RESEARCH HIGHLIGHTS

ASTRONOMY

That's the weigh to do it

Astrophys. J. **689,** 1044–1062 (2008)

The star S0-2 orbits very close to the black hole at the centre of the Milky Way. More than a decade's worth of data from the Keck telescope in Hawaii has allowed Andrea Ghez of the University of California, Los Angeles, and her colleagues to produce a model of this star's orbit around the black hole that is by far the most accurate to date.

Using measurements of S0-2's movement back and forth along a straight line between it and Earth, and also of its movements from side to side, the researchers estimate that the black hole, if stationary, has a mass of between 4 million and 5 million times that of the Sun, and is 8–8.9 kiloparsecs from Earth.

DEVELOPMENTAL BIOLOGY

Swing time

Development **136,** 129–138 (2009)

All mammalian embryos grow up female unless told not to, with their 'supporting' cells turning into granulosa cells, which occur in the ovaries. Only when a Y-chromosome gene called *Sry* triggers the supporters to specialize as testicular cells that nurture growing sperm — Sertoli cells — does maleness follow.

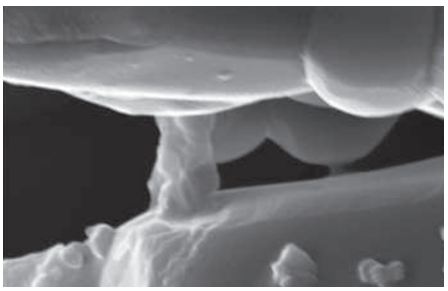
A team led by Yoshiakira Kanai of the University of Tokyo has created a line of transgenic mice in which the turning on and off of *Sry* can be very tightly controlled. Using these mice, they have shown that *Sry* activation must occur during a six-hour window eleven days after mating if the adult is to have Sertoli rather than granulosa cells.

MATERIALS SCIENCE

Tough shell secrets

Science **322,** 1516–1520 (2008)

Nacre, the substance that forms the shell of many molluscs, is an extremely strong material, even though it is made only of brittle and soft components. This has inspired researchers at the Lawrence Berkeley National Laboratory in California to create a material with a similar architecture to nacre's but such superior toughness that its strength is comparable to that of aluminium alloys.



E. MUNCH *ET AL.*

Robert Ritchie and his co-workers noted that the secret to nacre's useful properties lies in the stacking of its layers, which stops cracks from propagating. They recreated this feature using aluminium oxide and an organic polymer. The polymer was grafted (pictured below left) onto micrometre- and nanometre-scale ceramic pieces to help the two substances stick together.

M. DAVIS

Climate fallout

Geophys. Res. Lett. doi:10.1029/2008GL035556 (2008)

Most glaciers have a radioactive layer corresponding to the period of atmospheric nuclear testing in the 1950s and 1960s. The Naimona'nyi glacier, which sits six kilometres above sea level on the Tibetan mountain of the same name (pictured), lacks this fallout layer, according to ice cores drilled by Natalie Kehrwald of Ohio State University in Columbus and her colleagues. This suggests that the glacier has accumulated no new ice for more than 50 years.

It is therefore the highest glacier reported to be annually losing mass. If the same is true for other, similarly situated glaciers in the region, the downstream consequences for people who depend on the glaciers' meltwater — a significant fraction of Asia's population — could be severe.

MOLECULAR BIOLOGY

Not so common sense

Science doi:10.1126/science.1162253; doi: 10.1126/science.1162228 (2008)

A surprising number of the proteins that transcribe DNA into RNA are reading the DNA backwards, two large-scale surveys report.

RNA polymerases use DNA templates to make RNA molecules, some of which are then used to make proteins. Phillip Sharp of the Massachusetts Institute of Technology in Cambridge and his colleagues have found that, whereas one type of polymerase binds to the start of a gene and proceeds towards the end, another often binds near the start site and heads in the opposite direction. This creates a shorter, 'antisense' (complementary) RNA molecule.

Meanwhile, John Lis and his colleagues at Cornell University in Ithaca, New York, reached a similar conclusion after creating a quantitative map of sites at which polymerase is bound to DNA and is actively synthesizing RNA. The function of these short antisense RNAs remains unclear.

MICROBIOLOGY

The ABC of anthrax

PLoS Pathog. **4,** e1000210 (2008)

The bacterium that causes anthrax, *Bacillus anthracis*, is a quiet little spore — until it gets into a mammal. Then it produces a host-killing toxin and self-protecting capsules in response to higher bicarbonate levels than