OSIRIS-REx asteroid search tests instruments, science team

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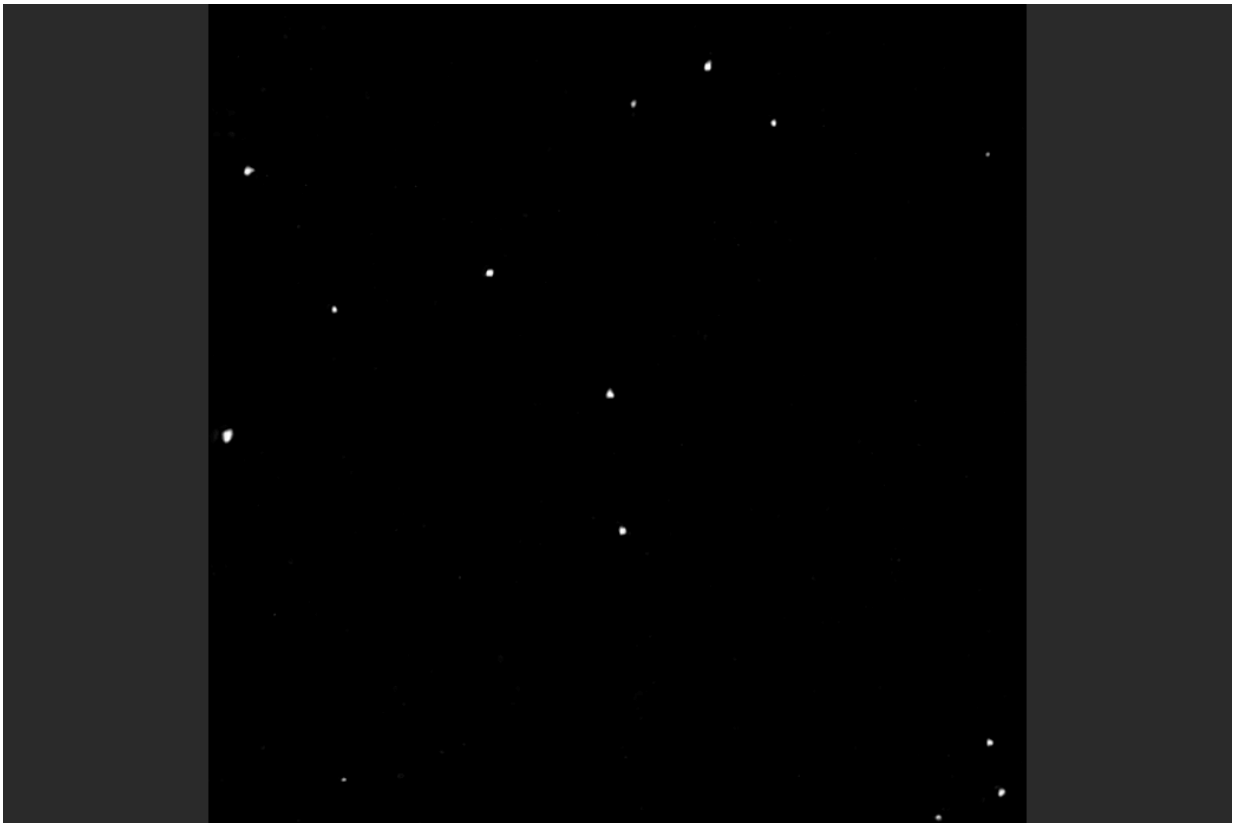

The path of the Main Belt asteroid 12 Victoria, as imaged by NASA's OSIRIS-REx spacecraft on Feb. 11, 2017, during the mission's Earth-Trojan Asteroid Search. This animation is made of a series of five images taken by the spacecraft's MapCam camera that were then cropped and centered on Victoria. The images were taken about 51 minutes apart and each was exposed for 10 seconds. Credit: NASA/Goddard/University of Arizona

During an almost two-week search, NASA's OSIRIS-REx mission team activated the spacecraft's MapCam imager and scanned part of the surrounding space for elusive Earth-Trojan asteroids—objects that scientists believe may exist in one of the stable regions that co-orbits the sun with Earth. Although no Earth-Trojans were discovered, the spacecraft's camera operated flawlessly and demonstrated that it could image objects two magnitudes dimmer than originally expected.

The spacecraft, currently on its outbound journey to the asteroid Bennu, flew through the center of Earth's fourth Lagrangian area—a stable region 60 degrees in front of Earth in its orbit where scientists believe asteroids may be trapped, such as asteroid 2010 TK7 discovered by NASA's Wide-field Infrared Survey Explorer (WISE) satellite in 2010. Though no new asteroids were discovered in the region that was scanned, the spacecraft's cameras MapCam and PolyCam successfully acquired and imaged Jupiter and several of its moons, as well as Main Belt asteroids.

"The Earth-Trojan Asteroid Search was a significant success for the OSIRIS-REx mission," said OSIRIS-REx Principal Investigator Dante Lauretta of the University of Arizona, Tucson. "In this first practical exercise of the mission's science operations, the mission team learned so much about this spacecraft's capabilities and flight operations that we are now ahead of the game for when we get to Bennu."

The Earth Trojan survey was designed primarily as an exercise for the mission team to rehearse the hazard search the spacecraft will perform as it approaches its target asteroid Bennu. This search will allow the mission team to avoid any natural satellites that may exist around the asteroid as the spacecraft prepares to collect a sample to return to Earth in 2023 for scientific study.

The spacecraft's MapCam imager, in particular, performed much better

than expected during the exercise. Based on the camera's design specifications, the team anticipated detecting four Main Belt asteroids. In practice, however, the camera was able to detect moving asteroids two magnitudes fainter than expected and imaged a total of 17 Main Belt asteroids. This indicates that the mission will be able to detect possible hazards around Bennu earlier and from a much greater distance that originally planned, further reducing mission risk.

Scientists are still analyzing the implications of the search's results for the potential population of Earth-Trojan asteroids and will publish conclusions after a thorough study of mission data.

Provided by NASA's Goddard Space Flight Center