

# 2018 8th International Conference on Environment and BioScience (ICEBS 2018)

October 10-12, 2018

Seoul, South Korea

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# Conference Venue

## **Bestwestern Premier Guro Hotel**

<http://gurohotel.co.kr/eng/html/main/main.asp>

#72, Digital-ro 32 gil, Guro-gu, Seoul, Korea

E-mail: [christy.lee@gurohotel.co.kr](mailto:christy.lee@gurohotel.co.kr)

Phone: 82-2-6905-9624, Fax: 82-2-6905-9509



Only a stroll from Guro Digital Complex Subway Station, 4-star Best Western Hotel offers elegantly furnished rooms with free internet. It features a restaurant and a fitness centre. The hotel offers free shuttle service to Myeongdong shopping area from Monday to Thursday.

Best Western Guro is a 20-minute drive from Gimpo Airport, while Yeongdeungpo's Time Square is about 3.7 miles away. The hotel is a 20-minute subway ride from Myeongdong and the limousine bus (no 6004) to Incheon International Airport is located right in-front of the hotel

**Kindly Reminder:** October is the peak season in Seoul, it is suggested that participants make reservation in advance.

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## Seoul Conference Introductions

Welcome to 2018 HKCBEEES Seoul conference. This conference is organized by HKCBEEES. The objective of the Seoul conference is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Environment and BioScience.

**2018 8th International Conference on Environment and BioScience (ICEBS 2018)**

Papers will be published in the following journal:



**International Journal of Chemical Engineering and Applications (IJCEA, ISSN: 2010-0221)**, and be included in Chemical Abstracts Services (CAS), Ulrich's Periodicals Directory, CABI, Electronic Journals Library, Google Scholar, ProQuest, and Crossref.

Conference website and email: <http://www.icebs.org/>; [icebs@cbees.org](mailto:icebs@cbees.org)

# Presentation Instructions

## Instructions for Oral Presentations

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

Laptop Computer (MS Windows Operating System with MS PowerPoint and Adobe Acrobat Reader)

Digital Projectors and Screen

Laser Sticks

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

PowerPoint or PDF Files (Files should be copied to the Conference laptop at the beginning of each Session.)

### **Duration of each Presentation (Tentatively):**

Regular Oral Presentation: about 12 Minutes of Presentation and 3 Minutes of Question and Answer

Keynote Speech: about 30 Minutes of Presentation and 5 Minutes of Question and Answer

## Instructions for Poster Presentation

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

The place to put poster

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

Home-made Posters

Maximum poster size is A1

Load Capacity: Holds up to 0.5 kg

## Best Presentation Award

One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on October 11, 2018.

## Dress code

Please wear formal clothes or national representative of clothing.

# Keynote Speaker Introductions

## Keynote Speaker I



Prof. Chan Jin Park  
Incheon National University, Republic of Korea

Prof. Park Chan Jin graduated from Korea University, and got Master and PhD degrees in same university. His major fields of research are the air pollution control, greenhouse gas technology and odor management technology. His another interest field of study is green growth policy. He is now full-professor at Urban and Environmental Engineering School in Incheon National University. And he is now a vice chairman of the Korean Society of Odor Research and Engineering. Recent research areas are odor pollution control technology, hazardous chemical management and policy of countermeasures against climate change



Topic: 'The sustainable development of renewable energy in the future'

*Abstract*—Due to climate change with increasing greenhouse gas emissions, various natural disasters such as floods, heavy snowfalls, and heat waves are frequent more and more. Since the industrial revolution, the concentration of carbon dioxide in the atmosphere has exceeded with the concentration of 410 ppm recently and is expected to be increased continuously in the future. Since the Paris Convention on climate change, there is a growing need for the development of renewable energy that does not generate greenhouse gases. In this study, the current state of energy generation and recent trends in greenhouse gas emissions were reviewed, and the characteristics of major renewable energy sources were illustrated. In addition, solutions to the problems caused during the practical use of renewable energy and sustainable development in the future were suggested

## Keynote Speaker II



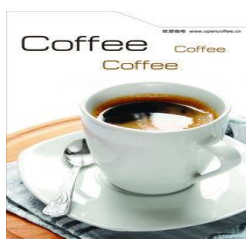
Prof. Hyo Choi

Gangneung-Wonju National University, South Korea

Dr. Hyo Choi is meteorologist, environmental scientist and physical oceanographer with over 40 years experiences in numerical modeling researches as Overseas invited senior researcher by Korean Government of Korea Ocean Research & Development Institute (KORDI (now, KIOST) of KAIST), Ministry of Science & Technology, a high-level Researcher (nominated by President of Korean Government) of National Fisheries & Research Development Institute (NFRDI), Ministry of Maritime Affairs & Fisheries, and Full Professor of Gangneung-Wonju National University. He obtained 2 Ph.D. degrees from Dept. of Civil Engineering, University of Texas at Austin, USA (1984) and College of Environmental Sciences, Peking University, Beijing; China (2004). His research interests cover a variety of fields in Meteorology, Environmental Science & Engineering and Physical Oceanography. He acted as not only Interpreter and Investigator of Korea Antarctic Scientific Expedition Team for two times (1985~1987), but also Korean Government Representative for Inter-governmental Meetings on Antarctic Treaty and Science Policies. He has been President of Korean Environmental Sciences Society (2002~2003), President and Vice President of Asia-Oceania Geosciences Society, Singapore (Atmospheric Section-60 Nations), Director General of Donghae Coastal Region Research Institute (1989~1991) and Dean of the Graduate School, Gangneung-Wonju National University, Korea (2009~2011, 2011~2012). In present, he is Director General of Atmospheric & Oceanic Disaster Research Institute, Korea (2014~Present), High-end Foreign Expert of South China Sea Institute of Oceanology, China (CAS; 2015~Present), and also acting as Editor-in-Chief of 13 international journals (USA, Singapore, India) and Editor of 25 ones (USA, UK, Italy, Canada, etc.) in Environmental Pollution, Disaster, Agriculture, Food sciences, Water resources, Lake and rivers, GIS, Physical sciences, Oceanography, Fishery and Meteorology.

Topic: “Formation of Fog Associated with Cold Front Passage in the Steep Eastern Mountainous Coast of Korea”

*Abstract*—The formation of fog in the Korean eastern mountainous coast was investigated, using a 3D-WRF-3.6 model from 00UTC October 26~28, 2003. As the cold front passing by the Bohai Sea and stretching from Manchuria to Sandoing peninsula moved eastward, south-westerly surface wind ahead of the front became more intensified by supplying more moisture from the Yellow Sea surface into the low atmosphere within 2km height, resulting in the formation of big stratus clouds from the Yellow Sea to the west of Mt Taegullyung near Gangeung city. For daytime, as convective boundary layer (CBL) was developed and extended from the ground surface to 1km height, upward motion of air from the surface could force the clouds to remain in the top of CBL without fog near the surface, but nighttime cooling of the ground surface making stable stability induced downward motion of air with clouds from the low atmosphere to the surface and also air near the surface should be cooled down to be condensed to form nocturnal surface inversion fog, combining with the daytime uplifted clouds downward within 1.2km height in the west basin of the mountain top. However, strong downslope wind over 16m/s along its eastern slope dissipated both cloud and fog on its slope, due to adiabatic heating of air by compressing air to heat up the cooled air parcel, resulting in neither fog nor cloud in the coastal inland and sea. In the open sea, a big cloud cluster was produced vertically by uplifting warm moist air from the sea surface into 6km height ahead of cold front.



