

# NASA-supported search programs that detect and track near-Earth objects

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A few NASA-funded astronomer teams are always on the hunt for potentially hazardous near-Earth objects, asteroids and comets whose orbits periodically bring them within 30 million miles of Earth's orbit. At NASA, the Planetary Defense Coordination Office supports the search programs, while also planning and coordinating any response to possible asteroid impacts.

Lindley Johnson Heads up this NASA office. He says, "We oversee several NASA-supported search programs that detect and track near-Earth objects," he explains. "The rate of asteroid discovery has increased considerably due to these dedicated astronomers and to upgraded telescopes coming online in recent years."

As part of NASA's planetary defense strategy, the Center for Near Earth Object Studies at the Jet Propulsion Laboratory analyzes the data collected on near-Earth objects and publishes the running statistics on numbers and types discovered.

Johnson says, "After almost 20 years of searching, over 93% of the near-Earth objects larger than one kilometer (.62 miles) are already discovered. The focus is now on finding 90% of those larger than 140 meters (450 feet). Almost 7,700 of these are now being tracked, but we believe there are still over twice that number out there to be found."

NASA is not only hunting asteroids, it's also working on ways to defend Earth against them. Astrodynamacists at the Center for Near Earth Object Studies predict orbits a century into the future to determine whether there are any risks for impact.

Johnson says, "Asteroid impacts are predictable and preventable. If we can find them before they strike, we can precisely predict their paths and time of possible impact. And we now have the space technologies to divert them."

For example, if an approaching asteroid were detected early enough, its path could be altered by using a large spacecraft as a 'gravity tractor.' It would fly alongside the asteroid for an extended time and slowly pull it out of Earth's path using nature's virtual tug-rope—gravity. Another method involves sending a heavy, high-speed spacecraft into the path of an approaching [object](#) to strike it at the right time and place. This technique, called the kinetic impactor, could slow or speed up the asteroid into a different trajectory, away from the Earth's path.

And then there's the Hollywood option.

"This is a last resort measure," says Johnson. "It involves exploding a device close enough to an asteroid that the super-heated surface material blows off, creating a powerful, rocket-like push. Though quite effective if time is short, it would take a lot of coordination and approval not only within the U.S. government, but also with the international community. Another reason we should find any impactors as early as possible is so more benign methods can be used."

All these techniques are in some stage of study or design. Meanwhile, the hunt for [potentially hazardous asteroids](#) goes on.

Johnson says, "After all, at NASA every day is an Asteroid Day."

Provided by NASA

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