[003]Bulletin 2015

出版情報：Green Asia Bulletin. 3, pp.1-, 2015. Kyushu University Program for Leading Graduate Schools Advanced Graduate Program in Global Strategy for Green Asia
バージョン：
権利関係：

Kyushu University Program for Leading Graduate Schools
Advanced Graduate Program in Global Strategy for **Green Asia**

BULLETIN 2015 Vol. 3 October

Contents

Kyushu University Program for Leading Graduate Schools
Advanced Graduate Program in Global Strategy for **Green Asia**

Jun-ichiro Hayashi
Professor, Institute for Materials Chemistry and Engineering

Preface

Time flies. Three years has already passed since our Advanced Graduate Program in Global Strategy for Green Asia was selected by MEXT and started in 2014. In applying our program to MEXT, we embedded an idea of what the program ought to be (i.e., an ideal). That was 'economic growth consistent with resource/energy saving' in the future Asia. I would like to consider this ideal again.

The economic growth (normally, that in GDP) is mandatory, as far as we live in the capitalist society. The Japanese economy has long been in depletion and deflation since 1997, mainly due to repeated adoption of wrong policies that could be based on wrong economics, as claimed by a Novel Prize winner, Dr. Paul Krugman. Abenomics for three years, finally, could not change the situation greatly. In 1998 the annual number of the suicides jumped up by about 10,000. Such higher number has been in continuation. Thus, depletion/deflation kill people. It is generally agreed that our societies are in the process of 'globalization' that maximizes global flow of capitals, product/service and labor force. Now, not few people are starting to suspect the idea that the globalization is inevitable evolution of the worldwide society. In fact, it is reasonable to say 'Euro system was a huge-scaled international social experiment of globalization, and it is failing without solution of problems.' Our program declares 'Global Strategy for Green Asia' which should be different from the strategy of the above-criticized Globalization. It would therefore be time for us to consider 'Global Strategy for Green Asia' and intensify/strengthen the current curriculum.

A correct or better economic policy may increase GDP, but may not be enough. Innovation, in other words, a sequence of development of new technology/system, its implementation in the society, and then the sustainable market development is really needed. Dr. Marriana Mazzucato has demonstrated in her world bestseller book 'The Entrepreneurial State' great importance of collaboration/linkage among industry, academia and government for the innovation. University researchers (including graduate students) in science/engineering normally study 'specific' or 'very specific' science and/or technology. But, it may be time for at least some researchers to start collaboration with social scientists as well as industrial engineers and policymaker in design of near/far future society and technology assessment, which could extract technologies and systems which we really need in the future. I believe that our Green Asia Program, which is under development and improvement, has a potential for development of 'top-down' type human resources for the society design and technology assessment/prediction toward innovation.

'Energy/resource saving' is equivalent with 'productivity improvement.' You may claim that another phrase such as mitigation of GHGs or that of CO_2 (for protecting global environment) is better. But, I believe we should keep the original words. For these 15–18 years, there is no clear trend of increasing global temperature while more than 80 global climate models predict steady increase in the temperature. The big gap between the prediction and reality lets us say that we do not have scientific proof of global warming due to troublesome CO_2. On the other hand, challenge to minimized consumption of fossil resources must be welcome from a viewpoint of energy/resource security, which is a basis of our lives. The energy/resource consumption is not a simple function of technology performance, but determined by total logistics of product/service and social structure. Again, talents who tackle the social design and innovation are needed. Can our program contribute to development of such human resources?

In view of the above, I believe that our Green Asia Program has a potential of pioneering a new academic field by integrating science and engineering with social sciences, and producing pioneers.

Program for Leading Graduate Schools

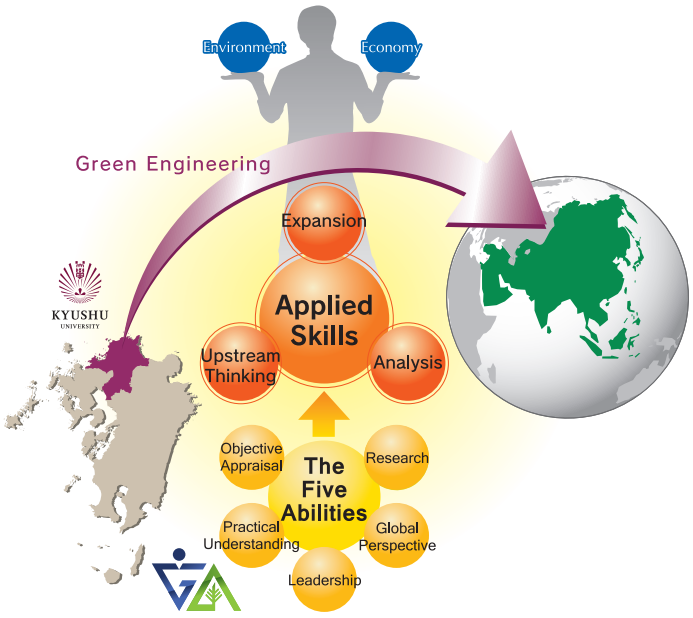
The Program for Leading Graduate Schools seeks to recruit talented individuals with traits of creativity and foresight who can play an active role in government, industry, and academia on a global scale. Our program offers a first-rate education, and trains students to work across a wide spectrum of platforms. With this approach, we are supporting a radical reformation of the graduate school system in Japan, and promoting the formation of a future-oriented renowned educational institution. Kyushu University Interdisciplinary Graduate School of Engineering Sciences (IGSES) and the Department of Earth Resources Engineering (SG Eng), Graduate School of Engineering, have teamed up to build a unique curriculum for this particular program.

Graduate students who are engaged in one of the three specialized research fields: materials science, system engineering, and resources engineering, will also study environmental science, basic sociology and economics. In addition, with the knowledge and practical experience gained domestically and overseas, students will be able to attain the five key competencies of research, practical understanding, global perspective, objective appraisal, and leadership, and to build a human resource network in Asia at the end of their studies at - "Advanced Graduate Program in Global Strategy for Green Asia".

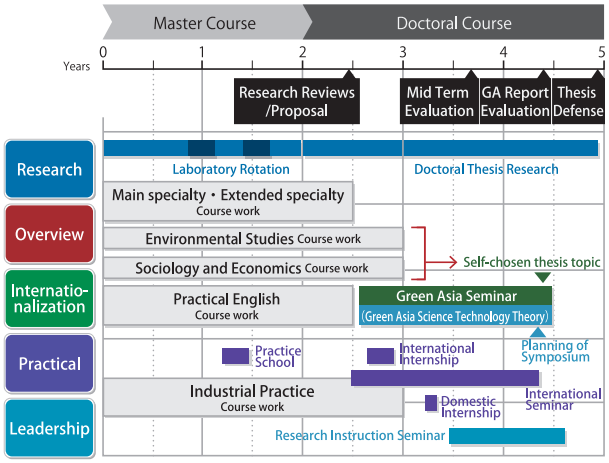
Energy Innovation from Asia to the World Leadership Program in Science and Technology

Our educational program aims at developing leadership in science and engineering to realize a balanced greening and economic growth in Asia. The entire world faces the challenge of maintaining positive economic growth, while drastically reducing resource consumption. Asia encompasses a large cultural and social diversity, and it is a typical melting pot model of an area with complex economic and environmental problems.

An effective strategy was never implemented for countries to accomplish sustainable economic growth while dealing with environmental and resource restrictions related to mass consumption of fossil fuels. In this century, the role of our country is to develop a global model, which distinguishes itself from the existing model to realize a Green Asia. Negative influences from globalization have emerged, such as the ever-widening gap between the rich and poor, rapid energy consumption in Asia and fossil resources price hike. The Global Strategy for Green Asia is a flexible approach based on social, industrial, and economic factors that are derived from Asian and Oceanian history and culture. Such an approach with a strong global network may generate a synergistic effect between greening and growth.

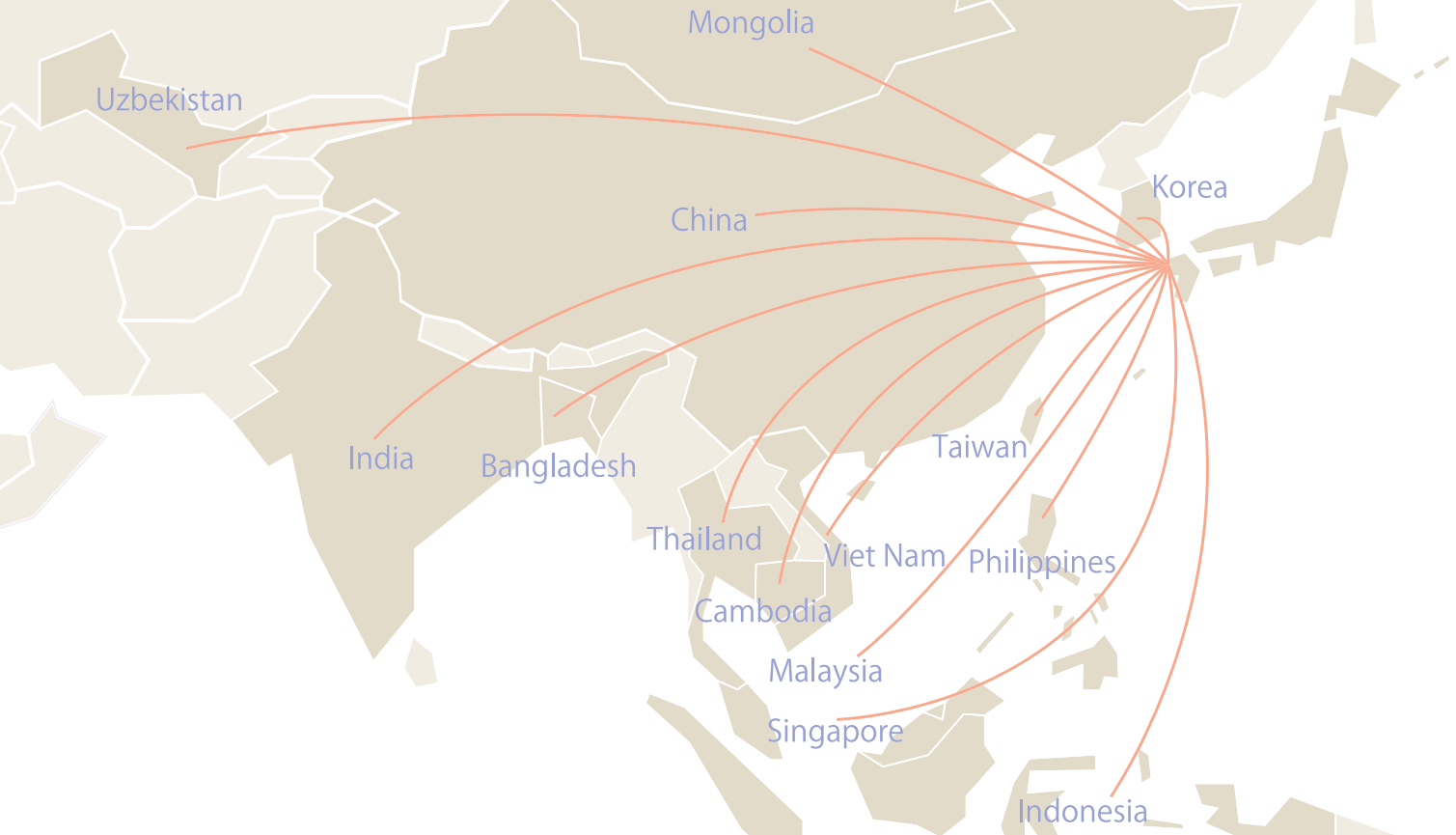


Green Asia Program Educational Model



Partner Organizations

The three departments (Applied Science for Electronics and Materials, Molecular and Material Sciences, and Advanced Energy Engineering Science) from the Interdisciplinary Graduate School of Engineering Sciences and the Department of Earth Resources Engineering from the Graduate School of Engineering are the four pillars of this program, which partner with research institutions within Kyushu University, as well as private sectors, local governments, and academic institutions overseas. Moreover, we have an extensive partnership network with six main collaborative institutions overseas and forty six collaborative institutions in the Asian region, which is a significant characteristic of our program.



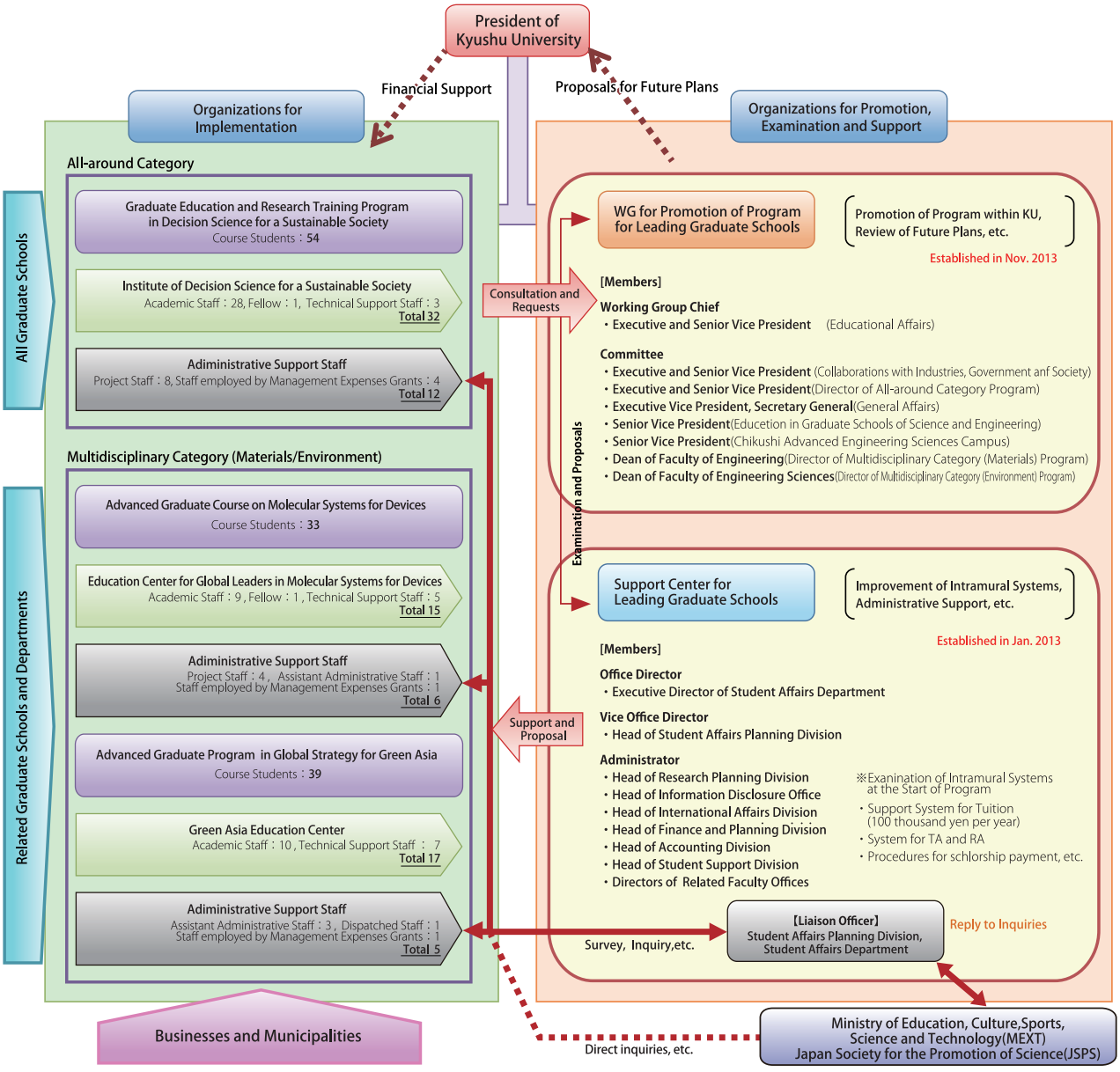
Kyushu University

Government-Industry-Academia Partnerships

Program for Leading Graduate Schools Implementation, Promotion and Support System in Kyushu University

Advanced Graduate Program in Global Strategy for Green Asia, along with the other two programs for leading graduate schools of Kyushu University, is positioned as a strategic project for promoting its graduate schools reform, including their internalization. Under the guidance of the Kyushu University President, a strong system for implementation, promotion and support of leading graduate schools has been built, which is comprised of Organizations for Implementation and Organizations for Promotion, Examination and Support (WG for Promotion of Program for Leading Graduate Schools and the Support Center for Leading Graduate Schools).

