2017 6th International Conference on Environment, Energy and Biotechnology (ICEEB 2017)

2017 6th International Conference on Geological and Environmental Sciences (ICGES 2017)

August 20-22, 2017,

Kitakyushu, Japan

The West Japan General Exhibition Center

Sponsored by "Kitakyushu City", "Kitakyushu Convention and Visitors Bureau"

Published by

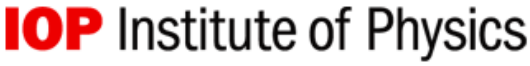

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Table of Contents

Session 1

Session 2

Session 3

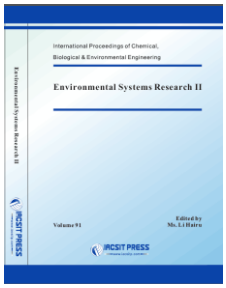
Session 4

2017 HKCBEES Kitakyushu Conference Introductions

Welcome to CBEES 2017 conference in Kitakyushu, Japan. The objective of the Kitakyushu 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, Energy and Biotechnology, Geological and Environmental Sciences.

2017 6th International Conference on Environment, Energy and Biotechnology (ICEEB 2017)

- **Paper publishing and index:** ICEEB 2017 papers will be published in the following proceeding:



International Proceeding of Chemical, Biological and Environmental Engineering (IPCBEE,ISSN:2010-4618), and all papers will be indexed by EBSCO, Chemical Abstracts Services (CAS), CABI, CNKI, WorldCat, Google Scholar, Ulrich's Periodicals Directory, Crossref, and Engineering & Technology Digital Library.

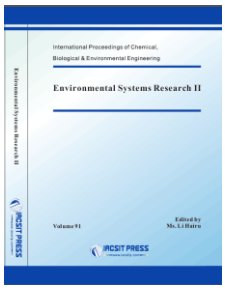
- **Conference website and email:** http://www.iceeb.org/; iceeb@cbees.org.

2017 6th International Conference on Geological and Environmental Sciences (ICGES 2017)

- **Paper publishing and index:** ICGES 2017 papers will be published in the following proceedings and journal:

IOP Conference Series: Earth and Environmental Science (EES) (ISSN: 1755-1315), which is indexed by EI Compendex, Scopus, Thomson Reuters (WoS), Inspec, et al

International Journal of Structural and Civil Engineering Research (ISSN: 2319-6009), which is Index Corpernicus, ProQuest, UDL, Google Scholar, Open J-Gate; etc.



International Proceeding of Chemical, Biological and Environmental Engineering (IPCBEE,ISSN:2010-4618), and all papers will be indexed by EBSCO, Chemical Abstracts Services (CAS), CABI, CNKI, WorldCat, Google Scholar, Ulrich's Periodicals Directory, Crossref, and Engineering & Technology Digital Library.

❄ **Conference website and email: http://www.icges.org/; icges@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 **35** 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 oral presentation will be selected from each oral presentation session, and the Certificate for Best Oral Presentation will be awarded at the end of each session on August 21, 2017.

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 interests is green growth policy. He is now full-professor in Incheon National University at Urban and Environmental Engineering School. He is member of INU ensemble taking part in piano (Chamber orchestra of his University).

Topic: “Recent Trends of Air Pollution Management in Urban Regions”

Abstract: Clean air quality has become our best wishes especially in urban regions because of air pollutants such as particulates, ozones and odorous materials from factories and landfill sites, incineration utilities with coal fired power plants surrounding urban cities. Odor problems are the most annoying and difficult tasks for local government and citizens. Therefore recent trends of air management with main concern of odor pollution in Korea will be suggested to make more clean air with sustainability in urban regions in this research.

Keynote Speaker II

Prof. Miwako Hosoda
Seisa University, Tokyo, Japan

Dr. Miwako Hosoda, Vice-President of Seisa University, has been doing her sociological research in the field of healthcare and environmental sciences. She is interested in the balance of human activities and advocates the protection of natural environments. Dr. Hosoda is also working to achieve a sustainable healthcare policy, and promotes the public's participation in the medical domain, both globally and locally. She graduated from the Department of Sociology at the University of Tokyo in 1992, and received an MA and PhD in Sociology from the University of Tokyo. After spending time as a research fellow in the Japan Society for the Promotion of Science, she studied at Columbia University Mailman School of Public Health and Harvard School of Public Health. Dr. Hosoda is now serving as a board member for the International Sociological Association, Research Committee of Sociology on Health.

Topic: “Community Energy Systems for Sustainable Future”

Abstract: We are born, we grow, and we work among familiar faces. Our core existence depends on the support of those within our communities. To create a sustainable future for our children, we have the responsibility to protect our local environments and cultures, revive our regional economic activities, and promote social welfare and employment. In my presentation, I will be talking on the theme of "producing and consuming local energy," which translates to using environmentally friendly energy created within the area for local economic activities and daily life. This mindset will lead us closer to achieving some of the Sustainable Development Goals (SDGs) proposed by the United Nations such as Goal 7: Affordable and Clean Energy and Goal 13: Climate Action. By grasping the modern-day problems pertaining to energy and reintroducing renewable energy on a local scale, we can realize a sustainable regional economy and promote the independence of various communities. Instead of relying on fossil fuel and nuclear power plant energy, we should instead be using natural energy to provide a sustainable environment for generations to come.

Keynote Speaker III

Prof. Bruno Martins
Geography Department, University of Coimbra, Portugal

Prof. Bruno Martins got the PhD degree in physical geography from the University of Coimbra. He is a professor of the Geography and Tourism Department of the University of Coimbra, Portugal and researcher in Centro de Estudos em Geografia e Ordenamento do Território CEGOT (Center of Geography and Planing Studies) of Coimbra, Minho and Oporto University, the author of several publications including: books, papers on journals, book chapters and papers in proceedings books with peer review. Throughout the recent years, he has developed researches in geomorphology, natural hazards and natural resources in the central and northern region of Portugal and Cape Verde

Topic: “The 2014 volcanic eruption in Fogo and the reterritorialization process: from risk to geographic resilience”

Abstract: The population of Fogo Island, in Cape Verde, shows a peculiar relationship with the living territory, given the eminence of volcanic risk is a reality they face every day. The 1951 and 1995 eruptions were particularly scarring in this insular geography, given they have left in several generations of Cape Verdeans the mark of the creation-destruction-restart cycle, as well as an attitude of symbiosis with nature. In this article it is intended to present and discuss results from a scientific research paper conducted in Fogo Island, in Cape Verde, in February 2016, where it was sought to understand the local population’s response to the last volcanic eruption (from November 2014 to February 2015), in a logic of deterritorialization-reterritorialization, namely in terms of community and territorial resilience. The analysis method was based on direct observation, with record of the views in a field journal, as well as the biographic narrative of all those who were affected, through questionnaires by interview.

Keynote Speaker IV

Prof. Nobuo Mishima
Urban Designer and Architect, Department of Civil Engineering and Architecture, Graduate School of Science and Engineering, Saga University

Prof. Nobuo Mishima was born in Fukuoka, Japan, on May 11 of 1964. He entered the Univ. of Tokyo in April of 1984 and belonged to the department of urban engineering. He received the B.E., M.E., and D.E. degrees in urban engineering from the Univ. of Tokyo, Japan in 1988, 1990, and 1995 respectively. He also studied at Faculty of architecture and urban planning, Tech. Univ. of Vienna, Austria, as a scholarship student of Austrian government with Joint Study Program between two institutions, from October of 1990 to March of 1993.

He worked at Eto Shinchi Architecture Atelier in Vienna and in Osaka, Japan, as a Technical Staff from 1992 to 1994. Since he was graduated from the doctor course of University of Tokyo, he has been with Saga University, Japan, as Lecturer from 1995 to 1998, Assistant Professor from 1998 to 2007, Associate Professor from 2007 to 2013, and Professor from 2013. Moreover, he got the Qualified Architect of First-class in Japan on February 7 of 1997.

Prof. Dr. Arch. Mishima belongs to Arch. Inst. of Japan (AIJ), The City Planning Inst. of Japan (CPIJ), Assoc. of Urban Housing Sci. (AUHS), Japan Inst. of Archt. (JIA), Saga Archt. Assoc. (SAA), Int. Assoc. of Lowland Technology (IALT), and Korea Contents Assoc. (KoCon). His main research interests include urban planning and design, and architectural design. He has many awards from several institutions, such as two Achievement Awards by AUHS in 2010 and 2012, Best Presentation Award of the Int. Conf. of Habitat Eng. and Design in 2012. He has also many publications of books, journal papers and proceeding papers of conferences.

Topics “An analysis for evacuation routes planning in a traditional lowland town considering complex disaster mainly caused by earthquake”

Abstract: Cultural heritage such as traditional wooden house is vulnerable to disasters. In Japan, probability of the event that earthquakes occur is high, and it may cause collapse of the traditional wooden houses. In case of lowland we target are also facing to dangerousness of high tide or tsunami. The residents of our study area do not want to evacuate in the designated refuges located in the low ground level. The aim of the study is to clarify a possibility of alternatives of evacuation routes to a refuge located at higher altitude in lowland. The study area is a traditional preservation area with local heritages called Hizenhamashuku in Kashima city, Saga prefecture, Japan. First, we survey the potential of primary evacuation places, which can be safe places or alternatives of refuges in this study area. Then, simulate the location of primary evacuation places and routes to a final refuge at higher altitude using multi agent system. Finally, we propose a location planning method of primary evacuation places as evacuation routes planning. Thus, we found some ideas to secure evacuation routes from traditional houses to a designated refuge place through primary evacuation places. Besides, we could find sites with problems on evacuation time to go to the final refuge. Although the conditions and setting of the analysis should be improved more for the future discussion, the simulation shows effective procedure to know the problems of the area.

