

KU Today

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Special Issue Faculty of Engineering

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KUToday is a biannual publication to present information about Kagoshima University to a wider international audience. Each edition will feature one faculty for prospective overseas students as well as other topics such as educational programmes, research and alumni information. Some articles are translations from the Japanese-language publication, Kadai Journal, upon which KUToday is loosely based. Any comments or suggestions about KUToday will be warmly received.

PDF files on KUToday can be downloaded from
<http://kokusai.kuas.kagoshima-u.ac.jp/kucip/>

A Note on Names
Following convention East Asian names appearing in KU Today are written family name followed by given name.



SPECIAL ISSUE
FACULTY OF ENGINEERING



CAMPUS WALK AROUND
THE INAMORI AUDITORIUM
A multipurpose hall generously funded by Inamori Kazuo

1



DISCOVER KU
DR. MOTOMURA, WORLD EXPERT IN SCORPIONFISH TAXONOMY

9



EXTRACURRICULAR ACTIVITIES
KU KYŪDŌ CLUB
Sakamoto Yūji, Captain, BSc student, Faculty of Science

12



INTERNATIONAL COMMUNITY
SATSUMA ISLAMIC CULTURE CENTER (SICC)
Yusuf Bohadi, Member, MSc in Fishery 2012

13



INTERNATIONAL PROGRAMMES
FOSTERING THE SPIRIT OF ENTERPRISE: AN EDUCATIONAL PROGRAMME IN SOUTH AMERICA
Katō Yasuhisa, Professor, Center for International Planning

14



FACES AND SNAPSHOTS

16



EXPLORING KAGOSHIMA
SATSUMA SHŌCHŪ INVIGORATING OUR REGION
Sameshima Yoshihiro, Professor, Faculty of Agriculture

18



Special Issue

Faculty of Engineering

<http://www.eng.kagoshima-u.ac.jp/english/index.html>
(ed. by Nakamura Yūzō)



Sumiyoshi Fumio, Dean

EXCITING ENGINEERING!!

SUPPORTING YOUR MONOZUKURI AMBITIONS

The Faculty of Engineering began as Kagoshima Prefectural College of Engineering and was established in 1945. The college of engineering became Kagoshima Prefectural University to be united with the college of medicine, then, the prefectural university was made part of Kagoshima University in 1955. Today, the faculty is located on Kagoshima University's main Korimoto campus close to centre of the scenic city of Kagoshima, 'Naples of the East'.

Over 17,000 students have graduated from the faculty so far, and many alumni are active in a wide variety of fields throughout society. One such alumnus is Dr. Inamori Kazuo, founder and chairman emeritus of Kyocera Corporation, who in 1994 funded construction of Inamori Auditorium(p.9) designed by eminent architect Andō Tadao, that is used for seminars, lectures and other university events.

With our mission of 'Exciting engineering—supporting your monozukuri (manufacturing)

ambitions", we aim to provide students with the fun of creativity whilst educating them with a global perspective, all the while contributing to the development of Japanese manufacturing technology. The Japanese way of manufacturing, based on culture and craftsmanship has been the pillar of Japanese industry. We also work to cultivate excellent human resources with leading research in many different fields and hope students learn the excitement of monozukuri based on Japanese heritage.

The faculty actively promotes internationalization in the field of engineering technology by collaborating with overseas universities, such as National Institute of Technology Karnataka (India), University of Indonesia (Indonesia), College of Engineering of National Cheng Kung University (Taiwan) and others in joint research, and student and academic staff exchanges.

We look forward to welcoming you in the Faculty of Engineering.

Undergraduate

(Present Staff, Annual Quota)

Faculty of Engineering (122, 440)

- Mechanical Engineering (23, 94)
- Electrical & Electronics Engineering (22, 78)
- Architecture & Architectural Engineering (15,55)
- Chemical Engineering (9, 35)
- Ocean Civil Engineering (12, 48)
- Information Science & Biomedical Science (23, 80)
- Chemistry & Biotechnology (17, 50)

Faculty of Science

- Mathematics & Computer Science
- Physics
- Chemistry & Bioscience
- Earth & Environmental Sciences

Graduate School of Science and Engineering

Lower Division (master course)
(Annual Quota)

Engineering course (222)

- Mechanical Engineering (50)
- Electrical & Electronics Engineering (45)
- Architecture & Architectural Engineering (25)
- Chemistry, Biotechnology & Chemical Engineering (42)
- Chemistry & Biotechnology (25)
- Chemical Engineering (17)
- Ocean Civil Engineering (18)
- Information and Computer Science (42)

Science course (64)

- Mathematics & Computer Science (14)
- Physics & Astronomy (15)
- Chemistry & Biochemistry (18)
- Earth & Environmental Sciences (17)

Upper Division (doctoral course)
(Annual Quota)

Material Science & Production Engineering (8)

- Structural Design
- Production Process
- Advanced Materials

System Information Science (8)

- System Control
- Intelligent Informatics
- Bio-molecular Science

Natural Science (8)

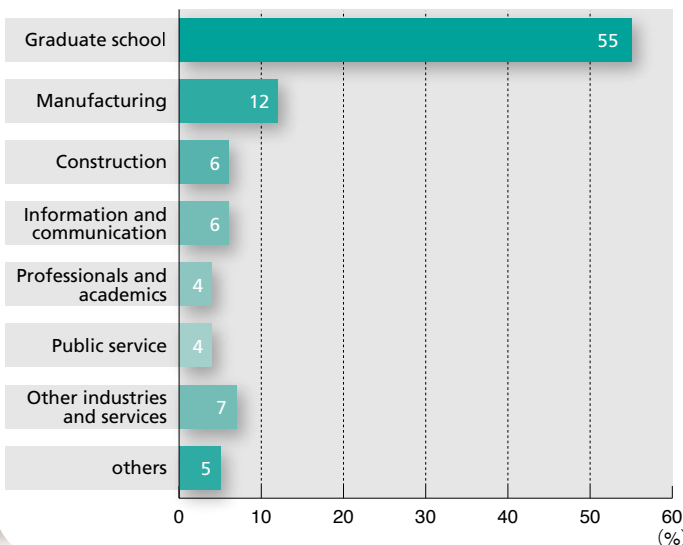
- Environmental Science
- Physics & Cosmology
- Geo-environmental Science

Education & Courses after Graduation

Most of the nuclear plants in Japan have been stopped since the Fukushima nuclear plant accident occurred on March 11th, 2011. Instead, electricity is mainly supplied by burning fossil fuels and increasing the emission of CO₂ gas which leads to global warming. According to public-opinion polls, most people want the abolition of nuclear power plants in the near future and hope for an increase in sustainable energy sources such as photovoltaic and wind power generation. However, the small and unstable supply of these sources is not preferred as one of the primary sources to maintain a constant supply of electric power for our society. The technology of hybrid cars is one of the answers to save energy sources and suppress global warming, while it accelerates the drain of rare metals which are necessary for electric motors with strong power comparable to engines. The technology and engineering which are needed to withstand unpredicted disasters such as big earthquakes and giant tsunamis are of urgent significance in Japan, which may also become very useful for regions where these disasters are expected to occur. The expectations and demands for the development and innovation of technologies are related very closely to individual life as well as world-wide interests. At the same time, these expectations and demands create new problems or conflicts which need to be solved in the future or require cooperation and effort around the world, as mentioned in the above examples.