We also engage in exchanging of opinions and views at all time with respect to the way of program management among the three programs for leading graduate schools within Kyushu University.



Domestic / International Internship

Advanced Graduate Program in Global Strategy for Green Asia gives the course students credits for the domestic and international on-the-job-training (internship) conducted outside the campus.

The purpose of the training is "to learn physically the knowledge and skills that is required in the fields of R&D and businesses". Each student determines which company or research organization he/she visits and makes a plan of their activity by him/herself in consultation with their mentors.

In addition to 'Practice School' that is conducted for about a month at a domestic company or research organization (chosen by each student) within two years after the enrollment (equivalent to the period of normal master's course), 'Domestic Internship' and 'International Internship' are conducted after the third year (equivalent to the period of normal doctoral course). The former is conducted for about two weeks (recommended to be set in the first semester of the fourth year), and the latter is conducted for one or two months (recommended to be set in the second semester of the third year).

After the internship finishes, students have to make a presentation of the results, which is a necessary condition for the recognition of credits.

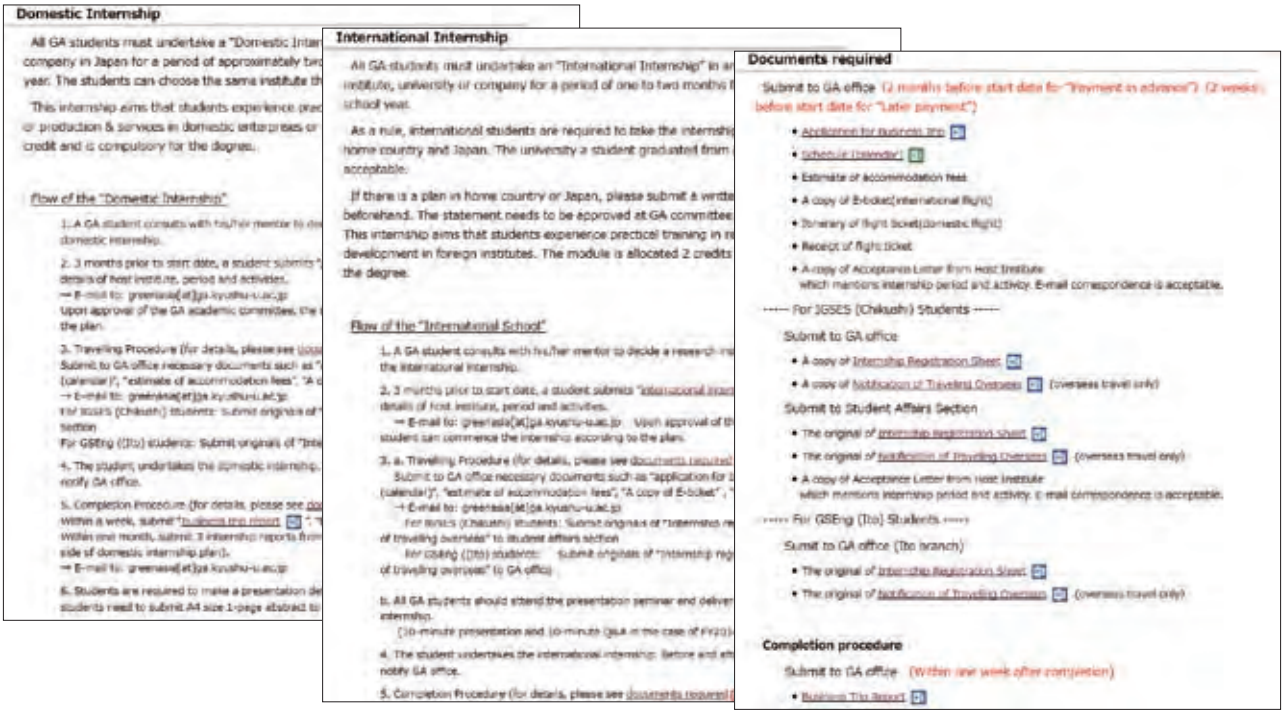
Although Practice School has already been conducted from the start of the GA program, International and Domestic Internship have started to be conducted mainly by the first batch students from the last financial year. Several students have been trying hard to learn much at companies and universities in Japan, Asia and Europe.




Internship at institutions outside is treated as a business trip, and the necessary expenses (including transportation and accommodation expenses, etc.) are covered by the GA center within the predetermined upper limit.

To ease the burden for students, GA center encourages them to apply for the internship as earlier as possible so that the center can cover the necessary expenses before their departure.

GA website contains formats and flow chart of business trip procedures at each campus, which enables students to understand the whole process easily.



Registration Form for Green Asia Subjects

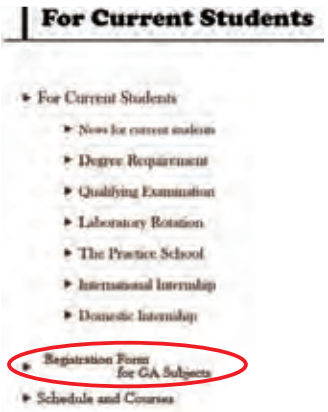
Although the Green Asia office had previously requested course students to send emails when they register for taking the Green Asia subjects, we have introduced an on-the-web registration system from May 2015, which is similar to the existing university-wide system and enables a more smooth registration process for both students and the staff.

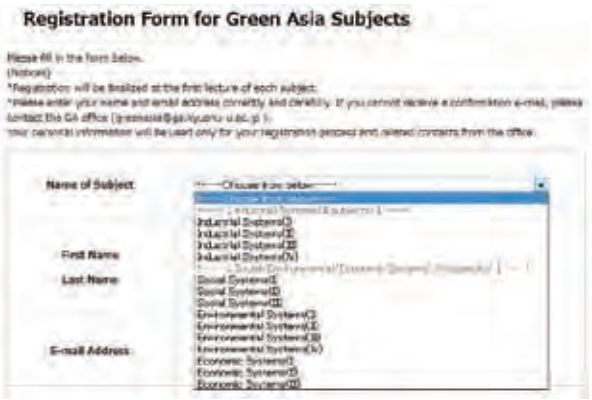
Students can use this system for 14 subjects offered by the Green Asia program. Entered data is automatically accumulated on the database, which enables us to list the data easily at any time.

Students can register their subjects by the following steps. First, students can click the "Education/For Current Students" in the top page of GA-Website, and "Registration Form for GA Subject" on the next page. Then, students can see the input form, and fill in the required information and put ‘transmit’ button.

Each student can select subjects etc. from the pull-down menu, and use a keyboard only for inputting his or her own name and student number.

Improper inputs are rejected automatically, which helps us to prevent errors, and only Kyushu University students are allowed to use this system.





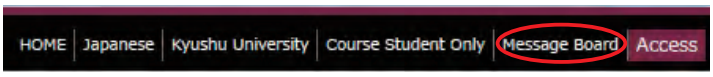
Message Board

We have launched a system called 'Message Board' in the GA homepage, on which students can submit their opinions on their study and student lives anonymously. Its operation started in August, 2015.
Although the access is limited within the campus, anonymity is fully guaranteed, and unlike usual posting system, posted messages cannot be viewed by many and unspecified persons.

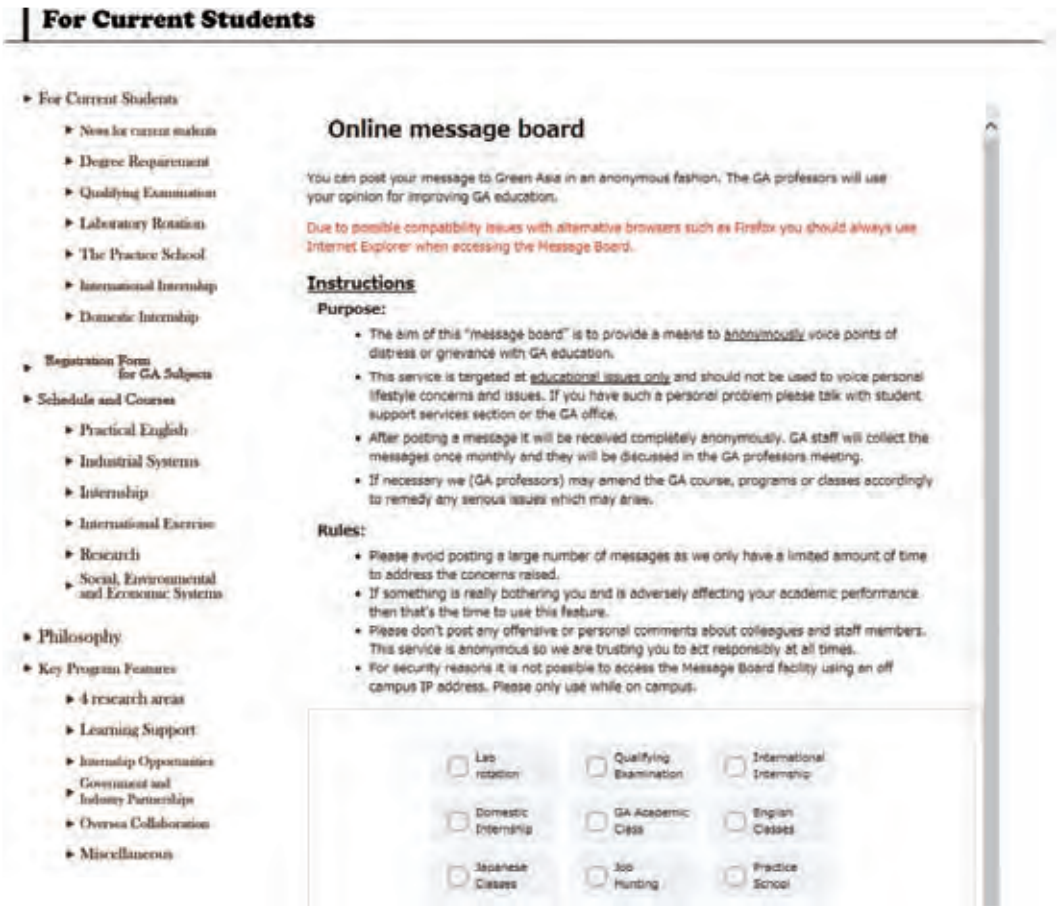
Posted messages van be viewed by limited number of teachers, and poster cannot be identified so that teachers can concentrate on problem solving.

There is a "Message Board" button on the upper right corner of GA English page, and users can login by putting the button and entering one's own id and password.

As posted contents cannot be viewed again on the web, a caution that advises users to keep a copy is displayed on the webpage.



(Login screen differs depending on the browser.)



GA Personnel

Akira Harata

Program Director
Professor, Department of Molecular and Material Sciences
Interdisciplinary Graduate School of Engineering Sciences, Kyushu University

Specialization: Analytical Chemistry
Research: Ultra-high sensitivity environmental molecular measurement; Development of new spectroscopic measurement methods; Single particle detection; Dynamic behaviors of solvent molecules including liquid molecules; Substance, structure, and orientation of molecules in aqueous media, on the surface and at the interface
E-mail: harata@mm.kyushu-u.ac.jp
Home Page: http://www.mm.kyushu-u.ac.jp/lab_07/index_e.html

Jun Tanimoto

Program Coordinator
Professor, Department of Energy and Environmental Engineering
Interdisciplinary Graduate School of Engineering Sciences, Kyushu University

Specialization: Human, Environmental, and Societal Systems
Research: Human, environmental, and societal systems; Statistical physics; Evolutionary game theory; Statistical physics; Complex sciences; Literary composition, critiques, as well as painting
E-mail: tanimoto@cm.kyushu-u.ac.jp
Home Page: http://ktlabo.cm.kyushu-u.ac.jp/e/index.html

Jun-ichiro Hayashi

Program-Vice Coordinator
Professor, Department of Applied Science for Electronics and Materials
Interdisciplinary Graduate School of Engineering Sciences, Kyushu University

Specialization: Chemical and Reaction Engineering
Research: Simulation of contribution of multi-components complex molecular-level reactions and reaction design; Heat-chemical reaction development for revolutionary carbon resource conversion and the realization of co-production; Meso- and micro-pores material solidification; Development of resource conversion methods for using polymer series gaps as reactionary sites; Development of radical-driven carbon-accelerating gas method; Hydrocarbon modification and carbon material synthesis through Chemical Vapor Deposition and Chemical Vapor Infiltration
E-mail: junichiro_hayashi@cm.kyushu-u.ac.jp
Home Page: http://www.cm.kyushu-u.ac.jp/hayashi/kn/index_en.html

Seigi Mizuno

Program-Vice Coordinator
Professor, Department of Molecular and Material Sciences
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Surface Science
Research: Structural analysis of solid surfaces using low-energy electron diffraction and scanning tunneling microscopy;Growth of surface new materials; Fabrication techniques for atomically sharpened tips
E-mail: mizuno@mm.kyushu-u.ac.jp
Home Page: http://www.mm.kyushu-u.ac.jp/lab_01/surface/home/surfaceE.html

