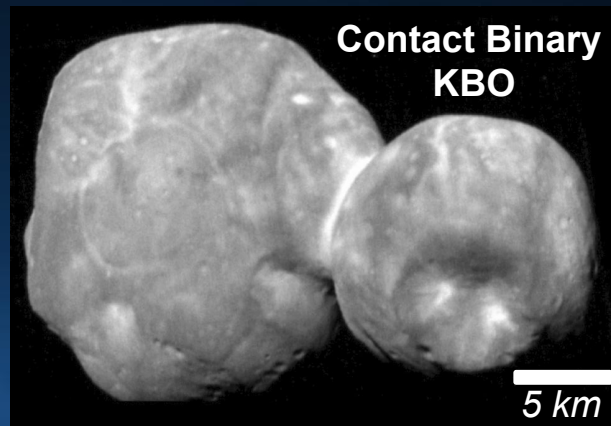


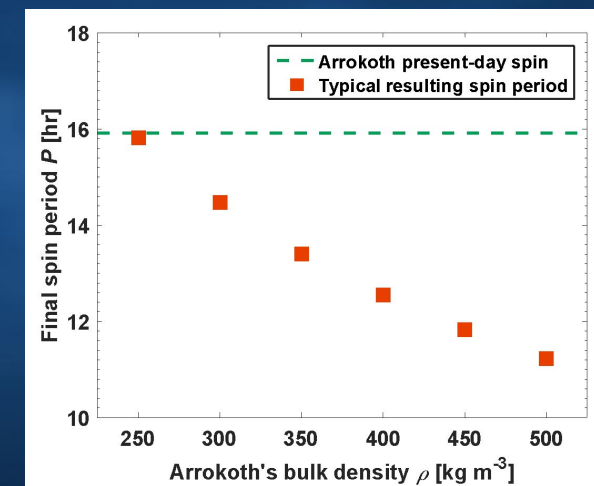
The Remarkably Low Density of Kuiper Belt Object Arrokoth



Arrokoth as seen by New Horizons

NASA's New Horizons spacecraft flew close by Arrokoth, the first explored Kuiper Belt Object (KBO), in 2019. Given that images show Arrokoth is comprised of two lobes, scientists are interested to understand how it formed.

- Arrokoth's shape and spin axis alignment indicate that the KBO formed by the gentle merger of two objects rotating around each other. However, Arrokoth's spin period is much slower than expected if the two objects had the same density as a packed snowball, as is measured in some comets.
- Numerical simulations (bottom left) show that the small KBOs hitting Arrokoth could have slowed down its post-merger spin, but not enough to explain its current 16-hour spin period, unless its density is at least two times lower than expected from typical comets.
- Therefore, Arrokoth may be a remarkably low-density, highly porous object with a bulk density similar to that of settled snow. This result has important implications for both KBO formation and comet evolution.



Simulation results of how KBOs hitting Arrokoth could have affected its spin.