High-energy astronomy

Flashes from planet smashes

Astrophys. J. (in the press); Preprint http://arxiv.org/abs/astro-ph/0308218 (2003)

Colliding planets around other stars produce flashes of light that should be detectable from Earth, say Bing Zhang and Steinn Sigurdsson. They estimate that there should be about 50 such events per year in the Milky Way galaxy, at least some of which would be close enough to be seen by ultraviolet or X-ray observatories.

The researchers calculate that a head-on smash between a planet of Jupiter's size and one like Earth would produce a flash lasting for several hours, with a peak wavelength in the extreme ultraviolet or soft X-ray part of the spectrum. This should be detectable by satellites such as the Extreme Ultraviolet Explorer (EUVE), which operated for eight years in the 1990s, or current X-ray satellites such as Chandra and XMM-Newton. Zhang and Sigurdsson think that up to ten such events might be found in the EUVE archives, and several in the data from the X-ray satellites.

The giant planet survives such a collision but continues to glow in the infrared for thousands of years. Bodies like this might be visible in nearby star-forming regions as 'hot' regions distinct from their parent stars. **Philip Ball**

Evolutionary biology

Golgi traces revealed

Proc. R. Soc. Lond. B doi: 10.1098/rsbl.2003.0058 (2003)

Joel B. Dacks *et al.* have challenged the view that a handful of eukaryotic cell lineages lack Golgi bodies. These membrane-bounded compartments move proteins around inside cells, and are thought to have contributed to the runaway success of eukaryotes.

Golgi bodies are virtually omnipresent in eukaryotes (loosely speaking, those organisms whose cells have defined nuclei). 'Golgi-lacking' organisms were traditionally thought to have branched off from other eukaryotes before the organelles were acquired, some 1–2 billion years ago.

By combing the genetic sequences of five Golgi-lacking organisms, however, Dacks *et al.* found evidence of genes similar to those that make Golgi components in mammals and yeast. The creatures represent four of the seven proposed Golgi-lacking eukaryotic lineages, and the findings include the first evidence for such genes in two of these, the heteroloboseids and pelobionts.

The authors argue that the organisms might once have possessed the visible stack of compartments typical of a Golgi body, but that the Golgi genes might now be involved in forming a differently shaped Golgi that traffics proteins via small vesicles. They conclude that the last common ancestor of eukaryotes did possess a Golgi body, but it is not known exactly how it was acquired. **Helen Pearson**

Neuroscience

How to forget

Neuron **39,** 655–669 (2003)

Some memories are with us for minutes, whereas others endure for years. Certain proteins help to move short-term memories into long-term storage, but, in a bid to prevent us from remembering absolutely everything, their effects seem to be balanced by a second group of molecules — memory suppressors.

One family of mammalian proteins, the C/EBPs, contains representatives from both camps. In an attempt to understand their function, Amy Chen *et al.* have used a novel protein-targeting approach to damp down the influence of the memory-suppressing C/EBP proteins in the brains of live mice, leaving the memory-storing members of the family unaffected. The authors found that these animals acquired long-term memories more easily. In a tricky test situation, the modified mice remembered the location of a hidden platform better than controls.

The results show how altering the balance of C/EBP proteins can modify the conversion of short-term to long-term memories. As a family, the proteins are known to act as gene-transcription factors, so the authors suggest that they might affect the expression of other memory-related genes. **Helen R. Pilcher**

Ecology

Under attack

Ecol. Lett. **6,** 712–715 (2003)

According to Anurag A. Agrawal and Peter M. Kotanen, herbivores attack foreign plant species just as much as native plants. This runs counter to the idea that invasive species are successful because they escape the natural enemies present in their homelands.

Agrawal and Kotanen conducted a field experiment in Ontario, Canada, using 30 plant species divided into 15 pairs of closely related American and Eurasian plants (see pictures). They found that the Eurasian species sustained significantly more damage from herbivores. The authors suggest that native plants might be better adapted to resist the local herbivores. Similarly, a laboratory test found that exotic species were just as palatable as their native counterparts to a caterpillar.

The finding challenges the 'enemy release' hypothesis that exotic species in general face lower levels of attack. Instead, Agrawal and Kotanen suggest, the species most likely to escape enemies might be those lacking close relatives — and pre-adapted herbivores — in the native flora. **John Whitfield**

Developmental biology

Creating diversity

Dev. Cell **5,** 231–243 (2003)

There are many different cell types in a multicellular organism, yet all of them originated from the same founder cell. Diversity is created through asymmetric cell divisions — divisions that produce not two identical daughter cells, but two different ones. Kate M. O'Connor-Giles and James B. Skeath now propose a new role for the Sanpodo protein during asymmetric cell division in the fly brain.

One way to create different cell fates is to switch on the so-called Notch signalling pathway in one daughter cell (A) and turn it off in the other (B). Selective delivery of the Numb protein to the B cell effectively numbs all Notch signals. Sanpodo, on the other hand, specifies the A (Notch-dependent) fate — even though it is present in A and B cells. The details of both processes are unknown.

O'Connor-Giles and Skeath show that, in A cells, Sanpodo is free to move to the cell surface, where it is found associated with the Notch receptor. But in B cells, Numb binds to Sanpodo and keeps it intracellular. These findings support a model in which the Numb protein blocks Notch signalling by keeping Sanpodo captive inside the cell. This prevents Sanpodo from associating with the Notch receptor at the cell surface and bringing about the A-cell fate. **Marie-Thérèse Heemels**

Native and foreign: *Lactuca canadensis* (left) and *L. serriola* (right).

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