Keiko Sasaki

Program-Vice Coordinator
Professor, Department of Earth Resources Engineering
Graduate School of Engineering, Kyushu University

Specialization: Environmental Remediation
Research: Remediation of groundwater and soil pollution; Biomineralization; Environmental materials
E-mail: keikos@mine.kyushu-u.ac.jp
Home Page: http://process.mine.kyushu-u.ac.jp/eng/index_eng.html

GA Personnel

Kiichi Hamamoto
Professor, Department of Applied Science for Electronics and Materials
Interdisciplinary Graduate School of Engineering Sciences

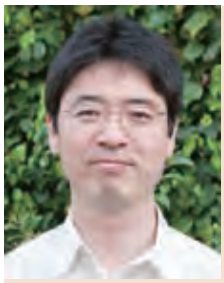
Specialization: Optoelectronics
Research: Research regarding ubiquitous optical sensing using optical waveguide gas cells; Active MMI dual-stabilizing laser accumulated memory components for optical RAM; High-output SLED from active MMI; Research regarding single-wavelength active MMI laser
E-mail: hamamoto@asem.kyushu-u.ac.jp
Home Page: http://www.asem.kyushu-u.ac.jp/ep/ep02/eng/index.html

Minoru Nishida
Professor, Department of Applied Science for Electronics and Materials
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Crystal Structure Engineering
Research: Microstructural analysis in phase transformation of crystalline materials; Development of functional materials using phase transformation; Mechanical propertics and applications of shape memory allays
E-mail: nishida@asem.kyushu-u.ac.jp
Home Page: http://www.asem.kyushu-u.ac.jp/of/of01/page40/index.html

Michitaka Ohtaki
Professor, Department of Applied Science for Electronics and Materials
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Inorganic Material Chemistry, and Industrial Physics and Chemistry
Research: Energy-saving and environmentally-compatible oxide thermoelectric conversion material; Unused waste heat energy consuming thermoelectric device; Invention of uniform low-dimensional quantum structure semi-conductor; New physical property manifested by nanostructure of single nm level; Light and energy converter material
E-mail: ohtaki@mm.kyushu-u.ac.jp
Home Page: http://www.asem.kyushu-u.ac.jp/~ohtaki/



Satoshi Hata
Professor, Department of Molecular and Material Sciences
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Metal Materials Engineering
Research: Microscopic analysis on structural material and superconducting material by transmission electron microscopy; Electron tomography
E-mail: hata.satoshi.207@m.kyushu-u.ac.jp
Home Page: http://www.mm.kyushu-u.ac.jp/lab_05/en/topE.html

Seong-Ho Yoon
Professor, Department of Applied Science for Electronics and Materials
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Materials Engineering and Carbonic Materials
Research: Carbonic resource shift; Hydrogen production; Reactionary engineering related to carbonic materials production; Research for the production of environmental catalysts using carbon nano-fibers; Deep removal of heavy oil; Research on nitrogen and metals removal
E-mail: yoon@cm.kyushu-u.ac.jp
Home Page: http://carbon.cm.kyushu-u.ac.jp/index-en.htm

Hiroshi Nakashima
Professor, Department of Applied Science for Electronics and Materials
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Semiconductor Device Engineering
Research: Elemental research and development for the realization of high-performance Ge-CMOS; Elemental research and development for the realization of onboard high-performance power devices; Crystalline evaluation of thin semiconductor films on dielectric film
E-mail: nakasima@astec.kyushu-u.ac.jp
Home Page: http://astec.kyushu-u.ac.jp/nakasima/english.htm

Hirotsugu Kikuchi
Professor, Department of Applied Science for Electronics and Materials
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Functional Molecular Engineering
Research: Construction of fusion materials using advanced mechanisms of organic molecules; Substance and understanding of frustrated liquid crystals; New model investigation; Applications for device materials
E-mail: kikuchi@cm.kyushu-u.ac.jp
Home Page: http://kikuchi-lab.cm.kyushu-u.ac.jp/eng/index.html

Shigeto Okada
Professor, Department of Applied Science for Electronics and Materials
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Non-organic and Electrical Chemistry
Research: Next-gen electric storage systems and electric storage materials with low environmental burden; Intercalation reactions; Lithium batteries; Positive electrode active materials; "Rare metal free"
E-mail: s-okada@cm.kyushu-u.ac.jp
Home Page: http://www.cm.kyushu-u.ac.jp/dv07/dv07e.html

Kungen Teii
Associate Professor, Department of Applied Science for Electronics and Materials
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Plasma Materials Engineering, Non-organic Materials and Physics
Research: Materials analysis and production of dielectric film and semiconductor film for electric devices; Vapor phase synthesis of diamond, nano-carbon, nitrous-boron, and silicon-carbide films; Investigation of reactive plasma through mass spectrometry, probe methods, and optical methods
E-mail: teii@asem.kyushu-u.ac.jp
Home Page: http://www.asem.kyushu-u.ac.jp/ep/ep02/jp/electronics_group/

Hiroki Ago
Associate Professor, Department of Applied Science for Electronics and Materials
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Materials Engineering
Research: Graphene; carbon nano-tubes; nano-electronics; crystal synthesis; surface science and self-organization
E-mail: ago@cm.kyushu-u.ac.jp
Home Page: http://nano.cm.kyushu-u.ac.jp/ago/index_ago_e.html

Yuriko Aoki
Professor, Department of Molecular and Material Sciences
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Quantum Theoretical Chemistry
Research: Development of highly-effective calculation method of the electronic state of macromolecules and solids; quantum chemistry for the material design of magnetism; conductivity and NLO properties; development of quantitative analysis method of stereoelectronic effect; theoretical chemistry on DNA and proteins
E-mail: aoki.yuriko.397@m.kyushu-u.ac.jp
Home Page: http://aoki.cube.kyushu-u.ac.jp/index_top-e.html

Hideharu Nakashima
Professor, Department of Molecular and Material Sciences
Interdisciplinary Graduate School of Engineering Sciences, Kyushu University

Specialization: Structural Materials Science
Research: High-temperature deformation mechanism of crystalline materials; Grain boundary structure in crystalline materials and their mechanical properties; Crystal orientation analysis and applications for strauctural materials
E-mail: nakashima.hideharu.792@m.kyushu-u.ac.jp
Home Page: http://www.mm.kyushu-u.ac.jp/lab_05/en/topE.html

Hideo Nagashima
Professor, Department of Molecular and Material Sciences
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Organic and Polymer Synthesis chemistry
Research: Environmental harmonic chemistry; development of process use high efficiency catalyst; Organic metal compound; Carbon-metal bonding; Synthesis and analysis of dinuclear complex
E-mail: nagasima@cm.kyushu-u.ac.jp
Home Page: http://www.cm.kyushu-u.ac.jp//dv04/english.html

Shigeru Koyama
Professor, Department of Energy and Environmental Engineering
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Mechanical Engineering and Thermal Engineering
Research: Development of next generation type energy conversion system; Modification of heat pump system; Heat transfer property of carbon dioxide in supercritical and sub-critical region
E-mail: koyama@cm.kyushu-u.ac.jp
Home Page: http://www.cm.kyushu-u.ac.jp/dv10/Koyama_lab/index_e.html

Kazuhide Ito
Associate Professor, Department of Energy and Environmental Engineering
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Environmental Engineering and Public Health Engineering
Research: Indoor environmental physics; indoor environment chemistry; indoor environment microbiology; public health engineering
E-mail: ito.kazuhide.297@m.kyushu-u.ac.jp
Home Page: http://www.phe-kyudai.jp/

Aya Hagishima
Associate Professor, Department of Energy and Environmental Engineering
Interdisciplinary Graduate School of Engineering Sciences

Specialization: Urban Environmental Engineering
Research: Numerical analysis by urban canopy model, Heat island phenomenon, Ecological environmental mitigation effect, Investigation of the exchange process of heat and molecule in the atmosphere of one city, Microatmosphere observation in urban space, Wind tunnel model experiment related to the air flow pattern in urban space, Evaluation methods of sustainable designs in architecture and cities
E-mail: aya@cm.kyushu-u.ac.jp
Home Page: http://ktlabo.cm.kyushu-u.ac.jp/e/index.html

Tsuyoshi Hirajima
Professor, Department of Earth Resources Engineering
Graduate School of Engineering

Specialization: Resource Disposal Engineering
Research: Advanced carbon resource disposal and recycling; Reuse of hollow spherical particles from coal emissions; Changing wood biomass and unused, low-quality carbonized hydrogen resources into fuel; Complete recycling of concrete emissions through pyro-processing method; Development of wastewater selection processes
E-mail: hirajima@mine.kyushu-u.ac.jp
Home Page: http://process.mine.kyushu-u.ac.jp/eng/index_eng.html

Koichiro Watanabe
Professor, Department of Earth Resources Engineering
Graduate School of Engineering

Specialization: Resource Geology
Research: Construction of geographical databases; Surveys for geological damage from earthquakes; Environmental impact of resource development
E-mail: wat@mine.kyushu-u.ac.jp
Home Page: http://xrd.mine.kyushu-u.ac.jp/index_e.html

Naoko Okibe
Associate Professor, Department of Earth Resources Engineering
Graduate School of Engineering

Specialization: Resource Disposal Engineering and Environmental Remediation Engineering
Research: Isolation and use of micro-organisms for biomineralization; Development of bio-remediation technology using eosinophilic bacteria; Immobilization of arsenic using thermophilic iron-oxide bacteria
E-mail: okibe@mine.kyushu-u.ac.jp
Home Page: http://process.mine.kyushu-u.ac.jp/eng/index_eng.html

Hiroshige Matsumoto
Professor, International Institute for Carbon-Neutral Energy Research (I^2CNER)

Specialization: Solid Ionic Engineering
Research: Ion conductive solid material; Development and applied research on functional material that especially employs proton conductive solid material
E-mail: matsumoto@i2cner.kyushu-u.ac.jp
Home Page: http://www.inamori-frontier.kyushu-u.ac.jp/environment_e/

GA Personnel

Yuji Ohya
Professor, Wind Engineering, Department of Aeronautics and Astronautics
Graduate School of Engineering

Specialization: Wind Engineering
Research: Research and development of sea-based floating compound wind farms; Research and development of small high-efficiency hydroelectric systems using lens watermills; Research on effective utilization of wind energy; Research on local wind condition prediction methods
E-mail: ohya@riam.kyushu-u.ac.jp
Home Page: http://www.riam.kyushu-u.ac.jp/windeng/en_index.php

Yuji Tsuburaya
Professor, Department of Philosophy
Graduate School of Humanities

Specialization: Environmental Theory and Scientific Philosophy
Research: Contemporary and near-modern Western philosophy; Contemporary and near-modern German and French philosophy
E-mail: tsuburaya.yuji.527@m.kyushu-u.ac.jp
Home Page: http://hyoka.ofc.kyushu-u.ac.jp/search/details/K000046/english.html

Toshiyuki Fujita
Professor, Department of Economic Engineering
Graduate School of Economics

Specialization: Environmental Economics
Research: Environmental economics based on micro-economic theory; Game Theory analysis of global environmental problems; Effects of uncertainty and irreversibility in environmental policy; Self-restriction in international environmental conventions; Game Theory
E-mail: tfujita@econ.kyushu-u.ac.jp
Home Page: http://hyoka.ofc.kyushu-u.ac.jp/search/details/K000641/english.html

Kayoko Kondo
Associate Professor, Department of Design
Graduate School of Design

Specialization: Asian Regional Environmental Policy
Research: Regional development through biomass; Environmental policy in the countries of Asia; Civil environmental activism; Consumer activism research regarding sustainable living environments
E-mail: kondo.kayoko.162@m.kyushu-u.ac.jp
Home Page: http://kondolab.exblog.jp/

List of Mentors

Overseas Mentors

Prof. Md. Sekul Islam
Dean & Professor, Faculty of Engineering and Technology, University of Dhaka, Bangladesh

Prof. Nilesh J. Vasa
Proffessor, Department of Engineering Design, Indian Institute of Technology Madras, India

Prof. Rudy Sayoga Gautama
Professor, Faculty of Mining and Petroleum Engineering, Institut Teknologi Bandung,Indonesia

Prof. Megat Johari Megat Mohd Noor
Professor, Malaysia Japan International Institute of Technology(MJIIT), Universiti Teknologi, Malaysia

Prof. Kim Choon Ng
Professor, Faculty of Engineering, National University of Singapore, Singapore

Prof. Taweechai Amornsakchai
Associate Professor, Faculty of Science, Mahidon University, Thailand

Technical Mentors

Mr. Shinya Okada
Senior Executive Officer, General Manager, Shiga Plant
Deputy General Manager, Airconditioning Manufacturing Div. Daikin Industries, Ltd.

Mr. Hironobu Furukawa
Green Asia International Strategic Comprehensive Special Zone
(Director, Strategic Comprehensive Special Zone Promotion Division, Fukuoka Prefectural Government)

Dr. Tatsuro Harada
Professor, Research and Education Center of Carbon Resources, Kyushu University

Dr. Manabu Takahashi
Fellow, General Manager, Head of Sheet & Coil Lab, Steel Research Laboratories
Technical Research & Development Bureau Nippon Steel & Sumitomo Metal Corporation

Mr. Tetsuro Kamo
Technology Division Sumitomo Metal Mining Co., Ltd.

Dr. Yasushi Nakamoto
Administration & Planning Dept. Corporate Research & Development Ube Industries, Ltd.

GA Research Profiles

Yasuyuki Nakao

Research Professor, Green Asia Education Center

Specialization:
Nuclear Science, Fusion Plasma Science

Research:
Nuclear reactions in high-density matter; Inertial confinement fusion; Advanced fuel fusion

E-mail:
nakao@nucl.kyushu-u.ac.jp

Yasuyuki Nakao was previously a full professor at Kyushu University until the end of March 2013 when he retired at 64 years old. He belonged to the *Department of Applied Quantum Physics and Nuclear Engineering* (graduate course), holding an additional post at the *Department of Energy Science and Engineering* (undergraduate course). After retiring he became a part-time lecturer of physics and mathematics at several private universities within Fukuoka. From March 2014, he joined the GA program as a research professor. His current role involves various organizational duties associated with the smooth running of the program.