**Coffee Break & Group Photo Taking**

**10:15~10:35**

## Keynote Speaker III



Prof. Denny K. S. Ng

The University of Nottingham Malaysia Campus, Malaysia

Professor Ir. Dr. Denny K. S. Ng is Head of Business Engagement and Innovation Services (BEIS), The University of Nottingham, Malaysia Campus. He is also Professor of Process Design and Integrated Biorefinery at the Department of Chemical and Environmental Engineering and Founding Director of Centre of Sustainable Palm Oil Research (CESPOR). Prof. Ng is well-published and well-cited (over 150 papers with an h-index of 30) and presented more than 180 papers in various conferences. He was the recipient of 1st World Wu Clans Excellence Award 2017, Ten Outstanding Young Malaysian Award (TOYM) 2017 (Scientific and Technological Development), Junior Chamber International (JCI); Institution of Engineers, Malaysia (IEM) Young Engineer Award 2015; Three Outstanding Young Persons of Negeri Sembilan (3OYP.NS) Awards, JCI 2014; Global IChemE Young Chemical Engineer of the Year 2012, etc. Other than the abovementioned personal awards, Prof Ng also received various awards from professional bodies and institutions on his great achievements and contributions to the society. Apart from focusing on research and development (R&D), Prof. Ng also applied his R&D output in industrial consultation projects. Prof Ng is also currently executive director for a spin off company of university, Nottingham Green Technologies Sdn. Bhd., which mainly commercialise the development technologies to the industry.

Topic: “Impact of Rainfall on Sustainable Oil Palm Plantation Management via Input-Output Optimisation Model”

*Abstract*—Oil palm trees require resources such as water, fertilisers and sunlight to grow fresh fruit bunches (FFBs) for crude palm oil (CPO) productions. In order to fulfill the increasing global demand for CPO, sustainable growth for FFB must be attained. A good plantation management system ensures that sufficient resources are supplied in a balanced proportion to maintain and improve the yield of FFB. The aim of this study is to model and optimise an oil palm plantation via input-output optimisation model, generating maximum economic yield with a fixed plantation size under limited rainfall availability. Installation of water irrigation system to supply sufficient water and greenhouse gases emission in the plantation are considered. The proposed approach is presented with a 13,737 ha plantation case study in Malaysia. Based on the optimised result, water irrigation system increases the FFB production from 270,000 to 343,000 t/y. In addition, 0.22 t CO<sub>2eq</sub>/t FFB (or 74,600 t CO<sub>2eq</sub>/y) of greenhouse gases emission could be reduced. This shows that the sustainability of a plantation can be improved significantly with proper management system.

# Brief Schedule for Conference

<b>Day 1</b>	<p style="text-align: center;"><b>October 10, 2018 (Wednesday) 13:00~17:00</b>  <b>Venue: Bestwestern Premier Guro Hotel (Lobby)</b>            (Add: #72,Digital-ro 32 gil, Guro-gu, Seoul, Korea)            Participants Onsite Registration &amp; Conference Materials Collection</p>
	<p style="text-align: center;"><b>October 11, 2018 (Thursday) 9:00~18:30</b>            Arrival Registration, Keynote Speech, Conference Presentation</p>
	<p><b>Morning Conference</b>  <b>Venue: Rose A</b></p>
	<p style="text-align: center;"><b>Opening Remarks 9:00~9:05</b>            Prof. Chan Jin Park            Incheon National University, Republic of Korea</p>
	<p style="text-align: center;"><b>Keynote Speech I 9:05~9:40</b>  <b>Topic: ‘Formation of Fog Associated with Cold Front Passage in the Steep Eastern Mountainous Coast of Korea’</b>            (Prof. Hyo Choi, Gangneung-Wonju National University, South Korea)</p>
	<p style="text-align: center;"><b>Keynote Speech II 9:40~10:15</b>  <b>Topic: ‘The sustainable development of renewable energy in the future’</b>            (Prof. Chan Jin Park, Incheon National University, Republic of Korea )</p>
	<p style="text-align: center;"><b>Coffee Break &amp; Group Photo Taking 10:15~10:35</b></p>
	<p style="text-align: center;"><b>Keynote Speech III 10:35~11:10</b>  <b>Topic: ‘Impact of Rainfall on Sustainable Oil Palm Plantation Management via Input-Output Optimisation Model’</b>            (Prof. Denny K. S. Ng, The University of Nottingham Malaysia Campus, Malaysia)</p>
	<p style="text-align: center;"><b>Session 1: 11:10~12:25 Venue: Rose A</b>            5 presentations-Topic: “Environmental and Chemical Engineering”            Session Chair: Prof. Hyo Choi</p>
	<p><b>Lunch 12:30~13:30</b></p> <p><b>Venue: Restaurant in the Hotel</b></p>
	<p><b>Afternoon Conference</b>  <b>Venue: Rose A</b></p>
	<p style="text-align: center;"><b>Session 2: 13:30~16:00 Venue: Rose A</b>            10 presentations-Topic: “Environmental and Chemical Engineering”            Session Chair: Prof. Denny K. S. Ng</p>
	<p style="text-align: center;"><b>Coffee Break 16:00~16:15</b></p>
	<p style="text-align: center;"><b>Session 3: 16:15~18:45 Venue: Rose A</b>            10 presentations-Topic: “Biological Science and Technology”            Session Chair:</p>

2018 HKCBEEES SEOUL CONFERENCE

	<b>Poster Session: 9:00-18:45    Venue: Rose A</b>
	<b>Dinner 19:00</b> <b>Venue: Restaurant in the Hotel</b>
<b>Day 3</b>	<b>October 12, 2018 (Friday) 9:00~17:00</b> <b>One Day Visit</b>

**Tips:** Please arrive at the conference to upload or copy PPT into the laptop room 10 minutes before the session begins.