The ability of engineering design, which involves not only the capability of fostering economic and technological interests but also the capacity of contributing to human welfare and the global environment, is increasingly required by society. The aim and mission of education in our faculty are to develop this ability in students based on a solid knowledge of the fundamentals of engineering. Our mission is in accordance with the educational objectives of

After graduation from our faculty



the third-party accreditation system, JABEE (Japan Accreditation Board for Engineering Education). On the other hand, advanced technologies requiring more complexity, elaboration, function, integrity and reliability are needed for better and more competitive products, which also require globalization from the efficiency of business and manufacturing. More than half of the undergraduate students currently enter our graduate school to deepen their understanding of advanced engineering, and most of our graduates from both undergraduate and postgraduate courses get professional jobs related to their major fields.

JABEE satisfies an international agreement for the accreditation of engineering education known as the Washington Accord (WA). The current signatory countries of the WA are Australia, Canada, Ireland, Hong Kong, Japan, New Zealand, Singapore, South Africa, South Korea, Taiwan, Malaysia, the United Kingdom and the United States. More education programmes from more countries are expected to join the WA in the future. Students who graduate from universities accredited by the WA are regarded as having the equivalent ability to a professional engineer.

Overseas Students & International Activities

About 270 overseas students from roughly 40 countries are enrolled at our university, of which 26 are currently studying in our faculty. This number is only 1.3% of total undergraduate student in our faculty. This relatively small number means that more care can be given due to our foreign students. On the whole most of them have learned some Japanese before coming to Japan and soon improve their conversation skills very rapidly with the support of the International Student Center. Lectures are given only in Japanese, but teachers and teaching assistants can easily help foreign students overcome the difficulty in understanding major subjects due to the shortage of technical terms in Japanese. Most of our foreign students, including graduate students, come from Asian countries, as can be seen in the table shown below. In addition to study and research, they enjoy Japanese culture and widening the knowledge about other countries by making good friendships with both Japanese and overseas students alike.

Course	Country(number) of Foreign Students
Undergraduate (Engineering)	China(12), Korea(3), Malaysia(6) Indonesia(2), Vietnam(2), Nepal(1) Short-stay: Sweden (1), Australia (1)
Master(Engineering)	China(4), Korea (1), Malaysia(1)
Doctoral (Science & Engineering)	China(6), Philippine(2), Malaysia(2), Myanmar(2), India(1), Indonesia(1), Egypt(1), Thai(1), Nigeria(1), Pakistan(1), Bangladesh(1)

Recently, two joint seminars, one on the recent advances in engineering and technology (2008, National Institute of Technology Karnataka, India), and one on nanostructure and advanced materials (2010, National Cheng Kung University, Taiwan), and an international symposium on the cooperative education of self-sustainable energy (2010, University of Indonesia, Indonesia) were held in the university's Inamori Auditorium. This kind of academic exchange is very beneficial in establishing close ties with overseas universities. In the last few years, we have also received visits from professors from Linköping University (Sweden), Universiti Teknologi Malaysia and Sichuan University Jinjiang College (China).

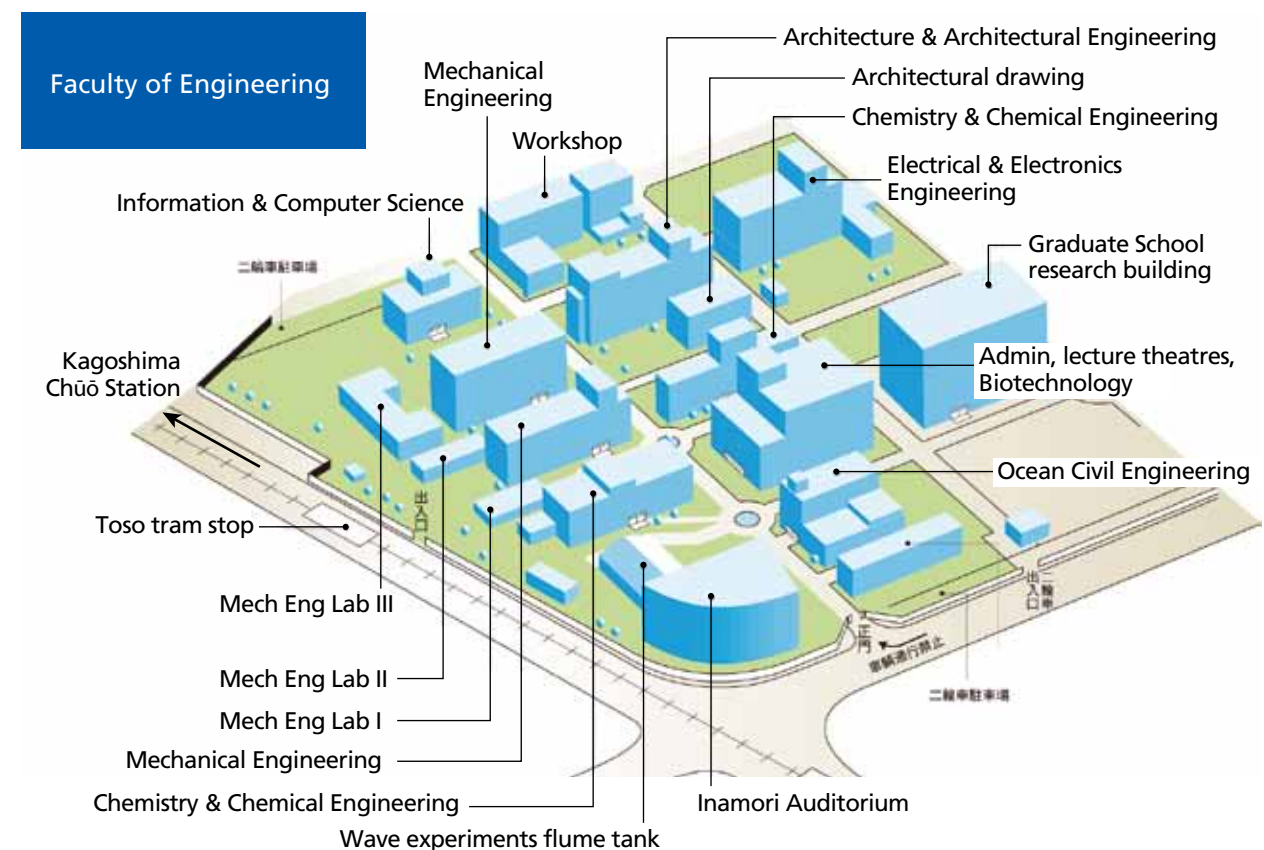
Educational and Research Environment

Our research building and laboratories of our faculty are on Kōrimoto campus in a quiet residential area. We are about 15 minutes' walk from Kagoshima Chūō Station where you can get the Shinkansen bullet train to Fukuoka in about 90 minutes. Kagoshima University's International Residence Halls provide cheap rooms for students (in their first year only) and researchers. After their first year in the halls, students usually find external accommodation. The cost of living in Kagoshima is not as expensive as in big cities such as Tokyo. According to a survey conducted by the International Student Centre, foreign students like Kagoshima's atmosphere and its people.