After passing 60 years old, Nakao's research interest moved to nuclear reactions in astrophysical circumstances rather than those on the earth. In cooperation with his Russian friend, Nakao has been studying the nuclear processes in primordial plasma, namely big bang nucleosynthesis (BBN). The main target of their research was one of the unsolved problems in BBN, *i.e.* the 'primordial lithium puzzle'— this is the sizable discrepancy (by a factor of 3) between the predicted and observed ^{7}Li abundances. Although they worked arduously and published 8 papers on this topic, their efforts were still not enough to solve the puzzle. Consequently their work continues to this day. The most-recent result is: V. T. Voronchev and Y. Nakao, "Nuclear spin polarization effects in big bang nucleosynthesis", which will appear in *Phys. Rev. D.*

Presently Nakao and Voronchev are investigating the nuclear processes within the solar core plasma. A rigorous description of the chain reaction kinetics in this plasma is one of the key issues in the development of energy generation in the Sun. Standard solar models (SSMs) depend on a nuclear reaction network operating with thermal reactions between Maxwellian particles. (The nuclei in stellar interiors are usually assumed to be in a state of thermal equilibrium, being described by the Maxwell-Boltzmann distribution of velocities.) In the solar core plasma, however, a number of non-thermal processes triggered by fast 'non- Maxwellian' particles — products of various exothermic reactions — can also take place. Voronchev recently began the simulation of non-thermal processes induced by 8.7-MeV alpha-particles born in the $p + {}^{7}\mathrm{Li} \rightarrow 2\alpha$ reaction of the *p-p* chain in the Sun. The results obtained to date demonstrate that although the amount of these fast alpha-particles is small, they can strongly enhance some reactions of the solar CNO cycle and distort its running in the outer core region (*Phys. Rev. C* **91**, 028801, 2015). For example, it has been found that one of the possible non-thermal reactions, $\alpha + {}^{14}\mathrm{N} \rightarrow p + {}^{17}\mathrm{O}$, neglected in SSM calculations can change the direction of nuclear flow in the CNO cycle and increase the ^{17}O number density up to 2 orders of magnitude. These new findings suggest that 'non-Maxwellian' nuclear processes can play an important role in the chain reaction kinetics in the Sun. To finally conclude this issue, a comprehensive analysis of various fast particle-induced reactions in the solar core is needed.

Nakao's publications during the period of 2014 to July 2015 include:

1. H. Nakaya, H. Matsuura, Y. Nakao, S. Shimakawa, M. Goto, S. Nakagawa, M. Nishikawa, "Core configuration of a gas-cooled reactor as a tritium production device for fusion reactor", *Nuclear Engineering and Design*, Vol. 271, pp. 505-509, 2014.
2. Y. Nakao, "What is nuclear elastic scattering ?", *Journal of Plasma and Fusion Research*, Vol. 91, No. 7, pp. 451-457, 2015 (in Japanese).

Bidyut Baran Saha

Professor, Green Asia Education Center

Specialization:
Adsorption Cooling and Desalination
Adsorption Fundamentals
Energy Efficiency Analysis
Heat Transfer Enhancement

E-mail:
saha.baran.bidyut.213@m.kyushu-u.ac.jp

Dr. Bidyut Baran Saha obtained his B.Sc. (Hons.) and M.Sc. degrees from Dhaka University of Bangladesh in 1987 and 1990, respectively. He received his Ph.D. in 1997 from the Tokyo University of Agriculture and Technology (TUAT), Japan. He joined to the Mechanical Systems Engineering Department of TUAT as Assistant Professor soon after finishing his Ph.D. degree and had been promoted to Associate Professor in 2000. In 2001, he joined at the interdisciplinary Graduate School of Engineering Sciences of Kyushu University and worked until 2008. In 2009, he joined to the Mechanical Engineering Department of National University of Singapore as a Senior Research Fellow and Co-PI under a NUS-KAUST special contract program. He joined to the Mechanical Engineering Department of Kyushu University in 2010 as a Professor. He joined the Kyushu University Program for Leading Graduate Schools, Green Asia Education Center in March 2013 as a professor. He has been working as a professor at the International Institute for Carbon-Neutral Energy Research (WPI-I2CNER) in the Division of Thermal Science and Engineering. His main research interests are thermally powered sorption systems, heat and mass transfer analysis, and energy efficiency assessment. He has published more than 300 articles in peer-reviewed journals and international conference proceedings. He has edited three books and holds thirteen patents. Recently, he served as managing Guest Editor for the journal of Applied Thermal Engineering and Heat Transfer Engineering and Editor-in-Chief of Evergreen. He teaches the course 'Fundamentals of Heat Transfer' for postgraduate students. His main peer reviewed journal publications during the period of September 2014 to August 2014 include:

1. A. Askalany and B.B. Saha, "Derivation of isosteric heat of adsorption for non-ideal gases", International Journal of Heat and Mass Transfer, **Vol. 89**, pp. 186–192, 2015.
2. M. Sultan, I.I. El-Sharkawy, T. Miyazaki, B.B Saha and S. Koyama, "An overview of solid desiccant dehumidification and air conditioning systems", Renewable and Sustainable Energy Reviews, **Vol. 46**, pp. 16-29, 2015.
3. M.K. Barai and B.B. Saha, "Energy security and sustainability in Japan", *Evergreen - Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy*, **Vol. 2**, No. 1, pp. 49-56, 2015.
4. A.F.M.M. Rahman, Y. Ueda, A. Akisawa, T. Miyazaki and B.B. Saha, "Study of a silica gel-water-based three-bed dual-mode adsorption cooling cycle", *Heat Transfer Research*, **Vol. 46**, No. 3, pp. 213–232, 2015.
5. S. Mitra, S.T. Oh, B.B. Saha, P. Dutta and K. Srinivasan, "Simulation study of the adsorption dynamics of cylindrical silica gel particles", *Heat Transfer Research*, **Vol. 46**, No. 2, pp. 123–140, 2015.
6. B.B. Saha, I.I. El-Sharkawy, T. Miyazaki, S. Koyama, S.K. Henninger, A. Herbst, C. Janiak, "Ethanol adsorption onto metal organic framework: Theory and experiments", *Energy*, **Vol. 79**, pp. 363-370, 2015.
7. A.A. Askalany and B.B. Saha, "Experimental and theoretical study of adsorption kinetics of Difluoromethane onto activated carbons", *International Journal of Refrigeration*, **Vol. 49**, pp. 160–168, 2015.
(One of the Most Downloaded Articles of Int. J. Refrig.)
8. I.I. El-Sharkawy, K. Uddin, T. Miyazaki, B.B. Saha, S. Koyama, H.S. Kil, S.H. Yoon and J. Miyawaki, "Adsorption of ethanol onto phenol resin based adsorbents for developing next generation cooling systems", *International Journal of Heat and Mass Transfer*, **Vol. 81**, pp. 171–178, 2015.
9. M. Alkhair, M. Y. Sulaiman, K. Sopian, C. H. Lim, E. Salleh, S. Mat and B.B. Saha, "Design and Modeling of One Refrigeration Ton (RT) Solar Assisted Adsorption Air Conditioning System", *ASME, Journal of Solar Energy Engineering*, **Vol. 137**, pp. 011005-1-011005-9, 2015.
10. A. Chakraborty, B.B. Saha and Y.I. Aristov, "Dynamic behaviors of adsorption chiller: Effects of the silica gel grain size and layers", *Energy*, **Vol. 78,** pp. 304-312, 2014.
11. B.B. Saha, Y. Takata and S.S. Murthy, "Special issue: Selected papers from the International Symposium on Innovative Materials for Processes in Energy Systems 2013 (IMPRES2013)", *Applied Thermal Engineering*, **Vol. 72**, pp. 151-152, 2014.
12. K. Thu, Y.D. Kim, A.B. Ismail, B.B. Saha and K.C. Ng, "Adsorption Characteristics of Methane on Maxsorb III by Gravimetric Method", *Applied Thermal Engineering*, **Vol. 72**, pp. 200-205, 2014.
13. K. Uddin, I.I. El-Sharkawy, T. Miyazaki, B.B. Saha, S. Koyama, H.S. Kil, J. Miyawaki and S.H. Yoon, "Adsorption characteristics of ethanol onto functional activated carbons with controlled oxygen content", *Applied Thermal Engineering*, **Vol. 72**, pp. 211-218, 2014.
14. A.A. Askalany, B.B. Saha, and I.M. Ismail, "Adsorption isotherms and kinetics of HFC410A onto activated carbons", *Applied Thermal Engineering*, **Vol. 72**, pp. 237-243, 2014.
15. K. Habib, B.B. Saha and S. Koyama, "Study of various adsorbent-refrigerant pairs for the application of solar driven adsorption cooling in tropical climates", *Applied Thermal Engineering*, **Vol. 72**, pp. 266-274, 2014.
16. M.W. Shahzad, K.C. Ng, K. Thu, B.B. Saha, W.G. Chun, "Multi effect desalination and adsorption desalination (MEDAD): A hybrid desalination method", *Applied Thermal Engineering*, **Vol. 72**, pp. 289-297, 2014.

Hiroshi Furuno

Associate Professor, Green Asia Education Center

Specialization:
Organic Chemistry

Research:
Fine organic synthesis; Asymmetric catalysis; Rare earth metal complex catalyst, Environmentally-friendly synthetic method; Reusable catalyst; Self-organized polymeric complex catalyst; Ionic liquid as reaction media; Chirality sensing and probing

E-mail:
furuno.hiroshi.770@m.kyushu-u.ac.jp

Hiroshi Furuno received his Ph.D. degree in 2000 from Kyushu University under the supervision of Professor Junji Inanaga, Institute for Fundamental Research of Organic Chemistry (IFOC), Kyushu University. After spending a year (2000) as postdoctoral fellow at Venture Laboratory in Kyoto Institute of Technology, he was appointed as Research Associate at IFOC. He moved to Institute for Materials Chemistry and Engineering (IMCE) as Research Associate in 2003 due to the reorganization of IFOC, and then became Assistant Professor in 2007. In March 2013, he joined to Advanced Graduate Program in Global Strategy for Green Asia as Associate Professor at Green Asia Education Center.

His research has mainly focused on developing new functional molecules such as metal complexes or organic catalysts and utilizing them for fine organic syntheses, particularly environmentally-friendly ones. He has been trying to develop recoverable and reusable homogeneous or heterogeneous catalyst systems based on Lewis acid or Lewis acid–base catalysis with rare earth metal complexes.

Andrew M. Spring

Assistant Professor, Green Asia Education Center

Specialization:
Synthetic Organic Chemistry Polymer Chemistry
Polymer Characterization
Electro-optic Materials

E-mail:
spring@cm.kyushu-u.ac.jp

Dr Andrew M. Spring obtained his MChem (1st class, Hons) from the University of Hull, England in 2005. He then moved to the University of Manchester, England to undertake a PhD degree under the supervision of Prof Michael L. Turner, completing it in early 2010. After which he travelled to the University of Florida, USA in mid-2010 to accept a position as a postdoctoral research associate with Prof John R. Reynolds. Upon developing a strong interest in the Japanese research ethos and culture, he moved to Fukuoka, accepting a position as a postdoctoral research associate at Kyushu University in 2011 with Prof Shiyoshi Yokoyama. After the creation of the Green Asia Education Center, he accepted a position as an assistant professor from 2013 to this current date.

Andrew is a synthetic organic/polymer chemist who is currently focussed on the design, preparation and evaluation of novel electro-optic (EO) polymeric materials. An organic EO polymer can provide a high EO coefficient (r_{33}) >100 pm/V, an ultrafast EO response time, a very low dispersion of up to 250 GHz, and facile compatibility with other materials. As a consequence of these outstanding properties, EO polymers are perfect candidates for utilization in telecommunications technology as a means to enlarge the bandwidth and because of their excellent compatibility with state-of-the-art complementary metal oxide semiconductor (CMOS) fabrication techniques. The EO affect quantifies the relationship between the refractive index change (Δn) of a material upon application of an electric field (E). The magnitude of this change is related to the materials EO coefficient (r_{33}) as described by the equation: $\Delta n=-1/2n^3 r_{33}E$.

An optimal EO material must exhibit a large EO coefficient, high optical transparency, thermal stability, temporal stability and a good solubility. It is possible to meet all these key requirements by the use of poly(norbornene-dicarboximide) (NDI) homopolymers, copolymers and polymer brushes. The academic interest in poly(norbornene-dicarboximides) (poly(NDI)s) has increased substantially as a consequence of their favorable thermal, mechanical and optical properties, giving them a range of practical uses in optics. Provided that the cyclic monomers exhibit a high ring strain and low steric hindrance, ring opening metathesis polymerization (ROMP) allows the preparation of well-defined homopolymers, random copolymers, block copolymers and polymer brushes. His publications thus far in 2015 are as follows;

1. "A hybrid electro-optic polymer and TiO2 double-slot waveguide modulator", Qiu Feng, Spring Andrew M, Maeda Daisuke, Ozawa Masa-aki, Odoi Keisuke, Otomo Akira, Aoki Isao, Yokoyama, Shiyoshi* - *Scientific Reports*, 2015, 5, 8561.

2. "An analysis of the structural, thermal and optical characteristics as well as the electrical resistivity of tert-butyldiphenylsilyl substituted poly(norbornene-dicarboximide)s", Andrew M. Spring, Daisuke Maeda, Masaaki Ozawa, Keisuke Odoi, Feng Qiu, Kazuhiro Yamamoto and Shiyoshi Yokoyama* - *Polymer*,2015, 56, 189-198.

3. "Athermal and High-Q Hybrid TiO2-Si3N4 Ring Resonator via an Etching-Free Fabrication Technique", Qiu Feng, Spring Andrew M and Yokoyama, Shiyoshi* - *ACS Photonics*, 2015, 2(3), 405-409.

4. "Glass transition temperature control by poly(norbornene-dicarboximide) copolymers", Andrew M. Spring, Daisuke Maeda, Masaaki , Ozawa, Keisuke Odoi, Feng Qiu, Kazuhiro Yamamoto, Shiyoshi Yokoyama* - *Polymer Bulletin*, 2015, 72(3), 503-521.

Yuuichi Orimoto

Assistant Professor, Green Asia Education Center

Specialization:
Quantum Chemistry, Theoretical Chemistry

Research:
Development of highly-efficient calculation method for the electronic structure of huge bio-molecules; Development of quantitative analysis method of intra-molecular orbital interactions (stereoelectronic effects etc.); Quantum chemistry based design of conductive, magnetic, and non-linear optical organic materials

E-mail:
orimoto.yuuichi.888@m.kyushu-u.ac.jp

My academic background is quantum chemistry, that is, a "chemistry" based on quantum mechanics. In the field, the behavior of electrons is studied. If one can acquire a relationship between the molecular structure and the corresponding electronic properties by the study, the functions of the system can be designed from a microscopic standpoint. This type of computational design can reduce the number of trial and error in the experiments and considered as an environmentally-friendly approach. However, even now, there are still many difficulties in the conventional quantum chemistry calculations. In this situation, my research purpose is to develop new theory & methodology beyond the conventional calculation method. I'm performing the research in Y. Aoki's group in IGSES, Kyushu University as my research basis. In recent years, I'm interested in the artificial DNAs and its potential application to an electronic material. Now, I'm investigating the influence of various modification (inclusion of metal complex, accepter/donor group, etc.) to the properties of DNAs such as conductive, ferromagnetic, non-linear optical properties. And, I'm developing new method for analyzing the electronic property of the artificial DNAs and its mechanism. For the reference, required skills in our field are chemistry (especially microscopic viewpoint), quantum mechanics, programing (e.g. FORTRAN on the Linux system), and so on. Finally, I'd like to say I'll do my best for the GA education; don't hesitate to ask me when you have any question and anxiety about GA program.