**Note: (1) The registration can also be done at any time during the conference.**

**(2) The organizer doesn't provide accommodation, and we suggest you make an early reservation.**

**(3) One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on October 11, 2018.**

# Session 1

**Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.**

**Afternoon, October 11, 2018 (Thursday)**

**Time: 11:10~12:25**

**Venue: Room “Rose A”**

**5 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Hyo Choi**

S1010 Presentation 1 (11:10~11:25)

The Ocean Carbon Sink and Climate Change: A Scientific and Ethical Assessment

**Choy Yee Keong**

Keio University, Tokyo, Japan

*Abstract-* The world’s oceans are intimately associated with human long-term existence; it is no exaggeration to claim that a thriving ocean means a thriving human civilization. Unfortunately, the world’s oceans today are in such a state that they actually threaten the long-term survival of humankind. They have been plagued by widespread physical and biological changes caused by various unsustainable human activities including unrestrained burning of fossil fuels. The main purpose of this paper is to provide insights into the importance of ocean sustainability in maintaining and sustaining human civilization into the indefinite future. The aim of this assessment is to instil and prompt human urgency to work towards arresting the increasing anthropogenic pressures exerted on the oceans. It is concluded that enabling the global community to appreciate fully the value of oceans to humanity based on ecocentrism could motivate diverse stakeholders to shoulder greater moral and thical responsibility towards the world’s oceans.



# Session 1

**Afternoon, October 11, 2018 (Thursday)**

**Time: 11:10~12:25**

**Venue: Room “Rose A”**

**5 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Hyo Choi**

S2003 Presentation 2 (11:25~11:40)

High Intensity Ultrasound Assisted Transesterification of Espresso Coffee Oil Methyl Ester: Optimization through Response Surface Methodology Approach

**Krit Somnuk**, Pichai Eawlex, Jarernporn Thawornprasert, and Gumpon Prateepchaikul  
Prince of Songkla University, Thailand

*Abstract-* High intensity ultrasound was used to accelerate the ester conversion of biodiesel production from espresso coffee oil (ECO) with a base-catalyzed transesterification. The ester conversion from ECO biodiesel production was optimized through three parameters: methanol, potassium hydroxide, and ultrasonic reaction time with a response surface methodology (RSM). After ECO has gone through the ultrasonic homogenizer (1000W ultrasonic power, 18 kHz ultrasonic frequency) for the biodiesel production. The maximum methyl ester of 96.385 wt.% was achieved under an optimal condition: 30.8 vol.% methanol, 16.6 gKOH/L, and 72 sec ultrasonic reaction time.

# Session 1

Afternoon, October 11, 2018 (Thursday)

Time: 11:10~12:25

Venue: Room “Rose A”

**5 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Hyo Choi**

S2014 Presentation 3 (11:40~11:55)

The Influences of Extraction Conditions on the Content of  $\beta$ -glucan Extracted from *Schizophyllum Commune* Processed-Product Residue

**Sujitra Nonting**, Chutimon Satirapipathkul, Dusadee Charnvanich  
Chulalongkorn University, Thailand

*Abstract-* In recent years, the interest in bio-based products, especially in the field of cosmetics, has risen extensively. Mushrooms have various derivative substances with excellent properties in terms of preventing and improving human skin structures. Especially,  $\beta$ -glucan which is water-soluble polysaccharides that can improve collagen generation and skin health. However, its relatively high production cost is concerned as the big problem for usage. Hence, utilizing the residue from food processing as a low-cost materials for  $\beta$ -glucan production would be economical. The objective of this study is to investigate the water extraction process for  $\beta$ -glucan from *Schizophyllum Commune* processed-product residue. The effects of solid-liquid ratio, extraction temperature and extraction time were evaluated. The experiments indicated that the suitable conditions for *Schizophyllum Commune* water extraction were the solid-liquid ratio of 1:10, the extraction time of 3 h and the extraction temperature of 70°C. The highest  $\beta$ -glucan content extracted from *Schizophyllum Commune* processed-product residue was 9.20%. Furthermore, microwave irradiation pretreatment before conventional extraction was determined to effectively increase beta glucan content to 11.77%.

# Session 1

**Afternoon, October 11, 2018 (Thursday)**

**Time: 11:10~12:25**

**Venue: Room “Rose A”**

**5 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Hyo Choi**

S2015 Presentation 4 (11:55~12:10)

The effects of Cationization on Dyeing Properties of Cotton Fabric Dyed with Marigold and Rose

**Matrikan Nutchawanit**, Chutimon Satirapipathkul, Rattanaphol Mongkholrattanasit  
Chulalongkorn University, Thailand

*Abstract-* A cationizing agent was used for increasing the color yield, in terms of the Kubelka–Munk values (color strength,  $K/S$ ). Cotton fabrics were dyed using the extract of waste marigold and rose. This work was to study the optimum of time, temperature and concentration in cationizing process on dyed cotton. The  $K/S$  and color values ( $L^*$ ,  $a^*$ ,  $b^*$ ) were measured to discover the suitable condition from color value and color strength estimation, cotton fabric cationized with 10 g/L of cationizing-agent concentration for 30 minutes at the 50 °C showed the highest  $K/S$ . In case of roses, the best condition is treated with cationizing-agent concentration of 15 g/L for 15 minutes at 50 °C. The obtainable results revealed that the color strength of cationized cotton fabrics were increased when compared to  $K/S$  of untreated cotton up to 34.26% and 331.91% for marigold and rose dyes, respectively, and the obtainable color of cationized cotton fabrics were brighter as compared to the untreated cotton.

# Session 1

Afternoon, October 11, 2018 (Thursday)

Time: 11:10~12:25

Venue: Room “Rose A”

**5 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Hyo Choi**

S2016 Presentation 5 (12:10~12:25)

The Influences of Extraction on the Quantity of Oxyresveratrol from *Artocarpus lakoocha* Roxb

**Kittiya Jiratanakittiwat**, Chutimon Satirapipathkul, Dusadee Charnvanich  
Chulalongkorn University, Thailand

*Abstract-* The aim of this study was to develop a process of extraction oxyresveratrol from *Artocarpus lakoocha* heartwood using a maceration method. The influences of types of solvent, a concentration of solvent, and time to extract on the yield of oxyresveratrol were studied. In addition, the antioxidant capacity of the extract was investigated. The quantitation of oxyresveratrol was measured by high-performance liquid chromatography (HPLC) analysis, and antioxidant activity was analyzed by 1, 1'-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay. The results indicated that 70-percent ethanol solvent by volume for 6 hours could extract the optimum oxyresveratrol at 13.09 percent of the dry weight of *Artocarpus lakoocha*, and antioxidant efficiency had an IC<sub>50</sub> of 47.70 µg/ml.



<b>Lunch</b>	<b>12:30~13:30</b>
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## Session 2

**Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.**

**Afternoon, October 11, 2018 (Thursday)**

**Time: 13:30~16:00**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Denny K. S. Ng**

S0003 A Presentation 1 (13:30~13:45)

Activated Carbon-Entrapped Microfibrilated Cellulose Films As An Effective Adsorbent For Removing Organic Dye From Aqueous Effluent

**Ying Pei**, Xuejing Zheng, and Xingjun Wu  
Zhengzhou University, China

*Abstract*—Activated carbon-entrapped microfibrilated cellulose (AC/C) films were successfully fabricated by self-assembly of cellulose microfibrils via a simple and environmentally friendly method. The structures and properties of films were characterized by scanning electron microscope (SEM) as well as density, turbidity, and mechanical analyses. Cationic brilliant red 5GN (CBR) was selected as a model dye, and the adsorption of CBR in aqueous solution by AC/C films was evaluated. Adsorption kinetics was described by the pseudo-second-order model, and the absorption behaviors were in agreement with a Langmuir isotherm.

