O<sub>4</sub>-activated carbon nanocomposite electrodes was investigated using constant current charge-discharge and Electrochemical Impedance Spectroscopy (EIS). An improved capacitive behaviour was observed due to the effect of enhanced ionic and electronic conductivities of the 4 wt% Fe<sub>3</sub>O<sub>4</sub>/AC by thermally heating at 200 oC for 6 hours. It was found that the internal resistance of 4 wt% Fe<sub>3</sub>O<sub>4</sub>/AC composite electrode calcined at 200 oC for 6 hours is the smallest (2.97 <math>\Omega</math>) in comparison to those untreated (4.36 <math>\Omega</math>) composite electrodes. The ion mobility inside the porous composite electrodes is favourable at 200 oC, accompanying with the enhanced electronic conductivity of oxide electrode as a result of improved crystallinity. The EIS results and analysis not only have significant impact on the fundamental understanding of the temperature-dependent structural and electrochemical properties of electrode but also provide the insights on the diffusion mechanism of the nanocomposite in neutral Na<sub>2</sub>SO<sub>3</sub> electrolyte.</p>
<p>R059</p> <p>Mr. Guangcun Wang</p>	<p>Erosion Behaviors of Impeller Material FV520B in Centrifugal Compressor</p> <p><b>Guangcun Wang</b>, Jianfeng Li, Xiujie Jia, Zhaoju Zhu, and Qi Guo</p> <p>Shandong University, China</p> <p><b>Abstract</b></p>

	<p>To study the erosion behaviors and mechanism of impeller material FV520B in centrifugal compressor, the erosion experiments with polygonal alumina particles were carried out on the high-speed erosion testing system. Microstructure of the erosion zone was analyzed by SEM to reveal the erosion mechanism. An erosion model to calculate the erosion rate of FV520B was developed. The results showed that, FV520B exhibited the erosion characteristics of typical plastic materials, the highest erosion rate occurred at the impact angle of 24°, the lowest erosion rate occurred at normal impact angle. The velocity index at the impact angle 24° and 90° were 3.37 and 3.68, it grew as the impact angle increased. The erosion mechanism of FV520B was micro-cutting and deformation wear, at low impact angles, the erosion was dominated by micro-cutting wear, while at high impact angle greater than 60 °, the erosion was dominated by deformation wear. Also the predictions of the erosion model were in good agreement with the results of experiments, indicating that this model can be used to estimate the erosion rate of compressor impeller under different working conditions.</p>
<p>R3004 Assoc. Prof. Ahmed Hassanin</p> 	<p>Nanocomposite Multilayer Fibrous Membrane for Sustained Drug Release <b>Ahmed Hassanin</b>, Ahmed Abd El-Moneim, Mohamed Ghaniem, and Hassan Nageh Alexandria university, Egypt</p> <p><b>Abstract.</b></p> <p>Building on the success of the many earlier studies on electrospun nanofibers technique which provide a non woven web to the order of nanometers introducing superior properties such as large surface area, superior mechanical properties and ease of implementation in many fields of applications, electrospun nanofibers became an important issue for many researchers in various fields. Using electrospun fibers as a drug carrier, is showing a huge promising potential for the future of biomedical application. Our work in this research is focusing on engineering a system to control the drug release profile rate especially for wound dressing. Nanocomposite multilayer fibrous membranes, using electrospinning method, have been developed for drug release in form of sandwich structure of three layers. Inner layer which is kept Polycaprolactane (PCL) loaded with drug. The two outer layers have been changed with different blend ratios between Chitosan (Cs) and PCL as follow [0%:100% Cs:PCL, 30%:70% Cs:PCL, 50%:50% Cs:PCL, 70%:30% Cs:PCL]. The results showed that the release rate has been affected dramatically by the outer layer composition. SEM images showed changing in the morphology due to the different in the composition of outer layer.</p>
<p>R070 Ms. V. Ranjithabala</p> 	<p>Effect of Process Parameters on Poly(Butylene Adipate Co-Terephthalate) Nanofibers Development by Electrospinning Technique J. Prasanna, T. Monisha, <b>V. Ranjithabala</b>, Ravikant Gupta, E. Vijayakumar, and D. Sangeetha Department of Mechanical Engineering, College of Engineering Guindy, Anna University, India</p> <p><b>Abstract</b></p> <p>Electrospinning process is proved to be one of the finest fabrication techniques to produce nanofibers. This research deals with the experimental study on the effect of various process parameters of electrospinning technique such as voltage, flow rate, distance (nozzle to collector distance) and concentration, on the development of nanofibers from a new polymer, namely PBAT. Taguchi's experimental design was implemented to carry out this research by conducting an L-18 orthogonal array. Taguchi method and Analysis of Variance (ANOVA) were employed to examine the effect of different process parameters simultaneously on the fabrication of nanofibers. The fibers were characterized through scanning electron microscope (SEM) for the measurement of its diameter. The experimental results indicate that all the chosen process parameters had significant influence on the fiber diameter. It was inferred that the concentration and voltage had a very notable impact on the fiber diameter. Confirmation experimental run was performed on the identified optimal setting of the process parameters.</p>
<p>R076 Assoc. Prof. An Cheng</p> 	<p>Variation in Fineness of Cement-based Composites Containing Sugarcane Bagasse Ashes <b>An Cheng</b>, Wei-Ting Lin, Sao-Jeng Chao and Hui-Mi Hsu National ILan University, Taiwan</p> <p><b>Abstract</b></p> <p>This study is aimed to evaluate the effect of sugarcane bagasse ash fineness on the properties of cement-based composites. Three sugarcane bagasse ash contents (10, 20 and 30% by weight of cement) and three particle sizes of bagasse ash (particles less than 45, 75 and 150 µm) were used as a partial replacement for cement in mortar specimens with a constant water/cementitious ratio of 0.55. The pozzolanic strength activity test, compressive strength test and scanning electron microscope observations were conducted and compared. Test results indicated that the compressive strength decreased with the addition of sugarcane bagasse ash content increased. Addition of sugarcane bagasse ash to replace cement in cementitious composites could provide hydration and pozzolanic reaction, but it would still keep more rugged and some larger pores observed from the paste surface and resulted in the weaker microstructures and poorer properties in cementitious composites. In conclusion, the critical usage of sugarcane bagasse ash is 10 % with 45µm particles.</p>