Hajime Miki

Assistant Professor, Green Asia Education Center

Specialization:
Mineral Processing, Hydrometallurgy, Electrochemistry

Research:
Leaching and flotation behavior of sulfide mineral with electrochemical method

E-mail:
miki@mine.kyushu-u.ac.jp

Hajime Miki graduated Ph. D course in Hokkaido University on 2002. Then worked as postdoc in Murdoch University in Australia, Perth for 9 years then in Universidad Catolica Del Norte in Northern Chile in Antofagasta city. Main and consistent research theme is recovery of valuable metal from sulfide minerals with hydrometallurgical process. Hydrometallurgical process is not popular in Japan but this method is widely used in Gold, Aluminum, Copper and Zinc as mining on-site recovery process.

Currently belongs to mineral processing and environmental remediation laboratory in Earth Resource System Department in Kyushu University under Professor Tsuyoshi Hirajima and Professor Keiko Sasaki. Separation process of valuable mineral from raw ore is called as mineral processing and this laboratory is one theme of this. Long history of mining is also history of environmental pollution. This is another theme of this laboratory.

Publication:

1. Mutia Dewi Yuniati, Tsuyoshi Hirajima, Hajime Miki, Keiko Sasaki, Silicate Covering Layer on Pyrite Surface in the Presence of Silicon–Catechol Complex for Acid Mine Drainage Prevention, Materials Transactions, M-M2015821, 2015.08.
2. Tsuyoshi Hirajima, Masanori Mori, Osamu Ichikawa, Keiko Sasaki, Hajime Miki, Mohsen Farahat, Mitsuru Sawada, Selective Flotation of Chalcopyrite and Molybdenite with Plasma Pre-treatment, Minerals Engineering,Vol.66-68,pp.102-111,102-111,2014.11.
3. Osamu ICHIKAWA, Tsuyoshi Hirajima, Masanori MORI, Keiko Sasaki, Hajime Miki, Mitsuru SAWADA,XPS and AFM Analysis of Plasma Oxidized Chalcopyrite and Molybdenite for New Selective Flotation Technique, International Conference on Biological, Civil and Environmental Engineering (BCEE-2014),P244,2014.03.
4. Akinobu IGUCHI, Hajime MIKI, Tsuyoshi HIRAJIMA, Keiko SASAKI, Mitsuru SAWADA, The Effect of Solution Potential and Silver Ion Addition on Dissolution Rate of Enargite, International Symposium on Earth Science and Technology 2014 (CINEST),2014.12.04.
5. Hidekazu MATSUOKA, Tsuyoshi HIRAJIMA, Keiko SASAKI, Hajime MIKI, Mitsuru SAWADA, Electrochemical Treatment of Molybdenite and Chalcopyrite, International Symposium on Earth Science

and Technology 2014 (CINEST),2014.12.04.

6. Mutia Dewi YUNIATI, Tsuyoshi HIRAJIMA, Hajime MIKI, Keiko SASAKI, Silica Covering Layer on the Chalcopyrite Surface: Electrochemical Behaviors and Depression Effect on Copper-Molybdenum Flotation, International Symposium on Earth Science and Technology 2014 (CINEST),2014.12.04.
7. Hajime MIKI, Tsuyoshi HIRAJIMA, Mutia Dewi YUNIATI, Keiko SASAKI, Suppression of Pyrite and Arsenopyrite Oxidation by Silica Coating: Electrochemical aspects and the mechanism, XXVII International Mineral Processing Congress (IMPC 2014),2014.10.20.
8. Tsuyoshi HIRAJIMA, Masanori MORI, Osamu ICHIKAWA, Keiko SASAKI, Hajime MIKI, Mitsuru SAWADA, Selective Flotation of Chalcopyrite and Molybdenite by Surface Oxidation, XXVII International Mineral Processing Congress (IMPC 2014),2014.10.20.

Keisuke Yamamoto

Green Asia Education Center
Assistant Professor, Ph. D (Engineering)

Specialization:
Semiconductor Device Engineering

Research:
Development of elementary process technology for realizing high-performance Ge-CMOS, SiC power device. Electrical evaluation of semiconductor structures.

E-mail:
yamamoto.keisuke.380@m.kyushu-u.ac.jp

Research topic (Keywords: Ge, SiC, metal-semiconductor contact, MOSFET)

- Technology development for Ge CMOS device and photonic device

  In order to progress IT society, high performance electronic device with low power consumption is strongly required. In place of silicon (Si), germanium (Ge) is received great interest as a new semiconductor material because Ge has higher mobility and its bandgap corresponds to near-infrared wavelength which is used for optical communication. I study process technology of Ge for application of Ge electronic and photonic devices.

- R&D of SiC electronic device for high temperature operation

  Silicon carbide (SiC) is a candidate material for future power devices because its bandgap is larger than that of Si. On the other hand, its large bandgap would be able to realize semiconductor device at high temperature environment, like near a heat engine. If a SiC-based logic device is actualized, a power device including a logic-circuit could be downsized on a chip. I study development of the fundamental process technology for SiC-based logic device.

For the past one year, I have accepted a GA course student for laboratory rotation program and researched together concerning above topics.

➢Shin Sakiyama (3rd batch student, research term: June – Aug 2015)
Research theme: Fabrication and characterization of Ge-on-Insulator structure

Recent publications

Electrical and structural properties of group-4 transition-metal nitride (TiN, ZrN, and HfN) contacts on Ge
Journal of Applied Physics (Accepted)
K. Yamamoto, R. Noguchi, M. Mitsuhara, M. Nishida, T. Hara, D. Wang, and H. Nakashima

Fabrication of PtGe/Ge contacts with high on/off ratio and its application to metal source/drain Ge p-channel MOSFETs
Jpn. J. Appl. Phys., Vol. 54, No. 7, pp. 070306-1-4 (2015)
Y. Nagatomi, S. Tanaka, Y. Nagaoka, K. Yamamoto, D. Wang, and H. Nakashima

Direct band gap electroluminescence from bulk germanium at room temperature using an asymmetric fin type metal/germanium/metal structure
Appl. Phys. Lett., Vol. 106, No. 7, pp. 071102-1-3(2015)
D. Wang, T. Maekura, S. Kamezawa, K. Yamamoto, and H. Nakashima

Takashi Watanabe

Assistant Professor, Green Asia Education Center

Specialization:
Modern western philosophy

Research:
Environmental philosophy concerning scientific uncertainty and ignorance; Philosophy of science

E-mail:
watanabe.takashi280.@m.kyushu-u.ac.jp

Research Profile

I obtained my Master of Literature qualification in 1998 from Kumamoto University. The title of thesis was *Study on the Origin of Good and Evil in Rousseau*. After graduation, I continued my studies focusing more specifically on Rousseau's political philosophy. I was awarded my PhD in 2006 from Kyushu University, the title of thesis was *A Study Concerning the Fundamental Structure of Rousseau's Political Philosophy*. I kept studying Rousseau's political philosophy especially his unique idea: the general will in social contract. The interpretation of the relation between individual's conscience and general will which has provoked heated and continuous arguments among researchers was also my chief concern. While I was in the doctoral course, I started to address my research to the environmental problems, which have recently become a greater concern for modern society.

After graduation, I started my teaching career in university at several universities around Fukuoka area. I had been at Kyushu University, Kurume University, Seinan Gakuen University and other colleges as a part time lecturer. I taught at these universities mostly environmental philosophy. Through discussions with students from various academic fields at that time, for example economics, jurisprudence, sociology and the arts, I noticed that the environmental problems are not as simple as we learn in schools and discuss in public; even experts in academic areas seemed underestimate the complexity and depth of the problems. They are in fact exceedingly intertwined with numerous elements in diversity that attracted my attention and led me to investigate the general structure of the environmental problems from a viewpoint of environmental philosophy and philosophy of science.

I joined the Green Asia Education Program (GA) in January 2013. After joining the GA, my main research field has gradually shifted to the environmental phenomenology and the environmental ethics. The GA is an education program for graduate students in the field of science and technology, which was an excellent opportunity for a researcher like myself whose research subject is concerned with factual scientific activities.

Current research:

My research interests are now mainly centered on the area of thoughts concerned with the relation between the environmental problems and the application of scientific knowledge to nature. In the research the environmental problems are reflected on from a viewpoint of modern western philosophy. Recently, I am generally interested in Husserl's phenomenology and his successors' works especially Heidegger's phenomenological thoughts on technology. More recently, my research is focused on the concept of scientific uncertainty and its surrounding ideas such as ignorance from a viewpoint of the environmental phenomenology.

Ignorance is a relatively newly introduced idea which is now attracting researchers' interest with respect to the explanation of unexpected catastrophe supposedly derived from the application of scientific knowledge and its products to the environment. Although we already have two cardinal measures for the protection of the environment in the form of risk assessment and the precautionary principle, they seem to be subjected to certain flaws due to scientific uncertainty. For example, (1) scientific uncertainty may cause unknown effects in the environment when certain technology is implemented to protect it, (2) the degree of impact of these unknown effects can result in the extinction of all living things including human beings, and (3) it is almost impossible to eliminate scientific uncertainty no matter how science/technology will advance in the future.

A crucial aspect of these flaws is that some of them seem to occur due to ignorance, which is known as an epistemological blind spot. Ignorance is generally considered as a sort of scientific uncertainty, which is the main reason for taking a precautionary approach. However, unlike scientific uncertainty which is commonly discussed in the field of science, when ignorance is concerned, any precautionary approach on the basis of scientific knowledge can become useless except in its extreme form, such as completely suspending the application of science/technology in any form whatsoever. This type of extreme argument is inevitable so long as we take ignorance into consideration. The difficulty of the problem lies here; the more non-realistic and abstract the problem becomes, the less significance the argument has even though the problem itself is crucially important for the future management of the environmental deterioration.

Tomoaki Watanabe

Assistant Professor, Green Asia Education Center

Specialization:
Comparative Environmental Politics, International Relations

Research:
International Environmental Politics, Basel Convention on Transboundary Movement of Hazardous Waste, Global Governance on Environmental Standard

E-mail:
watanabe.tomoaki.384@m.kyushu-u.ac.jp

His current research interests include global environmental politics, the Basel convention on transboundary movement of hazardous waste, and political process of the European Standardization System on the product design for environment.

He is a member of Japan Association for Environmental Law and Policy, Japan Association of International Relations, Japanese Political Science Association, and Japan Association of Global Governance.

<Publications>

Watanabe Tomoaki (2015) "The Humanities and Social Sciences in Graduate Engineering Education: A case in the Green Asia Program at Kyushu University." The 2015 JSEE Annual Conference, International Cooperation in Engineering Education, International Session Proceedings, pp. 20-24.

Watanabe Tomoaki (2015) "(Book Review) Green, Jessica F., Rethinking Private Authority: Agents and Entrepreneurs in Global Environmental Governance." *Evergreen*, Vol. 2 No. 1, pp. 57-58.

<Conference Presentation>

Watanabe Tomoaki (2014) "Does Politics Create Pollution Haven?" International Political Science Association, 23rd World Conference (Montreal, Canada) ,July 22, 2014.

Naoko Mae

Assistant Progessor, Green Asia Education Center

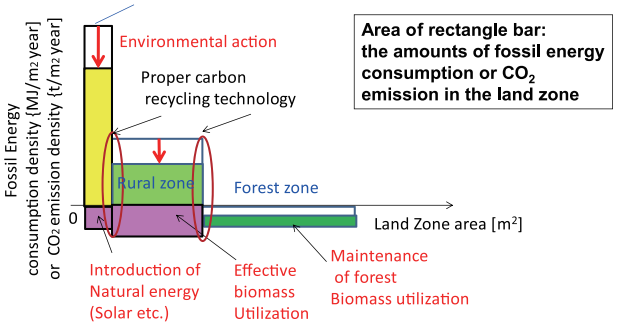
Specialization:
Sociology, Environmental System

Research:
Development of methods for energy and environmental assessment, Design of community for low carbon recycle-based society, Theory of internet community

E-mail:
mae.naoko.065@m.kyushu-u.ac.jp

My name is Naoko Mae, an assistant professor of Green Asia Education Center. I study "Development of a New Environmental Index and Design of the Local Community for Leading Sustainable Society" from the view point of integration of arts and sciences as a PhD thesis. In the thesis, I addressed it is essential to link effectively among technology, policy making, and action in order to build up a sustainable society.

To realize it, the following new methodologies are required: (1) Estimation method of local energy cost with technological options, (2) Design of low carbon emission life by smart utilization of household products, and (3) Promotion of effective environmental actions based on local community. From this viewpoint, I suggested new index of the environmental evaluation, new diagram for consideration of both energy and cost and estimation method for the value of environmental action. In addition I studied the analysis of the formed factor of intimacy in the internet community, and the examination of local environmental friendly community combined with real and internet communities for promoting environmental action.



Green Asia Short Term Fieldwork Assignment - March 2015

Andrew Mark Spring, GA assistant professor

From March 10th 2015 an assortment of approximately 40 Kyushu University (KU) staff and students embarked on a short term fieldwork assignment to Bangkok Thailand. The first event involved a visit to the Phayathai campus of Mahidol University (MU) which was located in downtown Bangkok. The day's activities were focussed on a series of presentations by students and staff of both KU and MU. A sizable delegation of MU students attended the seminar and participated actively.

After a brief introduction of MU by the Dean, Prof. Skorn Mongkolsuk, the activities and research focus of the Faculty of Science were also discussed. This was followed by an introduction of Green Asia (GA), Novel Carbon Resource Sciences (COE) and Campus Asia (CA) programs by Prof Nagashima of KU. A key note lecture by Prof Tsuji followed, entitled "synthesis of core-shell types of micelle nanoparticles in solutions and their applications."

