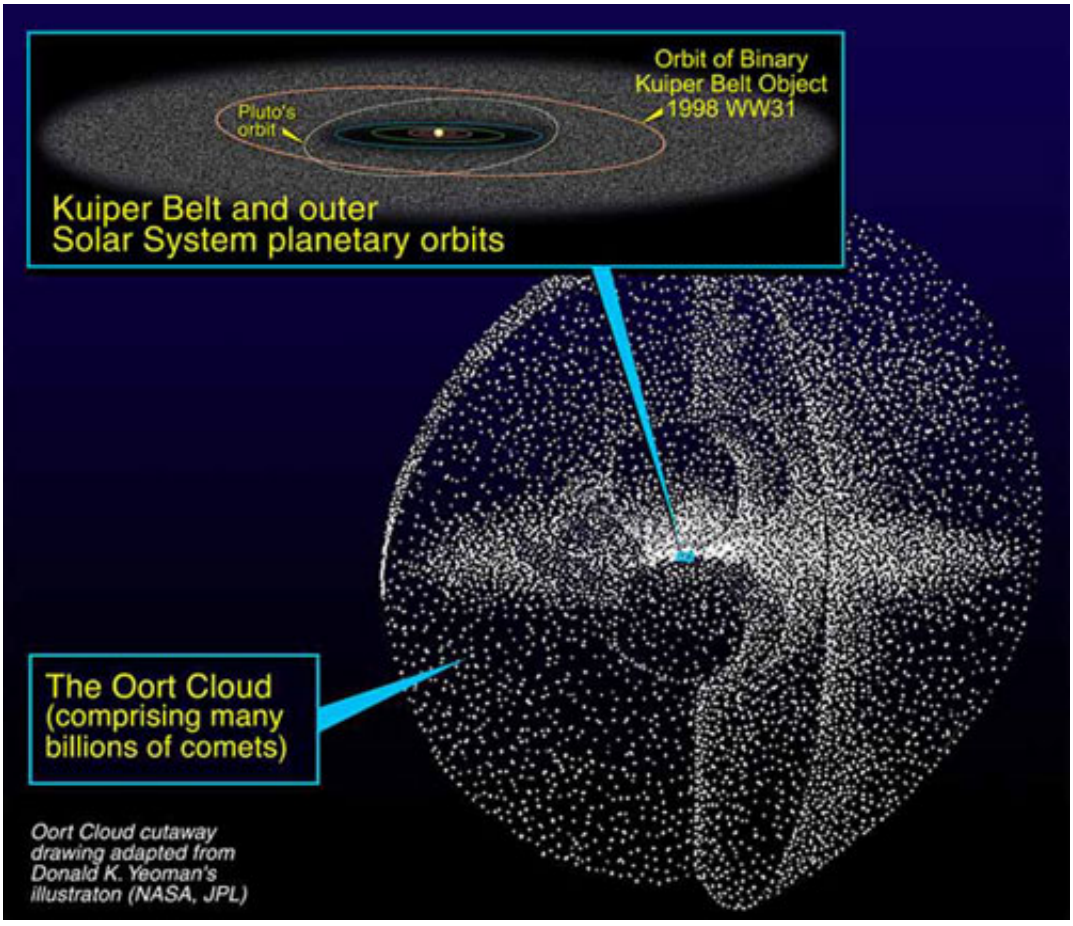
A possible naked-eye comet in March

February 9 2013, by Dr. Tony Phillips



An artist's concept of the Oort cloud. Credit: NASA

Far beyond the orbits of Neptune and Pluto, where the sun is a pinprick of light not much brighter than other stars, a vast swarm of icy bodies circles the solar system. Astronomers call it the "Oort Cloud," and it is the source of some of history's finest comets.

One of them could be heading our way now.

Comet Pan-STARRS was discovered by the Panoramic Survey Telescope & Rapid Response System atop the Haleakala volcano in Hawaii. Astronomers use the massive 1.8 meter telescope to scan the heavens for Earth-approaching objects, both asteroids and comets, that might pose a danger to our planet. In June 2011 a comet appeared, and it was named "Pan-STARRS" after the acronym for the telescope.

In early March, the comet will pass about 100 million miles from Earth as it briefly dips inside the orbit of Mercury. Most experts expect it to become a naked-eye object about as bright as the stars of the Big Dipper.

"But" says Karl Battams of the Naval Research Lab, "prepare to be surprised. A new comet from the Oort Cloud is always an unknown quantity equally capable of spectacular displays or dismal failures."

The Oort cloud is named after the 20th-century Dutch astronomer Jan Oort, who argued that such a cloud must exist to account for all the "fresh" comets that fall through the inner solar system. Unaltered by warmth and sunlight, the distant comets of the Oort cloud are like time capsules, harboring frozen gases and primitive, dusty material drawn from the original solar nebula 4.5 billion years ago. When these comets occasionally fall toward the sun, they bring their virgin ices with them.

Because this is Comet Pan-STARRS first visit, it has never been tested by the fierce heat and gravitational pull of the sun. "Almost anything could happen," says Battams. On one hand, the comet could fall apart—a fizzling disappointment. On the other hand, fresh veins of frozen material could open up to spew garish jets of gas and dust into the night sky.

"Because of its small distance from the sun, Pan-STARRS should be very active, producing a lot of dust and therefore a nice dust tail," predicts Matthew Knight of the Lowell Observatory.

"However," he cautions, "it could still be difficult to see. From our point of view on Earth, the comet will be very close to the sun. This means that it is only observable in twilight when the sky is not fully dark."

The best dates to look may be March 12th and 13th when Pan-STARRS emerges in the western sunset sky not far from the crescent Moon. A comet and the Moon, together, framed by twilight-blue is a rare sight. "My guess is that the primary feature visible to the naked eye will be the gaseous coma around the head of the comet," says Knight. "The comet's tail will probably require binoculars or a small telescope."

Two other key dates are March 5th when the comet comes closest to Earth (about 100 million miles away) and March 10th, when the comet comes closest to the sun. The dose of solar heating it receives just inside the orbit of Mercury could be just what the comet needs to push it into the realm of naked-eye visibility.

Comet Pan-STARRS should not be confused with another, even better comet coming later this year. In Nov. 2013, Comet ISON could shine as brightly as a full Moon in broad daylight when it passes through the atmosphere of the sun:

"Two bright comets in one year is a rare treat," says Battams. "This could be good."

Source: Science@NASA

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