

RESEARCH HIGHLIGHTS

Selections from the scientific literature

ASTROPHYSICS

Stellar duo tests Einstein's theory

By studying the shrinking orbit of a pair of recently discovered white dwarf stars, astronomers have found further evidence that Einstein's theory of general relativity is correct.

The theory predicts that massive, accelerating objects like the two closely orbiting white dwarfs should emit gravitational waves — ripples in space-time that have never been detected directly. This release of energy, in turn, would cause the dwarfs' orbit to decay at a rate of around 0.26 milliseconds a year. James Hermes of the University of Texas at Austin and his colleagues used four telescopes to observe the dwarfs over 13 months. Their observations confirm that this is indeed roughly the rate at which the dwarfs are moving closer together.

Additional data would be needed to detect an orbital decay that deviates significantly from the rate predicted by general relativity, the team adds.

Astrophys J. 757, L21 (2012)

ANIMAL COGNITION

Parrots can make inferences

Parrots show reasoning skills that have previously been seen only in great apes.

Humans, chimpanzees and other great apes can infer the presence or absence of hidden objects using even indirect evidence. Christian Schloegl and his colleagues at the University of Vienna



tasked six African grey parrots (*Psittacus erithacus*; pictured) with determining

which of two boxes obscured an object after they had witnessed one of them being rattled. Without the need for training, the parrots picked the correct container at rates above chance, even when the empty container was shaken and the birds had to use the absence of a sound to

guide their decisions.

Paying attention to sounds may be more important to parrots than to other animals that have failed the same test, including monkeys and dogs, the researchers suggest. *Proc. R. Soc. B* 279, 4135–4142 (2012)

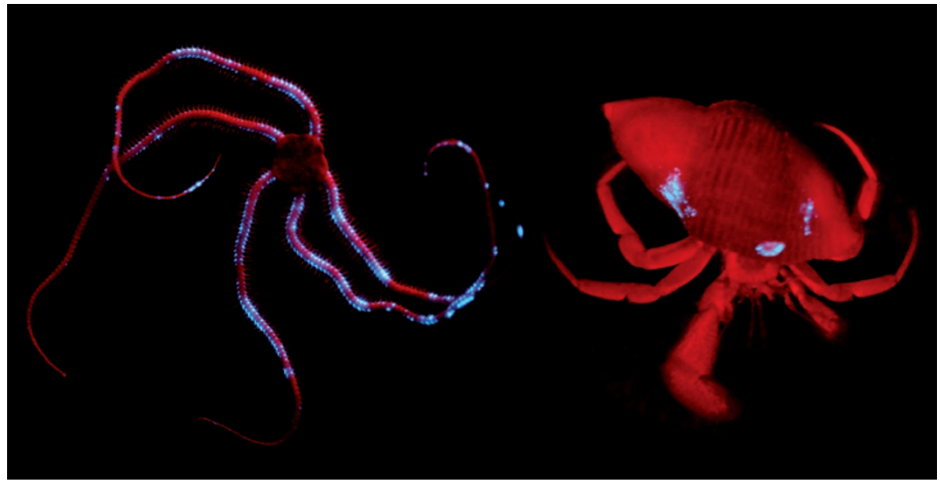
NEUROSCIENCE

Memory boost with sleep

Using external stimulation to 'replay' recent experiences during sleep can strengthen

the memories of those events, according to a study in rats.

Daniel Bendor and Matthew Wilson at the Massachusetts Institute of Technology in Cambridge trained rats to run to either the left or the right in response to one of two sounds, while recording from the brain's hippocampus. As the animals slept, the researchers played the sounds again to see whether this would trigger the rats to recall the task. The duo observed signs of 'replay' by analysing the response of neurons in the hippocampus,



MARINE BIOLOGY

Glowing is rare on the sea floor

A survey of animals that live on the sea floor suggests that they are less likely to be bioluminescent than are species that swim freely at similar depths.

Sönke Johnsen at Duke University in Durham, North Carolina, and his colleagues dredged species (examples pictured) from 500–1,000 metres below the sea surface around the Bahamas, and examined them in tanks. Fewer than 20% of the creatures glowed, whereas roughly 80% of free-swimming species from similar depths are bioluminescent.

In a separate study, Johnsen, along with Tamara Frank of Nova Southeastern University

in Dania Beach, Florida, and another colleague eased eight species of floor-dwelling crustacean up from the sea floor 500–700 metres down around the Bahamas and in the Gulf of Mexico.

The researchers kept the animals in light-tight boxes to protect their sensitive photoreceptors, and found that the creatures could best detect blue light — that is, wavelengths similar to those that filter through the water from the surface and are emitted by bioluminescent species. Some of the crustaceans had eyes that were sensitive to dim light, but were much less responsive to movement.

J. Exp. Biol. 215, 3335–3343; 3344–3353 (2012)