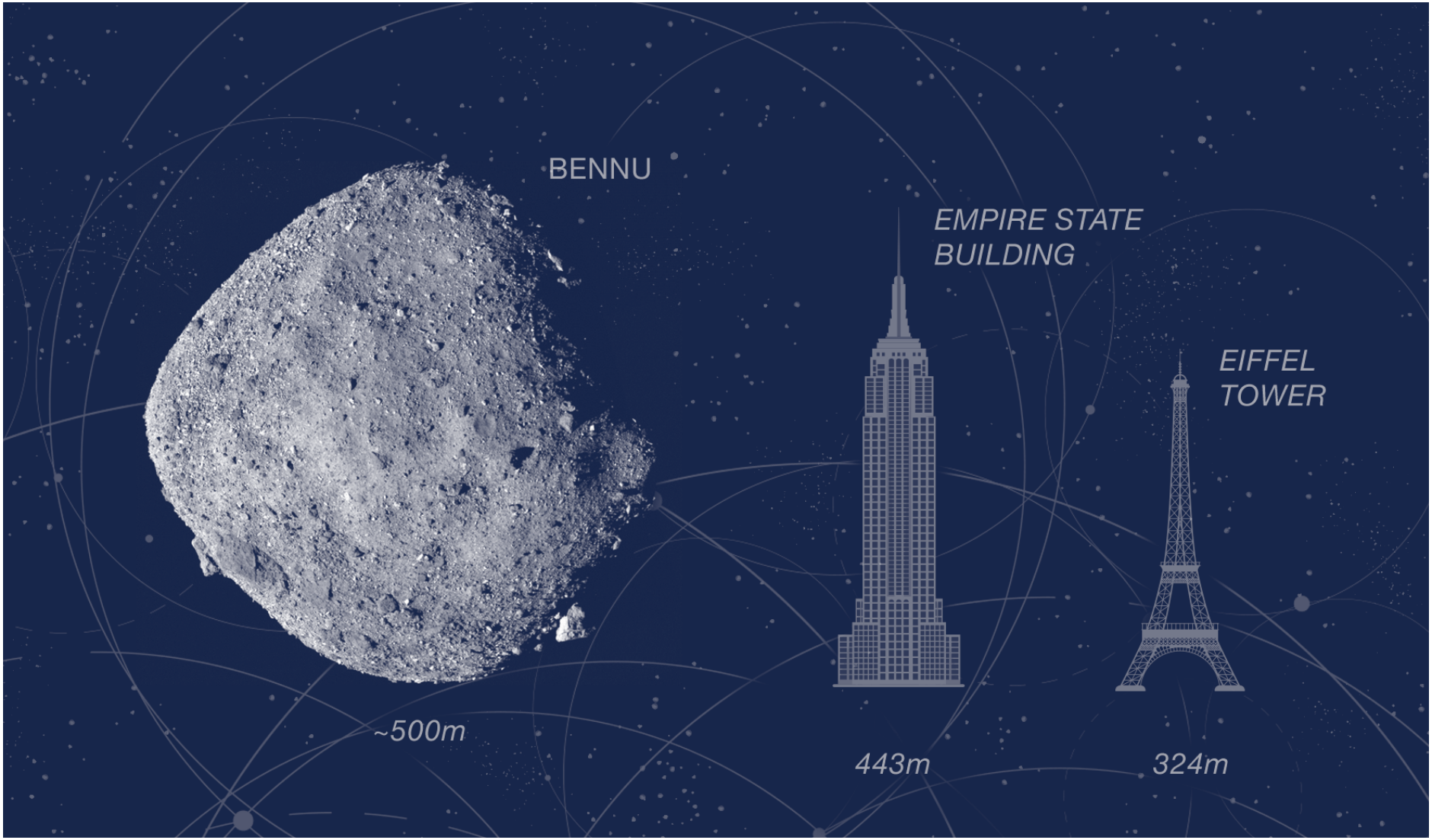
BENNU
EMPIRE STATE BUILDING
EIFFEL TOWER
~500m
443m
324m

At 2:43 p.m. EST on December 31, 2019, NASA's OSIRIS-REx spacecraft entered into orbit around the asteroid Bennu, and made Bennu the smallest object ever to be orbited by a spacecraft. The spacecraft is designed to study and reduce the presence of water on the spacecraft.

The purpose of NASA's OSIRIS-REx spacecraft—Origins, Spectral Interpretation, Resource Identification, and Security–Regolith Explorer—is to map and return samples from asteroid Bennu, a carbon-rich hunk of rock that might contain organic materials or molecular precursors to life. It is also an asteroid that could someday make a close pass or even a collision with Earth, though not for several centuries.

OSIRIS-REx is a mission to figure out where we came from, as asteroids are remnants from the formation of our solar system. But while the spacecraft might tell us some things about where we have been and where we are headed, it also can remind us of where we are right now.

**What is NASA doing to protect Earth from asteroid impacts?**

NASA's Near-Earth Object (NEO) Observations Program sponsors projects dedicated to finding, tracking, and characterizing near-Earth objects. All projects supported by this program are required to make their data available in a timely manner to the global scientific community. The global public archive for these data is the Minor Planet Center, which is sanctioned by the International Astronomical Union and supported by the NEO Observations Program.

NASA-funded surveys have found 98 percent of the known catalog of over 17,000 near-Earth objects (only a little more than 100 of these objects are comets). These surveys are currently finding NEOs at a rate of about 1,800 per year. The current objective of the NEO Observations Program is to find, track, and catalog at least 90 percent of the estimated population of NEOs that are equal to or greater than 140 meters in size in coming years and to characterize a subset of those objects that is representative of the entire population. Not quite half of the known catalog of NEOs – almost 8,000 – are objects larger than 140 meters in size. The estimated population of NEOs of this size is about 25,000. Current surveys are finding NEOs of this size at a rate of about 500 per year.

**How can we defend Earth from asteroid impacts?**

We can defend Earth from asteroid impacts by planning for planetary defense which entails:

- Finding and tracking near-Earth objects;
- Characterizing NEOs to determine their orbit trajectories, size, shape, mass, composition, rotational dynamics and other parameters, so that experts can determine the severity of a potential impact event, warn of its timing and potential effects, and determine ways to mitigate the impact; and
- Planning and executing measures to deflect a NEO that is on an impact course with Earth, or to mitigate the effects of an impact that cannot be prevented. Mitigation measures include evacuation of the impact area and movement of critical infrastructure such as public utilities, food and water supplies, medical facilities, transportation systems, and power generation and distribution.

**What is NASA doing to prepare for planetary defense?**

NASA has a Planetary Defense Coordination Office (PDCO) located at NASA Headquarters in Washington, D.C. Its responsibilities include:

- Ensuring the early detection of potentially hazardous objects (PHOs) – asteroids and comets whose orbits are predicted to bring them within 5 million miles (8 million kilometers) of Earth; and of a size large enough to reach Earth's surface – that is, greater than around 30 to 50 meters;
- Tracking and characterizing PHOs and issuing warnings about potential impacts;
- Providing timely and accurate communications about PHOs; and
- Performing a lead coordination role in U.S. Government planning for response to an actual impact threat.

The PDCO relies on data from projects sponsored by NASA's Near-Earth Object (NEO) Observations Program.

For more information, visit:

*www.nasa.gov/planetarydefense/overview*

*https://cneos.jpl.nasa.gov*

*www.minorplanetcenter.net*