RESEARCH HIGHLIGHTS

Selections from the scientific literature

ASTRONOMY

Magnetism drives star birth

Magnetic fields regulate how stars are born from massive clouds of interstellar gas.

A team led by Francesco Fontani at the Arcetri Astrophysical Observatory in Florence, Italy, used high-resolution data from the Atacama Large Millimeter/submillimeter Array telescope in northern Chile to create detailed maps of a particular gas cloud. They found that the gas collapsed under the force of gravity and fragmented, forming a string of clumps that aligned themselves with the magnetic field. The clumps will eventually form the cores of future stars.

The study's findings confirm theoretical predictions that magnetic fields play a major part in where proto-stars form.
Astron. Astrophys. 593, **L14 (2016)**

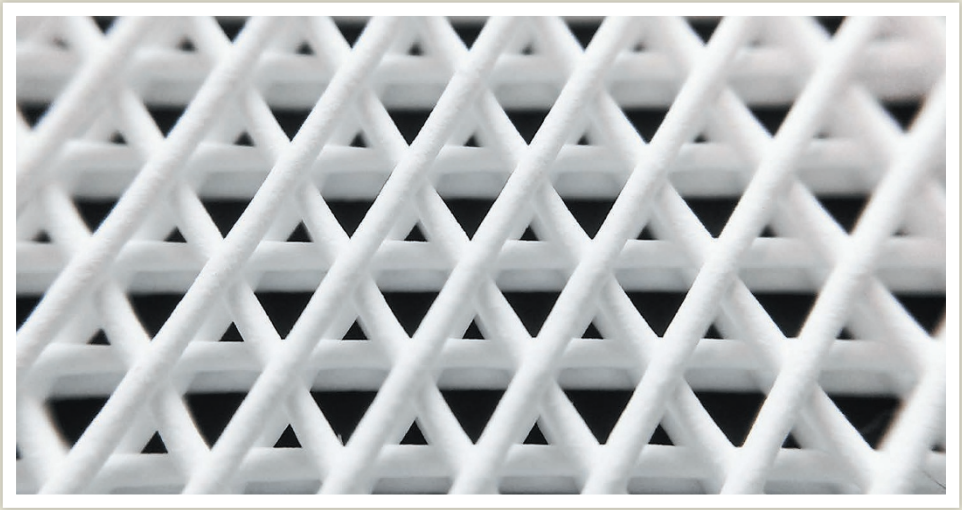
NEUROSCIENCE

Hunger overrides other motivations

Hungry mice will seek out food in fearful situations that they would normally avoid, and researchers have pinpointed the neurons in the brain that seem to control this behaviour.

Michael Krashes at the US National Institutes of Health in Bethesda, Maryland, and his colleagues stimulated appetite-regulating neurons in the hypothalami of mice that had recently been fed, and observed their behaviour in various settings. They found that the animals were more willing than non-stimulated ones to enter open, unprotected spaces or areas infused with fox odour in order to obtain food. Hungry or brain-stimulated males also opted to pursue food rather than spend time with a female mouse.

Future studies could reveal how these neurons suppress competing drives such as fear and sociality.
Neuron **http://doi.org/brbf (2016)**



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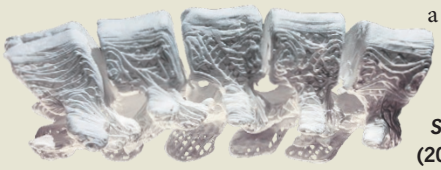
BIOMATERIALS

'Bones' made with 3D printer

Synthetic bones promote natural bone regeneration after being implanted into animals.

Ramille Shah at Northwestern University in Evanston, Illinois, and her colleagues used a 3D printer to generate 'hyperelastic bone'. The main component of the material was hydroxyapatite — a calcium mineral similar to one found in bone — which was mixed with one of two polymers used in medicine and tissue engineering. Grafts built with the material (main picture) and implanted into mice, rats and one macaque became integrated into tissue and stimulated bone growth without adverse effects. Moreover, a 3D-printed 'bone' shaped like a section of human femur was able to withstand loads similar to those experienced naturally.

The material can be rapidly printed into a variety of shapes (human spinal section, inset) and is easy to use in surgery, the authors say.
Sci. Transl. Med. 8, **358ra127 (2016)**



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MATERIALS

Graphene oxide is stiff yet bendy

An oxidized form of graphene — single-atom-thick layers of carbon — is extremely flexible, despite also being very resistant to stretching.

Cécile Zakri at the University of Bordeaux in France and her colleagues measured how much layers of graphene oxide resist bending by using X-rays to study how easily natural ripples in the sheet can be flattened. They found that graphene oxide is about 100 times easier to bend than graphene, even though both materials have a resistance to stretching along the plane of the sheet that is comparable to that of steel.

Graphene oxide's unique combination of stiffness and superflexibility makes it a suitable material for applications such as flexible but strong electronics, say the authors.
Proc. Natl Acad. Sci. USA **http://doi.org/bq7k (2016)**

CANCER IMMUNOTHERAPY

Dual action of targeted T cells

Immune cells engineered to attack tumours can also be used to deliver cancer-fighting proteins.

T cells that have been engineered to recognize