

## ECOLOGY

**Predator biomass no match for prey**

Twice as much prey does not lead to twice as many predators, according to Ian Hatton at McGill University in Montreal, Canada, and his colleagues.

In theory, more prey should mean more predators. The authors analysed published data on biomass and numbers of individuals for 2,260 ecosystems in 1,512 locations worldwide. They found that the biomass of predators increased along with the biomass of their prey, but that the ratio of the two values decreased. Across ecosystems from grassland to oceans, the ratio scales with an exponent of around 0.75, rather than scaling by 1 as in a linear relationship.

Similar scaling laws are well known between an organism's body mass and features such as metabolism, growth and reproduction, but had not been identified across whole ecosystems, say the researchers. This indicates an unappreciated degree of ecosystem organization.

*Science* <http://doi.org/7f3> (2015)

## ANIMAL PHYSIOLOGY

**How colonies of sea animals swim**

The animals that make up a colony of sea creatures contribute to its motion depending on their size.

Complex colonies called physonect siphonophores — relatives of jellyfish — are formed of many individuals that propel the colony using jets of water. John Costello at Providence College in Rhode Island and his team collected colonies of one physonect species (*Nanomia bijuga*) and photographed them as they swam. Individuals worked together to drive the colony around, but did not all contribute equally. Smaller, weaker colony members steered the swimming colony, and their more powerful neighbours

provided the thrust. *Nature Commun.* <http://dx.doi.org/10.1038/ncomms9158> (2015)

## CANCER

**Devil tumour type affects survival**

Some lineages of the infectious facial tumours that are devastating populations of the Tasmanian devil (*Sarcophilus harrisii*) can result in worse outcomes for animals.

Rodrigo Hamede at the University of Tasmania in Hobart, Australia, and his colleagues have monitored the outbreak of devil facial tumour disease at a site in northwestern Tasmania since 2006. Animals at this site initially had higher survival rates than other infected populations and a lower proportion of infected animals overall. Their tumours were found to have four sets of chromosomes.

Around 2011–12, this 'tetraploid' tumour lineage was replaced by a 'diploid' type with two sets of chromosomes, which the authors found was associated with an increased disease prevalence in adults (from around 25% of animals infected to 80%) and a significant population decline. Tumour variance can shape both epidemic patterns and outcomes, the authors warn. *Proc. R. Soc. B* 282, 20151468 (2015)

## PHYSICS

**Ring-shaped trap holds ions in check**

An electromagnetic trap can suspend 400 ions at a time, providing a useful system for studies of quantum information processing.

Ions can be pinned in place using oscillating and static electric fields, but trapping large numbers is challenging because experimenters must compensate for unavoidable background fields at each ion location. Daniel Stick at Sandia National Laboratories in Albuquerque, New Mexico,

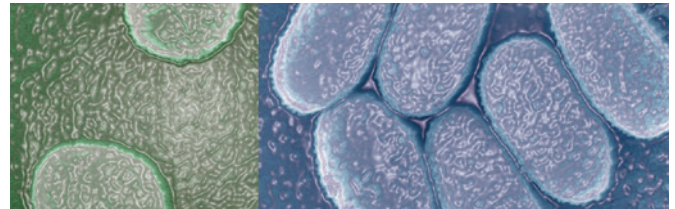
## SOCIAL SELECTION

Popular topics on social media

**Journal of ideas, data and more**

With so many journals already in existence, it is rare for a new title to draw attention. But researchers and publishing experts are taking notice of *Research Ideas and Outcomes*, or *RIO*, an open-access journal that launched on 1 September (<http://rio.pensoft.net>). As well as standard articles, it will publish proposals, experimental designs, data and software, and aims to cover research from all stages of the research cycle. Kelly Visnak, a scholarly-communications librarian at the University of Texas at Arlington, tweeted: "This Open Journal is a game changer." Stephen Curry, a structural biologist at Imperial College London, pondered on Twitter whether open access was now driving "the most innovative & important" developments in publishing.

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and his colleagues used 88 electrodes to measure and then suppress undesired electric fields at points around a ring-shaped trap. By compensating for background fields in just one direction, they succeeded in trapping 400 calcium ions at uniform intervals around the circle.

Most proposed quantum devices arrange ions in square lattices, but circular chains of ions could find uses in new designs as well as in quantum simulators, say the authors. *Phys. Rev. Appl.* 4, 031001 (2015)

## VIROLOGY

**Giant virus from permafrost**

A new species of 'giant' virus has been revived from a 30,000-year-old sample of Siberian permafrost.

The first giant virus visible with light microscopy was seen in 2003. Several species have been discovered since, including *Pithovirus sibericum* (pictured right) found in permafrost in 2014.

Jean-Michel Claverie and Chantal Abergel at the CNRS Institute of Microbiology of the Mediterranean in Marseille, France, and their team have now isolated another giant virus from the same piece of permafrost.

They found the virus — named *Mollivirus sibericum* (pictured left) and seen as spherical particles around 500–600 nanometres in size — multiplying in cultures of amoebas inoculated with the permafrost. Its genome is a double-stranded DNA of 651,523 base pairs, which is unusually devoid of repeats. The authors say that such viruses are probably not rare, and that forms that could infect humans may be reawakened as mining and drilling become more common in the Arctic. *Proc. Natl Acad. Sci. USA* <http://dx.doi.org/10.1073/pnas.1510795112> (2015)

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