RESEARCH HIGHLIGHTS

The long bask

Curr. Biol. doi:10.1016/j.cub.2009.04.019 (2009)

The question of where basking sharks — the world's second largest fish — in the western Atlantic go in winter has been answered.

Gregory Skomal of the Massachusetts Division of Marine Fisheries in Oak Bluffs and his colleagues tagged 25 basking sharks (*Cetorhinus maximus*) with temperature, depth and light-level recorders that popped off after a given interval. Reconstructing six of the creatures' travels, the researchers found that the sharks covered distances of about 9,000 kilometres and dived to depths of up to 1,000 metres, heading to deep tropical waters in the winter.

The sharks were formerly thought to be restricted to temperate waters, and the researchers are not sure why they travel so far. Perhaps, they speculate, their young are born deep in the tropics.

For a longer story on this research, see http://tinyurl.com/pwusgt.

L. PITKIN/NHPA

ECOLOGY

Bouillabaisse

Glob. Change Biol. doi:10.1111/j.1365-2486.2009.01875.x (2009)

A study of larvae of fishes off southern California has shown for the first time how climate change can affect the distribution and abundance of species.

Chih-Hao Hsieh, now at the National Taiwan University in Taipei, and his colleagues studied 34 species. When comparing data from a cooler period of 1951–1976 with those from a warmer time of 1977–1998, the team found a significant shift in the vertical or lateral distribution of 16 species, and that eight species had shifted their larger geographical distribution. The plankton-eating fishes typically sought cooler waters.

Surprisingly, the group found an overall increase in abundance, and that offshore fishes moved closer to shore. Thus climate change can drive species into new habitats, which could have unexpected ecological consequences.

ASTRONOMY

Strange star

Astrophys. J. **697,** L63–L67 (2009)

Astronomers have spotted a star with an unique mix of chemical elements in the Milky Way's halo, suggesting that stars in the Galaxy's outer reaches are more varied than previously believed.

David Lai of the University of California, Santa Cruz, and his colleagues studied 27 stars in the Galactic outer halo, some 50,000 light years from Earth and beyond. Spectral analysis of one star's light showed that it contains high amounts of calcium relative to other elements such as iron and magnesium.

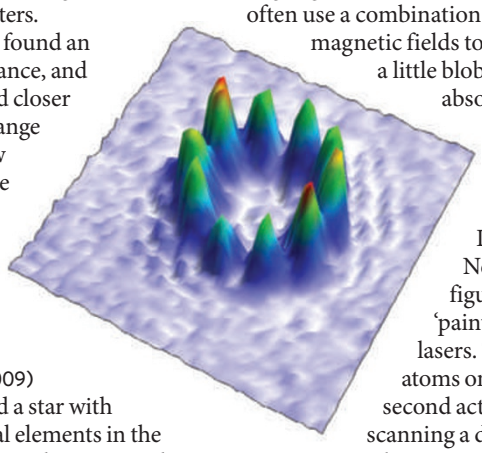
The authors say that the star may have been accreted into the outer halo from another nearby star system, suggesting that the Galaxy's history is more dynamic than thought.

QUANTUM PHYSICS

Atomic painting

N. J. Phys. **11,** 043030 (2009)

Bose–Einstein condensates (BECs) are clouds of ultracold atoms that behave as a single, giant quantum object. Physicists often use a combination of laser light and magnetic fields to trap and then cool a little blob of atoms to near absolute zero.



Malcolm Boshier and his colleagues at Los Alamos National Laboratory in New Mexico have figured out how to 'paint' a BEC using two lasers. The first traps the atoms on a flat canvas; the second acts as a paintbrush, scanning a desired shape and cooling it until a BEC forms. The group can make a BEC of rubidium atoms in any shape (example pictured left), for use in fundamental studies or quantum information processing.

GEOSCIENCES

The forever landscape

GSA Bulletin **121,** 688–697 (2009)

The rough surface of Israel's Negev Desert has the slowest rates of erosion ever measured, according to Ari Matmon of the Hebrew University of Jerusalem and his colleagues. His team calculated the speed of erosion there by measuring the concentration of the radioactive isotope beryllium-10 in chert clasts — little stones — collected from sites in the Negev. This isotope is formed when cosmic rays hit rocks and soils, so its concentration can indicate how long an object has been exposed to the sky.

This technique, along with others, suggests that the bits of chert covering parts of the Negev, Sinai, Sahara and Arabian deserts have been sitting there for upwards of 2 million years, making this landform the longest-lived one on Earth according to current measurements.

M. BOSHIER

IMAGING

Seeing beyond skin deep

Science **324,** 804–807 (2009)

A team led by Roger Tsien of the University of California, San Diego, reports that it has engineered the first protein that emits infrared light and can be used to image intact animals.

Existing fluorescent proteins are excited by shorter wavelengths, which don't penetrate far into animals' bodies. The new proteins were made from a light-detecting pigment called a phytochrome from the bacteria *Deinococcus radiodurans*. The phytochrome