The faculty is fully-furnished with up-to-the-minute equipment, instruments and facilities. Our central workshop plays a significant role in making or repairing research equipment. Technicians also participate in educational experiments and exercises, and they provide special courses to manufacturing to first-year students and school children during the summer vacation. The Division of Instrumental Analysis in the Frontier Science Research Centre has instruments used for materials science and engineering as well as biotechnology including TEM, AFM, NMR, FE-SEM, low-vacuum SEM, EDS, EBSD, EPMA, ESCA, fluorescent X-ray analysis, high-speed XRD, and FTIR. The division periodically holds lectures on the principles and operations of this equipment, which help students to operate them and conduct analysis by themselves.



Electron Probe Micro Analyzer (EPMA)



Department of Mechanical Engineering

This department provides education and substantial research programs for mechanical design, production, energy and system engineering in order to contribute to the development of mechanical engineering and the welfare of our society. The main fields of education and research are:

Production Engineering: strength of materials, materials engineering, production engineering, etc.

Energy Engineering: fluid engineering, fluid machinery, thermal engineering, internal combustion engines, etc.

Mechanical System Engineering: machinery dynamics, machining & processing, automatic control, robotics, etc.

Research examples

Manufacturing and Evaluation for Functionally Graded Materials

Functionally graded materials, FGM, are composed of different materials and are continuously changing the mixing ratio of the materials. As FGM are made by combining materials with different mechanical properties, it is possible to obtain excellent mechanical properties from FGM that a single material cannot have. The experimental equipment shown is a universal tensile testing machine installed in a high-temperature furnace. The optimum conditions of processing temperature and speed in semi-melt forming is being investigated using the equipment.



Experimental Equipment

Damage Evaluation & Remaining-Life Prediction of High-Temperature Materials

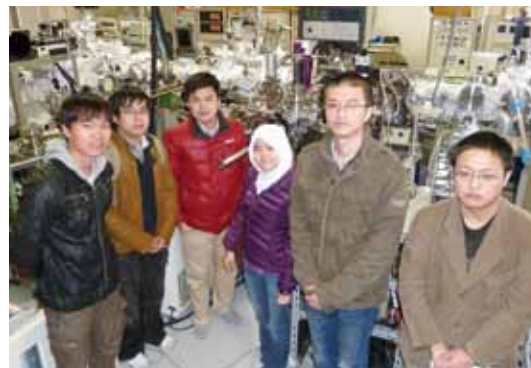
The purpose of this research is to detect early deterioration and damage in structural materials under extreme environments such as in thermal and nuclear power plants, nuclear fusion reactors, aircraft and rocket engines, and fuel cells, and then develop new technology to accurately estimate the remaining life of structural materials. The target materials include heat-resistant steel, stainless steel, nickel superalloys, aluminum alloys, and copper alloys. An example of the experimental equipment is the creep tester shown here. The small punch (SP) creep tester with miniaturized specimens can be used for evaluating the creep property of a local region and assessing the remaining life of high temperature components.



SP Creep Tester

Department of Electrical and Electronics Engineering

The outstanding feature of science and technology in a highly computerized society exists in the progress of the individual technology of new materials, VLSI, computers, etc., and their systematisation. In particular, the following technologies are utilised in contemporary society, and support the basis of a computerized society: Electronic Device Engineering for the development of new materials with new concepts and their devices, Electrical Power Engineering for the systematic utilisation of electrical energy, Communication System Engineering for the systematisation of communication, information and computer technology. In response to the contemporary system of electrical and electronics engineering, our department is divided into the three courses for education and research purposes.



**Nur Syjaah
Binti Shahrin**
(Malaysia)
BSc student

For me studying on the undergraduate course of electrical and electronics engineering is really challenging and interesting. Learning the theory of electromagnetism, theory of quantum mechanics and many other theories sometimes gets on my nerves because it is hard and needs a lot of imagination to understand them. But I can study them clearly with the help of the teaching staff, whether it is learning about experiments in lectures and or being taught individually or in groups. The small experiments in lecture classes are particularly pleasurable and motivate me to imagine some improvements. There are a lot of things to learn on this course and I hope I can bring back the Japanese technology that I learn and apply it in Malaysia.

Department of Architecture and Architectural Engineering

Architecture is a synthetic and comprehensive technology to create spaces for human activities. Therefore, this technology requires extensive knowledge, which ranges from natural science to the humanities and sociology, and advanced theories on architectural planning, building environment and building structures.

In the first year of this department, basic subjects, such as mathematics, physics and languages etc., and general educational subjects, such as philosophy, psychology and sociology etc., are studied. In the second and the third years, advanced subjects are studied, which are concerned with building structures under gravity load, seismic load and wind load, building environment to provide a comfortable space and theories of architectural planning. In addition, architectural design practices are studied over the first 3-year period and a trip to observe buildings in Kyoto, Osaka and Nara is undertaken in the second year. In the fourth year, each student is assigned to one of the following laboratories and produces both a dissertation and an architectural design in order to graduate.



A trip to observe buildings in Kyoto, Osaka and Nara

Laboratories in this department:

Architectural and computational engineering (Prof. Honma), Building structures (Prof. Shioya), Building materials and construction engineering (Assoc. Prof. Kurokawa), Steel structures (Assoc. Prof. Sawada), Building facilities (Prof. Nimiya), Environmental engineering (Assoc. Prof. Soga), Regional and architectural planning (Prof. Tomokiyo), Urban planning, architectural history and design (Assoc. Prof. Kikata), Architectural planning (Assoc. Prof. Suzuki)



Presentation and review of graduate work

Department of Chemical Engineering

Our department educates student who can contribute to the development of engineering and industry through studies in the fields of environment, energy, process and inorganic materials from the viewpoint of chemical engineering.

We offer a special educational program, which has been accredited as a Chemical Engineering Course by Japan Accreditation Board for Engineering Education (JABEE) since fiscal 2004. Students who have completed our course can receive a special exemption to skip the first stage examination of Professional Engineer (P.E. Jp), and can become an Associate Professional Engineer (As. P. E. Jp) after registration. Alumni will also earn another privilege to be enrolled as an Associate Professional Chemical Engineer (APCE) without examination if you join The Society of Chemical Engineers, Japan (SCEJ).

The central feature of our curriculum is that we offer a lot of opportunities to listen to lectures given by our alumni or company representatives. More than half of our students go on to graduate school. The MSc course curriculum is two years, during which graduate students can study further and add to their experience to become talented researchers or engineers in the future.

Since chemical engineering is a systematic discipline concerned with the way of thinking necessary for chemical engineers to work in companies, there are a lot of opportunities in a variety of fields involving chemical processes. Alumni get jobs in a number of fields including not only the chemical industry but also machinery, electronics, foods, environment, etc. Employment opportunities for our department students are quite good with almost 100% of them finding jobs.

