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Technology briefs

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Peeling back the cloak of invisibility

They can't match Harry Potter yet, but scientists are moving closer to creating a real cloak of invisibility.

Researchers at Duke University, who developed a material that can "cloak" an item from detection by microwaves, report that they have expanded the number of wavelengths they can block.

In 2006 the team reported they had developed so-called metamaterials that could deflect microwaves around a three-dimensional object, essentially making it invisible to the waves.

The system works like a mirage, where heat causes the bending of light rays and cloaks the road ahead behind an image of the sky.

The researchers report in Thursday's edition of the journal *Science* that they have developed a series of mathematical commands to guide the development of more types of metamaterials to cloak objects from an increasing range of electromagnetic waves.

NASA to fly two research drones

A powerful new scientific eye will be in the sky come summer.

NASA and Northrop Grumman on Thursday unveiled two unmanned drones that will be used for atmospheric research. One of the two Global Hawks, a version of the Air Force's top-of-the-line unmanned spy plane, will be outfitted with science instruments this spring and conduct its first earth science mission in June for NASA.

The planes, which are capable of staying aloft for more than 30 hours, will sample greenhouse gases responsible for ozone depletion and verify measurements by NASA's Aura atmosphere research satellite.

"It's a whole new ballgame for us," said project scientist Paul A. Newman of NASA's Goddard Space Flight Center.

Previous research aircraft deployed to sample the atmosphere typically are smaller and cannot stay airborne for as long as the Global Hawk can. During the Global Hawk flights, scientists would have access to their instruments through a dedicated satellite feed and can view data in real time, Newman said.

With a wingspan of 116 feet, the Global Hawks can fly up to 65,000 feet, which is twice the altitude of commercial airliners. The craft can also carry payloads up to 2,000 pounds.

Missions will fly in and out of Edwards Air Force Base north of Los Angeles.

Fish poop helps with acid balance

The ocean's delicate acid balance may be getting help from an unexpected source: fish poop.

The increase in carbon dioxide in the atmosphere not only drives global warming, but also raises the amount of CO₂ dissolved in ocean water, tending to make it more acid, potentially a threat to sea life.

Alkaline chemicals like calcium carbonate can help balance this acid. Scientists had thought the main source for this balancing chemical was the shells of marine plankton, but they were puzzled by the higher-than-expected amounts of carbonate in the top levels of the water.

Now researchers led by Rod W. Wilson of the University of Exeter in England report in the journal Science that marine fish contribute between 3 percent and 15 percent of total carbonate.

And the contribution may be even higher than that, say the researchers from the U.S., Canada and England.

They report that bony fish, a group that includes 90 percent of marine species, produce carbonate to dispose of the excess calcium they ingest in seawater. This forms into calcium carbonate crystals in the gut and the fish then simply excrete these "gut rocks."

The process is separate from digestion and production of feces, according to the researchers.

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