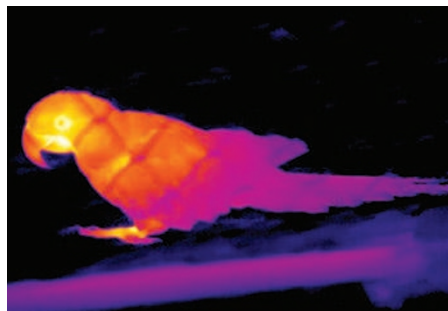


RESEARCH HIGHLIGHTS



EVOLUTIONARY BIOLOGY

Heat on for bills

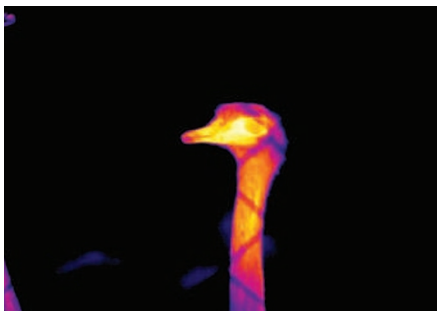
Am. Nat. doi:10.1086/653666 (2010)
In 1877, American zoologist Joel Asaph Allen posited that animals that regulate their own body temperatures have smaller

appendages relative to their body size if they live in colder environments to reduce heat loss.

For birds, bills are important heat exchangers (pictured: infrared thermal images). To see whether birds' bills conform to Allen's rule, Matthew Symonds

at the University of Melbourne in Australia and Glenn Tattersall at Brock University in St Catharines, Canada, compared bill lengths and evolutionary relationships in 214 species. These included African tinkerbirds, Antarctic penguins and South American toucans.

They found that bill length across species correlated strongly with temperature and latitude or altitude, with birds in colder climates sporting shorter bills. This suggests that temperature regulation helped to shape the evolution of birds' bills. **J.F.**



UNIV. CHICAGO

APPLIED PHYSICS

The dark side of the laser

Opt. Exp. **18**, 13385–13395 (2010)

Laser beams are usually hard to miss, but a new laser is notable for its lack of light.

Steven Cundiff at the University of Colorado in Boulder and his colleagues built the device by modifying a standard quantum-dot diode laser. Normally, lasers are amplified using two mirrors that reflect light between them, but Cundiff's group deposited light-absorbing material onto one of the mirrors. The laser still emitted light, but it flickered off at an extremely rapid and predictable rate.

The 'dark' pulses verify existing theories of lasing and could prove useful in encoding information in long-distance fibre-optic communications. **G.B.**

GEOSCIENCE

No shelter from storms

Geophys. Res. Lett. doi:10.1029/2010GL043124 (2010)

Major hurricanes can churn up sea-floor sediments at depths of up to 90 metres, which can trigger underwater mudslides, and damage oil and gas pipelines.

Hemantha Wijesekera and his colleagues at the Naval Research Laboratory of the Stennis Space Center in Mississippi analysed a rare set of data collected from instruments that measure current and wave properties in the Gulf of Mexico as Hurricane Ivan passed directly overhead in 2004.

Using a wave-current model to calculate friction and sea-floor stresses, the team found that these stresses correlated with wind

speed. Extreme surface waves and elevated currents produced damaging forces at the sea floor during the storm and for about one week after Hurricane Ivan's passage.

The Gulf of Mexico, which provides almost 30% of the United States' oil supply, hosts some 50,000 kilometres of sea-floor pipelines. Hurricane-induced stress should be considered in the engineering design of pipelines in shallow shelf regions, the researchers suggest. **Q.S.**

NEUROSCIENCE

Stressed out females

Mol. Psychiatry doi:10.1038/mp.2010.66 (2010)

Stress-related psychiatric disorders such as depression affect more women than men, and researchers have discovered a possible molecular basis for this in rats.

Debra Bangasser at the Children's Hospital of Philadelphia in Pennsylvania and her colleagues put male and female rats through stressful swim tests. They then looked at changes in signalling by the receptor for corticotropin-releasing factor (CRF), which mediates stress responses in the brain. Excessive CRF activity is thought to contribute to depression and post-traumatic stress disorder.

In unstressed females, the team found greater coupling of the receptor to a key protein — an important step in CRF signalling — than in unstressed males. Moreover, female rats' neurons did not internalize these receptors in response to stress — a mechanism for lowering the cells' sensitivity

to stress signals — whereas those in males did. These findings, the authors say, are consistent with previous work suggesting that females are more sensitive to low levels of CRF. **C.L.**

NANOTECHNOLOGY

Graphene touch

Nature Nano. doi:10.1038/nnano.2010.132 (2010)

A touch-screen with transparent electrodes made from graphene — single layers of carbon atoms — could be thinner, cheaper and more durable than today's devices that use indium tin oxide. But it has proved hard to manufacture these transparent films efficiently on a large scale.

Now Byung Hee Hong, Jong-Hyun Ahn at Sungkyunkwan University in Suwon, South Korea, and their colleagues have made such films (pictured) using a scalable industrial manufacturing process and incorporated them into a touch screen. They created 30-inch graphene films by depositing carbon atoms onto copper, which is later etched away. **R.V.N.**