Brief Schedule for Conference

<table>
<tr><td>Day 1</td><td colspan="2">August 20, 2017 (Sunday) 10:00~17:00
Venue: 305
Participants Onsite Registration & Conference Materials Collection</td></tr>
<tr><td rowspan="11">Day 2</td><td colspan="2">August 21, 2017 (Monday) 8:50~17:00
Venue: 303 & 304
Arrival Registration, Keynote Speeches, and Conference Presentations</td></tr>
<tr><td colspan="2">Morning Conference</td></tr>
<tr><td colspan="2">Venue: 303
Opening Speech 8:50~9:00
Keynote Speech I 9:00~9:40
Keynote Speech II 9:40~10:20
Coffee Break & Photo Taking 10:20~10:40
Keynote Speech III 10:40~11:20
Keynote Speech IV 11:20~12:00</td></tr>
<tr><td colspan="2">Lunch 12:00~13:30
Venue: Restaurant in Second floor of The West Japan General Exhibition Center</td></tr>
<tr><td colspan="2">Afternoon Conference</td></tr>
<tr><td>Session 1:13:30~15:00
Venue: 303
6 presentations-Topic: “Environmental Pollution and Management”</td><td>Session 2: 13:30~15:00
Venue: 304
6 presentations-Topic: “Energy Engineering and Geology”</td></tr>
<tr><td colspan="2">Coffee Break 15:00~15:30</td></tr>
<tr><td>Session 3: 15:30~17:00
Venue: 303
6 presentations-Topic: “Environmental Pollution and Management”</td><td>Session 4: 15:30~16:30
Venue: 304
4 presentations-Topic: “Energy Engineering and Geology”</td></tr>
<tr><td colspan="2">Poster session: 8:50~17:00
Venue: 305</td></tr>
<tr><td colspan="2">Dinner:18:00
Venue: Restaurant</td></tr>
<tr><td>Day 3</td><td colspan="2">August 22, 2017 (Tuesday) 9:30~17:00
Half Day Academic Visit and Half Day City Tour</td></tr>
</table>

Tips: Please arrive at conference room 10 minutes before the session beginning to upload PPT into conference laptop.

Detailed Schedule for Conference

August 20, 2017 (Sunday)
Venue: 305

10:00-17:00	**Arrival and Registration**

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 oral presentation will be selected from each oral presentation session, and the Certificate for Best Oral Presentation will be awarded at the end of each session on August 21 2017.

Morning, August 21, 2017 (Monday)
Venue: 303

8:50~9:00		**Welcoming Speech** Prof. Miwako Hosoda Seisa University, Tokyo, Japan
9:00~9:40		**Keynote Speech I** Prof. Chan Jin Park Incheon National University, Republic of Korea Topic: "Recent Trends of Air Pollution Management in Urban Regions"
9:40~10:20		**Keynote Speech II** Prof. Miwako Hosoda Seisa University, Tokyo, Japan Topic: "Community Energy Systems for Sustainable Future"
10:20~10:40		**Coffee Break & Photo Taking**
10:40~11:20		**Keynote Speaker III** Prof. Bruno Martins Geography Department, University of Coimbra, Portugal Topic: "The 2014 volcanic eruption in Fogo and the reterritorialization process: from risk to geographic resilience"
11:20~12:00		**Keynote Speaker IV** Prof. Nobuo Mishima Department of Civil Engineering and Architecture, Graduate School of Science and Engineering, Saga University, Japan Topic: "An analysis for evacuation routes planning in a traditional lowland town considering complex disaster mainly caused by earthquake"
12:00~13:30		**Lunch** **Venue: Restaurant in The West Japan General Exhibition Center**

Let's move to the Sessions!

Session 1

Tips: The schedule for each presentation is for reference only. In order note to missing your presentation, we strongly suggest that you attend the whole session.

Afternoon, August 21, 2017 (Monday)

Time: 13:30~15:00

Venue: 303

Session 1: 6 presentations-Topic: "Environmental Pollution and Management"

Session Chair: Prof. Miwako Hosoda

B0003 Presentation 1 (13:30~13:45)

Investigating the Spatial-temporal Variability between Microenvironmental Personal Exposures and Stationary Ambient Concentrations of Particulate and Gaseous Pollutants Using Real-time Measurements

Li-Te Chang, Chin-Sheng Tang and Shih-Chun Candice Lung

Department of Environmental Engineering & Science, Feng Chia University, Taichung, Taiwan

Abstract- Nowadays, use of both global positioning system (GPS) and geographic information system (GIS) technologies together provides new insights for human exposure assessment. The objectives of this study are to use mobile pollutant sensors coupled with GPS receivers to investigate the differences between microenvironmental personal exposures and stationary ambient measurements at a fine geographic scale. Monitoring was performed for 28 days during an 18-month period, with 7 sampling days in each season. In each sampling day, trained field staff wore multiple monitors while walking along a pre-determined route surrounding a stationary site in the morning, at noon, and in the evening. Continuous personal and stationary multi-sized particulate matters (PM), particle-bound polycyclic aromatic hydrocarbons (p-PAHs), and carbon monoxide (CO) concentrations were measured using the light-scattering monitor, the photoelectric aerosol sensor, and the electrochemical monitor in

respective. The stationary site was located on the Fu Jen Catholic University campus in New Taipei City, Taiwan. In addition, consumer-level GPS receivers were adopted to define activity patterns that could be linked to exposure monitoring data. Results showed that PM2.5, PM10, and CO all displayed the highest mean exposure concentrations in the morning, with the levels of 29.09 g/m3, 54.33 g/m3, and 4.85 ppm respectively, whereas p-PAHs had the highest exposure levels of 91.01 ng/m3 at noon. Aside from sharing the same pollution hotspots (heavy traffic roads and bus stops) with PM, p-PAHs had rather high exposure concentrations at the restaurant/shop microenvironment. Finally, the analysis of the ratio of microenvironmental and stationary measurements (M/S ratio) showed that both of the routes and the temporal periods were the significant factors affecting the M/S ratios.

Afternoon, August 21, 2017 (Monday)

Time: 13:30~15:00

Venue: 303

Session 1: 6 presentations-Topic: "Environmental Pollution and Management"

Session Chair: Prof. Miwako Hosoda

B0009 Presentation 2 (13:45~14:00)

Indoor Air-Condition Filter Dust Levels of Polybrominated diphenyl ethers in the Hospitals, South Taiwan

Shun-I Shih, **Danielle E. Que,** Yi-Chyun Hsu, Wei-Jung Tseng and How-Ran Chao

Department of Environmental Engineering, National Cheng Kung University, Taiwan

Abstract- Polybrominated diphenyl ethers (PBDEs) have been immensely investigated due to its ubiquitous and persistent characteristics in the environment. They are classified as a class of emerging persistent organic pollutants that are also known to cause negative health effects and are bioaccumulative in nature. Used as a main ingredient mixture in brominated fire retardants (BFRs) which delay ignition and flammability, PBDEs diffuse easily from the BFR-coated consumer products (e.g. electronic appliances, textiles, paints, etc.) via abrasion and volatilization. Many studies have investigated PBDEs levels found in independent-air-conditioner filter (IAF) and central-air-conditioner system filter (CASF) dusts in indoor places like offices, retail stores, universities, clinics, clean rooms, and workplaces but currently, there are still no investigations yet conducted on hospital waiting areas. For Taiwanese National Health Insurance holders, medical hospitals, especially its waiting areas, are important locations of exposure to PBDEs relative to their check up and visitation frequency. Thus, this study aims to investigate 14 PBDE congeners in indoor IAF dust from 16 different Taiwanese hospital waiting areas. The US EPA method M1614 was used and the sampling period duration was August-October 2016. Fourteen PBDE (BDE-28, 47, 100, 99, 154, 153, 183, 197, 203, 196, 208, 207, 206, 209) from IAF dust samples from eight hospital waiting areas were collected using a high efficiency particulate air filter (HEPA filter) vacuum cleaner then extracted using a Soxhlet extractor. The extract was then treated with sulfuric acid and passed through a multi-layered silica column and an acid alumina column for cleanup and later on, analyzed by a high resolution gas chromatography and using a high resolution mass spectrometry system (HRGC/HRMS). The mean and standard deviation for

