

Astrobiology News December 2018: Prepping for a “Grab-and-Go” at Asteroid Bennu

There was much nail-biting at Lockheed Martin in Littleton, Colorado on December 3rd, as NASA’s OSIRIS-REx spacecraft¹ arrived at asteroid Bennu only a week after InSight became the 8th NASA spacecraft to land successfully on Mars! OSIRIS-REx is an acronym for Origins, Spectral Interpretation, Resource Identification, and Security-Regolith Explorer. Just as the Egyptian god Osiris was envisioned to grant life from the underworld, OSIRIS-REx will help us investigate how planets formed and potentially how life began. Bennu, previously known only as 1999 RQ36, was named by 9-yr-old Michael Puzio, winner of the “Name That Asteroid!” contest. Puzio learned that Bennu, a large heron, was the living symbol of the Egyptian god Osiris. He thought that the spacecraft resembled Osiris’ winged representation, and that the asteroid itself resembled an egg.²

Bennu belongs to a class of particularly carbon-rich asteroids containing organic molecules and amino acids that may have been precursors to life on Earth. OSIRIS-REx’s spectrometers have already collected evidence that water-bearing clay minerals exist globally across the asteroid. Because Bennu is too small to have ever hosted liquid water, this discovery indicates it was part of a much larger asteroid in the past. Bennu’s composition confirms that it preserves a record of processes early in the formation of the Solar System. Although OSIRIS-REx won’t land on Bennu, over the next couple of years it’s preparing for a remarkable feat – extending its sampling arm to grab a “handful” (give or take) of the asteroid’s regolith during a period of about 5 seconds. The sample will arrive back at Earth in 2023.

There’s another excellent reason Bennu was chosen as the target of this mission. It’s a half-kilometer-sized Near-Earth Object (NEO) that passes within 0.002 A.U.³ of Earth every six years, and has a high probability of impacting the Earth in the late 22nd century. The more we know about its physical and orbital characteristics, the better to help future scientists develop a mission to mitigate its potential threat to Earth. To learn more about NEOs, check out NASA’s Center for Near Earth Object Studies.⁴

On a different but equally exciting note, *Zooniverse* launched the latest version of its popular exoplanet-finding project this month - Planet Hunters TESS⁵ asks volunteers to inspect data from NASA's TESS spacecraft. TESS's primary goal is to identify earth- and "super-earth"-sized exoplanets orbiting nearby stars. These identifications will be excellent targets for future missions, such as the James Webb Space Telescope, designed to study exoplanet atmospheres for possible signs of life!

Until next month,

Grace

¹ <https://www.nasa.gov/osiris-rex>

² <http://www.planetary.org/get-involved/contests/osirisrex/finalists/michael-puzio.html>

³ 1 A.U. is the distance between the Earth and Sun, about 93,000,000. 0.002 A.U. is just over $\frac{3}{4}$ of the distance between Earth and the Moon.

⁴ <https://cneos.jpl.nasa.gov/>

⁵ <https://www.zooniverse.org/projects/nora-dot-eisner/planet-hunters-tess>