The second feature of our department is the small class size in one grade (35 students), which enables our staff members to follow up students more effectively. The network established among students and teachers will be of assistance to you in the world of work after graduation. Another noteworthy feature is that we have rather a high proportion of foreign students, accounting for over 10% of new students in fiscal 2011. Four of 38 students are from abroad (China, Vietnam, Malaysia and Indonesia). Why not join us to learn and study together for the future of the earth?





Department of Ocean Civil Engineering

Ocean civil engineering is an integrated discipline covering civil engineering and ocean engineering. The objective of civil engineering is for people to live comfortable and safe lives, while balancing our natural and social environments at the same as providing the basic infrastructure for industry. Some remarkable accomplishments of ocean civil engineering in Japan include the Seikan Tunnel, linking Hokkaido to Honshu, the Honshu-Shikoku Bridges, Kansai International Airport and Tokyo Bay Aqua-Line.

- Preservation of the marine environment
- Creation of safe and pleasurable infrastructure



Our department was first opened in 1973 as the Department of Ocean Development & Ocean Civil Engineering. At that time there were 5 courses: Fundamentals of Ocean Engineering, Coastal Engineering, Ocean Construction Engineering, Planning for Ocean Development and Ocean Structural Engineering. We are currently the only national university in Japan to have a civil ocean engineering department. Our research and education aims to improve infrastructure and preserve the marine environment in coastal areas as well as produce graduates who have sufficient knowledge and judgement in the field.



The department's educational programme was completely overhauled for 2001, and from 2002 we began working towards accreditation by the Japan Accreditation Board for Engineering Education (JABEE), which we successfully attained in 2004.

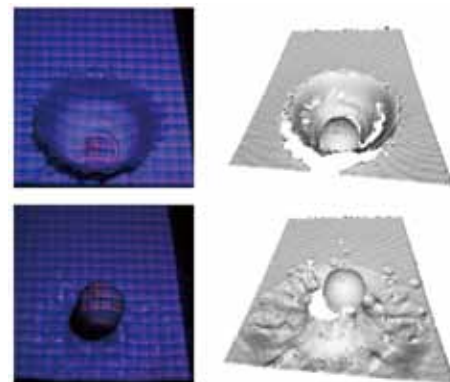
Department of Information Science and Biomedical Engineering

Our department consists of three educational and research fields: Information System Engineering, Brain Recognition Engineering and Biomedical Engineering. We always welcome foreign students and researchers and currently have people from China, Myanmar and France.



A presentation and a review of a graduate work (In the fourth year)

One of our important research themes is computer vision and graphics. This research investigates large scale scene modeling and rendering, 3D reconstruction for fast moving objects and super-resolution method from video images. In the fast 3D reconstruction method, we achieved a world's first in the reconstruction of the 3D shape of a droplet shed after dropping a ball in milk.

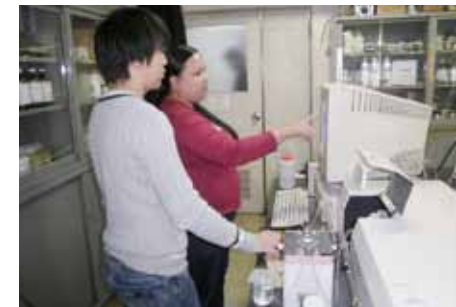


In image processing, super-resolution with dehazing techniques is being developed. With the technique, the recovery of areas occluded by smoke and haze can be achieved.



Department of Chemistry and Biotechnology

The Department of Chemistry and Biotechnology was established in April 2009, based on the Department of Applied Chemistry and Chemical Engineering (Applied Chemistry Course) and the Department of Bioengineering (Biofunctional Materials Course). The new department will complement and strengthen education and research in the areas of materials, environmental chemistry, biomolecular and biological chemistry in the Faculty of Engineering. We focus on the area involving stimuli-responsive materials, bio-related and synthetic materials hybrid, environmental engineering, functional macromolecules, organic synthesis, molecular biotechnology, bioconjugated molecules, and surface information chemistry.



Janice B. Rabor
(Philippines)
PhD student

Open-mindedness. Inquisitiveness. Attentiveness. Resourcefulness. Tenacity. These are the qualities of a good scientist and engineer that are fostered in Kagoshima University. The professors are supportive and are open to new ideas. The work ethic and research environment is intense and structured, but the interaction between colleagues is casual and friendly. Laboratory traditions include a summer sports event, a welcome party and year-end celebrations. They took it upon themselves to look out for our well-being as well as our productivity. They wanted to present to us the Japan they know, both inside and outside the university. The people of Kagoshima are kind and generous. They are open to new experiences and to different cultures. They are eager to share their own unique culture, history and industry with its numerous museums, landmarks, and famous local food and beverage products.

Student Voices



Mohd Hazwan bin Yusof
(Malaysia)
MSc student in Mechanical Eng

I've been studying at Kagoshima University for almost 6 years from undergraduate to the master's course and will continue here for my PhD. I'm doing research about a small refrigeration system called the vortex tube. In the Department of Mechanical Engineering, the teaching staff always tries to help foreign students like me whether I have difficulties with my studies or personal matters. Here, I've learned a lot about designing things using computers. I entered the laboratory 3 years ago and all of my supervisors always guide me with my experiments. They also teach me a lot about becoming a good researcher and a good person who can manage himself and his work. I'm really happy studying here.



Qu Ning Xing
(China)
BSc student in Architecture & Architectural Eng

For over a semester while majoring in architecture, I've learnt about drafting and a few aspects of building construction methods. The study tour helped stimulate my imagination. Additionally, I have tried to do my first design work - a rest house. In this process, I've achieved a lot through communicating with my classmates and from my teachers' advice. Our purpose is to create a comfortable and safe space for people to live in. In my opinion, nothing could be more exciting than creating a structure from planning, drawing the design chart, making a model and finally starting to construct it yourself.



Peng Gang
(Huizhou University, China)
PhD in Engineering 2004

I enjoyed my campus life at Kagoshima University where I received my PhD from the Graduate School of Science and Engineering. The study atmosphere was wonderful and the faculty members were supportive and collaborative. The experience deeply changed my personal life and career. Now I work for the department of Computer Science and Technology, Huizhou University, China as a Professor. I always introduce Japanese culture and customs to my students during lecture time or in my spare time. Many students hope to have an opportunity to study in Japan. Huizhou University is pushing to expand international education. Currently there are over 20 foreign teachers working there and sometimes we invite scholars from foreign universities to conduct short-term lectures for students. My PhD supervisor, Professor Nakayama presented a special lecture for my students this year. I hope to become the bridge between Kagoshima University and Huizhou University.



Goon Lum Mak
(Malaysia)
BSc student in
Chemical Engineering

My dad worked at a Japanese chemical company as a salesman. He always told me about Japanese chemical and engineering industries, so I had a really good image of Japan, and associated it with great engineering technique. Chemical engineering is like a booster for everything tested in labs. Study on this course always makes me feel like I can make something not only new but also large scale. I feel proud when almost everything my family and friends uses is manufactured using those engineering technologies.



