Lark bunting: Unlike other female birds, the state bird of Colorado doesn't necessarily choose a mate based on its plumage or ability to build a nest.
COURTESY OF MICHAEL SERAPHIN/COLORADO DIVISION OF WILDLIFE

ON THE HORIZON: NEWS FROM THE FRONTIERS OF SCIENCE.

Comets and asteroids made of similar stuff, a bird needs more than plumage to pick a mate, and nanotech builds a better radio.

By Peter N. Spotts
from the January 31, 2008 edition

E-mail | Print | Letter to the Editor | Republish | del.icio.us | digg

SCIENTISTS SAMPLE AN ODD COMET

For planetary scientists studying comets and asteroids, our solar system gets curiouser and curiouser.

Take Comet Wild 2, for instance. In 2006, the National Aeronautics and Space Administration's Stardust mission brought back samples of Wild 2's dust. Based on the comet's orbit, scientists thought Wild 2 had formed in the Kuiper Belt. That's a frigid region of icy objects that orbit between 1.8 billion and 4.6 billion miles from the sun. Thus, Wild 2 was thought to contain a lot of fairly pristine interstellar dust, which would open a window on the environment in which the solar system was born. Instead Wild 2's dust looks more like the stuff of asteroids, which hurtle around the inner solar system. Moreover, as researchers scrutinized Wild 2's dust samples, they found far fewer cosmic dust grains than found in samples that high-altitude jets collect from the upper atmosphere.

That leaves a couple of choices, according to the team, led by Hope Ishii at the Lawrence-Livermore National Laboratory in Livermore, Calif. Perhaps Wild 2 formed in the inner solar system, then got kicked into the Kuiper Belt. Or perhaps it formed in the Kuiper Belt from raw materials that were ejected from the inner solar system. Either way, the researchers say, it looks like any boundary between regions where Kuiper Belt comets formed and asteroids formed was fuzzy indeed. It may be that the difference between the two objects is largely one of age – many asteroids may be the skeletons of comets that lost their ice as, like Icarus, they flew a tad too close to the sun. The results appear in the current issue of the journal Science.

A BIRD'S FLEXIBLE MATING HABITS

One can only imagine the fence-post chatter: Like, check him out! His plumage is, like, uh, sooo

Photos | Kenya | Election '08

PHOTOS
Photos of the day
The best photos from January 31, 2008.

MOST-VIEWED STORIES
(FOR 02/03/2008)

Fed's main task: Save the banks
(02/01/2008)

'Caramel' is a sugar rush
(02/01/2008)

Sea captains' logbooks reveal secrets of New England's fishing culture
(02/01/2008)

On the dais again, it's the other Clinton
(01/24/2008)

Female suicide bombers shatter Baghdad calm
(02/01/2008)

last year.

Female lark buntings – the Colorado state bird – turn out to be slaves to fashion, in a manner of speaking. In many bird species, showy male plumage works best at catching a young lady's fancy. Males who boast the brightest colors – or in the case of some birds, the glitziest nests – get the mates.

But female lark buntings appear to be far more flexible in their mating choices, according to Bruce Lyon, an evolutionary biologist at the University of California at Santa Cruz. They select a new mate each year and split the avian equivalent of diaper duties with the males. Males exhibit a range of plumage intensities, anchored by distinctive white wing patches. By watching the birds over 14 years, his team found that the same female might select a mate with a large wing patch one year, then opt for a male with a smaller patch the next. The team says it suspects the females may be taking environmental factors into account as they make their choices. If ground squirrels are plentiful one year, females might select males based on their ability to ward off squirrels, which attack the nests. Or, if the birds' main source of food is scarce, the females might opt for good foragers. Somehow, plumage appears to tip a female off to these various male traits, the team suspects. The results appear in a recent issue of the journal Science.

A RADIO BUILT WITH SUPER-TINY STUFF

Baltimore radio station WBAL has become a bold-faced footnote in the history of the nanotechnology revolution. Researchers at Northrop-Grumman and the University of Illinois picked up its signal on the first transistor radio whose key components are built from carbon nanotubes.

The project is a proof-of-concept effort that demonstrates a unique approach to growing these diminutive tubes from pure carbon. Electronic components built from carbon nanotubes have superior electrical properties compared with their silicon counterparts. Circuit designers, for instance, could pack more powerful radio transmitters into smaller packages than silicon-based components allow.

Until now, however, researchers have built carbon-nanotube electronic devices one tube at a time. The Grumman-Illinois team has perfected an approach that for the first time builds almost perfect horizontal arrays of tubes with near-perfect shapes. This precision and uniformity prompted them to design transistors made from nanotubes, then incorporate them into a six-transistor radio. All six transistors could fit on a grain of sand, although when packaging is added, they become visible to the naked eye. Indeed, the team found it could build all the broad circuit types – from the active antenna to the audio amplifier driving the speaker – found in modern radios using its nanotransistors. The Eureka moment came when the team pulled in traffic reports from WBAL. The results appear in this week's issue of the journal Proceedings of the National Academy of Sciences.