



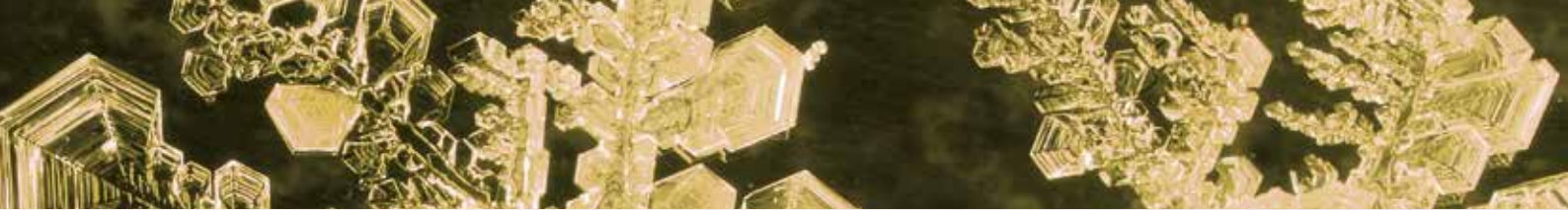
JSPS QUARTERLY

JAPAN SOCIETY FOR THE PROMOTION OF SCIENCE

■ FEATURE

New “Fund for the Promotion of Joint International Research” Launched

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Dynamic Support for Young and Mid-Career Researchers

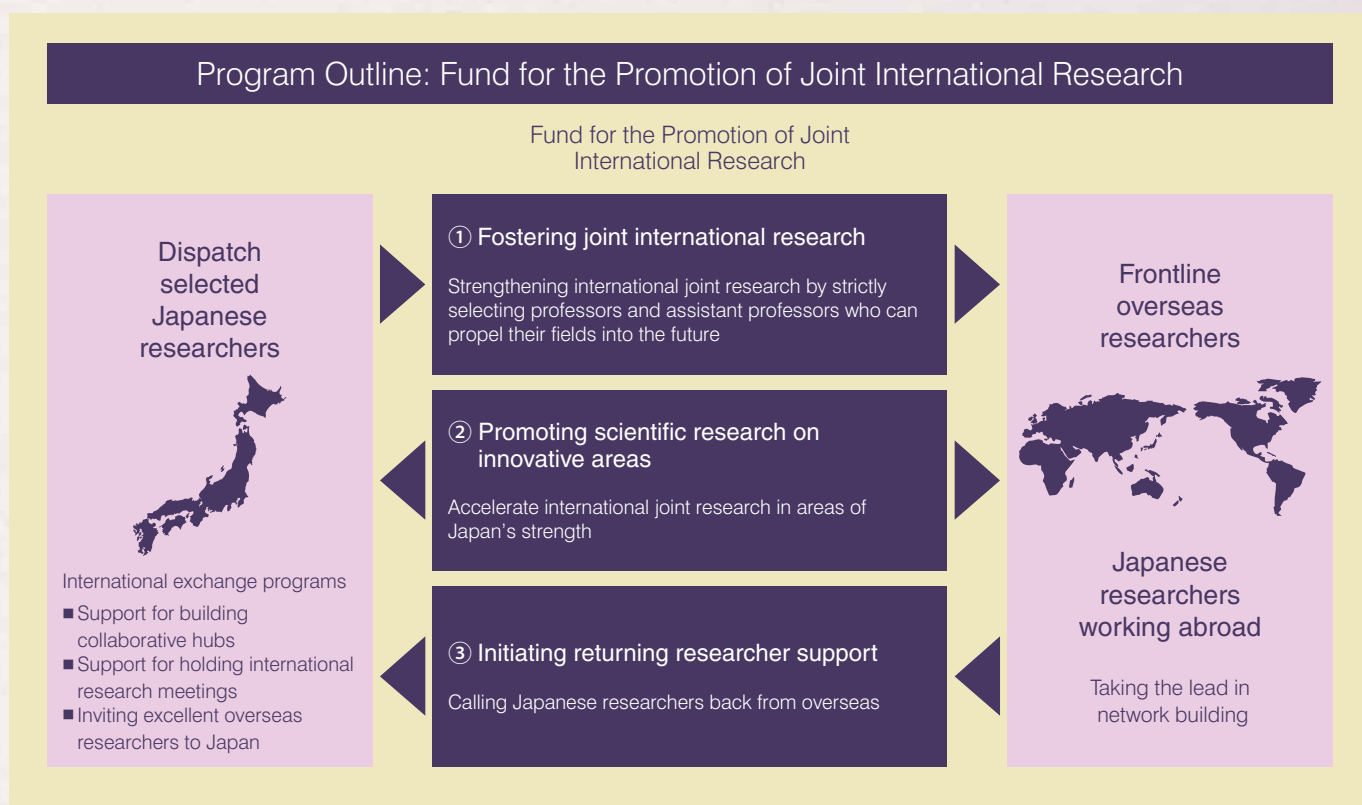


Two Japanese researchers were selected for Nobel Prizes this year. For sure, Japan’s scientific community has enjoyed a lot of good news over recent years. It’s wondered, however, what the next 10 or 20 years of expanding globalization holds in store for Japan. Looking into future, pessimistic voices can be heard when it comes to Japan sustaining its level of scientific advancement. Quoting a report from the Council for Science and Technology: “The increasing global circulation of the world’s best brains over recent years is spawning vibrant international networks. Japan, however, has not kept abreast this international flow.” On the frontlines of scientific research, a constant challenge persists to pioneer new genres of knowledge. While the nations of world are enmeshed in fierce scientific competition, researchers of differing value systems and cultures are interacting in friendly rivalry to advance a dialogue and exchanges that transcends their scientific fields, organizations and borders. Our article in this issue of the *Quarterly* describes a new program that JSPS has launched under its Grants-in-Aid for Scientific Research (or *KAKENHI*) to more deeply globalize Japan’s research community.

1. About Grants-in-Aid for Scientific Research

The KAKENHI program supports research activities carried out in universities and research institutions throughout Japan by awarding grants to the researchers who conduct them. Targeted for these grants is creative and cutting edge research, from basic to applied, in fields across the spectrum of the humanities, social sciences and natural sciences. Through its wide support for research that underpins all scientific activity, KAKENHI plays a vital role in planting and nurturing seeds of scientific innovation.

Taking an overview glance at the KAKENHI program, some 107,000 applications were received for FY2015 grants, from which about 30,000 were selected. To fund them and other ongoing grant projects, the program is allocated a ¥227.3 billion budget for this fiscal year. Several grant categories are provided to facilitate application and screening on various levels and scales of research. Applicants choose the grant category that best corresponds to the content and scope of their research. Applications are screened based on the scientific content of their research plans. Given the huge number of applicants, more than 6,000 examiners conduct peer reviews in the screening process. Multiple researchers in or near the applicant’s field evaluate each application.



This fiscal year, a new grant category “Fund for the Promotion of Joint International Research” was established to advance international joint research amidst rapidly expanding globalization. This is a multi-year fund that allows researchers to freely use their grants across fiscal years when carrying out joint research overseas and other related scientific endeavors.

2. About the Fund for the Promotion of Joint International Research

This program is implemented in three main categories: (1) Fostering joint international research, (2) Promoting scientific research on innovative areas, and (3) Initiating returning researcher support. Though each of the categories has its own function, they all work to promote the globalization of Japan’s scientific domain. Covering all three categories, the program’s FY2015 budget is ¥10.9 billion.

(1) Fostering joint international research

As the centerpiece of this new grant program, this “Fostering Joint International Research” category is allocated a budget of ¥6.4 billion. The funding is provided to mainly young and mid-career researchers who have already been selected for a Grant-in-Aid and who as future frontline researchers will drive forward Japan’s scientific research and become hubs for international collaboration. They are to use the grant to carry out international joint research while residing overseas for a set period of time. Through this initiative, the KAKENHI program is working to foster Japanese researchers with wide international perspectives, while building a vigorous international research environment throughout Japan. This fiscal year, the plan is to support about 400 researchers through this program.

(2) Promoting scientific research on innovative areas

“International Groups” are established within the program. Their function is to coordinate international joint research activities in new research domains formed in areas where Japan is deemed to have a high potential of amplifying its inherent strengths. In line with the unique characteristics of each domain, these Groups act independently in sending Japanese researchers abroad and inviting overseas researchers to Japan in ways that accelerate international research activities in their

respective domain. This fiscal year, 55 domains across the spectrum from the humanities to natural sciences are covered with a budget of ¥3.3 billion.

This new program establishes an optimal vehicle for advancing the international development of research domains. It works to strengthen each domain by discovering new elements lying latent in existing international research fields and pioneering new international networks. Concurrently, support in the form of analyzing international trends, advancing international joint research, and building overseas networks is provided. Also included under the program are the invitation of internationally adapted overseas researchers to Japan and the mutual dispatch of postdoctoral researchers.

(3) Initiating returning researcher support

Japanese researchers conducting frontline research overseas are given eligibility to apply for this grant under the category of “Returning Researcher Development Research.” If selected, they receive funding for a set period of time to carry out their research at an affiliated research institution after returning to Japan. While blazing a path for Japanese researchers to come back to Japan under advantageous conditions, this initiative also challenges young Japanese researchers to go abroad to pursue their work. In so doing, it promotes the international circulation of Japanese researchers. With a budget of ¥1.2 billion, 20 researchers are being supported in this fiscal year.