Σ14PBDEs concentration is found to be 935±1250 ng/g with BDE-209 having the highest mean concentration of 482±587 ng/g followed by BDE-206 at 155±245 ng/g and BDE-207 at 90±134 ng/g. As compared to the other studies, our mean Σ14PBDEs concentration is relatively lower, with BDE-209 being the predominant congener. BDE-209 levels in older buildings were observed to be lower than the new buildings as a result of BDE-209 debromination process undergoing over time and the possibility of newer buildings being redecorated more frequently, thus, emitting BDE-209 from redecoration materials. The sample size of our study is small so PBDEs levels are not correlated to the number of electronic devices or computers in the hospitals. The IAF dust PBDE homologues distributions analysis showed deca-BDE (BDE-209) having the highest percentage of distribution at 51.4% followed by nona-BDE (BDE-208, -207, and -206) at 29.3%, and octa-BDE (BDE-197, -203, and -196) at 15.4%. Considering that deca-BDE mixtures are still not phased out in Taiwan, our study have significantly detected the presence of higher brominated PBDEs in the indoor hospital waiting area IAF dust as being attributed to the ongoing usage of deca-BDE-coated consumer products and that deca-BDE debromination process resulted to the presence of nona-BDE and octa-BDE

Afternoon, August 21, 2017 (Monday)

Time: 13:30~15:00

Venue: 303

Session 1: 6 presentations-Topic: "Environmental Pollution and Management"

Session Chair: Prof. Miwako Hosoda

B2002 Presentation 3 (14:00~14:15)

Contamination by Butyltins in Sediment from Songkhla Old-Town Coast

Sutisa Yaeed, Thunwadee Suksaroj, Banjong Vitayavirasuk and **Thiwari Ophithakorn**

Songkhla Rajabhat University, Thailand

Abstract- This research studied the amounts of butyltins in sea water and sediment along the Songkhla Old-Town coast. The samples of water and sediment were collected from five survey sites, including the Songkhla Ferry Port, port opposite Songkhla Police Saving Cooperative Limited, port of Hlang Phrarham, port at the Hub Ho Hin Rice Mill and the port next to the Lake Inn Hotel. Water samples were prepared by liquid-liquid extraction and the sediment samples were prepared by methanol-acid digestion. The amounts of butyltins were analyzed by GC-MS and the analysis results of sea water samples did not show any butyltin contamination in any of the samples. The amount of tributyltin in the sediment did not exceed the accepted values and the highest composition of the butyltins in the sediment was tributyltin (37-56%) and the lowest was dibutyltin (14-33%). High concentrations of butyltins in the sediment were detected at the locations of commercial vessel harbors and had intensive boating activity in the past. Contamination by butyltins may exist for a long time because butyltins do not decay rapidly. To our knowledge, this is the first surveillance of butyltins along the Songkhla Old-Town coast and it is necessary to avoid serious pollution problems in the largest fishery area of Songkhla Province in the future.

Afternoon, August 21, 2017 (Monday)

Time: 13:30~15:00

Venue: 303

Session 1: 6 presentations-Topic: "Environmental Pollution and Management"

Session Chair: Prof. Miwako Hosoda

B2003 Presentation 4 (14:15~14:30)

Removal of Bromine from Waste Plastics by Pyrolysis with Hydrotalcite

N. Morita, M. Nakayasu, Y. Kawabata, and H. Nakagome

Department of Urban Environment Systems, Graduate School of Engineering, Chiba University, Japan

Abstract- In recent years, there has been increasing interest in the pyrolysis of waste plastics to fuels as a form of recycling. One associated challenge is the frequent presence of halogen-based flame retardants in various consumer plastics. In this study, waste polyethylene mixed with tetrabromobisphenol A was subjected to thermal decomposition, using hydrotalcite (HT) to reduce the halogen concentration in the product oil. Samples with and without HT or with various inert additives were pyrolyzed at 450 ℃ under nitrogen in a glass reactor and the product oils, solid residues, and gaseous products were investigated. The addition of HT was found to increase the yield of the product oil. As well, no brominated compounds were detected in the oil when using HT. Scanning electron microscopy provided evidence that brominated compounds are captured by HT in the solid residue during thermal decomposition, thus eliminating bromine from the product oil and gases.

Afternoon, August 21, 2017 (Monday)

Time: 13:30~15:00

Venue: 303

Session 1: 6 presentations-Topic: "Environmental Pollution and Management"

Session Chair: Prof. Miwako Hosoda

B0021 Presentation 5 (14:30~14:45)

Organic Fluorescent Characteristics of Five Tributaries in Gaoping River Basin in Dry Season

Guan-Ling Chen, Jing-Wen Cao, Chun-Yen Chiu, Lih-Fu Chen and **Wen-Liang Lai**

Environmental Management, ajin University, Taiwan

Abstract- In this research, fluorescence excitation emission spectrometry (Excitation emission fluorescent matrix, EEFM) and total organic carbon Analyzer were main instruments applied into evaluating the property and amount of natural organic matter in dry season for Gaoping River basin located in Southern Taiwan. Dissolved non-volatile organic carbon in water (non-purgeable dissolved organic carbon, NPDOC) was measured and SUVA, (UV254/NPDOC), BIX (Biological index, BIX) were compared in whole samples belonging to five segments. Results showed that NPDOC values of whole samplings in Gaoping River basin were less than the criteria of Source Water Standard of Drinking Water except for Jiouru bridges. SUVA values and BIX for whole samplings were less than 1, indicating that the source pollution in the Gaoping River Basin was mainly attributed to the human activity and microbial organic matter produced in the River. The variance of peak fluorescence locations and intensity, and the difference of fluorescence intensity among five fluorescent organic groups revealed that the significant divergences existed in the five segments in Gaoping River Basin. Peak fluorescent intensity belonging to humic-like substance, those values in Qishan River, Laonong River and Ailiao River were less than 100. Peak fluorescent intensity belonging to fulvic-like substance, only Laonong River was below 100. The average fluorescence intensity in Gaoping River mainstream was the highest value followed by Mino River; however, the lowest existed in Ailiao River.

Afternoon, August 21, 2017 (Monday)

Time: 13:30~15:00

Venue: 303

Session 1: 6 presentations-Topic: "Environmental Pollution and Management"

Session Chair: Prof. Miwako Hosoda

B3003 Presentation 6 (14:45~15:00)

Primary Study on Oilseed Peony for Phytoremediation of Soils Contaminated with Heavy Metals

Kokyo Oh, Jungang Wang, Tianhua Zhou, Gaofeng Liu, Shinichi Yonemochi, Tetsushi Yonekura, Yugo Isobe

Center for Environmental Science in Saitama, Saitama, Japan

Abstract-Phytoremediation is a technology that uses green plants for cleanup the contaminated soils. Although the heavy metal accumulator plants have been mainly used in phytoremediation so far, biofuel and ornamental plants have received increasingly attention as they produce valuable biomass as well as remediate contaminated soils. **Peony (*Paeonia suffruticosa*)** is a flowering plant usually with large and fragrant flowers, and oilseed peony is a woody oil resourceful plant which can both provide oil and flowers. This study summarized the development and utilization of oilseed peony and discussed its application potential in phytoremediation of soils with heavy metals. Studies have shown that heavy metals can accumulated in the roots, stems, shoots, and leaves of oilseed peony, and the accumulation potentials increase with soil heavy metal concentrations and cultivation time. When oilseed peony is used in phytoremediation, the seeds can be used for biofuel production, while the leaves and shoots can be used for biochar production. Heavy metal remediation using oilseed peony can also provide economic benefits to the owners of the contaminated site through selling the seeds for biofuel production factories and marketing flowers. Therefore, oilseed peony should be considered as a potential economic crop for phytoremediation. (This work was supported by JSPS KAKENHI No.16H05633).

15:00-15:30	Coffee Break




Session 2

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

Afternoon, August 21, 2017 (Monday)

Time: 13:30~15:00

Venue: 304

Session 2: 6 presentations-Topic: "Energy Engineering and Geology"

Session Chair: Prof. Bruno Martins

B0004 Presentation 1 (13:30~13:45)

A Multiobjective Interval Portfolio Formulation Approach for Supporting the Selection of Energy Efficient Lighting Technologies

Carla Oliveira Henriques and Dulce Coelho

Polytechnic Institute of Coimbra – ISCAC, Portugal

Abstract-A two-part methodological approach for supporting public investors with the selection of several energy efficient lighting technologies in the industrial sector has been developed. First, we develop an economic Input-Output Lifecycle Assessment modelling framework for the assessment of the energy payback-time of each technology. Then, a multiobjective optimization model with interval coefficients based on portfolio theory has been formulated to support public bodies with the selection of the industrial lighting efficient portfolios to be subsidized. The objective functions considered are the maximization of the return measured as the savings to investment ratio and the minimization of risk as the minimum necessary deviation of energy savings of the portfolio throughout its lifetime from the expected energy embodied (energy input) in its production. Constraints regarding the maximal capital allocated to the various lighting technologies are also considered under the imposition of a certain energy payback time. Finally, a new approach for obtaining the efficient portfolio lighting technologies has also been proposed which allows exploring three types of investment strategies, i.e., a conservative strategy, an aggressive strategy and a combined strategy for obtaining these solutions.

