

2009 GALLERY



IMAGES OF THE YEAR

Take a tour through the images that defined 2009, from the murkiest depths of the oceans, where warring worms pepper their enemies with glowing bombs, to the spectacular swirling rainbows thousands of light years away at the heart of the Milky Way.

This year has provided a pictorial panoply, with dust-filled volcanic eruptions captured on film by luck, the tiniest of toads at risk of being lost forever and humankind's outpost in space picked out in detail as it passes in front of the Sun.

Researched and written by Katharine Sanderson.

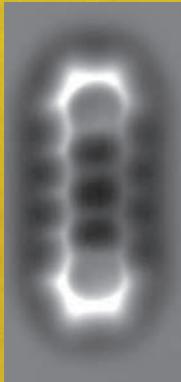
SPITZER, CHANDRA AND HUBBLE TEAM UP

The Hubble Space Telescope got a new lease of life this year, when astronauts from NASA's space shuttle *Atlantis* fitted the 19-year-old satellite with two new instruments and repaired two old ones. This view of the Milky Way's centre combines near-infrared data from the reinvigorated Hubble (yellow) with infrared signals from the Spitzer Space Telescope (red) and X-ray data from the Chandra X-ray Observatory (blue and violet).



LOW SPIRIT

Spirit, one of NASA's two vehicles still exploring Mars after almost six years, has spent much of the past year stuck in some soft soil. The robot is now making tentative escape attempts.



ATOMIC DETAIL

This is a molecule of pentacene, showing five rings of carbon in glorious atomic detail thanks to a specially designed atomic force microscope developed by Gerhard Meyer and his colleagues at IBM Research in Zurich, Switzerland.

SARYCHEV VOLCANO

In June, the International Space Station happened to be in orbit right above the Sarychev volcano on Russia's Kuril Islands, northeast of Japan, as it began to blow. The explosion sent plumes billowing 16 kilometres into the sky, spreading ash across a radius of hundreds of kilometres.

SATURN'S GIANT RING

This artist's impression shows the huge ring discovered around Saturn. Visible only in the infrared spectrum, the ring was spotted by the Spitzer Space Telescope. Thought to be made up of scattered dust particles, the ring has a diameter of at least 25 million kilometres, and might be responsible for darkening one face of Saturn's moon Iapetus.



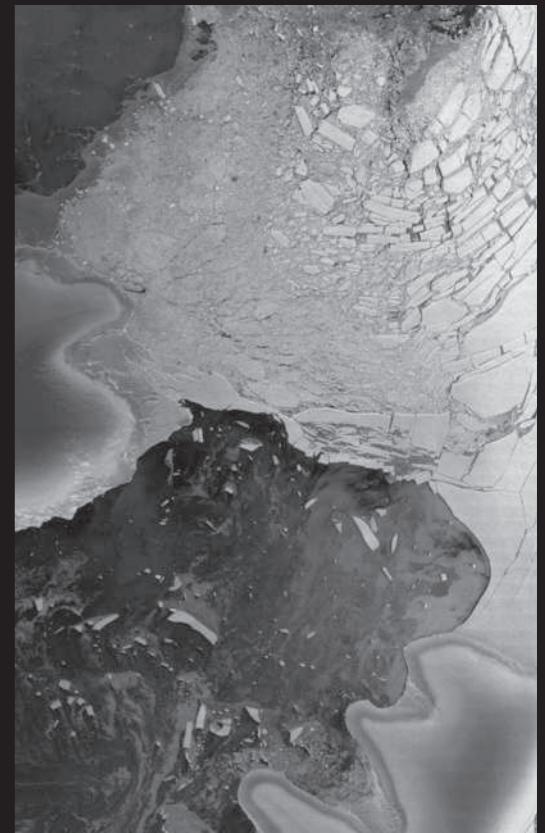
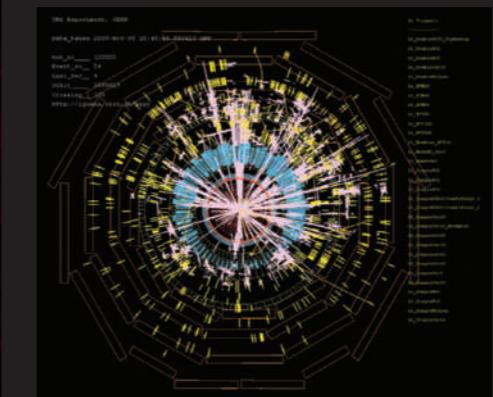
MAGNIFICENT MANDELBROT

Maths shows its beautiful side in the first true three-dimensional representations of the Mandelbrot set. Created by computer programmer Daniel White from Bedford, UK, this is the eerily beautiful 'Mandelbulb'.



