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Researchers look to B.C. lake in search for life on the red planet

11 hours ago

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The submersible in action.

Sub to help search for life on Mars in a B.C. lake

Updated Thu. Jun. 12 2008 9:45 PM ET

CTV.ca News Staff

As NASA's Phoenix Lander is searching for signs of life on Mars, there is already a search for ancient life taking place here on Earth. Pavilion Lake, B.C. to be exact.

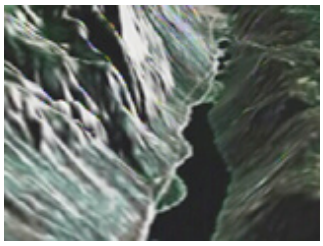
Researchers from the Canadian Space Agency and the University of British Columbia along with a group of NASA astronauts are using a space-age submersible to study a rare type of water coral-like structures called microbialites.

A diver in the submersible.

Scientists say that the structures are similar to those that they are searching for on Mars.

"These are very simple life forms that we believe are similar to the origins of life on Earth," Dr. Bernard Laval of UBC said.

Scientists believe that the origins of life on earth go back about 3.5 billion years and that at that time, the climate on Mars was similar to Earth's.



Pavillion Lake, B.C.

Therefore, if lifeforms like microbialites were thriving on Earth at that time, the theory is that they would be thriving on Mars.

"If we can understand how these are being formed on Earth then that will help us to design experiments to conclusively prove that the little rock you found on Mars is made in some part by life," Laval said.

The high-tech subs will descend in a couple of weeks but it will take months to study the coral. They hope that the B.C. project could be used as training for a future mission to Mars.

"Future human exploration of Mars will require astronauts who are well versed in scientific methods in addition to exploration strategies. Training

VIDEO

CTV News: Rob Brown on the search for life 1:40

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The Pavilion Lake Research Project

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opportunities that merge science and exploration goals in extreme, analog environments are crucial," the project's website explains. "(The Lake Pavilion mission) presents a unique opportunity to advance the long-term objective of human exploration of the Moon and Mars."

Pavilion Lake is about 400 kilometres north of Vancouver.

With a report from CTV's Rob Brown

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The Hamilton Spectator

Mac prof and student seek clues to Martian life on bottom of B.C. lake

Wednesday, July 2, 2008
Page: A4
Section: Local
Byline: Rachel De Lazzer
Source: The Hamilton Spectator

A McMaster professor is plumbing the depths of a mysterious lake in British Columbia that he hopes will one day help researchers discover life on other planets.

Dr. Greg Slater, assistant professor of environmental geochemistry and a recreational diver, has been spending his summers at Pavilion Lake since 2005.

He's part of a NASA and Canadian Space Agency supported research team that is exploring rare reef-like formations on the bottom of the lake, more than 400 kilometres north of Vancouver.

Some look like chimneys, others like pop bottles. They rise as high as four metres and are up to 11,000 years old. The structures are made of carbonate, a mineral-like compound, and are covered in bacteria.

"Our overarching, primary question is why are they in this lake," says Slater, noting only 10 to 20 lakes in the world have the formations.

The 40-plus-member team, which Slater co-leads with a University of British Columbia professor and a NASA researcher, is trying to discover if the structures are formed by some physical or chemical process and the bacteria just happen to live on them, or if the bacteria are making them grow.

They've made progress since the project began in 2004.

"We have direct evidence that they've grown in the last thousand years about six centimetres," he says.

So what difference does that make to life on Mars?

Understanding how these structures are formed would help scientists understand similar formations on other planets or even something as minuscule as the trace levels of carbonate that have already been found in Martian soil.

"From the perspective of going to another planet, (if) you could say biology formed this structure, you would have just proved that there was life on that planet."

This summer, the team has had a helping hand from single-person submarines.

From June 23 until tomorrow, the team is using DeepWorker submersibles to allow them to dive to depths of nearly 65 metres and reach specimens that are otherwise too deep to get to by recreational scuba diving. The mini-submarines also allow them to map the six-kilometre-long lake and the distribution of the structures.

McMaster PhD student Allyson Brady is also part of the team.

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905-526-3404

Grande Prairie Daily Herald-Tribune

B.C. lake may provide clues to life on Mars

Friday, June 20, 2008
Page: 35
Section: Science
Byline: BY SEAN PATRICK SULLIVAN, THE CANADIAN PRESS
Dateline: VANCOUVER

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The expedition runs from June 23 to July 4.