Thermodynamic analyses indicated that CBR adsorption onto AC/C film was favorable. The adsorption–desorption cycle of AC/C films was repeated three times without significant loss of adsorption capacity. Moreover, AC particles in films showed high stability during adsorption. This work proposes a novel utilization of bulk forms of adsorption particles within cellulose networks to achieve better adsorption applications in water treatment.

## Session 2

Afternoon, October 11, 2018 (Thursday)

Time: 13:30~16:00

Venue: Room “Rose A”

**10 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Denny K. S. Ng**

S0004 A Presentation 2 (13:45~14:00)

Increasing bioplastic production with light energy by coupling *Cupriavidus necator* with the photocatalyst CdS

**Mengying Xu**, Pier-Luc Tremblay, Tian Zhang

Wuhan University of Technology, China

*Abstract*—Bioproduction processes relying on natural photosynthesis such as ethanol production by sugarcane or oil production by algae have a low solar energy-to-specific product conversion efficiency. A possible response to this challenge is the development of hybrid photosynthesis systems where sunlight is harvested by more efficient inorganic devices, which then generate energy that can be used by microbial catalysts for the production of useful chemicals. In this project, the CdS photocatalyst was used to improve the production of polyhydroxybutyrate (PHB) from fructose by *Cupriavidus necator*. PHB is a bioplastic generated by *C. necator* for energy and carbon storage purposes. Its synthesis required reducing power under the form of NADPH. In the system presented here, the photocatalyst CdS harvests light energy to generate reducing equivalents that are used by *C. necator* in the conversion of the central metabolite acetyl-CoA into PHB. Preliminary results showed that coupling *C. necator* with the CdS photocatalyst under a light source augmented PHB production.

## Session 2

**Afternoon, October 11, 2018 (Thursday)**

**Time: 13:30~16:00**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Denny K. S. Ng**

S1002 A Presentation 3 (14:00~14:15)

The quest for the optimal cathode-microbe couple for carbon dioxide reduction by microbial electrosynthesis

**Tian Zhang**

Wuhan University of Technology, China

*Abstract*—Storage of electricity from intermittent renewable energy is a major challenge in the development of a sustainable energy industry. One promising approach named microbial electrosynthesis (MES) is to convert electricity and carbon dioxide into biofuels with microbes employing a cathode as source of electrons. With this method, electrical energy is amassed by living cells into the chemical bonds of compounds that can be stored and used whenever it is necessary. When compared with abiotic strategies, the main advantage of MES comes from the metabolic versatility of biocatalysts, which enables the synthesis of a wide range of longer carbon molecules. Although multiple groups around the world have been pursuing MES development in the last decade, productivity and energetic efficiency must still be improved significantly before competing with more well-established approaches such as the Sabatier process. A major axis in the development of MES should include an important effort for the optimization of the reactor’s core, which comprises the cathode and the microbial catalyst. Here, I will detail the recent work made in my lab to design and fabricate low-cost, robust and high-performance cathodes as well as optimal microbial catalysts.

## Session 2

Afternoon, October 11, 2018 (Thursday)

Time: 13:30~16:00

Venue: Room “Rose A”

**10 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Denny K. S. Ng**

S1004 A Presentation 4 (14:15~14:30)

Production of carboxylic acids from carbon dioxide by genetically-engineered *Cupriavidus necator*

**Ran Ding**, Pier-Luc Tremblay, Tian Zhang

Wuhan University of Technology, China

*Abstract*—The profitable bioconversion of CO<sub>2</sub>-rich industrial gas waste into useful chemicals is a major environmental, economic and scientific challenge. *Cupriavidus necator*, a metabolically-versatile bacterium, has been studied extensively for its capacity to reduce CO<sub>2</sub> to the bioplastic polyhydroxybutyrate with only H<sub>2</sub> as the electron source. *C. necator* can also be used as the biocatalyst for microbial electrosynthesis (MES), which is a process where the biological reduction of CO<sub>2</sub> into multicarbon compounds is powered by electricity *via* a bioelectrochemical reactor. *C. necator* can readily be genetically modified for the production of non-native compounds such as alcohols, terpenes and polythioesters. In the project presented here, we are engineering novel strains of *C. necator* to produce different carboxylic acids from CO<sub>2</sub> found in industrial waste or by MES. Carboxylic acids such as malic acid and glyoxylic acid were chosen as target because of their economic potential as well as the relatively low energy cost associated with their synthesis.



## Session 2

**Afternoon, October 11, 2018 (Thursday)**

**Time: 13:30~16:00**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Denny K. S. Ng**

S1005 A Presentation 5 (14:30~14:45)

Microfibrillation of Cellulose and Dialdehyde Microfibrillated Cellulose Based Biomass Composites

**Xuejing Zheng**, Ying Pei, Jie Liu, Keyong Tang  
Zhengzhou University, China

*Abstract*—In the present work, microfibrillated cellulose (MFC) with diameter of about 20 nm and three-dimensional network was successfully prepared from microcrystalline cellulose by high pressure homogenization. MFC was surface modified into dialdehyde microfibrillated cellulose (DAMFC) with abundant aldehyde groups on the surface of the cellulose microfibrils, while keeping the fibril morphology. Mixing DAMFC with gelatin or chitosan solution, the aldehyde groups of DAMFC reacted with the amino groups on gelatin or chitosan, therefore, giant three-dimensional network structure was constructed in the composites of DAMFC/gelatin and DAMFC/chitosan. The DAMFC/gelatin composite hydrogel showed drastically improved mechanical properties and easily regulated pore structure, which could be a promising candidate for tissue engineering scaffold. DAMFC/chitosan composite films showed significant improved stability in dye solution, as well as increased adsorption for anionic dyes in waste water.

## Session 2

**Afternoon, October 11, 2018 (Thursday)**

**Time: 13:30~16:00**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Denny K. S. Ng**

S0007 Presentation 6 (14:45~15:00)

Comparison of Effective in Batik Production Process Between Paraffin Wax and Gel Wax-Resist

**Sarath Simsiri**

Suan Dusit University, Thailand

*Abstract*—Comparison of effective in Batik production process between paraffin wax and gel wax-resist. This study focuses on the characteristics of Batik painting resist and to compare the Batik production processes between those wax-resist, to provide formal guidance how differences to make Batik both process. The research concluded that the Batik painting with gel wax can reduce the Batik equipment, less energy and time in overall process. The means of the opinion on production process and Batik identity from users using gel wax resist material were higher than the those of users using paraffin wax resist material with statistically significant ( $p < 0.05$ ).

