

# Internationalizing Japan's Scientific Landscape

By 2060, Japan's rapidly aging population will be cut almost in half, says William Tsutsui, dean of the College of Humanities and Sciences at Southern Methodist University and an expert in Japanese economic history. And with the mandatory retirement age set at 60 (or even younger) at many prominent research institutions, Japan's technical output is in danger. Tsutsui calls it a "timebomb." But in the last decade, the Japanese government has sought to counter this by internationalizing the country through a series of administrative innovations, alliances with foreign government agencies, financial support for foreign scholars, and programs that bolster top universities' international recruitment efforts. **By Alaina G. Levine**



"'Internationalize' has become a mantra." —William Tsutsui

**S**lowly but surely it appears that the Land of the Rising Sun is emerging from its self-imposed technological isolation. Many governmental plans are now in place to recruit and retain foreigners into Japan's scientific sphere; however, there are still some barriers for foreign scholars who would like to build their career in Japan, including a general lack of linguistic prowess and difficulty navigating cultural nuances.

"It is undeniable that there are plenty of small inconveniences for foreigners who wish to live and work in Japan," says **William Tsutsui**, dean of the College of Humanities and Sciences at Southern Methodist University and an expert in Japanese economic history. "I am not sure that any of these bureaucratic, social, and cultural challenges are greater than, say, the challenges faced by Indian or Chinese scientists who choose to study and work in the United States. Overseas scientists relocating to Japan will need patience, and some Japanese friends and colleagues to help them out in their transition, but shouldn't worry too much about relocating to one of the world's safest, healthiest, best educated, and wealthiest nations," he says.

However, Tsutsui does worry that the 9.0 magnitude earthquake that rocked Japan on March 11, 2011 may have hindered the country's internationalization endeavors. The effects of the earthquake, and related tsunami and nuclear concerns, will come down to whether there is enough money to support research in the future. The Japanese government supports science and technology (S&T) through a variety of programs

and ministries. Its funding priorities are determined every year based on the Science and Technology Basic Plan, which is a midterm national S&T policy revised every five years, explains **Takashi Ohama**, director of the Washington, D.C. office of the Japan Science and Technology Agency (JST), one of the major research funding agencies. "Currently, the fourth S&T Basic Plan 2011–2015 is under re-examination to incorporate necessary actions to recover from the disaster of the earthquake and the subsequent tsunami," says Ohama.

"Can that commitment to higher education stay as strong as in the last few years?" wonders Tsutsui. "Japan might become a victim of funding" quagmires, especially with a prolonged recession that has lasted more than 20 years and a soaring national debt, he says.

The government has been striving to internationalize the country for many years now through a multitude of programs, with mixed results. "'Internationalize' has become a mantra," says Tsutsui. But the earthquake could stymie certain goals of attracting foreign talent. For example, at RIKEN, one of the most prestigious research institutions in the **continued »**

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Junko Suzuki

country, its Foreign Postdoctoral Researchers (FPR) Program usually receives 130–200 applications every year, writes **Junko Suzuki**, deputy manager of RIKEN's Global Relations Office. "This year we have received slightly fewer applications than normal" because of the earthquake, she says.

On the other hand, in the months following the earthquake, "most foreign researchers have come back to Japan," observes **Fumiyo Kaneko**, deputy director of the Washington, D.C. office of the Japan Society for the Promotion of Science (JSPS), another funding agency. In fact, Kaneko states that 87 percent of foreign researchers have returned to the country, and the agency has altered some of its policies to allow for flexibility "so researchers wouldn't lose their funding" by leaving, as long as they return within the fiscal year, she says.

Japan "understands the importance of ties with other countries," says **Naoki Himiya**, the former director of the Global 30 (G30) Program, which was designed to help universities with internationalization. And even with a 4 percent decline in foreign students following the earthquake, he is optimistic about focusing the nation's energies on international partnerships. "After the earthquake, this kind of mindset is even stronger," notes Himiya.

**A NATIONAL GOAL: RECRUIT FOREIGNERS**

Although the government has sought to internationalize the country for decades, it wasn't until the early 2000s, when the Japanese government reorganized itself into new ministries, that recruiting foreign talent became more of a crystallized mission. The main ministries involved in S&T research and support are the Ministry of Education, Culture, Sports, Science and Technology (MEXT), and the Ministry of Economy, Trade, and Industry (METI). Within MEXT are the two funding agencies, JSPS and JST, which support foreign scientists through grants and fellowship programs.

JSPS, with a fiscal year 2011 budget of ¥334.7 billion (approximately US\$4.2 billion) (including ¥7 billion (US\$88 million) allocated for international projects) has collaborations with 90 international partner organizations, such as the National Science Foundation (NSF), National Institutes of Health, and National Natural Science Foundation of China. It awards grants to

individual investigators for curiosity-driven, bottom-up projects that might not necessarily be in line with the strategic goals of the agency.

In contrast, JST, with an annual operating budget of approximately ¥118 billion (US\$1.5 billion), sponsors research that is top down, aligning with the annual strategic objectives of MEXT, such as developing advanced materials, achieving a low-carbon society, and advancing immunology. Requests for Proposals are typical and research is more mission-oriented.

