# RESEARCH HIGHLIGHTS

*Selections from the scientific literature*

## CRISPR corrects β-thalassaemia

A common genetic blood disorder has been corrected in cultured stem cells by using a cutting-edge genome-editing technique.

The disorder β-thalassaemia is characterized by reduced levels of haemoglobin due to mutations in the gene for β-globin (*HBB*). Yuet Kan and his colleagues at the University of California, San Francisco, created induced pluripotent stem cells using skin fibroblasts from a person with β-thalassaemia. They then used the CRISPR–Cas9 gene-editing technique to correct the unwanted mutation precisely, without affecting other genes. After differentiation in culture into precursors of red blood cells, the modified cells showed higher expression of *HBB* than unmodified cells.

Transplantation of such corrected cells back into the original patient could one day provide a cure for β-thalassaemia, say the authors.
*Genome Res.* **http://doi.org/t3v (2014)**

### ASTRONOMY

## Another super-Earth found

A 'super-Earth' planet — an extrasolar planet larger than Earth but smaller than Neptune — has been detected in the habitable zone of a star called Gliese 832.

Robert Wittenmyer at the University of New South Wales in Sydney, Australia, and his colleagues used data from various telescopes to detect a planet with a mass of 5.4 Earths in orbit around this star. Although the planet
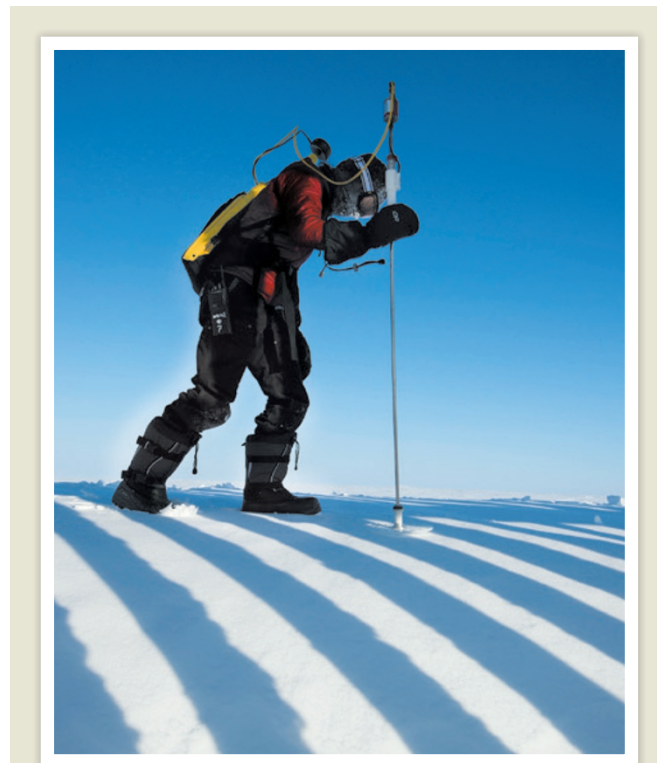


### POLAR SCIENCE

## Arctic snowpack thins

As Arctic sea ice has shrunk and thinned, so has the snowpack blanketing it.

Melinda Webster at the University of Washington in Seattle and her colleagues studied data on spring snow depth gathered between 2009 and 2013 by radar surveys conducted from the air and verified with surface measurements (pictured). They compared these to information collected between 1954 and 1991 by Soviet ice stations. The error bars are large, but between the older and the current surveys, snow thickness had decreased by some 37% in the western Arctic and by 56% in the Beaufort and Chukchi seas.

As sea ice starts forming later each autumn, there is less time for snow to accumulate before winter sets in, the authors say.
*J. Geophys. Res. Oceans* **http://doi.org/t3q (2014)**

is in the habitable zone — the region around a star in which it is thought that life could potentially exist — its large size suggests that it may have a thick atmosphere. This might make it more like a 'super-Venus', with a dense atmosphere leading to high surface temperatures that would render it inhospitable.

Despite this, the presence of this potentially rocky inner planet, as well as a previously discovered outer giant planet, makes the Gliese 832 system a rare miniature version of our Solar System, the authors suggest.
*Astrophys. J.* 791, **114 (2014)**

### CHEMISTRY

## Cleaner, greener ammonia

A method of producing ammonia could yield a greener route to nitrogen-based fertilizers.

Ammonia is currently synthesized by combining nitrogen and hydrogen under high pressures and temperatures in a reaction called the Haber–Bosch process. Making the hydrogen consumes around 5% of the world's natural-gas production, and releases large amounts of carbon dioxide.

Stuart Licht at George Washington University in Washington DC and his colleagues applied a voltage to steam and air (the source of nitrogen) bubbling through molten hydroxide containing catalytic nanoparticles of iron oxide. This produced ammonia from nitrogen and water directly by electrolysis. The nanoparticles clump together over time, slowing the reaction, and moderate temperatures and pressures are still needed. However, if the process can be scaled up, it could be less energy-intensive than the current industrial method.
*Science* 345, **637–640 (2014)**

### MICROBIOLOGY

## Resistance genes mapped

Researchers have pinpointed mutations encoding antibiotic resistance in bacteria that cause pneumonia, borrowing a technique more often used to hunt for gene variations linked to common human diseases.

*Streptococcus pneumoniae* is a leading killer of children under five worldwide. The bacterium is prone to develop antibiotic resistance, but pinning down the mutations