# RESEARCH HIGHLIGHTS

*Selections from the scientific literature*

NANOMATERIALS

## Droplets surf graphene waves

Tiny particles of liquid move quickly across thin layers of carbon by 'surfing' waves that ripple through the sheets.

Angelos Michaelides at University College London and his colleagues used computer simulations to investigate how liquids move across graphene — a layer of carbon one atom thick. Graphene has wave-like ripples that transport nanometre-scale droplets of water and oil, and even ice particles. This happens because the particles are attracted to the high density of carbon atoms in the wave trough. These nanodroplets move much more quickly on flexible layers of material such as graphene than on rigid materials like metal.

If validated by experiments, this mechanism could be used to control the delivery of water-soluble drugs on surfaces coated with a layered material, the authors say.

***Nature Mater.*** **http://dx.doi.org/10.1038/nmat4449 (2015)**

NASA/JHUAPL/SWRI

PLANETARY SCIENCE

## Pluto hosts wildly varying terrain

The first published findings from NASA's New Horizons mission to Pluto confirm that the dwarf planet has geological features that resemble those found on Mars and various moons in the Solar System.

NASA's spacecraft flew past Pluto in July, sending back reams of data that have been analysed by Alan Stern at the Southwest Research Institute in Boulder, Colorado, and his colleagues. Broad, bright plains on Pluto known as Sputnik Planum seem to be covered by nitrogen glaciers; these quickly erase craters made by crashing asteroids. Nearby lies the dark Cthulhu region, which is covered in craters that are thought to be up to 4 billion years old.

Pluto also hosts unique features, such as 'snakeskin' terrain that may have been sharpened into ridges over time as material froze and then sublimated away.

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PROSTHETICS

## Bionic touch lights up neurons

A thin, flexible device can sense a wide range of pressures and produces signals that stimulate nerve cells in a dish.

Zhenan Bao of Stanford University in California and her collaborators embedded carbon nanotubes in a rubbery polymer and attached that material to a flexible circuit (**pictured** mounted on a robotic hand). The device mimicked the response of touch-sensitive nerve cells in the skin by emitting discrete electrical spikes of increasing frequency in response to applied pressure. The team converted the electronic signal into light that then stimulated genetically engineered, light-sensitive mouse neurons *in vitro*.

Such artificial skin could one day restore sensation for people wearing prostheses, the authors say.

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ECOLOGY

## Caffeine keeps bees coming back

Caffeine-infused nectar tricks honeybees into changing their foraging behaviour in ways that may benefit the plant.

Many plants produce the bitter-tasting caffeine to deter herbivores, but also rely on bees to spread their pollen for reproduction. To look at caffeine's effect on pollinators, Margaret Couvillon and her colleagues at the University of Sussex near Brighton, UK, monitored honeybees feeding from a sugar solution. They then compared the bees' behaviour to those feeding on the same solution but with caffeine added at