JSPS also has a number of fellowship programs that are designed to engage international scholars at all levels in their careers, while JST offers a cofunding program in cooperation with more than 20 counterpart foreign funding organizations in order to promote bilateral and multilateral research collaboration.

G30, which was established in 2009 under MEXT, focused on administering grants to universities to launch classes in English, improve mechanisms for accepting international students, promote international cooperation, and nurture personnel who can play an active role in the global arena, according to Osaka University's G30 website ([www.rcnp.osaka-u.ac.jp/osaka-ip/International/g30.php](http://www.rcnp.osaka-u.ac.jp/osaka-ip/International/g30.php)). It recognized that "the (G30) universities are the core, the center of internationalizing Japanese society," says Himiya.

MEXT's goal was to support 30 of the best universities in Japan, and 13 institutions have benefitted from the program so far. And although G30 has been phased into **continued »**

**FEATURED PARTICIPANTS**



**Advanced Industrial Science and Technology**  
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**Japan Science and Technology Agency**  
[www.jst.go.jp/EN](http://www.jst.go.jp/EN)

**Okinawa Institute of Science and Technology**  
[www.oist.jp](http://www.oist.jp)

**Japan Society for the Promotion of Science**  
[www.jspis.go.jp/english](http://www.jspis.go.jp/english)

**Osaka University**  
[www.osaka-u.ac.jp/en](http://www.osaka-u.ac.jp/en)

**Ministry of Economy, Trade, and Industry**  
[www.meti.go.jp/english/index.html](http://www.meti.go.jp/english/index.html)

**RIKEN**  
[www.riken.go.jp/eng](http://www.riken.go.jp/eng)

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[www.mext.go.jp/english](http://www.mext.go.jp/english)

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[www.titech.ac.jp/english](http://www.titech.ac.jp/english)

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“The FPR program offers young foreign researchers with creative ideas the opportunity to pursue research at RIKEN under the direction of a RIKEN laboratory head.”

—Karin Sörgjerd

another program called JUMP (Japanese Universities for Motivated People, see [www.uni.international.mext.go.jp/](http://www.uni.international.mext.go.jp/)), designed for “prospective students willing to study in Japanese universities supported by the ‘Global 30’ project,” these 13 universities will continue to lead Japan’s internationalization efforts through this new program (according to JUMP’s website). All of these have already established both undergraduate and graduate classes in English and have increased the number of foreign faculty members from 2,000 to 3,200. “The G30 universities and other universities are beginning to think more about internationalization,” emphasizes Himiya. They are changing their internal systems to better serve foreign academics and pupils, such as publishing documents in English. Scholars and students from China and Korea have been the priority so far, he says, although in general “universities think diversity is a key concept.”

#### RIKEN AS AN OASIS

One government organization that is particularly dedicated to internationalization is RIKEN. It is a network of seven institutes and groups across eight sites in Japan (and abroad), employs approximately 1,900 research scientists and postdocs and 700 technical staff, and hosts 1,300 students, including undergraduates. About 270 of RIKEN’s scientists have joint appointments at either domestic or international universities, either as professors or lecturers, and some hold multiple joint appointments. Approximately 15 percent of the scientists are foreigners, adds Okada.

**Karin Sörgjerd** is currently a postdoc in RIKEN’s Advanced Science Institute, located in Wako. She was accepted into the FPR program, which launched only a few years ago because

“RIKEN wanted to recruit more foreigners, to get a more global and international research environment,” she writes. After receiving her Ph.D. from Linköping University in her native Sweden, she arrived in Japan in 2009 and has greatly enjoyed her experience. “The FPR program offers young foreign researchers with creative ideas the opportunity to pursue research at RIKEN under the direction of a RIKEN laboratory head,” she describes. Postdoc applicants need to propose their own original research project and find a lab that will meet their needs.

Sörgjerd says her research at the Bioengineering Laboratory, which focuses on protein misfolding, is both stimulating and fun. As an added benefit, she receives a slightly higher salary than the average postdoc salary in Japan. Each month, she also receives ¥487,000 (US\$6,100) for living expenses and a housing allowance of ¥40,000 (US\$500), and annually she is granted ¥1 million (US\$12,600) for any research-related expense, including travel and equipment. Though her initial contract is only for one year, she can extend it to a maximum of three.

#### THE CHALLENGES TO FOREIGN RECRUITMENT

A systemic hierarchical culture can be taxing to navigate, but “the biggest single challenge” to Japan’s current and future triumph in science is language-related, says **James R. Bartholomew**, a professor of history at the Ohio State University with a specialty in the history of Japanese science and higher education. Indeed, many foreigners indicate that not knowing Japanese has impeded their ability to prosper in the country. For example, some grant applications are only allowed to be submitted in Japanese. One RIKEN principal investigator (PI) describes how administrative meetings are held in Japanese and though his secretary can translate, she doesn’t catch the subtle political nuances being discussed that impact his research.

