

Photovoltaic invention brings inventor acclaim

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(PhysOrg.com) -- An invention by a South Dakota State University engineer could improve alternative energy technologies by making it easier for scientists to test new devices.

Assistant professor Mahdi Farrokh Baroughi has developed a multivariable photovoltaic measurement system. The [invention](#) makes it much easier for researchers in universities and [private industry](#) to test photovoltaic devices such as solar cells in order to improve the efficiency with which they convert [sunlight](#) to electricity.

Farrokh Baroughi won SDSU's inaugural Pat and Jo Cannon [Intellectual Property](#) Commercialization Award in February 2011 for the device. A start-up company called Integrid Technologies has invested in the idea, funded in part by a grant from SDSU's [Technology Transfer](#) Office and the seed-stage venture capital investment group, South Dakota Innovation Partners.

“This award recognizes SDSU researchers’ achievements to highlight SDSU’s role as an economic development engine with a new model to commercialize SDSU’s research results in partnership with a private investment group,” said Denichiro Otsuga, director of the Technology Transfer Office. “The new model developed by the Technology Transfer Office links three ingredients for the successful commercialization of research: high quality technology, well organized funding structure and expertise in operation, and financing and intellectual property management to bring about entrepreneurship. What we have is a recipe

to create companies and jobs. The award to Mahdi from Pat and Jo is so fitting because of Pat’s background as an engineer, his inventive mind and entrepreneurial spirit.”

Farrokh Baroughi is an instructor and researcher in the Department of Electrical Engineering and Computer Science who came to SDSU in 2007. He said the invention fills a need in industry and university research, especially given the current emphases in photovoltaic technologies.

“The trend now is toward making photovoltaic [electricity](#) cheaper. The need for lower cost solar cell technologies forces the researchers toward using lower quality materials and simpler fabrication processes,” Farrokh Baroughi said. “While this leads to a simpler manufacturing process, it introduces a lot of complexities into the structure of the fabricated devices in terms of electronic defects. Simpler processing often leads to less control, less purity, and less information about the details of the device structure and its parameters.”

The system Farrokh Baroughi is developing can provide some of that information after the fact — what’s working well in a particular photovoltaic device and what’s not. That can help researchers tweak their designs for [solar cells](#) or similar devices.

Early trials have produced “elegant” results from the device, Farrokh Baroughi said.

The Pat and Jo Cannon Intellectual Property Commercialization Award is one of several donor-funded initiatives that are taking shape as South Dakota State University responds to emerging needs in the state and regional economy. The award recognizes faculty or faculty teams that may include students for producing research-derived innovations and new technologies that show promise. A cash award and formal

recognition at SDSU's annual Celebration of Faculty Excellence encourage faculty members and their teams to pursue research activities that could yield innovations or intellectual property with commercial potential.

Farrokh Baroughi has a Ph.D. in electrical engineering from the University of Waterloo in Ontario, Canada. Undergraduate students Alex Richter, Neil Albares and Ben Goemann, and graduate students Hari Paudel and Sadeh Mottaghian are working in Farrokh Baroughi's lab on the project.

Provided by South Dakota State University

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