

RALPH C. EAGLE JR/SPL

experience some of the highest increases in sea-surface temperature in Antarctica. *Geophys. Res. Lett.* <http://doi.org/bzsd> (2017)

## PLANETARY SCIENCE

## Ceres has complex chemistry

The dwarf planet Ceres hosts organic compounds that are possible ingredients for life.

NASA's Dawn spacecraft is orbiting Ceres (**pictured**), which is also the largest asteroid in the Solar System, and the craft has previously



NASA/JPL-CALTECH/UCLA/WFS/DLR/IDA

spotted signs of salts, ice and other basic chemicals on its surface. Using Dawn's mapping spectrometer, a team led by Maria Cristina De Sanctis at the National Institute of Astrophysics in Rome has discovered signatures of complex organic matter — in particular open chains of carbon atoms — on Ceres.

Organic compounds have been seen on comets and a few other asteroids. But Ceres has water and internal heat as well, meaning that it could have a rich, potentially life-sustaining environment.

*Science* 355, 719–722 (2017)

## PALAEOLOGY

## Ancient reptile bore live young

A 245-million-year-old fossil of a pregnant reptile offers the first evidence for live birth in the animal group that includes modern birds and crocodiles.

Live birth has evolved dozens of times in vertebrates,

but has never been seen in archosauromorphs, which emerged around 260 million years ago. This group comprises dinosaurs as well as extant birds and crocodiles.

A team led by Jun Liu at the Hefei University of Technology in China analysed the fossil — found in 2008 in southwestern China — and concluded that it was a long-necked marine reptile called *Dinocephalosaurus*. A relatively large creature found inside its rib cage was curled up and positioned in a way that is typical of vertebrate embryos.

The fossil suggests that no genetic or developmental barriers prevented live births in archosauromorphs, the authors say.

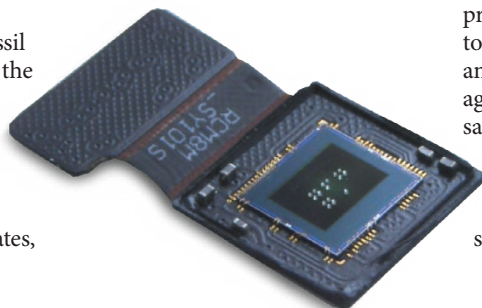
*Nature Commun.* 8, 14445 (2017)

## IMAGING

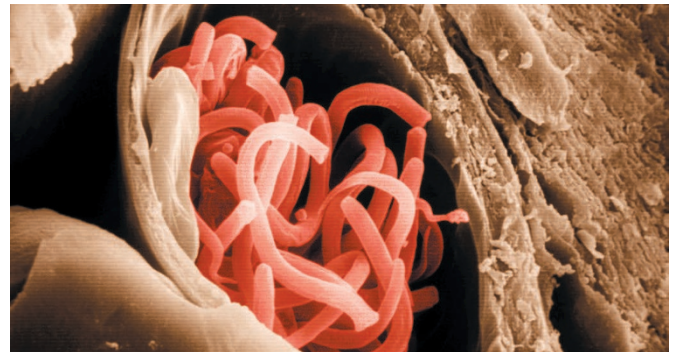
## 3D-printed camera sees like an eagle

A tiny camera made of four different lenses 3D-printed on a chip can generate images with high resolution in the centre — similarly to the way the eyes of eagles and humans work.

Simon Thiele and his colleagues at the University of Stuttgart, Germany, printed multiple groups of four objective lenses onto a semiconductor image-sensor chip just a few millimetres wide (**pictured**). Each lens has a different field of view, and so can focus at various distances. A computer combines data from the lenses to form an image that has increasing resolution towards the middle. This mimics the vision of predators, which is more sharply focused in the centre and allows them to quickly spot prey.



SIMON THIELE



With further improvements, the technology could be used in miniature drone cameras and for other applications, the authors say.

*Sci. Adv.* 3, e1602655 (2017)

## INFECTIOUS DISEASE

## Autoimmunity in nodding syndrome

A mysterious disorder that causes seizures in children in East Africa could be due to an autoimmune reaction.

In Tanzania, Uganda and South Sudan, nodding syndrome causes children's heads to drop and results in epileptic seizures, cognitive impairment and sometimes death. Although people with the syndrome are often infected with the parasitic worm *Onchocerca volvulus* (**pictured**), researchers have not found a causal link between the two.

Now, a team led by Avindra Nath at the National Institute of Neurological Disorders and Stroke in Bethesda, Maryland, has discovered that people with nodding syndrome have higher levels of antibodies against a protein called leiomodrin-1 than do healthy people from the same village. The researchers show that leiomodrin-1 is made by human neurons and by key parts of the mouse brain. This protein is structurally similar to those made by *O. volvulus*, and antibodies that react against *O. volvulus* do the same against leiomodrin-1,

suggesting an autoimmune response.

People with the syndrome currently receive

anti-epilepsy drugs, but the findings suggest that they might also benefit from therapies that modulate the immune system, the authors say.

*Sci. Transl. Med.* 9, eaaf6953 (2017)

## METEOROLOGY

## High winds add to extreme deluges

Narrow bands of water vapour that typically travel over the ocean and dump huge volumes of rain on land, often causing flooding and landslides, come with another hazard — extreme wind.

Duane Waliser of the Jet Propulsion Laboratory in Pasadena, California, and Bin Guan of the University of California, Los Angeles compared global data on these 'atmospheric rivers' with data on wind and precipitation extremes between 1997 and 2014. They found that across most mid-latitude regions, up to half of the most extreme wind and rain storms were associated with atmospheric rivers. The majority of damaging wind storms in Europe between 1997 and 2013 were also linked to these bands of vapour.

The typical wind speed associated with a land-falling atmospheric river was at least double the average for all storm types.

*Nature Geosci.* <http://dx.doi.org/10.1038/ngeo2894> (2017)

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