

# Mars spacemen in over their heads

## Submersibles will collect ancient fossils

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**ASTRONAUTS** are being trained to pilot deepwater submersibles designed on the North Shore with hope that, one day, the skills learned will lead to discovering life on other planets.

The Pavilion Lake Research Project, near Cache Creek, B.C., is where astronauts will first apply their new talents by collecting samples of freshwater microbialites.

Microbialites are rocks created by microorganisms on a cold lakebed or ocean floor. Fossil remains of microbialites date back 2.5 billion years, making them some of the first living entities on Earth.

Astronauts from both the Canadian Space Agency and NASA are learning how to fly deep-water submersibles in Burrard Inlet because they will be the people who venture into the rest of the solar system.

"(Astronauts) will be in the most direct positions to discover life on other planets," said NASA's Darlene Lim, who is lead researcher at the PLRP. "If they can operate on their own, they will be able to recognize, stop and pick up a rock that holds the secret to life."

Mars will be one of the first planets explored because of the noticeable dry beds where lakes were previously. When exploration begins on that planet, it will be more beneficial to send humans, according to Lim, who also specializes in the geography of bodies of water.

DeepWorkers, which are about the size of a Smart Car, were designed by North Vancouver's Nuytco Research Ltd. to get to previously unreachable underwater terrain.

Jeff Heaton is one of the designers of the DeepWorkers and is instrumental in helping the astronauts understand the research machines.

Before CSA's Chris Hadfield and NASA's Stan Love did the first dive in their own DeepWorkers, they had to learn what to do in case of an emergency. Once that was understood the rest was on-the-job education.

"A person has to go to ground school for months to fly a plane, but here they just plop me in the water and start doing useful things immediately," said Love.



NEWS photo Paul McGrath

**CANADIAN astronaut Chris Hadfield tries out a Nuytco DeepWorker at the federal government's Centre for Aquaculture and Environmental Research in West Vancouver. He and NASA astronaut Stan Love were training for an underwater scientific mission in Pavilion Lake, B.C.**

DeepWorkers are used to recover salvage wreckage, look for survivors in water-borne crashes and cable and pipeline surveying.

"There's not much we can't do with them," said Heaton.

The submersibles are designed to go as deep as 600 metres for as long as 80 hours, which is ample time for a dive in Pavilion Lake.

The maximum time an astronaut will journey to the lake's deepest regions of around 60 metres is four hours. The record for a DeepWorker dive is eight hours, according to Heaton.

However the record could be broken if required, according to Love, who has been to space once in 2008.

"Being in a (DeepWorker) is a lot more comfortable than a space suit. A space suit conforms to your body, but movement is still very difficult. This submersible gives me a chair to sit in and I can move my arms around," said Love. "It is quite cushy compared to a space suit."

DeepWorkers are equipped with sonar, GPS and an HD camera that takes a picture every three seconds. This gives the PLRP a considerable boost in data

collection, when compared to what a scuba diver used to bring back.

With the added technology, a detailed map of Pavilion Lake's bottom can be gathered which will enable researchers to determine where microbialites are more likely to be located on other planets, according to Lim.

Grad students from across Canada are analyzing the data collected. One such student has been processing lakebed data for her project for a year with about two years to go until she completes her thesis paper.

The sheer amount of data is the reason why doctorates take as long as six years to complete, according to Lim.

Pavilion Lake is located in Marble Canyon Provincial Park and environmental maintenance is a high priority for the research project according to its mission statement.

The DeepWorkers have been used twice previously for the PLRP.

The two being used to train the astronauts will be shipped to Pavilion Lake in late June and will be used for two weeks in July.

For more information go to the project's website at [www.pavilionlake.com](http://www.pavilionlake.com).