In sum, the purpose of each of these program categories is to foster internationally adept researchers while accelerating the globalization of Japan’s research community. Ultimately, this Fund for the Promotion of Joint International Research works to advance science in ways that make global contributions. Though small in scale relative to the overall budget of the KAKENHI program, this new system is expected to untap yet-uncultivated research potential. When placed into full operation, it will, as vehicle for giving uniquely expanded support to researchers and research organizations, contribute significantly to advancing, while further globalizing, Japanese science.

For more information about KAKENHI, please visit the program’s website at: <https://www.jsps.go.jp/english/e-grants/>



Positioning of KAKENHI from the Perspective of Paper Citations

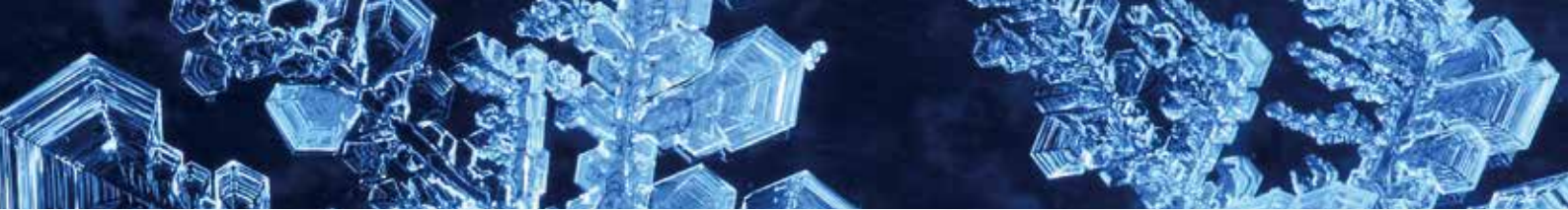
As of May 2014, the abstract and citation database Scopus of Elsevier B.V. registered papers published in more than 21,000 journals. Based on it, a comparison can be made of “Japanese papers” (authored by researchers in Japanese research institutions), “KAKENHI papers” (among the Japanese papers, authored with support from KAKENHI grants), and “non-KAKENHI papers” (among the Japanese papers, other than KAKENHI papers). Using the number of citations per paper is one means of gauging the impact of research.

- Comparing these three types of papers over the 15-year period from 1996 through 2010 shows the citations of

KAKENHI papers to be about twice those of non-KAKENHI papers and 1.5-1.6 times those of Japanese papers.

- Likewise, the percentage of KAKENHI paper citations included among the top 10% of papers was about twice those of non-KAKENHI papers and 1.5 times those of Japanese papers.
- The percentage of KAKENHI paper citations included among the top 1% papers was also about twice that of non-KAKENHI papers.

Note: Japanese language KAKENHI papers are not included in this survey because Scopus does not database papers written in Japanese.



International Workshop

Held on Research Excellence Initiatives



In FY 2007, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) launched the World Premier International Research Center Initiative (WPI Program) and commissioned JSPS to administer it. The WPI Program seeks to build within Japan “globally visible” research centers that boast a very high research standard and outstanding research environment, sufficiently attractive to prompt frontline researchers from around the world to want to work in them. There are currently nine of these WPI centers in operation. The first five were selected in 2007, with another established in 2010 and three more in 2012. As the WPI Program approaches its tenth year, an international workshop was held to contemplate its future scheme and vision. Convened over the two days of 14-15 October at Sheraton Miyako Hotel Tokyo, the workshop brought together administrators of Research Excellence Initiatives (REIs) from countries around the world.

REIs are special programs supported by large budgets over long periods. They constitute a new kind of science-advancement stratagem, government spearheaded and system designed to yield milestone research results in a global era. More than two-thirds of OECD-member countries implement REIs. In the OECD report “Promoting Research Excellence: New Approaches to Funding” (issued in February 2014) Japan’s WPI Program was introduced as an REI role model.

Dynamic Two-Day Program

The program was carried out in two parts: The REI International Workshop and invited lectures on the first day and a Roundtable Discussion on the second day. Participating in the workshop were REI program representatives from Japan, Germany, France, Canada, Israel, UK, the US, and China. They delivered presentations on their respective REI policies and undertakings. In his presentation, WPI program director Dr. Toshio Kuroki talked about the active role that young researchers are given in Japan’s REI projects and how a merit-based pay system has been introduced. He described how Japan is responding to the imperative for organizational reform including the internationalization of the centers’ and their host institutions’ administrative staffs, stating that some of the centers are still slow moving in fully implementing internationalization measures. Dr. Luis C. Ho, director of the WPI Kavli Institute for Astronomy and Astrophysics, spoke from an astrophysicist’s perspective about China’s strategy to establish top world-level research centers, while it is placing emphasis on developing researchers and building an international research environment. Dr. Klaus von Klitzing, director of Max Planck Institute for Solid State Research and 1985 Nobel laureate in physics, stressed the importance

of allowing researchers free discretion in pursuit of their activities in order for creative research with high societal impact to be successfully advanced.

The second day’s Roundtable took antecedents from the previous day’s discussion in advancing a dialogue on issues encountered by research organizations in carrying out REI strategies and on a future concept for the WPI Program. It was learned in the course of the discussion that the US and Germany will continue creating new centers as part of an effort to sustain the “metabolism” of their REI programs, and that the other countries also have plans to continue building new research centers.

This workshop afforded REI program representatives, WPI program committee members, MEXT and JSPS officials, and WPI center representatives an ideal opportunity to meet and exchange views. To survive and prosper in a highly globalized world, countries will need to implement funding schemes that strike a sustainable balance between leveraging their national strengths and sharing knowledge and wisdom that overarches national boundaries. The discussion advanced in this workshop stimulated innovative thinking on each country’s future REI concepts. As such, it is expected to have planted and nurtured seeds for designing ever-more effective REI programs and support systems.

After the REI workshop, the participants relocated to Hakuho-kan banquet hall in the beautifully landscaped “eight-view” Happo-en garden for a reception. It was attended by MEXT Minister Hiroshi Hase, who praised the results achieved so far under the WPI Program, expressed expectation in future program advances, and offered words of encouragement to all the participants. Also attending the reception were representatives of foreign embassies, government ministries and agencies, and academic institutions along with the directors of the WPI centers. All enjoyed a spirited exchange of views and information, including on the academic trends and vistas of their various fields and organizations.

University-Industry Cooperation and Research Program Division



Prof. Julika Griem

Two Japanese Researchers Awarded 2015 Nobel Prize

In the evenings of October 5th and 6th, JSPS staff became restless as they watched the clock. It wasn't that they had a deadline to meet or something scheduled to do after work, rather they were on pins and needles waiting to see the announcement to be broadcast live on the 2015 Nobel Prize winners. On the 5th, they were thrilled to hear that Prof. Satoshi Omura, distinguished emeritus professor, Kitasato University, was chosen for the Nobel Prize in physiology or medicine. Then, on the 6th, they jumped again for joy to learn that Prof. Takaaki Kajita, Institute for Cosmic Ray Research, University of Tokyo, would receive the Nobel Prize in physics.

Known to say "My work is advanced by borrowing the power of microorganisms," Prof. Omura developed the drug Ivermectin, which is said to have saved the lives of some 200 million people afflicted with parasitic diseases. Underscoring this accomplishment was the exhaustive search that he conducted



Prof. Omura

for bioactive compounds produced by microbes that he isolated and cultured from soil samples. During the period from 1970 through 2006, JSPS had through a variety of vehicles, including its Grants-in-Aid (*Kakenhi*) Program, 21st Century COE Program, and Research for the Future Program, been supporting basic research on new medical and pharmaceutical materials derived from natural products and microorganisms.

Prof. Kajita has said "It's good enough for research driven by intellectual curiosity to expand the horizons of human knowledge, even if it doesn't have an immediate application." Following in the footsteps of Dr. Masatoshi Koshiba, 2002 Nobel laureate in physics, and Dr. Yoji Totsuka, former director of JSPS's Research Center for Science Systems, Prof. Kajita made the ground-breaking discovery that neutrinos have

mass—a breakthrough he achieved through painstaking observations at the Super-Kamiokande. Sparking a storm of innovation across the field of particle physics, this discovery advanced yet another step human understanding of the universe and its origins. From 1990, JSPS has been supporting research in neutrino oscillation via several avenues, including its *Kakenhi* Program, Leading-edge Research Infrastructure Program, World Premier International Research Center Initiative (WPI program), Japanese-American Frontiers of Science (JAFoS) symposiums with young US researchers, and bilateral exchanges with Korean researchers.



Prof. Kajita

Evidenced by these two Nobel awards, JSPS has since its establishment in 1932 unrelentingly contributed to advancing research of a kind undertaken by scientists who could go on to win Nobel Prizes. As demonstrated, bottom-up support for challenging and creative research coupled with continual support for basic research can be of momentous impetus to research advancement within the scientific community.

