

FACT SHEET

TAWANI 2008 INTERNATIONAL ANTARCTIC EXPEDITION

NOVEMBER 3, 2008

ABOUT THE MISSION

Timeline and Location

The Tawani 2008 International Antarctic Expedition Science Team will depart Cape Town, South Africa on November 5, 2008 for a forty-five day expedition. The team will be based at Novolazarevskaya Station, Antarctica, and will establish a remote camp at Lake Untersee for study there and at Schirmacher Oasis through December 20, 2008.

Mission Goals and Objectives

The Tawani Science Team will study life in the extreme environments of the Untersee Oasis. In addition, the scientists will test scientific instrumentation that will further the search for life elsewhere in the Universe. Ecosystems found in polar regions are highly susceptible to the effects of climate change, and the investigations in the Untersee Oasis will help develop baseline ecological information for the region, an important beginning in the quest of better understanding the impacts of global warming. There is also a robust, internet-based educational component to involve students in daily reports and experiments from the team.

The inter-disciplinary Tawani Expedition includes representatives from the fields of limnology, microbiology, paleontology, geology, biochemistry, astrogeophysics, biophysics, molecular biology, astrobiology and medicine. The scientists will search for the unique metabolic tricks life has employed to survive in the harsh south polar environment and they will look at the complex adaptive mechanisms organisms employ when they respond to environmental stress or change. Research efforts will attempt to identify novel organisms, find unique proteins useful in diagnosing and treating human illness, establish a meteorological station that will continuously monitor local climatic conditions, and use metagenomic techniques, a relatively new way to study the communities of microbial organisms directly in their natural environments – such as those of the Untersee Oasis.

The Region

Lake Untersee is a perennially ice-covered, ultra-oligotrophic, lake in the Gruber Mountains of central Dronning Maud Land. It is 563 m above sea level and with 11.4 km² surface area is the largest freshwater lake in east Antarctica. It has a perennial ice-cover that reaches 3 meters in thickness. While considerable work has been done on ecosystems of the McMurdo Dry Valleys, Vestfold Hills and other oasis areas of Antarctica, comparatively much less is known about microbial ecosystems of the Untersee Oasis.

The Schirmacher Oasis of central Dronning Maud Land, Antarctica is 3 km wide, 20 km long and contains over 180 lakes. Several of the epishelf lakes are perennially ice-covered while most all of the others melt out by mid-summer. The Russian Antarctic Station Novolazarevskaya (70°46'04" S and 11°49'54" E) and the Indian Station Maitri (70°45'57" S, 11°44'09" E) are located in the Oasis.

Expedition Organization

The expedition is funded by the Tawani Foundation (Chicago, Illinois) founded by James N. Pritzker and has received extensive logistical support through the international partnership of the Russian Arctic and Antarctic Institute, NASA, Planetary Studies Foundation and the Von Braun Center for Science & Innovation (Huntsville, Alabama).

The Science Team

The fifteen team scientists and educators from the United States, Russia, Austria, and New Zealand are specialists in the study of life in extreme environments. The expedition team will be studying how the physics and chemistry of the lake and the desert soils constrain life, and how life itself modifies the region during times of global climate change.

The team will be on the ice for 45 days in the Lake Untersee region of Antarctica and will focus their research activities on the ecosystem of this remote lake. By studying the lake, soil and glacier ecosystems of the region the team can better understand the physical and chemical environments that constrain life and also identify novel organisms discovered by the sampling. A very large part of the research involves quantifying the various metabolic processes that occur in the lake or the cryoconite holes on the glaciers. This will demonstrate the relationship between the organisms and the environment in which they live.

In the science vernacular, Lake Untersee is an end-member ecosystem and represents extreme conditions compared to most other environments. Although this region of the globe has mean annual temperatures well below freezing -- about -12° C -- it is still possible to find areas with water that remains liquid year round. These oases in an otherwise frozen desert allow life to exploit them. By studying how life adapts to such extremes on Earth, scientists can shape the search for life on other planets such as Mars as well as the icy moons of Jupiter, Saturn and Neptune and even provide a glimpse of what Earth's earliest biosphere was like billions of years ago.

Tawani 2008 Antarctic Expedition Team Members

Art Mortvedt, Expedition Lead, Manley Hot Springs, Alaska USA
James Pritzker, History, Philanthropy, Tawani Foundation, Chicago, Illinois USA
Dale Anderson, Science Lead, Astrobiology, Polar Sciences, Lake Placid, New York USA
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Vladimir Akimov, Microbiology, Pushchino, Russia
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Alicia Anzaldo, Biology, Educator, Chicago, Illinois, USA
Sindy Main, Educator, Chicago, Illinois, USA
Pavel Parkhaev, Paleontology, Moscow, Russia
Mikhail Levitan, Sedimentary Geochemistry, Moscow, Russia
Asim Bej, Birmingham, Molecular Genetic Microbiology, Alabama, USA
Michael Storrie Lombardi, Astrobiology, Medicine, Bioinformatics, Pasadena, California, USA

For extensive biographical information, visit: expedition.tawanifoundation.org.

Educational Opportunities

Tawani 2008 International Antarctic Expedition is committed to inspiring the next generation of scientists, explorers, and educators. Multiple educational efforts will be initiated by team members for immediate dissemination from the ice and for future educational outreach programs via the internet. To track the team and their activities on a daily basis while they are on the ice in Antarctica, or to access the educational efforts already underway, see the Tawani Foundation web page: expedition.tawanifoundation.org

About the Tawani Expedition Patch

Students from Innsbruck, Austria and Galena, Illinois spearheaded the design of the expedition patches. To view the Expedition patch and learn how it was created, visit: expedition.tawanifoundation.org.

More Information

For more information on the Tawani 2008 International Antarctic Expedition visit: expedition.tawanifoundation.org or contact:

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