Tsutsui counters that the language issue is a “misconception” and that “the biggest change over the last 40 years” has been the shift to solidifying English as the language of use in the S&T climate. More and more classes are being offered in English, and in lab environments, discussions and talks often take place in English. At RIKEN, English generally is the language of choice, especially for labs that employ foreigners.

There are other obstacles. Not all landlords will rent apartments to immigrants. It is not easy to set up a bank account, says one foreign PI, and good international schools for scholars’ children can be hard to find.

But knowing that these difficulties exist, the government seeks to assist foreigners. For example, JSPS holds several orientation meetings relating to Japanese language, culture, and society for international JSPS fellows, says Kaneko.

#### AVAILABILITY OF PERMANENT POSITIONS

One issue of great concern to both Japanese and foreign scholars is the scarcity of tenured faculty positions. “Permanent positions at universities and labs are quite limited,” says **Michio Kondo**, a professor at Tokyo Institute of Technology and a project director in the Research Center for Photovoltaic Technologies at the National Institute of Advanced Industrial Science and Technology (AIST). At this institute, one can **continued »**



obtain a five-year position, which is considered temporary, but then apply for another five years, almost as a formality. However, the person has to leave at the conclusion of the 10 years if a tenured position has not been offered. And the number of these permanent positions is small.

**Uwe Schneider**, an assistant professor of organic chemistry at the University of Tokyo, explains that crafting relationships is a major key to procuring permanent academic employment. He

has been in Japan for more than seven years, starting off as a JST-supported postdoc, and then advancing to a temporary staff job. When a professorial position became available, in his current department, he applied and won it. As an assistant professor, he is already tenured. "Working as a postdoc and a staff member helped," he says. His research was clearly known among his colleagues, which bolstered his chances of landing the job.

Although networking and reputation management are important in any industry and in any country, in Japan, sources say, it is even more critical to be known. **Luca Baiotti**, an Italian physicist at Osaka University, currently has a temporary job under the G30 Program. As a "Specially Appointed Assistant Professor," he has a five-year contract to teach physics in English to foreign M.S. and Ph.D. students, in addition to doing research. When the contract expires, Baiotti affirms his desire to pursue a permanent position. "In Japan," he says, "more than in the U.S., it is very important to build a network of acquaintances who know you well to advance in one's career."

Baiotti stresses that having an established scientific reputation within the Japanese university is crucial, but it is also important to be known throughout Japan and even in China, Korea, and Taiwan as well.

### AN ISOLATED NATION

Even while it aggressively seeks to internationalize, Japan must face a long-term zeitgeist that everything needed to do research is already in Japan, so it is not necessary to go elsewhere. **Adarsh Sandhu**, a professor of physics and electronics at the Toyohashi University of Technology, notices that younger scientists typically do not want to go overseas to pursue their research and therefore may miss opportunities to work with the best researchers in the world. Unlike China and India, he says, he doesn't see a "hunger" within Japan to advance outside its national borders, because "there's enough funding to do research here." But this attitude "will affect the future of science in this country," he cautions.

Indeed, Kaneko remarks that a misunderstood aspect of Japanese scientific culture is why young native scientists don't



Michio Kondo

necessarily go outside of the nation for their research. "It is difficult to find a job in Japan after they come back," she illuminates. "They are out of the loop, so to speak." And she has found that a certain number of Japanese early career professionals "don't find any necessity to go abroad because the research environment in Japan has gotten better."

### THE ATTRACTION AND ADVICE FOR FUTURE RECRUITS

Bartholomew believes it will take at least a decade for the nation to recover from the earthquake.

But even with one-tenth the population of China, Japan "will do whatever is necessary to be competitive, and anyone who forgets that is shortsighted," he declares.

Japan continues to employ new initiatives to attract international talent. The Okinawa Institute of Science and Technology (OIST) was established with a requirement that 50 percent of its faculty and students be foreigners. The MEXT-funded World Premier International Research Center Initiative (WPI) wants its six centers to have at least 30 percent of its personnel, including faculty and students, to be non-Japanese. "The Government of Japan has made internationalizing its universities and its S&T enterprise a priority and is implementing a variety of programs to advance this goal. These programs—some of which logically involve limited term appointments—will enable Japanese university science and engineering departments to open their faculty positions to the most qualified scientists and engineers from around the world, bringing diversity, breadth of experience, and greater opportunities for international research collaborations to Japanese universities," says **Anne Emig**, head of the National Science Foundation Tokyo Regional Office.

Meanwhile, sources advise that the best way for young professionals to secure a job, particularly one of the precious few tenured positions in academia, is to migrate to Japan early in one's career. Go as a postdoc, and get to know researchers in the department, say Schneider and Baiotti.

A postdoc appointment in Japan "can be a glorious experience as long as there are matched interests with the PI," says **Kathy Rockland**, who spent a decade as head of a laboratory at RIKEN'S Brain Science Institute. Her advice is simple and mirrors almost every other foreigner interviewed: Learn the language. She also recommends asking for introductions to other labs while in-country and "keeping collaborations open in your home country." Sörgjerd gleefully attests, "I would recommend for anybody to do a postdoc in Japan, and I would do it again if given the chance."

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