Afternoon, August 21, 2017 (Monday)

Time: 13:30~15:00

Venue: 304

Session 2: 6 presentations-Topic: "Energy Engineering and Geology"

Session Chair: Prof. Bruno Martins

B0008 Presentation 2 (13:45~14:00)

Optimization of Torrefaction Process by Biomass Characteristics

Kwang Cheol Oh, **Dae Hyun Kim**, Sang Yeol Lee, Chung Geon Lee, Sang Yeon Joo, La Hyun Cho, Seo Hyun Lee, In Seon Jeong and Sun Yong Park

Kangwon National University, Korea

Abstract-Recently, global warming and environmental pollution are accelerating because of the continuous use of fossil fuels. Energy sources from biomass are considered one of the possible solutions to overcome this problem. In this study, application of agricultural by-products as new bioenergy resources through torrefaction was investigated. Pepper stems were selected from among domestic agricultural by-products to perform this energy conversion process. The sample was crushed and separated (standard testing sieve) into particles of 2.36 mm or less. The selected materials were injected into a prototype capsule, and the experiment was repeated three times for 10 min at a reaction temperature of 200℃, 230℃, or 270℃ for up to 40 min. Mass reduction was measured after 1 h of cooling to minimize rapid reaction with oxygen in the atmosphere. Frequency factor coefficients and activation energy of lignocellulosic biomass were investigated for simulation analysis. The reaction rate constants were derived from the experimental results, and mass reduction was predicted with respect to different temperatures through a simulation. The experimental results of the mass reduction rate were in good agreement with the simulation values : 0.95 of r-squared and 0.00339 of root mean square error. It will be necessary to develop a model including dry moisture, particle size, and reactor shape, because these factors may have a significant influence on the torrefaction process.

Afternoon, August 21, 2017 (Monday)

Time: 13:30~15:00

Venue: 304

Session 2: 6 presentations-Topic: "Energy Engineering and Geology"

Session Chair: Prof. Bruno Martins

B0011 Presentation 3 (14:00~14:15)

Study the Effect of Grinding and Dilute Acid Pre-treatment Methods on Increasing the Total Fermentable Sugar Produced from Wheat Straw

Mohammed O. Abdulsattar, Sharif Zein and Gillian Greenway

School of Engineering and Computer Science, Faculty of Science and Engineering, University of Hull (UoH), U.K

Abstract-Wheat straw is one of the most promising feedstock for bio-fuel production and the pre-treatment process is the key point in the whole process. In this paper the effect of grinding and dilute sulphuric acid (H2SO4) treatment were studied. The wheat straw was ground and sieved to give a range of particle sizes from 250 μm to>2000 μm. The hydrolysis was performed by using Cellulase from T. reesei, xylanase from T. longibrachiatum and Glucosidase from Aspergillus enzymes. These results show that the 250-μm sample gave the highest sugar yield (35 %) without acid treatment. When the 250-μm sample was treated with dilute H2SO4 and the sugar yield increased to 52 %. A new approach to hydrolysis was also carried out by first hydrolysing the 250-μm sample and then treating the solid residue with H2SO4, the final total sugar yield after performing hydrolysis reached up to 60 %.

Afternoon, August 21, 2017 (Monday)

Time: 13:30~15:00

Venue: 304

Session 2: 6 presentations-Topic: "Energy Engineering and Geology"

Session Chair: Prof. Bruno Martins

B0017 Presentation 4 (14:15~14:30)

Electricity Generation and Leachate Wastewater Treatment Using an Algal Cathode Microbial Fuel Cell in a Continuous Mode Operation

Hai Nguyen and Booki Min

Department of Environmental Science and Engineering, Kyung Hee University, Republic of Korea

Abstract-Leachate, which is the liquid from a landfill, is one of the most toxic pollutants because of large amount of nitrogen and organic compounds in its composition. Treating landfill leachate normally requires to combine several advanced methods before its disposal into the natural environment. Microbial fuel cells (MFCs) with algae grown in the cathode are considered as a promising alternative approach for advanced leachate wastewater treatment and green energy production due to the capability of nutrient removal and electricity generation. In this study, we tested the algae cathode MFC in continuous mode at several hydraulic retention times (HRTs; 10 h, 20 h, 40 h and 60 h) using leachate wastewater in terms of electricity generation and simultaneous COD and nutrient removal. The experiment was conducted in a double chambered cube MFCs, which have 260 mL working volume of anode chamber and 230 mL working volume of cathode chamber. Cell voltage and cathode potential were measured at the time interval of 5 minutes across a fixed resistor of 600 Ω with a data acquisition system. The compositions of the leachate wastewater (15% leachate) in the inlet MFC were 416.6 mg COD/L, 428.8 mg NH4+-N/L, and 2.9 mg TP/L. The maximum DO concentration was 5 mg/L at HRT of 60 h, but DO levels were measured at almost 0 mg/L at shorter HRTs. The highest average cell voltage was 300 mV at HRT of 20 h, and at HRT of 40 h, the cell voltage of 200 mV was observed. No current generation was obtained at 10 and 60 h HRT. Nutrient (nitrogen and phosphorus) removal increased with increasing HRTs, and the maximum removal efficiency was 76.4% and 86.3% for ammonium and TP, respectively, at 60 h HRT. The highest COD removal of 26% was observed at HRT of 60 h, and at other HRTs, lower removal efficiency was observed. This study suggests that algae cathode MFC with an appropriate HRT can continuously generate electricity with nutrient removal from real landfill leachate wastewater in field application.

Afternoon, August 21, 2017 (Monday)

Time: 13:30~15:00

Venue: 304

Session 2: 6 presentations-Topic: "Energy Engineering and Geology"

Session Chair: Prof. Bruno Martins

B0018 Presentation 5 (14:30~14:45)

Effect of Relative Humidity Levels on an Air Cathode MFC Performance with Different Separators

Mungyu Lee, Taeyeon Jeon, Inhae Kim and Booki Min

Department of Environmental Science and Engineering, Kyung Hee University, Republic of Korea

Abstract-Air cathode MFCs with different separators were operated in batch mode to evaluate the effect of various humidity conditions at the cathode chamber on MFC performance. The MFCs with a polyprophylene (PP) 80 separator produced the highest cell voltage of 0.53V with 600-ohm external resistance at relative humidity (RH) of 30 ± 2 % compared to the other humidity conditions of 50 ± 3 % (0.50 V) and 90 ± 3 % (0.48 V). In polarization analysis, the maximum power density of 381mW/m2 (current density of 1.60 A/m2) was obtained at the same 30 % humidity. At higher humidity levels of 50 and 90%, the maximum power density was decreased to 353 mW/m2 and 284 mW/m2, respectively. With Nafion 117, the highest voltage of 0.35V was obtained with a fixed resistance of 600-ohm at 90 ± 2% humidity, which was higher than with PP80 separator, and at lower humidity conditions, decreased voltage generations were observed. The maximum power density of 132 mW/m2 was observed, which was nearly three times lower than the value with PP 80, at the same 30 ± 3 % relative humidity as with PP80. At higher humidity conditions, the maximum power densities were decreased by more than about 35%. Cyclic voltammogram analysis with PP 80 exhibited a higher reduction current of -0.068A at 50 ± 3 % humidity than with 30 ± 3 % (-0.049A) and 90 ± 3 % (-0.046A). The highest reduction current with Nafion 117 was -0.051A at relatively higher humidity of 90 ± 2 %, and lower currents of -0.015A and -0.007A were obtained at 30 ± 3 %; and 50 ± 3 %, respectively.

Afternoon, August 21, 2017 (Monday)

Time: 13:30~15:00

Venue: 304

Session 2: 6 presentations-Topic: "Energy Engineering and Geology"

Session Chair: Prof. Bruno Martins

B0007 Presentation 6 (14:45~15:00)

Biomass and Lipid Production of Chlorella sp. Using Municipal Wastewater under Cultivation

Yi Chun Yang, Jhong Fu Jian, Chiu Mei Kuo, Wen Xin Zhang and Chih Sheng Lin

National Chiao Tung University, Taiwan

Abstract-The stable-growth performance and CO2 fixation of Chlorella sp. cultivated in municipal wastewater were investigated. The biomass concentration and biomass productivity of Chlorella sp. cultured with the addition of nutrients in municipal wastewater were 6.48 g/L and 0.883 g/L/day, respectively. The biomass concentration and biomass productivity of Chlorella sp. cultured with nutrient addition in municipal wastewater were both approximately three fold higher than those observed in cultures without extra nutrients. In semi-continuous cultures, the half volume of culture broth was replaced every 2, 3 and 4 days during a period of 12 days, and the average biomass productivities with nutrient addition in municipal wastewater were 4.15, 4.62 and 5.43 g/L, and 1.071, 0.809 and 0.718 g/L/day, respectively. The accumulated biomass production in the 1-L photobioreactor in 2-day, 3-day and 4-day replacements of the semi-continuous culture for 12 days were 14.6, 11.6 and 10.8 g. Compared with the batch culture, the average biomass productivity and accumulated biomass production were 1.7- to 2.5-fold and 1.6- to 2.1-fold higher in the semi-continuous cultures, respectively. The higher biomass production in a semi-continuous culture was obtained because Chlorella sp. was maintained in an exponential phase. The average lipid content of Chlorella sp. in semi-continuous cultures (19.7%) was lower than that of batch culture (21.1%). Due to the higher biomass productivity observed in the semi-continuous culturing system, the maximum lipid productivity (0.209 g/L/day), which was obtained in the 2-day replacement, was 2.3-fold higher than that in batch culture. Furthermore, the content of C16:0, C18:0, C18:1 and C18:2 of Chlorella sp. was more than 75% of the totalfatty acids, regardless of whether the semi-continuous or batch culture was performed.

