

# RESEARCH HIGHLIGHTS

## ASTRONOMY

### Blast from the past

*Astrophys. J.* doi:10.1086/589761 (2008)

The famous supernova 1987A has a cousin. In 2001, astronomers at Pennsylvania State University working with NASA's Chandra X-ray Observatory spotted stellar fireworks in the Circinus galaxy, which is 13 million light years from Earth — close in astronomical terms. The blast seemed like a supernova, but, at the time, Franz Bauer could not confidently say what had set the sparks off.

A team of astronomers led by Bauer of Columbia University in New York has now confirmed that the X-ray source is a type II supernova, dubbed SN 1996cr, light from which first reached Earth a dozen years ago. The blast got steadily brighter in terms of X-rays and radio waves; both of these types of radiation were a thousand times brighter than in SN 1987A's case.

## CLIMATE CHANGE

### Mulled wine

*Climate Res.* doi:10.3354/cr00759 (2008)

During the past few decades the Priorat region of northeastern Spain has risen from oenocultural near-abandonment to producing some of the world's most coveted wines. But climate change may make sustaining the pre-eminence of these cult wines ever harder.

María Concepción Ramos at the University of Lleida in Spain and her colleagues analysed climate records from 1952 to 2006. They found that climate change — especially increasing maximum temperature — is pushing the Priorat climate into a range that may be too warm to support the intense yet balanced wines for which the region is known. In an area with severe water limitations, the decreases in early-season precipitation that the team recorded may prove even more challenging than temperature change.



## Silent killer

*Science* 322, 1392–1395 (2008)

Experimental drugs called bicyclic nitroimidazoles kill non-replicating as well as replicating bacteria, making them promising candidates for the treatment of latent tuberculosis. One such compound, PA-824, does this by a mechanism that suggests a new avenue for anti-infective drug design, report Clifton Barry of the US National Institute of Allergy and Infectious Diseases in Bethesda, Maryland, and his colleagues.

PA-824 inhibits cell division by interfering with the manufacture of bacteria's sticky outer layers. Barry and his colleagues report that it also generates nitric oxide, which is toxic regardless of whether or not a cell is dividing. PA-824 should not have this effect on mammalian cells or on all bacteria — only on bacteria such as *Mycobacterium tuberculosis* that produce a compound known as F<sub>420</sub>. This is needed for the drug to trigger nitric oxide release.



D. GUERCHOIS/REUTERS

## NEUROBIOLOGY

### Mad mouse disease

*Neuron* 60, 598–609 (2008)

Studies of Creutzfeldt–Jakob disease (CJD), of which 'mad cow' disease is a form, have suffered from a lack of suitable animal models. A newly developed mutant mouse could reinvigorate the field.

To create it, Roberto Chiesa of the Mario Negri Institute for Pharmacological Research in Milan, Italy, and his colleagues expressed a disease-associated variant of prion protein (PrP) in mice. The mutant mice exhibited all the classic symptoms of CJD, including a lack of coordination, accumulation of PrP aggregates in the brain, memory loss and abnormal electroencephalographic and sleep-wake patterns. Previous models of CJD have replicated only the motor effects of the disease.

## STATISTICS

### One size fits all

*Phys. Rev. Lett.* 101, 218701 (2008)

In the 1940s, linguist George Kingsley Zipf found that the probability distribution of a wide range of variables, including word-use frequency and demographic distributions,

depends on the rank of the variable according to a power law. Now Thomas Maillart and his colleagues at ETH Zurich in Switzerland report empirical evidence from the spread of open-source software that an explanation posited in 1955 is correct.

This came from economist Herbert Simon. He thought that Zipf's law stems from the growth of a population of which the size varies at random but with a standard deviation proportional to that size. An analysis of exceptionally detailed data reveals that the Zipf law in incoming links to packages of the Debian Linux computer-operating system is supported by exactly this growth process.

## EVOLUTION

### Electric love

*Biol. Lett.* doi:10.1098/rsbl.2008.0566 (2008)

Fish from the lower reaches of the Congo River, of the genus *Campylomormyrus*, use the discharge of their electric organ to find prey. Such discharges may also be driving species divergence, suggest experiments by Philine Feulner, now of the University of Sheffield, UK, and her colleagues.

They gave ready-to-spawn