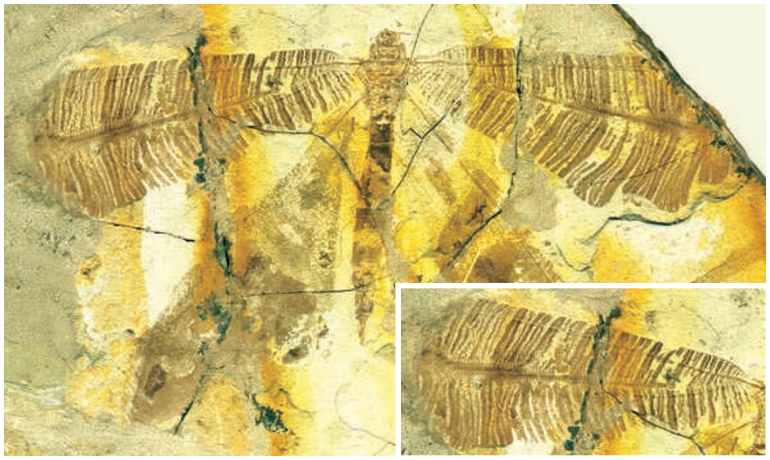
RESEARCH HIGHLIGHTS

PALAEONTOLOGY

Leaf-like history of lacewings

Proc. Natl Acad. Sci. USA doi:10.1073/pnas.1006460107 (2010)
The discovery of two well-preserved fossil lacewings from northeast China shows that insects had evolved leaf-mimicking shapes 165 million years ago — well before flowering plants rose to dominance.

Although their camouflage is not as advanced as that of some of today's plant-like insects, the wings of *Bellinympha filicifolia* and *Bellinympha dancei* (pictured) clearly resemble the feather-like leaves of ancient gymnosperm plants (inset). This, say Dong Ren of Capital Normal University in Beijing and his team, suggests that the biotic world of the Mesozoic period was more complex than previously thought. The insects probably faded when the plants their wings mimicked were usurped by an explosion in flowering plants some 100 million years ago.



NATL ACAD. SCI.

ASTROPHYSICS

The nuances of a fireball

Astrophys. J. **720,** 1008–1015 (2010)
Gamma-ray bursts are flashes of extremely high-energy gamma rays, thought to be caused by the merger of neutron stars or the death of massive stars. Alessandra Corsi, currently at the California Institute of Technology in Pasadena, and her colleagues tried to tease out the details of the fireball explosion that produces the signal by analysing one short gamma-ray burst: GRB 090510, which was observed by NASA's Fermi Gamma-r Ray Space Telescope, and other satellites, in May 2009.

The authors say that a simple model, in which all of the signal is due to radiation from particles accelerated by shockwaves, cannot explain the fact that the signal starts off at lower energy and then moves to higher energy. Instead, they suggest a twofold mechanism, with the initial signal coming from emissions from particles accelerated in a first shell around the fireball's centre, and the remainder from particles in a second, faster-moving shell.

MARINE ECOLOGY

Crab fights

Proc. R. Soc. B doi: 10.1098/rspb.2010.1418 (2010)
A perfect shell is worth fighting for. But although common hermit crabs (*Pagurus bernhardus*) with undersized accommodation have increased motivation to trade up, they may be less physically fit for duels over shells.

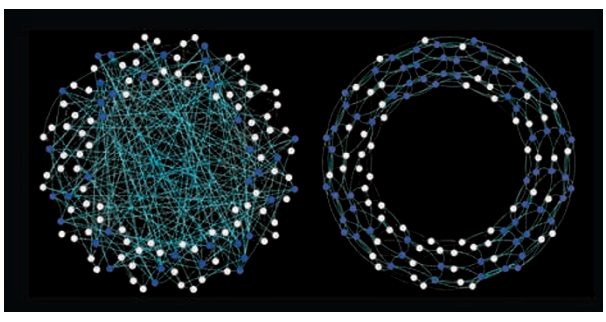
Hermit crabs protect their soft abdomens with discarded snail shells. As they outgrow their borrowed homes, they fight for bigger shells, sizing up their opponents' shells with their appendages and then rapping their shells against their opponents', hoping to evict the incumbent. Sharon Doake and Bob Elwood at Queen's University, Belfast, observed 130 interactions between individual crabs. Crabs squeezed into shells that were much too small were more likely to attack. However, the small shell restricted respiration, meaning that these crabs tired more quickly.

NETWORKS

Contagious behaviour

Science **329,** 1194–1197 (2010)
A person needs contact with only one infected individual to catch a disease. But new behaviours can be harder to catch, with people often needing to have contact with several others who have adopted a behaviour before deciding to do so themselves.

Damon Centola at the Massachusetts Institute of Technology in Cambridge set up an online community, instigated a behaviour — registering for an online health forum — and watched as it spread through the network. He found that more people who were in 'clustered' communities (pictured right) joined the forum than people in communities with 'random' networks (left). This, Centola says, was because people in clusters tended to receive encouragement from several members of their social network.



SCIENCE/AAAS

ASTROPHYSICS

How the galaxy lost its stars

Astron. Astrophys. **518,** L155 (2010)
When a black hole at the centre of a galaxy grows large enough, it sucks the surrounding gas towards it, causing the bulge around the hole to glow brightly. Researchers have suspected that much of the flowing gas grows hot enough to be ejected from the galactic core, depleting the galaxy of fuel and halting star formation.

Chiara Feruglio with the National Centre for Scientific Research and based in Saclay, France, Roberto Maiolino at the National Institute for Astrophysics in Rome and their colleagues have now used a radio interferometer to observe gas flowing out of a distant galactic centre at the prodigious rate of 700 solar masses per year. As predicted, the flow rate is large enough to one day stop new stars from forming in the galaxy — explaining why such galaxies die out.

PRIMATOLOGY

Thanks mum!

Proc. R. Soc. B doi:10.1098/rspb.2010.1572 (2010)
Among humans, a lurking mother is not viewed as a great aphrodisiac. Not so among our cousins, the bonobos (*Pan paniscus*).

Martin Surbeck and his colleagues at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, observed a community of bonobos at Salonga National Park in the Democratic Republic of the Congo. Despite the species' reputation as egalitarian and sexually freewheeling, the team found that males arranged themselves in a rigid linear dominance hierarchy. As expected,

© 2010 Macmillan Publishers Limited. All rights reserved