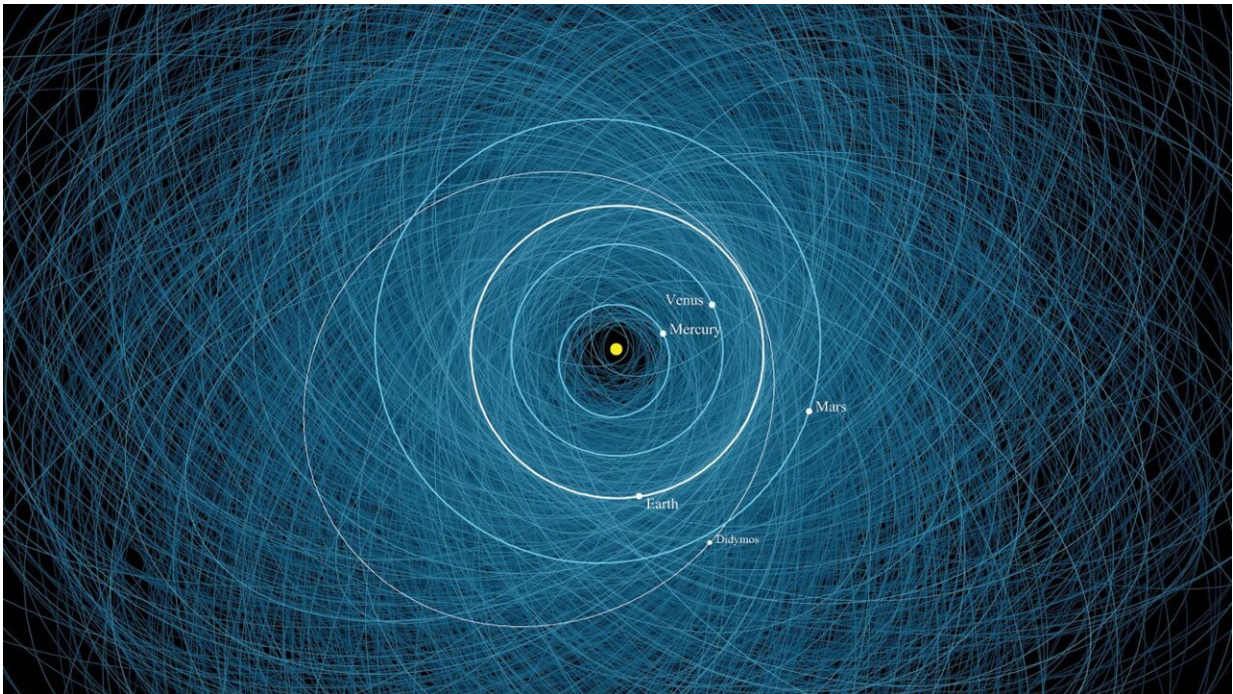


Here's how NASA is planning to protect Earth from asteroids and comets

April 25 2023, by Nancy Atkinson



This diagram shows the orbits of 2,200 potentially hazardous objects as calculated by JPL's Center for Near Earth Object Studies (CNEOS). Highlighted is the orbit of the double asteroid Didymos, the target of NASA's Double Asteroid Redirect Test (DART) mission. Credit: NASA/JPL-Caltech

The large impact craters dotting our planet are powerful reminders that asteroids and comets strike the Earth from time to time. As often said, it's not a question of "if"; it's a matter of "when" our planet will face an

impending strike from space. But an impact is one existential threat humanity is finally starting to take seriously and wrap its head around.

Seemingly spurred by the success of the Double Asteroid Redirection Test (DART), NASA just released a new planetary defense strategy and action plan, describing its efforts to find and identify potentially hazardous objects to provide an advanced warning, and then even push them off an impact trajectory.

This 10-year strategy looks to advance efforts to protect the Earth from a devastating encounter with a Near Earth asteroid or comet.

"An asteroid impact with Earth has potential for catastrophic devastation, and it is also the only natural disaster humanity now has sufficient technology to completely prevent," said Lindley Johnson, NASA's planetary defense officer, in a NASA press release. "The release of this NASA strategy steps up NASA's intentions for the next 10 years to ensure the agency works both nationally and internationally to protect our planet for the benefit of all."

The 46-page "NASA Planetary Defense Strategy and Action Plan" ([pdf document](#)) was released on April 18, 2023 and follows another document that was put out on April 3 by the White House Office of Science and Technology Policy, "National Preparedness Strategy and Action Plan for Near-Earth Object Hazards and Planetary Defense" ([pdf document](#)).

Each of the reports focuses on enhancing the detection, characterization and responses to impact threats as well as improving international cooperation for coordinating strategies among government agencies.

NASA wants to focus on six key areas for planetary defense over the next decade:

- Improving NEO survey, detection, and characterization efforts to work toward a completed catalog of all NEOs that might pose an impact hazard to Earth
- Developing and demonstrating NEO mitigation technologies similar to the agency's Double Asteroid Redirection Test (DART) mission, the world's first planetary defense test mission, which successfully demonstrated one method of asteroid deflection using a kinetic impactor spacecraft
- Fostering [international collaboration](#) related to NEO surveying and mitigation to leverage international capabilities
- Strengthening interagency coordination between NASA and other U.S. [government agencies](#) to enhance and streamline U.S. government NEO preparedness and response planning
- Review the agency's internal planning to maximize the benefits obtained from limited resources
- Better integrate messaging regarding planetary defense work with the agency's strategic communications

Each of the strategy objectives are defined into short-term, medium-term, long-term, and ongoing timelines with the goal of meeting all objectives within the next 10 years.

