Invisible cloaks like the one imagined in the Harry Potter books are in the realm of possibility.

Technology

Cool disappearing acts

New developments suggest that we can in fact make ourselves invisible

By Joseph Wilson

It seems that ancient Athens was ahead of its time. The Greek myths of Perseus that have trickled down to us over the years often make reference to an invisible cloak or cap that allowed the hero to sneak up on Medusa or mess with Pluto or complete any number of extraordinary adventures.

This fantastical invention, reprised in the Harry Potter books and in the cloaking devices of Star Trek, has been inching closer to becoming a reality in recent months through some remarkable discoveries in high-energy physics.

The oldest working version of an invisible cloak was developed a few years ago by researchers at the University of Tokyo. Their “optical camouflage technology” consists of a long silver jacket with an image projected onto its surface of what is behind the wearer. You can see some videos of the jacket at www.youtube.com/watch?v=JKPVQal851U.

It’s hard to get the projection’s timing right, and the jacket is made out of some pretty nifty material to seem like a realistic representation of the background, but this process is really just an optical illusion and does nothing extraordinary to the light rays bouncing around the room.

Early this year, however, a group from the University of Pennsylvania announced they could use the properties of the particles on the surfaces of some metallic objects (so-called plasmons) to absorb the electromagnetic radiation hitting them.

The researchers claim that microscopic objects can be made invisible to the human eye under a microscope, but a large object like a human could only be made invisible to microwaves, which doesn’t really help much if you’re trying to sneak your Romulan warship into enemy territory.

Light is notoriously difficult to mess with because it travels at a whopping 300,000 kilometres per second. The only way the researchers were able to test their materials was by using electromagnetic radiation such as microwaves that travel at the same speed but have much longer wavelengths, making them easier to manipulate.

More recently, researchers at the Imperial College London suggested a slightly different solution. They’ve developed a kind of meta-material, a hodgepodge of polymers, wires and molecules, that has the potential to bend the path of any light that hits it. Light rays sweep around the object, allowing the viewer to see what is behind it but not the object itself.

Theory became reality in October 2006, when scientists at Duke University released pictures of a small copper cylinder rendered invisible to microwaves (http://inventorspot.com/files/images/061019-invisible-cloak_big.img_assist_custom.jpg). The microwaves flow around a tiny copper tube and recombine on the other side like a stream flowing around a boulder.

The cloak was tiny, however, measuring a mere 13-by-1 centimetres, not nearly enough to provide decent cover for Harry Potter and his crew. Another difficulty is that the object cast a faint “shadow” that hints at the fact that something is being covered up.

Furthermore, if the object moves slightly, the jig is up and it leaps into view. The prototype also only works on one specific wavelength, a complication in the natural world, which is flooded with a huge spectrum of variable wavelengths.

Researchers are pretty confident they can solve these problems, though, so you just might see a working version of Perseus’s cloak appear in a university lab near you.

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