The Hindustan Times

Rock structures in British Columbian lake may hold vital clues to history of life on Earth

Tuesday, June 17, 2008
Section: News

Report from Asian News International brought to you by HT Syndication.

Washington, June 17 -- Scientists will take the help of single person submersibles to retrieve samples from a lake (Pavillion) in northern British Columbia that may hold vital clues to the history of life on Earth and on other planets.

Pavilion Lake is located about 500 kilometres north of Vancouver in Marble Canyon Provincial Park.

It was formed by a glacier more than 10,000 years ago, and has for the last decade been the site of several studies into astrobiology.

According to Greg Slater, an environmental geochemist in the Faculty of Science, the objects of scientific interest are unique carbonate rock structures, known as microbialites because they are covered with microbes.

Some of these microbialites grow at depths up to 180 feet below the water's surface, too deep to reach by non-decompression Scuba diving.

By studying these microbialites, scientists want to know that are they the result of biological or geological processes, and, why are there different microbes living on them and how long have these microbial communities been preserved.

"It's going to help us develop a baseline of understanding about life on our planet," said Slater.

"As amazing as it sounds, the bottom of a lake can answer lots of questions about life on Earth. And how we explore this Lake will lay the groundwork for how we will explore Mars," he added.

The mission is significant for astronauts as they are interested in the similarities between field scientific activities in the submersible and using a lunar rover for geological research in future missions sending astronauts back to the Moon.

According to astronaut Dave Williams, "What's new about the work at Pavilion Lake this summer is the use of advanced underwater exploration technology to enable investigators to study previously inaccessible specimens."

"Now we're able to use Rover-type subs with robotic arms similar to what is envisioned for exploring the lunar surface," he said.

Times & Transcript (Moncton)

Mars life in B.C. lake?; Researchers look to B.C. lake in search for life on the red planet

Saturday, June 14, 2008
Page: D3
Section: News
Byline: THE CANADIAN PRESS

Scientists will be diving deep into a British Columbia lake in the coming weeks to study organisms they hope will provide a window into life on ancient Mars.

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After all, scientists can only look for life as we know it here on Earth, which started out as rocks made by bacteria.

The Edmonton Sun

NASA eyes B.C. lake

Saturday, June 14, 2008
Page: 44
Section: News
Byline: BY CP
Dateline: VANCOUVER

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The North Bay Nugget

Researchers to study B. C. lake for life on Mars;

Saturday, June 14, 2008
Page: A10
Section: News
Byline: THE CANADIAN PRESS

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Brockville Recorder And Times

Researchers look to B.C. lake in search of life on red planet

Saturday, June 14, 2008
Page: C3
Section: News
Byline: BY THE CANADIAN PRESS
Dateline: VANCOUVER

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The Toronto Sun

B.C. lake doubles for Mars

Saturday, June 14, 2008
Page: 29
Section: News
Byline: BY CP
Dateline: VANCOUVER

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The Whitehorse Daily Star

Researchers look to B.C. lake in search for life on the red planet

Friday, June 13, 2008
Page: 36
Section: Environment
Byline: Sean Patrick Sullivan
Dateline: VANCOUVER
Source: Canadian Press

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Times Colonist (Victoria)

Search for life on Mars starts at bottom of a deep B.C. lake; Single-passenger sub to probe large reefs that might resemble fossils on red planet

Friday, June 13, 2008
Page: A6
Section: News
Byline: Chantal Eustace
Dateline: VANCOUVER
Source: Canwest News Service
Illustrations: Colour Photo: NUYTCO RESEARCH LTD. / Project researchers will use the vessel, on loan from North Vancouver's Nuytco Research Ltd., to collect samples of ancient fossils deep in Pavilion Lake.

VANCOUVER -- Deep below the clear blue waters of B.C.'s Pavilion Lake, a team of astronauts and scientists hope to uncover clues about life on Mars.

Using a single-passenger submarine, they will spend about three weeks studying large reefs found from the depth of five metres to the bottom of the lake. Studying these formations could help them understand the conditions in which life formed on Earth.

"What we learn from going into the lake will help us answer the question about life on Mars," University of British Columbia civil engineering Prof. Bernard Lava said yesterday. "What we're looking for on Mars is evidence of past life."

If similar formations are found on Mars, it could help to prove that life has existed on the red planet.