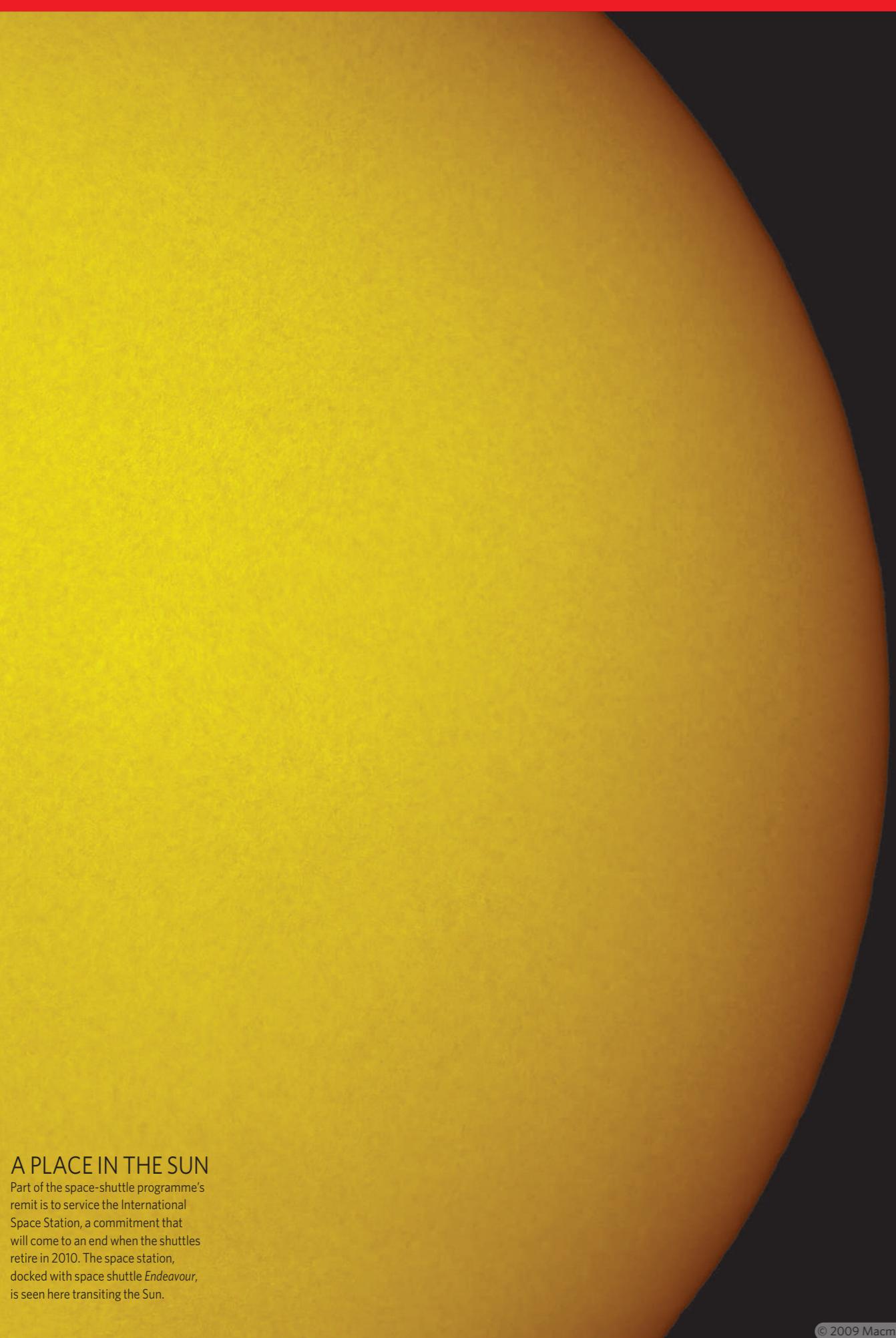
SMASHING SUCCESS

If 2008 was the Large Hadron Collider's *annus horribilis*, 2009 has seen its redemption. By the end of this year the collider was up and running again after it broke down in 2008, and is now smashing records as well as particles — accelerating protons to the highest energy ever.



