RESEARCH HIGHLIGHTS

Selections from the scientific literature

PHOTONICS

Practical source of single photons

Single-photon sources are essential for quantum computers that encode information in light. Now, physicists have produced photons with high quality and at high rates.

Chao-Yang Lu and Jian-Wei Pan at the University of Science and Technology of China in Shanghai and their colleagues used a laser to excite an artificial atom in a semiconductor crystal, known as a quantum dot. By using finely tuned laser pulses, they produced individual photons with near-perfect uniformity. They crafted the crystal into a tiny pillar-shaped cavity to maximize the number of photons that escaped.

The device emitted 3.7 million high-quality photons per second — a rate that makes it good enough for practical applications, say the authors.

Another group, led by Pascale Senellart at the University of Paris-Saclay and her colleagues, has achieved comparable success using a similar technique.

Phys. Rev. Lett. 116, **020401 (2016); preprint on arXiv http://arxiv.org/abs/1510.06499 (2015)**

ESTHER HERRMANN

ANIMAL BEHAVIOUR

Chimp friendships based on trust

Trust does not seem to be unique to humans and may have a long evolutionary history, according to a study in chimpanzees.

Jan Engelmann and Esther Herrmann at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, identified captive chimps (*Pan troglodytes*) that were friends with each other — individuals that frequently groomed and spent time together. The animals were then paired up and each chimp was presented with a choice of two ropes that it could pull. The 'no-trust' rope gave the chimp a small food reward and left the partner empty-handed. The 'trust' rope gave the partner a reward, part of which could be sent back to the other chimp.

Chimps were more likely to choose the trust rope when paired with friends than with non-friends, showing that trust in close relationships is not unique to humans. The characteristic might have evolved to stabilize social bonds in primates, the authors say.

Curr. Biol. **http://doi.org/bbvs (2016)**

CLIMATE CHANGE

Oceans take a lot of heat

Of the heat taken up by the world's oceans since 1865, nearly half has been absorbed in just the past two decades.

Peter Gleckler at the Lawrence Livermore National Laboratory in California and his colleagues examined data on ocean temperatures from ship-based measurements dating back to the mid-nineteenth century, and from a near-global network of floating sensors deployed since 2004. They found that most of the heat has accumulated in the upper layer of oceans.

But the data, and model simulations of the full depth of the ocean, suggest that more than one-third of the heat is stored below 700 metres, and this amount is rapidly increasing as Earth's climate warms.

Nature Clim. Change **http://dx.doi.org/10.1038/nclimate2915 (2016)**

IMMUNOLOGY

Immune cell goes awry with age

Inflammation increases as the body ages, and one cause could be changes in a type of white blood cell.

Increased inflammation throughout the body is linked to age-related diseases from dementia to heart disease, and growing levels of an inflammatory protein called TNF are a known culprit. Dawn Bowdish at McMaster University in Hamilton, Canada, and her colleagues studied the effects of TNF in aged mice. They found that the protein boosted the production of immature and dysfunctional monocytes, a type of immune cell, when the mice were infected with the bacterium *Streptococcus pneumoniae*. These immature monocytes drove further inflammation, and the infected animals were less able to rid themselves of the bacteria than were young mice. Blocking TNF in old mice restored this ability.

Antibacterial treatments