JSPS president Dr. Yuichiro Anzai extended the following message of applause to Professors Omura and Kajita: "The award of your Nobel Prizes gives recognition to the global impact exerted by Japan's basic research while being a source of pride and encouragement to those engaged in scientific pursuit, especially younger researchers who with great zest and vigor strive to push forward their work. Driven by the power of knowledge, JSPS will continue carrying out its programs in ways that enable Japan to contribute to global society. Most especially, we will support a wide range of creative research rooted in researchers own free ideas, while working to create an environment in which young researchers will go out into the world and give birth to ever-greater milestone research results."

New Edition of *Life in Japan* Published



In December, JSPS published a new edition of *Life in Japan*, subtitled "For Foreign Researchers 2016-2017." It covers a wide range of basic information to help make living in Japan a pleasant and convenient experience for overseas researchers. For that purpose, this handbook provides up-to-date information on such things as visa and residency procedures, public services, lodging accommodations, children's education, medical care, emergencies, and even museums, all of which are supplemented with useful references including websites.

The information in *Life in Japan* is reviewed and renewed every two years so as to keep it updated. The handbook is

distributed to overseas researchers who come to Japan under JSPS's postdoctoral and invitational fellowship programs and its Summer Program. It is normally sent to newly selected JSPS fellows along with their award letter. This 214-page volume can also be accessed on JSPS's website at the following URL:

https://www.jsps.go.jp/english/e-plaza/51_lifelnJapan.html

The book comprises six chapters.

- Chapter 1: Procedures for Entry and Residence in Japan
- Chapter 2: Living Accommodations in Japan
- Chapter 3: Daily Life in Japan
- Chapter 4: Other Useful Information
- Chapter 5: Academic Information
- Chapter 6: Japan Society for the Promotion of Science

JSPS Fellows Plaza

A-HORCs & ASIAHORCs Meetings Held in Okinawa

Over the period of 9-12 November, the 13th meeting of the Heads of Research Councils in Asia (A-HORCs) and the 9th meeting of the Asian Heads of Research Councils (ASIAHORCs) were held in tandem with a Northeastern Asian (NEA)/ASIAHORCs Joint Symposium. Held in Okinawa, this year's meetings were hosted by JSPS. Their aim was to advance leading-edge science and foster excellent young researchers within the Asian region.

13th A-HORCs Meeting

A-HORCs meetings are convened annually to bring together the heads of top science-promotion organizations in Japan, China and Korea in an exchange of views on their countries' S&T policies and other matters of mutual interest. This year's meeting was attended by JSPS president Dr. Yuichiro Anzai, National Natural Science Foundation of China (NSFC) vice president Prof. Wen Gao, and National Research Foundation of Korea (NRF) president Dr. Min Keun Chung. After giving country presentations on the theme "Research Funding for Breakthroughs," they advanced a discussion



on policies and measures for improving each country's review system and exchanged views and information on programs being implemented by their respective organizations. Lastly, they agreed upon setting "Molecular Imaging-based Precision Medicine" as the theme for the next Northeastern Asian Symposium.

9th ASIAHORCs Meeting

The ASIAHORCs meeting assembled under one roof the heads of leading science-promotion organizations in Japan, China, India, Indonesia, Korea, the Philippines, Thailand and Vietnam to carry out an exchange of views on the topic "Trends of Science and Technology Policy in Asian Countries." In his presentation, JSPS president Dr. Anzai introduced Japan's S&T-promotion policies and described innovative reforms recently made to JSPS's Grant-in-Aid for Scientific Research (*Kakenhi*) program. After each country presentation, the speakers responded to a volley of questions.

International Policy Planning Division



Dr. Yuichiro Anzai

Joint Asian Symposium Held in Okinawa

On 9-10 November, a joint NEA/A-HORCs symposium was held at the Okinawa Institute of Science and Technology Graduate University (OIST) on the theme "Chemical Biology." The Northeast Asian (NEA) Symposium is sponsored by JSPS, NSFC and NRF and the A-HORCs symposium by its consortium's 10 member countries.

The joint symposium was held amidst OIST's ideal environment with modern facilities and beautiful natural surroundings. It brought together a range of participants from renowned scientists to young researchers, who numbering 41 in total came from Japan, China, Korea and five other Asian countries. Over the two days, they presented their research and engaged each other in spirited Q&A discussions, which continued with vibrant momentum during the session breaks and reception. Deepening their collegial ties, the participants discussed possibilities for ongoing research collaboration.



After the symposium, the JSPS staff received such comments from the participants as "The discussions were very meaningful to me." "I was able to meet people with whom I'd truly like to conduct international joint research in the future." Admiring Japan's superb research environment, others said "I'd really like to do my research at OIST."

Though short, the time shared by the participants was intensive as they used it to inform each other their cutting-edge research activities in the area of chemical biology. The networks formed among the researchers attending the symposium are expected to spawn and advance to the next levels of international joint research.

Research Cooperation Division



International Symposium Held with Germany on Research Integrity

On 30 September, Japan-Germany International Symposium was held on the theme “Effort to Enhancing Research Integrity: Examples and Experiences of Japan and Germany.” Cosponsored by JSPS, the Japan Science and Technology Agency (JST), Japan Agency for Medical Research and Development (AMED), and German Research Foundation (DFG), the symposium was convened in Tokyo at the Hotel Grand Arc Hanzomon.

The symposium began with opening remarks by Dr. Jörg Schneider, Head of DFG International Affairs, and DFG vice president Prof. Frank Allgöwer, followed by greetings from the sponsors: JST president Dr. Michiharu Nakamura and AMED president Dr. Makoto Suematsu. Next, guest remarks were offered by Mr. Nobuaki Kawakami, Director-General, Science and Technology Policy Bureau, Ministry of Education, Culture, Sports, Science and Technology (MEXT), and Dr. Stephan Grabherr, minister, German Embassy in Tokyo.

Two keynote speeches were delivered. Dr. Yuko Harayama, executive member, Council for Science, Technology and Innovation (CSTI), spoke on the theme “Research integrity as the foundation of science, technology and innovation,” describing the government’s basic thinking regarding research integrity, CSTI initiatives to promote it, and related actions to be taken by research organizations. Dr. Kirsten Hüttemann, in-house counsel at Human Resources and Legal Affairs, spoke on the theme “Rules of Good Scientific Practice—The German System of Scientific Self-Regulation,” introducing an ombudsman system for investigating and arbitrating cases of research misconduct and its effective results to date.

Three sessions were held in the afternoon. The first was on measures to enhance research integrity taken in Germany and Japan. Dr. Christine Spitzer, in-house counsel, Human Resources and Legal Affairs, told about

initiatives being taken in Germany, while representatives of MEXT, JSPS, JST and AMED introduced measures being taken in Japan. In the second session, various on-the-ground examples were given of measures to promote research integrity. Providing them on the



German side was Professor Dr. med. Klaus-Michael Debatin, Chairman, Department of Pediatrics and Adolescent Medicine, Ulm University Medical Center, and on the Japan side were Dr. Teruyuki Nagamune, University of Tokyo, Dr. Tomoaki Tsuchida, Waseda University, and Dr. Katsunori Matsuoka, vice president, National Institute of Advanced Industrial Science and Technology.

To wrap up the day’s discourse, a panel discussion was held in the third session. It started with short presentations by Dr. Iekuni Ichikawa, Shinshu University, and Dr. Jun Fudano, Tokyo Institute of Technology. JSPS executive director Dr. Makoto Asashima moderated the discussion, which focused on the imperative to develop excellent researchers imbued with a high standard of integrity. Both the Japanese and German panellists agreed that accomplishing this will require more than just ethics education, that research integrity must be cultivated spontaneously through frank and upbeat discussions in the lab.

Then, the panellists engaged the floor in a spirited Q&A discussion, in which opinions were exchanged on whether there is a need to use standardized ethics education materials or whether Japan and Germany should take different educational approaches based on their varying circumstances and respective types of research ethics violations. Such discourse and interaction made the symposium a highly meaningful experience for both the lecturers and participants.

In his closing remarks, Dr. Asashima lauded the members of the symposium for their rich exchange of information on measures being taken in the two countries to elevate research integrity and for strengthening the public’s understanding of initiatives implemented to ensure a high standard of research ethics. He added that he looked forward to further opportunities like this symposium to work toward the achievement of even higher levels of research integrity.

Attended by not only researchers but also many administrators of research organizations, the symposium bore witness to the high level of importance placed on research ethics education in their various organizations. Having accomplished its objectives, the curtain closed on this very fruitful event.

For details on the symposium, please see the following website:
www.jsp.go.jp/information/index4.html#20151026

Research Integrity Office

Japanese-German Frontiers of Science Symposium Held in Kyoto

Frontiers of Science (FoS) Symposiums are held on a wide range of topics across the spectrum of the humanities, social sciences and natural sciences. They pit excellent young researchers from Japan and the counterpart country in cross-disciplinary discussions in a format that widens their scientific horizons and expands their networks. While these symposiums build and deepen collegial and friendship ties among the young participants, they give them a unique opportunity to engage in exchanges that transcend their research fields and national borders. The way in which different topics are juxtaposed in the symposium’s sessions spurs free and creative thinking by the participants. Ultimately, the aim of FoS symposiums is to foster the next generation of world leaders, who, possessing wide perspectives, will go on to play active international roles.

