Sandia National Laboratories

Energy, Climate & Infrastructure Security

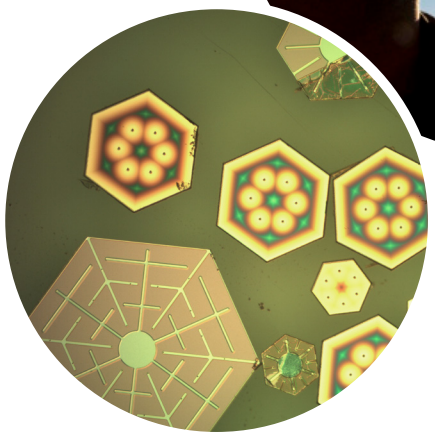
Solar Glitter

Vision

To enhance the nation's security and prosperity through sustainable, transformative approaches to our most challenging energy, climate, and infrastructure problems.

Sandia developed tiny glitter-sized photovoltaic (PV) cells that could revolutionize solar energy collection. The crystalline silicon micro-PV cells will be cheaper and have greater efficiencies than current PV collectors. Micro-PV cells require relatively little material to form well-controlled, highly efficient devices. Cell fabrication uses common microelectronic and micro-electromechanical systems (MEMS) techniques. From 14–20 μm thick, they are 10 times thinner than conventional cells, yet perform at about the same efficiency.

Micro-PV benefits include improved performance, reduced costs, higher efficiencies, and new applications. Units could wrap around unusual shapes for solar power integrated into buildings, tents, and maybe even clothing. Rooftop micro-PV modules could have intelligent controls, inverters, and even storage built into the chip—simplifying the grid-integration process. The tiny cells could turn a person into a solar battery charger—military personnel in the field or backcountry hikers could recharge batteries for phones, cameras, and other electronics as they walk or rest.



Greg Nielson holds up a test strip of the solar glitter cells. To the left is a micrograph of the crystalline silicon micro-PV cells.

LDRD LABORATORY DIRECTED RESEARCH & DEVELOPMENT

For more information please contact:

Greg Nielson
E-mail: gnniels@sandia.gov
Phone: (505) 284-6378
Website: energy.sandia.gov

U.S. DEPARTMENT OF ENERGY

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. SAND2011-1815P