

Thaxted Astronomical Society

News

Features

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Japan's Pictures Of

Asteroid Ryugu

## Japan's Hayabusa2 spacecraft captures pictures of asteroid Ryugu in stunning detail after touching down on its surface

Daily Mail 7<sup>th</sup> May 2020 >

- The shots were taken on February 21, 2019, after months of study from orbit
- Researchers have used the image to interpret some of the asteroid's history
- At one point, it must have passed close to the Sun, reddening some of its rocks

Japan's Hayabusa2 spacecraft captured pictures of the near-Earth asteroid Ryugu in stunning detail after touching down on its surface, a new study has revealed.

The image is the latest stunner to come back from the Hayabusa2 mission, which previously landed two rovers on the asteroid in a world's first.

The shots have allowed researchers led from the University of Tokyo to determine that Ryugu once passed much closer to the Sun, which reddened some of its rocks.

Alongside pictures, Hayabusa2 also collected a sample of Ryugu, which it will be bringing back to Earth when it returns at the end of this year.

<https://www.dailymail.co.uk/sciencetech/article-8297699/Japans-Hayabusa2-spacecraft-captures-pictures-asteroid-Ryugu-stunning-detail.html>

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The images were taken on February 21, 2019, following months of orbital observations that scientists used to determine the best location for the Hayabusa2 spacecraft to collect a sample of the carbon-rich asteroid's surface.

Previous observations made by Hayabusa2 have shown that Ryugu — which orbits for the most part between the orbits of Earth and Mars — has a surface composed of two types of material, one redder, the other bluer.

Analysis of the high-resolution images taken of the asteroid's surface — including the disturbances caused by the spacecraft's sampling manoeuvre — have allowed researchers to analyse the geology and likely history of Ryugu's surface.

Immediately after touchdown, Hayabusa2's thrusters disturbed dark, fine grains that originate from the redder materials,' wrote planetary scientist Tomokatsu Morota of the University of Tokyo and colleagues in their paper,

'The stratigraphic relationship between identified craters and the redder material indicates that surface reddening occurred over a short period of time.'

'We suggest that Ryugu previously experienced an orbital excursion near the Sun.'

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The team believe that getting closer to the Sun for a short period of time caused a reddening of the equatorial regions of the asteroid by increased levels of space weathering.

Subsequent impact events and mass wasting of material from the equatorial regions towards the poles redistributed the weathered rock to form the patterns of distributions seen today.

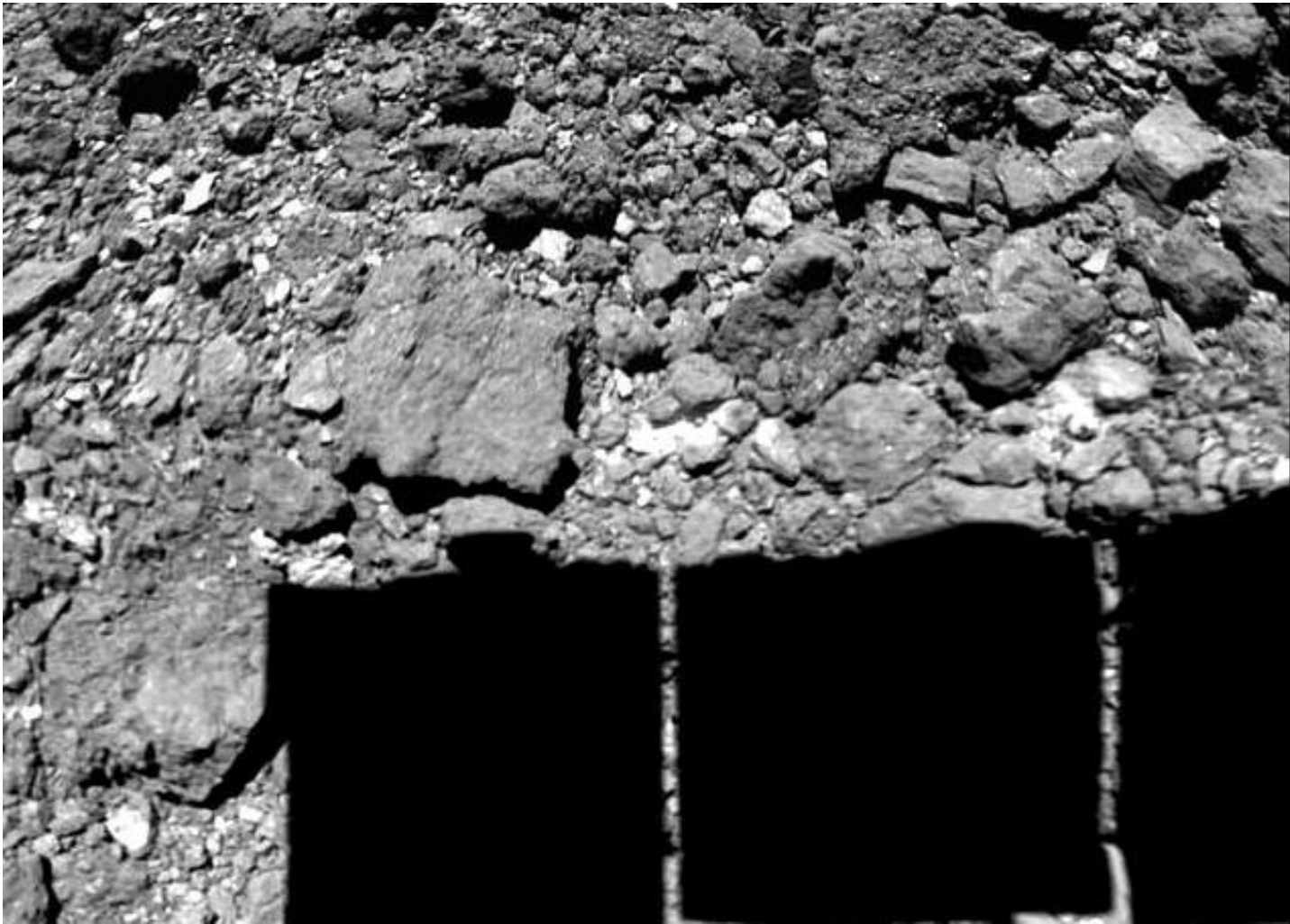
The full findings of the study were published in the journal Science.

