easily scratched. To overcome this, Ivan Parkin at University College London and his colleagues covered titanium dioxide nanoparticles with a hydrophobic polymer and suspended the particles in ethanol.

They sprayed or painted the suspension onto hard surfaces such as glass and steel, and dipped soft fabric materials into it. The coating repelled water and dirt, and did so even after being exposed to oil. Bonding the coating to surfaces using commercial adhesives made the film resistant to scratches from a knife and sandpaper.

The material could be useful in industrial applications that involve harsh and oily environments, the authors say.
Science **347, 1132–1135 (2015)**

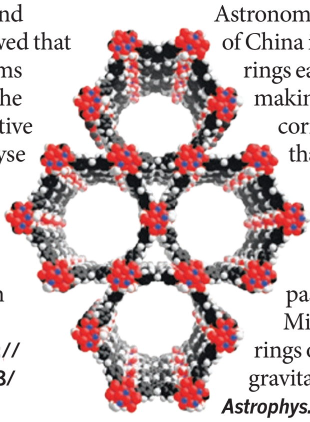
CHEMISTRY

Metal framework zaps nerve agents

A crystalline compound catalyses the destruction of a nerve agent much faster than other clean-up chemicals do.

Omar Farha and Joseph Hupp at Northwestern University in Evanston, Illinois, and their colleagues studied a metal–organic framework (MOF) — a porous network of metal nodes linked by organic groups. They found that their zirconium-containing MOF (**pictured**) broke down half of a simulant of the chemical warfare agent DMNP in 15 minutes. Breakdown of 50% of the nerve agent GD took just 3 minutes.

Experiments and calculations showed that this MOF performs quickly because the zirconium ion active sites, which catalyse the breakdown reactions, are more easily reached by the nerve agents than in other MOFs.
Nature Mater. **http://dx.doi.org/10.1038/nmat4238 (2015)**



JOSEPH E. MONDLOCH

MARINE MICROBIOLOGY

Microbes lurk deep below the sea

Microbial life may exist far deeper in the ocean floor than is often assumed.

Steven D'Hondt at the University of Rhode Island in Narragansett and his colleagues sampled sediments across the southern Pacific Ocean. They found that oxygen, and microbes that require it, permeated depths of up to 75 metres below the sea floor — more than double previous estimates.

The team found that oxygen penetrates the entire sediment column where the sediment accumulates slowly in a shallow layer. On this basis, the authors estimate that microbes that use oxygen may exist at low, but measurable, amounts throughout sediment in around 15–44% of the Pacific and in 9–37% of the global sea floor.
Nature Geosci. **http://dx.doi.org/10.1038/ngeo2387 (2015)**

ASTRONOMY

Milky Way has corrugated rings

The Milky Way's stars sprawl outwards in a series of concentric ripples, hinting that it might extend farther into space than was thought.

Data from the Sloan Digital Sky Survey confirm a previously known ring of stars at about 9,000 parsecs from the Sun. They also show another ring about 14,000 parsecs from the Sun, says a team led by Yan Xu of the National Astronomical Observatories of China in Beijing. These rings each form a ripple, making our Galaxy corrugated rather than flat.

The ripples may have formed when a dwarf galaxy passed through the Milky Way, creating rings of stars with its gravitational pull.
Astrophys. J. **801, 105 (2015)**

SOCIAL SELECTION *Popular articles on social media*

'Science fandom' can hurt science

Research stories that go viral on social media can bring science to a wider audience. But there is a downside to this 'science fandom', argues writer Ben Thomas in an essay on the Medium website that triggered discussion online (see go.nature.com/k9vwqj). Much of what gets shared lacks the nuance and uncertainty of science — a gloss that Thomas dubs "scienceyness". He writes that sharing the latest sciencey headlines without any critical thought or fact-checking, whether by scientists or non-scientists, is contributing to an "onslaught of misinformation". Some on social media thought the blame was misplaced. Picking on the consumer who may not have science training "is a little unfair", says Lindsay Waldrop, a mathematical biologist at the University of North Carolina in Chapel Hill, who commented on the article on Twitter. Others suggested an upside to scienceyness. Paul Coxon, a materials scientist at the University of Cambridge, UK, tweeted: ""Scienceyness" isn't bad. It's often a way for excluded groups to get involved."

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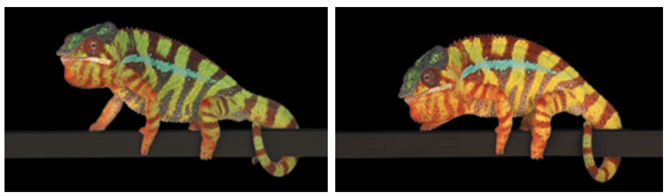

J. TEYSSIER, S. V. SAENKO, D. VAN DER MAREL AND M. C. MILINKOVITCH

BIOPHYSICS

Chameleons tune cells to change hue

Chameleons change colour by tuning nanoscopic structures in their skin cells to reflect different wavelengths of light.

Michel Milinkovitch and his colleagues at the University of Geneva, Switzerland, studied skin cells of the panther chameleon (*Furcifer pardalis*) from Madagascar. They found that the lizards have two layers of specialized cells called iridophores. Each layer contains light-reflecting guanine nanocrystals. By altering the spacing between the crystals in the upper layer, the cells shift from reflecting blue light to reflecting yellow or red wavelengths, which interact with the chameleon's yellow pigments. This produces a change in colour from green (**pictured**, left) to yellow–orange (right). The deeper layer consists of cells that reflect a broad set of wavelengths, particularly those in the near-infrared range.

The first layer of cells allows the animals to quickly switch between camouflage and an ostentatious display to attract mates or expel a rival male, whereas the second layer provides thermal protection.
Nature Commun. **6, 6368 (2015)**

CORRECTION

In the Research Highlight 'X-rays reveal virus innards' (*Nature* **519,** 132–133; 2015), the image was described as showing the virus. In fact, it shows the X-ray diffraction patterns of the virus.

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