

ON THE RECORD

“A bunch of people with strong egos and God complexes. That sounds like rock ‘n’ roll to me.”

Publisher Bob Guccione explains why scientists, the focus of his newly purchased magazine *Discover*, aren't so different from the musicians featured in his former magazine *Spin*.

“We were almost done with our ark and were training the animals to march in two-by-two, but we just didn't make it.”

Dan Maloney of New Orleans' Audubon Zoo explains why staff stayed behind to care for the zoo's animals when Hurricane Katrina hit.

Source: New York Times, Reuters

SCORECARD

Spotted eggs
It's not decoration, nor is it camouflage. The reason some eggs are speckled comes down to strength. The red spots on eggs laid by great tits occur where the shell is at its thinnest.

Energy at sea
Russia unveils plans to build the world's first floating nuclear power plant. The project is already throwing up some unusual safety questions, including how to protect it from attack by divers.

Bats
Some 40% of China's horseshoe bats are carrying a SARS-like virus. Bat meat and faeces, used in traditional food and medicine respectively, may now see a drop in demand.

NUMBER CRUNCH

100 billion bases of sequenced genetic code have been deposited in three major public databases since 1982.

165,000 is the number of organisms whose complete or partial genome is coded for by these bases.

90% of this information was deposited during the past five years.

Spacecraft on course to score a first with asteroid samples

Japan's most ambitious space mission entered a final, critical phase this week as the Hayabusa spacecraft parked itself 20 kilometres from the asteroid Itokawa. If all goes to plan, the mission will be the first to return samples of an asteroid to Earth.

The US\$100-million Hayabusa mission is primarily a test of technology, and will carry out “a lot of firsts for the Japanese”, says Andrew Cheng of the Johns Hopkins University Applied Physics Laboratory in Laurel, Maryland. Cheng is one of several Americans on the project's science team.

A Japanese-built ion propulsion system delivered the craft to the 600-metre-long asteroid, and Cheng considers this a success in itself. A strong solar flare in 2003 degraded the spacecraft's solar panels, reducing the power output of the ion drive engines and causing a three-month delay in reaching the asteroid. One of three reaction wheels that help Hayabusa to hold a steady position has also failed, although project officials say the effects on the observing programme will be relatively minor.

More hurdles lie ahead. After mapping the asteroid's surface with cameras, and X-ray and infrared spectrometers, Hayabusa will move in for a closer survey. In November, it will make brief contact with Itokawa, firing tantalum ‘bullets’ into the asteroid, then capturing the material that flies up in a horn-like collecting tube. Scientists hope to gather a gram or more of material from two or three locations.

Just before firing the first bullet, the craft

will drop a tiny ‘hopper’ called Minerva on to the asteroid. This cube, equipped with cameras and thermometers, will flip around the surface like a tiddlywink in the low gravity. Finally, in December, Hayabusa will head home, its samples tucked inside a hermetically sealed capsule that will land near Woomera, Australia, in 2007.

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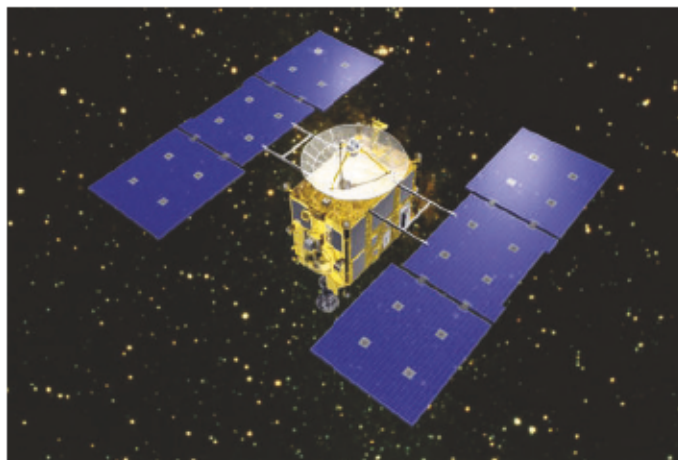
Cheng praises the mission as “very innovative”, and says the scientific pay-off should be high if all the technology works as hoped. No spacecraft

has ever visited such a small asteroid. Ground observations suggest that Itokawa, which was only discovered in 1998, is an S-class asteroid similar in make-up to a class of stony meteorites known as chondrites.

The samples from Hayabusa will be compared with telescope observations and meteorites on Earth. So far, scientists have matched only one meteorite to an asteroid source — Vesta — and even that link is debatable, says Michael Zolensky of NASA's Johnson Space Center in Houston, Texas, who will help to analyse the samples that come back. Having a piece of a well-studied object such as Itokawa will give researchers greater confidence in making assumptions about asteroids based solely on spectral analysis from Earth.

Once the samples arrive they will stay in Japan for a year, where a team of Japanese, US and Australian researchers will have first crack at them. The samples will then be shared with other international researchers, and some 10% will be turned over to NASA permanently. ■

Tony Reichhardt



On target: the Japanese craft Hayabusa (left) will collect material from the asteroid Itokawa (above) and return it to Earth.