## Session 2

**Afternoon, October 11, 2018 (Thursday)**

**Time: 13:30~16:00**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Denny K. S. Ng**

S2012 Presentation 7 (15:00~15:15)

Preliminary studies regarding the water quality of Danube River using different kind of methods

**Mihaela Timofti**, Catalina Iticescu, Mădălina Călmuc, Valentina-Andreea Călmuc, Ionela Cotloguț, Andreea-Liliana Nistor, Adrian Florescu, Maxim Arseni, Adrian Roșu, Lucian P. Georgescu

ECEE of Sciences and Environment Faculty, Dunarea de Jos University of Galati, Romania

*Abstract-* In Romania, for most of the water quality indicators, surface waters monitoring is carried out according with specific European Directives, in generally once a month. The most important surface water in Romania is the Danube River, which is the second largest in Europe. In this study, approximatively 30 chemical and physico-chemical indicators were monitored over a two-month period, weekly frequencies. The parameters were determined using different kind of methods (volumetric, electrochemical, spectrophotometry, AAS).

The results that were obtained were subjected to a preliminary statistical study that included: t-Test, Pearson correlation and BoxPlot representation. Other statistical methods will be applied later: ANOVA, PCA, FA etc. Preliminary statistical methods have led to some expected results but also to some surprising results. For some of the indicators (e.g., nutrients), it would be better if the monitoring will be performed weekly than monthly as is performed in the moment, as this would help authorities intervene in time to identify the pollution event and, why not, the polluter.

## Session 2

**Afternoon, October 11, 2018 (Thursday)**

**Time: 13:30~16:00**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Denny K. S. Ng**

S2008 Presentation 8 (15:15~15:30)

Air Pollution ventilation coefficient assessment and consideration in location of energy and related industries

Ademola M. Rabi, **Otolorin Adelaja Osibote**

Department of Mathematics and Physics, Cape Peninsula University of Technology, Cape Town 8000, South Africa

*Abstract-* This study demonstrated the need for the climatic and ecological systems of an area to be considered when locating energy industries. The air pollution potential of the Delta Area air basin is carried out by determining the criteria pollutants loads due to energy and related industries. The air ventilation coefficient of the area obtained from the radiosonde data is then used to estimate the maximum allowable emission rates. The loads for all the criteria pollutants were found to exceed the allowable limits confirming the existence of air pollution problem in the area due to energy industries activities. It is concluded that areas with high air ventilation coefficient are more suitable for location of high polluting energy and related industries.

## Session 2

Afternoon, October 11, 2018 (Thursday)

Time: 13:30~16:00

Venue: Room “Rose A”

**10 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Denny K. S. Ng**

S2009 Presentation 9 (15:30~15:45)

Natural Radionuclide Activities in soil on oil palm plantations

**Otolorin Adelaja Osibote**, Oluwafemi Oguntibeju, Bola Oladunni Olafisoye

Faculty of Applied Sciences, Department of Mathematics and Physics, Cape Peninsula University of Technology, Cape Town, South Africa

*Abstract-* Naturally occurring radionuclide activity was investigated on soils from oil palm plantations using a Hyper-Pure Germanium detector with appropriate shielding coupled to a Canberra Multichannel Analyzer. Activity concentrations of the radionuclides  $^{238}\text{U}$ ,  $^{232}\text{Th}$  and  $^{40}\text{K}$  were obtained from the activity concentrations of their respective daughter radionuclides. The total activity for the soil in all the sampling locations recorded the range of 1.64 - 31.880 Bq/kg with a mean of 4.787 Bq/kg; 1.345 - 9.410 Bq/kg with a mean of 4.120 Bq/kg and 1.476 -6.275 Bq/kg with a mean of 3.979 Bq/kg for  $^{40}\text{K}$ ,  $^{238}\text{U}$  and  $^{232}\text{Th}$  respectively.

The estimated radium equivalent  $\text{Ra}_{\text{eq}}$  obtained has a range of 15.472 - 57.600 Bq/kg. None of the samples exceeded the permissible levels of  $370 \text{ Bqkg}^{-1}$  recommended by UNSCEAR. The absorbed dose rate lies in the range of  $2.427 \text{ nGyh}^{-1}$  and  $10.414 \text{ nGyh}^{-1}$ . Other radiological hazards in terms of Internal and External hazard indices and Representative hazard index were determined and found to be within safe limits.

# Session 2

Afternoon, October 11, 2018 (Thursday)

Time: 13:30~16:00

Venue: Room “Rose A”

**10 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Denny K. S. Ng**

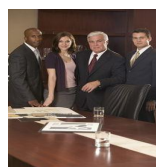
S0012 Presentation 10 (15:45~16:00)

Synergistic Extraction of Cd, Cu and Ni with D2EHPA/TBP: Screening of Factors by Fractional Factorial Design

L. Y. Lee, **N. Morad**, I. Norli, and M. Rafatullah

University Sains Malaysia (USM), Penang, Malaysia.

*Abstract*—This work is aimed to determine the significant factors that provide great impacts on the efficiency of synergistic extraction of Cd, Cu and Ni from mixed synthetic aqueous solutions with a mixture of extractants, di-(2-ethylhexyl) phosphoric acid (D2EHPA) and tributyl phosphate (TBP), by using two-level fractional factorial design. Six factors affecting the synergistic extraction consisted of mixing time (t), concentration of D2EHPA [D2EHPA], concentration of TBP [TBP], concentration of sodium sulphate [Na<sub>2</sub>SO<sub>4</sub>], equilibrium pH (pHeq) and organic to aqueous ratio (O:A) were examined. Results from the application of 26-1 fractional factorial design showed that [D2EHPA], O:A and interaction of D2EHPA with TBP ([D2EHPA] × [TBP]) have significantly influenced the extraction percentage (E%) for Cd and Cu.



**Coffee Break**

**16:00~16:15**

## Session 3

**Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.**

**Afternoon, October 11, 2018 (Thursday)**

**Time: 16:15~18:45**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Biological Science and Technology”**

**Session Chair: Prof. Pier-Luc Tremblay**

S2004 Presentation 1 (16:15~16:30)

Intraspecific variation in the wing shape of the mango leafhopper, *Idioscopus clypealis*, among orchards in the Philippines

**Mark Ronald S. Manseguido**, Cesar G. Demayo

Davao del Norte State College, Philippines

*Abstract-* Plants have differential expression of genes despite being propagated through cloning as in the case of mango. This study aimed to determine the effect of intraspecific variation in the host mangoes to the wing shape of the mango leafhopper, *Idioscopus clypealis*. Leafhopper populations were collected from four different orchards from individual trees. Wings were dissected, imaged and analyzed using multivariate analysis of variance, thin plate spline analysis and relative warp analysis. Results showed significant variation across all sampled trees in each geographic location regardless of farm management methods in the wing shape of the leafhopper. This variation is observed between genders and between trees in an orchard. Results also show that there is intraspecific variation in each host tree even in unsprayed populations and organic pesticide use. High adaptability to host defense and pesticides evidenced by wing variation may be key to persistence in this high value crop despite natural and synthetic control measures.