15:00-15:30	**Coffee Break**




Session 3

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

Afternoon, August 21, 2017 (Monday)

Time: 15:30~17:00

Venue: 303

Session 3: 6 presentations-Topic: "Environmental Pollution and Management"

Session Chair: Prof. Chan Jin Park

B0010 Presentation 1 (15:30~15:45)

Dioxin Levels in Northern, Eastern, Central, and Southern Taiwanese Soils

Danielle E. Que, **How-Ran Chao**, Shun-I Shih and Lin-Chi Wang

National Pingtung University of Science and Technology, Taiwan

Abstract-Polychlorinated dibenzo-p-dioxins/furans (PCDD/Fs) are halogenated aromatic hydrocarbons have been widely monitored due to their persistence in various environmental media and their associated health risks due to their bioaccumulation, carcinogenesis, and mutagenesis. In the present study, dioxin levels surveillance in Northern, Eastern, Central, and Southern Taiwan and the islands including Matsu, Kimmen, and Penghu were conducted. Soils were collected from the sampling areas. Soil samples were extracted, concentrated, and cleanuped before high resolution gas chromatography with high resolution mass spectrometry. The average WHO2005-TEQ concentrations of ΣPCDD/Fs in central Taiwan was found to be 17.5±22.2 pg WHO2005-TEQ/g dw and is the highest as compared to that of the northern (13.8±20.4 pg WHO2005-TEQ/g dw), southern (14.5±18.3 pg WHO2005-TEQ/g dw), and eastern (3.74±2.57 pg WHO2005-TEQ/g dw) Taiwan, respectively, in the potentially contaminated areas. These results in the potentially contaminated areas from western Taiwan are relatively very high as compared to the previous studies. For the potentially contaminated areas, OCDD was found to be the dominant congener in the central area (1467±3055 pg/g dw) and OCDF, in the northern area (858±4071 pg/g dw). For the background levels, the highest average WHO2005-TEQ concentrations of ΣPCDD/Fs were detected in the southern area

(9.95±29.7 pg WHO2005-TEQ/g dw) followed by the northern (5.28±3.62 pg WHO2005-TEQ/g dw), central (4.24±4.24 pg WHO2005-TEQ/g dw), and eastern areas (3.26±5.05 pg WHO2005-TEQ/g dw), and the islands (1.28±0.269 pg WHO2005-TEQ/g dw). The background congener mean concentrations showed OCDD as having the highest level in the northern area (859±674 pg/g dw) followed by that in the southern area (628±2782 pg/g dw). In addition, 1,2,3,4,6,7,8-HpCDD was also found to have a high mean background concentrations in the southern area (116±667 pg/g dw). A survey of personal income distribution (SPID) was also conducted and was found to have a good correlation with dioxins (pg WHO2005-TEQ/g) for background areas (n=5, R2=0.86, p=0.028), potentially contaminated areas (n=4, R2=0.919, p=0.009), and total levels (n=5, R2=0.921, p=0.009). The population and population density was also correlated with dioxins-TEQ/g and was also found to have good correlations with the background levels (n=5, R2=0.895, p=0.016), pollution levels (n=4, R2=0.950, p=0.00370), and total levels (n=5, R2=0.953, p=0.00327).

Afternoon, August 21, 2017 (Monday)

Time: 15:30~17:00

Venue: 303

Session 3: 6 presentations-Topic: "Environmental Pollution and Management"

Session Chair: Prof. Chan Jin Park

B0005 Presentation 2 (15:45~16:00)

Associations of Dengue Fever Cases with Air Pollutants and Environmental Factors in Southern Taiwan During 2006-2015

Wei-Jung Tseng, Yi-Wen Liao and How-Ran Chao

Department of Environmental Science and Engineering, National Pingtung University of Science and Technology, Neipu, Pingtung County, Taiwan

Abstract-The vector-borne diseases, as Dengue and ZIKA, has been a serious public health problem in this years because global warming has increased the risk to outbreak the epidemics. In 2006-2015, the 2 cities of outbreaks of dengue fever located in the subtropical climate of the southern Taiwan be concerned in the public apprehension and social consequences. The purpose of this study is to investigate the associations between dengue fever cases and environmental factors as air pollutants to examine the potential effects of meteorological variations with dengue fever cases in Taiwan during 2006–2015.

This data in 2006-2015 of the meteorological factors (rainfall, temperatures, relative humidity etc.) from Central Weather Bureau, R.O.C.(Taiwan) ,the environmental factors as the air pollutions (CH4、CO、NMHC、NO、NO2、NOx、PM10、PM2.5、SO2、THC) from Environmental Protection Administration,and the Dengue cases from the Centers for Disease Control , are collected respectively. The software used to perform data analysis is SPSS version 18.The dengue cases were linked by the meteorological factors and environmental factors as the air pollutions through multiple regression analysis.

The results are showed no significant between dengue fever cases either on rainfall、NO、NO2、NOx、PM10, but showed that are significant on CH4、CO、O3、PM2.5 and SO2. The significant that the dengue cases with PM2.5 , and the R value was -0.079, showing associated with a low degree of negative correlation, because this area lower PM2.5 concentration might lead to the people stay at home more time and increase the risk by mosquitos bitten. The study was showed the results that the number of dengue cases is not

significant as comparing rainfall, however, it is not as same as the other findings. NCTU1 and Chlorella sp. WT was reached at pH 10. These results show that Chlorella sp. NCTU1 could grow well in pH 8 - 10 medium and the optimal pH is 10. This study demonstrated that the alkali-tolerant mutant strain Chlorella sp. NCTU1 can grow well in alkaline medium, which can capture more CO2 for microalgae growth. However, the further studies are still needed to investigate the optimal operation strategy of using alkaline medium on the microalgae cultivation to obtain the more CO2 fixation efficiency and microalgal biomass production.

Afternoon, August 21, 2017 (Monday)

Time: 15:30~17:00

Venue: 303

Session 3: 6 presentations-Topic: "Environmental Pollution and Management"

Session Chair: Prof. Chan Jin Park

B0023 Presentation 3 (16:00~16:15)

Study on Environmentally Friendly Sludge Drying Method

Ji Ye Yoo, HeeJung Kim and ChanJin Park

Department Climate International Cooperation, Incheon National University, Republic of Korea

Abstract-In 2012, the marine outflow of sewage sludge was prohibited due to the revision of the Marine Pollution Act and introduction of the Treaty of London, which is an international environmental regulation of disposal of wastes. As a result of the revision of the enforcement regulations of the Waste Management Act, the simple and direct landfill of sewage sludge was prohibited.

Treatment costs such as incineration or solidification of sewage sludge and landfill are increasing. Incheon city's sludge treatment had depends on the marine outflow. It is inevitably inevitable to make an efficient alternate treatment plan for sewage sludge. Considering the right to live in a healthy and pleasant environment for the residents near the sewage treatment facility, research on the development of sludge drying technology using environmentally friendly energy is essential.

In this research, by using renewable energy to reduce secondary processing cost of sewage sludge, development of sewage sludge treatment technology that can treat sewage sludge economically and environmentally by minimizing energy consumption. In this study, developed a drying facility in a greenhouse form with easy sun penetration by sewage sludge drying technology using the principle of moisture evaporation by solar thermal energy. Then, temperature, humidity, solar radiation amount measured by using the measurement sensor, and the sludge was dried while maintaining optimum conditions such as stirring and aeration of sludge at an appropriate time.

Afternoon, August 21, 2017 (Monday)

Time: 15:30~17:00

Venue: 303

Session 3: 6 presentations-Topic: "Environmental Pollution and Management"

Session Chair: Prof. Chan Jin Park

E0004 Presentation 4 (16:15~16:30)

The Heavy Metals Content Characteristics and Potential Ecological Risk Surrounding the Production Wells of Jilin Province Songyuan Oilfield

Wei Su, Dongmei Liang, Zhaoqi Zhang, Zundong Xiao, Jingxin Li

ilin Provincial Academy of Environmental Sciences, Changchun 130012, China

Abstract- Heavy metals of Pb, Hg and As in farmland soil surrounding the production wells of Jilin Province Songyuan oilfield were taken as the research object. The content characteristics of Pb, As, Hg in soil, potential ecological risk and its influencing factors were studied. The results show that the average contents of heavy metal Pb, Hg, As were 6.39, 0.0791, and 23.31 mg ŀkg-1, respectively, which were 0.33, 2.20 and 2.39 times of their background values in soil, indicating that Hg and As were accumulated apparently in soil. 4.00% of Hg was in the moderate pollution status, 16.00% was in the medium - heavy pollution status, but Pb and As were almost in a state of non-pollution status. The potential ecological risk order of heavy metals was Hg>As>Pb, and 20% of Hg was in the strong - very strong ecological risk levels. Soil heavy metal contents were affected by pH, OM content obviously.

