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MEDIA RELEASE

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AUSTRALIAN ROBOTS AID THE SEARCH FOR LIFE ON MARS – VIA NEW ZEALAND

Mars Society Australia (MSA) announces its participation in Spaceward Bound New Zealand (SBNZ), a project of the New Zealand Astrobiology Initiative (NZAI) in conjunction with University of Auckland, AUT and the Astrobiology Group of the Royal Astronomical Society of New Zealand, Mars Society New Zealand and the KiwiSpace Foundation. Spaceward Bound is a NASA initiated program that engaged students and teachers in the great adventure of exploration seeking answers to some of the most fundamental questions: ‘What is life?’, ‘How does life begin and evolve?’ ‘Does life exist elsewhere in the Universe?’ and ‘What is the future of life on Earth and beyond?’. This is done through a series of international expeditions to exotic locations in the US, Canada, Chile, Namibia, Australia and now New Zealand. Participation in Spaceward Bound is international.

The SBNZ expedition will explore unique geological features and extreme life forms of the North Island of New Zealand with a team of NASA scientists and engineers and their partners from Australia and New Zealand. The program is aligned with the NZ science curriculum and aimed at secondary teachers and university. The expedition will examine hot springs and volcanoes on the North Island of New Zealand, sampling for extreme organisms and their chemical traces (biomarkers) that will aid the search for life on Mars and beyond. The expedition will have with them several robots and drones, these will be used to both support the scientist’s work and as test beds for robotic exploration concepts.

Among the Australian participants is Piddarth Pandey, a PhD student at UNSW Australia (Australian Defence Force Academy Campus) with experience with the Indian Space Research Organisation, NASA, and the European Space Agency (ESA). He is studying pneumatic and mechanical sampling systems and thermal performance for the European Space Agency’s ExoMars rover. Siddarth is looking forward to the expedition: “For me, understanding the requirements from the planetary scientists, constraints faced due to Martian extremes and during EVA operations is critical. Assisting scientists in conducting field work and making important notes during analogous studies shall help me gain insight of the scientific requirements and help provide engineering solutions. A sound understanding of planetary geology and challenges faced while searching for extremophiles on Mars shall help me come up with new instrument configurations for future Mars missions”.

Steve Hobbs is another Australian on the Expedition. Steve is a former ADFA student who recently was awarded his PhD studying martian gullies and their terrestrial counterparts near Canberra, at Woomera and in New Zealand. He is taking *Marsobot Junior* with him, a 7 kg robot he has built to collect temperature and spectral data as well as imagery and positional information. Steve says that “Spaceward Bound excites me as the region in New Zealand we’re going to provides great analogues to what life living in extreme conditions may have looked like on a geothermally active Mars. Spaceward Bound gives me the opportunity to tryout *Marsobot Junior* in the field. This will help us work out what sort of equipment we would need for a Mars mission to be able to detect the presence of extreme forms of life there.”

Jonathan Clarke is a Canberra-based geologist and veteran of eight MSA expeditions to Arkaroola, the Pilbara, Central Australia and Utah. As president of MSA he looks forward to the opportunity to strengthen links with NASA colleagues and build awareness of the important of astrobiology and analogue research for Australian space research. “New Zealand has many things we do not have in Australia”, he says “including active volcanoes, geothermal springs and glaciers. While we have ancient examples of all these processes in Australia, it is a great advantage to see them actively forming.” Jonathan is also excited at the opportunity to interact with Australian and New Zealand students and New Zealand teachers “Inspiring the next generation of scientists and space explorers is something very important for future of both countries. Australia and New Zealand have a great legacy of exploration and science, including in Antarctica, geology, biology and astronomy. We have a tremendous opportunity to expand that legacy to including other worlds in our Solar System”.

Ken Silburn is head science teacher at Casula High School in NSW. This is his fourth Spaceward Bound expedition. Ken is enthusiastic about the goals of Spaceward Bound. “The Spaceward Bound Program allows us to get back to what science is all about. Looking at how we can solve problems that will ultimately end up in improving our world. Whether that be getting to Mars or tackling global warming issues. For many science teachers the last time they completed any real science or field

work was during their initial teacher training. For some teachers this could be twenty years ago. To work with teaching colleagues from other countries alongside practicing scientists and researchers from NASA on real projects is a buzz", he observes. In addition "Spaceward Bound "allows teachers to network and work on projects that continue across national borders. So I look forward to working again with educators and scientists that I met five years ago in the Mojave Desert."

There is more to SBNZ than science and engineering. Annalea Beattie of RMIT University in Melbourne is an artist and MSA director. Her *Dark Skies Project* removes the telescope lens from the experience of seeing the night sky and understands the magnitude of night light through drawing in the dark. "Working collaboratively with NZ science teachers and NASA scientists, the project emphasises qualitative observation of the night sky via first-hand experiences of drawing. As we peer in to the night sky, time slows down as we connect sensation, imagination and physical movement to negotiate the geometry of space and trace our perceptions of the dark sky through drawing" Annalea says. During the expedition participants have the opportunity to focus each night (weather permitting) on a piece of the night sky and draw the intensity of light and the stars it contains. Using the John Bortle Scale as a tonal guide for visual acuity, participants examine their own images to understand the impact of any light pollution on the visibility of stars in our environment".

The seven-strong Australian contingent departs for SBNZ on January 15th and will return by January 25th.

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ADDITIONAL RESOURCES

Mars Society Australia: www.marsociety.org.au

Spaceward Bound New Zealand <http://astrobiology.kiwi/spaceward-bound-new-zealand/>

Mars Society Australia Facebook page <https://www.facebook.com/groups/marsocietyaustralia/>

Spaceward Bound New Zealand Facebook page <https://www.facebook.com/events/1533721626844214/>

IMAGES

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Champagne Pool, Waiotapu, an alkaline hot spring rimmed by orange arsenic minerals and silica deposits formed by microbial activity.



Marsobot Junior, a 7 kg robot, built by Steve Hobbs of MSA is equipped with web cams, multispectral camera, spectrometer and a non-contact thermometer. It will be tested in the hot springs and volcanic terrains of New Zealand.



Another view of Marsobot Junior, undergoing trials near Queanbeyan, east of Canberra



This photo shows a volcanic or hydrothermal explosion bomb (arrowed) at "Home Plate", Columbia Hills, Mars, imaged by the *Spirit* rover. This feature, and the associated silica deposits, show that hydrothermal vents similar to those at Rotarua, once existed on Mars (modified from NASA/JPL image http://mars.nasa.gov/mer/gallery/press/spirit/20070503a/Figure_3_br2.jpg)

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