

Solar Glitter

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Problem

Our expanding use of electronic equipment has increased the demand for reliable, affordable energy sources to power them. Concern over environmental damage caused by the use of fossil fuels is driving energy providers to seek out alternate renewable power sources. Sun and wind are both viable options, but of these, only solar power has the potential for widespread portable use. Traditionally, the collection and conversion of sunlight to electricity has been expensive. However, Sandia scientists have developed glitter-sized photovoltaic (PV) cells that have the potential to achieve the cost breakthrough necessary to move solar energy into the mainstream.

Innovative Edge

The miniaturized solar cells are produced using Sandia's Microsystems-Enabled Photovoltaics (MEPV) technology, which employs microdesign and microfabrication techniques common to the semiconductor, LCD, and microsystems industries. The PV cells are then "printed" onto a low-cost substrate with embedded contacts and microlenses for focusing sunlight onto the cells. The small size of the collectors makes versatile applications possible. "Eventually, units could be mass-produced and wrapped around unusual shapes," said Greg Nielson, lead investigator for the project. If integrated into buildings, tents, and potentially clothing, MEPV technology would allow users such as hunters, hikers, and military personnel to recharge batteries for phones, cameras, and other electronic devices while in the field.