## Macau, 2014

<p>R057 Mr. Myeongjin Kim</p> 	<p>Fabrication of Homogeneously Dispersed Nanoneedle Manganese Dioxide/graphene Composite for High-Performance Electrode Use in Supercapacitor</p> <p><b>Myeongjin Kim</b>, Kiho Kim, Myeongyeol Yoo and Jooheon Kim Chung-Ang Univ. Korea</p> <p style="text-align: center;"><b>Abstract</b></p> <p>Two types of graphene/MnO<sub>2</sub> composites were synthesized by different reaction procedures. R-GO/MnO<sub>2</sub> was synthesized as follows: first, nanoneedle MnO<sub>2</sub> was formed on the GO sheets using various functional groups (GO/MnO<sub>2</sub>). In the second stage, GO/MnO<sub>2</sub> was reduced to graphene/MnO<sub>2</sub> (R-GO/MnO<sub>2</sub>) via the dipping method. rGO/MnO<sub>2</sub> was synthesized using a different reaction order: first, graphene oxide was reduced to graphene and nanoneedle MnO<sub>2</sub> was formed on graphene sheets. Characterization indicated that the nanoneedle MnO<sub>2</sub> structures in the R-GO/MnO<sub>2</sub> composite were homogeneously dispersed on graphene sheets, whereas MnO<sub>2</sub> in the rGO/MnO<sub>2</sub> composite formed aggregates due to absence of functional groups. The R-GO/MnO<sub>2</sub> electrode exhibited a specific capacitance as high as 327.5 Fg<sup>-1</sup> at 10 mVs<sup>-1</sup>, which was higher than that of the rGO/MnO<sub>2</sub> electrode (229.9 Fg<sup>-1</sup>). It is anticipated that the formation of nanoneedle MnO<sub>2</sub> on the GO surface following the reduction procedure could be a promising fabrication method for supercapacitor electrodes.</p>
<p>R050 Ms.Duangsamorn Morawong</p>	<p>A Sulfide ion Sensor from Commercial Bentonite</p> <p><b>Duangsamorn Morawong</b>, Atchana Wongchaisuwat, and Ladda Meesuk Kasetsart University,Thailand</p> <p style="text-align: center;"><b>Abstract.</b></p> <p>Bentonite is a synonymous term of montmorillonite which is a clay mineral consisting of 2 : 1 aluminosilicate layered structure. In this work, a commercial bentonite was used to prepare an intercalation compound [Ca(2,2'-bipyridine)<sub>3</sub>]<sup>2+</sup> in the interlayer space, by solid-solid reaction, which formation was confirmed by the expansion of the interlayer space of bentonite from 1.5 to 1.8 nm, by powder X-Ray Diffraction technique. The intercalation compound [Ca(2,2'- bipyridine)<sub>3</sub>]<sup>2+</sup>-bentonite was then used as a sensor to assemble a potentiometric electrode. The electrode gave best response to sulfide ion in terms of Nernstian slope. Precision of measurement, reproducibility and percent recovery were also studied. The electrode could be used to measure sulfide ion in real water samples and gave satisfactory results.</p>
<p>R072 Dr. Jagannathan Krishnan</p> 	<p>Preparation, Characterization and Effectivity of N, Fe-TiO<sub>2</sub> as a Visible Light Active Photocatalyst</p> <p>Arman Sikirman, <b>Jagannathan Krishnan</b>, Junaidah Jai and Faraziehan Senusi Universiti Teknologi MARA, Malaysia</p> <p style="text-align: center;"><b>Abstract</b></p> <p>Surface modification of the titanium dioxide by doping and co-doping with nitrogen and iron in order to make the photocatalyst active under visible light was investigated. Solgel method was adapted for the preparation of surface modified titanium dioxide, where tetra titanium isopropoxide, ammonium nitrate and ferric nitrate were used as precursors while maintaining the dopant concentration and calcination temperature at 0.75% and 600oC, respectively. The prepared photocatalyst samples were characterized by XRD, FE-SEM and FTIR in order to study their physical properties. The results from XRD confirmed that all prepared photocatalyst were of anatase phase. FE-SEM image analysis revealed the formation of fine particles and the FTIR analysis verified the presence of dopants. The effectivity of photocatalysts was tested by performing a standard batch photocatalytic degradation experiment with methylene blue as a model pollutant under visible light. The result showed that co-doped photocatalyst (0.75% N, 075% Fe-TiO<sub>2</sub>-600) yielded a maximum of 76% methylene blue degraded within three hours of irradiation time.</p>
<p><b>18:30p.m-20:00p.m</b></p> <p><b>Dinner at Mistral Restaurant</b></p>	

