

SCIENCE LAB



DISTANCE RUNNER

Japanese spacecraft reaches target, but touchdown is still ahead

Here's the mission for Japan's Hayabusa2 spacecraft in a nutshell: Fly to a carbon-rich asteroid between the orbits of Earth and Mars, study it for a year and a half and then bring back some pieces for additional study.

The Hayabusa2 was launched in 2014. In late June, it reached its target, and it is now some miles above Ryugu, an asteroid about half a mile wide. The Japanese astronomers studying it say it has the shape of a top or an abacus bead.

Ryugu, as dark as coal, is a carbonaceous asteroid, meaning it is full of carbon molecules known as organics, including

possibly amino acids, the building blocks of proteins. Such molecules are not always associated with biology and can form from chemical reactions in deep space, but asteroids could have seeded Earth with the organic matter that led to life.

If it stays on schedule, by the end of July, Hayabusa2 will descend to within about three miles of Ryugu's surface to measure the gravity field around the asteroid. In September or October, Hayabusa2 is to make its first touchdown operation on the asteroid. *KENNETH CHANG*

JAXA, UNIVERSITY OF TOKYO, KOCHI UNIVERSITY, RIKIKYO UNIVERSITY, NAGOYA UNIVERSITY, CHIBA INSTITUTE OF TECHNOLOGY, MEIJI UNIVERSITY, AIZU UNIVERSITY, AIST

LONDON CALLING

British bumblebees find farm living isn't for them

Pesticides, disease and habitat loss are wiping out all types of bees worldwide. Yet people have noticed more bumblebees buzzing around cities. A new study from researchers in England may explain why.

Researchers transplanted bee colonies to 38 sites in London's center and



ASH SAMUELSON

in surrounding suburbs, villages and farms. Compared with those placed in cities and villages, colonies placed in agricultural fields produced fewer reproductive offspring and fewer workers, and their queens died sooner. Even more remarkable was that suburban colonies were no better off than city colonies.

Perhaps modern farm life — with fewer floral resources and potentially more pesticides — may be too stressful for the bees, the study suggested. *JOANNA KLEIN*



POMPEII ARCHAEOLOGICAL PARK

COLD CASE

The real killer of Pompeii's 'unluckiest man'

He has become known across the internet as Pompeii's "unluckiest man." But the story about his demise may have been greatly exaggerated.

In May, archaeologists uncovered the remains of a man seemingly crushed by a 600-pound boulder while fleeing from the eruption of Mount Vesuvius in 79 A.D.

Only his skeletal legs and lower

torso protruded from the block.

Further digging has unearthed the man's intact skull with his mouth wide open, suggesting he was not crushed by a volcanic projectile. The skull and the man's upper torso and arms were found about three feet below the rest of the body and stone.

"The death of the victim arrived not because of the block falling on the skull," said Massimo Osanna, the director of the Pompeii archaeological site. "Our new hypothesis is that he died from asphyxiation from the pyroclastic flow." *NICHOLAS ST. FLEUR*

'Make no mistake, I'm not happy sitting here having to share this story. We never want to do this.'

Thomas Zurbuchen, associate administrator of NASA, on the James Webb Space Telescope's delay until at least 2021.



