

Unique Undersea Lab Prep for Future Exploration

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NASA is sending three astronauts and a Cincinnati doctor to test new space medicine concepts and extravehicular techniques in a unique underwater laboratory off the Florida coast.

NASA astronaut Lee Morin leads the crew on an 18-day undersea mission Oct. 3 to 20 aboard the National Oceanic and Atmospheric Administration (NOAA) Aquarius Underwater Laboratory. Astronauts Nicole Stott and Ron Garan, and Dr. Tim Broderick of the University of Cincinnati, round out the crew. Canadian astronaut Chris Hadfield is a backup crew member and Canadian physician-astronaut Dave Williams is a science investigator. Jim Buckley and Joe Marsh of the University of North Carolina at Wilmington will provide engineering support.

Long-distance health care, like tele-monitoring and tele-robotic surgery, could be keys to maintaining the wellness of spacefarers and responding to medical emergencies on the International Space Station, the moon or Mars. Techniques will be tested on a patient simulator during the NASA Extreme Environment Mission Operations (NEEMO) project.

Undersea extravehicular activities, imitating moon walks, will test concepts for lunar mobility. Construction of an underwater structure, with the help of a remotely operated vehicle, will also simulate lunar conditions.

The work will be coordinated and monitored at NASA's Johnson Space Center (JSC), Houston. JSC's Exploration Planning Operations Center is

testing and evaluating the new techniques for meeting operational challenges such as the two-second communications delay between Earth and the moon.

"This mission will be the longest NEEMO and Aquarius mission. Our partnerships with other agencies and countries should provide a treasure chest of useful medical and exploration operations knowledge," said NEEMO Project Manager Bill Todd.

NEEMO 9 will demonstrate and evaluate innovative technologies and procedures for remote surgery. Dr. Mehran Anvari will use two-way telecommunication to guide astronauts through diagnosis and surgery and use virtual reality control technology to guide tele-robotic surgery. Anvari is director of the McMaster University Centre for Minimal Access Surgery at St. Joseph's Healthcare, Hamilton, Ontario. Similar in size to the Space Station's living quarters, Aquarius is the world's only permanent underwater habitat and research laboratory. The 45-foot long, 13-foot diameter complex is three miles off Key Largo in the Florida Keys National Marine Sanctuary. It rests about 62 feet beneath the surface. A buoy on the surface provides and outlet for power, life support and communications capabilities for Aquarius. A shore-based mission control center in Florida monitors the habitat and crew.

Aquarius is owned and funded by NOAA, and it is operated by the University of North Carolina at Wilmington. The NEEMO missions are a cooperative project among NASA, NOAA and the university.

Source: NASA

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