

Solar-powered partnership

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Arizona State University has established a partnership with the University of Tokyo, Japan, aimed at strengthening research and educational endeavors at both institutions to advance solar energy technology.

The University of Tokyo is rated by the Global University Ranking organization and others as one the leading universities and research institutions in Asia, and it is the leading solar-energy research institution in Japan.

Its Research Center for Advanced Science and Technology was recently awarded almost \$100 million over a seven-year period from the government of Japan for the Solar Quest program on advanced photovoltaic design, said Stephen Goodnick, director of the Arizona Initiative for [Renewable Energy](#) at ASU.

Photovoltaics is the field of [semiconductor technology](#) that involves converting sunlight into electrical power.

Goodnick also is a professor in the School of Electrical, Computer and Energy Engineering, a part of ASU's Ira A. Fulton Schools of Engineering. At the invitation of the University of Tokyo, he and fellow ASU electrical and energy engineering professor Yong-Hang Zhang attended an international photovoltaics workshop last year in Japan. The idea for the partnership grew out of meetings Goodnick and Zhang had with Japanese colleagues during the conference.

Under the three-year partnership agreement, the two universities will collaborate on research projects, exchange educational information and materials, conduct joint lectures and symposia and exchange services of faculty members, research staff and students.

"It is our great pleasure to have concluded the partnership agreement with one of the most advanced research institutes in the United States in the field of renewable energy," said professor Yoshiaki Nakano, leader of the Solar Quest program. "We believe this will have a significant impact on our research progress at Solar Quest."

The universities' partnership, along with cooperative efforts by the governments of the United States and Japan, will help both countries "achieve far better solutions to our common challenges of producing renewable energy and protecting our environment," Nakano said.

At ASU, researchers with the Arizona Initiative for Renewable Energy, the Biodesign Institute and the Ira A. Fulton Schools of Engineering are involved in a wide range of efforts to make solar cell technology more efficient and affordable.

The partnership with the University of Tokyo "will greatly advance research in what is called third-generation photovoltaics, which seeks to make major improvements in the efficiency of solar electricity, leading to significant cost reductions," Goodnick says.

One of the first joint efforts of the partnership will be the study of high-efficiency, multi-junction solar cells, using compound semiconductor materials to optimize the absorption of the full solar spectrum.

Zhang says this type of cell could be used for [solar energy](#) generation both in space and for terrestrial applications in what is termed "concentrating photovoltaics," where sunlight is focused at up to 1,000

times its normal intensity onto such high-efficiency cells, reducing the cost of generating solar electricity.

This work is currently supported by the Science Foundation Arizona in partnership with Roger Angel at the University of Arizona.

A second project will involve joint research on intermediate-band solar cells to capture more photons from the solar spectrum, which will increase cell efficiency, Goodnick says.

Based on growing nanostructures such as quantum dots within the solar cell, this project will involve collaboration with Christiana Honsberg, director of the recently established Solar Power Laboratory at ASU.

More information: For more information on the Arizona Initiative for Renewable Energy, see: aire.asu.edu/index.shtml

Provided by Arizona State University

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