

Science Breakthroughs

History-making research on stem cells, genomics, cosmic rays, and other topics appeared on the pages of *Science*.

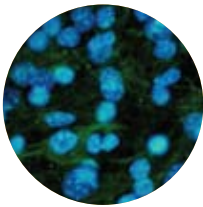
These discoveries pushed forward our knowledge about the universe, the human body, and the health of our environment.

See www.sciencemag.org. In 2007, *Science* highlights included these and other breakthroughs:

Research Highlights

BREAKTHROUGH OF THE YEAR: DAZZLING VARIATIONS

In 2007, researchers were dazzled by the degree to which genomes vary from one human to another, leading *Science* to recognize “Human Genetic Variation” as the Breakthrough of the Year. (21 December)



HUMAN SKIN CELLS MADE TO MIMIC EMBRYONIC STEM CELLS

Scientists reprogrammed human skin cells by introducing just four genes, which seemed in preliminary studies to give the cells many of the characteristics of embryonic stem cells. (20 November, *Science Express*)



CLOSING IN ON COSMIC RAY SOURCE

Many of the mysterious, high-energy cosmic rays that crash into the atmosphere seem to come from galaxy centers called Active Galactic Nuclei, an international research team discovered. Scientists had been trying for decades to determine the source of these particles, some of which have tremendous energy when they first enter the atmosphere; roughly comparable to that of a fast-moving baseball. (9 November)



OUT OF BODY EXPERIENCES

Using virtual reality goggles to mix up the sensory signals reaching the brain, scientists induced out-of-body-like experiences in healthy people, suggesting a scientific explanation for a phenomenon often thought to be a figment of the imagination. (24 August)



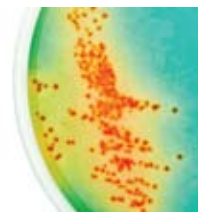
WHITEFLY SECRETS TO SUCCESS

A population of the whitefly *Bemisia tabaci* has become one of the world's worst invasive pests through mating behaviors that help it invade the territory of native whitefly populations, according to research conducted in China and Australia. (8 November, *Science Express*)



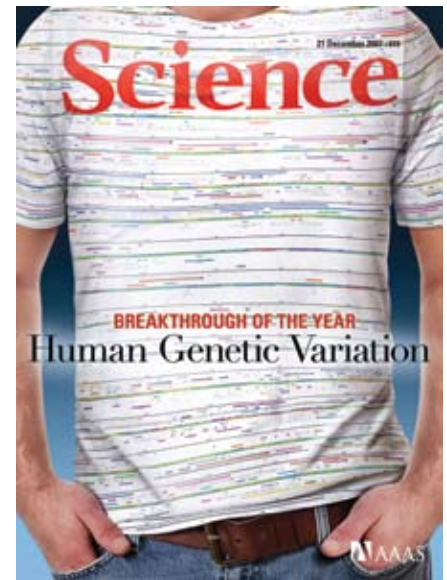
PERFECT CHECKERS GAME

After nearly two decades of playing, computers solved the game of checkers once and for all. (19 July, *Science Express*)



STEP TOWARD SYNTHETIC GENOMES

Researchers replaced the whole genome of a bacterial cell with one from a closely related species, a key step toward constructing a simple genome from scratch. Creating a synthetic genome could allow researchers to develop microorganisms



that could be used for producing bio-fuels, cleaning up toxic waste, sequestering carbon, or other applications. (28 June, *Science Express*)



DISEASE RISK AND THE GENOME

A trio of research teams reported three new genomic regions that are linked to type 2 diabetes. A week later, a pair of independent teams described a stretch of DNA in the genome that increases the risk of coronary heart disease in Caucasian populations. (26 April and 3 May, *Science Express*)



DAMAGE TO BRAIN REGION EASES URGE TO SMOKE

A silver-dollar-sized region in the brain called the insula is intimately involved in smoking addiction, and damage to this structure can completely erase the body's urge to smoke, researchers discovered. (26 January)



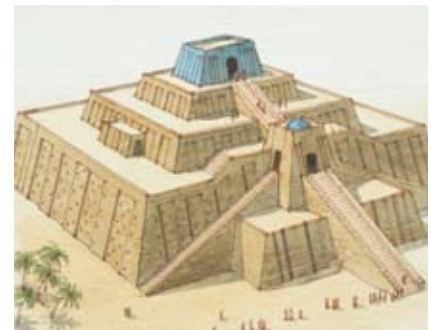
LOGGING HARMS AMAZON BIRDS

Chopping down the Amazon forest into small, isolated habitat patches has a consistently strong negative effect on many native species of forest birds, a 13-year-long study showed. (12 January)

Science News Highlights

MIDDLE ASIA TAKES CENTER STAGE

Long dismissed as a backwater, the vast area between Mesopotamia and the Indus Valley is now revealing a tapestry of wealthy urban centers that shaped humanity's first concerted attempt at city life. This news report by Andrew Lawler described a significant shift in perspective among archaeologists about the importance of this region to the development of urban societies. (3 August)



A WORLD WITHOUT CORALS?

Besieged by pathogens, predators, and people, the "rainforests of the sea" may soon face their ultimate foe: rising ocean acidity driven by carbon dioxide emissions, Richard Kerr reported. (4 May)



ANIMAL EXTREMISTS GET PERSONAL

Greg Miller took an in-depth look at attacks and threats by animal rights extremists on individual researchers in the United States. (21 December)

Other Science Developments

BRUCE ALBERTS NAMED NEW EDITOR-IN-CHIEF

The AAAS Board of Directors announced that Bruce Alberts, president emeritus of the U.S. National Academy of Sciences and chair of the National Research Council (1993-2005), would serve as *Science's* next editor-in-chief.

SCIENCE CAREERS WORKSHOPS

London, Cambridge, Manchester, and other U.K. cities provided a backdrop for career-development workshops organized in 2007 by *Science Careers*. The free, online resource now includes thousands of career-related articles, graduate

program information, grant information, meetings and event notices, and a job listings page that is updated daily. See www.sciencecareers.org.

PRINCE OF ASTURIAS AWARD

Science received Spain's Prince of Asturias Foundation 2007 Communications and Humanities Award at a ceremony in Oviedo, Spain on 26 October. The prestigious prize recognizes *Science's* excellence in science communications and its pivotal role in delivering groundbreaking research to the public.