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## Scientists see no asteroid threat ... yet

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DENVER, Feb. 13 (UPI) -- Of about 650 large, near-Earth asteroids that have been identified and tracked so far, none poses a direct threat to the planet within the next century or two, astronomers reported Thursday.

However, the astronomers added, those objects represent only about 60 percent of the largest bodies estimated to have the potential to strike the planet, and comets also comprise a threat that will remain unquantifiable for some time to come.

"We just don't know about the (450 or so other large bodies) and we know nothing about the small ones," said David Morrison, senior scientist at NASA's Astrobiology Institute at the Ames Research Center in Mountain View, Calif.

However, Morrison said, the current assessment represents substantial progress in identifying potentially dangerous near-Earth objects -- of which a new one is found almost once a day -- over what was known a decade ago, when the program called the Spaceguard survey was begun. He delivered his remarks at a panel discussion on near-Earth asteroids at the American Association for the Advancement of Science's annual meeting.

Spaceguard is a 25-year effort to identify and track objects, both asteroids and what are called short-period comets, that potentially endanger Earth. The first part of the effort requires identifying objects that have a diameter of about 1 kilometer (about 0.62 mile) or greater. Objects of that size could strike Earth with a force to wipe out most of civilization.

Future surveys could be designed to locate objects as small as about 50 meters (160 feet) in diameter, such as the one that struck the Tunguska area of Siberia in 1908 and leveled a circular area nearly 40 kilometers (25 miles) in diameter. Such objects strike Earth about once every thousand years.

Lee Clarke, a sociologist with Rutgers, the State University of New Jersey, said perhaps the most challenging problem in the search for dangerous objects is how to communicate prospective events to the public -- an application he and the other panels said has relevance to America's current heightened state of alert. He urged government officials to discount the possibility of mass panic because of possible acts of terror.

"Probably the single most important reason there weren't more World Trade Center fatalities (during the attack of Sept. 11, 2001) was because people did not panic," Clarke said. "If you give people specific and credible warnings, they will follow the instructions," he added. "Just upping the (alert) level to orange and telling people to buy plastic is not effective," he said, referring to recent instructions to citizens in certain U.S. cities to prepare for a possible chemical or biological attack.

Clarke cited the examples of fire drills held regularly in every school building, the hurricane evacuation plans issued in coastal areas and, historically, the air raid alerts given to citizens of London during the Blitz in World War II.

Just as in dealing with terror, authorities responsible for asteroid impact warnings would face twin dilemmas, Clarke continued. They would have to communicate the risks of a catastrophe and then, perhaps, react to its aftermath. However, they would face an additional problem: the possibility of a very long lead time.

"Who is going to think it through if we have (to wait) 200 years?" Clarke asked.

Geoff Sommer, a policy analyst with the RAND Corporation in Santa Monica, Calif., said a continuing problem associated with the search for dangerous objects is the challenge of communicating just the right amount of warning.

"We've already had several asteroid scares," Sommer said, referring to news reports over the past couple of years involving possible impacts, arriving anywhere from 18 years to more than 100. "We need to counteract the social costs of warning," he added.

Clark Chapman, a planetary scientist with the Southwest Research Institute in Boulder, Colo., described how, given enough warning, the technology already exists to nudge an errant asteroid out of its collision course with Earth.

The process would involve sending a spacecraft to rendezvous with the object as long before a potential impact as possible. Then, using rocket engines or other, non-explosive means, the craft would disrupt the asteroid's orbital path just enough to avoid disaster. At least, Chapman said, that is the possibility for asteroids.

"Comets are another story," he said, explaining the icy blobs originate in the outer solar system where they are extremely difficult to detect. Instead of years or even decades of warning, as with the asteroids that have been detected, comets travel at a much higher velocity, and new ones would be detected only months ahead, at best.

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