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The asteroid's surface, with the spacecraft's solar ray paddle casting a shadow in the bottom right

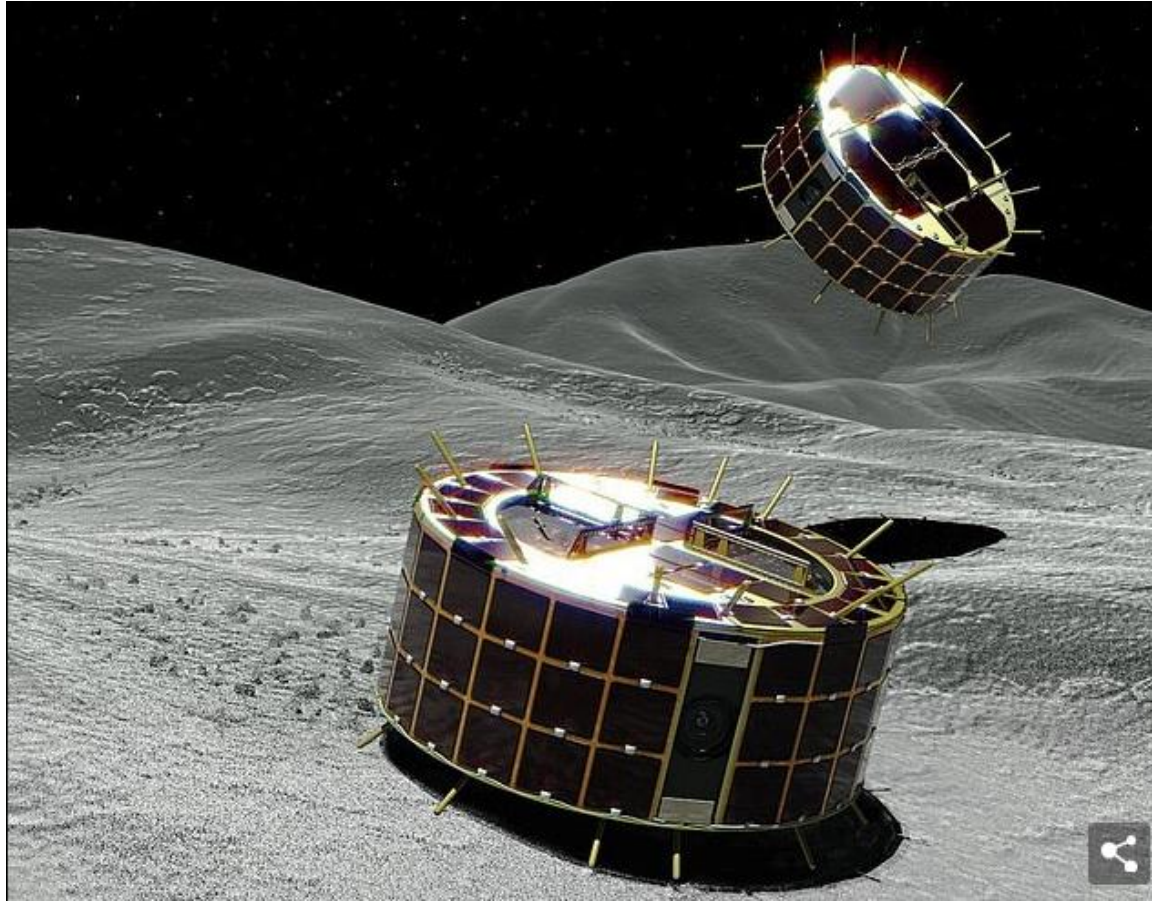


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The Hayabusa2 spacecraft was also responsible for landing two rovers onto the Ryugu asteroid in September 2018. The two MINERVA-II1 robots — dubbed Rover-1A and Rover-1B, pictured in an artist's impression — are the first such vehicles to land on the surface of an asteroid