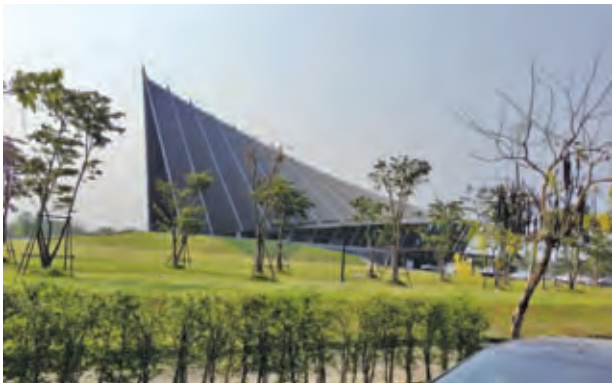
KU students on a lab tour in MU Salaya Campus.

Following a short coffee break which facilitated active discussions between the students and staff of both institutions, the lecture series was continued by Assist Prof Sunintaboon from MU who discussed the "fabrication of amine-functionalized polymeric particles and their potential applications." Next Assist Prof Spring from KU gave an overview of the "recent innovations in electro-optic polymeric materials and chromophore design." After lunch the afternoon session began, which was primarily focussed on student participation. A total of 8 students delivered their research presentation of 10 minutes duration, each followed by a short discussion. The delegation then split into 2 groups, the GA staff accompanied the KU and MU students on a laboratory and Phayathai campus tour, while the remaining KU Profs discussed their research collaborations with MU colleagues. Overall it was a very productive day, enjoyed greatly by all those who participated.

The Collage of Music building from MU Phayathai Campus.

A group photo of KU and MU delegates outside the Faculty of Science building, MU Salaya Campus.

A group picture of all participants including the Dean of MU, Prof Skorn Mongkolsuk.



A stunning view of the Ceremonial Hall in MU Salaya Campus.

The 12th of March involved a short excursion to MU Salaya campus which was located on the outskirts of the capital. This was a very modern, fresh and innovative looking campus with beautiful architecture and large landscaped grounds. After arrival at the Faculty of Science building we received a brief introduction regarding the history of this new campus by the Assistant Dean, Associate Prof. Taweechai Amornsakchai, followed by a more specific overview of the Department of Chemistry Polymer Group and its research activities by the Program Director, Prof. Pranee Phinyocheep. KU was also initially introduced by Prof Koyama leading up to his key note lecture entitled "research and development of alternative refrigerants for heat pump and air-conditioning systems in japan." Prof. Siwaporn Meejoo Smith. of MU then presented her research into the "thermoelectric properties of non-sintered carbon nanotube/sodium cobalt oxide composite."

Following a short coffee break, the student centred afternoon session began which involved presentations by 13 students in total. Each student was allowed 10 minutes to present followed by a short Q&A session. Upon the conclusion of the afternoon session, the KU delegation embarked upon a laboratory tour of the Chemistry Department and a trip by bus around the campus grounds. All members of the KU delegation were left with an excellent impression of Mahidol University. The academic and English ability of the Thai students was exceptional, giving us all a renewed motivation for the continuing globalization of KU.

KU students participating in the Daikin Industries Thailand Q and A session.

The 2nd part of the short term fieldwork assignment involved a visit to the Daikin Industries Thailand factory which was organized by Prof Koyama. During this highly interesting and educational excursion, the KU delegation firstly received a brief introduction of the background, product line and future potential of the Daikin Thailand plant by the Daikin managerial staff. Upon completion of a very active Q&A session we were divided into two groups (Japanese and Overseas) and embarked upon a detailed and comprehensive factory tour. During this tour a Daikin staff member carefully explained the various aspects of production, and how the Japanese concept of "Kaizen" had been successfully applied to each stage in order to enhance the efficiency of the overall process. The tour was greatly enjoyed by all those who attended and left us with an excellent impression of Daikin Industries Thailand.

The remaining day (March 14th) included a chance for the KU delegation to experience the various aspects of Thailand's rich and vibrant culture, as well as the numerous important historical sites in and around Bangkok.

Daikin Industries Thailand staff giving a short presentation followed by a Q and A session with KU students.

GA domestic factory tour (Nippon Steel & Sumitomo Metal Corporation, Fujikura, Daikin)

Yuuichi Orimoto, GA assistant professor

A domestic factory tour visiting three Japanese global companies was held on March 17-20, 2015 as a part of an oversea short trip for GA industrial system subject. In this tour, we visited the nation's largest core industrial plants regarding iron manufacture, optical fiber, and air-conditioning apparatus fields in a single trip, and had an opportunity to hear various stories about research and development. Total 46 participants including 27 GA course students, 12 GA-RA students, and 7 academic staffs spent the fulfilling time, and it became the largest GA domestic tour in history on its scale.

On March 18, we visited the Kimitsu Works and Futtsu Research & Engineering (RE) Center of the *Nippon Steel & Sumitomo Metal Corporation* (NSSMC) in Chiba Prefecture.

The Kimitsu Works is about 15 minutes bus ride away from the JR Kimitsu station. After getting the instruction of the Works, a factory tour starts by making 2 groups using a bus to watch inside the Works. It was surprising that the fact that private transportation and transmigration system well developed inside the Works. For example, the cars have the specific number plate for the Work's private use. Moreover, private trains run inside the field; of course, there are private railway trucks and railroad crossing. We first visited the No.4 blast furnace. The aspects of the blast furnace from the viewpoint called "Otachi-dai" (space with a distinguished history) have tremendous impacts. Next, we headed for the hot-rolling area. We could see here a very powerful aspects that thick and huge red-hot steel plate was rolled out to more thin plate with a thundering noise and strong heat. Then, we transferred to the Futtsu RE center located about 20 minutes bus ride away from the Works. After getting the center's instruction, we visited several research points in the center. For example, the use of by-product generated in the iron

manufacturing process was researched for solving sea desert phenomenon. As the other example, the research for examining detailed composition of the materials at an atomic level to understand the strength of ironware from the microscopic viewpoint. Finally, we performed a Q&A session with 40 minutes and heard valuable stories on the care and idea regarding research and development.

On March 19, we visited the Sakura Plant of *Fujikura* well known as a company manufacturing optical fiber, conducting wire, etc.; the plant is about 10 minutes bus ride away from the JR Sakura station in Chiba Prefecture. After getting the instruction of the plant, a factory tour starts by making 4 groups using the bus in the plant. At first, we visited the fiber

spinning plant of optical fiber. In the spinning plant, a thick base material for optical fiber is stringed out from the top of the 6th floor high of the building and stretched to an ultrafine wire when it reaches to the 1st floor. Inner structure of the base material consisting of several layers is retained as it is during the process. We also saw micro-size devices for maintaining optical fibers such as a fusion splice. Many working processes

for the maintenance requiring a lot of experiences at one time were automated in these devices, and which lead to a reduced burden of daily work and the retain of working quality. At several points, we got the instruction from the company using VTR and samples. Finally, a Q&A session with around 30

minutes was held and it became a meaningful opportunity for the exchange of opinions.

In the morning of March 20, we visited the Miyako ecology center in Kyoto Prefecture. In the center, we can directly touch many displays regarding ecological wisdom and proposal for environmental problems. Furthermore, the building in itself includes many ingenuities saving energy and resources. We could feel many ideas on ecological point of view from the visit.

In the afternoon of March 20, we transferred to Shiga Prefecture and visited the Shiga factory of *Daikin* about 30

minutes bus ride away from the JR Kusatsu station. After getting the instruction from the company, a factory tour starts by making 2 groups. In the factory, we saw many automated guided vehicles running and working. And, it was surprising that there were various automatons using gravity force, inertial force, etc. to the maximum. Furthermore, various measures with "Kaizen" spirit improve well a working environment in Daikin. After that, we got the instruction of "Production of DAIKIN system (PDS)". In the system, the species and amount of the products are timely changed to the consumer's needs. The same products are not provided on the same line so that we can reduce the stock as much as possible. Finally, we make a Q&A session with around 50 minutes. In the session, the student who visited the Daikin Industries Thailand made a question about the difference between domestic and overseas bases, and it lead to the impressive discussion.

The domestic factory tour using continuous three days was a valuable activity not only for the GA students but also staffs for visiting the nation's largest industrial plants at once. We are extremely grateful to the three companies for kindly welcoming us regardless of its busy schedule.

International Forum for Green Asia 2014

Hiroshi Furuno
GA associate professor

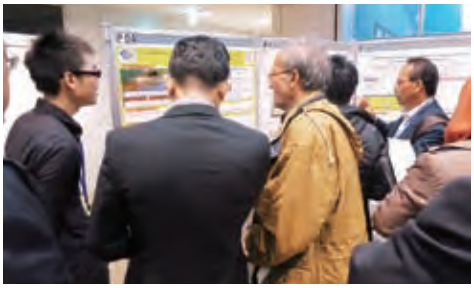
On November 28 and 29, we organized the International Forum for Green Asia 2014 at the Chikushi campus. This forum was held as a combination of two seminars, the annual international seminar of the Green Asia (GA) Program and the annual IGSES Seminar organized by the Interdisciplinary Graduate School of Engineering Sciences (IGSES) same as last. We also started the Poster Session and the Student Session by students from this forum.

In the afternoon of the November 28, after the opening remarks by Prof. Hideharu Nakashima, Dean of the IGSES, Prof. Jun Tanimoto, Vise-Coordinator of the GA Program, explained the purpose of this forum, and then Prof. Akira Harata, Coordinator of the GA Program, introduced the GA Program. Subsequently, two invited speakers who have actively conducted research and education at universities provided lectures. Prof. Tetsuo Hayashi (IGSES, Kyushu University) explained about simulation for warmer environment of houses. Dr. Mitsuaki Ueda (Institute of Advanced Research and Education, Doshisha University) introduced activities in the Program for Leading Graduate Schools of Doshisha University, "Global Resource Management". Then, third-grade students of the GA Program (first-grade Ph.D. course students) and students who had joined the GA Program as a research assistant (GA-RA students) reported findings of their researches in the Poster Session. While only fourteen students gave the presentation, participants had active discussions.

At the session in the morning of November 29, two keynote lectures were conducted. Prof. Kwadwo Osseo-Asare (The Pennsylvania State University, USA/The Nelson Mandela African Institute of Science and Technology, Tanzania) described a current state of and issues regarding resource development and environment in Africa. Mr. Seiichiro Ikeda (Vice President, CHIYODA Corporation/Board Director and Project Operations Manager, CHIYODA CCC Engineering Ltd.) introduced overseas expansion of CHIYODA Corporation as an engineering company.

In the afternoon, the Student Session was held. All students of the GA Program and the GA-RA students were divided into four groups beforehand, and appointed group leaders determined discussion topics for each group. In this session, the students discussed and debated about such topics, and then presented the conclusion. The Student Session and the Poster Session were conducted as part of subjects "International Exercise B" of the GA Program and "International Exercise" of the Global COE Program "Novel Carbon Resource Sciences", which co-hosted the forum. We also held the annual International Advisory Board Meeting during the discussion and debate time in the Student Session, and reported to professors from six collaborative institutions overseas on current activities and future plans of the GA Program.

The forum had more than a hundred participants from inside and outside Japan, and was considered a success. While we conducted this forum only in English without introducing Japanese-English simultaneous translation, we did not have a particular problem. From next year, fourth-year students of the GA Program (second-year Ph.D. course students) will take part in design, preparation and management of this forum, and thus, further improvement will be required.



Three Leading Program + Texas State University Joint Fieldwork (Okinoshima Island)

Hajime Miki, GA assistant professor

Field trip has done from 16-22nd August 2015 with three leading program (Doshisya University: Global Resource Management, Kyushu University: Green Asia, Hiroshima University: Taoyaka Program) and Texas State University Austin School (world ranking 27th). This field trip starts from last year and last year Doshisya University had organized. This year field trip was organized by Hiroshima University as joint field work with Texas State University which is close relationship. Field work was held on Okinoshima island in Shimane prefecture and theme is determined as "Renewable Energy Technology (RET) development on remote island". Contents were lectures such as situation of Okinoshima island, RET plan in Okinoshima island and visit of RET plant, students group work and presentation. Attendances are from 11 countries and total 33 students (Kyushu Uni. 4, Doshisya Uni. 4, Hiroshima Uni. 15, Texas State Uni. 10) and total 11 faculty staff (Kyushu Uni. 1, Doshisya Uni. 1, Hiroshima Uni. 7, Texas State Uni. 1, Finland Professor 1).

After stayed overnight on Saijo in Higashi Hirosima, went to Sakaiminato Port with bus followed by went to Okinoshima island with ferry. In Okinoshima Island, Opening ceremony was held then member was grouped then theme was checked. Lecture was held by Dr. Okamoto, Hiroshima Uni. about energy situation in Japan. This day students were stayed in log house on completely remote area. It seems inconvenient place but students were happy to stay there and they enjoyed swimming and walking around. Next day lecture was held by office person in Okinoshima town about situation of Okinoshima island, RET plan in Okinoshima by Chugoku Electroc, Energy situation in remote island by Dr. Kaneko, Hiroshima Uni. These lectures were consistent theme. On afternoon Saigo fire power plant and biomass beneficiation R&D plant was visited. This power plant produce most of power in this island and large fuel tank which completed recently can supply fuel stably and low cost. On biomass beneficiation R&D plant is challenging to beneficiate waste wood which produced in this island with collaboration of Mie University and it is success to produce Urushi like lacquer with low cost. After visit group work was continued inside and outside of log house. Some groups interviewed to Okinoshima people and recording movie. 3rd day is visit another island with ferry, Ama town in Nakanoshima island to see wind power plant plan and visit Nishinoshima town in Nishinoshima island to see hybrid battery plant. Wind farm will be completed on next year and this power plant will cover 30% of electricity in this island. Battery plant which must need for RET in this island is maximum size in Japan, consist from NAS battery (Na and S) and Li ion battery. Whole day of this day is for visit with ferry transport. All view is so picturesque and Kunimi beach where stop off was especially beautiful, it seems very good experience for students. Next day lecture was held about RET plan in Naruto city by WWF then RET with tourism by Professor Pedersen from Finland. On afternoon group work was held with notice from Professor Norton in Texas State University. On last day spent whole day for group work followed by group presentation. Vice mayor in Okinoshima island came to visit for us.

Member of this field trip was consist from 4 Universities and group member was mixed with different University. Students of leading program are all socialized and it is no problem to discuss with different University and different major. Also it was good study to have lecture from different position about RET and visit consistently.

We would like to express appreciation to staff in Hiroshima, Doshisya and Kyushu University to support and organize this trip. Also would like to appreciate to office people in Okinoshima island town, they always supported us.

Kunimi Beach

Biomass beneficiation R&D plant

Saigo fire power plant

Green Asia Afternoon-Colloquium 2015

Takashi Watanabe, GA assistant professor

The Green Asia Afternoon-Colloquium 2015 started as a component course of social systems Ⅲ for both master and doctoral students.