## Session 3

**Afternoon, October 11, 2018 (Thursday)**

**Time: 16:15~18:45**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Biological Science and Technology”**

**Session Chair: Prof. Pier-Luc Tremblay**

S0005 A Presentation 2 (16:30~16:45)

Adaptation and physiological response of living bacterial cells to long-term exposure to heavy atmospheric pollution

**Xiaochen Shi**, Pier-Luc Tremblay, Tian Zhang  
Wuhan University of Technology, China

*Abstract*—90% of the world population is exposed to heavy atmospheric pollution (HAP). This is a major public health issue causing 7 million death each year via multiple illnesses including heart disease, stroke and lung cancer. HAP contains a large array of pollutants such as particulate matters, ozone, carbon monoxide, metals and polycyclic aromatic hydrocarbons. Taken together, these compounds impose a multifactorial stress on living cells. In this project, we exposed the living bacterial cells to HAP for 390 generations to assess the long-term effects of atmospheric pollutants on the genome, transcriptome, metabolism and physiology of this model bacterium. Over this period, the bacterial cells acquired an adaptive mutation and evolved to grow faster. Transcriptome of adapted and wild type strains grown under different types of HAP as well as biochemical assays showed the involvement of cell membrane composition, exopolysaccharides accumulation and amino acids homeostasis in cell response to atmospheric pollutants. This study demonstrates that adaptive mutations can be fixed in living cells after long-term exposure to HAP leading to transformative physiological changes. It also provides a comprehensive portrait of cell response mechanisms to the combination of pollutants to which human are usually exposed.



# Session 3

**Afternoon, October 11, 2018 (Thursday)**

**Time: 16:15~18:45**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Biological Science and Technology”**

**Session Chair: Prof. Pier-Luc Tremblay**

S1003 A Presentation 3 (16:45~17:00)

Heterologous gene expression in the electroautotroph *Sporomusa ovata*

**Pier-Luc Tremblay**, Tian Zhang

Wuhan University of Technology, China

*Abstract*—*Sporomusa ovata* is an acetogenic bacterium capable of acquiring electrons from the electrode of a bioelectrochemical reactor for the reduction of carbon dioxide into acetate and other useful chemicals. Until now, no genetic system has been made available for *S. ovata*, which has prevented the development of recombinant strains more performant for microbial electrosynthesis, for methanol oxidation-based biotechnology or for other applications. This has also stymied our capacity to conduct studies aiming at understanding better the metabolism and physiology of this fascinating microbe. Here, we developed an electroporation protocol enabling the transformation of foreign replicative plasmids in *S. ovata*. With this method, we were able to demonstrate the expression of foreign genes such as the acetone biosynthesis pathway. Furthermore, a series of promoters were screened to establish their transcriptional strength and expand the genetic toolbox of *S. ovata*. The objective of our most recent work is to develop a genome editing system to modify native genes or to integrate foreign genes in the chromosome of *S. ovata*.

# Session 3

**Afternoon, October 11, 2018 (Thursday)**

**Time: 16:15~18:45**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Biological Science and Technology”**

**Session Chair: Prof. Pier-Luc Tremblay**

S1008 A Presentation 4 (17:00~17:15)

Development of ab initio system for genome-wide identification of transcription factor binding motifs with highly variability sequence features

**Huaxin Yu**, Asuka Sugimoto, Takuya Sumi, Jiyoung Kang, Masaru Tateno

University of Hyogo, Japan

*Abstract*—Recognition in biological macromolecular systems, such as DNA–protein recognition, is one of the most crucial problems to solve toward understanding the fundamental mechanisms of various biological processes. Since specific base sequences of genome DNA are discriminated by proteins, such as transcription factors (TFs), finding TF binding motifs (TFBMs) in whole genome DNA sequences is currently a central issue in interdisciplinary biophysical and information sciences. To understand the genome-wide regulation mechanisms of various biological functions, it is essential to identify the TFBMs relevant to the functions. In our previous studies, we developed two theoretical schemes for the genome-wide identification of TFBMs, which were referred to as MODIC and DIMON. By combining both systems, the knowledge-free ab initio (MODIC) and data-driven neural network-based machine learning (DIMON) algorithms were unified, which thus enabled the system to operate as a knowledge-free ab initio scheme. In order to apply this unified system to actual experimental datasets, we further developed the statistical evaluation schemes that discriminate even TFBMs exhibiting extremely diverse and highly variability in the motif sequence features. In the session, we also discuss our recent analyses of ChIP-seq datasets of an enzyme that is responsible for genome-wide transcriptional regulations of various genes.

# Session 3

**Afternoon, October 11, 2018 (Thursday)**

**Time: 16:15~18:45**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Biological Science and Technology”**

**Session Chair: Prof. Pier-Luc Tremblay**

S1009 A Presentation 5 (17:15~17:30)

Dynamical electronic structure rearrangements in hybrid ribozyme/proteincatalysis

**Masaru Tateno**, Jiyoung Kang, Hiori Kino, and Martin J. Field

University of Hyogo, Japan

*Abstract*—We analyzed the electronic structural changes that occur in the reaction cycle of a biological catalyst composed of leucyl-tRNA synthetase (LeuRS) and mis-aminoacylated tRNA<sup>Leu</sup>, and elucidated the dynamical rearrangements of the electronic structure that was obtained from our previous study in which ab initio quantum mechanics (QM)/molecular mechanics (MM) molecular dynamics (MD) simulations were performed. Analysis of the electronic structure of the active site along the pathway reveals dramatic rearrangements in the MOs that are directly involved in catalysis. Two changes are particularly noteworthy. One concerns the MO that contains a contribution from the nucleophilic water. It initially has a much lower energy than the HOMO, but it is activated as the reaction proceeds until it becomes the reactive HOMO. The other involves the reactive LUMO of anti-bonding character between H and O atoms of the nucleophilic water that emerges in the transition. We term these processes dynamical induction of the reactive HOMO (DIRH) and LUMO (DIRL), respectively. In the complex environment of a biological macromolecule, the reactive HOMO and LUMO are much more likely to be hidden and so these systems must implement DIRH and DIRL mechanisms that expose them for the reaction.