On 1-4 October, a FoS symposium was co-organized with the German Alexander von Humboldt Foundation. Venued at Kyoto Brighton Hotel, it was the twelfth in the series of Japanese-German Frontiers of Science (JGFoS) Symposiums. Participating in it were 59 outstanding young researchers (30 from Japan and 29 from Germany). The symposium was designed and implemented by its Planning Group, co-chaired by Prof. Dariusz Zifonun, Philipps-Universität Marburg, and Dr. Ichiro Hiratani, RIKEN Center for Developmental Biology. Starting their preparations a year in advance, the Planning Group members paired up to select and invite the speakers who would introduce their session’s topics from their respective research fields. The introductory speakers are dealt a difficult task, as they must grasp and somehow merge the content of leading-edge research being conducted in juxtaposed fields. It is the advancing of such discussions that attempt to intersect the lines of diverse fields that makes FoS symposiums such an exciting and challenging experience.

Six wide ranging topics were discussed during the symposium. In the social sciences session, the theme “Managing mega cities” addressed

population explosion in developing countries. In the physics/astrophysics session, the topic “SPIN—key phenomena in the smallest and the largest scale of nature” delved into the spin angular momentum of elementary particles. Their Q&A discussions being highly animated, all of the six sessions ran overtime. Particularly in the chemistry/materials science session, which focused on “White Biotechnology” as applied to various industrial processes, probing questions were asked from unorthodox angles by several social scientists, enlivening the cross-disciplinary exchange.

Besides the speakers, the participants were given an opportunity to introduce their various research activities through a 1-minute presentation with a poster, further energizing the criss-crossing discussion among them.

JSPS offers a follow-up program that provides FoS participants from counterpart countries support for coming to Japan to visit their Japanese colleagues. The networks formed through these symposiums spawn vibrant international exchanges and joint research projects.

Research Cooperation Division



Symposium on Nuclear Issues Held at UC Berkeley

Over a 2-day period from 30 September, the JSPS San Francisco Office and the Center for Japanese Studies (CJS) at the University of California, Berkeley held a joint symposium on the theme “Perspective on 70 Years of the Nuclear Age: From Berkeley, a Birthplace of the Atomic Bomb.” It was venues at the Berkeley City Club.

Over the past seventy years, nuclear technologies have brought about both atomic weapons and new sources of electric energy, which are now woven deeply into the fabric of many advanced societies. This symposium brought together US and Japanese scientists, historians, and other experts to share their views on past, present and future nuclear issues in an open, cross-disciplinary exchange. Their presentations addressed the political and scientific histories of the nuclear industries in Japan and the US and how they influenced the ethical and scientific challenges we face today.

The symposium began with opening remarks from CJS chair Dr. Dana Buntrock, vice chair Dr. Joonhong Ahn (Department of



Nuclear Engineering), and JSPS San Francisco director Dr. Masayuki Izutsu. Six sessions were held on five themes: Before Hiroshima and Nagasaki; Impacts on Political Powers; Nuclear Technologies; Impacts on Humans; and Toward a Nuclear-free World.

This series of sessions delved into such topics as the history and societal background preceding and following the bombing of Hiroshima and Nagasaki; the peaceful use of nuclear power and disarmament technologies; atomic bomb survivors, cancer epidemiology and the influence of radiation on humans; Japan’s dilemma: A desire to be nuclear free while needing nuclear energy to power its electric grid; and democratic decision making with regard to the use of nuclear technology. In the last session, all of the speakers got together for a panel discussion moderated by Mr. Martin Fackler (journalist-in-residence and research fellow at the Rebuild Japan Initiative Foundation).

More than 80 researchers, interested members of the public, and UC Berkeley students attended this 2-day symposium. Its multi-disciplinary discussions gave added thrust to collaboration between Japanese and US researchers on such topics as nuclear policies, technologies and ethics.

The JSPS San Francisco will continue to support symposiums like this one, which spawn and broaden linkage between academia and society while promoting robust US-Japan collaboration.

For the speakers’ abstracts and other information on this JSPS-CJS Joint Symposium, please visit its website:
<http://berkeleynuclearsymposium.weebly.com/>

JSPS San Francisco Office

Symposium Held in London on East Asian Art History

The field of East Asian Art History could not have been born without a symbiotic relationship unfolding among various groups of artists, said Dr. Eriko Tomizawa-Kay, a researcher at not only the University of London’s symposium-hosting School of Oriental and African Studies (SOAS), but also the Sainsbury Institute for the Study of Japanese Art and Culture, and the University of East Anglia. Active research exchanges among art historians in Asian and Western countries are revealing that the geographic, temporal and generic paradigms that currently frame the art history of East Asia are not set in stone but undergo dynamic changes. This symposium, titled “Deconstructing Boundaries: Is ‘East Asian Art History’ Possible?,” was convened to explore changes in the boundaries and concepts of “art” that occur in Japan and continental East Asian countries (principally China and Korea). Venued at SOAS, the event was held on 10-11 October.

The symposium comprised three sessions, entitled “Constructing the Idea of East Asian Art in Japan,” “Japanese Academies as Centre,” and “War and Body.” Participating in them were highly spirited researchers, including doctoral students and postdocs, hailing from Japan, China, Korea, the UK and the US. They discussed the ways in which Japanese and East Asian genres of art have influenced each other over a long period of many eras. In their presentations and exchanges the speakers and participants used a cornucopia of visual materials to introduce each other to their various areas of art history. As the period addressed spans the gamut from the 13th to 21st centuries, space doesn’t allow everything discussed to be introduced in this article. For a more detailed and wider coverage, please see the website noted at the end.

Throughout the discussions, all of the participants—art historians specializing in diverse periods and locations across such fields as Japanese art, Buddhist art and Western art—strived with great ardor to devise a new concept of “deconstructing art boundaries.” That made it a challenging symposium, designed from a perspective of comparative art to advance a critical dialogue on restructuring the academic framework of East Asian Art History.

Every year, JSPS London solicits proposals from members of the Alumni Association of the UK and the Republic of Ireland and the group “Japanese Researchers based in the UK” (JBUK) for interesting, cutting-edge symposiums, which are selected and held through a process of peer review. Organized upon this “JSPS London Office Symposium Scheme,” these events provide a vibrant platform for members of the alumni association and JBUK to play a vital role in academic exchange between British, Irish and Japanese researchers.

Presently, there are some 350 JBUK members, who include Japanese researchers with tenured lecturer and professor posts and also Japanese doctoral students and postdocs. The members are employed or enrolled in universities throughout the UK, not just in the London area. They are engaged in a wide spectrum of academic fields. It’s the London Office’s mission and privilege to support the JBUK members by publicizing their research activities.

Plans are to compile and publish the outcomes of this symposium. In the meantime, please find its program and lecture abstracts on the following website:

www.jsps.org/event/2015/06/

JSPS London Office



International Workshop in China on Frontier of Science and Technology

On 23 October, JSPS, the National Natural Science Foundation of China (NSFC) and the Chinese Academy of Sciences (CAS) joined forces in sponsoring an “International Workshop on Frontier of Science and Technology 2015” in Wuhan, located in China’s Hubei Province. This was the third of these annual workshops to be held jointly with JSPS’s counterpart agencies in China.

The theme of this year’s workshop reflected JSPS Beijing Office director Prof. Kaoru Hirota’s field of research: “Control and Intelligent Technology in Engineering Applications.” Organized by Prof. Min Wu, dean, School of Automation, China University of Geosciences, the workshop drew more than 185 participants.

In the opening ceremony, the president of China University of Geosciences, Prof. Yanxin Wang spoke on behalf of the workshop sponsors, extending appreciation to the other sponsoring and supporting organizations and expressing lofty expectation in the further advancement of Sino-Japanese scientific collaboration. Then, Dr. Yongtao Zhang, division chief, Asian, African and International Organization Affairs, NSFC’s Bureau of International Cooperation, and Mr. Haitao Chen, Division of Asian and African Affairs, CAS’s Bureau of International Cooperation, elaborated upon the results achieved by way of their organizations’ exchanges with JSPS, saying that they looked forward to ever-stronger bilateral relationships unfolding in the future. After them, Prof. Hirota gave a 30-minute presentation on JSPS’s international exchange programs, placing particular focus on its fellowship programs for overseas researchers.

Divided between the morning and afternoon, four sessions were held, in which a total of 14 researchers (5 Japanese, 9 Chinese) delivered lectures on their most recent research results. The majority of the workshop participants being young researchers, each session was highly animated with spirited discussions. On the following day, the participants changed venues to China University of Geosciences, where a more specialized international workshop was held on “Advanced Computational Intelligence and Intelligent Informatics.” It was attended by mostly young researchers, who took the initiative to travel from Japan and around China to present papers on their latest research.

JSPS Beijing Office



Desert Technology: International Conference in Cairo University

On 16-19 November, Desert Technology 12th International Conference was held at University of Cairo. It addressed three subjects: 1) Special characteristics and benefits of desert ecosystems, 2) Mechanism of desertification and its management, and 3) Appropriate technologies for developed and developing regions. Around 200 researchers from 15 countries joined the conference, with several coming from the Japanese Association for Arid Land Studies.

