

Portable Telescopes Reveal the Silhouette of Next New Horizons Flyby Target

NASA's New Horizons spacecraft is cruising into the Kuiper Belt to fly past its next target, 2014 MU69, on January 1, 2019. "MU69" will be the most distant object ever visited by a spacecraft. Discovered in 2014 by the Hubble Space Telescope (HST), MU69 is so faint that no ground-based telescope has ever detected it, and even HST cannot determine the size or shape of this primordial object.

One way to measure the size and shape of MU69 is to observe a star when MU69 passes directly in front of, or "occults", the star and casts its shadow on the Earth. By precisely measuring the duration of the time that the star disappears, scientists can determine the size and shape of MU69. In the summer of 2017, three of these stellar "occultations" by MU69 took place on June 3, July 10, and July 17. Critical predictions of the shadow path were provided by precise measurements from HST and ESA's Gaia satellite.

NASA deployed twenty-five portable telescopes to South Africa and Argentina and the airborne Stratospheric Observatory for Infrared Astronomy (SOFIA) over the Pacific ocean to witness these occultation events. On July 17, five occultation "chords" observed by the telescopes in Argentina revealed that MU69 has an unusual shape; it actually might be two objects approximately 20 and 18 kilometers (12 and 11 miles) across, or it may be a single, elongated object. That is just one of the mysteries New Horizons will resolve when it encounters MU69 in 2019.

