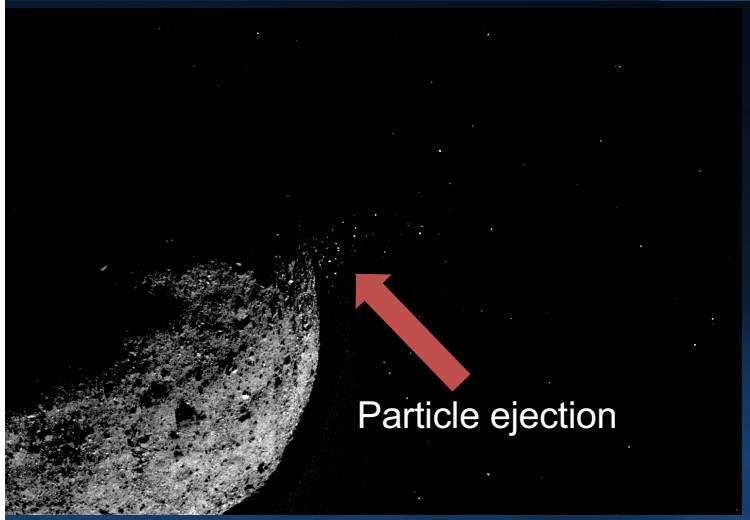
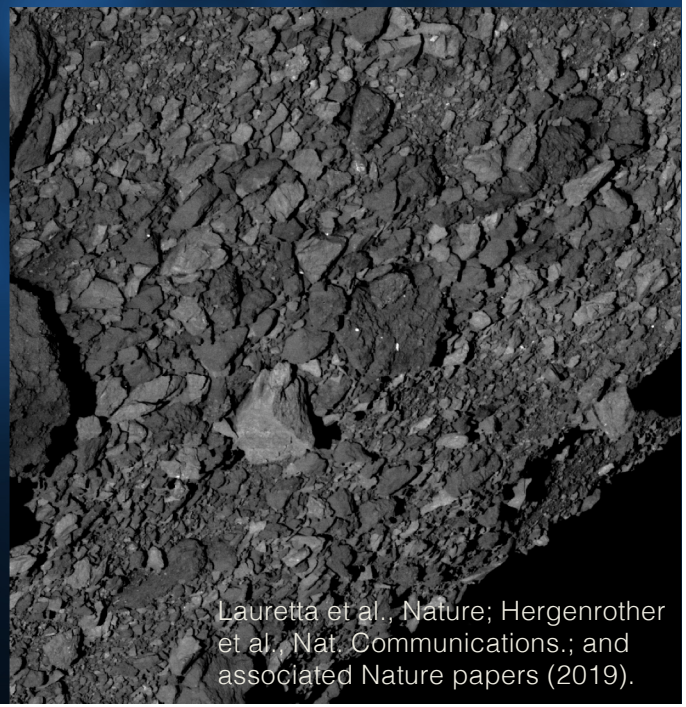
Asteroid Bennu, Unexpected



The first few months of observations by the OSIRIS-REx spacecraft at asteroid Bennu revealed several surprises.

- Shortly after entering orbit, the mission made the first-ever close-up observations of particle plumes erupting from an asteroid's surface (left). Although many of the particles were ejected clear of Bennu, some orbited as satellites before returning to the asteroid's surface.
- Bennu is more rugged than expected, challenging the mission to alter flight and sample collection plans. It was expected to have a smooth surface with few large boulders, but OSIRIS-REx found the surface rough and dense with boulders (right).
- A change in the spin rate of Bennu was directly observed as a result of the YORP effect: the uneven heating and cooling of Bennu as it rotates in sunlight causes the asteroid to increase its rotation speed, decreasing the rotation period by about one second every 100 years.



Lauretta et al., Nature; Hergenrother et al., Nat. Communications.; and associated Nature papers (2019).