"Better understanding of how ancient fossils on Earth were created will hone our ability to find and detect life, and remnants of life, on other planets," Laval said.

But first, he said, there is a lot of research to be done. And trolling the bottom of the lake is a good start.

For the past five years, observation of these so-called "microbialite" structures, which likely began to form nearly 11,000 years ago, has been undertaken by scuba divers.

But on June 23, the team will kick off the first major study of the lake's terrain using DeepWorker submersibles, equipped with high-definition cameras and tracking systems.

Pavilion Lake is about a five- hour drive northeast of Vancouver.

Project researchers will use the vessel, on loan from North Vancouver's Nuytco Research Ltd., to map and collect samples of the microbialite in depths of more than 60 metres.

The $700,000 craft, which looks like a cross between a bumper car and a Zamboni, is operated by foot pedals, said Geoff Heaton, one of Nuytco's divers, as he demonstrated how to manoeuvre its robotic arm yesterday.

"You really can move these things in three dimensions. We can spin on a dime. We can move vertically. We can move horizontally," Heaton said.

The company's president and designer of the submersibles, Phil Nuytten, said training underwater simulates the experience of being in outer space. The Pavilion Lake mission will take this a step further, linking practical training to relevant exploration.

"What's the connection between a B.C. lake and Mars?" Nuytten said, smiling. "They believe that if there are fossil lake beds on Mars, they will find the same kind of fossil evidence [as Pavilion Lake]."

The Canadian Press

Researchers look to B.C. lake in search for life on the red planet

Friday, June 13, 2008
Section: National General News
Byline: BY SEAN PATRICK SULLIVAN

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The expedition runs from June 23 to July 4.

The Canadian Press - Broadcast News

NATIONAL Audio 9:15 a.m. ET

Friday, June 13, 2008
Section: Audio Schedules

102 - (Tax-Freedom-Day)

TORONTO (Chris Mayberry) 29s. Tax freedom day -- the day average Canadians shed the year's tax load and start working for themselves -- arrives four days early this year. (SOURCE:The Canadian Press) (915a)

103 - (Mars-In-Lake)

VANCOUVER. x--15s. Scientists will be diving deep into a B-C lake in the coming weeks to study organisms they hope will provide a window into life on ancient Mars. Dr. Bernard Laval of U-B-C says Pavilion Lake contains organisms that may resemble life that could have existed on the red planet billions of years ago.

(``...carbonate reefs.") (SOURCE:The Canadian Press) (915a)

TAG: The lake is one of the few places in the world with the unique reef-like structures that are made up of bacteria. Laval says the study will help scientists trying to find evidence of life on Mars.

104 - (Obama-Smears)

UNDATED. x--18s. You've probably heard the stories, either on news reports, or e-mails -- Barack Obama's wife used the word ``whitey" during a church speech, that he's secretly a Muslim and stuff like that. Now the U-S presidential candidate's campaign has put up a website aimed at refuting those rumours. A-B-C News analyst George Stephanopoulos says ``Fight-the-Smears-dot-com" lists five sets of rumours about Obama, along with responses that explain their falsehoods.

(``...untrue e-mails.") (SOURCE:ABC) (915a)

TAG: Obama's campaign notes that while the site may spread the rumours to those who haven't heard them, refusing to address the rumours only perpetuates them.

105 - (ENT-MUSIC-R. Kelly-Trial)

UNDATED (Oscar Wells Gabriel) 22s. At R-and-B singer R-Kelly's child pornography trial in Chicago, the defence told the jury that the alleged victim's family is certain their relative isn't on a sex tape that's at the heart of the case. (SOURCE:The Associated Press) (915a)

The Peterborough Examiner

Diving deep for life on Mars; Researchers look to B. C. lake in search for life on the red planet;

Friday, June 13, 2008
Page: A2
Section: News
Byline: THE CANADIAN PRESS
Dateline: VANCOUVER
Illustrations: Canadian Press photo

Phil Nuytten, president of Nuytco Research, left, and pilot Jeff Heaton show off their deep worker submersibles to the media in North Vancouver yesterday. The submersibles will be used later this month in an underwater exploration by the University of British Columbia and McMaster University with support from Canadian Space Agency and NASA.

Scientists will be diving deep into a British Columbia lake in the coming weeks to study organisms they hope will provide a window into life on ancient Mars.

