RESEARCH HIGHLIGHTS

Don't you step on my...

Behav. Ecol. Sociobiol. doi:10.1007/s00265-008-0620-6 (2008)

Among blue-footed boobies, bright blue feet are known to be important for courtship, but it seems that's not all they're good for. Researchers now find that if male feet lose colour after a first egg is laid, females reduce their reproductive efforts.

Roxana Torres at the National Autonomous University of Mexico in Mexico City and her colleagues monitored pairs of the birds (*Sula nebouxii*) on Isla Isabel, off the coast of Mexico. In general, boobies lay two eggs of similar weight each year, with an average delay of four days between the two. The team captured males within 24 hours of the first egg being laid and used crayons to make the foot colour of half the males duller and so less healthy looking.

The researchers found that females paired with males that returned with unsavoury feet delayed laying their second eggs and, when they did lay them, produced smaller eggs than did females with untampered mates.

C. COURTEAU/NATURE PL

ELECTROPHYSIOLOGY

On the pulse

Appl. Phys. Lett. **93,** 033906 (2008)

They're a staple of every hospital television show: to get the beeping signal of an electrocardiograph, medics hurriedly attach electrodes to a patient's skin. Now Robert Prance and his colleagues at the University of Sussex in Brighton, UK, have found a way to measure the electrical signals of a person's breathing and heartbeat remotely.

Their sensor detected clear signals from both the front and back of a seated subject, up to 40 centimetres away, in a laboratory full of distracting electrical noise. Other techniques exist that can remotely discern the tiny movements of the heart and lungs, but those systems actively irradiate their subject with laser light or microwaves.

The researchers note that their passive system could be used for security and healthcare, and perhaps even to detect driver drowsiness.

MICROBIOLOGY

Running on arsenic

Science **321,** 967–970 (2008)

Arsenic-fuelled photosynthetic bacteria may have helped shape the arsenic cycle on ancient Earth.

The newly discovered bacteria use electrons from arsenite to drive photosynthesis in the absence of oxygen, producing arsenate in the process. Ronald Oremland of the US Geological Survey in Menlo Park, California, and his co-workers found the microbes growing in red and green mats in arsenite-rich brine pools (pictured right) at Mono Lake, California. A pure culture of one purple bacterium isolated from the red mats required both light and arsenite to thrive.

Although other bacteria are known to rely on arsenic, this is the first example of the photosynthetic use of arsenite in the absence of oxygen. The process could have been important on Earth before oxygenic photosynthesis reshaped the atmosphere.

L. G. MILLER & S. BAESMAN

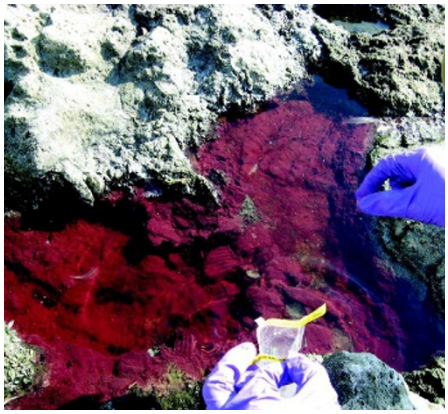
FLUID DYNAMICS

Slip and slide

Phys. Rev. Lett. **101,** 064501 (2008)

A principle of fluid flow is that the bottom-most molecules of a liquid stick to the surface of the solid they are sliding past — creating friction that, for instance, slows down water flowing through a pipe.

Choongyeop Lee at the University of California, Los Angeles, and his colleagues created textured surfaces with micrometre-scale grooves and posts. On these, fluids can slip past friction-free for tiny distances, coasting on the pockets of air between the grooves or posts. They report a slip length for water almost ten times longer than previously achieved — long enough, they suggest, to show that engineered surfaces can significantly reduce drag in fluid systems.



ATMOSPHERIC CHEMISTRY

Attacked from within

J. Am. Chem. Soc. doi 10.1021/ja8041965 (2008)

Organic compounds in the lower atmosphere can be attacked by the particles they are sitting on, according to researchers at the University of California, Irvine.

Lab-based experiments by Barbara Finlayson-Pitts and her colleagues show that airborne sea-salt particles containing nitrate or nitrite ions can produce reactive hydroxyl radicals that attack the organic compounds adsorbed onto the particles' surfaces. It was previously thought that oxidation of these organics occurred through attack from outside by ozone or hydroxyl radicals.

Nitrate and nitrite ions are known to be present in many atmospheric particles and in the polar snowpacks. On the basis of the group's experiments, Finlayson-Pitts says it is highly likely that this bottom-up oxidation is happening in air, and could be contributing to atmospheric chemistry.

CLIMATE INDICATORS

Early birds

Global Change Biol. **14,** 1959–1972 (2008)

The first robin sighting of spring may not be the best indicator of climate warming.

Abraham Miller-Rushing at Boston University and his colleagues analysed 33 years' worth of data on 32 bird species in