## Session 3

**Afternoon, October 11, 2018 (Thursday)**

**Time: 16:15~18:45**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Biological Science and Technology”**

**Session Chair: Prof. Pier-Luc Tremblay**

S1011 A Presentation 6 (17:30~17:45)

Rational design of PET imaging drug acting as a probe specific to glutamate transporter  
**Jiyoung Kang**, Takuya Sumi, Hiroshi Yamaguchi, Masaru Tateno  
Yonsei University, Republic of Korea

*Abstract*—Molecular docking simulations have played a pivotal role for molecular design of pharmaceutical compounds. We optimized the conformational and configurational sampling spaces of ligands to be searched for in a docking program, ASEdock, and then applied our new scheme toward our design works for creation of novel imaging drugs acting as a probe of positron emission tomography (PET), that specifically bind to glutamate transporter (Glt). The conditions required for the compounds are, in general, as follows: (i) the drugs should specifically bind to the target protein (Glt), and (ii) should not bind to the other proteins expressed in the brain (i.e., off-targets). Actually, a recent study reported that a PET imaging drug for tau filaments ( $^{18}\text{F}$ -THK5351), which was employed in hospitals in order to make diagnoses in the early stages of Alzheimer’s diseases, also selectively bind to monoamine oxidase B (MAOB). In this study, we performed docking simulations of  $^{18}\text{F}$ -THK5351 with both target and off-target proteins, and compared the binding modes. We further performed molecular dynamics simulations to identify water molecules in the binding site of MAOB. This could be a solid basis to develop a novel computational system that enables us to generally and automatically identifies the off-targets.

## Session 3

**Afternoon, October 11, 2018 (Thursday)**

**Time: 16:15~18:45**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Biological Science and Technology”**

**Session Chair: Prof. Pier-Luc Tremblay**

S1012 A Presentation 7 (17:45~18:00)

Molecular dynamics study of selective binding of supercoiled-DNA recognition peptide with spatially-crossover DNA

**Hiroshi Nishigami**, Jiyoung Kang, Kakeru Sakabe, Hiori Kino, Kazuhiko Yamasaki, and Masaru Tateno

University of Hyogo, Japan

*Abstract*—Lens Epithelium-Derived Growth Factor (LEDGF) is a co-activator of the general transcriptional regulation, involved in insertion of cDNA of HIV-1 into host cell genome. LEDGF selectively binds to the negatively supercoiled DNA through the DNA-binding domain, where a cluster with the conservative amino acid sequence consisted of Lys and Glu/Asp residues is present. Surprisingly, some isolated polypeptide segments extracted from the protein (e.g. K9E9K9) preserve the comparable selectivity for the negatively supercoiled DNA, thus referred to here as the supercoiled-DNA recognition (SDR) peptide. In this study, we conducted molecular dynamics (MD) docking simulations of the SDR peptides and the spatially-crossing double stranded DNA (dsDNA), which may appear in the negatively-supercoiled DNA. The analysis showed that the symmetric properties of the crossover dsDNA induced binding of four SDR peptide molecules, each of which adopted a similar binding mode with the crossover dsDNA: For each SDR peptide, the two K9 segments was bound to the major grooves of the distinct dsDNA molecules, and thus the E9 segment bridged these two dsDNA. In fact, the obtained structure was consistent with our spectroscopic data. Furthermore, we obtained the free energy profiles of the complex formation, which provided a thermodynamic explanation of the selective binding.

## Session 3

**Afternoon, October 11, 2018 (Thursday)**

**Time: 16:15~18:45**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Biological Science and Technology”**

**Session Chair: Prof. Pier-Luc Tremblay**

S1006 Presentation 8 (18:00~18:15)

Effect of Short Break Application on Productivity and Fatigue on The Shift System of Work

**Dyah Rachmawati Lucitasari**, Puryani, Winda Cipta Puspita

Universitas Pembangunan Nasional “Veteran” Yogyakarta, Indonesia

*Abstract*—This study analyzed the subjective and objective fatigue levels of morning, afternoon, and night shift at PT. XY and the effect of setting a short break on a shift that has a high level of fatigue. Questionnaire of 30 Item of Rating Scale was apply to determine the level of subjective fatigue with an indication of decreased activity, motivation, and physic condition. The Bourdon Wiersma Test method was performed to determine the degree of objective fatigue of employees in the interpretation of speed, constancy and accuracy of work. Results showed that subjective fatigue in morning shift are at low grade with decreased of activity, motivation and physic. The level of objectivity of the morning shift with the interpretation of speed is good (9.97), accuracy is quite good (3.75), and the constancy is good (1.95). Subjective fatigue in afternoon shift has decrease activity in high classification, decrease motivation physical condition in moderate classification. Subjective fatigue of the night shift is in a high class (level 3). It is indicated that there is a decrease in activity, motivation and physical condition. The level of objectivity of the night shift is in sufficient class with the interpretation of speed is 14.62, accuracy is 11.25, and the constancy is 6.05. Short break should be applied to shifts that have a high level of fatigue and have a positive influence on subjective and objective fatigue and the level of employee productivity.

## Session 3

**Afternoon, October 11, 2018 (Thursday)**

**Time: 16:15~18:45**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Biological Science and Technology”**

**Session Chair: Prof. Pier-Luc Tremblay**

S1007 Presentation 9 (18:15~18:30)

Repellence Effect of Various parts of Guavas shoot to Asian citrus Psyllid (*Diaphorina citri* Kuwayama)

**Mofit Eko Poerwanto** and Cimayatus Solichah

Universitas Pembangunan Nasional “Veteran” Yogyakarta, Indonesia

*Abstract*—CVPD or Huanglongbing is the most devastating disease on citrus production in Indonesia and in the world. It is vectored by asian citrus psyllid. Guava leave extract is a prospective control means for reducing psyllid population. Repellent effect of dried upper shoot (leaf number 1 and 2 from the top), middle shoot (leaf number 3 and 4 from the top), and bottom shoot (leaf number 5 and 6 from the top) of red, white, and non-seed guava leave to ten adult psyllids of mixed gender were determined in Y-tube olfactometer. The result shows that guava leave has repellence effect to psyllids adult. The effect is reduced as the increase of leaf age. Highest repellence effect is found from red guava leave, followed by non-seed guava and white guava. It is suggested that the highest repellent properties is in upper shoots or youngest leaf of guava.

## Session 3

**Afternoon, October 11, 2018 (Thursday)**

**Time: 16:15~18:45**

**Venue: Room “Rose A”**

**10 presentations- Topic: “Biological Science and Technology”**

**Session Chair: Prof. Pier-Luc Tremblay**

S3016 Presentation 10 (18:30~18:45)

Methods and Techniques for Lower Danube Sturgeons Monitoring used for the Assessment of Anthropogenic Activities Pressures and the Quantification of Risks on these Species

Tiberius Danalache, Gyorgy Deak, Puiu - Lucian Georgescu, Marius Raischi, **Elena Holban**, Madalina Boboc

National Institute for Research and Development in Environmental Protection, Bucharest – INCDPM, Romania

*Abstract-* At present, on the Lower Danube, different types of pressures have been identified that affect the anadromous sturgeons stocks with an impact that leads to their decline. This paper presents techniques and procedures used by Romanian experts in the tagging and monitoring of anadromous sturgeons, as well as unique results at international level obtained on the basis of an informational volume collected in over 7 years of monitoring on these species behavior (both for adults as well as for ultrasonically tagged juveniles) on the Lower Danube. The local impact of hydrotechnical constructions (bottom sill, maritime navigation channel), the global impact of the poaching phenomenon and the impact of the restocking programs with sturgeon juveniles were assessed. Thus, the bottom sill impact on the Bala branch, the Bastroe channel (cross-border impact) and the poaching phenomenon at the level of the Lower Danube was analyzed on the basis of a unique informational volume obtained through the use of patented monitoring systems by the Romanian experts (DKTB respectively, DKMR-01T). At the same time, the results from the monitoring of ultrasonically tagged sturgeon juveniles from the 2015 repopulation program are presented. Conclusions resulting from research can ensure favorable premises for finding some conservation solutions for CITES-protected sturgeon species that have survived for millions of years, currently being 1 species on the brink of extinction - Russian sturgeon, 2 species in danger of extinction - Beluga sturgeon and Stellate sturgeon and 2 species already extinct from the Lower Danube, namely Common sturgeon and Ship sturgeon.



