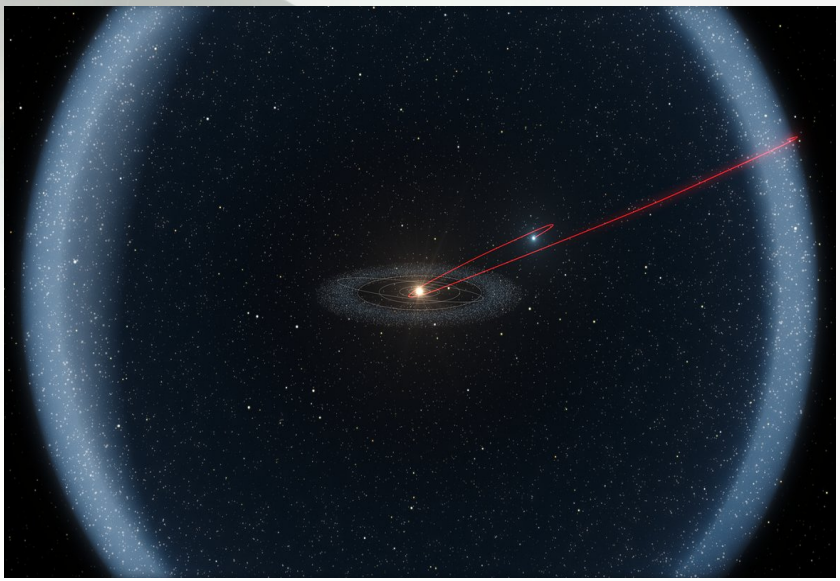
From the Inner Solar System to the Oort Cloud and Back Again: A Comet's Tale

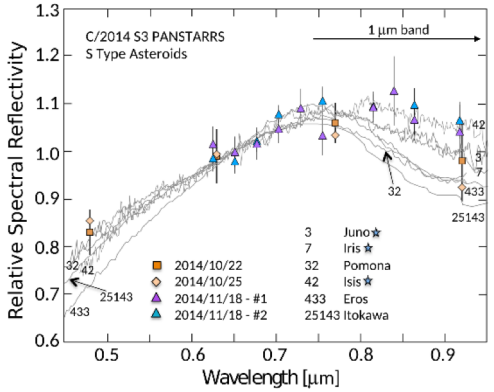
Discovered in 2014 by the Pan-STARRS-1 survey, long period comet C/2014 S3 (PANSTARRS), is nearly inactive. It has a short tail representing weak activity with H_2O sublimation 5-6 orders of magnitude less than that of typical long period comets. Dubbed a "Manx" comet after the tailless cat, it also has some spectrophotometric characteristics of certain classes of rocky asteroids residing in the inner part of the main asteroid belt.

Artist's impression of the surface of C/2014 S3 (
Credit: ESO/M. Kornmesser.

Recent dynamical models provide different predictions on the presence of rocky material expelled from the inner solar system to reside for a long time in the Oort cloud. *C/2014 S3 could be the key to verifying these predictions of the migration-based dynamical models.*



The probable history of the orbit of C/2014 S3 in both the inner and outer solar system over four billion years. Most of the comet's time was spent in the region of the Oort Cloud. Credit: ESO/C. Calcada



Weakly active Manx comet shows a spectrum similar to some types of rocky inner solar system asteroids. This may provide support for a key prediction of solar system formation models.

Meech et al. 2016 http://advances.sciencemag.org/content/2/4/e1600038