MELTDOWN

This radar image, 150 kilometres across, shows an ice bridge collapsing away from the Wilkins ice shelf in the Antarctic in April. Its disappearance threatens to accelerate the shelf's destruction and allow more ice from the continent's glaciers to flow into the ocean.



A PLACE IN THE SUN

Part of the space-shuttle programme's remit is to service the International Space Station, a commitment that will come to an end when the shuttles retire in 2010. The space station, docked with space shuttle *Endeavour*, is seen here transiting the Sun.



GROOVY

Meet the psychedelic frogfish (*Histiophryne psychedelica*), which was discovered by Theodor Pietsch at the University of Washington, Seattle, and his colleagues, in waters off Indonesia, and gets around with a lolling hop along the sea floor.



FROG FISH: D. HALL/SEAPHOTOS.COM; SEA CUCUMBER: L. MADIN, WOODS HOLE OCEANOGRAPHIC INST.; CAPSID: J. PAN & Y. J. TAO; MARMOSET: E. SASAKI/HIDA; FRANZEN ET AL./PLoS ONE 4, E5723 (2009); WORMS: K. J. OSBORN; TOAD: J. LARSEN/MAHER/WCS

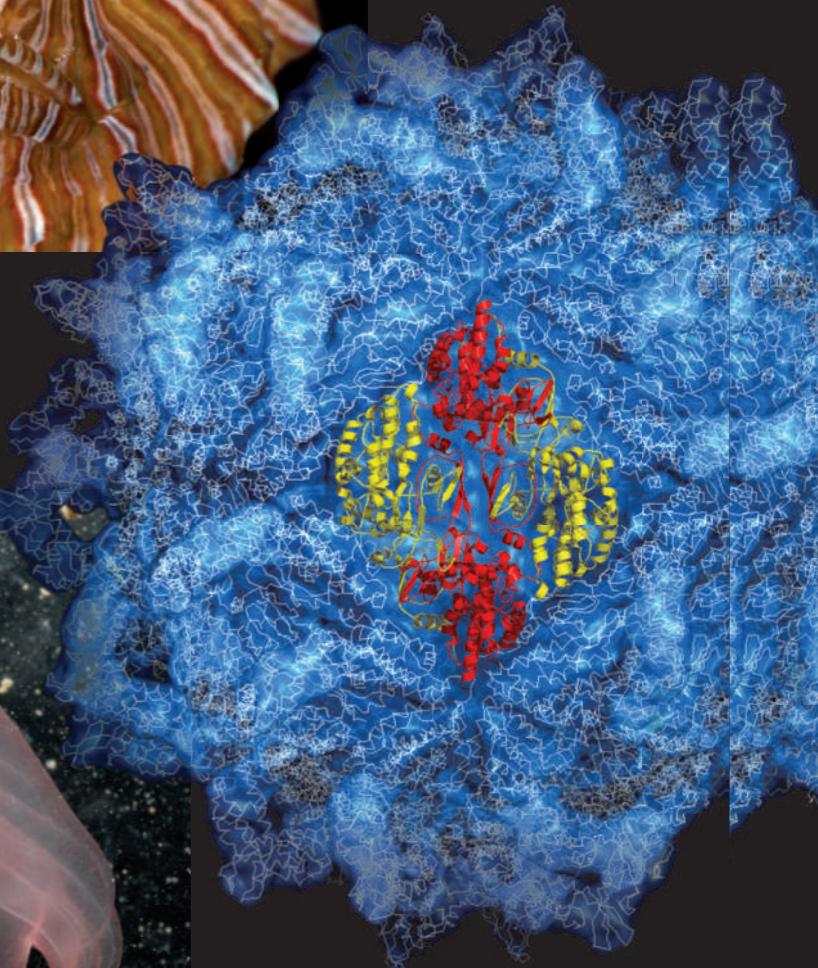


CAPTIVATING CAPSID

It took three years to image the five million atoms in this capsid, a protein coat used by many virus particles to protect their DNA. Junhua Pan, then at Rice University in Houston, Texas, created the picture from hundreds of smaller X-ray-diffraction images of the *Penicillium stoloniferum* virus F, which infects the fungus that makes penicillin.

