Kono Laboratory – International Programs Overview

See http://kono.rice.edu/intl-pgms/

Within the Kono Laboratory in the Department of Electrical and Computer Engineering at Rice University, we manage a number of innovative international research and education programs for students at all levels. To learn more about our innovative international research and education programs see the overviews and links below.

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Nakatani RIES: Research & International Experiences for Students Fellowship (2016 – present)

This program connects undergraduates with the best of science & engineering research in the U.S. or Japan. The program serves as a catalyst for U.S. & Japanese students interested in future graduate study and research and contributes to the development of a generation of globally-engaged scientists & engineers who have the technical and culture skills to contribute to vibrant international research collaborations in the future.

Japanese Fellows can apply to spend up to six weeks in the U.S. from August – September. While abroad, Japanese fellows participate in an two-day Orientation to Research & Higher Education in the U.S. at Rice University, a five-week, hands-on research internship in a science or engineering host laboratory at Rice University with the capstone being the presentation of a research poster at a university symposium, and a one-week final week program on the East Coast.

To date, 31 Japanese undergraduates have participated in this program from 13 different universities in Japan. Among these participants, 17 or 44.4% have been women.

Institution Name	Participants	Institution Name	Participants
Doshisha University	1	Tohoku University	6
Hiroshima University	1	Tokyo Institute of Technology	2
Kyoto University	1	Toyota Technological Institute	1
Kyushu University	1	University of Tokyo, The	7
Nagoya University	3	University of Tsukuba	1
Osaka University	2	Waseda University	2
Ritsumeikan University	2		

U.S. Fellows can apply to spend up to 13 weeks in Japan in summer from mid-May to mid-August. The program includes a 2-day Pre-Departure Orientation at Rice University, a three-week Japanese language, culture, and society orientation and introduction to research in Tokyo, a nine-week, hands-on science or engineering research internships at a Japanese university, and a one-day closing workshop in Tokyo, and a three-day Re-Entry Program at Rice University with the capstone being the presentation of a research poster at the Smalley-Curl Institute Summer Research Colloquium.

To date, 38 U.S. undergraduates have participated in this program from 24 different universities and colleges throughout the U.S. Among these participants, 14 or 45.1% have been women.

Institution Name	Participants	Institution Name	Participants
Bethel University	2	St. Joseph's College (NY)	1
Brown University	1	Stevens Institute of Technology	1
Carnegie Mellon University	2	University of Florida	1
Case Western Reserve University	2	University of Hawai'i at Mānoa	2
College of William and Mary	1	University of Massachusetts, Amherst	1
Columbia University	1	University of Pittsburgh	1
Cornell University	2	University of Rochester	1
Georgia Institute of Technology	1	University of Texas, Austin	3
Pennsylvania State University	1	University of Wisconsin, Madison	1
Purdue University	1	Washington University in St. Louis	1
Rice University	8	Willamette University	1
Southern Illinois Univ., Carbondale	1	Yale University	1

The Nakatani RIES Fellowship Program is organized by the Nakatani Foundation and is implemented by the Department of Electrical & Computer Engineering at Rice University.

For more information see http://nakatani-ries.rice.edu/

TOMODACHI STEM @ Rice University Program for Female Japanese Students (2016 – Present)

This is a five-week research internship program for 10 female undergraduates from Japan who are majoring in science & engineering (S&E). Held at Rice University in Houston, TX, the program will enable students to gain real world experience with S&E research, provide an introduction to U.S. higher education and provide opportunities for cultural engagement and collaboration with U.S. students. The program will serve as a catalyst for female Japanese students interested in S&E study and research and engagement with the U.S. through international research collaborations.

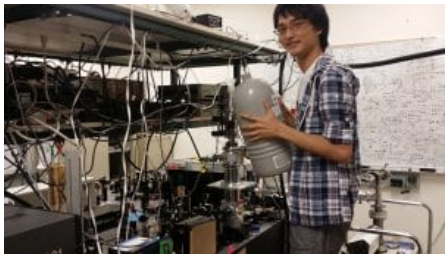
To date, 30 Japanese undergraduate students from 17 universities in Japan have participated in this program. Of these participants, 26 or 86.6% have been women.

Institution Name	Participants	Institution Name	Participants
Doshisha University	2	Tohoku University	1
Keio University	1	Tokyo Institute of Technology	2
Kyoto University	1	Tokyo University of Science	2
Kyushu University	2	Tokyo Women's Medical University	1
Meiji University	1	Tottori University	1
Nagoya University	1	Toyota Technological Institute	1
Ochonomizu University	1	University of Tokyo, The	5
Osaka University	4	University of Tsukuba	1
Sophia University	1	Waseda University	2

Funding for this program is provided by the U.S.-Japan Council through their TOMODACHI Initiative, a public-private partnership, born out of support for Japan's recovery from the Great East Japan Earthquake, that invests in the next generation of Japanese and American leaders through educational and cultural exchanges as well as leadership programs.

For more information see http://tomodachistem.rice.edu/.

