RESEARCH HIGHLIGHTS

Selections from the scientific literature

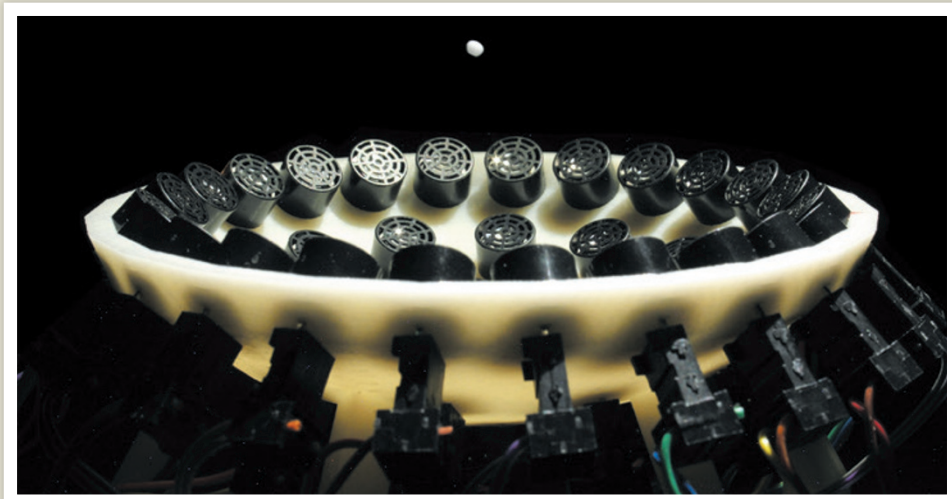
ECOLOGY

Carnivores curbed mammoth numbers

Sabre-toothed cats and other large carnivores were probably able to hunt down young mammoths and mastodons during the Pleistocene epoch, between 2.6 million years and 12,000 years ago. That would explain why Earth's forests were not grazed to death by the large numbers of big herbivores before they went extinct.

Researchers have long thought that mammoths and other giant herbivores were too large to have predators. Blaire Van Valkenburgh of the University of California, Los Angeles, and her colleagues analysed data on the relative body masses of modern predators and prey, and compared them with those of fossil specimens. They estimate that some Pleistocene predators, such as sabre-toothed cats and very large hyenas, were big enough to kill young megaherbivores — enabling them to control herbivore populations.

Proc. Natl Acad. Sci. USA **http://doi.org/8th (2015)**



NATURE COMMUN.

ACOUSTICS

Beads dance on sound waves

A bank of speakers can grip, move and rotate particles in air from one side (pictured).

Sound has been used to levitate small objects, but single-sided devices offered little manoeuvrability. Asier Marzo at the Public University of Navarre in Pamplona, Spain, and his colleagues used a flat array of 64 loudspeakers to levitate beads of polystyrene up to 3 millimetres wide. The authors used algorithms to create interference patterns in waves of ultrasound that formed regions of high and low intensity — shaped as tweezers, tornadoes or bottles — which allowed them to trap and then move the particles in various directions.

The device could be used to manipulate particles for targeted drug delivery or to operate tiny surgical devices from outside the body, say the authors.

Nature Commun. 6, **8661 (2015)**

ANIMAL BEHAVIOUR

Related wasps commit treason

Yellow-jacket wasps live to serve their mother, the queen, but will kill her if she fails to secure more than one mate.

KEVIN LOOPE

Colonies of yellow-jacket wasps (*Dolichovespula arenaria;* **pictured**) have a single queen that generates female workers, which rarely reproduce, and reproductive males. But Kevin Loope at Cornell University in Ithaca, New York, found that just under half of colonies eventually revolt, with the workers killing their queen and producing their own males. To find out why, Loope collected wasp nests and measured the workers' relatedness. Matricide was most common in colonies where workers were more closely related to each other.

This means that the queen had only one mate, making workers less closely related to the queen's sons than to the sons of other workers. Workers prefer males that are more closely related to them, so it benefits them to overthrow the queen and produce their own sons.

Curr. Biol. **http://doi.org/8vz (2015)**

CRYOSPHERE

Arctic open-water season grows

Ice could cover Arctic coastal regions for only half the year by the 2070s, if human-induced climate change continues.

Most of these areas are now covered in ice for more than half the year, and even all year in some places. Using data on daily sea-ice concentrations, Katherine Barnhart at the University of Colorado Boulder and her colleagues mapped changes in the Arctic's open-water season since pre-industrial times, and used models to project future changes. They found that throughout the Arctic, the season began to lengthen in the 1990s, with ice break-up starting earlier and freeze-up setting in later. In business-as-usual climate-change scenarios, the models indicate that the duration of open-water seasons for much of the region will start to exceed pre-industrial bounds by the middle of this century.