

RESEARCH HIGHLIGHTS

Selections from the scientific literature

ASTRONOMY

Spinning black holes align

Black holes at the cores of galaxies tend to spin in the same direction.

This unexpected result comes from a survey of 65 galaxies in the same patch of sky by the Giant Metrewave Radio Telescope near Pune in India. Andrew Russ Taylor and Preshanth Jagannathan at the University of Cape Town in South Africa measured the orientation of jets of plasma shooting out from the strong magnetic fields swirling near the supermassive black holes. They found that more than a dozen jets pointed in the same direction, suggesting that the black holes have the same spin direction. Their galaxies, which are tens of millions of light years apart, form a large 'filament' across the sky.

The galaxies may have all spawned from one enormous structure of rotating gas in the early Universe, the authors suggest.

Mon. Not. R. Astron. Soc. 459, L36–L40 (2016)

IMMUNOLOGY

Parasite promotes gut health

Infection by certain intestinal worms may help to foster the growth of bacteria that protect against gut inflammation.

Mutations in the *NOD2* gene are linked to an inflammatory bowel disease called Crohn's. In mice lacking this gene, researchers discovered that introducing parasitic helminths to the gut helped to reverse cellular defects in the small intestine and reduce inflammation.

Ken Cadwell at the New York University School of Medicine and his colleagues found that the worms promoted the growth of Clostridiales bacteria, which suppressed inflammation-causing Bacteroidales microbes in the gut. The researchers also observed a similar protective balance of intestinal microbes in people from rural areas (where helminth infections are relatively common), which was not seen in people from urban regions.

The results support the hygiene hypothesis, which says that a 'cleaner' microbial environment has made some

people more susceptible to inflammatory disorders.

Science <http://doi.org/bfc6> (2016)

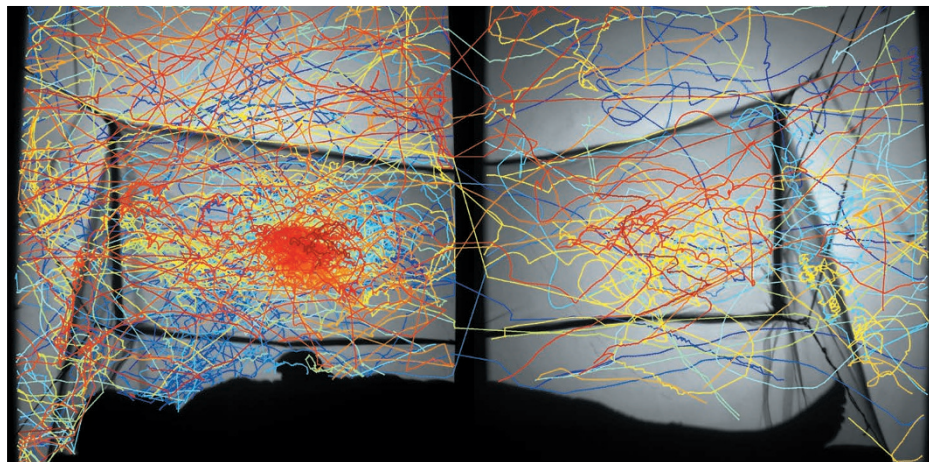
PARTICLE PHYSICS

Theories abound for new particle

Four research groups have proposed the existence of various new particles to explain an anomalous signal picked up by the two largest particle detectors at the Large Hadron Collider at CERN, Europe's particle-physics lab in Geneva, Switzerland.

Physicists with the ATLAS and CMS detectors

announced in December 2015 that they had found an excess pair of photons with a combined energy of 750 gigaelectronvolts. Christoffer Petersson at Chalmers University of Technology in Gothenburg, Sweden, and Riccardo Torre at the Swiss Federal Institute of Technology in Lausanne say that the two photons could come from the decay of a boson that is the 'super partner' of a goldstino fermion. Yuichiro Nakai at Harvard University in Cambridge, Massachusetts, and his team suggest that the new particle is made of two exotic quarks held together



BEHAVIOURAL ECOLOGY

Video reveals mosquito antics

Video monitoring has shown that mosquitoes spend most of the time near the head of a person lying under a bednet at night.

Mosquitoes carry several human diseases but are difficult to study in the field. David Towers at the University of Warwick in Coventry, UK, and his co-workers used infrared light-emitting diode backlighting to make mosquitoes visible on video. They filmed the insects with two cameras at night around a mosquito net in the laboratory and in the field in Tanzania. The team developed algorithms to track individual

mosquitoes, and found that the insects focused their efforts around the roof of the net, above the person's head (mosquito tracks pictured as coloured lines). The mosquito species that transmits West Nile virus (*Culex quinquefasciatus*) tended to be more active than the carrier of human malaria, *Anopheles gambiae*.

The technique could help to improve understanding of how mosquito behaviour affects disease transmission.

J. R. Soc. Interface 13, 20150974 (2016)