MYSTERIES OF THE DEEP

This see-through sea cucumber of the genus *Enypniastes* was discovered this year lurking 2,750 metres below sea level in the northern Gulf of Mexico. Part of the Census of Marine Life's COMARGE project, the find was just one example of an unexpected array of marine biodiversity.



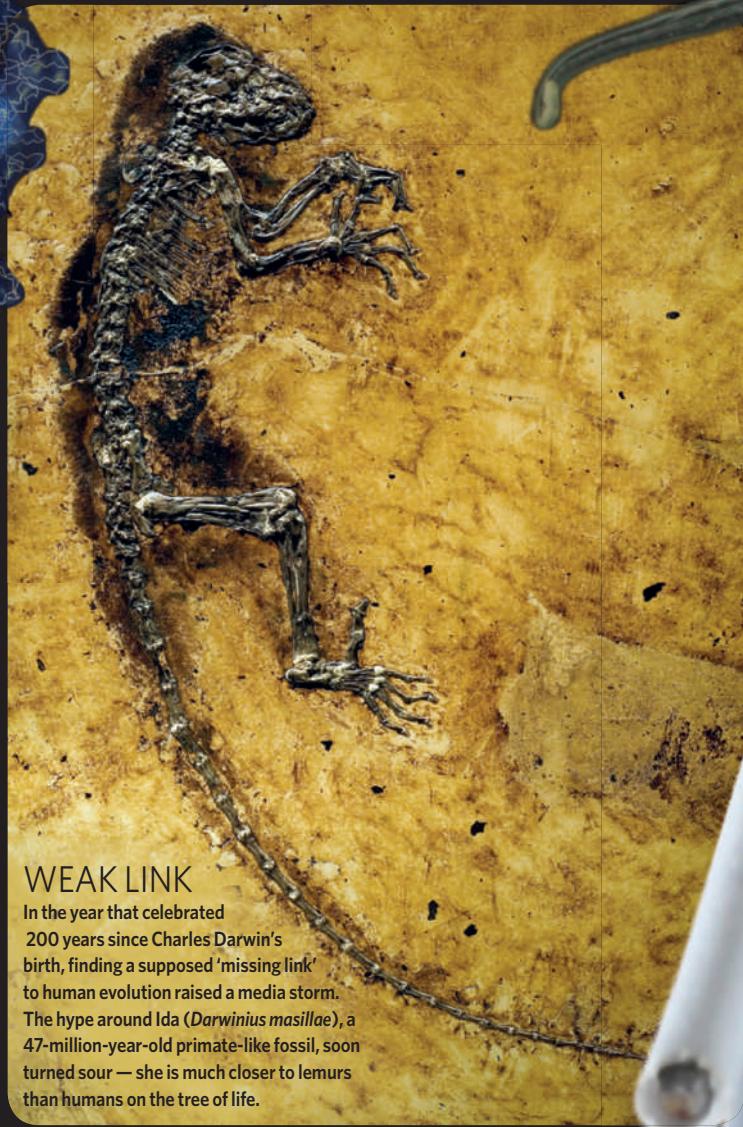
◀ GREEN GENES

These glowing paws belong to some remarkable marmosets. The animals are the world's first transgenic primates — born to parents with altered genes that express green fluorescent protein. The achievement could help to produce primate models of human diseases.



WORMS OF MASS DESTRUCTION ▶

Several species of deep-sea worm with an unusual defensive strategy were discovered by Karen Osborn of the Scripps Institution of Oceanography in La Jolla, California, and her colleagues. The worms scare predators by releasing little bombs that glow green.



WEAK LINK

In the year that celebrated 200 years since Charles Darwin's birth, finding a supposed 'missing link' to human evolution raised a media storm. The hype around Ida (*Darwinius masillae*), a 47-million-year-old primate-like fossil, soon turned sour — she is much closer to lemurs than humans on the tree of life.

TOADS IN TROUBLE

This baby Kihansi spray toad and its kin are in trouble. The species (*Nectophrynoides asperginis*), which grows to a few centimetres as an adult, this year became extinct in the wild. The toads' former habitat was Kihansi Falls in the Udzungwa mountains of eastern Tanzania. The Red List, drawn up each year by the International Union for Conservation of Nature, now says that 17,291 species out of the 47,677 it has assessed are threatened with extinction.