A special feature of this conference’s presentations was an added focus on human sciences. Eight of them were delivered by Japanese researchers. The JSPS Alumni Association in Egypt (JSPSAAE) held a special session on collaboration between Egypt and Japan on the morning of the 17th. Eight presentations were given, starting with one by JSPSAAE president Prof. Ibrahim Tantawy. It is, of course, well known that Egypt is surrounded by desert; this session explored partnership between arid areas such as the Middle East and humid areas such as Asia’s monsoon region.

Research Collaboration between Egypt and Japan

JSPSAAE has some breaking news: Three of its members were appointed university deans in 2015. They are Prof. Hany El Shimy, Faculty of Agriculture, Cairo University; Prof. Adel El Beltagy, Faculty of Agriculture, Menoufia University; and Prof. Abu El-Hassan, Faculty of Science, Menoufia University.

The Second E-JUST International Conference, this time on Innovative Engineering, was held on 19-21 May in Alexandria. E-JUST stands for “Egypt-Japan University of Science and

Technology.” It was established in 2009 as a bilateral project between the Egyptian and Japanese governments.

As a significant point, Egyptian scholars who go to Japan study mostly science and technology, while Japanese scholars who come to Egypt are usually archeologists, historians and economists. Recently, collaboration between these S&T scholars and social science/humanities scholars is rapidly increasing.

Searching for the Next Step

On 16 January, a symposium will be held to celebrate the thirtieth anniversary of the JSPS Cairo Research Station. To be attended by JSPS president Dr. Yuichiro Anzai and former directors of the Cairo Research Station, the event will focus on the historical relationship and research exchanges between Egypt and Japan.

Amplifying their good relationship, JSPSAAE and JSPS Cairo Research Station are also planning to hold a workshop at Suez University in 2016. The program will include a briefing on JSPS’s research promotion activities and a session to address the subject “World Megacity” from a historical viewpoint, with focus on Cairo as a megacity with a long and illustrious history.

Through these events and future activities, the JSPS Cairo Research Station will provide assistance to building a network for bilateral research collaboration that jumps the discipline barrier.

Further information can be found at:
www.desert-technology-12.agr.cu.edu.eg/dt12/S

JSPS Cairo Research Station



Sphinx and Pyramids, Cairo



Introducing JSPS Alumni Associations



German JSPS Alumni Talk about Past and Future Successes of Their Association

2015 marks the twentieth year since the German alumni association (German JSPS Club) was established in 1995. To celebrate this anniversary, a symposium on the theme “The Role of Renewable Energy for a Sustainable Energy Supply” was held by JSPS and the Club at Meiji University in Tokyo. It was attended by some 120 people, including many from Germany.

Currently, there are 14 JSPS alumni associations in operation around the world. With cooperation from JSPS’s Tokyo headquarters and Bonn Office, the German JSPS Club carries out a wide range of self-initiated, creative activities. Members of the association who came to Japan to attend the symposium talked to the *Quarterly* staff about what it is that has made the German JSPS Club so successful over a continuum of 20 years.

What’s the secret to the Club’s 20 years of success?

In answering this question, “personal relationships” was the first thing mentioned by Ms. Sabine Ganter-Richter (the Club’s public relations officer). A stalwart of the Club’s operation since its establishment, she spoke from experience when she told us about the members: They’ve all had highly positive experiences in Japan, making the Club an “interest group,” permeated with a family atmosphere, in Japanese culture. The Club’s treasurer Dr. Arnulf Jäger-Waldau emphasized “commitment” as being instrumental, explaining that the members pay dues and act as a group upon what they agree to do.

Club chair Prof. Heinrich Menkhaus said almost spontaneously that the secret to the Club’s success is “responsibility”—particularly that which the executive board exercises in support the association. He noted that any board member seen to neglect that responsibility would be replaced. Prof. Ivor Fleck (prizes officer) said that “hard work” underlies the association’s success, telling us with glee about how hard work has paid big dividends in building the alumni network. Dr. Wolfgang Staguhn (membership officer) said that it is no secret that “good communication” and “joint decisions” are key elements of the Club’s excellent performance. He went on to say that the members are all interested in and even love Japan, and are committed to their relationships with Japanese colleagues. He stressed that the successes achieved by the Club wouldn’t be possible if it weren’t for the support it receives from JSPS’s Bonn Office. Past Club chairman Prof. Uwe Czarnetzki was animated in quoting three reasons for the association’s success: “enthusiasm,” “nice members,” and “JSPS support.” It’s his belief that the German JSPS Club couldn’t have been so successful over a 20-year continuum if any of the above stated attributes had been missing.

For the Next 20 Years

We asked what the members will do propel the alumni association’s success over the next 20 years. We were told that their plan is to promote exchange between young researchers just returning from Japan and mid-career and senior researchers, and to help young researchers welcomed into the Club



Dr. Menkhaus

advance their careers. Dr. Chantal Weber (newsletter editor) stressed that to sustain the Club’s success, it will need to act as a mentor to its younger members. Dr. Weber said that before participating in a JSPS program she heard about the Club from Prof. Ingrid Fritsch, a board member at the time, and had joined some Club events. Those experiences having sparked her interest, she came to Japan to do research under a JSPS postdoctoral fellowship. Furthermore, some Club members encourage students in their labs to study in Japanese universities, and have even sent their sons and daughters to Japan to do so as well. In this way, the members are passing the baton of German-Japanese exchange on to the younger generation.

The reception of the 20-year anniversary symposium was attended by JSPS academic advisor Dr. Makoto Asashima, executive directors Dr. Yasuhiro Iye and Mr. Takaaki Iwasa, former president Prof. Motoyuki Ono along with past generations of Bonn Office members. At it, a brightly costumed street musician (*chindonya*) performance was put on as a gift to the new generation of alumni. Not even the Japanese have many opportunities to see this culturally steeped traditional performing art. We believe that the upcoming generation of JSPS alumni will take on new challenges while sustaining the pride and spirit of their forerunners. Our eyes remain riveted on the German JSPS Club’s future program innovations and successes.

20 Years of Cooperation between the German JSPS Club and Bonn Office

The Club was established in 1995 as an alumni association covering Germany and German-speaking regions. Receiving strong support under its partnership with JSPS and the JSPS Bonn Office and also utilizing its own financial resources, the Club carries out an array of German-Japanese exchange activities. Two decades having elapsed, this year the Club boasts a 400-person membership. Among the Club’s main activities are holding annual Japanese-German Symposiums jointly with the Bonn Office, publishing the newsletter *Neues vom Club*, reporting on cutting-edge scientific developments in Germany and Japan, and issuing the association’s own “Club Award” to persons with an outstanding record of achievements in building collaborative bridges between Germany and Japan. In July 2012, the Japanese government awarded the German JSPS Club the Foreign Minister’s Commendation (Group) for its many and various contributions to promoting a relationship of neighborly friendship with Japan.

Bonn Office Director Receives Commendation

JSPS Bonn Office director Prof. Keiichi Kodaira was awarded the Foreign Minister’s Commendation (Individual), which was presented to him by Mr. Takeshi Nakane, Ambassador of Japan, at the JSPS Abend held in Bonn on September 2nd. After receiving a doctorate from Kiel University, he held successive posts at Heidelberg University and Technische Universität Berlin (TU Berlin). As the director of JSPS’s Bonn Office, he has over long years strived to advance exchange between Japanese and German researchers by strengthening JSPS’s network with counterpart German agencies. It was out of recognition for the extensive contributions he has made to Japanese-German exchange that Prof. Kodaira was awarded this prestigious commendation. He expressed gratitude at the Abend, saying the award is attributable to everyone who has supported the Bonn Office’s activities.

Attended by representatives of German science-promotion



Prof. Kodaira and his wife

Eiichiro Komatsu, director, Max Planck Institute for Astrophysics, on frontiers being pioneered in his field of astrophysics.

agencies and universities, the annual Abend is held by JSPS and the Bonn Office to report their activities over the past year and thank their German counterparts for cooperating in carrying them out. At this year’s Abend, a dynamic lecture was given by Prof.

For more information on the German JSPS Club, please see the following website:
www.jsps-club.de/

JSPS Fellows Plaza & JSPS Bonn Office



JAAT-NRCT Seminar at Thailand Research Expo 2015

On August 16, the JSPS Alumni Association of Thailand (JAAT) put on a seminar titled “Nanomaterials and Cancer.” It was held in cooperation with the National Research Council of Thailand (NRCT) and JSPS as a part of “Thailand Research Expo 2015,” sponsored by NRCT. The seminar was chaired by JAAT secretary Dr. Danai Tiwawech and committee member Dr. Wichet Leelamanit.

The proceedings kicked off with welcome remarks by NRCT deputy secretary-general Mr. Krithawat Nopnakeepongse, Mr. Hiroshi Ando, head of the International Policy Planning Division at JSPS’s Tokyo headquarters, and JAAT president Dr. Suneo Mallikamarl.

Three lectures were delivered. The first, titled “Mechanism Based Short-term Assay Model for Carcinogenic Effect of Nanomaterials,” was delivered by Dr. Hiroyuki Tsuda, Nagoya City University, Japan. He explained the background of his research, asserting that various types of carbon nanomaterials are being introduced into the market and that they far exceed safety testing capabilities. Doing such testing, he said, would entail whole body exposure tests, requiring huge facilities and enormous costs. As a solution, Dr. Tsuda is working on developing short-term assay models, for which he introduced three study designs and mechanisms in his lecture.