NanoREIS: Research Experiences for International Graduate Students at Rice University (2008 – present)



Graduate students and post-docs from former TeraNano PIRE partner institutions in Japan, or other countries, are welcome to apply to Rice University for unpaid, non-credit bearing, short-term research internships of 6 – 12 months in laboratories at Rice University in academic departments within the School of Engineering or School of Natural Sciences.

For more information see http://kono.rice.edu/intl-pgms/nanoreis-research-experiences-for-international-students-at-rice-university/

TeraNano PIRE NanoJapan IREU in Japan (2006 – 2015)

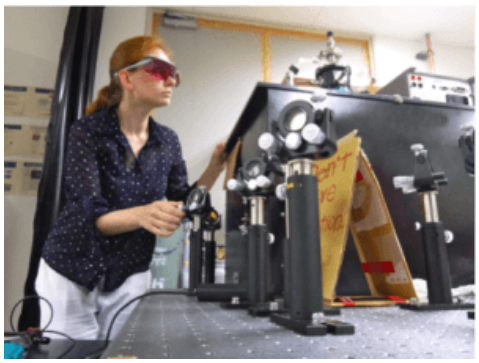
Headquartered at Rice University, this NSF-PIRE renewal award (OISE-0968405) was a continuation of our successful PIRE I award. In total, these two PIRE grants supported our research and educational activities from 2005 – 2015. This program has now ended but the NanoJapan: IREU program model was leveraged to create the NanoREIS program for graduate students, the Nakatani RIES Fellowship for U.S. and Japanese undergraduates, and the TOMODACHI STEM program for female Japanese undergraduates.

About NSF PIRE Grant Program: Partnerships for International Research and Education (PIRE) is an NSF-wide program that supports international activities across all NSF-supported disciplines. The primary goal of PIRE is to support high quality projects in which advances in research and education could not occur without international collaboration. PIRE seeks to **catalyze a higher level of international engagement** in the U.S. science and engineering community. **International partnerships are essential** to addressing critical science and engineering problems. **In the global context, U.S. researchers and educators must be able to operate effectively in teams with partners from different national environments and cultural backgrounds**. PIRE promotes excellence in science and engineering through international collaboration and **facilitates development of a diverse, globally-engaged, U.S. science and engineering workforce.**

The Rice University TeraNano PIRE project brought together researchers from Rice University, the University at Buffalo (SUNY), the University of Florida, Texas A&M University, the University of Tulsa, and many research collaborators from universities throughout Japan to investigate terahertz (THz) science and technology of nanosystems. The U.S. and Japan are world leaders in both THz research and nanotechnology, with complementary expertise that creates real value to the U.S. from collaboration. Japan is a world leader in the fabrication of nanostructures, and the U.S. is a world leader in characterization, that is, in studying the properties of materials. Our PIRE team's research breakthroughs will lead to real-world applications, including airport and customs screening technology, next-generation wireless communication networks with ultrahigh data rates, and rapid and safe cancer detection methods.

Equally importantly, this PIRE award has accomplished impressive results in fostering interest in nanotechnology, an integral part of the 21st century economy, among early stage American undergraduate students through its award-winning NanoJapan: International Research Experience for Undergraduates Program. The NanoJapan Program was a 12-week, summer research internship focusing on Terahertz (THz) Dynamics in Nanostructures that is open to freshman and sophomore engineering and physics students from universities nationwide. Our program design, combining the best aspects of a traditional study abroad experience with intensive nanotechnology research internships, has been nationally recognized as an innovative and effective model for international STEM programs.

- In 2012, NanoJapan was profiled in a National Academy of Engineering Report on "Infusing Real World Experience into Engineering Education" (see pg. 33)
- In 2008 NanoJapan received the IIE Heiskell Award as a 'Best Practice in Study Abroad' for expanding opportunities for STEM students.
- View more awards and publications about the NanoJapan: IREU program model.



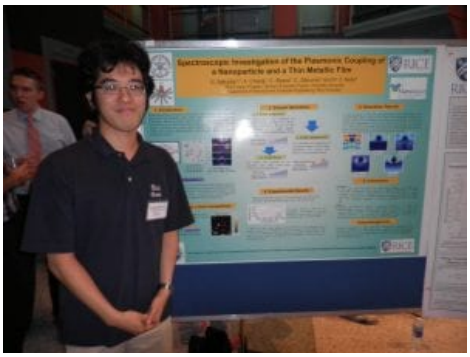
From **2006 to 2015, 144 freshman and sophomore students participated** in the NanoJapan: IREU Program, representing **49 different U.S. institutions**. This includes two historically black colleges and universities, five community colleges, liberal arts colleges, and a wide range of public and private research institutions. The program was particularly successful in recruiting underrepresented STEM students. Female students represented 35.4% of NanoJapan participants overall and 16.8% of participants reported being members of diverse ethnic groups in STEM fields *(not Asian or Caucasian)*.

For more information on this program see our archived website at http://nanojapan.blogs.rice.edu/.