A two-week expedition by a team of researchers from McMaster University in Hamilton and the University of British Columbia, with backing from NASA and the Canadian Space Agency, will also help design the planning for sending people to the moon and then Mars, says UBC Civil Engineering Prof. Bernard Laval.

Laval is one of the leaders of the research at Pavilion Lake, about a five-hour drive north of Vancouver. The lake is unique in its population of freshwater microbialites -- reef-like structures that resemble fossils of what's believed to be the first life forms on Earth.

Between three and 3.5 billion years ago, these living, breathing ecosystems covered the oceans of the world, Laval said, but began to recede as life evolved and became more complex.

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"Normally when you dive in the bottom of a freshwater lake in British Columbia, you find mud and branches and some hubcaps and beer bottles maybe, but this lake, once you get below 15 metres, you find these large carbonite reefs."

Like a handful of sites around the world that are analogous to planetary exploration, the bottom of Pavilion Lake may resemble ancient Mars, which was thought to be warm, wet and covered with oceans, Laval said.

Learning to recognize how these and ancient fossils on Earth were created will help scientists find and detect remnants of life on other planets, he said. After all, scientists can only look for life as we know it here on Earth, which started out as rocks made by bacteria.

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The expedition runs from June 23 to July 4.

The Province

Joint project to help scientists in their search for life on Mars

Friday, June 13, 2008
Page: A17
Section: News
Byline: Cassidy Olivier
Source: The Province

Findings of a joint research project between two Canadian universities and NASA are expected to provide scientists and engineers with insight on how to best search for life on Mars.

Beginning June 23, researchers from the University of B.C. and McMaster University in Hamilton will team up with NASA scientists and astronauts for a two-week underwater study of Pavilion Lake, between Cache Creek and Lillooet.

The purpose of the study will be to collect samples of the bacteria-based organisms known as microbialites that line the bottom of the lake. These structures resemble fossils from the early Cambrian period when life first formed on Earth and when the planet's constitution resembled that of Mars.

Bernard Laval, a professor of civil engineering at UBC and a co-principal investigator of the Pavilion Lake Research Project, said studying these organisms will allow scientists to hone their ability to "detect life on other planets."

"The science that we are doing here would help direct surveys of Mars and help really look for evidence of ancient life on Mars," he said.

Researchers will be sent more than 60 metres to the bottom of the lake to collect samples in single-person submersibles developed by North Vancouver company Nuytco Research Ltd.

Laval said the project will not only help scientists to detect life on other planets but also offer a simulation of what it is like to collect samples in a weightless environment.

"How you go about exploring the bottom of the sea is in a lot of ways very similar to how you go about exploring the surface of another planet," he said.

For more information, visit www.pavilionlake.com.

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The Daily News (Prince Rupert)

B.C. lake's Mars link

Friday, June 13, 2008
Page: 11
Section: Provincial News
Dateline: VANCOUVER
Source: The CanadianPress

VANCOUVER -- Scientists will be diving deep into a British Columbia lake in the coming weeks to study organisms they hope will provide a window into life on ancient Mars.

A two-week expedition by a team of researchers from McMaster University in Hamilton, Ont., and the University of British Columbia, with backing from NASA and the Canadian Space Agency, will also help design the planning for sending people to the moon and then Mars, says UBC Civil Engineering Prof. Bernard Laval.

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The expedition runs from June 23 to July 4.

Prince George Citizen

B.C. lake studied to confirm life on Mars

Friday, June 13, 2008
Page: 5
Section: Local/Province
Dateline: VANCOUVER
Source: The Canadian Press

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Vancouver Sun

Exploring Mars in a B.C. lake; Researchers hope fossil beds hold the key to life on the red planet

Friday, June 13, 2008
Page: B2
Section: Westcoast News
Byline: Chantal Eustace
Source: Vancouver Sun
Illustrations: Colour Photo: Submersibles like these will be used this month in the Pavilion Lake Research Project.

Deep in the clear blue waters of a freshwater lake in the B.C. Interior, astronauts and scientists hope to uncover clues about whether life existed on Mars.

Later this month, their outer space exploration will take them to the depths of Pavilion Lake, about five hours northeast of Vancouver.

"What we learn from going into the lake will help us answer the question about life on Mars," said University of B.C. civil engineering Prof. Bernard Laval. "What we're looking for on Mars is evidence of past life."

On Thursday, Laval stood next to a single-passenger submarine in a North Vancouver lane to announce the project.

