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Wireless Energy

By CLAY RISEN

The [M.I.T.](#) physicist Marin Soljacic found inspiration for his latest invention in the dying batteries of his wife's cellphone. Every morning around 2 her phone would beep loudly. "One night it occurred to me, wouldn't it be great if this thing took care of its own charging?" he says.

The question was how to transfer energy wirelessly. There are many ways to transfer low levels of energy, like using radio waves, and many ways to transfer very large, concentrated levels, like using lasers. The problem is that radio waves dissipate energy in all directions, and lasers are too powerful to use safely for this purpose.

Soljacic and his research team eventually hit on the answer: magnetic resonance. It's roughly comparable to a singer who shatters a glass by producing sound waves at the same frequency as the glass's so-called resonant frequency. Soljacic figured the same principle could apply to electrical energy. (In the early 20th century, the inventor Nikola Tesla tried developing something similar but ran out of money.)

This summer, the team announced the success of their "WiTricity" experiment in the journal *Science*. Using a pair of copper-wire coils, they transferred, with an efficiency of about 40 percent, enough energy across about six feet of open air to power a 60-watt bulb, even when they stuck a board between the coils.

The possible applications are endless. Wireless energy ports could eliminate cords on everything from lamps to laptops. Imagine pacemakers that never need a new battery, or highways that continuously recharge electric cars. At the very least, phone chargers would be a thing of the past — meaning Soljacic and his wife could finally get a good night's sleep.

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