Afternoon, August 21, 2017 (Monday)

Time: 15:30~17:00

Venue: 303

Session 3: 6 presentations-Topic: "Environmental Pollution and Management"

Session Chair: Prof. Chan Jin Park

B0025 Presentation 5 (16:30~16:45)

Investigation of Classroom Thermal Environment and Occupant Thermal Comfort in Hangzhou, China

Jianyu Shen and Shoichi Kojima

Department of Civil Engineering and Architecture, Graduate School of Science and Engineering, Saga University, Saga, Japan

Abstract-A comfortable indoor thermal environment is one of the most important factors which promote the growth and education of young people. This study aimed to find the perception of classroom thermal environment for students aged 19-21 years old, at the beginning of summer in Hangzhou, China. In this study, both the thermal environment parameters and the occupant thermal sensation surveys were obtained simultaneously from 6 naturally ventilated classrooms, and a total of 695 effectual questionnaires were collected from 384 students. Based on the measurement and the questionnaires results, the mean thermal sensation vote(MTS) and the predicted mean vote(PMV) were evaluated. It was found that during the beginning of summer, an indoor operative temperature of 25.7℃ is a neutral comfort temperature for students, and the comfortable temperature range is 22.9-28.5℃. The results also showed that the air velocity has obvious effect on human thermal comfort.

Afternoon, August 21, 2017 (Monday)

Time: 15:30~17:00

Venue: 303

Session 3: 6 presentations-Topic: "Environmental Pollution and Management"

Session Chair: Prof. Chan Jin Park

B0006 Presentation 6 (16:45~17:00)

Screening of the Alkali-tolerant Mutant of Chlorella sp. and Evaluation the Growth Performance in Alkaline Medium

Chiu-Mei Kuo, Tsung-Hsien Lin, Yi-Chun Yang, Wen-Xin Zhang and Chih-Sheng Lin

Department of Biological Science and Technology, National Chiao Tung University, Hsinchu, Taiwan

Abstract-Microalgae-based carbon dioxide (CO2) biological fixation is regarded as a feasible CO2 capture method because of high CO2 fixation rates by photosynthesis. However, the limitation is the low efficiency of atmospheric CO2 being dissolved into water for microalgae growth. It is known that higher pH medium can capture more CO2 for microalgae growth. Hence, mutant strains are needed; the mutants should have the high capacity for CO2 utilization.

The aim of this study is to screen an alkali-tolerant mutant strain Chlorella sp. NCTU1 by N-methyl-N -nitro-N-nitrosoguanidine (NTG) mutagenesis and evaluate the growth of Chlorella sp. NCTU1 by capturing higher CO2 concentration in alkaline medium. First, the lethality of Chlorella sp. WT (wild-type) with different dosage of NTG (0.1, 0.5, 1, 5, 10, 50, 100 and 250 μg/mL) treatment for 60 min was investigated. When the NTG dosage was lower than 5 μg/mL, a positive correlation is a relationship between NTG dosage and lethality of Chlorella sp. WT. When Chlorella sp. WT was treated with 5 μg/mL NTG treatment for different time (10, 20, 30, 40, 50, 60, 90 and 120 min), approximately 50% lethality of Chlorella sp. WT was obtained with NTG treatment for 10 min. In this study the lethality of Chlorella sp. WT was approximately 80% with 5 μg/mL NTG for 60 min treatment, the 6 fast-growing colonies (Chlorella sp. NCTU1 to Chlorella sp. NCTU6) after NTG treatment were selected on pH 11.5 agar plates by NaOH addition. When the 6 fast-growing colonies were cultured in pH 10 medium in 250 mL-flask at 100 rpm, 100 mol/m2/s light intensity and 28±1℃, the biomass productivities of Chlorella sp. NCTU1 to Chlorella sp. NCTU6 were

0.045, 0.017, 0.023, 0.013, 0.035 and 0.025 g/L/d, respectively. Chlorella sp. NCTU1 was further cultured in pH 6, 7, 8, 9, 10 and 11 medium with air aeration in 1-L photobioreactor (PBR), the maximum biomass concentration of Chlorella sp. NCTU1 was 1.326 g/L in pH 10 medium for 7-days cultivation. In pH 11 medium the Chlorella sp. NCTU1 grew well before 3-days cultivation, after that the Chlorella sp. NCTU1 entered stationary phase of growth. However, the growth of Chlorella sp. WT was significantly inhibited as initial pH > 8 medium, and microalgal growth was not obtained in pH 11 medium. When the Chlorella sp. NCTU1 and Chlorella sp. WT cultured with air aeration in initial Ph higher than 8 medium, the pH medium was increased to 10-11 after 7-days cultivation. Compared with the specific growth rate of alkali-tolerant mutant strain Chlorella sp. NCTU1 and Chlorella sp. WT strain in different pH medium with air aeration, specific growth rate of Chlorella sp. NCTU1 in pH 6 - 11 medium was 2- to 11-fold higher than Chlorella sp. WT. When the initial pH of medium was higher than 8 with air aeration in microalgal cultivation, the difference of biomass productivity and specific growth rate was increased with initial pH. The maximum difference of specific growth and biomass productivity between Chlorella sp. NCTU1 and *Chlorella* sp. WT was reached at pH 10. These results show that *Chlorella* sp. NCTU1 could grow well in pH 8 - 10 medium and the optimal pH is 10.

This study demonstrated that the alkali-tolerant mutant strain *Chlorella* sp. NCTU1 can grow well in alkaline medium, which can capture more CO2 for microalgae growth. However, the further studies are still needed to investigate the optimal operation strategy of using alkaline medium on the microalgae cultivation to obtain the more CO2 fixation efficiency and microalgal biomass production.

Session 4

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

Afternoon, August 21, 2017 (Monday)

Time: 15:30~16:30

Venue: 304

Session 4: 4 presentations-Topic: "Energy Science and Engineering"

Session Chair: Prof. Kokyo Oh

E0010 Presentation 1 (15:30~15:45)

Hydrocarbon Prospectivity of Cendrawasih Bay Area

Citra Nurwani, Zulfikar Imran, Chalid Idham Abdullah, Suci Nurmala Mulyati and Dicky Rahmadi Aprillian

SKK Migas

Abstract-Cendrawasih Bay area is one of area in eastern Indonesia with hydrocarbon prospect, it covers Cendrawasih Basin and North Waipoga/Memberamo Basin. Several wells have been drilled in this area since 1973 resulted hydrocarbon indication, either oil and gas show and gas. Those wells drilled with Memberamo Formation and Makats Formation as their primary target, some targets show moderate maturity hydrocarbon. The result of drop core oil analysis and geochemistry analysis help the identification of source rock maturity which is show that the best reservoir and source rock in this area is Memberamo Formation (Memberamo-E). Existing exploration data shows that this area have maturity problem. 3D seismic acquisition and processing, geological modelling, drop core oil analysis and geochemistry analysis could identified more about the maturity and organic content of the hydrocarbon source rock. This area have a high potential of hydrocarbon, weather thermogenic or biogenic.

Afternoon, August 21, 2017 (Monday)

Time: 15:30~16:30

Venue: 304

Session 4: 4 presentations-Topic: "Energy Engineering and Geology"

Session Chair: Prof. Kokyo Oh

E0002 Presentation 2 (15:45~16:00)

Comparison between Theoretical and Practical Compression Capacities of Deep / Long Piles in Dubai

Mohamed Nabil Omar and **Abid Abu Tai**

British University in Dubai/Engineering Department, Dubai, U.A.E

Abstract- In most standards and codes of practice, the piles specifications and recommendations are stated for short piles which has a maximum depth range between 18.0 to 20.0 m [708.66 to 787.40 in]. In addition, the theoretical equations for pile design, charts and different soil parameters are based on old practical studies of short piles behavior. In this research, a comparison was conducted between the theoretical pile compression capacity, the practical pile compression capacity which is derived from the results of pile's static load test and the numerical pile capacity by using PLAXIS 2D software.
The study covered one case of bored piles constructed in Dubai, that pile depth is equal to 34 m [1338.58 in]. Moreover, a finite element model done by using PLAXIS 2D software, to judge between the practical and theoretical pile capacities. As a result of the research, the theoretical compression pile capacity was almost 70% of the practical and numerical pile capacity with the same specifications.

Afternoon, August 21, 2017 (Monday)

Time: 15:30~16:30

Venue: 304

Session 4: 4 presentations-Topic: "Energy Engineering and Geology"

Session Chair: Prof. Kokyo Oh

B3002 Presentation 3 (16:00~16:15)

One Pot Green Synthesis and Characterization of Trimetallic oxide CuCrNiO NPs using Eryngium campestre leaf extract

Zahra Vaseghi, **Omid Tavakoli** and Ali Nematollahzadeh

University of Tehran, Iran

Abstract- Trimetallic oxide CuCrNiO nanoparticles (NPs) were successfully synthesized from their precursor salts including $CuSO_4.5H_2O$, $Cr(NO_3)_3.9H_2O$, and $Ni(NO_3)_2.6H_2O$ in a facile and green method using aqueous leaf extract of *Eryngium campestre* as reducing and stabilizing agents. NPs were characterized using UV-vis spectroscopy, FTIR, EDX, XRD, and FESEM showing that trimetallic oxide NPs were synthesized in the form of nanoplates with the thickness of 18.73 nm and crystallite size of 17.39 nm.

