

# Testing Telepresence for Ocean Worlds

As part of a NASA/NOAA partnership, scientists are gaining experience with “telepresence” and exploring ocean floor hydrothermal systems that may be similar to environments on ocean worlds in our Solar System.

- SUBSEA (Systematic Underwater Biogeochemical Science and Exploration Analog) scientists aboard the Exploration Vehicle Nautilus will deploy two remotely operated vehicles, Hercules and Argus, to the Lō`ihi seamount, an underwater volcano 22 miles southeast of the Big Island of Hawaii, and treat them as if they were deployed on as part of a mission to explore other worlds.

- The Lō`ihi seamount (right) contains an extensive network of hydrothermal vents, where hot, mineral-rich water comes out of the seafloor. Such locations are rich in biodiversity, ranging from clouds of bacteria to giant clams and tubeworms.
- The inspiration for SUBSEA comes in large part from the findings of Cassini, which orbited Saturn from 2004 to 2017. The probe showed that, beneath its icy surface, Enceladus (above), a 313-mile wide moon of Saturn, has a vast subsurface ocean up to 20 miles deep, and after analyzing jets of water erupting from Enceladus’s south pole, confirmed the suspected presence of hydrothermal vents and revealed that Enceladus’s ocean is laced with organic compounds.
- Testing operations of remotely controlled robots, where there may be time-lags or other problems is the first step in understanding how humans explorers and robots may work together in future exploration of the solar system.

