Nanotechnology improves solar cell efficiency

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Scientists have long struggled to create a new kind of solar cell, one made of plastic that would be lightweight, flexible, and more efficient than the more familiar silicon solar cells.

And now they're getting closer. Earth & Sky spoke with David Carroll of Wake Forest University about his recent success using nanotechnology to improve the efficiency of plastic solar cells. He's developed a method to embed nano-sized balls of carbon known as "fullerenes" into light-absorbing plastic.

David Carroll: They look like a little soccer ball. They're made from carbon and they're less than a nanometer across and you disperse them in the plastic and then you manipulate them around as we have done.

The fullerenes increase the efficiency of the plastic solar cell. Dr. Carroll explained that the goal is to make the plastic absorb a wider range of the sun's energy.

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David Carroll: Silicon can absorb the higher energy photons, but plastics don't do as well. And so what you have to do is you have to put something in the plastic to help do the absorption of the photon, like the fullerenes are doing, but you want to kind of capture more of the high energy and low energy photons. What we say is that we're trying to increase the spectral overlap with the sun.

In other words, the new plastic solar cells can absorb more of the colors of the rainbow, so they're more efficient.

Thanks today to the National Science Foundation.

Our thanks to David Carroll.

David Carroll is Associate Professor in the Department of Physics at Wake Forest University in Winston-Salem, North Carolina.

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