RESEARCH HIGHLIGHTS

Bird's-nose view

Proc. R. Soc. B doi:10.1098/rspb.2008.0607 (2008)
Smell may be much more important to the way birds perceive their surroundings than biologists have thought. A study of nine species of bird from seven orders found, in all cases, that the majority of olfactory-receptor genes were probably functional, report Silke Steiger of the Max Planck Institute for Ornithology in Starnberg, Germany, and her co-workers. The only previous estimate — from a draft genomic sequence of the red jungle fowl (*Gallus gallus*) — put that proportion at just 15%.

The total number of working olfactory-receptor genes that an animal has probably indicates how many different scents it can distinguish. Of the species in this sample, the kakapo (*Strigops habroptilus*, pictured), which forages at night, had the most 'smell' genes, 82% of which probably contribute to this bird's sense of smell.

C. COURTEAU/NATUREPL.COM

PHYSICS

Parting a cloud

Appl. Phys. Lett. **92,** 254102 (2008)
A team of researchers has made three-dimensional 'atom chips' that give unprecedented control over Bose–Einstein condensates (BECs) — clouds of extremely cold atoms that all share the same quantum state.

Thorsten Schumm at Vienna University of Technology and his colleagues used ultraviolet light and electron beams to pattern multiple wiring layers, separated by insulators, onto a semiconductor. By running currents through the wires, the team created magnetic potentials able to hold and manipulate BECs.

For instance, they can split a BEC in two and perform experiments on its halves. They believe that the work might lead to highly sensitive magnetometers and applications in quantum information technology.

B. FASANI/CORBIS

ACOUSTICS

Chuckle vision

J. Acoust. Soc. Am. **124,** 472–483 (2008)
Laughter is considered to be a reflex action, an adaptive tension-reliever with analogues in many non-human species. That congenitally deaf people laugh out loud supports this theory. But do they produce the same sounds as those who hear normally?

Maja Makagon of Cornell University in Ithaca, New York, and her colleagues showed congenitally deaf volunteers clips of films such as *Mr Bean* and *The Naked Gun*, and compared the acoustic properties of their laughter with that of unimpaired controls. The quality of the sound was remarkably similar; the differences in the sound-waves' shapes were more consistent with deaf people having less vocal-muscle control than with hearers having learned how laughing 'should sound'.

The deaf volunteers laughed more quietly, perhaps owing to social conditioning that led them to lower vocal volume overall.

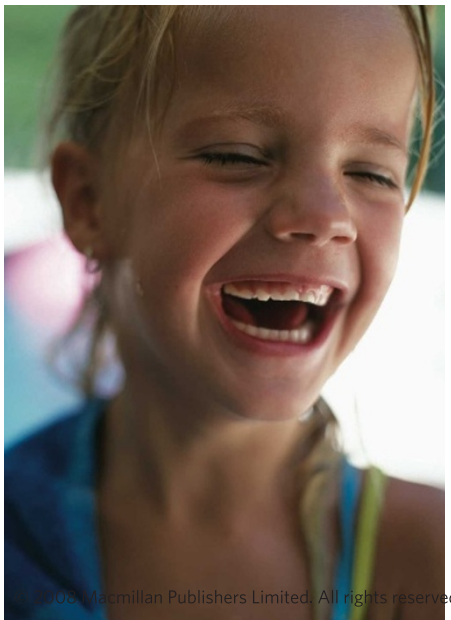
PLANT SCIENCES

Poisonous grains

Proc. Natl Acad. Sci. USA doi:10.1073/pnas.0802361105 (2008)
Rice is efficient, indeed disconcertingly so, at assimilating arsenic from the soils of paddy fields. But how it does this has been unclear. Now Fang-Jie Zhao at Rothamsted Research in Harpenden, UK, Jian Feng Ma at Okayama University in Japan and their colleagues have discovered that it is taken into the plant as though it were silicon.

They found that two transporter proteins belonging to the family known as aquaporins enable arsenite to move from rice's soggy surroundings into its vascular system. Mutations in the genes encoding either of these proteins reduced arsenite uptake by the roots and the amount of arsenic that accumulated in shoots and grains.

The authors hope that different versions of these genes exist that favour silicon transport over that of arsenite. If so, rice carrying such versions could be planted in regions of the world where arsenic poisoning is a problem.



PHYSICS

Gravity up close

Phys. Rev. D **78,** 022002 (2008)
Gravity is the weakest and least well understood of the four fundamental forces. It behaves well over large distances. But many theorists suspect that undiscovered particles or extra dimensions might cause its observed behaviour to break down over very short distances — which might help to reconcile gravity with the three other forces.

Current approaches will hold a little while longer, however, thanks to Andrew Geraci and his colleagues at Stanford University in California, who have made the most precise measurements yet of gravity over 10 micrometres. They found no anomalies.

The researchers placed a 1.5-microgram gold cuboid on a silicon cantilever a quarter of a millimetre long, rather like a diver on a