Afternoon, August 21, 2017 (Monday)

Time: 15:30~16:30

Venue: 304

Session 4: 4 presentations-Topic: "Energy Engineering and Geology"

Session Chair: Prof. Kokyo Oh

E0013 Presentation 4 (16:15~16:30)

GIS-Based Decision Making Model for Road Maintenance with VB .Net for Kabul City Roads

Fardeen Nodrat and Kang Dongshik

Graduate School of Engineering and Science, University of the Ryukyus, Nishihara-Cho, 903-0213, Okinawa, Japan

Abstract-Afghanistan is facing monumental challenges in dealing with road maintenance. Based on a survey conducted in 2009 by JICA, from the total of 183.2 km secondary/city roads, 16.8 km, 11.5 km and
154.9 km are in fair, poor and very poor conditions respectively. Currently, a technology based road maintenance model is an essential need of the government. Considering the problem, ArcGIS have the
capabilities of analyzing, collecting, storing, manipulating, displaying editing vector and raster data and VB .Net language programming beside having so many resources is a fast and easy way to produce .Netbased suitable applications. In order to show the effectiveness and better adoption with ArcGIS, the developed model will be coded as ArcGIS environment and merge with the GIS platform. The aim of this research is to develop a decision-making model with VB .Net and using it in ArcGIS platform which we could produce road network and thematic maps and prioritize the road maintenance activities. For better using and planning of the budget a deterioration model will be consists of the model.

Poster Session

August 21, 2017 (Monday)

Time: 8:50~17:00

Venue: 305

B2004 Poster Presentation 1 (8:50~17:00)

High Efficiency Dye-sensitized Solar Cells Based on Aligned ZnO Nanowire

Ming-Cheng Kao, Ruey-Gwo Chung, Hone-Zern Chen, Kai-Huang Chen, San-Lin Young, Jen-Bin Shi and Cheng-Ying Lu

Hsiuping University of Science and Technology, Taiwan

Abstract-Aligned ZnO nanowires have been deposited on ITO-coated glass substrates by using the hydrothermal deposition method for application as the work electrode for dye-sensitized solar cells (DSSC). The compact ZnO thin films were prepared by sol-gel methods on ITO-coated glass substrates as the buffer layer between the ZnO nanowire and the ITO conducting substrate. The effects of immersion concentrations (5mM, 10mM, and 20mM) on the microstructure, morphology and optical properties of ZnO nanowire were studied. From the results, the length and surface area of ZnO nanowire increases with increasing the concentrations of solutions from 5mM to 20 mM. The increases in length and surface area of ZnO nanowire can increase adsorption of the N3 dye through ZnO layers to improve the short-circuit photocurrent (Jsc) and fill factor (FF), respectively.

Poster Session

August 21, 2017 (Monday)

Time: 8:50~17:00

Venue: 305

B3004 Poster Presentation 2 (8:50~17:00)

Review of Sewage and Sewage Sludge Treatment in Korea

Hee Jung Kim, Ji Ye You and Chan Jin Park

Department of Energy and Environment. Engineering, Incheon National University, Republic of Korea

Abstract-China's economic growth rate has averaged 9.7% annually since the 1970s.However, unlike the increase in economic growth, water shortage and water pollution, which are getting worse day by day, are increasingly threatening socio - economic development. About 700 million people drink contaminated water with drinking water. It is a very serious problem in China that contaminated water is continuously used as drinking water. Therefore, mature sewage treatment technology is an important component of municipal sewage treatment system, so it is necessary to develop sewage treatment process gradually.

Therefore, China's sewage treatment business needs to be improved with the introduction of high-tech overseas. At present, China has favorable policies only in the fields of sewage treatment and sewage disposal, which require technical expertise, and the rest are dominated by local government-owned enterprises. [3]

With the rapid economic growth of China, demand for sewage treatment is expected to grow, and the sewage treatment plant constructed with China's own technology is expected to continue to support the Chinese government in the future. [6]

South Korea achieved 92.1% penetration rate of sewage into the advanced countries through the 1st National Sewage Comprehensive Plan (2007 ~ 2015) through continuous expansion of sewage treatment facilities. The establishment of a sewerage system for sewerage systems, expansion of public sewage treatment facilities to improve sewage maintenance, enhancement of sewage management, improvement of sewerage management and management, improvement of sewerage management, establishment of water resources circulation utilization system, sewage treatment technology and sewage sludge treatment The technology has already reached a high level.

Japan has implemented projects such as semi-reclamation, food waste disposal, and water purification facilities in Asian countries. Also the Japanese government plans to promote the development of long-term recycling technologies and has called and implemented these plans as the LOTUS project (2004 ~ 2007). [15]

Therefore, it would be better to look for ways to incorporate these Korean and Japan technologies with China's current situation.

Poster Session

August 21, 2017 (Monday)

Time: 8:50~17:00

Venue: 305

B0027 Poster Presentation 3 (8:50~17:00)

MICROBIAL ELECTRO SYNTHESIS OF BIO-ALCOHOLS THROUGH REDUCTION OF DIFFERENT CONCENTRATIONS OF ACETIC AND BUTYRIC ACIDS USING MIXED CULTURES.

Jose Gavilanes and **Booki Min**

Environmental Biotechnology Laboratory for Water and Energy, Kyung Hee University Global Campus, Yongin City-South Korea.

Abstract-Bio-alcohols production through the reduction of acetic and butyric acids using microbial electro synthesis systems (MES) has shown higher production rates and efficiency enhancement than conventional fermentation process. Though, since it is well known that high concentrations of organic substrates could inhibit the microbial metabolism; it is worth and a challenge to find an appropriate initial substrate configuration which achieves the better performance of the system. The aim of this work is to assess the behavior of the MES under different volatile fatty acids concentrations and estimate a close approach to the best initial input concentration of these organic acids for the operation improvement.

Four double compartment MES were operated in batch mode with 1.5V applied external voltage and adjusted pH of 5 at the beginning of the operation, the reactors were fed with different amounts of an equitable mixture of acetic and butyric acids (1:1 ratio). The initial concentrations were 2, 4, 6 and 8 g/l COD and the analysis procedure was focused in the changes and products observed in the cathodic compartment.

pH variation was followed as a key parameter since alcohol generation happens in the most efficient way at low values around 5, this study found that at lower initial COD (2, 4 g/l), the pH increased from 5 to 7 in less than 5 days and substrate degradation was around 50 and 75 % respectively, while for the higher concentrations (6, 8 g/l), the same pH variation doubled the time and the acids degradation was 88 and 75% respectively. Based on alcohol analysis, it was found small amounts of methanol, propanol and negligible amounts of ethanol within 10 days of operation; moreover, after 25 days it was not observed further substrates degradation. Bio-alcohols generation was being observed within few days after the inoculation.

Methane generation was observed when the catholyte pH raised to values around 6. Current generation showed higher values as 0.4 mA when 4 and 6 g/l COD were used, which means more intense microbial activity under these concentrations of substrate. The pH changes affect significantly to alcohols generation due to the development of methanogens.

Dinner	
18:00	**Restaurant**

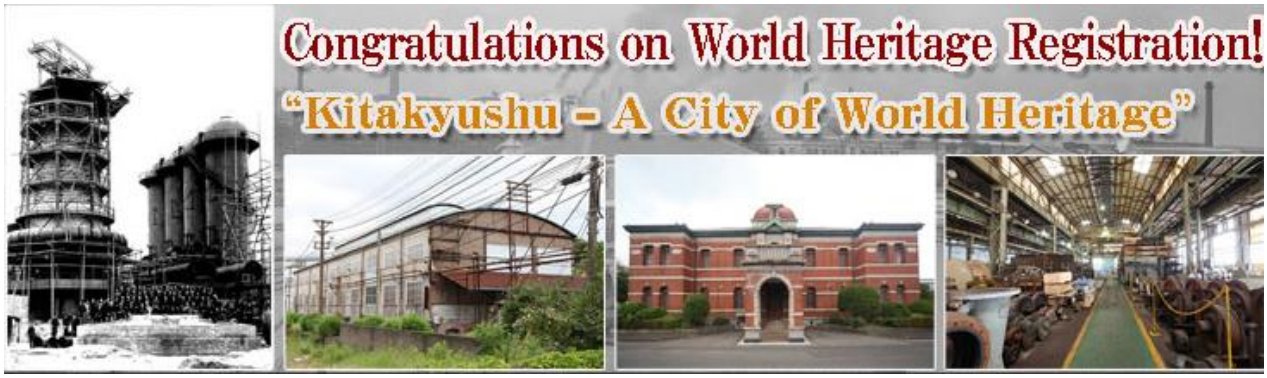
Half Day Academic Visit

August 22, 2017 (Tuesday) 9:30~11:30

Kitakyushu Eco-Town Tour

Address: 1-1 Jonai, Kokurakita-ku, Kitakyushu 803-8501 JAPAN

http://www.city.kitakyushu.lg.jp/english/file_0040.html



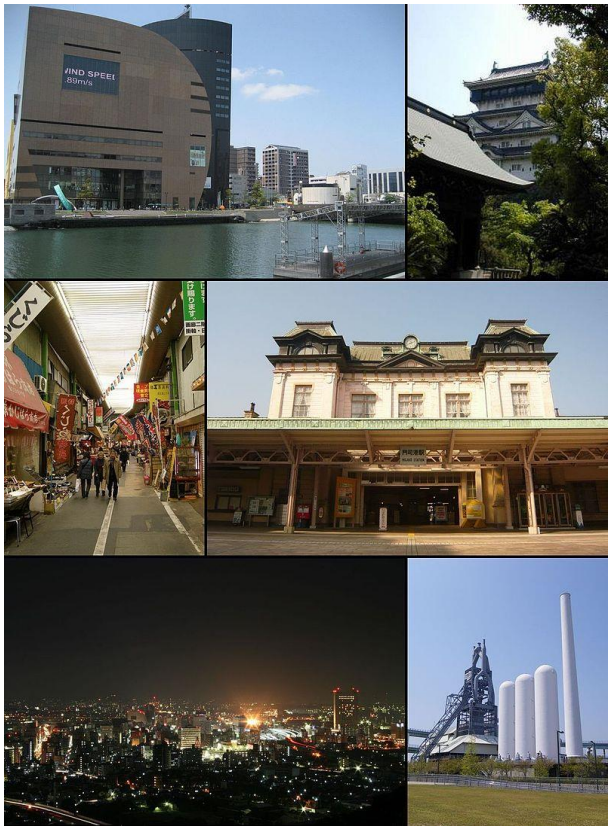
9:30 ---11:30 Visiting the Kitakyushu Eco-Town Tour

