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## Quote of the day

We've arranged a civilization in which most crucial elements profoundly depend on science and technology.

Carl Sagan



## Micro-windmills used to recharge cell phones

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Posted in [Hardware](#) on 12th Jan, 2014 12:29 AM by [Alex Muller](#)

A micro-windmill that generates wind energy and may become an innovative solution to cell phone batteries constantly in need of recharging and home energy generation where large windmills are not preferred.

Smitha Rao and J.-C. Chiao designed and built the device that is about 1.8 mm at its widest point. A single grain of rice could hold about 10 of these tiny windmills. Hundreds of the windmills could be embedded in a sleeve for a cell phone. Wind, created by waving the cell phone in air or holding it up to an open window on a windy day, would generate the electricity that could be collected by the cell phone's battery.

Rao's works in micro-robotic devices initially heightened a Taiwanese company's interest in having Rao and Chiao brainstorm over novel device designs and applications for the company's unique fabrication techniques, which are known in the semiconductor industry for their reliability.

"The company was quite surprised with the micro-windmill idea when we showed the demo video of working devices," Rao said. "It was something completely out of the blue for them and their investors."

Rao's designs blend origami concepts into conventional wafer-scale semiconductor device layouts so complex 3-D moveable mechanical structures can be self-assembled from two-dimensional metal pieces utilizing planar multilayer electroplating techniques that have been optimized by WinMEMS Technologies Co., the Taiwanese fabrication foundry that took an initial interest in Rao's work.

"The micro-windmills work well because the metal alloy is flexible and Smitha's design follows minimalism for functionality," Chiao said. WinMEMS became interested in the micro-electro mechanical system research and started a relationship with UT Arlington. Company representatives visited with the UT Arlington team several times in 2013 to discuss collaboration.

Tags: energy, wind energy, windmill, smartphone, mobile, battery,

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Author: *Guest* Posted: 2014-01-12 +2

What an interesting way to generate energy. At the moment just an idea but definitely one that should be developed further and tested in several applications

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Author: *Guest* Posted: 2014-01-12 +1

Great. I found that these inventions are essential to build micro-robots that can be used as surgical tools, sensing machines to explore disaster zones or manufacturing tools to assemble micro-machines. 😊

1 Replies

Author: *tamas* Posted: 2014-01-12 +0

There could be many applications for WinMEMS. Because of the small sizes, flat panels with thousand of windmills could be made and mounted on the walls of houses or building to harvest energy for lighting, security or environmental sensing and wireless communication.

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Author: *Guest* Posted: 2014-01-12 +0

The fabrication cost of making this device is predicted to be low, giving us an inexpensive systems. I think this is the most important point

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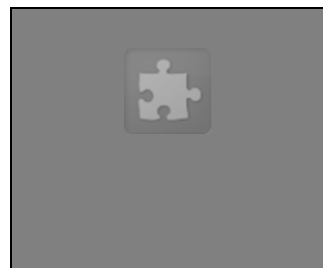
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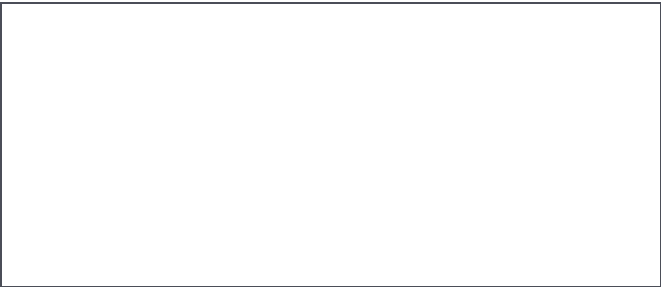
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I this how they describe it work for charging phones. When the phone is out of battery power, all you need to do is to put on the sleeve where device is place, wave the phone in the air for a few minutes and you can use the phone again 🐞  
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