Brian John Sarno
(Philippines)
PhD student in Chemistry &
Biotechnology

Time flies so fast and I barely notice it, maybe because Japan and Kagoshima have so much to offer for foreign students like me. It's almost 5 years since I first arrived in "the land of the rising sun," it has been my home away from home. I came here to pursue my graduate studies in chemical engineering. I graduated from 2 courses, physics and chemistry and landed a job as a researcher in my university in Cebu, Philippines. In search for more knowledge and enthusiasm to travel around the world, encouraged me to apply for a MEXT Scholarship and luckily I passed and received the said scholarship.

I'm working on my doctoral research about the application of IR-ATR technique to particle size measurement. Life in my laboratory is hard but everything seems light and interesting especially when your labmates and adviser are helpful to you.



Photo credit: Kagoshima University Museum



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The Inamori Auditorium

A multipurpose hall generously funded by Inamori Kazuo

The Inamori Auditorium was established to provide a venue for the exchange of information and intellectual interaction for science and technology.

In order to fully optimize the auditorium for use as a multipurpose facility, both the main hall and smaller meeting rooms feature a system installed to provide simultaneous bilingual translation for up to 270 guests, in addition to having the latest in projection, lighting and sound equipment. The surround seating branches out from the lower semicircular center stage of the main auditorium in a way specifically designed to evoke a sense of togetherness between the speaker and audience, making it an ideal environment for both conferences and lectures. The auditorium has thus far served as the host venue for a wide variety of event including international conventions, academic conferences, lectures, presentations and public programs. Whilst the auditorium is mainly used for Kagoshima University events, it is also available for use by outside organizations from time to time.

Construction of the auditorium was completed in October 1994, and was funded by a donation from

Inamori Kazuo to mark the 50th anniversary of the establishment of the Faculty of Engineering at Kagoshima University. Inamori, the President Emeritus of the Kyocera Corporation, graduated from the department of applied chemistry in the Kagoshima University faculty of engineering in 1955. On 28 June 1995 he was awarded a medal of honor by the Emperor of Japan in acknowledgement of his philanthropic contributions to society.

Situated just to the left of the Faculty of Engineering entrance gate, the ferroconcrete Inamori Auditorium is comprised of three above ground floors, and one underground. This stunning building was designed by the world-renowned architect, Andō Tadao. It's striking as-cast concrete facade is representative of Andō's unique style, and it is an eye-catching feature of the streetscape. According to Ando the egg-shaped dome imbedded in the building is "like a newly created life-form dwelling in its own small universe". And just as the architect envisioned, this unique concept certainly does grab the attention of all those who visit.

探知の鹿大

Dr. Motomura, world expert in scorpionfish taxonomy

The scorpionfishes (Scorpaenidae) are known as arakabu in the Kagoshima region and Professor Motomura Hiroyuki of the Kagoshima University Museum is the world leading taxonomist in the field of scorpionfish research. His work in this field involving the collection of specimens, classification, and ocean surveys has taken him to all parts of the world and within the complex field of fish taxonomy, the scorpionfishes are said to be the most difficult to classify of all fish species. The seas of Kagoshima are renowned for being home to the largest number of fish species in Japanese waters and Professor Motomura is actively conducting major fish fauna surveys across the region.

Professor Motomura of the Kagoshima University Museum receives hundreds of e-mails daily. His inbox is literally abuzz with enquiries about scorpionfishes from all around the world. He is the only taxonomist in the world who specializes in this group.

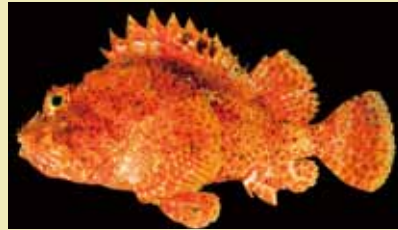
The difficulties of classifying scorpionfishes

Scorpionfishes are a unique species that often develop morphological differences even within the same species or population dependent on their individual habitat, and these disparities can be huge, thus making them one of the most difficult fish group to classify. According to Professor Motomura, the fact that many scorpionfishes live in solitude and inhabit less accessible places such as deep seas and lurk amongst rock shadows, means that an accurate count of actual biological species is virtually impossible.

"One day my wife came home from the supermarket with a whole scorpionfish to serve up as sashimi. The moment she put it on the dinner table I knew that it was a yet undescribed species. That shows just how much the research of this particular species has lagged." The difficulties of species classification, a general lack of researchers in the field to begin with, and the retirement of the few U.S. researchers working in this field has left Professor Motomura as the sole taxonomist specializing in scorpionfishes.

A vital field for clarifying the mechanism of biodiversity

Fish taxonomy, Professor Motomura's area of research, is a complex field which involves investigation of the mechanism of species evolution and speciation, biogeography, morphology, redescription of described species, and the description and naming of newly discovered fish taxa. Professor Motomura explains; "Fish taxonomy requires us to morphologically identify, name



A new species called the 'Pumpkin Scorpionfish', discovered by Professor Motomura.
Scientific name: *Scorpaena pepo*

and make inferences on a certain fish evolutionary relationship. It is a field of scientific scholarship in which we explore the evolutionary path. Further to this, the fish fauna surveys that we conduct in a wide variety of marine regions enable us to understand species diversity in each region and the biogeographic characteristics of the regions. This is the basis of this vital field of fish taxonomy, in order to deepen our understanding of how this diversification occurs."

To date, Professor Motomura himself has discovered and described 34 new taxa of fishes. However glamorous the discovery of a new species may sound, he emphasizes that this is simply a 'bi-product or part of the job' for any researchers. "Ultimately we need to accumulate detailed and properly organized data, with internationally standardized scientific names so as to enable people to search for information and accurately identify specimens with ease. (The problem at present is that almost every single species has any number of scientific names, and the need to review which names are the valid ones, is a pressing one.) Our aim is to clarify our understanding of the mechanism of diversity, evolution and speciation."

The importance of voucher specimens in fish taxonomy

In taxonomy, research focuses upon gathering data on numerous points of identification; external characteristics such as the scales and fins, and internal characteristics such as the organs, bone structure and DNA of the fish need to be thoroughly analyzed and for this purpose the availability of good specimens is vital. The quality of the specimen becomes even more important when a new fish species is to be described, given a scientific name and announced, as the specimen will become the name-bearing type specimen of the new species. The specimen is vital not only to ensure the objectivity and reproducibility of the research, but to act

as a basis of comparison when new taxa are being described.

"In the west there has been a long history of collecting samples and preserving specimens for scientific enquiry while travelling to various destinations, dating back to the age of the great sea voyages and exploration. Even today, many precious type specimens that were collected by Siebold and Perry, then taken back to their respective countries following their early expeditions to Japan remain carefully preserved. Unfortunately during this era the Japanese did not engage in this practice or recognize the importance of establishing collections and preserving specimens for the benefit of science. Therefore researchers in Japan could only conduct their research of species based upon specimens or the literature of other countries," says Professor Motomura.

