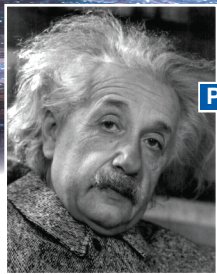


Scientific achievements of 2014



PRIMORDIAL RIPPLES

Gravitational waves, elusive signals from beginning of time, are detected by U.S.-led BICEP2 group, opening up a whole new world of physics.

Ripples in space-time, created a trillionth of a second after the Big Bang, were predicted by **Albert Einstein** (left) in his theory of general relativity in 1916. Previous signals only allowed views back to about 380,000 years after the Big Bang

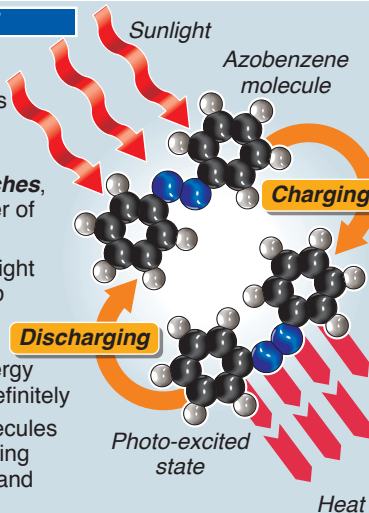
STORING SUNLIGHT

Researchers at MIT store solar energy in azobenzene molecules packed tightly into nanotubes

Known as **photoswitches**, they can assume either of two different shapes

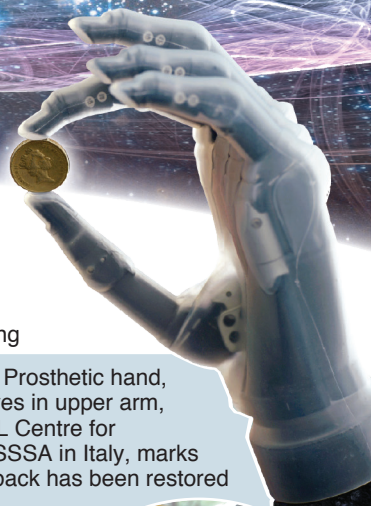
Exposing them to sunlight causes them to absorb energy and jump from one configuration to the other – storing energy in chemical bonds indefinitely

A catalyst reverts molecules to original form, releasing stored energy on demand as heat



SENSE OF TOUCH

Prosthetic hand, surgically wired to nerves in upper arm, by researchers at EPFL Centre for Neuroprosthetics and SSSA in Italy, marks first time sensory feedback has been restored to an amputee



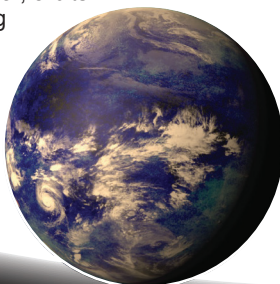
FEEDING THE HUNGRY

Scientists at Cornell University in the U.S. and Rothamsted Research in the UK genetically engineer **RuBisCo** – the protein that converts carbon dioxide into sugar in plants – using gene from ancient blue-green algae that has more efficient photosynthesis rate



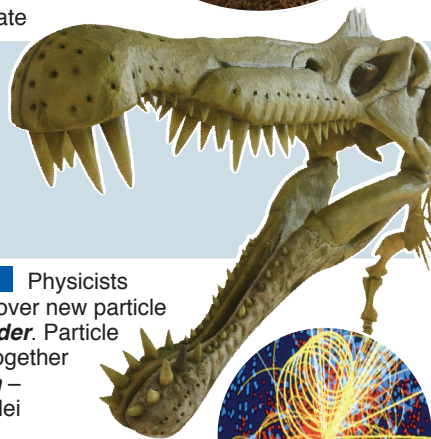
GOLDILOCKS PLANET

NASA's Kepler space telescope spots planet of similar size to Earth, in so-called **Goldilocks zone** – habitable zone that might have water and right conditions for life. Planet **Kepler-186f**, orbits a dwarf star along with four other inner planets, in the constellation Cygnus, 500 light years from Earth



DINO HEAVEN

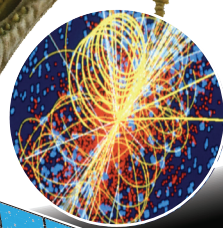
During 2014 new dinosaurs are found almost every two weeks, including **Spinosaurus** (right), first known semi-aquatic dinosaur and two massive **Titanosaurs** from Argentina. One Titanosaur, excavated by a team from Museum of Palaeontology Egidio Feruglio, weighs in at 77,000kg, taking title of biggest animal ever found



NEW SUBATOMIC PARTICLE

Physicists from University of Warwick discover new particle at CERN's **Large Hadron Collider**. Particle named **DS3*(2860)** is bound together by so-called **strong-interaction** – little-known force that stops nuclei of atoms randomly flying apart

Along with **gravity**, **electromagnetic interaction** and **weak nuclear force**, strong-interactions are one of four fundamental forces of nature



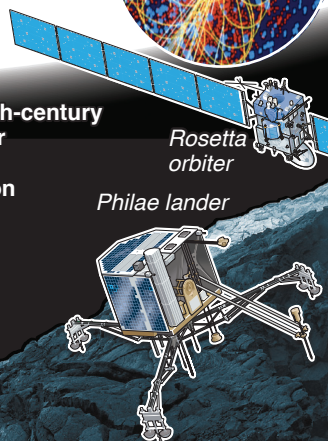
GENETICS

DNA analysis of the bones of Richard III, 15th-century king of England, by scientists at University of Leicester reveals genetic evidence reaching over 20 generations to his living descendants – the oldest DNA identification case of a known individual



ROSETTA MISSION

European Space Agency achieves first, historic landing of a probe on a comet. The Philae lander finds organic molecules – carbon and hydrogen-containing chemicals – essential for life, on surface of **Comet 67P/Churyumov-Gerasimenko**. Discovery could provide new clues about how early chemical ingredients that led to life, arrived on Earth



Rosetta orbiter

Philae lander