The City of Kitakyushu has been encouraging environmental industries, the reduction of waste products. The goal of the "Eco-Town Project" is to create a recycling-orientated society.
At the Kitakyushu Eco-Town Center, to help educate people about recycling and reusing, there is an exhibition that displays and introduces the various Eco-Town enterprises and also tours of the recycling plants.

12:00~13:30 Lunch

Half Day City Tour

August 22, 2017 (Tuesday) 13:30~17:00



Kitakyushu (Japanese: 北九州市 Hepburn: Kitakyūshū-shi, lit. "North Kyushu City") is one of two designated cities in Fukuoka Prefecture, Japan, together with Fukuoka, with a population of just under 1 million people.

The city of Kitakyushu was founded on February 10, 1963 and was designated on April 1, 1963 by government ordinance. The city was born from the merger of five municipalities (Moji, Kokura, Tobata, Yahata and Wakamatsu) centered around the ancient feudal city of Kokura. The city's symbol mark is a flower with the character "north" (北 kita) in the middle and five petals representing the towns that merged.

Kokura Castle (小倉城 Kokura-jō) was built by Hosokawa Tadaoki in 1602. It was the property of the Ogasawara clan (from Harima) between 1632 and 1860. The castle was burnt down in 1865 in the war between the Kokura and Choshu clans.

Hiraodai (平尾台, lit. Flat Tail Plateau) karst plateau and Mount Adachi (足立山 Adachi-san) in Kokura Minami ward and Mount Sarakura (皿倉山 Sarakura-san) and Kawachi Dam (河内貯水池 Kawachi-chosuichi) in Yahata Higashi ward are noted walking areas with fine scenery. The limestone outcroppings on Hiraodai are said to resemble grazing sheep, so the plateau, the highest in Kyushu at 400–600 meters, is also known as the Yogun Plain. Some of the limestone caverns are open to the public.[11] The area contains the Sugao and Nanae Waterfalls. Sugao is about 20 meters. Nanae means "seven stages."

Space World is an ice rink and amusement park in Kitayusha. In November 2016 the rink froze 5,000 fish under the ice. This sparked protests and Space World apologized.

Conference Venue

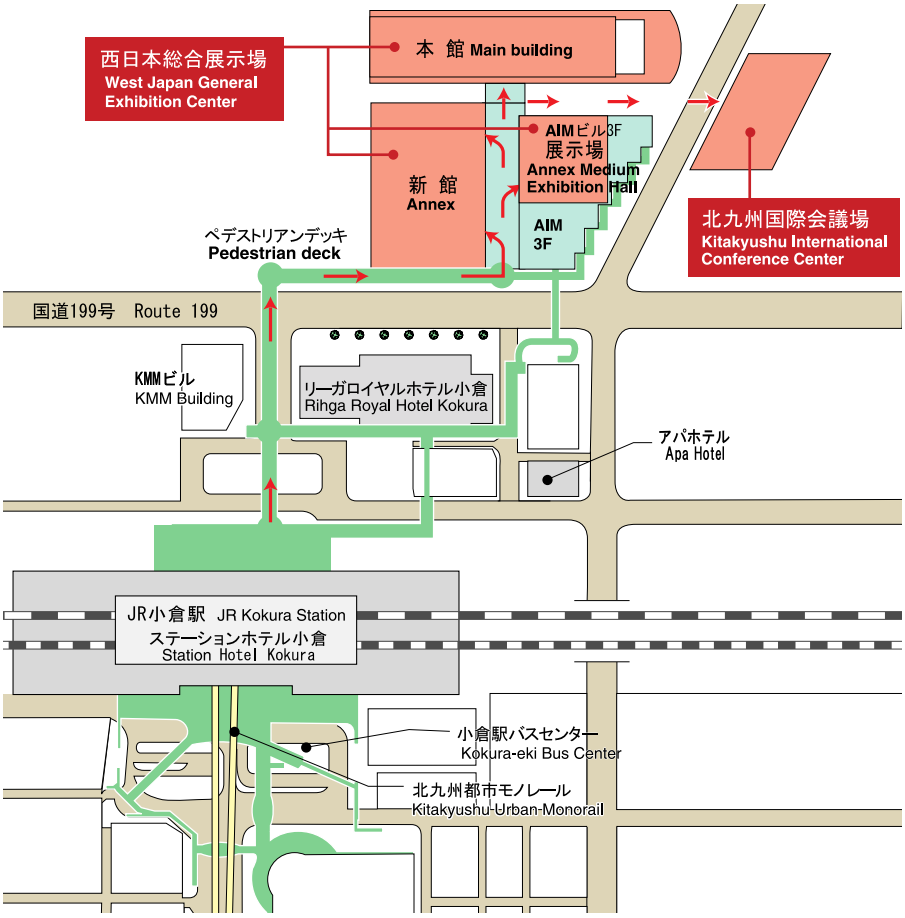
The West Japan General Exhibition Center Annex

(Address: 3-8-1 Asano, Kokurakita-ku, Kitakyushu-shi, Fukuoka 802-0001)
You can check the map and the way to School of Humanities Conference Room
http://www.convention-a.jp/en/

The West Japan General Exhibition Center Annex boasts 8,000 square meters (86,100 sq. ft.) of open floor space, the Main Building 7,000 square meters (75,340 sq. ft.), and AIM 3F and the medium hall 1,400 square meters (15,060 sq. ft.) to meet the needs of the exhibitors. The facilities allow to hold flexible full-scale trade shows and exhibitions to attract visitors.

The annex is suitable for varied special events of large scale. It can be arranged in ways that could not be realized before. High-quality conventions can therefore freely be organized.Another attractive feature is the possibility for the annex and the medium hall to be converted to three sizes (large, medium-size, small) to one's goals with high-tech specifications.Moreover, with its history and past accomplishments the main building occupies an indisputable position as pioneer among all facilities.The slogan at every facility is to 'develop new businesses and networks'

コンベンションシティ北九州市 アクセスマップ



周辺案内図

■JR …… JR小倉駅より徒歩5分
■バス …… 西鉄浅野(西日本総合展示場)バス停前
■車 …… 国道199号沿い
北九州都市高速道路
(小倉駅北ランプより1分)
(足立ランプより8分)
■フェリー …… 日明港より車10分
新門司港より車30分
砂津港より徒歩2分
■飛行機 …… 北九州空港より
路線バス約40分
(小倉駅バスセンター下車)
車 約30分

Access

Train
5 minutes from JR Kokura Station on foot
Bus
In front of Nishitetsu Asano bus stop
(West Japan General Exhibition Center)
Vehicle
Along route 199
Kitakyushu Urban Expressway - 3
(1 minute from Kokura-eki Kita Ramp)
Ferry
10 minutes from Hiagari Port by car
30 minutes from Shin-Moji Port by car
2 minutes from Sunatsu Port on foot
Airplane
40 minutes from Kitakyushu Airport by bus on regular route (getting out at Kokura-eki Bus center)
30 minute from kitakyushu Airport by car

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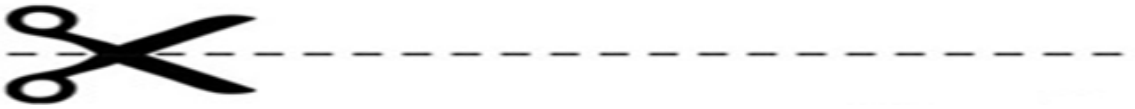

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(Please fill this form and return it to conference specialist during the conference days.)

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E-mail Address	
Area of Research	
Affiliation	

Please indicate your overall satisfaction with this conference with "√"

	Very Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Very Dissatisfied
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Presentation and Paper Value					
Registration Process					
Venue					
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Would you please specify the main reason for attending this conference?	
Did the conference fulfill your reason for attending?	Yes– Absolutely □ Yes- But not to my full extent □No□ (If "No", please tell us the main reason)

Would you please list the top 3 to 5 universities in your city?	
Other Field of Interest	
Any Other Suggestions/Comments	

Thank you for taking time to participate in this conference evaluation. Your comments will enable us to execute future conferences better and tailor them to your needs!