# Poster Session

**October 11, 2018 (Thursday)**

**Time: 9:00~18:45**

**Venue: Rose A**

**3 presentations**

S2002 Presentation 1

Preparation of Porous and Recyclable PVA-TiO<sub>2</sub> Hybrid Hydrogel

**Mingxin Shi**

Baldwin School, Bryn Mawr, PA 19010 USA

*Abstract-* Nano TiO<sub>2</sub>, one of the most promising photocatalyst, has been widely used in air purification, sewage treatment, water spitting, reduction of CO<sub>2</sub> and solar cells. Nowadays, the most effective method to recycle nano TiO<sub>2</sub> during the photocatalysis is to immobilize TiO<sub>2</sub> onto matrix, such as polyvinyl alcohol (PVA). However, due to the slow water permeability of PVA after cross-linking, the pollutants could not contact with nano TiO<sub>2</sub> photocatalyst in time. To overcome this problem, we dispersed calcium carbonate particles into a PVA-TiO<sub>2</sub> mixture and then filmed the glass. PVA-TiO<sub>2</sub>-CaCO<sub>3</sub> films were obtained by drying. Through thermal treatment, we obtained the cross-linked PVA-TiO<sub>2</sub>-CaCO<sub>3</sub> films. Finally, the calcium carbonate in the film was dissolved by hydrochloric acid, and the porous PVA-TiO<sub>2</sub> composite photocatalyst was obtained. The results show the addition of CaCO<sub>3</sub> has no obvious effect on PVA cross-linking and that a large number of cavities have been generated on the surface and inside of porous PVA-TiO<sub>2</sub> hybrid hydrogel film. The size of the holes is about 5-15 $\mu$ m, which is consistent with that of CaCO<sub>3</sub>. The photocatalytic rate constant of porous PVA-TiO<sub>2</sub> hybrid hydrogel film is 2.49 times higher than that of nonporous PVA-TiO<sub>2</sub> hybrid hydrogel film.

# Poster Session

**October 11, 2018 (Thursday)**

**Time: 9:00~18:45**

**Venue: Rose A**

**3 presentations**

S2010 Presentation 2

The composition of sewage sludge from treatment plants in the South-East region of Romania  
**Catalina Iticescu**, Lucian Georgescu, Gyorgy Deak, Maxim Arseni, Adrian Rosu  
Dunarea de Jos” University of Galati, Romania

*Abstract-* In recent years, Romania has invested heavily in the extending and building of new waste water treatment plants (WWTP) in various types of localities, from large to small ones, which was also the case of the SE region. The emergence of WWTP has led to an improvement in the quality of surface water which used to take away untreated domestic water but that has led to the emergence of a new environmental problem: the accumulation of increasing amounts of sewage sludge.

The present paper analyzes the composition of sewage sludge collected from the studied areas and provides suggestions regarding the possibility of using these sludges according to their physico-chemical characteristics.

The physicochemical characteristics were determined using the XRF technique, the energy-dispersive X-ray spectroscopy (EDX) and spectrophotometric methods.

The sludge resulted from the purge of domestic wastewater in the selected treatment plants is used in agriculture, it is incinerated in cement or in thermal plants, or it is simply stored in landfills according to their characteristics, to the legislation in force and to the possibility of being collected from different areas of economic activity.

# Poster Session

October 11, 2018 (Thursday)

Time: 9:00~18:45

Venue: Rose A

3 presentations

S2013 Presentation 3

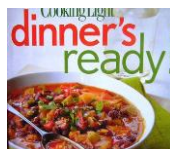
The assessment of Danube water quality in the Galati area, Romania, through water quality index (WQI)

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*Abstract-* In highly industrialized areas monitoring of surface water quality is very important. The Galati area is a sensitive area because it is the largest river basin of Romania, with the confluence of the Danube River with two of the largest rivers in the country, the Siret and the Prut rivers. The area is heavily industrialized (steel industry, naval, etc.) and is also an important urban agglomeration, with more than 500,000 inhabitants here (Galati - Braila metropolitan area) of which over 50% have the Danube as a source of drinking water.

The team of scientists involved in this study has been monitoring over 20 years the main parameters that determine the quality of water. In this paper we present the results of the monitoring of 22 parameters, the samples being taken from 5 sampling stations located in anthropically sensitive areas. Water quality assessment was performed using the water quality index (WQI) and used as a Weighted Arithmetic Water Quality Method. The following parameters were monitored: pH, conductivity, OD, TDS (total solids dissolved), Turbidity, COD (chemical oxygen demand), BOD (biochemical oxygen demand), N-NH<sub>4</sub><sup>+</sup>, N-NO<sub>2</sub><sup>-</sup>, N-NO<sub>3</sub><sup>-</sup>, N total, P-PO<sub>4</sub><sup>3-</sup>, P total, SO<sub>4</sub><sup>2-</sup>, Cl<sup>-</sup>, Fe-total, Cr-total, Pb<sup>2+</sup>, Ni<sup>2+</sup>, Mn<sup>2+</sup>, Zn<sup>2+</sup>, As<sup>2+</sup>. Work methods were electrometric, spectrophotometric and atomic absorption spectroscopy (AAS).



Dinner

19:00

# One Day Visit

**October 12, 2018 (Friday) 9:00~17:00**

*(Tip: Please arrive at “Bestwestern Premier Guro Hotel” at 8:30 a.m. The following places are for references, and the final schedule should be adjusted to the actual notice.)*

## 1. Youngdeungpo Arisoo purification center (Seoul Water Purification Facility)



Youngdeungpo Arisoo purification center is a part of Seoul water purification facility by the Seoul Metropolitan Government which is in charge of the entire process of treating and supplying tap water with various environmental technology for the city of Seoul. This facility provides to the citizens to produce healthy and delicious Arisu(name of tap water) by installing and operating an advanced water treatment process in the standard treatment facility

## 2. Seoul Energy Dream Center



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