Proving that an unidentified fish specimen represents actually a new species is no easy task. This requires specimens of both males and females, and mature and immature individuals to be collected from waters habitats in various parts of the world. An enormous number of specimens must be prepared then meticulously handled and without the cooperation of countless volunteers worldwide this task would be impossible. The morphological characteristics of the fish must be distinguished and comparative examination made with related species. The researcher must take extreme care to avoid misidentifying what they believe to be a new species, as at times this can happen due to geographically related mutations or anomalies.

The professor explains, "We researchers can go out and collect specimens, and investigate comparisons related-species type specimens, however when in doubt we may need to delve even deeper, even to thoroughly investigate the life and of the person who gathered the original specimen, and that may even be someone who found it over 200 years ago. Of the course of our investigations we need to be able to read many languages such as English, Latin, Greek, and when visiting sites by boat and so on in various locations worldwide, the ability to be able to communicate with the local people there is vital. We spend many a sleepless night busily preparing and preserving our specimens and conducting our surveys, so this work can be very physically demanding. No-one doing this kind of research has time to rest on their laurels."

The professor's work has taken him to cooperate in fish fauna surveys in Cambodia at locations such as Lake Tonle Sap, and the area surrounding the Angkor Wat monuments where a detailed study of indigenous fish species there is in progress.

Unveiling the bounty of Kagoshima's waters

Professor Motomura has a single goal in mind, to ultimately complete his research into the taxonomy of scorpionfishes. The period of time it takes to classify, investigate and officially described a single new fish can

be a drawn out and painstaking process of up to ten years. It is his hope that this research can progress at a better rate, for example to describe a few new species each year and ideally to be able to conduct a number of research projects simultaneously.

The seas of Kagoshima are home to the highest fish species diversity in Japanese waters, and the Professor Motomura is conducting a countless surveys of in order to ascertain the diversity, and to produce a thorough field guide of the region's marine life. In 2010 he completed a field guide of the waters surrounding the island of Yakushima, in which 951 species were noted, and is currently working with the cooperation of a wide network of volunteers to improve the specimen collections housed at Kagoshima University.

"We currently have 100,000 specimens here at the university, of which only 40,000 have been properly catalogued. In an average year we receive around 70 requests, (up to 1000 individual pieces), to loan out as specimens from researchers in both Japan and abroad and this figure is comparable to that of Harvard University Museum of Natural History. We also have the largest collection of Malaysian and Cambodian fish species in the world. Not only is our collection an invaluable resource for the field of ichthyological research it is also a shared asset for all humanity. So my goal is to strive for the preservation and ongoing improvement of the collection, and in future to become the largest fish specimen center in southern Japan."



Professor Motomura Hiroyuki was born in Shizuoka Prefecture, in 1973. He completed a PhD Degree at the United Graduate School of Agriculture, Kagoshima University in 2001. He was appointed to the National Museum of Nature and Science through a JSPS research fellowship for young researchers and through this fellowship worked at the Australian Museum from 2003 to 2005, followed by an additional 6 months there as a guest researcher. Later that year he was appointed to the Kagoshima University Museum as an Associate Professor, and promoted to Professor in June 2010. His field of specialization is fish taxonomy and systematics.

As a preservation committee member for International Union for Conservation of Nature, he compiled a world-wide endangered species list of tropical fish. He was the Japanese representative on the International Steering Committee for Indo-Pacific Fish Conference for four years. He is a contributing editor of the Ichthyologic Society of Japan (ISJ), and as a member of the Kagoshima Nature Conservation Association is part of a working group responsible for the revision of the endangered species list in for the Kagoshima region. He is also involved with a working group responsible for promotion and development of the local Kagoshima Aquarium and Hirakawa Zoo.



KU Kyūdō Club

Sakamoto Yūji, Captain,
BSc student, Faculty of Science



KU Kyūdō Club 50th anniversary

I would like to tell you a little bit about Kagoshima University Kyūdō Club, under the guidance of our coach, practices everyday with the goal of winning every competition we take part in.

First of all, what is kyūdō, Japanese archery, all about? It is one of Japan's traditional martial arts and many people overseas are interested in it. We have even had three overseas students in our club. The competitions we enter are against other university's clubs, but the biggest battle is with yourself, so if you are not mentally in tune it is very easy to miss the target, which is a 36cm across round mat 28m away! And it is not just a question of hitting the target, but rather how elegantly you can draw the bow and shoot. As the four character Japanese idiom 正射必中(seishahitchū) runs, if you shoot correctly you are guaranteed to hit the target. In fact the ultimate goal of kyūdō is 真善美 (shinzenbi) to be true, good and graceful. In this way, you will find that kyūdō is a noble and deep sport, putting demands on your body, mind and technique whilst requiring high levels of concentration. It may look easy, but I can tell you it is actually surprisingly difficult.

This year the club is entering its 57th year and has had a long and illustrious history. In the beginning there



Kyūdō practice

was nowhere to practice so the club members simply practiced outside. Today we have a specially-equipped dōjō which we use everyday. Many of those former club members also keep in regular contact with current members today.

During the year we have many club events. One is taking part in the annual university festival. We sell mizuamesembei, which are traditional sweet rice crackers and are really popular with young kids. If you have chance to come to the festival, please come and find our stall. Another big event is our Ibusuki Tournament. Every year we invite the first-year members from 40 university club teams from all over Kyushu to the hot spring resort of Ibusuki, just down the coast from Kagoshima, to take part in the tournament. Our club has been organizing this tournament for 47 years and we hope that it has help contribute to raising the levels of kyūdō in the Kyushu region.

Finally, I hope that having read this are now at least a little bit interested in kyūdō and if you are ever at Kagoshima University, you are very welcome to visit us at the dōjō- there is so much more to our sport and club than I could possibly write about here. Hope to see you there.



Satsuma Islamic Culture Center (SICC)

Yusuf Bohadi, Member, MSc in Fishery 2012



SICC Bus Tour to Sendai Nuclear Plant

SICC is a nonprofit organization established by the wonderfully diverse Muslim students and professors of Kagoshima University together with citizens of the Satsuma (Kagoshima) region in Kyushu. After its establishment in December 2008, the organisation has been committed to offering diverse perspectives for the wide array of Muslim ethnicities, races, education and cultures including South Asians, Arabs, Chinese, Turks, Japanese, Africans, and Caucasians, who came from different regions of the globe. The force that unifies these different ethics and educational backgrounds is the Islam faith. "Strength in diversity" is the phrase that simply describes SICC.

Members of the extraordinarily diverse Muslim community of SICC cooperate with one another, with the interfaith communities, with civil organizations, and with academics as well as the public sector in Kagoshima to serve the well-being, encourage dialogue, and build coalitions that promote justice and mutual understanding in southern Japan.

The main commitment of SICC is thus to provide religious and social services for the Muslim communities in the region, a link to the other faiths, and to deliver the true image of Islam with the objectives of eliminating any misconceptions or false accusations of xenophobia surrounding the religion. Furthermore, SICC services include celebration of different Islamic occasions to solidify the bonds and bring happiness to the young and old between the diverse Muslims with their non-Muslim friends. It is a platform to serve the communities in Kagoshima, whether Muslim or non-Muslim, through interaction, as the prophet Muhammad (peace be upon him) said, "The leader of the community is its servant."

