RESEARCH HIGHLIGHTS

Fjord focus

Nature Geosci. doi 10.1038/ngeo201 (2008)

The Hitchhikers Guide to the Galaxy ascribes the pleasing depth and drama of Earth's fjords to an alien planetary engineer named Slartibartfast. A model produced by Mark Kessler at the University of Colorado in Boulder and his colleagues captures a more plausible sculptural process involving only ice and mountain ranges. The researchers show that a tendency for ice to flow through existing mountain passes deepens these passes, reinforcing the original tendency. This feedback can lead to the carving of kilometre-deep fjords in a million years.

Their model also suggests that once a landscape is equipped with fjords its ice caps will be smaller and more sensitive to climate change, as it is easier for the ice to get away.

G. WILTSIE/NATL GEOGRAPHIC

MICROSCOPY

Enter, the nanoscope

Nature Methods doi:10.1038/nmeth.1214 (2008)

A high-resolution microscope built in Germany can capture three-dimensional images of proteins within tiny cellular organelles such as mitochondria.

Traditional fluorescence microscopes image a sample 'slice-by-slice' and then assemble those images into a three-dimensional picture. They usually handle slices more than 200 nanometres thick. Alexander Egner and Stefan Hell of the Max Planck Institute for Biophysical Chemistry in Göttingen and their co-workers have created a 'nanoscope' that improves resolution in three dimensions and can image slices measuring about 40 nanometres across.

The researchers used their invention to build up a picture of the distribution of a fluorescently labelled protein called Tom20 in mitochondria. They found that Tom20 forms clusters in the outer mitochondrial membrane.

ZOOLOGY

Less than slothful

Biol. Lett. doi:10.1098/rsbl.2008.0203 (2008)

Wild brown-throated three-toed sloths (*Bradypus variegatus*; pictured right) sleep for a mere nine to ten hours a day, much less than the 16 hours of shut-eye observed in captive sloths.

Niels Rattenborg of the Max Planck Institute for Ornithology in Starnberg, Germany, and his colleagues made the discovery by fitting a miniature electroencephalogram (EEG), which measures electrical activity in the brain, to three adult female sloths in the tropical forest surrounding the Smithsonian Tropical Research Institute in Panama.

The recordings are the first of their kind from any animal in the wild. The researchers suggest that, because they need to find their own food and keep a look out for predators, other wild creatures may also spend less time in slumber than has been assumed from studies of animals in captivity.

M. FOGDEN & P. FOGDEN/MINDEN PICTURES/FLPA

CHEMISTRY

Up close and structural

Science **320,** 924–928 (2008)

Chemists from the University of Virginia in Charlottesville have developed a rotational spectroscopy technique that allows them to watch as a molecule alters the conformation of its constituent atoms.

Such changes take only picoseconds, although they happened 16 times more slowly than theory had predicted in the molecule that Brooks Pate and his co-workers studied. The team blasted cyclopropane carboxaldehyde with energy, then followed as it switched between 'syn' and 'anti' isomers, its two stable forms.

Collecting the data took only 52 hours. Using standard methods and apparatus it would have taken about 27 years, the authors estimate.

MOLECULAR BIOLOGY

AAAAnswers

Genes Dev. **22,** 1141–1146 (2008)

Cells 'tag' newly synthesized RNA with tails of repeating units of adenine in order to make the RNA molecule more stable and prepare it for life in the cytoplasm.

Rebecca Oakey of King's College London and her colleagues report that, for a particular mouse gene, the choice of tagging site correlates with the extent to which the relevant DNA carries methyl groups. This methylation is a form of 'epigenetic imprinting' — a propensity for a particular copy of a gene to be expressed or not that is, itself, inherited.

This is the first evidence that epigenetic imprinting can affect the composition of RNA transcripts in this way.

POPULATION BIOLOGY

Keep off the grass

Biol. Lett. doi: 10.1098/rsbl.2008.0106 (2008)

The dramatic cycling of vole populations with time may be driven by grasses responding to the furry creatures' herbivory. So say Fergus Massey of the University of Sussex in Brighton, UK, and his co-workers, who studied interactions between the vole