

# Sunflower-Inspired Solar Panels Track Sun Without Motors

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*Developed by an engineer at the University of Wisconsin-Madison, the system allows the panels to collect more solar energy without using additional electricity.*



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A new, sunflower-inspired solar panel stand is able to turn to face the sun without using any motors. The system increases the amount of energy the panels can harvest without using any additional electricity.

"The whole point of solar tracking is to increase the electricity output of the system," the solar panel stand's creator, University of Wisconsin-Madison engineer Hongrui Jiang, said in a statement. Jiang's team was inspired by heliotropism, the ability of some leaves and flowers, such as sunflowers, to track the sun as it moves across the sky, they say. "This is exactly what nature does," Jiang said.

Solar panels gather more energy when they're pointed directly at the sun, so several labs and companies have developed trackers that keep panels aimed at the sun as it moves across the sky during the day. Many of these trackers depend on electrical motors and GPS, which use 2 to 3 percent of the energy a solar panel gathers, according to a 2009 paper in the journal Renewable

and Sustainable Energy Reviews. Jiang and his colleagues wanted a way to track the sun without using electricity.

The system depends on a new material Jiang's team developed, which combines a rubbery material, called liquid crystalline elastomer, with tiny carbon fibers. The fibers are able to absorb a wide range of light, including light waves in the visible and infrared spectrums.

When sunlight falls on the carbon fibers, they heat up. The difference in temperature between the hot carbon fibers and the cooler outside air causes the liquid crystalline elastomer to shrink.

When the sun moves on, the material cools and expands again to its original size.

Jiang stood hexagonal solar panels on top of an array of six columns made of his new sun-activated material. Whenever sunlight hit one of the columns, it shrank, tilting the panel on top toward the sun. Compared with solar panels that don't move, the sun-facing panels harvest 10 percent more energy, Jiang's team found.

Other research teams have created electricity-free sun trackers using gases or metals that expand and contract when they're warmed by the sun, Jiang's team wrote in a paper they published Aug. 1 in the journal Advanced Functional Materials. Their tracker is less complicated than others' efforts, they wrote.

The researchers have built prototypes about a foot tall, which they've [posted](#) on YouTube. For their next study, they plan to try to build bigger trackers that would work with industrial-size panels, Jiang said.

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