

# RESEARCH HIGHLIGHTS

Selections from the scientific literature

## GEOPHYSICS

### Rain slows seismic waves

The recent occurrence of earthquakes and even heavy rainfall reduce the near-surface velocity of a type of seismic wave responsible for the worst damage during earthquakes.

Nori Nakata and Roel Snieder at the Colorado School of Mines in Golden studied these 'shear' waves using seismic interferometry, which measures how the waves propagate from depth to the surface. The authors analysed the average velocities of shear waves in nearly 112,000 quakes — most of them minor — recorded between 2000 and 2010 by Japan's network of seismic stations. They found that, three months after major earthquakes, wave velocities recorded at nearby stations were 3–4% lower than normal.

In southern Japan, shear-wave propagation was also slower during rainy summers than drier seasons, possibly because of the increase in fluid pressure that occurs when the ground is infiltrated by rainwater.

*J. Geophys. Res.* <http://dx.doi.org/10.1029/2011JB008595> (2012)

## PHYSIOLOGY

### Sawfish snouts sense and stab

The serrated snouts of sawfish have an unusual double role: the fish use them to both detect and disable prey.

A number of fish species have elongated 'noses' that they use either to detect or to attack food. In studies of captive juvenile freshwater sawfish (*Pristis microdon*), Barbara

Wueringer at the University of West Australia in Crawley and her colleagues show that sawfish do both.

The animals have a network of electrical sensors in their saws (**pictured**), and the team found that a weak electric dipole suspended in the water to mimic the field created by a prey item elicits saw-waving. But the fish were also filmed using their saws to slice mullet and chunks of tuna before consumption.

*Curr. Biol.* 22, R150–R151 (2012)

## ORGANIC ELECTRONICS

### Sterilization-ready transistors

The striking flexibility of organic electronics means that they hold immense promise for use in biomedical devices such as catheters. But most organic materials melt or degrade when heated to the temperatures needed to sterilize materials, as required for medical use.

Takeo Someya at the University of Tokyo and his colleagues have built a flexible organic thin-film transistor that is heat resistant and works at the low voltages that might

be used in the human body. They heated the device, which consists of a thiophene-based aromatic active layer with aluminium oxide and alkyl phosphonic acid insulating layers, up to 150°C and found that its electrical characteristics remained stable.

*Nature Commun.* 3, 723 (2012)

## CANCER GENETICS

### Many genomes in one tumour

Separate parts of a single tumour can contain distinct genetic mutations, and clinicians might suggest



## PLANT EVOLUTION

### Outback palms were planted

The Australian outback's only palm trees, thought to be living fossils of the ancient Gondwanan rainforest that covered the region 15 million years ago, may in fact be descended from transplants carried by humans.

Toshiaki Kondo at Hiroshima University and his colleagues compared DNA samples from four populations of the outback's *Livistona mariae*, which give their name to the Palm Valley Oasis, with those of other Australian palms. They found that the species is genetically almost identical to

its northern relation, *Livistona rigida* — meaning that the two are not distinct species. Genetic analysis revealed that the populations started to diverge between 7,000 and 31,000 years ago, a timeline that overlaps with intermittent human migrations from northern to central Australia.

The authors suggest that Aboriginal people may have brought the palm seeds with them as a food resource or raw material.

*Proc. R. Soc. B* <http://dx.doi.org/10.1098/rspb.2012.0103> (2012)