The team -- including Laval, researchers from McMaster University and astronauts from the Canadian Space Agency and the U.S. space agency, NASA -- won't be searching for Martians in the B.C. lake.

They will spend about three weeks studying large reef-like structures found in Pavilion Lake, formed out of the bodies of tiny creatures called microbialites.

These formations could help them understand the conditions in which life first formed on Earth. If similar formations are found on Mars, it could help to prove that life has existed on the red planet.

"Better understanding of how ancient fossils on Earth were created will hone our ability to find and detect life, and remnants of life, on other planets," said Laval.

But first, he said, there is a lot of research to be done. Trolling the bottom of the lake is a good start.

For the past five years, observation of the microbialite structures, which likely began to form nearly 11,000 years ago, has been undertaken by scuba diving.

June 23 will kick off the first major study of the lake's terrain using small single-passenger submarines, called DeepWorker submersibles, equipped with high-definition cameras and tracking systems.

Project researchers will use the submersibles, on loan from North Vancouver's Nuytco Research Ltd., to map and collect samples of the microbialite deposits in depths of more than 60 metres.

The $700,000 DeepWorker crafts, which look like a crosses between a bumper car and a zamboni, are operated by foot petals, said Geoff Heaton, one of Nuytco's divers, demonstrating how to manoeuvre the vehicle's robotic arm. "You really can move these things in three-dimension. We can spin on a dime. We can move vertically. We can move horizontally," said Heaton.

The company's president, Phil Nuytten, who designed the submersibles that will be used in the project, said training underwater simulates the experience of being in outer space. The Pavilion Lake mission will take this a step further, linking practical training to relevant exploration.

"What's the connection between a B.C. lake and Mars?" Nuytten said, smiling. "They believe that if there are fossil lake beds on Mars, they will find the same kind of fossil evidence in those lake beds [as in Pavilion Lake] if Mars has -- or ever had -- life."

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ONLINE

See a video on Chantal Eustace's submersible story at vancouversun.com

The Daily News (Nanaimo)

Lake used to study Mars; Team of astronauts will research reefs to gain insight about life on the red planet

Friday, June 13, 2008
Page: A8
Section: News
Byline: Chantal Eustace
Source: Canwest News Service
Illustrations: Photo: Canwest News Service / Nuytco Research Ltd. unveils the submarine that will be used later this month in a project that aims to help scientists understand Mars.

Deep below the clear blue waters of B.C.'s Pavilion Lake, a team of astronauts and scientists hope to uncover clues about life on Mars.

Using a single-passenger submarine, they will spend about three weeks studying large reefs found from the depth of five metres to the bottom of the lake. Studying these formations could help them understand the conditions in which life formed on Earth.

"What we learn from going into the lake will help us answer the question about life on Mars," said University of British Columbia civil engineering Prof. Bernard Lava on Thursday. "What we're looking for on Mars is evidence of past life."

If similar formations are found on Mars, it could help to prove that life has existed on the red planet.

"Better understanding of how ancient fossils on Earth were created will hone our ability to find and detect life, and remnants of life, on other planets," said Laval.

But first, he said, there is a lot of research to be done. And trolling the bottom of the lake is a good start.

For the past five years, observation of these so-called "microbialite" structures, which likely began to form nearly 11,000 years ago, has been undertaken by scuba divers.

But on June 23, the team will kick off the first major study of the lake's terrain using DeepWorker submersibles, equipped with high-definition cameras and tracking systems. Pavilion Lake is about five hours northeast of Vancouver.

Project researchers will use the vessel, on loan from North Vancouver's Nuytco Research Ltd., to map and collect samples of the microbialite in depths of more than 60 metres.

The $700,000 craft, which looks like a cross between a bumper car and a Zamboni, is operated by foot pedals, said Geoff Heaton, one of Nuytco's divers, as he demonstrated how to manoeuvre its robotic arm Thursday.

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The Daily Bulletin (Kimberley)

Researchers look to B.C. lake in search for life on Mars

Friday, June 13, 2008
Page: 19
Section: News
Byline: Sean Patrick Sullivan
Dateline: VANCOUVER
Source: The Canadian Press

Scientists will be diving deep into a British Columbia lake in the coming weeks to study organisms they hope will provide a window into life on ancient Mars.

