

# Astronomers discover missing link for origin of comets

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(PhysOrg.com) -- An international team of scientists that includes University of British Columbia astronomer Brett Gladman has found an unusual object whose backward and tilted orbit around the Sun may clarify the origins of certain comets.

In the first discovery of its kind, researchers from Canada, France and the United States have discovered an object that orbits around the Sun backwards, and tilted at an angle of 104 degrees – almost perpendicular to the orbits of the planets.

"Certain types of comets are not naturally produced after planet formation, especially those with highly tilted orbits," says Prof. Gladman. "This discovery may finally show how they transition from the Oort Cloud to become objects like Halley's Comet."

Composed of icy rock, 2008 KV42 is called a "trans-Neptunian" object since its orbital path is larger than that of Neptune. The object is roughly 50 kilometres across and at present 35 times further from than the Sun than Earth.

The orbits of such objects in the region beyond Neptune's orbit provide fresh insights into the early history of our solar system, says Gladman, who teaches in the Dept. of Physics and Astronomy and holds the Canada Research Chair in Planetary Astronomy.

The international team has been carrying out a targeted search for

objects with highly tilted orbits. Their discovery was made using the Canada-France-Hawaii Telescope in Hawaii, with follow-up observations provided by the MMT telescope in Arizona, the Cerro Tololo Inter-American Observatory (CTIO) four-metre telescope in Chile, and the Gemini South telescope, also in Chile, in which Canada is a partner.

"Having quick access to the MMT and Gemini South telescopes, via the generous support of the observers and directors, was critical here. Given the highly unusual orbit, the object would have been lost without the rapid tracking from these large telescopes," says Gladman.

The discovery team is currently performing follow-up observations of 2008 KV42 to pin down its orbit with greater precision. They will then begin unravelling the archaeological information trapped in the orbit of this highly exceptional member of the trans-Neptunian population.

Additional information about 2008 KV42 can be found at [www.cfeps.net](http://www.cfeps.net) .

Source: University of British Columbia

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