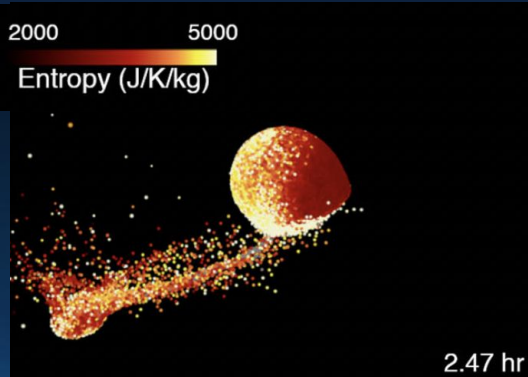


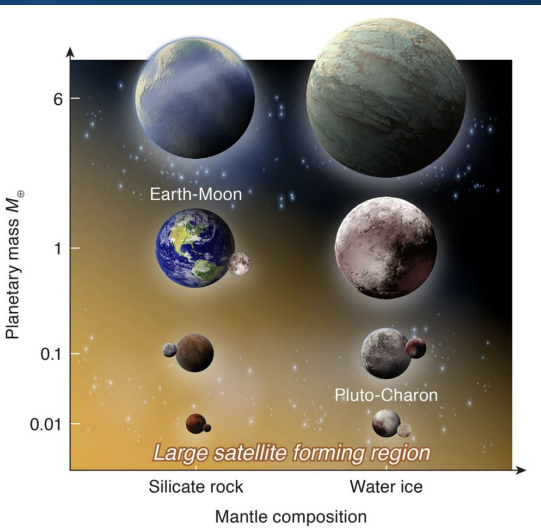
Only small planets can form fractionally large moons!



Giant impact simulation with SPH. The color shows the mantle entropy.

A recent study found that only small planets (< 1.6 Earth radii) can form impact-induced moons that are large with respect to the sizes of their host planets.

- Our Moon formed from a disk generated by a planetary impact. Given that planetary impacts are common, one might expect that impact-induced moons are common as well in the solar and extrasolar systems.
- However, no exomoon (moons in extrasolar systems) has been confirmed to date. This may mean that not all planets can form impact-induced large moons.
- A recent study conducted giant impact simulations with the smoothed particle hydrodynamics (SPH) method and found that large (>1.6 Earth radii) terrestrial (rocky) and icy planets produced completely vapor disks that are not capable of forming large impact-induced moons because growing moons experience strong gas drag and fall toward the host planet too quickly. In contrast, smaller planets produced more vapor-poor disks, which do not have this gas drag issue.
- The results of this study suggest that small (<1.6 Earth radii) terrestrial (rocky) and icy planets are ideal candidates to host large moons and should be the focus of future exomoon observations.



Schematic view of the mass range in which a fractionally large exomoon can form by an impact.