

# RESEARCH HIGHLIGHTS

Selections from the scientific literature

## ASTROPHYSICS

### Rare element from space

The element tellurium probably originated in exploding stars, or supernovae, through a process by which nuclei rapidly capture neutrons and become heavier.

Ian Roederer of the Carnegie Observatories in Pasadena, California, and his colleagues used the Hubble Space Telescope to detect signs of tellurium in three ancient stars in the halo of the Milky Way. Tellurium is the heaviest element for which production by rapid neutron capture, called the *r*-process, can be predicted using laboratory data.

The authors report that the observed levels of tellurium match earlier predictions made for the *r*-process in the Solar System. They conclude that tellurium and other heavy elements are produced predominantly by this process. *Astrophys. J.* 747, L8 (2012)

## BIODIVERSITY

### New amphibians with no limbs

A family of limbless amphibians has been discovered in the soils of northeastern India.

Sathyabhama Das Biju at the University of Delhi and his colleagues unearthed more than 500 examples

encompassing seven new species of the caecilian order of amphibians. An analysis of the animals' genomes and cranial anatomy showed that these Chikilidae (pictured with a clutch of eggs) — which measure up to 25 centimetres in length — probably first appeared during the early Cretaceous period, about 140 million years ago.

The animals' closest known relatives are in Africa. The authors suggest that, historically, caecilians are likely to have been geographically restricted, with low rates of speciation.



A. TOENING/GETTY

## CLIMATE SCIENCE

### The extended reach of Australian drought

The Big Dry, a prolonged drought that affected southeast Australia from 1997 to 2011, was more extensive than previously thought.

Gavan McGrath at the University of Western Australia in Crawley and his colleagues analysed satellite data from across the continent and found evidence of decreased water storage, rainfall and plant growth throughout the country between 2002 and 2010. In the southeast, the drought correlated with an irregular Indian Ocean circulation,

whereas in the northwest it was associated with a decreased frequency of tropical cyclones. The authors say that the northwest drought coincided with and probably exacerbated the one in the southeast.

The findings suggest that distinct climatic factors such as decadal cyclone trends and changes in ocean circulation can combine to create a continental-scale drought.

*Geophys. Res. Lett.* <http://dx.doi.org/10.1029/2011GL050263> (2012)

They also warn that these and other creatures in this region of India are threatened by deforestation and rapid population growth.

*Proc. R. Soc. B* <http://dx.doi.org/10.1098/rspb.2012.0150> (2012)

## EVOLUTION

### Invasive mosquito adapts fast

Since arriving in the United States from Japan in 1985, the invasive Asian tiger mosquito has spread across the country's eastern reaches, providing a natural demonstration of

adaptive evolution. Peter Armbruster at Georgetown University in Washington DC and his colleagues report that over roughly 20 years, the insect (*Aedes albopictus*) has adapted to differences in the timing of winter onset across roughly 15° of latitude.

The authors measured the day length required to induce winter-time dormancy in mosquitoes across various latitudes in the US and Japan between 2005 and 2008, and compared the measurements with those taken about 20 years earlier. They found a response to seasonal change that is among the fastest documented

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