

NASA announces two upcoming undersea missions

June 11 2014, by Joshua Buck

NASA is returning to the bottom of the ocean. Twice this summer, aquanauts participating in the NASA Extreme Environment Mission Operations (NEEMO) will conduct activities on the ocean floor that will inform future International Space Station and exploration activities.

These studies provide information that correlates directly to life aboard the [space station](#), where crew members must frequently perform critical tasks that present constraining factors similar to those experienced in an undersea environment.

"It is both challenging and exciting for our astronaut crews to participate in these undersea missions in preparation for spaceflight," says Bill Todd, NEEMO project manager at NASA's Johnson Space Center in Houston. "It is critical that we perform science applicable to NASA's exploration goals in a high-fidelity space operational context. The extreme environment of life undersea is as close to being in space as possible."

NEEMO 18, a nine-day mission beginning July 21, will focus on studies in behavioral health and performance, human health issues, and habitability. Astronaut Akihiko Hoshide of the Japan Aerospace Exploration Agency (JAXA) will command NEEMO 18. He will be joined by NASA astronauts Jeanette Epps and Mark Vande Hei and European Space Agency (ESA) astronaut Thomas Pesquet.

NEEMO 19, which begins Sept. 7 and runs seven days, will focus on the

evaluation of tele-mentoring operations for ESA. Telementoring is when a crew member is given instruction for a task by an expert who is located remotely but is virtually present via a video and voice connection. NASA astronaut Randy Bresnik will command this second mission. He will be joined by Canadian Space Agency astronaut Jeremy Hansen, ESA astronaut Andreas Mogensen, and Herve Stevenin, ESA's Head of Extravehicular Activity (EVA) Training at the European Astronaut Center in Cologne, Germany.

Both NEEMO missions will include EVA objectives and engineering investigations to mature technologies and training techniques for use on the space station and in asteroid exploration. These EVAs will focus on evaluating man-machine work systems and EVA tools and techniques for exploration tasks in varying levels of gravity ranging from that of asteroids to the gravity of Martian moons and Mars itself. The EVAs also will evaluate techniques to address re-planning of exploration operations accounting for different communications time delays.

The missions also will investigate tools to help [astronauts](#) learn new procedures while in flight. One such tool for the "just in time training" that is delivered to the crew in orbit is "intuitive procedures." These procedures use a combination of text, pictures, and videos to instruct the crew on how to perform a task that they were never trained on, and are presented in a way such that the crew understands it quickly.

The NEEMO crews will live 62 feet below the surface of the Atlantic Ocean, 5.4 nautical miles off the coast of Key Largo, Florida, in Florida International University's undersea research habitat Aquarius Reef Base, along with two professional habitat technicians.

Provided by NASA

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