RESEARCH HIGHLIGHTS

Selections from the scientific literature

MATERIALS

Could graphene be a laser?

Graphene — sheets of carbon just one atom thick with exceptional mechanical and electrical properties — also has the potential to be used as a laser.

Tianqi Li of the Ames Laboratory at Iowa State University and his colleagues demonstrate that 'pumping' a graphene monolayer with 35-femtosecond pulses of light causes the graphene to reach an excited state called a population-inverted state. It can then be triggered to emit light. With strong pumping, the graphene emits more light across a range of near-infrared frequencies than it absorbs — a sign of the 'optical gain' that is crucial for lasers.

Graphene's unique properties could improve the performance of current laser technology.

Phys. Rev. Lett. 108, **167401 (2012)**

ZOOLOGY

Mammal sings with syntax

Mammalian vocalizations containing complex structure, or syntax — such as those of whales and bats — may be more common than previously thought.

Arik Kershenbaum at the University of Haifa in Israel and his colleagues analysed the calls of the male rock hyrax (*Procavia capensis*; **pictured**), a small mammal common in Africa and the Middle East. Hyrax songs are made up of five types of syllable — wail, chuck, snort, squeak and tweet. The authors found that animals living within a few kilometres of each other produced songs with a similar syllable order. Over larger areas, there was no relationship between syntax and location, suggesting that hyraxes have a limited territorial range and that their songs may be a socially learned behaviour.

Proc. R. Soc. B **http://dx.doi.org/10.1098/rspb.2012.0322 (2012)**

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CLAY TRAUERNICHT

ECOLOGY

Savannah trees resist fires

A fire-sensitive tree species has managed to survive in one of Earth's most fire-prone locales because the trees form closed canopies that support a fire-resistant plant community.

The conifer *Callitris intratropica* can be found in patches of woodland across the savannah of northern Australia. Clay Trauernicht and his colleagues at the University of Tasmania in Australia conducted controlled burns and compared the response of *C. intratropica* conifer groves with either open or closed canopies. Closed-canopy groves (pictured) supported a distinct plant community with lower fuel availability and produced more seedlings and saplings. Compared with the surrounding eucalyptus-dominated savannah, closed-canopy conifer groves were less likely to burn, and experienced milder fires.

J. Ecol. **http://dx.doi.org/10.1111/j.1365-2745.2012.01970.x (2012)**

MICROBIOLOGY

Gene behind MRSA's menace

A rare gene from a dangerous antibiotic-resistant bacterium is becoming more common by being transferred between strains, and seems to boost virulence in skin and respiratory infections.

Yuan Lu at Fudan University in Shanghai, China, and Michael Otto at the National Institute of Allergy and Infectious Diseases in Bethesda, Maryland, and their colleagues studied the gene — called *sasX* — which was recently discovered in methicillin-resistant *Staphylococcus aureus* (MRSA). They found that *sasX* encodes a cell-surface protein that helps the bacterium to cling to human nasal cells and to evade the immune system. Mice infected with *sasX*-positive bacteria developed larger skin abscesses and more severe lung inflammation and tissue damage than animals infected with bacteria engineered to lack *sasX*.

The SasX protein could be a target for new drugs to combat MRSA, the authors suggest.

Nature Med. **http://dx.doi.org/10.1038/nm.2692 (2012)**