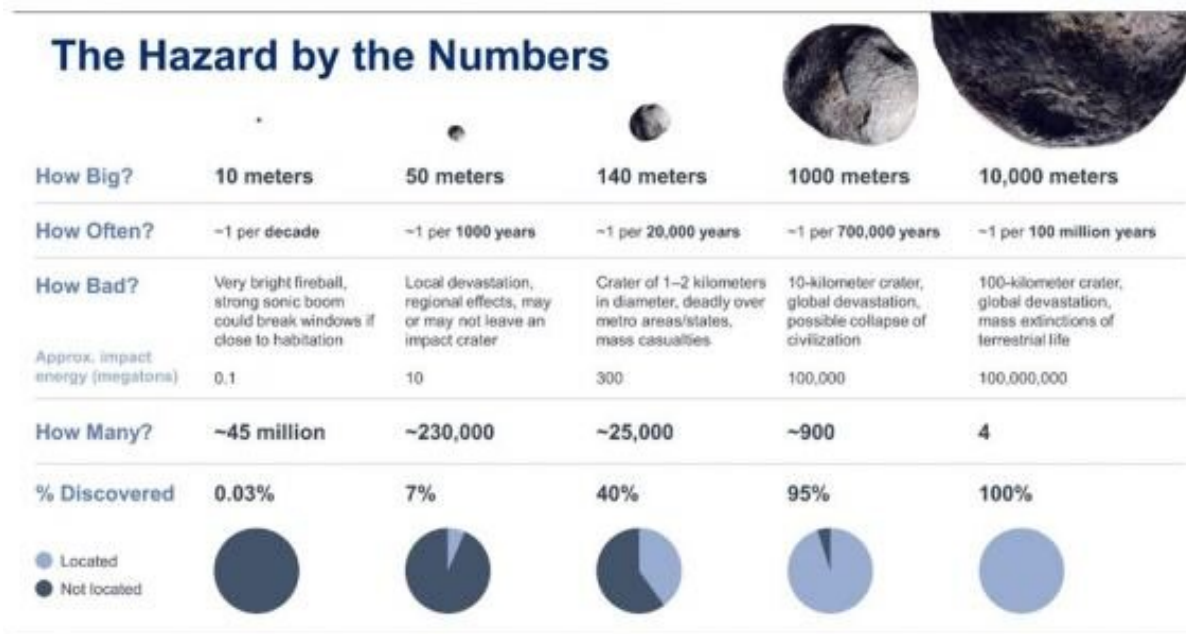


Figure 3: NEO size and hazard. (Credit: Johns Hopkins University / Applied Physics Lab)

NEO size and hazard. Credit: Johns Hopkins University / Applied Physics Lab

The Near Earth Objects (NEOs) that NASA feels are of most concern range in diameter from 10 m (33 ft.) to more than 10,000 meters (33,000 ft), and that come within 42 million km (30 million miles) of the Earth's orbital path.

For decades, scientists and other proponents have been championing the need for humanity to prepare for an what will certainly happen at some point. Apollo astronaut Rusty Schweickart, who helped found the planetary defense nonprofit advocate B612 Foundation has talked with Universe Today numerous times about planetary defense. Even back in 2010, he emphasized that the technology needed to divert an asteroid already existed.

"That is, we do not have to go into a big technology development program in order to deflect most asteroids that would pose a threat of impact," he said. He also added that coordination and cooperation between countries around the world was essential, and would perhaps be even more difficult to organize than the technology.

"Bureaucracy is the most likely reason we will be hit with an asteroid in the future, not the technology," said Schweickart. "That is an audacious statement to make, but if we can get past that and do our jobs right we should never be hit in the future by an asteroid that could threaten life on Earth. And it's going to be a heck of a challenge."

Of course, finding the NEOs that are potentially on course for our planet is key. One such mission is now officially on track. The Near Earth Object (NEO) Surveyor mission is a space telescope to detect near Earth asteroids as part of NASA's planetary defense efforts. The [fiscal year](#) 2023 omnibus spending bill enacted in December directed NASA to spend no less than \$90 million on this mission and it is tentatively set to launch no earlier than 2028.

The DART mission was a key milestone for addressing the need for testing ways to deflect an asteroid. On Sept. 26, 2022, DART slammed into Dimorphos, a 530-ft. asteroid moonlet almost 7 million mi. from Earth and successfully demonstrated a kinetic-impact strategy for diverting an NEO on a course to strike the Earth. Dimorphos does not pose an actual threat, but was chosen for the test because it and its larger parent asteroid, Didymos, could be observed from Earth before and after the encounter to measure the effectiveness of a kinetic impact.

"As we saw with the success of the DART mission, NASA is committed to protecting Earth from potentially hazardous asteroids and comets," said NASA Administrator Bill Nelson. "Planetary [defense](#) benefits all of humanity and NASA's strategy and action plan outlines how we will

continue to protect our home planet over the next decade."

NASA says that the release of this plan of action is an important step forward in ensuring the momentum of DART and the upcoming NEO Surveyor mission continues to move forward for safeguarding Earth from potentially hazardous NEOs for generations to come.

Provided by Universe Today

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