Interaction with the non-Muslim communities, both Japanese and non-Japanese, is thought by SICC to be a very important contribution to the well-being. For this, SICC establishes annual activities such as its "Sharing Ramadan" event, where both Muslims and non-Muslims share a wonderful evening dining together during the holy month of Ramadan. It is a joyful occasion that offers an opportunity for friends of all faiths to share the breaking of the fast with Muslim families and to taste Islamic customs. Sharing Ramadan is a big event for SICC that is attended by the public, academics, law officials and key business men and women of the Kagoshima region, whereas all have the opportunity to gain clearer vision about Ramadan and sensitive issues to Muslims while enjoying meals from multiple international kitchens.

Visiting historical and educational landmarks is also another activity that is organised by SICC for Muslims and their Japanese friends. One such event is the bus tour to visit Sendai Nuclear Plant. Aimed at providing awareness as well as reaching to the local community, the nuclear plant bus tour was both an educational and pleasurable day out for 34 Japanese and 43 foreigners of different nationalities.

There are many other ways in which SICC serves the community: such activities include weekly Arabic language and Quran teaching classes to adults and children for Muslims and non-Muslims. SICC arranges a monthly gathering to share food and offer presentations about important Islamic topics and also runs a flea market for newcomers to Kagoshima and to fund other activities. SICC also answers social needs by arranging official wedding ceremonies for foreigners and Japanese couples.

One of SICC's biggest future plans is to build the first Islamic center in Kagoshima (namely Masjed), as a place where Muslims can practice their activities and as a centre to extend its role in serving Kagoshima's citizens.

As a reflection of SICC's social mission, individual members have long donated their time and expertise to SICC programs, with tangible results. Since "You cannot have service without sacrifice", our future sacrifice programs for the region range from sensitivity training for officials, school tutoring, neighborhood care and disaster relief.



SICC Flea Mart SICC Flea Market

Website: <http://sicc-kagoshima.org/index.html>

Contact email: shura@sicc-kagoshima.org



Fostering the spirit of enterprise: an educational programme in South America

By Katō Yasuhisa, Professor, Center for International Planning

From 1897 onwards, many waves of Japanese immigrants left for the American continent dreaming of new but challenging lives. From the onset, many of those people were from Kagoshima taking part in the government organised immigration programmes. Those immigrant communities have become known for the success they achieved despite the tremendous challenges they faced. This programme, initiated by university president, Yoshida Hiroki, considered that a spirit of enterprise can be fostered if young people learn from those immigrant societies. In close collaboration with the Japanese societies there, a study tour to Brazil and Paraguay took place from 16-28 August 2011 with 12 students and two supervising professors. The study tour had the following two educational goals:

- i. Learning the spirit of enterprise through communication with immigrants from Kagoshima in Brazil and Paraguay who overcame an unfavorable and hostile environment to show great achievement.
- ii. Learning the different but self-sustaining agriculture in those countries, which may provide hints of improving Japanese agriculture system that is currently encountering problems from external pressure.

Furthermore, it was hoped that communicating with people in Brazil and Paraguay would enhance the students' capacity to better understand different cultures.

Compared to multi-ethnic countries which require the nation as a symbol to consolidate the people's efforts, the concept of nation is largely not needed for mostly homogenous Japan. Young Japanese students who are satisfied with Japan's current economically rich but internationally isolated society while they stay in Japan, rarely discuss the country in their daily lives. What is more, they tend not to consider Japan positively mainly due to their microscopic views of their uniform society. Such views can

be considered as quite unique in international society and have a negative effect anyone wishing to actively develop an international career. In this respect, all the participants on the programme felt some culture shock when they met the first generation of Japanese immigrants, the issei, who had demonstrated strong pride for Japan, being Japanese and their own personal histories.

This is not due to the fact that they simply stayed in a foreign country, but related more to their heroic experiences. The pride in being Japanese had developed hand in hand with the confidence that they gained achieving success alone without the support of the Japanese Government. The confidence is further supported by the great reliance shown by the issei appreciating Japanese nature. It was hope that this culture shock would positively influence the students when they understood that Japanese had succeeded on the other side of the world, and this success had been inherited by the second and third generations who are of similar age to them.

The second educational goal was to confirm the role of



Maruyama Shōta
1st year student, Faculty of Law,
Economics and Humanities.

The nature, economy, culture and people of Brazil have all shown us the power of a nation that we do not feel in Japan at present: the diversified environments spreading over the world's fifth largest country; the economy drastically booming as one of the BRICs; the large amount of agriculture production providing 90% of their food security; a dynamic meat-eating food culture which held so many culinary surprises for us; and of course their passion for football was beyond our imagination. Even though we had come from the other side of the world, we were welcomed warmly and treated as members of the family by our hosts. We were inspired by everything, completely overturning our images of Brazil as somewhere that was suffering from decreasing public safety and industrial pollution from its rapid economic development. Yet, what we saw was totally different. The great influence that Japanese immigrants have had on the current life of Brazil was also surprising and impressive. You could go as far as saying that Brazilian life would be quite different had the immigrants not arrived from Japan. The Japanese communities in Brazil were highly regarded for their great achievements in many different fields. Such evaluation by the local community is the same in Paraguay, where we were told that Japanese immigrants totally changed agriculture developing it from scratch. Due to this success, we were able to observe an even higher appreciation for Japanese communities in Paraguay.



Japanese immigrants in contributing to the development of a balanced diet in both countries which were used to eat more meat and fewer vegetables. All students paid great respect to the immigrants' achievements understanding that food culture is very conservative and difficult to modify to the level recognized by the countries concerned. Students were particularly impressed with the unique cultivating method called no-till farming in Iguassu, Paraguay. They were all greatly surprised on the scale of agriculture managed by the immigrants, whose predecessors had developed 200-1200ha of land clearing tropical forest, compared to Japan where most farms are small scale and could not exist without government subsidies.

No-till farming is unique in terms of its idea to deny the need for cultivation. The practice is to cover the land with the agricultural residue of the previous harvest and seed it using a special large-scale machine without having to till. It was found that the system could utilize residue as fertilizer with the aid of bacteria and it would eventually increase the fertility of the soil (3ton/ha of production without using additional fertilizer) beneath the cover, both shaded from strong sunlight and protected from surface erosion during the seasonal heavy rains. Although the system may not be applicable to agriculture in Japan, it is worth consideration

for tropical agriculture in other areas. Seeing this different but impressive agriculture system so very apt for the local ecosystem was also an educational benefit for the students to foster wider views for their future international careers.

This programme had the additional benefit of providing the students the opportunity to learn about people from other cultures by meeting students from a vocational school in Itu, and Sao Carlos University in Sorocaba, Brazil and young farmers in Iguassu and students at Este University in Paraguay. In particular the homestays in Sorocaba proved a memorable experience for everyone.

Lastly, since the sister university arrangement between Sao Carlos University and Kagoshima University was concluded during the trip, it is hoped that this kind of educational programme connecting universities and Japanese immigrant societies will continue and help to deepen mutual cooperation.



