# RESEARCH HIGHLIGHTS

*Selections from the scientific literature*

GEOCHEMISTRY

## Minerals mimic synthetic structure

Researchers have found naturally occurring metal–organic frameworks (MOFs) — chemical structures that were thought to exist only when made in the lab.

MOFs have open, porous architectures, which could make them useful in catalysis, photovoltaics and other applications. Tomislav Friščić at McGill University in Montreal, Canada, Sergey Krivovichev at Saint Petersburg State University in Russia and their colleagues used X-ray diffraction to study two samples from a permafrost drill core, which was taken from a Siberian coal mine 230 metres below Earth's surface more than 70 years ago. They observed that the rare organic minerals stepanovite and zhemchuzhnikovite contain channels, pores and other structures that are found in synthetic MOFs.

These are the only organic minerals known so far to have open architectures, the authors say.

***Sci. Adv.*** 2, **e1600621 (2016)**

URBAN ECOLOGY

## Insect mix high in rich areas

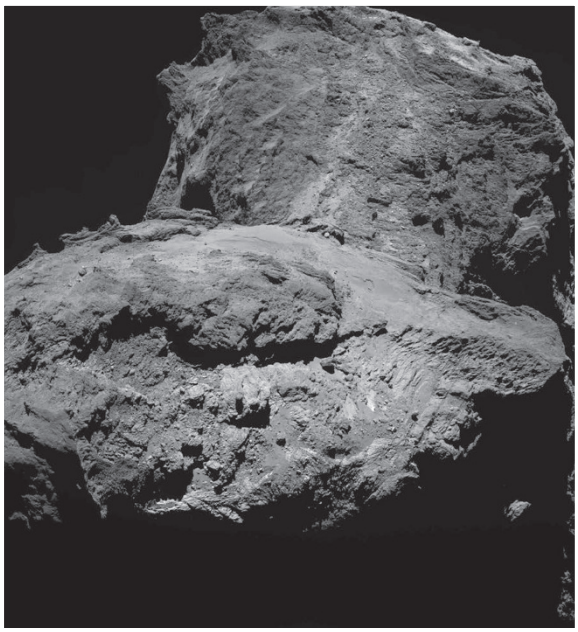
The interiors of homes in affluent neighbourhoods host a wider diversity of insects and spiders than do those in less wealthy areas.

Neighbourhoods with a high income often have a higher diversity of plants and certain animals, such as birds, than other areas. To find out whether this 'luxury effect' extends indoors, Misha Leong at the California Academy of Sciences in San Francisco and her colleagues sampled all arthropods — living and dead — including insects (**pictured** is *Sciara hemerobioides*), spiders and millipedes, inside 50 homes in and around Raleigh, North Carolina. They found that arthropod diversity increased with house size and diversity of surrounding vegetation, and were surprised to find a strong influence of average neighbourhood income, too.

Affluence could be affecting arthropod diversity through urban planning and landscaping at the neighbourhood level.

***Biol. Lett.*** 12, **20160322 (2016)**

IAN REDDING/GETTY



ESA/ROSETTA/MPS FOR OSIRIS TEAM

ASTRONOMY

## Gentle birth of a comet

The comet 67P/Churyumov–Gerasimenko (pictured), which has been orbited by the Rosetta spacecraft since 2014, might date back to the primordial Solar System billions of years ago.

A team led by Björn Davidsson at NASA's Jet Propulsion Laboratory in Pasadena, California, used instruments on the European Space Agency's spacecraft to examine the structure of the comet's core. The porous consistency of 67P shows that it did not form through violent collisions. Instead, the authors propose that the comet was made gradually, when icy pebbles from the outer reaches of the developing Solar System clumped together. The two lobes of 67P may have gently joined together during the final stages of the comet's formation.

***Astron. Astrophys.*** 592, **A63 (2016)**

PALAEOECOLOGY

## Thirst finished off the mammoths

One of the last woolly mammoth populations died out on an island off the coast of Alaska nearly 6,000 years ago, probably because of a shrinking supply of fresh water.

Human hunting has been linked to the extinction of the species (*Mammuthus primigenius*), but this relict population perished without our help, according to Russell Graham of Pennsylvania State University in University Park and his colleagues. The authors examined ancient DNA, isotopes and plant and animal material in sediment cores from a lake on St Paul Island. They also studied mammoth fossils. The researchers estimate that the island's mammoths became extinct 5,600 years ago, when the island was shrinking because of sea-level rise and the lake was evaporating into a salty puddle — perhaps because of long-standing drought, or depletion by the mammoths themselves.

Freshwater scarcity could drive island extinctions more often than previously thought, the authors say — and will only increase as the climate changes.

***Proc. Natl Acad. Sci. USA*** **http://doi.org/bm9z (2016)**

PARTICLE PHYSICS

## No sign of new neutrino

A massive detector at the South Pole has found no evidence of a 'sterile' neutrino: a near-massless particle that is thought to interact only through gravity.

Hints of this possible fourth type of neutrino first emerged in the 1990s, and were rekindled early this year by an experiment in China. In the latest work, researchers