

# RESEARCH HIGHLIGHTS

## EXOPLANETS

### Avoiding shrinkage

*Astrophys. J.* **700**, 1921–1932 (2009)

Many of the planets discovered outside the Solar System are bigger than Jupiter. Some are larger than expected given the steady shrinking that occurs as gas-giant planets cool.

Using simulations, Laurent Ibgui and Adam Burrows of Princeton University in New Jersey have shown how the enormous size of some of these planets can be attributed to peculiar conditions at their birth. Just after formation, the planet could wind up in an eccentric orbit close to its star. Later, tides between the star and planet would pump heat into the planet's interior and inflate it.

The process, the authors say, might explain the lack of shrinkage for some older giants, giving them the look of a planet a billion years younger.

## CANCER BIOLOGY

### HPV's unexpected effect

*Cancer Prev. Res.* doi:10.1158/1940-6207.capr-09-0149 (2009)

People infected with human papillomavirus (HPV) have a better chance of surviving a type of head and neck cancer than those without the infection. The findings may help explain why black cancer patients fare worse than whites.

Kevin Cullen of the University of Maryland in Baltimore and his colleagues found that whites with squamous cell carcinoma of the throat survived about three times longer than blacks with this condition. By analysing biopsy specimens from 196 whites and 28 blacks, the authors determined that this disparity might be explained by HPV status: the survival rate was two-and-a-half times higher for infected patients than uninfected patients, and white patients were almost nine times more likely to be HPV-positive than blacks.

Cullen says HPV may make tumours more vulnerable to chemotherapy and radiation.

## MATERIALS SCIENCE

### Foam finesse

*Colloids Surf. A: Physicochem. Eng. Aspects* doi:10.1016/j.colsurfa.2009.05.010 (2009)

When gas rushes through solidifying foam to create porous polymers — used worldwide in insulation, packaging and sponges — it randomly scatters into bubbles of varying size.

Wiebke Drenckhan, a CNRS researcher at the University of Paris South, and her colleagues now report



### Arboreal ascent

*Proc. R. Soc. B* doi:10.1098/rspb.2009.0911 (2009)

Vertebrates have been out on a limb for longer than previously thought, say Jörg Fröbisch at the Field Museum in Chicago, Illinois, and Robert Reisz of the University of Toronto at Mississauga in Canada.

Their preliminary description of the anatomy of *Suminia getmanovi*, a 260-million-year-old distant relative of mammals, concludes that the species represents the oldest evidence of a tree-dwelling vertebrate.

Comparison of the features of *S. getmanovi*

fossils with those of modern reptiles and mammals reveals numerous features indicative of a life spent in trees. These include elongated limbs, a long and perhaps prehensile tail, and digits seemingly adapted for grasping and climbing, possibly with opposable thumbs.

a way to create plastics filled with ordered and nearly uniform bubbles. The researchers combine chemical reagents, surfactants, air and water in such a way that bubbles form and pack together in the liquid phase just before the surrounding material 'freezes' in a polymerization reaction.

Working with German chemicals company BASF, in Ludwigshafen, they have created bubble-stuffed foam sheets and threads that absorb water and can even be woven or knitted into fabrics (pictured below). Such foams might be used as membranes, acoustic filters or shear-resistant wraps for fibres containing carbon nanotubes.



## NEUROSCIENCE

### Learning experience

*Neuron* **63**, 244–253 (2009)

Sustained firing by neurons in two brain regions may help animals learn from the consequences of earlier actions.

Mark Histed, now at Harvard Medical School, and his colleagues trained macaques to move their eyes left or right in response to visual cues. The researchers located neurons in the prefrontal cortex and the caudate nucleus of the basal ganglia — two regions known to be involved in learning — that fired for several seconds after the monkeys found out whether their eye movements were correct.

The firing lasted until the following trial, suggesting that the neurons carried the link between the monkey's behaviour and its outcome into the next trial to facilitate learning.

## GENETICS

### Context is king

*Science* doi:10.1126/science.1174148 (2009)

In recent years geneticists have started looking at how genetic differences between individuals affect gene expression. Different levels of expression generally correlate with variations in regulatory genes.