Tanaka Emi
1st year student,
Faculty of Agriculture

Iguassu is known as the place where no-till farming started in Paraguay. This method, which completely overturned common agriculture practice, was developed by one of the Japanese immigrants and introduced to Iguassu Agriculture Cooperative to protect against the erosion of farmland in 1982. We visited a farm of a few hundred hectares owned by Mr. Fukami, who was a founder of the no-till method. Although the surface of the land was covered by the agriculture residue of previous harvests and the soil looked hard from not having been tilled, the soil beneath the cover was soft. It was explained that there are lots of cracks in the sun and wind hardened surface soil which enable the required nutrients to penetrate the soil underneath. Brazil and Paraguay both have vast land areas with large scale agriculture production allowing them to produce enough agriculturally to meet their national needs. Compared to these countries, Japan has a much smaller amount of farmland, most of it located in the mountain areas, which is less appropriate for agriculture production. After seeing the agriculture practices in South America, I am convinced that Japan needs to develop more advanced technology to be able to produce at least enough agricultural products to meet national needs even in such handicapped conditions for agriculture.

Study Kagoshima Short Stay Programme

The Study Kagoshima Short Stay Programme, supported by Japan Student Services Organization (JASSO), was held for the first time in the International Student Centre from 17-28 August, 2011 and welcomed 10 students from overseas sister universities in China, Korea, India and USA. This programme was organised to give foreign students the opportunity to learn both Japanese and about the culture in Kagoshima. One of the objectives of the programmes is that it is hoped that the students will consider studying at Kagoshima University in the future.

The morning Japanese language classes were followed in the afternoon by English lectures on cross-cultural understanding, healthcare and Kagoshima's natural environment. The students also took part in tours of historical sites, museums and other places to extend their knowledge of Kagoshima and Japan.



University President in China

University president, Dr. Yoshida Hiroki, was invited to Hunan Agricultural University in Changsha in late September, 2011, to participate in the university's 60th anniversary commemorative events. Dean Iwamoto Izumi and Professor Hou De-Xing both from Faculty of Agriculture also attended.

Dr. Yoshida and Professor Hou then visited Northeastern University in Shenyang to meet Professor Ding Lieyun, the new president of the university. The meeting finished successfully with valuable discussion regarding collaborative activities such as mutual student exchange programs and for the further development of the cooperative relationship between the two universities.



After the official visits, Dr. Yoshida met with alumni in Shenyang and Beijing to make them Kagoshima University Network Ambassadors in order to help promote the university's international development.

German Consul General's Visit

Dr. Alexander Olbrich, Consul General of the German General Consulate Osaka-Kobe visited Kagoshima University to meet our president and give a lecture on 31 January 2011. His visit was organized by Professor Umenai, president of the Japan-Germany society in Kagoshima, in commemoration of the 150th anniversary of ties between the two countries.

Dr. Olbrich's lecture on energy policy in Germany was given in German to roughly 90 first-year German students, who were not only extremely interested in the topic, but also happy to have the opportunity to hear native German.

After the lecture, Dr. Olbrich enjoyed talking with our university president about education and research exchanges between Japan and Germany. In the meeting, Dr. Olbrich offered active cooperation for our university's academic collaborations with German institutions in the future.

Shōchū Science Symposium

The 8th Shōchū Science Symposium, 'Alcohol and Food Collaboration in Asia', was held by the Faculty of Agriculture on 16 December 2011 attended by about 150 people including members of the general public, representatives from local brewing companies, and university staff and students.

The symposium began with opening address from executive vice president, Dr. Maeda Yoshizane, and Dr. Li Zhiqiang, president of Sichuan University Jinjiang College. After presentations by academic staff from both Kagoshima University and Sichuan University, keynote lectures were given by two eminent researchers, Dr. Koizumi Takeo, professor emeritus of Tokyo University of Agriculture and visiting professor of Kagoshima University, and Dr. Ishige Naomichi, professor emeritus and former director-general of the National Museum of Ethnology.

Before the symposium, an international exchange agreement was signed by Professor Iwamoto Izumi on behalf of the Faculty of Agriculture and and Dr. Lito further collaboration between the two institutions in the field of fermentation studies and to establish student exchanges.

Chinese exchange students in Kagoshima

Kagoshima University welcomed students from Northeastern University in November 2011. The stay was part of a JASSO supported exchange that had already seen Kagoshima students go to China. Study tours focused on environmental issues and strategies in both countries. The Kagoshima students had visited Shenyang and the desert area of Horqin, where they learned about the effects of desertification, as well as the history and culture of Northern China. The Chinese students visited Kagoshima, Izumi, and Minamata to learn about local government recycling systems, life in rural areas of Japan, and the history of Minamata disease. They were also able to enjoy sightseeing and shopping in Kagoshima city and a one-night farm stay in Izumi.





SATSUMA SHŌCHŪ INVIGORATING OUR REGION

薩摩焼酎にみる地域おこし

Sameshima Yoshihiro
Professor, Faculty of Agriculture

The oldest existing written record of Satsuma shōchū dates back to 1546, when a Portuguese trader wrote to St. Francis Xavier mentioning that shōchū made from rice was regularly consumed in the Kagoshima region. The word 'shōchū' also appeared in an inscription written in 1559, found at the Yahata shrine in Isa. In that era, shōchū was produced using rice, but from the early 18th century *Satsuma-imo* (sweet potato) was introduced to the region and due a local rice shortage at the time, *Satsuma-imo* became the primary ingredient for what became known as imo-shōchū. The production of imo-shōchū then spread rapidly.

Yet even up to the middle of the Meiji era, the poorly made shōchū of the times had a reputation for 'being so awful it would make your clothes stink'. shōchū however had its 'renaissance' so to speak, in the latter half of the Meiji era when major improvements in processing methods were achieved. In the years that followed this same process method was to spread to all regions of Japan, with various base ingredients used and many new varieties of shōchū being developed, and as a result shōchū experienced a major boom during the mid-70s to 80s. shōchū has nowadays come to be known for its soft



'Shōchū Studies' students receiving on the job training in shōchū production.

flavor, which when mixed with hot water (known as *oyuwari*) could be enjoyed at various strengths to taste, it goes well with all types of dishes, and Satsuma shōchū has an image as a healthy beverage in that it is known for being less likely to lead to hangovers.

While the warm southern climate here is said to be less conducive to the production of alcohol, and with the difficulties that lie in growing Satsuma imo, major developments in production methods and the popularity of drinking *oyuwari* have enabled these hurdles to be overcome and shōchū drinking has become a quintessential part of Kagoshima life. The history of Satsuma shōchū is truly one of overcoming adversity through originality and innovation, with problems leading to solutions, then strengths that have given us this proud legacy as the leading shōchū producing region.

We strive to go forward from this fine legacy by selectively using locally grown produce, and to continue to innovate to create more original products, and while doing so have shōchū as a model of local industry that is tangibly contributing to the wealth of our local region.

* Front Cover



Campus in Winter Evening

Photograph by Kuratsu Masaki
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