A two-week expedition by a team of researchers from McMaster University in Hamilton, Ont., and the University of British Columbia, with backing from NASA and the Canadian Space Agency, will also help design the planning for sending people to the moon and then Mars, says UBC Civil Engineering Prof. Bernard Laval.

Laval is one of the leaders of the research at Pavilion Lake, about a five-hour drive north of Vancouver. The lake is unique in its population of freshwater microbialites -- reef-like structures that resemble fossils of what's believed to be the first life forms on Earth.

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The expedition runs from June 23 to July 4.

The Daily News (Kamloops)

Researchers look to Pavilion Lake for clues to life on Mars

Friday, June 13, 2008
Page: A7
Section: News
Dateline: VANCOUVER
Source: The Canadian Press

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Edmonton Journal

Deep, clear B.C. lake could offer clues to life on Mars

Friday, June 13, 2008
Page: B12
Section: News
Byline: Chantal Eustace
Dateline: VANCOUVER
Source: Vancouver Sun; Canwest News Service
Illustrations: Colour Photo: Handout Photo

Nuytco Research Ltd / Nuytco Research's DeepWorker submersible on a test prior to work at the Pavilion Lake Research Project (PLRP), an underwater exploration of a unique aquatic environment by researchers from UBC and McMaster University

VANCOUVER - Deep below the clear blue waters of B.C.'s Pavilion Lake, a team of astronauts and scientists hope to uncover clues about life on Mars.

Using a single-passenger submarine, they will spend about three weeks studying large reefs found from the depth of five metres to the bottom of the lake. Studying these formations could help them understand the conditions in which life formed on Earth.

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But first, he said, there is a lot of research to be done. And trolling the bottom of the lake is a good start. For the past five years, observation of these so-called "microbialite" structures, which likely began to form nearly 11,000 years ago, has been undertaken by scuba divers.

But on June 23, the team will kick off the first major study of the lake's terrain using DeepWorker submersibles, equipped with high-definition cameras and tracking systems. Pavilion Lake is about five hours northeast of Vancouver.

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The Daily Townsman (Cranbrook)

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Canwest News Service

B.C. lake could offers clues to life on Mars.

Thursday, June 12, 2008
Byline: Chantal Eustace
Dateline: VANCOUVER
Source: Canwest News Service

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Vancouver Sun

ceustace@png.canwest.com

CTV NEWS

Life on Mars

Broadcast Date: Thursday, June 12, 2008
Time: 23:00:00 ET
End Time: 23:30:00 ET
Network: CTV

LLOYD ROBERTSON: And finally for us tonight, a fascinating new frontier in the search for ancient life on Mars. It's not in the celestial heavens, nor even on the red planet itself, but rather at the bottom of a British Columbia lake. Yes, tiny Pavilion Lake, 400 kilometres north of Vancouver, contains rare fresh water coral growths that have some NASA scientists very excited. CTV's Rob Brown explains why.

ROB BROWN (Reporter): It's a question for the ages, was there ever life on Mars? NASA's Phoenix Lander is now on the red planet in search of an answer. These images arriving today show Martian soil being loaded on to a microscope. But the search is also taking place here on earth.

UNIDENTIFIED MAN: We're looking for evidence that there was life on Mars.

BERNARD LAVAL (UBC Researcher): The subs are very well suited for this mission.

BROWN: This space-age submersible will soon be taken to the bottom of BC's Pavilion Lake. There, a group of NASA astronauts and researchers from UBC and McMaster University will use the sub to study these rare fresh water coral-like structures called microbilites. So what's so special about them?

LAVAL: These are very simple life forms that we believe are similar to the original life on earth.

BROWN: You see scientists believe the origins of life on earth go back some three-and-a-half billion years, and they think that around that time the climate on Mars was very similar to the climate on our planet. So if life forms like microbilites were thriving here at that time, the theory is they would also be thriving there.

LAVAL: If we can understand how these are being formed on earth, then that will help us design experiments to conclusively prove that, you know, the little rock you found on Mars was formed in some part by life.

BROWN: The subs will descend in a couple weeks, but it will take months to study the coral. That groundbreaking research combined with what the Phoenix is finding could soon help unravel the mystery of Mars. Rob Brown, CTV News, Vancouver.

ROBERTSON: And that's the kind of day it's been this Thursday, June the 12th. I'm Lloyd Robertson. For all of us here in the national newsroom, good night. Sandie Rinaldo will be here tomorrow night and the weekend. For some of you, local CTV News is coming next.