

RESEARCH HIGHLIGHTS

Greased lightning

Geophys. Res. Lett. doi:10.1029/2009GL040915 (2009)

Air pollution may increase lightning activity, at least in the storm-prone regions of the southeastern United States.

Thomas Bell of NASA's Goddard Space Flight Center in Greenbelt, Maryland, and his collaborators analysed data gathered by the National Lightning Detection Network from the summers between 1998 and 2009.

They found that lightning activity peaked midweek. The researchers attribute this to changes in atmospheric mixing processes brought about by polluting aerosols, which also peak in concentration by the middle of the week.



S. RESNICK/SCIENCE FACTION/CORBIS

PALAEONTOLOGY

Mammoth fungal trail

Science 326, 1100–1103 (2009)

The collapse of large animal populations, including mammoths and mastodons, in North America may have set off widespread ecosystem changes and occurred before major climatic events that have been put forward as causes of the die-off.

By analysing sediment cores, Jacquelyn Gill of the University of Wisconsin–Madison and her co-workers found that levels of spores of the dung-borne fungus *Sporormiella* began dropping 14,800 years ago, finally falling to a level indicating a megafaunal collapse by 13,700 years ago. By studying levels of fossil pollen and charcoal, the researchers surmised that the extinction of the herbivores led to a larger variety of plant species and a higher frequency of fires.

The team also concludes that neither the cooling period known as the Younger Dryas nor a purported comet impact wiped out the megafauna, as has been hypothesized.

CHEMISTRY

Get into the groove

J. Am. Chem. Soc. doi:10.1021/ja9085512 (2009)

At some point in their careers, most chemists have scratched a beaker to induce crystallization, but how this trick works is still mysterious. Amanda Page and Richard Sear of the University of Surrey in Guildford, UK, have studied the process using computer simulations.

They modelled scratches as wedge-shaped

grooves and found that when the angle of the wedge is optimal, the rate of crystal nucleation is orders of magnitude higher in the wedge than on a flat surface, as is seen in experiments.

Nucleation is fastest when this angle allows a defect-free piece of crystal to fit perfectly in the wedge. So by tuning a wedge angle to fit a particular crystal polymorph, the creation of this form could be favoured over others, the authors say.

DEVELOPMENTAL BIOLOGY

Down the tube

Cell 139, 791–801 (2009)

Little is known about how the body forms the tubing that snakes through many organs. Henrik Semb of Lund University in Sweden and his colleagues tracked pancreas development (pictured right) in mice and showed that the same protein signal that controls tube formation also determines how progenitor cells develop to form the surrounding tissue.

The team found that the cell-cycle regulator protein Cdc42 is essential for initiating and maintaining tube development. The protein also helps to create a distinct microenvironment around the forming tubes that controls the specialization of other early cells in the organ.

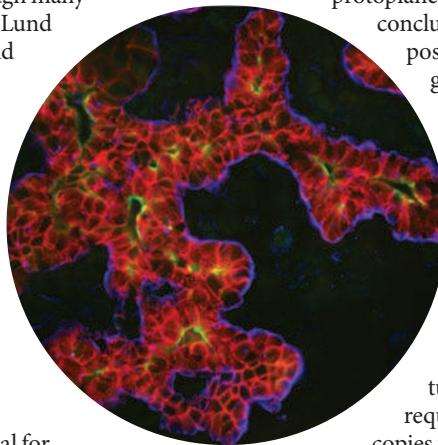
ASTRONOMY

Galaxies aglow

Astrophys. J. 706, 1020–1035 (2009)

Recent space-based observations of distant galaxies show that many are shining unexpectedly brightly at near-infrared wavelengths.

Erin Mentuch of the University of Toronto in Canada and her colleagues say that disks of material that are the precursors of planets could be responsible for the glow. The team analysed 103 galaxies between 1.9 billion and 5.2 billion parsecs from the Milky Way and found that their light shared similar features to that from nearby stars surrounded by protoplanetary disks. The group concludes that it might be possible to use the excess glow to measure planet-formation rates in distant galaxies.



CANCER BIOLOGY

Dicer blocker

Genes Dev. doi:10.1101/gad.1848209 (2009)

A gene involved in gene silencing is also a tumour suppressor that requires two functional copies to protect against cancer. Tyler Jacks at the Massachusetts Institute of Technology in Cambridge and his colleagues studied several mouse models of cancer in which one or both copies of *Dicer1* were deleted. This gene encodes a protein