The second lecture, titled “Nanotoxicology versus Cancer,” was delivered by Dr. Kasem Rattanapinyopituk, Faculty of Veterinary Science, Chulalongkorn University, who spoke about nanotoxicology in cancer therapy. He explained that nanoparticles can be effectively applied to cancer cell detection, imaging and drug delivery through

EPR (Enhanced Permeation and Retention) Effect. He also pointed out, however, that nanotoxicity may cause DNA damage in normal cells, inducing cancer.

The last lecture, titled “Nanoencapsulated Curcumin on Periductal Fibrosis,” a predisposing lesion of opisthorchiasis-associated cholangiocarcinoma, was delivered by Dr. Somchai Pinlaor, Faculty of Medicine, Khon Kaen University. He described opisthorchiasis viverrini (flake infection in bile ducts), which induces cholangiocarcinoma (bile duct cancer); then, talked about an investigation into whether nanoencapsulated curcumin can reduce periductal fibrosis in opisthorchiasis viverrini, being conducted through animal experimentation.

Recently, the Thai people have become increasingly mindful to health issues especially cancer, as demonstrated by the fact that more than 100 of them joined this seminar.

JSPS Bangkok Office



Alumni Association of the Philippines Holds Symposium and General Assembly

On July 27, the JSPS Alumni Association of the Philippines (JAAP) convened its 3rd general assembly following a scientific symposium on “Disaster Resilience through Science and Technology,” venue at SMX Convention Center in Pasay City.

The symposium was held as a part of National Science and Technology Week sponsored by the Department of Science and Technology (DOST). It started off with a welcome address by JAAP president Dr. Jaime C. Montoya, followed by messages from Mr. Kazunori Higuchi, head of the Overseas Fellowship Division at JSPS’s Tokyo headquarters, Mr. Tatsuo Kitagawa, counsellor of the Embassy of Japan in the Philippines, and Dr. Amelia Guevara, DOST undersecretary for research and development. They were followed by a ceremony to award RONPAKU medals.

Two keynote lectures were delivered. The first was by Prof. Akihiro Kijima, Laboratory of Integrative Aquatic Biology, Graduate School of Agricultural Sciences, Tohoku University, who spoke on

the subject “The TEAMS (Tohoku Ecosystem-Associated Marine Sciences) Project: Restoring the Rich Ocean Through Science.” He told about the decade-long project he had carried out to monitor and aid the restoration of marine ecosystems and marine products, which were greatly damaged by the 2011 Great East Japan Earthquake.

The second keynote lecture was given by Prof. Masashi Takahashi, Center for Disaster Medicine and Education, Faculty of Medicine, Niigata University, on the title “New Information Technology for Disaster Medicine Using Geographic Information System in Japan.” Besides developing the “Air Tag system,” an information management system for disaster medical care, Prof. Takahashi was himself involved in disaster medical care as a member of Niigata University’s Disaster Medical Assistance Team (DMAT). Drawing upon his deep personal experiences as a DMAT member in several earthquakes, the talk he gave moved the audience who gave him a standing ovation when it ended.

In the 3rd JAAP general assembly held that afternoon, Dr. Montoya reported on the alumni association’s activities such as the nomination results for the FY2015 BRIDGE Fellowship, JAAP’s participation in National Science and Technology Week, and collaboration with other Japanese alumni associations in joining an event at Japanese ambassador’s residence. He also touched upon such future activities as updating the membership directory, organizing a JSPS program briefing at Central Luzon State University, and implementing community based projects. Following these reports, Dr. Montoya and Mr. Higuchi conferred JSPS alumni badges on new JAAP members.

JSPS Bangkok Office





Creating New Possibilities to Uncover the Mysteries of the Universe

Every day, researchers from different backgrounds and fields are sharing ideas to find answers to the biggest scientific questions about our universe: where did we come from, where are we going, and why are we here.



Hitoshi Murayama, director of Kavli IPMU

The Kavli Institute for the Physics and Mathematics of the Universe (Kavli IPMU) at the University of Tokyo was launched in 2007 and has become a leading center harnessing the strengths of mathematicians, physicists, and astronomers. Currently, it is home to 85 core researchers and 250 affiliate members and students, half of whom are from overseas.

Although humans have been gazing up at the sky and studying stars for centuries, as science and technology advanced, scientists found that everything we could see, planets, stars, galaxies, only made up 5 percent of the entire universe. The remaining 95 percent is something invisible that scientists have yet to discover. Some of this is "dark matter," the glue that holds all atoms and galaxies together, while the rest is "dark energy" which causes the universe to expand at an accelerated rate.

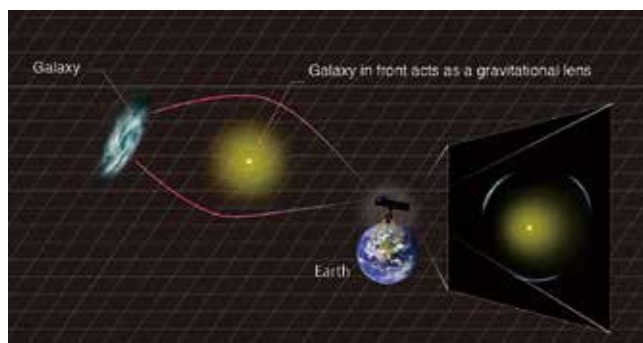
While dark matter or dark energy cannot be seen directly, Kavli IPMU researchers study their effects on celestial objects to learn more about their characteristics. By using high-powered telescopes, including the Hyper Suprime-Cam instrument on the Subaru Telescope, researchers look for gravitational lensing, an effect where dark matter distorts the images of distant galaxies.

Other Kavli IPMU researchers use gigantic particle astrophysics detectors (i.e., Super-Kamiokande, XMASS, KamLAND) located in an underground mountain mine in Kamioka to search for neutrinos produced by ancient star explosions in order to learn

about particles when the universe was young and find traces of dark matter. They also hope to make the world's first observation of neutrino-antineutrino annihilation.

Back in Tokyo, the Kavli IPMU building has been designed to encourage collisions of intellect and ideas. All offices face towards a central lounge area scattered with blackboards, while glass-walled seminar rooms allow researchers to keep an eye on what people are working on. Daily tea-time breaks encourage researchers to come downstairs and discuss ideas and research over coffee and cake. Blackboards become a central tool to collide imaginations about anything from supersymmetry to untangling strange space-time structures predicted by string theory.

The institute's director and theoretical physicist Hitoshi Murayama says that basic research is about uniting people from different countries. By addressing truly fundamental questions about the universe, Kavli IPMU embodies this true nature of science.



How one galaxy's image appears distorted due to another galaxy

Drs. Surhud & Anupreeta More



Surhud More's Profile

2009 Ph.D. (Astronomy) Max Planck Institute for Astronomy
2009 Postdoctoral Researcher, Max Planck Institute for Astronomy
2009-2012 Kavli Institute for Cosmological Physics (KICP) Fellow, University of Chicago
2012-2014 Project Researcher, Kavli IPMU
2014-Project Assistant Professor, Kavli IPMU

Anupreeta More's Profile

2008 Ph.D. (Astronomy) Max Planck Institute for Radio Astronomy
2008-2009 National Center for Scientific Research (CNRS) Postdoctoral Fellow, Laboratoire d'Astrophysique de Marseille
2009-2012 Associate Fellow, KICP, University of Chicago
2012 Project Researcher, Kavli IPMU
2012-2014 University of Tokyo Postdoctoral Research Fellow, JSPS Fellow
2014-Project Researcher, Kavli IPMU

Anupreeta and Surhud More are both researchers interested in studying the nature of dark matter and dark energy. The couple came to the University of Tokyo after becoming interested in the research being carried out in Japan.

One of the projects they are both involved in is Space Warps, an online classification system guiding citizen scientists in a hunt for galaxies and group of galaxies that act as gravitational lenses. These galaxies bend the light coming from background galaxies, stretching their images into magnificent arcs and creating multiple images.

With the help of thousands of volunteers, Space Warps has sifted through hundreds of thousands of night sky images to find these rare lenses. The details of 29 new potential gravitational lenses found through Space Warps was published in *Monthly Notices of the Royal Astronomical Society* in September 2015.

The next step for Anupreeta and her team is to use data taken from the Hyper Suprime-Cam instrument on the Subaru Telescope to discover thousands of gravitational lenses using Space Warps. This would make it possible to double the number of new lens discoveries from the last few decades to be made within the space of a few years. These lenses will help scientists learn more about dark energy and dark matter distribution.

For more detailed information about Kavli IPMU, please visit its website: www.ipmu.jp



Scientific Venture of a South Korean Fellow in Japan

Dr. Damee Choi



Dr. Choi visited Meizen High School in Kurume, Fukuoka Prefecture, to give a lecture under JSPS's Science Dialogue to 15 second-year senior high school students on October 20th. Hailing from South Korea, she is currently carrying out research in the field of social neuroscience in the Faculty of Design at Kyushu University. Dr. Choi chose to give her Science Dialogue lecture on the

theme "Oxytocin receptor genetic variation modulates brain activity and personality."

"GG, GA, or AA?"