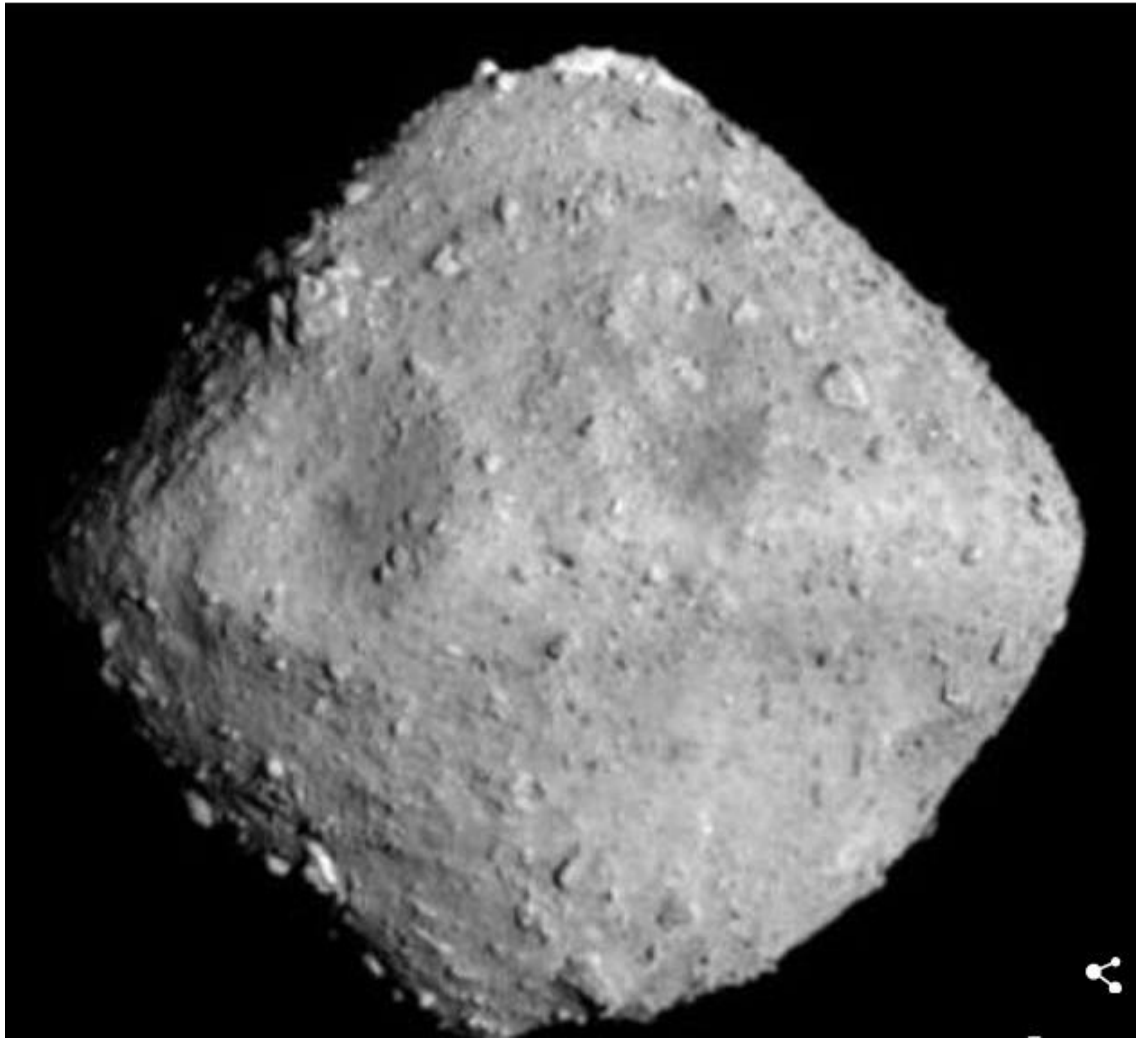


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### STUDYING THE ASTEROID RYUGU WILL HELP SCIENTISTS UNDERSTAND THE HISTORY OF THE SOLAR SYSTEM

Jaxa's Hayabusa Two probe is on a mission to study the ancient asteroid Ryugu in a bid to help scientists better understand the origins of the solar system.

The probe launched in December 2014 and arrived at the dice-shaped space rock on June 27, 2018.

Hayabusa Two is studying soil and rock samples using several pieces of equipment.

The probe is loaded with four surface landers, an array of cameras and even an explosive device that will dig out subsurface rock samples.

Ryugu, a Type C asteroid, contains traces of water and organic material and it is hoped that analysing this material will reveal what the early conditions were like at the time the solar system formed around 4,6 billion years ago.

Hayabusa Two is expected to return to Earth in late 2020 carrying samples for further analysis.