MICHAEL DODGE/GETTY IMAGES

KNOCK ON WOOD

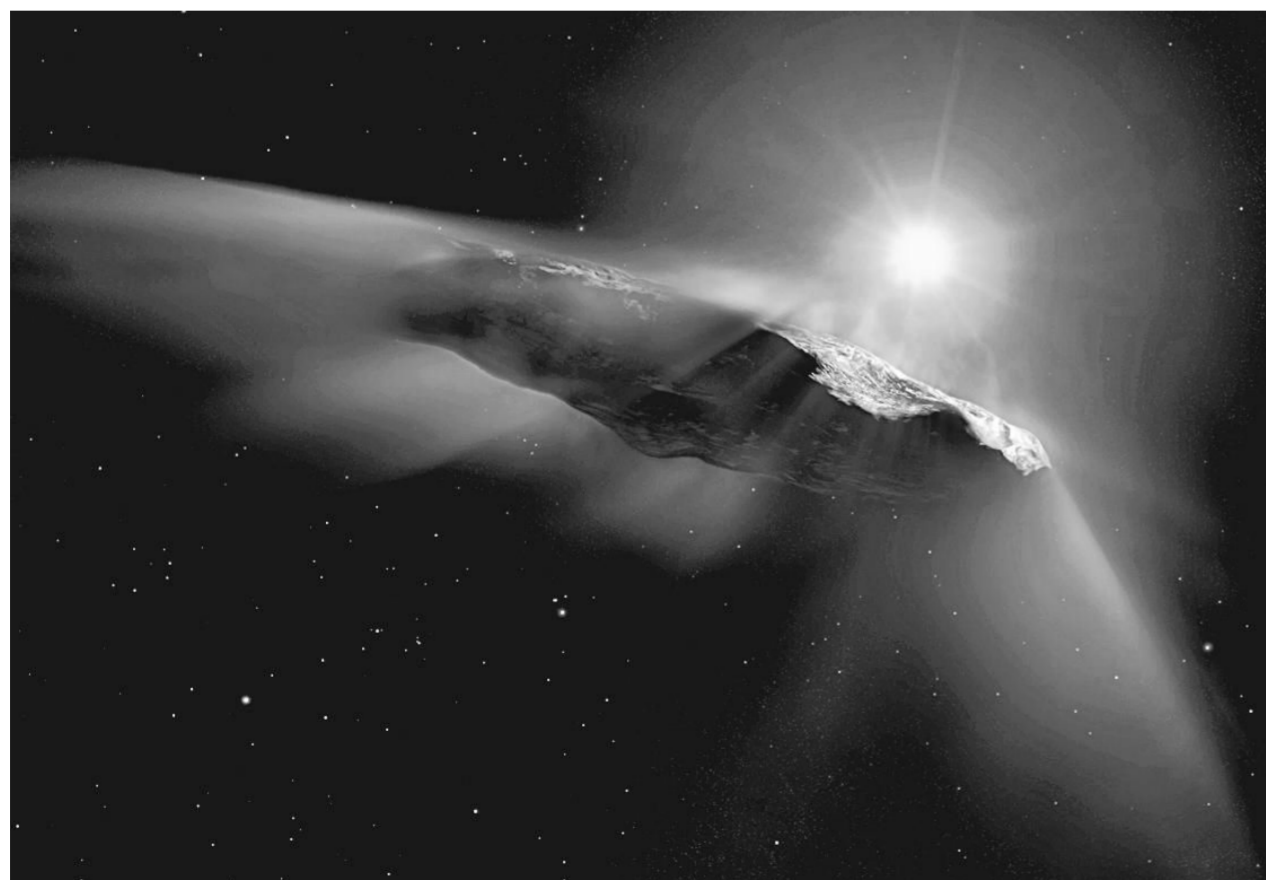
Using DNA mapping to find salvation for threatened trees

Forests are disappearing. Maps show shrinking woodlands all over the world. Even trees coveted for their wood that are protected from logging are chopped down.

Now environmental advocates are driving a project to create a DNA database of populations of the bigleaf maple tree on the West Coast. The eventual goal is to create a DNA mapping system that can be used to combat the thriving black markets for timber in tropical countries.

"We are taking leaf tissue from the maple trees and taking samples along the entire length of the species range from Southern California to British Columbia," said Meaghan Parker-Forney, a science officer with the World Resources Institute, which promotes environmental sustainability. The DNA database is a project for the Norwegian government, which is jointly funding the effort with the United States Forest Service.

Norway hopes to see whether such a database is feasible in places like Indonesia and Peru, where illegal logging is rampant. *SANDRA E. GARCIA*



M. KORNMESSER/AGENCE FRANCE-PRESSE — GETTY IMAGES

FALSE ALARM

As space aliens go, Oumuamua is kind of a dud

It came from outer space, zooming through the solar system at 50 miles a second last October: a lazily spinning reddish cigar-shaped rock named Oumuamua.

It was an interstellar something, but

what, exactly? Some astronomers turned radio telescopes on it just in case it was an alien spaceship.

But Oumuamua never lit up like a comet on its passage past our sun, so astronomers concluded that it was an alien asteroid. Now, researchers have concluded that it was a comet after all.

The key to this conclusion comes from an analysis of Oumuamua's trajectory as measured by a variety of

telescopes. Marco Micheli of the European Space Agency's SSA-NEO Coordination Centre in Frascati, Italy, found that the gravity of the sun and planets was not the only force acting on the little wanderer.

Something else was pushing the object away. Such nongravitational forces, caused by the release of gas and dust, are characteristic of comets. *DENNIS OVERBYE*

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