

RESEARCH HIGHLIGHTS

Brass eye

Nature Mater. doi:10.1038/nmat2561 (2009)

Whether it be light or sound, there is a limit to the detail a lens can resolve. Because of diffraction, a conventional lens will never resolve features smaller than about half a wavelength.

But this rule doesn't hold for lenses made of metamaterials, composite materials that bend light or sound waves in unusual ways. Xiang Zhang and his colleagues at the University of California, Berkeley, used 36 precisely machined brass fins to create just such a lens for sound waves. Their 'hyperlens' compresses evanescent sound waves, which fade away very quickly, into more robust propagating waves, magnifying sub-diffraction features by a factor of eight. The technology could lead to higher-resolution images in sonar and ultrasound.



ANIMAL BEHAVIOUR

Fruit-bat fellatio

PLoS One 4, e7595 (2009)

Libiao Zhang of Guangdong Entomological Institute in China and his colleagues have documented what may be the first case of regular fellatio in adult animals other than humans.

They report that female short-nosed fruit bats (*Cynopterus sphinx*) licked their mate's penis during 14 of 20 observed copulations. Matings that involved licking lasted significantly longer than those that did not.

Possible functions for this behaviour include stimulation to prolong copulation and assist fertilization; mate guarding; antibacterial effects; and the detection of chemicals assisting in mate choice.

The authors say their observations could suggest a possible adaptive benefit for the activity in this species.

CLIMATE

Aerosols overlooked

Science 326, 716–718 (2009)

Aerosol particles in the atmosphere and their short-term interactions with gases have been overlooked in climate-change mitigation policies and emissions-trading schemes, say Drew Shindell from NASA's Goddard Institute for Space Studies, New York, and his colleagues.

The team found that methane's global-warming potential is greater when combined with aerosols — atmospheric particles such as dust, sea salt, sulphates and soot. The picture is complicated: some aerosols cool the

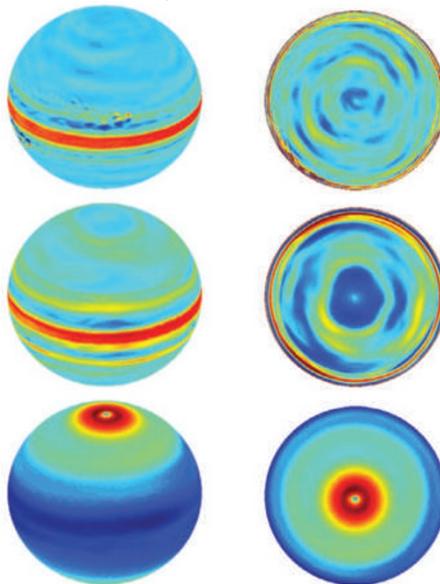
planet, some warm it, and other components of the overall climate system, such as ozone, are also affected.

PLANETARY SCIENCE

Jet setting

Icarus doi:10.1016/j.icarus.2009.10.006 (2009)

The fast-flowing gas currents that give the giant planets their banded appearance may be caused by energy released when water condenses into clouds and storms. Jupiter (pictured below, top) and Saturn (below, middle) have 20 to 30 of these jet streams, including a broad eastward jet that flows around the equator. Uranus and Neptune (below, bottom) each have only about three, with a westward jet at the equator.



Yuan Lian and Adam Showman from the University of Arizona in Tucson used simulations to show that the heat produced when water condenses during storms could drive jet streams matching those observed on all four planets. They found that expected differences in water abundance on the planets could account for the distinct stream patterns.

NEUROSCIENCE

Bridging the gap

Neuron 64, 165–172 (2009)

With the right approach, spinal cord neurons can be coaxed to regenerate more than a year after spinal injury.

The strategy, identified by Mark Tuszynski of the University of California, San Diego, and his colleagues, involves a series of steps targeting cellular growth mechanisms and environmental obstacles that hinder neurons' ability to regenerate.

The researchers severed the spinal cord in rats and applied their complex combination therapy either six weeks or 15 months later. In both cases the long axons of sensory neurons grew across the lesion and beyond, although the number of regenerating axons and the distance they travelled fell over time.

EVOLUTIONARY GENETICS

Mutation elevation

Genetics doi:10.1534/genetics.109.108803 (2009)

High mutation rates are thought to drive populations to extinction through the build-up of harmful genetic changes. This is not necessarily so, according to a new experiment.

James Bull and his colleagues at the