

RESEARCH HIGHLIGHTS

Selections from the scientific literature

CLIMATE CHANGE

Black carbon a warming culprit

The soot that is emitted into the atmosphere from activities such as burning of diesel and biomass is making a bigger contribution to global warming than previously thought. This finding puts 'black carbon' second only to carbon dioxide in terms of its warming impact.

Tami Bond at the University of Illinois at Urbana-Champaign and her colleagues analysed data from a ground-based network of aerosol sensors, run by NASA, as well as satellite observations and global-emissions inventories. The authors found that the amount of warming from black carbon — which absorbs solar radiation and heats the atmosphere, as well as melting snow and ice — is roughly double most earlier estimates.

Lowering black-carbon emissions could be a quick way to cool the climate, but the overall effect of atmospheric aerosols on climate is still uncertain, the authors caution.

J. Geophys. Res. <http://dx.doi.org/10.1002/jgrd.50171> (2013)

For more on this research, see go.nature.com/ztcgcf

MATERIALS

Ceramics make water unwelcome

Water-repellent materials have a wide range of applications, but many hydrophobic coatings cannot withstand harsh conditions. Now, researchers at the Massachusetts Institute of Technology, Cambridge, report the production, from rare-earth

oxides, of ceramic materials that remain hydrophobic even after exposure to harsh environments.

Kripa Varanasi and his colleagues synthesized ceramics from the lanthanide oxide series, including cerium oxide. In analysing the surface chemistry of the ceramics, the researchers found that the oxides' electronic structure inhibits hydrogen bonding with water molecules. They show that water droplets bounce off a cerium oxide surface

(pictured), leaving the surface dry. Moreover, the ceramics maintain their hydrophobic nature even after abrasion and exposure to high temperatures. *Nature Mater.* <http://dx.doi.org/10.1038/nmat3545> (2013)

GENOMICS

Gene linked to Alzheimer's

Two studies have identified a rare genetic mutation that boosts the risk of

Alzheimer's disease.

Kári Stefánsson of deCODE Genetics in Reykjavik and his group analysed the genomes of 2,261 Icelanders and uncovered a mutation in the *TREM2* gene that increased the risk of Alzheimer's disease roughly threefold. A separate research team, led by John Hardy at University College London, discovered the same mutation, along with several others in the same gene, when analysing the genomes of more than 1,000 people with the disease.

The protein encoded by *TREM2* is expressed in brain immune cells called microglia, and regulates the process by which these cells engulf cell debris. The findings suggest



P. G. LOVELL ET AL. CURR. BIOL.

ANIMAL BEHAVIOUR

Quail pick nests that best hide eggs

Individuals of a bird species may nest in different areas according to which best camouflages the patterns on their eggs, report George Lovell at Abertay University in Dundee, UK, and his colleagues.

Japanese quail (*Coturnix japonica*) lay speckled eggs that vary greatly in appearance between mothers. The authors offered 15 females four different colours of sand in which to lay their eggs. Using photographic analysis, the team

found that females with more highly spotted eggs typically chose darker sand that matched the colour of the spots. By contrast, quail that laid lightly spotted eggs selected paler sand that matched the background colour of the eggs.

The authors suggest that individual female quail select egg-laying strategies best suited to hiding their eggs from detection by predators. *Curr. Biol.* <http://dx.doi.org/10.1016/j.cub.2012.12.031> (2013)

