

Mission Overview

- Launch in 2038-2039;
launch energy C3: $106 \text{ km}^2 \text{ s}^{-2}$
- Science Phase 2050 - 2054
- 1.5 Earth-year orbit science;
passive plume sample collection
- 2 Earth-year surface science;
active & passive collection



6600 kg launch wet mass | 2700 kg landed | 125 kg science payload

- Powered with 2 Next-Generation RTGs
- Chemical propulsion: $\Delta V > 2400 \text{ m s}^{-1}$
- Enceladus L1/L2 south polar halo orbit
with autonomous station-keeping
- Deorbit & landing with on-board terrain-relative navigation
- Ka-band direct-to-Earth telecom for science data return
(total ~1 TeraByte)
- Cost: \$FY25 2.5B excluding launch vehicle

The Enceladus Orbilander

- NASA's Cassini mission unexpectedly observed erupting water plumes on Saturn's small icy moon, Enceladus.
- An APL-led team of scientists and engineers conceptualized a mission to return to Enceladus to search for extant life.
- The combination orbiter-lander, or Orbilander, can detect life at levels 500x scarcer than found in Earth's oceans from orbit and 500,000x scarcer from the surface. Whether or not Enceladus is found to host life, Orbilander measurements would tell us why.
- This mission concept is being submitted for consideration to the National Academies' Planetary Science Decadal Survey, which recommends priorities for NASA's 2023-2033 portfolio.

A robust search for life on Enceladus can be accomplished with today's technology.