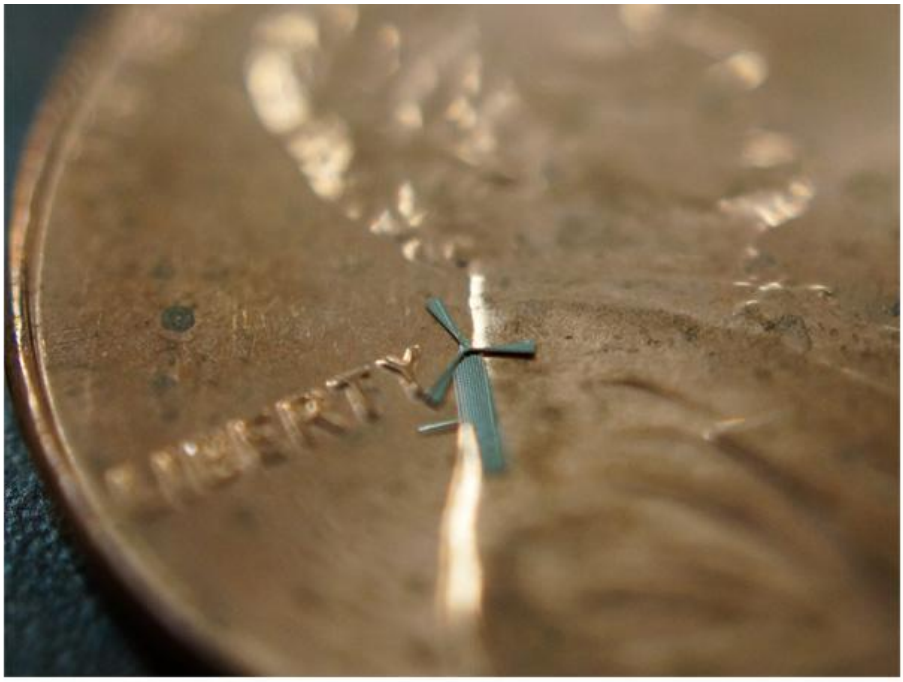
Teeny tiny windmills could recharge phones



A microscopic windmill could one day provide a portable method of charging devices. The tiny machines, just 1.8 millimeters at their widest point (10 can fit on a single grain of rice), can harvest energy from the movement of air.

They are the work of University of Texas, Arlington, research associate Smitha Rao and electrical engineering professor J.-C. Chiao. The pair envisions smartphone cases embedded with hundreds of windmills that could charge the phones therein when waved through the air or held by an open window on a windy day.

The windmills were crafted using origami techniques that allow two-dimensional shapes to be electroplated on a flat plane, then self-assembled into 3D moving mechanical structures. They're made of a durable, flexible nickel alloy that can stand up to strong winds without fracturing, helped by a minimal, aerodynamic design.

Rao and Chiao created the windmill for a Taiwanese superconductor company called WinMEMS, which developed the fabrication technique and was interested in Rao based on her work in micro-robotics.

"It's very gratifying to first be noticed by an international company and second to work on something like this where you can see immediately how it might be used," Rao said. "However, I think we've only scratched the surface on how these micro-windmills might be used."

Chiao added that the windmills could perhaps be crafted into panels of thousands, which could then be attached to the sides of buildings to harvest wind energy for lighting, security, or wireless communication