## Walking in Macau

Macau Peninsula was originally an island, but a connecting sandbar gradually turned into a narrow isthmus, thus changing Macau into a peninsula. Land reclamation in the 17th century transformed Macau into a peninsula with generally flat terrain, though numerous steep hills still mark the original land mass. Alto de Coloane is the highest point in Macau, with an altitude of 170.6 metres (559.7 ft). With a dense urban environment, Macau has no arable land, pastures, forest, or woodland.

Walking is the best choice to visit Macau, it is not a big city, here, we advise a route to visiting:

### 1. From **hotel Sofitel Macau at Ponte 16 (The conference venue)** to **Largo do Senado (Senado Square)** (议事亭前地)

transportation: 1. By walking (10-20 minutes); 2. take bus 33 (10-20 minutes).



#### A Brief Introduction of Largo do Senado (Senado Square) (议事亭前地)

It is a paved area in the centre of the former Portuguese colony of Macau, enclosed by the buildings of the Leal Senado, the General Post Office, and St. Dominic's Church. The square is paved in the traditional Portuguese pavement. The main road of Macau's historic centre, Avenida de Almeida Ribeiro passes through the square.



### 2. From **Largo do Senado (Senado Square)** (议事亭前地) to **St. Dominic's Church** (玫瑰圣母堂)

transportation: By walking (5-10 minutes)

From the map we will see that, the St. Dominic's Church is enclosing the Senado Square, taking a walk is more convenient than others.

(A: Senado Square, B: St. Dominic's Church)



#### A Brief Introduction of St. Dominic's Church (玫瑰圣母堂)

St. Dominic's Church is a late 16th century Baroque-style church that serves within the Cathedral Parish of the Roman Catholic Diocese of Macau. It is located in the peninsular part of the city at the Largo de São Domingos. This construction was finished in 1587 which is the



oldest in Macau.

The church was built in a Baroque style and is noted for its mixture of European and local Macanese features in its design. This is demonstrated in the church's use of Chinese-style roof tiles and doors made of teak. The church's high altar features a statue of the Madonna and Child as the centerpiece and is flanked by wood and ivory-carved statues of several saints.



### 3. From **St. Dominic's Church (玫瑰圣母堂)** to **Ruins of St. Paul's(大三巴牌坊)**

transportation: By walking (5-10 minutes)

#### **A Brief Introduction of St. Paul's**

The Ruins of St. Paul's refers to the ruins of a 16th-century complex in Macau including of what was originally St. Paul's College and the Cathedral of St. Paul also known as "Mater Dei", a 17th-century Portuguese cathedral dedicated to Saint Paul the Apostle. Today, the ruins are one of Macau's most famous landmarks. It is listed as one of the 29 sites that form the Historic Centre of Macau, a UNESCO World Heritage Site.



#### **Enjoyment of Food**

During the visiting, you can taste a variously delicious food which are famous and popular. Such as traditional Chinese cuisine, local dishes Macau, Portuguese, Japanese, Korean and Thai food. However, the most attractive one is Portuguese dishes and also be sure not missing the native snakes sawdust pudding, Pastel De Nata, Fruity Mix, Water Crab Porridge and so on.



Pastel de nata 葡式蛋挞



Water crab porridge 水蟹粥



Fruity Mix 鲜果捞



Bacalhau 马介休

This image shows a full page of blank handwriting practice paper. It features 20 evenly spaced, horizontal orange lines that run across the entire width of the page. The background is a solid light blue color. There are no margins, text, or other markings on the page.