RESEARCH HIGHLIGHTS

Selections from the scientific literature

QUANTUM COMPUTING

Qubits come close to perfection

Physicists have created quantum units of information that operate with some of the lowest levels of error ever seen.

David Lucas at the University of Oxford, UK, and his colleagues trapped ions of the rare isotope calcium-43 with electric fields and manipulated them with lasers and microwaves, forming 'quantum bits' or qubits. Their set-up was robust enough to outside interference that the qubits kept their fragile quantum states for 50 seconds and errors arose only once in every 1 million operations, 10 times better than previous demonstrations.

Because correcting codes can overcome these very low levels of error, the authors say that their qubits are accurate enough to be used in quantum computing. However, linking up many of these qubits in a scalable system remains a challenge.

Phys. Rev. Lett. 113, **220501 (2014)**

BERT PIJS/MINDEN PICTURES/FLPA

CONSERVATION BIOLOGY

Bees lose their favourite flowers

Shrinking populations of bees' preferred plants could help to explain the worldwide decline in many wild bee species.

Jeroen Scheper of Wageningen University in the Netherlands and his colleagues carefully scraped pollen grains off the legs of museum specimens of 57 Dutch bee species to identify which plants the bees had fed on. The bees were collected before 1950, and thus before many wildflower populations began to decline because of agricultural intensification. The study revealed that bees whose favourite plants have declined the most are now showing the steepest drop in population numbers. Populations of larger bees, which have greater food requirements, also showed big decreases.

The findings support calls to plant specific flowers for these threatened pollinators.

Proc. Natl Acad. Sci. USA **http://doi.org/xdd (2014)**

CANCER

Old blood reveals cancer risk factors

DNA sequencing could help to identify people who are at risk of developing blood cancers months or even years before malignancy appears.

To search for early indicators of cancers such as acute myeloid leukaemia, Steven McCarroll at Harvard Medical School in Boston, Massachusetts, and his colleagues sequenced the DNA from stored white blood cells collected from 12,380 people. A team led by Benjamin Ebert at Brigham and Women's Hospital, also in Boston, looked at similar data for another 17,182 people. Both groups then used medical records to find out which people had subsequently been diagnosed with cancer. Older people were more likely to have mutations in genes implicated in blood cancers. People carrying these mutations were up to 32 times more likely than non-carriers to be diagnosed with a blood cancer months or years later.

The authors point out that DNA sequencing cannot yet predict blood cancers accurately enough for use in clinical care.

N. Engl. J. Med. **http://doi.org/xdp (2014); http://doi.org/xdq (2014)**

MATERIALS

How the silver Koi carp shines

Japanese koi carp are famous for their iridescent shimmer, but Lia Addadi at the Weizmann Institute of Science in Rehovot, Israel, and her colleagues have discovered why some glimmer more brightly than others.

They used correlated optical and electron microscopy to compare scales and skin of a common variety of koi with those from a shinier type called Gin Rin. In the scales and skin of both types are cells called iridophores, which contain reflective stacks made up of layers of guanine crystals and