

The extreme Centaur 2013 AZ₆₀

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2013AZ₆₀ is an extreme Centaur moving on a highly eccentric orbit of $e = 0.9922$, with a semimajor axis of 1021.09 au, and a perihelion distance of 7.91 au. 2013AZ₆₀ was observed with the PACS camera of the Herschel Space Observatory, and, using these thermal emission measurements, we were able to derive an effective size of 66.5 ± 3.7 km in diameter, and a geometric albedo of $p_V = 0.026 \pm 0.003$. Photometric measurements revealed a low-amplitude lightcurve (0.045 ± 0.007 mag in the r' band) with a likely full period of $P = 9.39$ h. The dynamical analysis shows that the orbit of 2013AZ₆₀ is highly unstable, with a ~ 50 per cent probability that the target is ejected from the Solar System after about 700 kyr. This high level of instability indicates that 2013AZ₆₀ may just have recently been captured to its current orbit. Investigating the total time the target could have spent at small heliocentric distances (< 100 au), it seems to be likely that this has only been at most 100 to 1000 years and it has a low probability that the target could reach Earth-crossing orbits (i.e., < 1 au). As the likely origin of this target is the Oort Cloud, these together suggests a relatively unaltered, pristine surface, in contradiction with the very low albedo (~ 2.6 per cent) derived from the thermal infrared measurements which rather indicates an "extinct cometary" surface, also in agreement with the photometric colors.

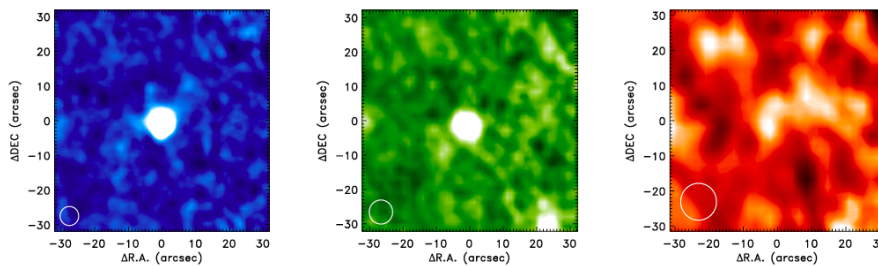


Figure: Herschel/PACS images of 2013 AZ₆₀ at 70 (left), 100 (middle), and 160 μ m (right).

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