Dr. Choi began her lecture by introducing her life in South Korea where she received her Bachelor of Science degree in 2008. She came to Fukuoka Prefecture in the same year to continue her academic pursuit. Living in Japan for more than eight years since then, she now speaks Japanese fluently and has gone on to earn a PhD at Kyushu University.

In her lecture, she explained social neuroscience by using an experimental case study she conducted on "genetic variations in an oxytocin receptor." Oxytocin is typically known for the effect it has on pro-social behavior, such as its role in facilitating trust and affection between individuals. Therefore, it is commonly referred to as the "love hormone." Social neuroscience is important because, as she told the students, "staying socially connected is a basic human need much like food and warmth."

When explaining oxytocin, Dr. Choi used both English and Japanese along with an array of visual supports such as photos and illustrations to aid the students in understanding such aspect of oxytocin as how it affects behavior. She explained that genetic variations in the oxytocin receptor affect individual differences in social behavior. She said that there are three types of receptors: GG, AG, and AA¹, telling the students that persons who are G-allele carriers have higher sensitivity to social cues such as facial expressions and exhibit greater pro-social behaviors than AA carriers. She showed how a recent study she conducted appears to reveal that the percentage of each type varies regionally. During the Q&A session, one student asked, "How can I know my oxytocin receptor genotype?" Dr. Choi told her that the most accurate way would be to "have your saliva genetically tested."

She told the students that like genetic testing, science requires accurate analysis and assessment. To develop that kind of ability and become a scientist, she encouraged the students to "work very hard, read many books, and study English." Then, one day they will encounter a subject that they will love to scientifically pursue and receive warm support from people in achieving their goals, like "I have at Kyushu University."



¹G: Guanine, A: Adenine



The following fellows participated in JSPS's Science Dialogue Program during the period from July through September 2015. For details about the program, please see its website: www.jsps.go.jp/english/e-plaza/e-sdialogue/

Overseas Fellowship Division

Venue	Lecturer	Nationality
Hokkaido Kushiro Koryo High School	Magnus Axelsson	Sweden
	Chit Hong Yam	UK
Aomori Prefectural Hirosaki Minami High School	Ponthip Limlahapun	Thailand
Fukushima Prefectural Fukushima High School	Lyubomir I. Aleksandrov	Bulgaria
	Filip Blaschke	Czech
	Renata Kierepko	Poland
	Lionel S.P. Landre	France
	Duncan G. G. McMillan	New Zealand
	Chelsea M. Robles	USA
	Wonsuh Song	Korea
	Tien M. Vu	Vietnam
Ibaraki Prefectural Namiki Secondary School	Felipe A. Sandoval Garrido	Chile
	Eszter Nemeth	Hungary
	Mohammed B. Uddin	Bangladesh
	Laura Zambelli	France
Saitama Prefectural Kawagoe Girls' High School	Pablo Solis-Fernandez	Spain
Chiba Municipal Chiba High School	Alisa Kongjaimun	Thailand
Chiba Prefectural Chosei Senior High School	Mei Han	China
Chiba Prefectural Funabashi Senior High School	Marine Lasbleis	France
Ichikawa Gakuen Ichikawa Senior High School (Chiba)	Angela Ares	Spain
Junior High School at Komaba, University of Tsukuba (Tokyo)	Martin M. Casco Robles	Nicaragua
	Joseph M. Rogers	UK
Senior High School at Komaba, University of Tsukuba (Tokyo)	Othman M. Benomar	France
Tokyo Metropolitan Tama High School of Science and Technology	Lucas S. Trindade	Brazil
Tokyo Metropolitan Toyama Senior High School	Rui Shang	China
Fukui Prefectural Fujishima Senior High School	Rico L. Gamuyao	Philippines
	Andreas W. Schell	Germany

Venue	Lecturer	Nationality
Fukui Prefectural Koshi Senior High School	Javier Menendez Sanchez	Spain
Fukui Prefectural Takefu High School	Florian Gimbert	France
Fukui Prefectural Wakasa High School	Joohee Lee	Korea
	Santosh K. Sharma	Greece
	Konstantinos A. Skalomenos	India
	Vipavee Trivittayasil	Thailand
Yamanashi Prefectural Hikawa High School	Ernst D. Herbschleb	Netherlands
Yamanashi Prefectural Tsuru High School	Kenny Kuchta	Germany
Yamanashi Prefectural Yoshida High School	Oluwasesan Adegoke	Nigeria
Yamanashi Prefectural Yoshida High School	Zhaoming Tian	China
Nagano Prefecture Suwa Seiryu Senior High School	Jorge L. Espinoza Calderon	Nicaragua
Shizuoka Prefectural Hamamatsu Minami High School	Thangaraju Dheivasigamani	India
Shizuoka Prefectural Iwata Minami High School	Luca Chiari	Italy
Aichi Prefectural Jishukan Senior High School	Beata A. Bober	Poland
	Fargol Taba	Australia
Aichi Prefectural Kariya High School	Ian J. Watson	Australia
	Hoai T. Nguyen	Vietnam
Nagoya City Meito Senior High School (Aichi)	Anna Franciosini	Italy
	Sebastian Halder	Germany
	Denis Matrov	Estonia
Osaka Prefectural Hirakata Senior High School	Ramesh Yella	India
National Institute of Technology, Akashi College (Hyogo)	Florian N. Pelupessy	Netherlands
Wakayama Shin-ai Junior and Senior High School	Hui-Ju Yang	Taiwan
Kagawa Prefectural Kan-onji Daiichi High School	Tarek M. M. Abd El Kader	Egypt
	Scott V. C. Groom	Australia
Ikedagakuen Ikeda Junior-Senior High School (Kagoshima)	Marko Jusup	Croatia
Okinawa Prefectural Kyuyo Senior High School	Ra Mason	UK

Hailing from India, Dr. Soma Purkait has been conducting research with her host professor Dr. Masanobu Kaneko at Kyushu University under a JSPS postdoctoral fellowship. We asked her about her research and life in Japan.

What are you currently researching under the JSPS fellowship?

I work in the area of Number Theory in Mathematics. One of its basic problems is to find solutions of a given polynomial with rational coefficients in rational numbers, if they exist. For example, consider the polynomial $Y^2 = X^3 - X$ in the two variables X and Y , it has precisely three rational solutions, namely, $(X, Y) = (0, 0), (1, 0), (-1, 0)$. In some special cases, this arithmetic question can be related to analytic objects called *modular forms* from which you can sometimes deduce whether or not a given polynomial, like the example above, has infinitely many rational solutions. I am studying *modular forms of integral and half-integral weight* and questions regarding the infinitude of rational solutions for *elliptic curves*, which are defined by rational polynomials of the form $Y^2 = X^3 + aX + b$ where a, b are rational numbers. (The above polynomial $Y^2 = X^3 - X$ is an example of an elliptic curve.)



When did you find your research subject and why did you choose to pursue it?

I spent my childhood in Delhi, India, where I did all my schooling and received my undergraduate degree. While I was in school, mathematics was my favorite subject, mainly because mathematics is logical and rule-based and unlike history, for example, I didn't need to memorize a lot of facts! Also, scoring high in math tests was easy for me. So, it was natural to pursue mathematics as an undergraduate and continue on to a master's study, which I did in Bangalore, India. I particularly liked algebra and number theory. For me, there are two things that make number theory special. First, problems are usually very easy to state so that even school students can understand them. At the same time, number theory problems also constitute some of the oldest unsolved problems in mathematics, for example the Congruent Number Problem, which asks if a positive integer N can be realized as the area of a right-angled triangle with all sides having rational lengths. This problem is still unsolved, making it a 1,000 year-old unsolved problem. Second, most of modern mathematics has been advanced while solving this kind of problems in number theory. So, it is absolutely fascinating!

How did you get to know your Japanese host researcher?

Before coming to Japan, I had decided to pursue my PhD in the UK like some of my batch mates. During my PhD studies in Warwick, I visited Japan and really liked the place and culture. At that time, I visited Kyushu University to give a talk and made some friends here. After completing my PhD, I wanted to come back to Japan to continue my research. I wrote to Prof. Masanobu Kaneko, who specializes in number theory and modular forms, and later met him at Kyushu University. He kindly agreed to be my host researcher.

Is that why you choose Japan to pursue your research?

The Japanese contribution to the mathematical area of number theory and particularly modular forms is well known. There are, for example, the works of Yutaka Taniyama and Goro Shimura including their famous *Taniyama–Shimura conjecture*, which is now a theorem thanks to Andrew Wiles et al. There are also several fundamental lifting results like the *Saito–Kurokawa lift* constructed by Hiroshi Saito and Nobushige Kurokawa, the *Doi–Naganuma lifting*, and the *Ikeda lifts*. When I visited Kyushu University to give that talk, I had a good chance to interact with people in its number theory group. I was also fascinated by Japan's beauty and culture. Besides, as my husband is Japanese and is currently working in Tokyo, I was also looking for a work opportunity in Japan.

What is your impression of your host institution?

