at the University of Nottingham and the University of Newcastle upon Tyne, UK, found that bigger pores have a smaller affinity for the gas. They conclude that the optimum pore size is obtained when increasing capacity is balanced with decreasing affinity. In the materials the team studied, the optimum pores had a diameter of about 0.7 nanometres.

NEUROSCIENCE

## Guided trips in the brain

*Nature Neurosci.* doi:10.1038/nn1764 (2006)

The thin layer of tissue that surrounds the brain, known as the meninges, has an unexpected role in brain development, say Victor Borrell and Oscar Marín of the Institute of Neuroscience in Alicante, Spain.

Their discovery comes from a study of Cajal-Retzius cells, a transient population of cells that sits at the edge of the brain and guides the development of neuronal layers in the cerebral cortex. The authors tracked the migration of Cajal-Retzius cells in mice, and found that the cells move to their positions by travelling along the meninges. CXCL12, a cell-signalling molecule secreted by the meninges, seems to play a key part.

ASTRONOMY

## When the giant has passed

*Science* **313,** 1413–1416 (2006)

Earth-like planets could exist in as many as a third of the planetary systems that have been found to harbour giant planets, new simulations suggest, despite the havoc wrought when the giants wander.

In many of these systems, giant planets that formed in the outer reaches appear to have migrated inwards, forming 'hot Jupiters'. Researchers thought such migrations were likely either to disrupt the formation of terrestrial planets in the star's neither-too-hot-nor-too-cold 'habitable zone', or to scatter such planets into unsuitable orbits.

Now researchers in the United States report simulations that suggest that Earth-like planets can form in the habitable zones after the giant has passed. Such planets, the model predicts, would be peculiarly water-rich and iron-poor compared with Earth.

CELL BIOLOGY

## A twist in the tail

*Cell* **126,** 905–916 (2006)

Researchers have discovered a novel type of histone modification. This structural change to the proteins that package DNA can affect gene regulation.

Tony Kouzarides and his team at the University of Cambridge, UK, studied an enzyme called Fpr4 in yeast. They found that it switches the amino acid proline, found in the protruding 'tail' of histone H3, between two different mirror-image forms known as *cis* and *trans*.

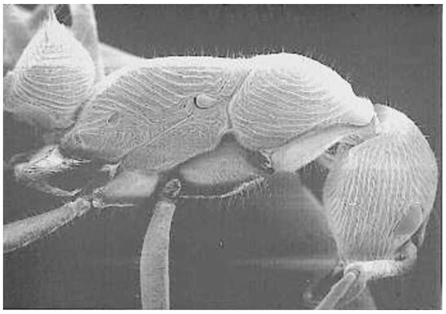
The *cis* form bends the tail sharply and allows another enzyme, Set2, to chemically alter a neighbouring amino acid, which affects the activity of genes in the surrounding DNA. The team suggests that these tail changes could also alter the structure of chromatin, the larger-scale packaging of DNA and proteins, which is known to control gene behaviour.

ANIMAL BEHAVIOUR

## Once bitten

*Anim. Behav.* **72,** 305–311 (2006)

In queenless ant colonies, one or a few workers nevertheless corner the mating and egg-laying market. In most *Diacamma* species (pictured below), they do so by mutilating every other ant. They bite off an appendage necessary for mating soon after the ant emerges from the cocoon.



C. PEETERS

Christian Peeters of the Pierre and Marie Curie University in Paris, France, and his colleagues wondered whether the newborns fight back. It turns out they don't when the attacking ant has reproduced and might therefore be their mother, but do when the attacker is young and so probably a sibling.

The researchers reason that this makes genetic sense. The mutilated ant would only have passed on half its genes to any of its offspring, the same fraction that it shares with the offspring of its mother. But a sibling's offspring share only around a third of the ant's genes, so the victim would do better by reproducing itself.

**Correction**
In the Research Highlight "Changing the code" (*Nature* **442,** 960; 2006), DNA should have been described as a template that is transcribed, not translated, into RNA.

# JOURNAL CLUB

**Henrik Stapelfeldt**
**Aarhus University, Denmark**

**A chemist tries to see things from the molecule's perspective.**

One research goal in my laboratory is to watch, in real time, how atoms exchange and electrons rearrange during a chemical reaction.

A promising technique is the femtosecond version of photoelectron spectroscopy. In the traditional version, ultraviolet light knocks 'photoelectrons' from the target molecule, revealing the molecular electronic structure.

A few years ago, Albert Stolow of the National Research Council Canada in Ottawa and his colleagues married this method with a laser whose pulses last less than 100 femtoseconds, or $10^{-13}$ seconds. This provided the time resolution needed to follow the flow of charge and energy during reactions (V. Blanchet *et al. Nature* **401,** 52–54; 1999).

One key element was missing, however. Scientists want to observe these processes from the molecule's frame, rather than from the laboratory. This requires that we measure the electrons' emission directions with respect to the parent molecule, a fundamental experimental problem because the molecule tends to orient randomly.

Recently, Stolow's group found a way around this problem for one process: the photoinduced cleavage of the nitric oxide dimer (O. Geßner *et al. Science* **311,** 219–222; 2006). In this reaction, the molecule breaks up, which allows its initial orientation to be determined by detection of the fragments. Combining these data with photoelectron measurements gave a picture of the electron clouds in the molecular frame — a most important milestone.

My lab recently developed a complementary solution, using laser-based techniques to hold molecules in fixed orientations. Either approach, or both combined, should get us closer to understanding reaction dynamics from the most natural point of view: the molecule's!