RESEARCH HIGHLIGHTS

Copy bat

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Biol. Lett. doi:10.1098/rsbl.2009.0685 (2009)

Humans, elephants and seals can do it, but can bats also imitate sounds? It's long been thought that the flying mammals can, and Mirjam Knörnschild at the University of Erlangen-Nuremberg in Germany and her colleagues set out to find the evidence.

They recorded a total of 337 songs from 17 pups of the greater sac-winged bat (*Saccopteryx bilineata*) in Costa Rica and compared them with 57 territorial songs from six adult males belonging to the same harems as the pups. Acoustic analysis showed that as the pups matured, their calls developed into territorial songs that were similar to those of harem males. The team ruled out relatedness, gender and physical maturation as factors. The bats learned through imitation.

The authors suggest that this mammalian model — easier to study than others — could permit further investgation of how vocal imitation evolved.

ATMOSPHERIC SCIENCE

Monsoon madness

J. Geophys. Res. doi:10.1029/2009JD011733 (2009)

The severity of the east Asian summer monsoon, which affects more than 1 billion people, may be better forecast by analysing the North Atlantic Oscillation (NAO). This describes a large-scale system in which atmospheric pressure rises and falls in a see-saw motion from the polar to the subtropical region.

The monsoon's strength has been linked to the El Niño and La Niña cycles, but the NAO connection may further improve predictions, say Zhiwei Wu of the Chinese Academy of Sciences in Beijing and colleagues.

By combining data on global precipitation and atmospheric circulation with other indices of atmospheric activity, the researchers found that changes in the spring NAO can influence how strong or weak the monsoon gets later in the year.

PHYSICS

Holy yocto!

Phys. Rev. Lett. **103,** 152301 (2009)

Scientists want to image atomic processes occurring in real time, which requires extremely short pulses of light. Current state-of-the-art lasers can take attosecond (10^{-18} second) snapshots, but Andreas Ipp, Christoph Keitel and Jörg Evers at the Max Plank Institute for Nuclear Physics in Heidelberg, Germany, think that they can do a million times better using heavy-ion collisions.

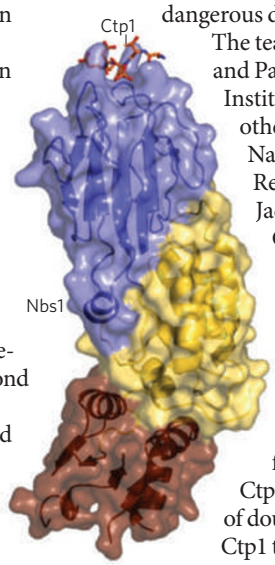
When nuclei such as those of lead or gold collide, the quarks inside protons and neutrons briefly become free to move on their own. Over the course of a few yoctoseconds (10^{-24} second) they expand, releasing a super-short pulse of light. Only a few yoctosecond-long photons would be released by even the highest-energy collisions, but on the basis of their calculations, the authors believe that under the right conditions, the pulses could be used for ultrafast imaging.

STRUCTURAL BIOLOGY

DNA first responder

Cell **139,** 87–99; 100–111 (2009)

Work by two independent groups has deduced the structure and role of a key component of a protein complex that repairs dangerous double-stranded breaks in DNA.



The teams — one led by John Tainer and Paul Russell of the Scripps Research Institute in La Jolla, California, the other by Steve Smerdon of the National Institute for Medical Research in London and Stephen Jackson of the University of Cambridge, UK — crystallized and characterized one of three subunits that make up the MRN protein complex, which responds to DNA damage.

The researchers found that the subunit, Nbs1 (pictured left), extends from the complex like a flexible arm and tethers the protein Ctp1, which is essential for the repair of double-stranded breaks. Nbs1 helps Ctp1 to home in on the site of the break.

BIOGEOCHEMISTRY

Preindustrial carbon

Glob. Biogeochem. Cycles doi:10.1029/2009GB003488 (2009)

Even before industrialization, humans were having an effect on atmospheric carbon dioxide levels by transforming natural land for agricultural uses, report researchers from the Max Planck Institute for Meteorology in Hamburg, Germany.

Julia Pongratz and her co-workers combined a reconstruction of historical land cover with a coupled biosphere–atmosphere–ocean general-circulation model going back over more than a millennium. The work suggests that land-use changes resulted in the release of 53 gigatonnes of carbon between AD 800 and 1850. Only 21% of this remained airborne, with the rest being reabsorbed by the oceans and biosphere, but that was enough to bump CO_2 emissions up above background levels by the late medieval period.

The team also looked at the impact of wars and epidemics, and found that the thirteenth-century Mongol invasion of China resulted in carbon sequestration, because the massive death toll led to vegetation regrowth on abandoned farmlands.

ELSEVIER

VIROLOGY

Infectious fatigue

Science doi:10.1126/science.1179052 (2009)

Researchers have linked chronic fatigue syndrome, a debilitating disease of unknown cause, to an infectious retrovirus that has also been associated with prostate tumours.

Judy Mikovits at the Whittemore Peterson Institute in Reno, Nevada, and her colleagues