

## NETWORKS

## Online peer-pressure threshold

An analysis of 100 million installations of applications — or 'apps' — on the popular social-networking site Facebook demonstrates that online social influences have an on-off pattern. Social pressure pushed apps that were installed by more than about 55 users per day to heights of popularity. Below this tipping point, users seemed to install or not install apps regardless of what their friends or others in the network were doing, suggesting that there was no social influence.

Felix Reed-Tsochas and Jukka-Pekka Onnela of the University of Oxford, UK, identified the behavioural threshold, which has never been seen in the offline world, by combing through data from 2,705 apps. The researchers consider it to be an inherent property of this particular networking systems and expect it to be observed in other online networks. *Proc. Natl Acad. Sci. USA* 10.1073/pnas.0914572107 (2010)

## GEOPHYSICS

## Planet Earth, squeezed

Earth isn't perfectly round, and the factors underlying its shape have undergone a rethink.

The theoretical shape of an entirely fluid, rotating Earth is an ellipsoid with a difference of about 21 kilometres between the equatorial and the polar radius. In reality, however, convective processes in Earth's mantle, triggered by differences in density, account for an additional 100-metre or so difference between the radii.

Frédéric Chambat at the University of Lyon in France and his colleagues recalculated the difference in radii caused by rotation. By subtracting this from the observed value, they found that convection causes a

113-metre difference between the equatorial and the polar radius instead of the 98 metres that is currently used in calculations.

*Geophys. J. Int.* doi:10.1111/j.1365-246X.2010.04771.x (2010)

## PALAEOLOGY

## Introducing Sarahsaurus

Long-necked dinosaurs called sauropodomorphs originated in the Southern Hemisphere during the mid to late Triassic period, some 230 million years ago. From there, they dispersed to all early continents, but there is some debate as to how. Some have assumed that a single taxon dispersed widely across the Pangaea supercontinent and diversified later. But Timothy Rowe at the University of Texas at Austin and his colleagues argue that this ubiquitous 'cosmopolitan' dinosaur never existed.

They recently described a new taxon named Sarahsaurus (fossil vertebrae pictured), found in Arizona, and analysed its relationships to other North American sauropodomorphs. Their analysis suggests separate arrivals for different groups. Geographical isolation events, extinctions and dispersal happened multiple times throughout the Mesozoic period, they argue. *Proc. R. Soc. B* doi:10.1098/rspb.2010.1867 (2010)

## PLANT EVOLUTION

## Model plant's secret past

The darling of plant research may be millions of years older than botanists thought.

*Arabidopsis thaliana* is a dainty weed used by plant biologists around the globe, but the details of its evolutionary history are controversial. Sarah Mathews and Mark Beilstein of the Arnold Arboretum of

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## ECOLOGY

## The tundra warms and grows

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The effects of climate change on tundra in the high Arctic are chronicled in this study by James Hudson and Greg Henry of the University of British Columbia in Vancouver, Canada.

Data collected from study plots over a 13-year period and survey data covering 27 years on the tundra of Ellesmere Island in Nunavut, Canada, show an ecosystem 'in transition'. Temperatures have risen and the growing season has lengthened. The biomass of mosses has increased by 74% and that of evergreen shrubs by 60%. The total biomass of the system has increased significantly, and vegetation has grown taller. But because there was plenty of open ground at the site into which plants could expand, these changes did not result in decreases in any group. The research indicates that climate change has already begun to increase plant productivity in the high Arctic.

*Ecology* 90, 2657–2663 (2009)

Harvard University in Jamaica Plain, Massachusetts, and their colleagues re-examined its fossil record, including several fossils that other studies had overlooked.

The team determined that the genus *Arabidopsis* split from the genus *Brassica*, which includes broccoli and cabbage, about 43 million years ago — two to three times earlier than previously thought. The results suggest that the *Arabidopsis* genome has been changing more slowly than expected, and that members of the order Brassicales, which includes *Arabidopsis*, coevolved with butterflies that are able to detoxify the plants' defensive chemicals.

*Proc. Natl Acad. Sci. USA* doi:10.1073/pnas.0909766107 (2010)

## NEUROBIOLOGY

## Powerless against Parkinson's

Cellular power outages may contribute to Parkinson's disease, according to an analysis of gene expression in hundreds of brain tissue samples.

When Clemens Scherzer at the Brigham and Women's Hospital in Cambridge, Massachusetts, and his colleagues looked for pathways that are wrongly expressed in Parkinson's disease, they found ten that had not previously been linked to the condition. All ten are important for proper functioning of the cell's energy-generating structures, the mitochondria.

In particular, genes under the control of a protein called PGC-1 $\alpha$  are expressed at low levels in patients with Parkinson's disease. When the team overexpressed PGC-1 $\alpha$  in rat neurons grown in culture, the cells became more resistant to chemicals that damage mitochondria and cause Parkinson's-like changes. The results suggest that PGC-1 $\alpha$  activation could one day be used to treat the disease. *Sci. Transl. Med.* 2, 52ra73 (2010). For a longer story on this research see go.nature.com/q3orms

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