I feel that Kyushu University is one of the leading and ever-growing universities in Japan. We have a lot of international students as well as several international faculty members, which makes it extremely vibrant. I was pleasantly surprised to see so many people of different nationalities and hear different languages being spoken when I first visited the university's Ito campus. The campus is very big and surrounded by nature. It provides a very good environment for studying and doing research. Currently, the Hakozaki campus is moving to Ito campus, expanding it even further. This will definitely accelerate the growth of Kyushu University. Most particularly, the faculty, staff and other members of the mathematics department are extremely helpful and accommodating to me. Language has never been a problem. I enjoy my work and life in Japan thanks to them.

What is your impression of Japan's research environment compared to India and the UK?

I feel that the mathematics research environments in Japan, India and the UK are quite similar. However, the laboratory culture in Japan is rather unique. Professors have their own labs and put a lot of effort into supporting PhD students by, for example, organizing regular study groups for them and reviewing



Dr. Soma Purkait

JSPS Postdoctoral Fellow, Faculty of Mathematics, Kyushu University, 2014-present
 Research Fellow, Warwick Mathematics Institute, University of Warwick, 2012-2014
 Ph.D. (Mathematics), Warwick Mathematics Institute, University of Warwick, 2008-2012
 Junior Research Fellow, Statistics and Mathematics Unit, Indian Statistical Institute, Bangalore, 2007-2008
 M. Math., Statistics and Mathematics Unit, Indian Statistical Institute, Bangalore, 2005-2007

their presentations. The lab feels more like a family. In India and UK, I had not experienced this kind of labs, which hold regular seminars involving several groups under different professors. The research environment in the UK feels more independent; students tend to work on their own, occasionally meeting their supervisors. In my lab here in Japan, I really don't feel any difficulties; there is quite a lot of freedom and no hierarchy at all. Regarding the language, most of my Japanese lab mates present their work in written English and they help me with translation when I do not understand something in spoken Japanese. I would like to see Japanese academic societies organize more seminars and conferences in the English language so that more foreigners can participate.

How have you advanced your research under the JSPS fellowship so far?

In the classical theory of modular forms of integral weight, we have a very special subspace called "newspace." Its definition involves using a certain inner product called "Pettersson inner product." In my research, we have been able to define a new family of operators on the space of modular forms and to characterize the newspace in terms of eigenspaces with specific eigenvalues of finitely many of these operators. Essentially, we were able to remove the Pettersson inner product from the characterization. We would like to similarly define newspaces in the space of half-integral weight modular forms in terms of the

eigenspaces of certain operators. I am currently working towards accomplishing this. So far, I have had several opportunities to present my results, including four research meetings in Japan and a conference in Beijing.

Also, my host researcher Prof. Kaneko is an expert in the theory of Multiple Zeta values, so besides my own research, I am also learning about MZVs. In mathematics one often finds quite similar results in different branches. There appears to be a certain unifying framework among them. Difficult problems have been solved using connections between theories in different fields. For example, the proof of Fermat's last theorem relies on *Taniyama-Shimura conjecture*, which connects the world of modular forms to that of rational elliptic curves. As a mathematician, I want to be part of this mathematical unification process, so I am trying to understand many different theories. Mathematics has several applications in our everyday life, in particular number theory is applied to the field of cryptography; for example, elliptic curves have recently been used for encryption in mobile devices.

What do you think of life in Japan—its culture and customs?

Japanese culture is a fantastic fusion of tradition and modernity. On one hand, you can see leading technology all around, such as a Softbank robot. On the other, Japan continues to maintain age-old traditions and customs like the admonishment "*Hi no youjin*" (Be careful not to cause a fire). Japanese culture seems to me to be conservative and full of intricacies, but it doesn't take long to appreciate and adapt to this cultural blend. Another thing I really like

about the Japanese culture is its harmonious way of living. Japanese people are very polite and accommodating. I also enjoy the cuisine here, the fruits and vegetables are extremely delicious. My life in Japan has been quite wonderful so far.

Before coming to Japan, what kind of image did you have of the country? Has it changed?

When I first came to Japan, I had imagined that modern bustling cities like Tokyo were in almost every place, so I was captivated by the country's beautiful countryside. Also, three-fourths of Japan is covered by mountains and two-third by forests, so for me, as a person who likes to explore nature, it was a most pleasant surprise.

Japan is known to have an extremely demanding work culture. After I started living in Japan, however, I felt that while people do work hard they also enjoy life a lot. People are very collaborative, giving the country a nice atmosphere for working and interacting with various people.

What do you do outside your research work?

In my free time, I travel and do photography. Also, I am studying Japanese and like to explore the food and culture with my Japanese friends. I like most of the food here and enjoy its differences from Indian cuisine which uses a lot of different spices. Japanese food enhances the natural taste of its ingredients like in *sushi* and pot-cooked *nabe* cuisines. I really enjoy eating *sushi* and Fukuoka's specialty *ramen*! Although my mother in India still doesn't believe that I can eat raw fish! Well, I am not a fan of some foods with a strong smell like dried squid.

What do you plan to do after your fellowship ends?

I would like to pursue research and teaching in mathematics, so I will be looking for an academic position in Japan or other place.

Please give some advice for young researchers who may be thinking about doing research in Japan?

Japan is one of the world's leading countries in technology and innovation, so it definitely provides top-class opportunities for research. Japan also has a tradition of beautiful co-existence with nature. The people are very polite and helpful and life is very comfortable. All in all, it will be a lifetime experience for you to stay and do research in Japan.

Throughout our interview with Dr. Soma Purkait, she confounded our perception of a typical mathematician as a person with a contemplative and subdued manner. Dr. Purkait was certainly contemplative but strikingly extroverted and she burst into a laugh whenever she found a chance. We were intrigued by her research, which delves into mathematical problems that seem like mystifying puzzles to us. We are very encouraged that she has been able to advance this perplexing research to the extent that she is being invited to present papers both in Japan and abroad. In continuing her work, Dr. Purkait said that she may seek a position in Japan after her JSPS fellowship ends next year. We hope that this will fit into her career equation, as she has created a wonderful relationship with her Japanese colleagues and has strong affinity for the Japanese culture and people. Not to leave out of the equation the "operator" that her husband Kiminori is Japanese.

Introducing Japan: Fukuoka City

Fukuoka is Kyushu's largest and Japan's seventh most populated city. It is the capital of Fukuoka Prefecture. The city and its environs are well connected by subway; it takes only 10 minutes to reach the center of the city's Hakata district from Fukuoka Airport, which has flights to both domestic and international destinations. With its friendly atmosphere and rich food culture, Fukuoka ranks the 12th most livable city in Monocle's 2015 Quality of Life Survey.

Many of the city's best tourist attractions are located in the Gion district, which is full of historical temples and shrines, including the Tocho-ji temple with its 10.8-meter Great Buddha; Shofuku-ji temple, Japan's first Zen temple; and the 8th century Kushida Shrine, the starting point for the famous float-pulling race featured as part of the 700-year-old Hakata Gion Yamakasa Festival. A short walk from Gion takes one to the Kawabata shopping arcade, Hakata's oldest shopping street, which connects to yet another attraction, Canal City Hakata. Fukuoka city also has several nice parks. For example, the Fukuoka Castle ruins and Ohori-koen park are two of the best places to view beautiful cherry blossoms.

Though not a typical tourist attraction, the Itoshima area where Kyushu University's Ito campus (Japan's largest campus) is situated is a wonderful place surrounded by mountains, rice fields and the seaside. It's a place where people enjoy several outdoor activities such as hiking, camping, beach walking, and surfing. You can also purchase fresh Itoshima fruits and vegetables at the "Ito Sai Sai" marketplace, one of Kyushu's largest farmers' market.

Another interesting spot in Fukuoka Prefecture is Dazaifu city, located on the outskirts of Fukuoka. The city also has several beautiful temples and shrines, the most famous of which is Tenmangu that enshrines Sugawarano Michizane, the deity of education. Having over 6,000 plum trees it is one of the most popular spots for enjoying fragrant plum blossoms during the period from late February to mid-March.

For eating, I recommend that you visit city's famous *yatai* food stalls in the Tenjin and Nakasu areas where you can have Hakata *ramen*, thin noodles in a thick, creamy *tonkotsu* pork-bone soup. You can enjoy a *teishoku* lunch containing fresh seafood and *mentaiko* spicy

cod roe at a very reasonable price at Chikae restaurant in Akasaka. Near the Ito campus, I would recommend Pizzeria da Ciruzzo for a great pizza bash.



Tenmangu Shrine





Cover photo:

Frost Crystals
Differing from English, in Japanese frost is said to "fall" from the sky like snow. Frost (*shimo*) is a word often used in *haiku* (Japanese poetry) to depict winter. The Japanese researcher Dr. Ukichiro Nakaya is well known for his interesting research on snow and frost crystals.

About JSPS

The Japan Society for the Promotion of Science (JSPS) operates as an independent administrative institution to perform the following main functions: fund scientific research, foster researchers, promote international scientific exchange, and advance university reform.

Crowing Rooster



From days of old in Japan, it has been the belief that the vigorous cry of the rooster in the gray of the morning augurs the coming of a new and bright day. As the crowing rooster can therefore be thought of as a harbinger of the kind of new knowledge that promises a brilliant future for humankind, it was chosen as the emblem of the Japan Society for the Promotion of Science. This emblem was designed in 1938 by Professor Sanzo Wada of Tokyo Fine Arts School to depict the rooster that symbolizes the breaking dawn in a verse composed by Emperor Showa.

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