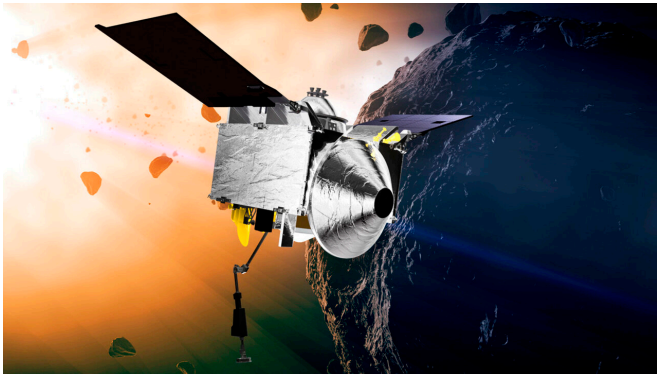


NASA spacecraft begins 2-year trip home with asteroid rubble

10 May 2021, by Marcia Dunn



This illustration provided by NASA depicts the OSIRIS-REx spacecraft at the asteroid Bennu. On Monday, May 10, 2021, the robotic explorer fired its engines, headed back to Earth with samples it collected from the asteroid, nearly 200 million miles away. (Conceptual Image Lab/Goddard Space Flight Center/NASA via AP)

With rubble from an asteroid tucked inside, a NASA spacecraft fired its engines and began the long journey back to Earth on Monday, leaving the ancient space rock in its rearview mirror.

The trip home for the robotic prospector, Osiris-Rex, will take two years.

Osiris-Rex reached asteroid Bennu in 2018 and spent two years flying near and around it, before collecting rubble from the surface last fall.

The University of Arizona's Dante Lauretta, the principal scientist, estimates the spacecraft holds between a half pound and 1 pound (200 grams and 400 grams) of mostly bite-size chunks. Either way, it easily exceeds the target of at least 2 ounces (60 grams).

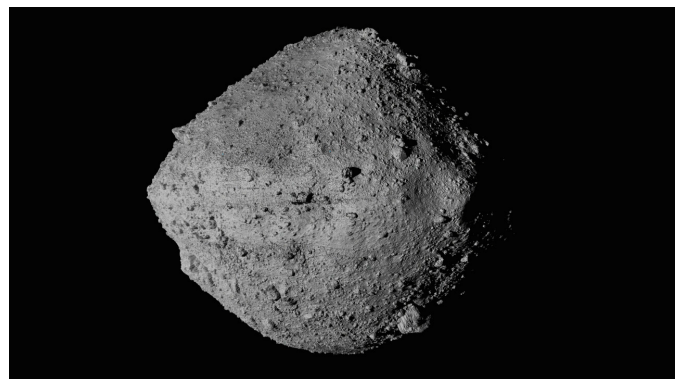
It will be the biggest cosmic haul for the U.S. since the Apollo moon rocks. While NASA has returned comet dust and solar wind samples, this is the first

time it's gone after pieces of an asteroid. Japan has accomplished it twice, but in tiny amounts.

Scientists described Monday's departure from Bennu's neighborhood as bittersweet.

"I've been working on getting a sample back from an asteroid since my daughter was in diapers and now she's graduating from high school, so it's been a long journey," said NASA project scientist Jason Dworkin.

Added Lauretta: "We have gotten used to being at Bennu and seeing new and exciting images and data coming back to us here on Earth."



This undated image made available by NASA shows the asteroid Bennu from the OSIRIS-REx spacecraft. (NASA/Goddard/University of Arizona/CSA/York/MDA via AP)

Osiris-Rex was already nearly 200 miles (300 kilometers) from the solar-orbiting Bennu when it fired its main engines Monday afternoon for a fast, clean get-away.

Colorado-based flight controllers for spacecraft builder Lockheed Martin applauded when confirmation arrived of the spacecraft's departure:

"We're bringing the samples home!"

Scientists hope to uncover some of the solar system's secrets from the samples vacuumed last October from Bennu's dark, rough, carbon-rich surface. The asteroid is an estimated 1,600 feet (490 meters) wide and 4.5 billion years old.

Bennu—considered a broken chunk from a bigger asteroid—is believed to hold the preserved building blocks of the solar system. The returning pieces could shed light on how the planets formed and how life arose on Earth. They also could improve Earth's odds against any incoming rocks.

Although the asteroid is 178 million miles (287 million kilometers) away, Osiris-Rex will put another 1.4 billion miles (2.3 billion kilometers) on its odometer to catch up with Earth.



This artist's rendering made available by NASA on Tuesday, Sept. 6, 2016 shows the Origins Spectral Interpretation Resource Identification Security - Regolith Explorer (OSIRIS-REx) spacecraft contacting the asteroid Bennu with the Touch-And-Go Sample Arm Mechanism. (NASA/Goddard Space Flight Center via AP)

The SUV-size spacecraft will circle the sun twice before delivering its small sample capsule to Utah's desert floor on Sept. 24, 2023, to end the more than \$800 million mission. It launched from Cape Canaveral in 2016.

The precious samples will be housed at a new lab under construction at NASA's Johnson Space Center in Houston, already home to hundreds of pounds of lunar material collected by the 12 Apollo moonwalkers from 1969 to 1972.

Scientists initially thought the spacecraft stored 2 pounds (1 kilogram) of asteroid rubble, but more recently revised their estimate downward. They won't know for certain how much is on board until the capsule is opened after touchdown.

"Every bit of sample is valuable," Dworkin said. "We have to be patient."

NASA has lots more asteroid projects planned.

Set to launch in October, a spacecraft named Lucy will fly past swarms of asteroids out near Jupiter, while a spacecraft known as Dart will blast off in November in an attempt to redirect an asteroid as part of a planetary protection test. Then in 2022, the Psyche spacecraft will take off for an odd, metallic asteroid bearing the same name. None of these missions, however, involve sample return.



In this image taken from video released by NASA, the Osiris-Rex spacecraft touches the surface of asteroid Bennu on Tuesday, Oct. 20, 2020. (NASA via AP)

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