

Scientists seek to corral asteroid for study

May 13 2013, by Lisa M. Krieger

Scheming to rearrange the heavens, scientists are busy planning how to pluck, push and park a spinning asteroid between here and the moon. While most of us hope to dodge space rocks, NASA has unveiled an ambitious, \$105 million plan to build a spaceship to drag one closer to Earth. It's the Space Age equivalent of bringing the mountain to Muhammad and a first step in our future voyage to Mars.

"Our goal is to go out there and rendezvous - then get it into the hands of the people who can understand it," said David Korsmeyer, director of the Engineering Directorate at Mountain View, Calif.'s NASA Ames Research Center, which will contribute to the project.

Asteroids command our respect because a big one could play us like a billiard ball. February's twofer - a little one rocked Russia and a bigger one was a near miss - only added to the anxiety.

But they're also valuable, and pursuing one could launch us into deeper space.

That's because we'll need a vehicle a whole lot better than a fuel-driven rocket. With an infusion of new NASA money, engineers hope to design a futuristic solar-electric vehicle that would make a slow, steady and sustainable trip to find an [asteroid](#). It's the journey, not just the destination, that thrills scientists.

After finding a suitable space rock orbiting our way, the spaceship might push, tug or harpoon the asteroid. Or it might stuff the rock into a big

bag, or perhaps lasso it in some 21st century version of a Roy Rogers rope trick.

"As a space-faring country it has been more than 40 years since we have been to deep space," out where asteroids lurk, said Stanford University aeronautics professor G. Scott Hubbard, who conceived the Mars Pathfinder mission and formerly directed NASA Ames.

"We need to regain our 'chops,' " he said. "It's a demonstration of space exploration technologies for the future."

The "Asteroid Retrieval Mission" is still under development in Washington, D.C., where it is a major new goal for an agency that has retired the shuttle fleet and grounded a moon-landing plan.

Suggested last year by the Keck Institute for Space Studies at the California Institute of Technology, the idea has found favor at the White House Office of Science and Technology Policy. In his sole space speech, President Barack Obama vowed we would land on an asteroid by 2025. There's a cooler reception in the budget-wrangling Congress.

Developing the technologies needed to bring home an asteroid will greatly boost costs, warned Stanford's Hubbard. The \$105 million is just a down payment on a project that could cost billions of dollars.

"I would caution the developers to be very clear-minded and open-eyed about what the ultimate cost ... might be," he said.

In the summer, Ames and other NASA research centers will gather their scientists to work out the details.

At Ames, "we can provide tools that make the mission more successful," Korsmeyer said.

For instance, he said, Ames scientists could devise tools similar to their CheMin device aboard the Mars rover that analyzes the composition of Martian rocks. Ames could also build sensors to help find an asteroid.

Most asteroids live too far away to be useful when they're not crashing into, for example, Russia. And some are huge.

But petite ones - say, the size of a dump truck - might be practical to grab using unmanned spaceships, NASA says.

Asteroids are the rubble left from the formation of our solar system about 4.6 billion years ago and hold clues about our origins and, perhaps, valuable metals.

Although the main goal is not to protect the Earth from an errant [space rock](#), the technology developed "could prove useful in diverting a larger, rogue asteroid," said planetary scientist and former astronaut Tom Jones, an adviser to the asteroid-seeking B612 Foundation.

The hunt won't be easy: The perfect asteroid will be tough to find because it will be too small to reflect light.

Moreover, it doesn't want to be captured. NASA calls it "an uncooperative object" - moving at 17,000 mph, content in its own orbit, and spinning like a top. It may not even be solid, like granite, but just a tumbling bunch of rocky ice.

Then there's the challenge of intercepting it. Korsmeyer calls it "a multivariable math game." Envision catching a baseball while on a Ferris wheel.

Once captured, it would be slowly pushed or pulled, and nudged close to the moon.

There, remote-controlled ships would arrive to chip off chunks for study. Eventually, astronauts would visit it.

"It's not a trivial undertaking," Korsmeyer said. "You are lining up a whole set of moving balls to try to put one in the pocket."

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