THE FIRST KNOWN INTERSTELLAR ASTEROID

This artist's impression shows the 1st interstellar asteroid, which has been named `Oumuamua. Data analysis reveals that is is a dark red highly-elongated metallic or rocky object, about 400 meters long, unlike anything normally found in our solar system.

A few weeks ago a small object was reported visiting us from beyond our solar system. Now astronomers have scrutinized data from this object, which has been given the name `Oumuamua, and which must have travelled through space for millions of years before its chance encounter with our star system. **The conclusion is that it's a dark, reddish, highly-elongated rocky or high-metal-content object. And, indeed, it is the first known asteroid from interstellar space**.

These new results were published on November 20, 2017 in the peer-reviewed journal Nature.

Some astronomers thought the object was a comet when the Pan-STARRS 1 telescope in Hawai`i first picked it up on October 19, as a faint point of light moving across the sky. Others thought it looked like a typical fast-moving small asteroid. As they tracked its motion through space, astronomers began to be able to calculate its orbit, showing beyond any doubt that this body did not originate from inside our solar system, like all other asteroids or comets ever observed.

Instead, this object was doubtless from interstellar space.

Observations revealed no signs of cometary activity after it passed closest to the sun in September 2017. It has now been reclassified as an interstellar asteroid – the first ever observed – and named 1I/2017 U1 ('Oumuamua). A statement from the Institute for Astronomy (IfA) at the University of Hawaii described the intricacies of naming this object:

> *Originally denoted A/2017 U1 (with the A for asteroid), the body is now the first to receive an I (for interstellar) designation from the International Astronomical Union, which created the new category after the discovery. In addition, it has been officially given the name `Oumuamua. The name, which was chosen in consultation with Hawaiian language experts* ***Ka`iu Kimura*** *and* ***Larry Kimura****, reflects the way this object is like a scout or messenger sent from the distant past to reach out to us (`ou means "reach out for", and mua, with the second mua placing emphasis, means "first, in advance of").*

The object's full official name is 1I/2017 U1 (`Oumuamua), and can also be correctly referred to as 1I, 1I/2017 U1, and 1I/`Oumuamua.

But all of that – name, designations, characterizations of the object – came later. First, astronomers had to observe it and try to understand just what this speedy visitor to our solar system might be. And they had to do it quickly. By the time earthly telescopes first noticed it, `Oumuamua had already passed its closest point to the Sun, and was heading back into interstellar space. An international team lead by astronomer **Karen Meech** of IfA observed the object. They gathered data from telescopes around the world, including the Canada-France-Hawaii Telescope (CFHT), the United Kingdom Infrared Telescope (UKIRT) and the Keck Telescope on Maunakea, the Gemini South telescope, and the European Southern Observatory (ESO) Very Large Telescope (VLT) in Chile. These observations led to detailed measurements of the visitor's properties. Meech commented: "This thing is very strange. What we found was a rapidly rotating object, at least the size of a football field, that changed in brightness quite dramatically. This change in brightness hints that `Oumuamua could be more than 10 times longer than it is wide – something which has never been seen in our own solar system."

At first – by looking backwards along the orbit that had been calculated for `Oumuamua – astronomers suggested the object had come from the approximate direction of the bright star Vega, in the northern constellation Lyra the Harp. But, although it's travelling about 95,000 km/hour, `Oumuamua would have taken about 300,000 years to journey to our solar system and Vega may not have been at that position when the asteroid was there.

According to astronomers 'Oumuamua may well have been wandering through the Milky Way, unattached to any star system, for hundreds of millions of years before its chance encounter with the solar system.

AK, with EarthSky Notes