The Afternoon Colloquium is characterized by providing students with general and comprehensive knowledge including not only scientific but also a number of liberal arts fields such as economics, sociology, jurisprudence and literature. They are presented by reputed scholars and specialists from around Japan, in order to develop an advanced knowledge and understanding of the Global Society and to find common solutions to Global Problems.

Students who attend this course are required to:

1. Develop fundamental competence in comprehensive knowledge and debates in the field of science and liberal arts.
2. Develop critical thinking skills by participating and organizing debates. In particular, successful students will learn to analyze information logically and to respond to the problems in the various fields provided by presenters.
3. Communicate knowledge, reasoning and ideas clearly in written and oral forms appropriate to discuss modern Global Problems.

The final grade for the course will be determined by:

1. Attendance at least 10 sessions.
2. Submission of a short summary within 3days. The summary must be at least 400 words long, typed, 12pt Times New Roman with an A4 sheet.

The Afternoon Colloquium is held at the room 710, 7th floor of c-cube Chikushi campus and the room 531, 5th floor of No.2 West Building, Ito campus from 4 to 6 p.m., every alternate Friday if feasible.

As shown in the table below, we have already held 7 afternoon colloquia inviting renowned researchers, specialists and entrepreneurs as lecturer from various field and from around Japan.

Date	Lecturer and Department	Lecture Title	Venue
30 April	Prof. Osama Eljamal, Faculty of Engineering Sciences	Bioremediation; Biological Treatment Processes	Chikushi
25 May	Prof. Dr. Valeriy S. Maisotsenko, Idalex Inc. and Coolerado Inc.	Renewable Energy From Air: The Maisotsenko Cycle is solid basis to develop a new energy saving strategy	Chikushi
4 June	Assoc. Prof. Naoji Yamamoto, Engineering Science for Advanced energy system	Hiking	Chikushi
10 June	Prof. Nilesh J. Vasa, Department of Engineering Design Indian Institute of Technology Madras	Title: Advances in Optical Techniques for Trace Gas Sensing in Environmental Monitoring Abstract: The last decade or so has been a renaissance in the field of optoelectronics and their applications to industry, communications and medicine. Although the emphasis is being on the development of optoelectronic devices, applications of solid-state and diode lasers in sensing, environmental monitoring instrumentation have increased significantly. In the talk, recent advances in application of different optical techniques for mixed gas sensing in combustion analysis and environmental monitoring will be discussed. In addition, applications of laser induced breakdown spectroscopy technique for surface characteristics and element analysis will be discussed. Keywords: Combustion analysis, gas sensing, environmental monitoring, elemental analysis	Chikushi
3 July	Prof. Satoshi Hata, Department of Engineering Sciences for Electronics and Materials	Three-dimensional electron microscopy	Chikushi
24 July	Prof. Hiroshige Matsumoto, International Institute for Carbon-Neutral Energy Research (I^2CNER)	Hydrogen Energy	Chikushi
4 Sept.	Assoc. Prof. Akihiro Yabushita, Department of Molecular and Material Sciences	Photodissociation dynamics of water ice	Chikushi



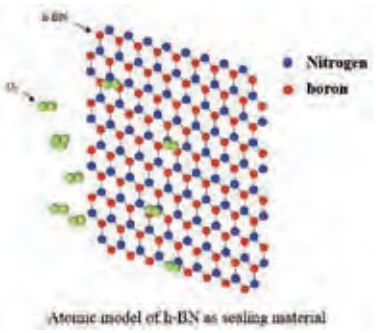
GA Lab Rotation

Third batch

Yuki Uchida

Applied Science for Electronics and Materials, M2

My name is Yuki Uchida and I am a 2nd year master student of Green Asia Program. I belong to Ago Laboratory. My research area is Nanoscience, focused in atomically thin materials. I am working on CVD growth of high-quality h-BN as insulator for a two-dimensional transistor. It's also expected as sealing material as well as the transistor. Because h-BN has good gas barrier property. To apply h-BN to a display as sealing material, I started laboratory rotation at Hattori Lab. Their major is display engineering. In this laboratory, the material is handled based on display application. Therefore, I have studied from the viewpoint I didn't have so far. It's the valuable chance to become the researcher who can judge a matter from wide knowledge and viewpoint and I stimulated every day. On the other hand, I felt that it is not easy to do many things. Thus, I need to devise more how to use time to acquire wide knowledge efficiently.



Atomic model of h-BN as sealing material

Shin Sakiyama

Applied Science for Electronics and Materials, M2

I have been conducting a lab rotation in Nakashima laboratory and Ohtaki laboratory. My main research topic in Fujita laboratory is organic semiconductor. In modern society, however, inorganic semiconductor is an essential tool to construct digital devices. I'm investigating not only semiconductor basic knowledge but also state-of-the-art (inorganic) semiconductor process technology in Nakashima laboratory. I have been studying Ge-on-Insulator device which can improve performance and power consumption of digital devices and it is completely different from my main topic in Fujita laboratory.

In Ohtaki laboratory, this lab-rotation goal is basic knowledege learning of thermoelectric conversion element. Organic thermoelectric conversion element has been extensively studied. However, my laboratory have no know-how to fabricate organic thermoelectric conversion. Recently, I fabricated a thermoelectric conversion measuring instrument.

Yuta Sato

Applied Science for Electronics and Materials, M2

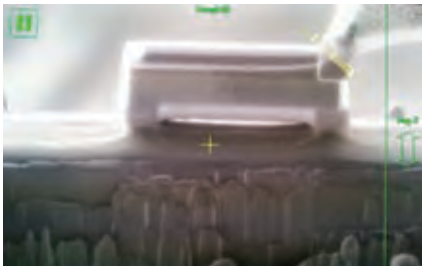
The Green Asia students have to study another three laboratories as the lab rotation during master course. We can get wide knowledge in this activities. I am studying about Extreme Ultra Violet (EUV) resources plasma in Uchino/Yamagata laboratory. EUV is expected as next generation semiconductor lithography light.

In January, I studied electrical circuit and devices in Hattori laboratory. This lab rotation became very good experience for me because I have learned electrical engineering since I was 16 years old but I have not made it in practice. In September, I am going to go to Hayashi lab as third lab rotation and I will study plasma application. Lab rotation give us opportunities with good experience.

Satoshi Takeichi

Applied Science for Electronics and Materials, M2

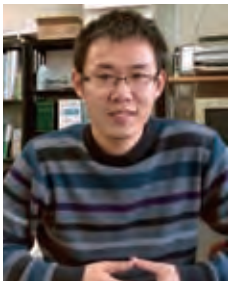
I learned about TEM and EELS measurement through laboratory rotation for the purpose of acquiring skills to analyze nanostructure of materials. These measurement is a powerful method to observe nano-range of materials directly.



In the experiment, I tried observing grain boundary of semiconductor materials which has nanostructure and revealing mechanism of electric property using TEM and EELS. Through this activity, I could learn how to prepare samples for TEM measurement, operate TEM apparatus and analyze the data given from measurement.

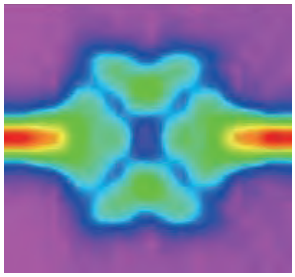
These experiences are beneficial for my future research.

GA Lab Rotation



Hong BingZhou

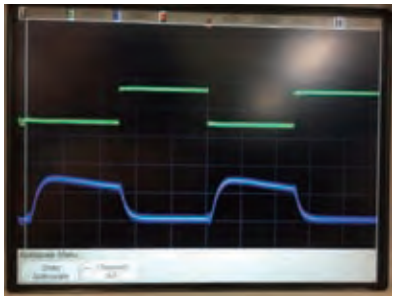
Applied Science for Electronics and Materials, M2



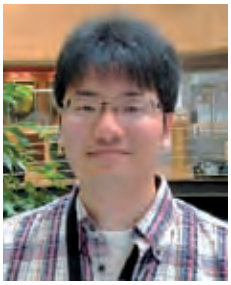
It's almost 1 year science we joined GA course. I learned a lot from events and activities held by GA staffs and members. I had the honour to be selected as one of the student representative science then. Up to now we had a regular lunch chatting every two weeks and some interesting trips occasionally. During these events, GA members knew each other better and became in good relation. Currently, I'm busy in my own research about semiconductor lasers. My work focused on the next device design. We will, however, plan more events and activities in the near future. As we GA members come from diverse culture, we will try to enhance our understanding of different culture more deeply through next plans.

Takayuki Maekura

Applied Science for Electronics and Materials, M2



I choose Hamamoto laboratory as a first laboratory rotation. The laboratory is famous about optical device such as optical sensor and optical waveguide. They have many optical characteristic evaluation systems and knowledge. Purpose of my laboratory rotation is getting knowledge and method of measurement for high frequency characteristic in photodetector. Actually, I can get some results. Photodetector could convert from optical signal to electrical signal in response to a signal. But, frequency is very low speed which is 1 kHz. So, I have to improve my device. Before first laboratory rotation, I evaluate only electrical characteristics in my device. This time, I learned about optical evaluation system. The experience is very effective to understand my next study. I plan to do second laboratory rotation in laboratory using TEM. I'll do my best there too.



Takaya Fujisaki

Molecular and Material Sciences, M2

My name is Fujisaki. I joined this program a year ago. I would like to introduce my experience of this program. There are approximately 10 foreigners and 10 Japanese students accepted to this course for each school year, and we use English as the official language in all classes and extracurricular activities. This was my first experience and therefore, this program is surely full of surprises and discoveries.

These days, I have the opportunity to utilize our characteristic curriculum and engage in an activity termed "Laboratory Rotation". This is the opportunity for all Green Asia students to join two laboratories in addition to my main laboratory. This will help to broaden my view points.

I've joined the laboratories for computational science and material science. I am especially excited by the latter which is the laboratory of Massachusetts Institute of Technology in Kyushu University. The reason why I joined is that I wanted to discuss my topic in English and with people from a leading university in the world.

This curriculum is the part of Green Asia Program, and I think that I can broaden my knowledge by stacking all curriculum. I will always be grateful for relevant parties in this course and their efforts to help me achieve my goal.

Kibria Mohammad Tawheed

Molecular and Material Sciences, M2

Hello Everyone!!!

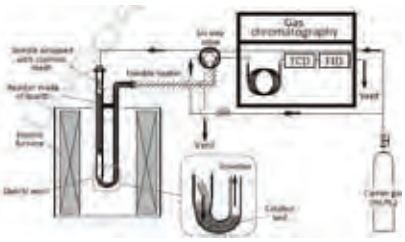
I'm Mohammad Tawheed Kibria, as a Green Asia student I'm enrolling my Master course (M1) in molecular and material science department in Kyushu University. For fulfillment of master course credit I have to conduct my research in two different laboratories excluding my major laboratory.

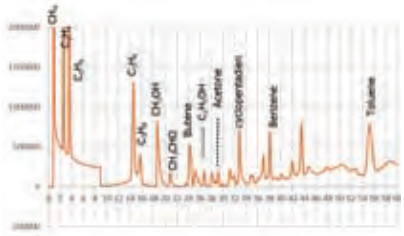
In this regard, I started my first lab rotation at Thermal Energy Conversion system Laboratory under the supervision of Prof. Bidyut Baran SAHA. This was facilitated me to gain knowledge of consolidated composite material adsorbent manufacturing process. Specifically these consolidated composite material adsorbents main application is adsorption cooling system. Consolidated composite material adsorbent was made by especially activated carbon powder, carbon nano fiber, different binder and so on. Measurement of consolidated composite material weight was done by the sophisticated weight machine and Equilibrium adsorption of the adsorbent was measured by experimental setup.

This research study will give me opportunity to study the practical application of the studied material.

Ni'mah Ayu Lestari

Applied Science for Electronics and Materials, M2



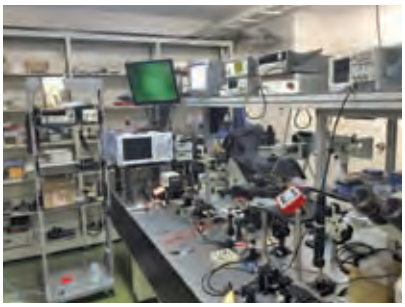


It is such a challenge for experiencing lots of activities in Green Asia program. Unlike an ordinary master course program which is only joining related lectures and conducting a research. Green Asia never fail me to love their activities more. Let the students broadening their knowledge beyond their specialties by learning other fields such as economy, social, industrial and environment. It is indeed completing our point of view about a problem. Had a chance to listen real experience from the expert who work in industry from industrial system lecture educating us on how to create a project as an engineer. The activity certainly not only take place in the class and inside campus, but also had touring in the real plant site. We spent 3 days domestic industry tour outside of Fukuoka and some students also spent 5 days overseas industry tour. And now I started already my laboratory rotation to do an experiment about the topic still related to my major research topic. It allow us to grasp a deeper understanding of research. Doing 2 labwork in parallel along with other activities is surely not an easy thing. However those are the effective way to train us managing our time and business, how to make it work effectively. And 2 months later, I have to go internship in research institute in Tokyo in order to get an experience of real work in applying our knowledge during studying.

My main research concerning about handling one of substituent in lignocellulosic biomass that is lignin. Focused on how to produce aromatic from lignin via fast pyrolysis process and reforming. Even though it is still not yet showing feasible result, I am still striving to modify the process parameter to give high yield of desired product.

Cheng Xiaoyang

Molecular and Material Sciences, M2



My name is Cheng Xiaoyang and I am a master 1st student belongs to the Advanced Green Asia Graduate Program. After one year's study process, I am grateful as one of GA Program. My major is the fabrication of waveguide devices in Yokoyama laboratory. My main topic is about the micro-ring resonator, which is a hot topic intensively due to the huge demand of the big data traffic.

In this semester, I have experience the lab rotation activity in Hamamoto sensei's lab. My lab rotation major is about setting up the voltage operational amplifier circuit to supply enough rectangular voltage wave to operate the first order mode switch of waveguide device, whose structure was used to divide the input mode into fundamental mode. During this activity, considering as a zero beginner of setting up amplifier circuit, I learnt fundamental principle knowledge of transistor, oscillator and amplifier, how to select the elements and even how to operate in actually way. I found that I have established huge interest about the circuit analog and I have really learnt a lot. Though it is still a challengeable topic for me, I am still interested into this field and will do my best to achieve my goal. I am sure that through the Green Asia Program I can achieve great experience which will be useful for my future career.

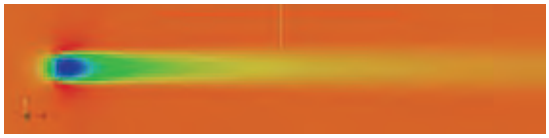
Omar Mohamed Ali Mohamed Ibrahim

Energy and Environmental Engineering, M2

My name is Omar Ibrahim, I am currently a master's student at the Advanced Graduate Program in Global Strategy for Green Asia, Kyushu University.