2011 Reverse NanoJapan Program in Response to 3/11 Great East Japan Earthquake and Tsunami

Our existing NanoJapan program structure and experience bringing visiting international graduate students to Rice University through the NanoREIS program (see above) proved invaluable when the March 3, 2011 Great East Japan Earthquake forced us to reverse the NanoJapan: IREU program design and **bring 14 U.S. and 25 Japanese students to Rice for the '2011 Reverse NanoJapan'.**

Rice's research facilities were made available to the Japanese students whose research had been suspended due to energy shortages and other after effects of the disaster in Japan and, at the same time, the U.S. students were able to still be involved in international research collaboration with a Japanese student; one of the hallmarks of the NanoJapan Program. The NSF offered supplemental funding through a special allocation for projects impacted by the earthquake an tsunami which enabled us to off-set some travel and program costs for the Japanese student participants. The Office of the President at Rice University also provided full funding for on-campus housing in the graduate apartments, enabling the U.S. and Japanese students to live together for a more robust inter-cultural experience. In-kind support in the form of guest speakers, special workshops, and other cultural events was also provided by a range of Houston-area organizations including the Japanese Consulate in Houston, the Japan Association of Greater Houston, and Kaminari Taiko.



"Rice has been very supportive," Prof. Junichiro Kono, PI of the NSF-PIRE grant that funds NanoJapan, said. "The President's Office kindly provided all the housing support and meals for all the students, both U.S. and Japanese. The National Science Foundation has allowed us to use our grant to support the Japanese students, which is also unusual. We're also getting some personal and industry donations to support this program. Everything is working great. The NanoJapan Program will return to Japan in 2012, but since this reverse program is going so well, if we can get enough support, we want to continue in some way to have Japanese students here at Rice."

- View Video of 2011 Reverse NanoJapan
- Read Overview of 2011 Reverse NanoJapan – In English
- Read Overview of 2011 Reverse NanoJapan – In Japanese
- Read *Photonics Spectra* article on Reverse NanoJapan – In English
- Read Southern *Journal* article on Reverse NanoJapan – In Japanese, Pg. 3
- Read *Gulfstream: Japanese Business Association of Houston Newsletter* article on Reverse NanoJapan – In Japanese

INNOVATE: Technology Globalization and Innovation Conference in Asia (2006 – 2010)

With partial funding from our NSF-PIRE grant, Rice University served as the headquarters for the *INNOVATE: Technology, Globalization, and Innovation Conference in Asia* from 2006 – 2010. This program brought 310 undergraduate and graduate students to two different countries in Asia for a 10-day program abroad for site visits to leading engineering and technology companies. INNOVATE gave students the opportunity to learn first-hand how technology has driven globalization and business decision-making in the Asia-Pacific.

Students were also concurrently enrolled in a spring semester seminar course, *ENGI 205: Topics in Global Leadership and Technology* that was taught via live interactive webcast with partner instructors at the University of Tulsa and University of Pittsburgh. The first part of the course focused on preparing students for the intensive, 10-day program abroad held during spring break. The last part of the course focused on reflections of that study-tour and a better understanding of issues facing both the U.S. and the host countries in Asia. Each week focused on a relevant topic: history and politics, economics, contemporary culture and demographics, and technological and engineering trends.

- INNOVATE 2006: Shanghai, China & Osaka Japan
  - 58 student delegates from IAESTE China, IAESTE U.S., Keio University (Japan), North Carolina State University, the University of Pittsburgh, Rice University, and the Tokyo Institute of Technology (Japan).
- INNOVATE 2007: Beijing, China and Bangalore, India
  - 63 student delegates from Georgia Institute of Technology, IAESTE US, the Indian Institute of Technology, Bombay, the Indian Institute of Technology, Madras, Keio University, the National University of Singapore, North Carolina State University, Singapore Management University, Rice University, University of Pittsburgh, and the University of Tulsa.
- INNOVATE 2008: Vietnam & Singapore
  - 69 student delegates from Georgia Institute of Technology, IAESTE US, Keio University, National University of Singapore, North Carolina State University, Rice University, the University of Pittsburgh, the University of Tulsa, and a number of other Vietnamese universities.
- INNOVATE 2009: Vietnam & Taiwan
  - 56 student delegates from the American University of Beirut, Georgia Institute of Technology, Keio University, National Cheng Kung University (Taiwan), National University of Singapore, Rice University, University of Pittsburgh, University of Tulsa, Yuan Ze University (Taiwan).
- INNOVATE 2010: Vietnam & Taiwan
  - 64 student delegates from Georgia Institute of Technology, Hokkaido University (Japan), Keio University, National Cheng Kung University, National Taiwan University, Pennsylvania State University, Rice University, University of Pittsburgh, University of Tulsa, and Vietnam National University
- INNOVATE 2011 – 2013: China
  - In 2011, the University of Pittsburgh School of Engineering took over the management and implementation of INNOVATE. Rice university students participated in conference abroad and ELEC 205 course.