

COMETS

Seeing double

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Asteroids come in all shapes and sizes and hold records within them of the primordial condition of our Solar System. And in a few cases they come in twos. While several binary (and even a few triple) asteroids are known to us, Jessica Agarwal and collaborators report the surprising discovery of a binary asteroid, 288P, that shows comet-like activity. Originating in the main-belt of asteroids, 288P shows a peculiar combination of properties that sets it apart.

Hubble Space Telescope observations of 288P as it passed close to Earth not only revealed its binary nature but, through the analysis by Agarwal et al., they indicated that the system is made up of two almost equal-size asteroids that are found in a highly elliptical and widely separated orbit. While the size and separation of 288P does not allow the authors to conclude whether one or both of the asteroids are experiencing sublimation leading to their comet-like appearance, it is still puzzling how the system managed to attain such a wide separation.

Rotational fission or catastrophic collision events can create binary asteroids. The former — a plausible mechanism to create equal-sized companions — can only create binaries with separations less than half of what is observed for 288P. Catastrophic collisions, on the other hand, could create a widely separated binary asteroid, but the alignment of 288P's binary orbit with its heliocentric orbit would then be highly unlikely. Agarwal et al. conclude that the most probable evolutionary scenario is that 288P broke into two due to rotation but then sublimation torques widened its separation.

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