During my first laboratory, I studied wind turbine aerodynamics in order to develop a wind turbine wake model. The wake model will be beneficial for the optimization of a wind farm layout, thus maximizing energy production.

The knowledge and skills I acquired in my first laboratory were very useful for my laboratory rotation, since the topic of the laboratory rotation was about tidal current turbines. The main research goal of this laboratory rotation was to apply the principles learned about wind turbines to tidal current turbines, as there are common points between wind and tidal turbines.

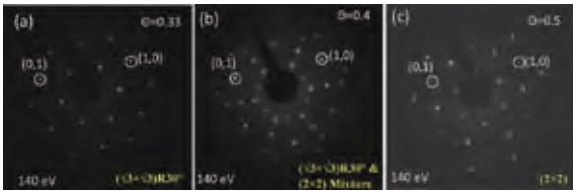


I think the laboratory rotation was very helpful to me, and it broadened my horizons, as it gave me the opportunity to use my skills in a different field of study.

GA Lab Rotation

Islam Md Amirul

Energy and Environmental Engineering, M2



Ultra-thin film technology became more prevalent in scientific research because of the special properties it holds. Surface area (2-D) up to few atomic layers is of great interest along with the bulk materials. I have started my first laboratory rotation at May 2015 in Mizuno-Nakagawa laboratory of Molecular and Material Science (MMS) department. My major objective was to deposit Silicon on pure Nickel (111) substrate inside an ultra-high vacuum chamber, observe the phase change (if happens) up to few atomic layers with low energy electron diffraction (LEED) and determine the modified structure. Before Si deposition, the Ni (111) substrate was cleaned several times by Argon ion sputtering and high temperature annealing. Si deposition time and time of annealing after deposition was varied from two to thirty minutes to observe the phase change. A sharp $(\sqrt{3}\times\sqrt{3})R30°$ LEED pattern for quantitative analysis was obtained at a Si deposition time of 12 min with annealing at 850K. A mixed phase LEED pattern for $(\sqrt{3}\times\sqrt{3})R30°$ and (2×2) phases was obtained at Si deposition time from 14 to 16 min. Whereas, at Si deposition time from 20 to 30 min, only the (2×2) LEED pattern was observed. All these three phases are shown in the figure. These structural modifications were not reported before by the researchers and can be utilized to invent new devices.

I have fulfilled my laboratory rotation objective successfully with satisfactory result. I am very grateful to Prof. Seigi Mizuno, PhD student Md. Sazzadur Rahman and other students for their heartiest cooperation.

Kitjanukit Santisak

Eath Resources Engineering, M2

Last May to July, I had an opportunity to participate Green Asia's (GA) activity, laboratory rotation, at The Ultramicroscopy Research Center (URC) in Kyushu University Ito campus. In URC, there are plenty of facilities which open for researchers, students to use. Moreover, there is one high voltage electron microscope (less than 5 in the world) which also open for usage. During this activity, I learned how to operate the powerful microscope, transmission electron microscope (TEM), and proper sample preparation for biological samples. By participating this laboratory rotation, I could improve my experiment data quality and gained a lots of experience from technicians.

Next laboratory rotation will be in mineral processing laboratory (Hirajima's laboratory) as planned, which I will learn principle of mineral processing and practice such as grinding and separation. This event will start after I finished practice school (internship) at 水 ing Corporation.

Tomy Alvin Rivai

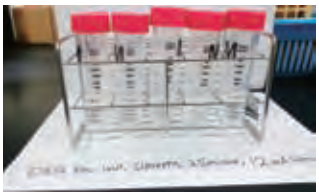
Eath Resources Engineering, M2

I am Tomy Alvin Rivai, first year of master student in the Green Asia (GA) Program. I belong to Laboratory of Economic Geology, Department of Earth Resources Engineering, Kyushu University. I have commenced my first laboratory rotation in Laboratory of Rock Engineering and Mining Machinery since the end of May 2015. It talks about preliminary study on mechanical properties of veins at the Hill Reef 1, Poboya Prospect, Indonesia.

Activities of this laboratory rotation can be divided into three stages: literature review, experiment, and writing report. The first stage is aimed to obtain initial information about the properties and experimental set-up to collect required data. The second stage is carried out to prepare the appropriate samples and to acquire the necessary data. The last stage is conducted to display and present the results through an academically acceptable way. Although this topic does not correspond directly to my core research, which talks about the gold mineralization characteristics at the same location, I can learn many things related to further steps of resource development.

Konadu Kojo Twum

Eath Resources Engineering, M2



Hello, I am Kojo Twum Konadu from Ghana. I am with the Mineral processing and environmental remediation laboratory of the Earth Resources Engineering Department in Kyushu University. I joined the Green Asia (GA) program in October, 2014. I got my Bachelor degree in July, 2013 in mineral engineering from the University of Mines and Technology in Ghana. I joined the green Asia program because the scholarship offered an interesting and exciting blend of science with economic, social and environmental studies. In the year since I joined the program, I have taken courses in philosophy of science, microeconomics, and project management to name a few. This has helped to broaden my knowledge and understanding of society and how I can contribute to this knowledge to play my part in developing wherever I find myself in life.

My research is on the biodegradation of carbonaceous matter in some gold ore using the extracts produced by the microbe *Phanerochaete Chrysosporium* to minimize gold loses during recovery. This project is being supervised by Prof. Keiko Sasaki. One of the impressive aspects of the GA program is the laboratory rotation program. This allows students to work with two other professors in specialized fields for up to three months on their research activities. I have completed the first part of my laboratory rotation with Prof. Hiroyuki Wariishi of the Agriculture Department in Kyushu University. Prof. Hiroyuki Wariishi is one of the world's experts on *P. Chrysosporium* and it has been a pleasure working for him.

I am very grateful for the help and support provided by my supervisor Prof. Keiko Sasaki, mentor Prof. Kwadwo Osseo-Asare. I would also like to thank Prof. Hiroyuki Wariishi, and Prof. Hiroyuki Furuta for their time and patience. Finally, I am very appreciative of the support provided to me by the students and staff of both the Mineral processing and environmental remediation laboratory and Green Asia program in my studies and general life so far.

Second batch

Ryota Yoneda

Applied Science for Electronics and Materials, D1

During the master period, lab-rotation is the main subject for us to focus on. I chose very different fields from one another: electric circuit design, semiconductor processing and social issue analysis. In each field, the processes of how to approach and solve the issue are slightly different. Through these experiences, I could learn multilateral point of view. Now I am doing Ph.D research in the fusion-plasma physics, which is also new for me to start. Since a lot of knowledge and experiences are required in this field, I am sure the standpoints from lab-rotation are helpful and provide insight into what I am doing.

List of GA students

2015/10/1

Course Entry	No.	Name	Nationality	Faculty	Department	Grade	Mentor
Oct. 2015	1	Yusuke Egawa	Japan	IGSES	MMS	M1	Hisahiro Einaga
	2	Tsubasa Ooji	Japan	SGEng	ERE	M1	Keiko Sasaki
	3	Keishi Oyama	Japan	SGEng	ERE	M1	Naoko Okibe
	1	Sampad Ghosh	Bangladesh	IGSES	ASEM	M1	Kiichi Hamamoto
	2	Dabin Chung	South Korea	IGSES	ASEM	M1	Yoon Seong-Ho
	3	Gede D.S. Prayoga	Indonesia	IGSES	ASEM	M1	Koyo Norinaga
	4	Wei-Chen Wen	Taiwan	IGSES	ASEM	M1	Hiroshi Nakashima
	5	John J. Duckworth	U.K	IGSES	MMS	M1	Mitsugu Todo
	6	Alisa Bannaron	Thailand	IGSES	MMS	M1	Shiyoshi Yokoyama
	7	Rezwan Ahmed	Bangladesh	IGSES	MMS	M1	Seigi Mizuno
	8	Ali Yousefian	Iran	IGSES	EEE	M1	Takahiko Miyazaki
	9	M L Palash	Bangladesh	IGSES	EEE	M1	Bidyut Baran Saha
	10	Cao Cong	China	SGEng	ERE	M1	Takashi Tsuji
Oct. 2014	1	Yuki Uchida	Japan	IGSES	ASEM	M2	Hiroki Ago
	2	Shin Sakiyama	Japan	IGSES	ASEM	M2	Katsuhiko Fujita
	3	Yuta Sato	Japan	IGSES	ASEM	M2	Kiichiro Uchino
	4	Satoshi Takeichi	Japan	IGSES	ASEM	M2	Tsuyoshi Yoshitake
	5	Hong BingZhou	China	IGSES	ASEM	M2	Kiichi Hamamoto
	6	Takayuki Maekura	Japan	IGSES	ASEM	M2	Hiroshi Nakashima
	7	Takaya Fujisaki	Japan	IGSES	MMS	M2	Akira Harata
	8	Yoshiaki Takahashi	Japan	SGEng	ERE	M2	Hideki Shimada
	1	Ni'Mah Ayu Lestari	Indonesia	IGSES	ASEM	M2	Koyo Norinaga
	2	Hatem Omar Amin Mostafa Elserafy	Egypt	IGSES	ASEM	M2	Kiichi Hamamoto
	3	Kibria Mohammad Tawheed	Bangladesh	IGSES	MMS	M2	Takeshi Nakagawa
	4	Cheng Xiaoyang	China	IGSES	MMS	M2	Shiyoshi Yokoyama
	5	Islam Md Amirul	Bangladesh	IGSES	EEE	M2	Bidyut Baran Saha
	6	Omar Mohamed Ali Mohamed Ibrahim	Egypt	IGSES	EEE	M2	Jun Tanimoto
	7	Konadu Kojo Twum	Ghana	SGEng	ERE	M2	Keiko Sasaki
	8	Kitjanukit Santisak	Thailand	SGEng	ERE	M2	Naoko Okibe
	9	Tomy Alvin Rivai	Indonesia	SGEng	ERE	M2	Koichiro Watanabe
Oct. 2013	1	Yu Narazaki	Japan	IGSES	ASEM	D1	Hirotsugu Kikuchi
	2	Natsuhiko Hamada	Japan	IGSES	ASEM	D1	Ki-ichiro Uchino
	3	Yuki Furutani	Japan	IGSES	ASEM	D1	Jun-ichiro Hayashi
	4	Ryota Yoneda	Japan	IGSES	ASEM	D1	Reiji Hattori
	5	Tomoaki Hirakawa	Japan	IGSES	EEE	D1	Kazuhide Ito
	6	Masahito Tanaka	Japan	SGEng	ERE	D1	Naoko Okibe
	1	Anis Syazwani Binti Shuhaimi	Malaysian	IGSES	ASEM	D1	Koyo Norinaga
	2	Zayda Faizah Zahara	Indonesia	IGSES	ASEM	D1	Jun-ichiro Hayashi
	3	Tarek Mahmoud Atia Mostafa	Egypt	IGSES	ASEM	D1	Reiji Hattori
	4	Ryan Imansyah	Indonesia	IGSES	ASEM	D1	Ki-ichi Hamamoto
	5	Azizah Intan Pangesty	Indonesia	IGSES	MMS	D1	Mitsugu Todo
	6	Pennapa Tungjiratthitikan	Thailand	IGSES	MMS	D1	Hiroshi Furuno
	7	Marzia Khanam	Bangladesh	IGSES	EEE	D1	Takahiko Miyazaki
	8	Animesh Pal	Bangladesh	IGSES	EEE	D1	Bidyut Baran Saha
	9	Choi Cheolyong	South Korea	IGSES	EEE	D1	Jun-ichiro Hayashi
	10	Sendy Dwiki	Indonesia	SGEng	ERE	D1	Hideki Shimada
Oct. 2012	1	Hiroshi Akamine	Japan	IGSES	ASEM	D2	Minoru Nishida
	2	Hiroki Gima	Japan	IGSES	ASEM	D2	Tsuyoshi Yoshitake
	3	Takanori Hanada	Japan	IGSES	ASEM	D2	Tsuyoshi Yoshitake
	4	Tsuyoshi Sato	Japan	IGSES	EEE	D2	Aya Hagishima
	5	Yusei Masaki	Japan	SGEng	ERE	D2	Naoko Okibe
	6	Shinji Matsumoto	Japan	SGEng	ERE	D2	Hideki Shimada

Faculty
IGSES: Interdisciplinary Graduate School of Engineering Sciences
SGEng: Graduate School of Engineering Sciences

Department
ASEM: Applied Science for Electronics and Materials
MMS: Molecular and Material Sciences
EEE: Energy and Environmental Engineering
ERE: Earth Resources Engineering

Contact Information and Upcoming Events

Contact Information

Secretariat, Contact address
Room313 E bldg, 3F, 6-1 Kasuga-koen, Kasuga City, Fukuoka, 816-8580
TEL.092-583-7823/7825
FAX.092-583-8909

Ito Branch
Room641 West zone 2 bldg, 6F, 744 Motooka Nishi-ku, Fukuoka, 819-0395
TEL.092-802-6660
FAX.092-802-6660

E-mail: greenasia@ga.kyushu-u.ac.jp
HomePage: http://www.tj.kyushu-u.ac.jp/leading/en/index.html

Upcoming events

October 24-25, 2015
Leading Forum 2015

November 26, 2015
International Symposium of Integrated Research and Education Center for Energy Conversion, Storage, Saving, and Transport Technologies

November 27, 2015
International Forum for Green Asia 2015

March 25, 2016
Graduation Ceremony

Lecture Schedule (plan)

October, 2015
Economic Systems (I)

October, 2015
Advanced topics on Social, environment, and economic systems Ⅱ

December, 2015
Industrial Systems Ⅰ/Ⅱ (Domestic fieldwork)

Kyushu University Program for Leading Graduate Schools
Advanced Graduate Program in Global Strategy for **Green Asia**

BULLETIN 2015

Bulletin 2015 is a promotional publication which aims to give a general overview of the Green Asia Program. Published on a annual basis in November, this issue volume three, details the key objectives of the program, staff profiles, program features and current overseas and domestic activities.

Secretariat, Contact address

Room 313 E bldg, 3F, 6-1 Kasuga-koen, Kasuga,
Fukuoka, 816-8580, Japan
TEL.+81-92-583-7823/7825
FAX.+81-92-583-8909

Ito Branch

Room 641 West zone 2 bldg, 6F, 744 Motooka, Nishi-ku,
Fukuoka, 819-0395, Japan
TEL.+81-92-802-6660
FAX.+81-92-802-6660

E-mail:greenasia@ga.kyushu-u.ac.jp
http://www.tj.kyushu-u.ac.jp/leading/en/index.html