

# Science Focus

ENDING THE YEAR WITH A BANG

**SPECIAL  
ISSUE**  
RADICAL  
THEORIES YOU  
NEED TO  
KNOW

# WILD IDEAS TO BLOW YOUR MIND

**AGEING HAS AN OFF-SWITCH**

**BABIES WITHOUT PREGNANCY**

**PLANTS ARE CONSCIOUS**

**MUSHROOMS CAN SAVE THE WORLD**

**ROBOTS WON'T THINK LIKE US**

**WE'VE ALREADY FOUND LIFE ON MARS**

**DEATH IS REVERSIBLE**

**DARK MATTER IS UNDER OUR FEET**



Artist's impression  
of a black hole  
shredding a star

## ASTRONOMY

# Scientists hunt mini black holes

It appears that a whole population of miniature black holes might be lurking unsuspected in the cosmos.

The discovery came after an international team of astronomers developed a new way to search for black holes. These mysterious cosmic entities – which have a gravitational pull so strong that nothing, not even light can escape it – form when massive stars collapse at the end of their life. If a dying star is below a certain mass, on the other hand, it will collapse not into a black hole but into a small, dense neutron star.

Neutron stars are generally no bigger than about twice the mass of the Sun – were they any bigger, they'd collapse into a black hole. However, all of the stellar black holes that astronomers have discovered so far have a mass at least five times that of the Sun. This clearly leaves a gap between the biggest neutron stars and the smallest known black holes, and that gap has remained stubbornly unfilled – until now.

The new technique makes use of the fact that black holes can often be found in a binary system, where two stars are locked together in mutual orbit. If one of the stars dies and becomes a black hole, it can stay in the system, its presence revealed by changes in the living star's light spectrum as it orbits its invisible companion.

The researchers used data from APOGEE (the Apache Point Observatory Galactic Evolution

Experiment), which collected light spectra from around 100,000 stars across the Milky Way, and homed in on 200 stars that looked like they might be orbiting a black hole. Further data-crunching then revealed a 'red giant' star orbiting a low-mass black hole, estimated to be about 3.3 times the mass of the Sun.

"What we've done here is come up with a new way to search for black holes," said Prof Todd Thompson from Ohio State University, who was lead author of the study. "But we've also, potentially, identified one of the first of a whole new class of low-mass black holes that astronomers hadn't previously known about," he added.

"If we could reveal a new population of black holes," he continued, "it would tell us more about which stars explode, which don't, which form black holes, and which form neutron stars. It opens up a new area of study."