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# Top 10 Discoveries of 2009



In a year dominated by negative financial headlines, many of 2009's most amazing technological and scientific breakthroughs went unnoticed. This week, we take a look at 10 discoveries made this year that are likely to change forever the way we live.



### **The world's first successful AIDS vaccine**

An AIDS vaccine has long been considered one of the holy grails in modern medicine. In 2009, scientists made a significant step towards this life-saving goal. A six-year trial showed that a combination of two individually ineffective vaccines somehow reduces infection rates by 31% when taken together. It's not a perfect solution, and there are still many more questions to be answered before it can be approved for use, but it has opened up many new doors in the field of HIV/AIDS research and given hope to millions.



### **The everlasting light bulb**

In September, Phillips Electronics entered the U.S. Department of Energy's L Prize Competition, which will award \$10 million for an LED alternative to the common 60-watt light bulb. Phillips is the only company to have entered the competition so far, and they may very well win the prize before anyone else enters. Its LED light offers the exact same light as a typical light bulb for one-sixth of the energy and lasts 25 times longer.



### **The microchip that cures blindness**

Top researchers at MIT made ground on a partial solution for blindness by embedding a tiny microchip into the eyeball. A special pair of eyeglasses with a built-in camera records images of people and transmits that data to the brain. Researchers believe that when finished, the so-called electric eye will enable blind people to recognize faces and navigate a room with confidence. As the technology progresses, it may even be possible to restore full vision or enhance normal vision.



## The pocket ultrasound machine

In October, GE revealed the Vscan, a portable ultrasound machine that can fit easily into a doctor's pocket. The device makes it quicker, easier, and cheaper to perform ultrasounds. The portable ultrasound is only the first in a whole wave of portable medical devices scheduled to hit the market over the next several years. In the future, your doctor may perform the majority of tests with devices that fit nicely inside her pocket.



## Teleportation

Scientists at the University of Maryland have made history with the first successful teleportation. The teleportation is not quite up to Star Trek standards yet; simply, a small piece of data was transferred from one atom to another atom one meter away. Though we may be a long way away from beaming from our spaceship to the planet below, scientists believe that this form of teleportation could be instrumental in developing a new breed of super-fast computers and enabling more secure data transfers.



## The world's first 3-D camera

Fujifilm released the first ever 3-D camera in 2009. The 3-D camera perceives depth much like the human eye. There are two lenses separated by a few inches that allow the camera to snap shots of the same subject from two different angles, creating an illusion of depth on the camera or in compatible software viewers.



## A better material for bone replacements

In 2009, a small group of Italian scientists discovered that when it comes to bone replacements, sometimes back is forward. Using common wood to craft bone replacements that retain much of the density and texture (i.e., sponginess), scientists have found that live bone grows into the replacements more quickly than when they are made with titanium or ceramic--the most common materials used in today's replacements.



## Vertical Farming

Texas-based company Valcent has a unique approach to one of the world's most complicated problems. As global population increases, farmers are called upon to feed more and more people with less and less land. Valcent's solution is to build up instead of building out. Vertical farming is a radical new hydroponic growing solution that places crops in rotating rows that can be stacked, providing crops just the right access to sunlight and allowing for more efficient use of water and land.



## Levitation

Researchers at NASA were able to levitate a mouse using a series of magnets. The set-up is being used to test the effects of zero-gravity environments on mammals. Researchers believe that one day they may be able to learn more about how to help astronauts adjust to longer periods in space without the negative physical side effects of space travel. Of course, it is also possible that eventually we will build a zero-gravity simulator for humans, using the same technological principles.



## Remote-controlled insects

An engineering team at Berkley recently took the first steps towards human control of insects. By attaching small electrodes to the brains of beetles and controlling those electrodes by remote control, the scientists were able to influence the behavior of beetles, directing them to take off, hover, or turn on command. The research was funded by the Pentagon, which hopes one day to use beetles in the delivery of small payloads across enemy lines.