Identification of Recent Near-Earth Asteroid Disruption Events: Implications for the Earth's Meteor Environment

Nicholas Moskovitz, Petr Fatka, Davide Farnocchia, Maxime Devogele, David Polishook, Cristina A. Thomas, Michael Mommert

Collisional families and genetically related pairs of asteroids have been studied in the Main Belt for many decades. However, due to complex dynamics and incompleteness in the catalog of known near-Earth objects (NEOs), such associations have largely evaded detection in near-Earth space. We will present data and analysis that supports the existence of two new genetically-related NEO pairs. The components of these pairs are not in gravitationally bound configurations like binary asteroids, but they do share extremely similar heliocentric orbits. Our analysis suggests likely formation via YORP spin-up and/or dissociation of a binary precursor, and in one case a separation age of <10 kyr, making this particular system amongst the youngest multiple asteroid systems known to date. We will present an overview of these newly identified NEO pairs and discuss implications of their formation for the meteor flux at Earth.