

RESEARCH HIGHLIGHTS

Selections from the scientific literature

ASTRONOMY

Star dines on young planet

Astronomers report the discovery of a possible extrasolar planet just a few million years old — which poses problems for some models of planetary formation.

The planet — the youngest yet seen to cross the face of its host star — is about 5.5 times the mass of Jupiter and takes just 11 hours to orbit its 2.7-million-year-old star. The planet is so close to the star that Julian van Eyken of the California Institute of Technology in Pasadena and his team suggest that it may be in the process of being consumed. Moreover, the young age of this extrasolar system challenges astronomical models that require up to ten million years for planetary formation to occur.

Astrophys. J. 755, 42 (2012)

GEOLOGY

Plants changed water cycle

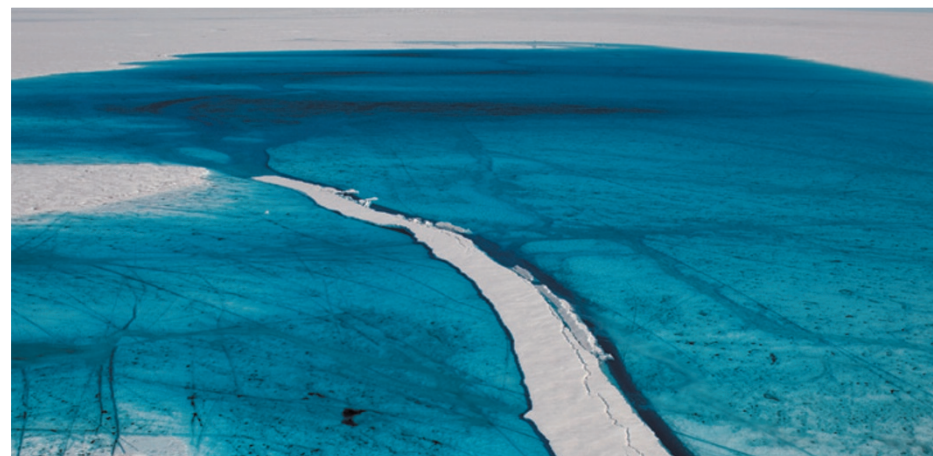
A doubling of carbon dioxide levels some 200 million years ago may have reduced plants' uptake and release of water — drastically altering local water cycles and leading to a decrease in animal biodiversity.

Margret Steinthorsdottir, now at Stockholm University, and her team examined 91 fossil plants from eastern Greenland, spanning the transition between the Triassic

and Jurassic periods. The researchers measured the fossils' stomata — tiny holes through which plants vent water (**stoma pictured**) — and found that their density and size decreased over the Triassic–Jurassic transition. This suggests that the volume of water released by plants in a process called transpiration fell by 50–60% during a time marked by mass species extinctions and high levels of atmospheric carbon dioxide.

Sediment analysis revealed that the drop in transpiration coincided with increased water run-off and erosion, suggesting that the change may have reduced soil quality, contributing to a decline in biodiversity.

Geology <http://dx.doi.org/10.1130/G333334.1> (2012)



J. BALOG/AURORA/GETTY

CLIMATE SCIENCE

Abrupt changes in Greenland ice cycles

An analysis of aerial photographs suggests that ice loss in northwestern Greenland results from discrete events driven by changes in ocean and atmospheric temperature.

Kurt Kjær at the University of Copenhagen's Natural History Museum and his team used photographs dating back to 1985 to create a three-dimensional model of ice loss and gain.

Rather than exhibiting a uniform melt rate, the model revealed that ice loss peaked in two periods: 1985–93 and 2005–10. The researchers linked this ice loss to warmer oceans and higher summer air temperatures. Ice-sheet models must account for such variability if they are to produce reliable forecasts.

Science 337, 569–573 (2012)

CHEMISTRY

Nanorods all in a row

Tiny carpets of gold rods, all standing upright, can be manufactured more easily and accurately thanks to a method exploiting capillary action. These nanorods have precise optical properties that can be used in sensors and solar energy harvesting.

Udo Bach at Monash University in Clayton, Australia, and his team patterned silica-coated wafers with gold squares 2 micrometres wide and 4 micrometres apart. The wafers are placed in tubes with an aqueous solution of gold nanorods modified with thiol and polyethyleneglycol (PEG).

When the solvent evaporates, the nanorods crystallize upwards from the gold squares. Thiol and PEG molecules bind the rods together as capillary action from the evaporating solvent drags them upright. The process can be controlled easily by changing the solution concentration and evaporation temperature.

Angew. Chem. Int. Edn. <http://dx.doi.org/10.1002/anie.201204609> (2012)

ZOOLOGY

Bats sound out frisky flies

Hungry bats can tune in to the sound of flies mating to pick out tiny prey that they would otherwise be unable to detect.

Stefan Greif at the Max

