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25 big ideas for 2012: Wireless mind control

By [Ed Yong \(/search/author/Ed+Yong\)](#) | 01 January 12



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In [Massachusetts Institute of Technology \(http://www.mit.edu\)](http://www.mit.edu) (MIT), a mouse sits in a lab wearing a hat. But this is no fashion statement; the headpiece is allowing scientists to steer the rodent's movements. It is the latest innovation in optogenetics: controlling animals using light. By illuminating neurons that have been loaded with light-sensitive proteins, scientists can trigger specific bursts of brain activity and direct their subjects' behaviour. This used to require a tangle of clunky optic fibres, but [Ed Boyden \(/edboyden.org/\)](#), a founder of optogenetics and leader of the Synthetic Neurobiology Group at MIT, has made his technique wireless.

Boyden's mind-control helmet runs 16 LEDs from wireless power, and can be controlled from a USB base station. He is able to control the roaming rodents over long periods of time, and can scale up neuroscience by controlling dozens of them at once in order to study long-term processes such as sleep, epilepsy or even Alzheimer's. His work may go on to inform the better design of pacemakers or electrical implants for controlling the symptoms of Parkinson's disease. Hats off to the MIT mice.

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