

Spaceward Bound Australia 2009 Expedition: June Progress Update

Introduction

This report is for the participants and parties interested in the Spaceward Bound Australia 2009 (SBA2009) expedition to the South Australian desert. Some parts of the report have been repeated from the previous 'April Update' for those new to the expedition.

Expedition Aim and Program

The Spaceward Bound Australian 2009 expedition is a 'Planetary and space science' expedition to Arkaroola and other remote locations in the South Australian desert involving scientists and teachers from the US and Australia. The expedition is a joint project between NASA Spaceward Bound located at NASA Ames and Spaceward Bound Australia an arm of 'Mars Society Australia'.

Expedition funding and support has been provided by NASA Spaceward Bound, CSIRO Space and Technology Division, Mars Society Australia, Australian National University, University of New South Wales, University of South Australia and the schools listed in the table 'Expedition Participant List'. In addition some individuals have made personal contributions. The expedition organisers wish to thank these institutions and people for their contributions support.

The expedition aim is in two parts:

- First, is to undertake field science supporting research into 'the evolution of life' in our solar system and to perform engineering trials of a field robot. Planetary scientists, geologists and engineers from the US and Australia are jointly participating in the expedition; and,
- Second, is to invite teachers and students from the US and Australia to participate and work together with the scientists undertaking practical field science. Teachers and students will have an opportunity for additional training and inspiration which, as part of the NASA Spaceward Bound program, will be passed on into school classrooms. Teachers will meet and work with scientists closely involved in recent space exploration missions to the Moon Mars and Titan.

Teachers have been undertaking 'on line' training from NASA Spaceward Bound education coordinator, Dr Liza Coe in preparation to work with the scientists on the expedition.

The SBA 2009 expedition will occur from the 9th to 16th July starting and finishing in Adelaide leading to the 9th Australian Mars Exploration Conference held on the following weekend on the 18th & 19th July at the University of South Australia in Adelaide.

Table 1 lists the program as planned at in mid June. It covers the timing and places to be visited including Arkaroola, Marree and Reedy Springs, all located north of the Flinders Ranges in South Australia. A map of the region showing the locations is attached in the appendix. Expedition contacts and science activities are listed at the end of the report.

Table1: Program

Day	Activity	Travel Distance	Travel Time
Day 1, Thursday 9th July	Meet in Adelaide at: Mantra Hindmarsh Square 55-67 Hindmarsh Sq, Adelaide, SA 5000 Ph 61 8 8412 3333 hindmarsh.res@mantra.com.au Pick up vehicles		
Day 2, Friday 10th July	Travel from Adelaide to Arkaroola village Ph:61 8 8648 4848 res@arkaroola.com.au	659 kM	9 hrs 21 min
Day 3, Saturday 11th July	Science activities around Arkaroola Evening Presentations and/or astronomy	40 kM	
Day 4, Sunday 12th July	Science activities around Arkaroola Evening Presentations and/or astronomy	40 kM	
Day 5, Monday 13th July	Travel from Arkaroola to slightly north of Marree along the Birdsville track. Stay at Marree Hotel Railway Terrace Marree, South Australia, Marree, Australia, 5733 Ph 61 8 8675-8344	283 kM	5 hours
Day 6, Tuesday 14th July	Stay at Marree in Morning. Travel from Marree to Lyndhurst in afternoon. Stay at Lyndhurst Hotel-Motel: 3 Short Street, Lyndhurst, South Australia 5731 Ph 61 8 86757781 Lyndhurstpub@bigpond.com	230 kM	4hrs 40 min
Day 7, Wednesday 15th July	Travel from Lyndhurst to Reedy Springs Work at Reedy Springs to late afternoon Travel from Reedy Springs to Lyndhurst	300 kM	4 hours 30 min
Day 8, Thursday 16th July	Travel from Lyndhurst to Adelaide Stay at Mantra Hindmarsh Square	563 kM	7 hrs 40 min
		TOTAL 1965 kM	

The aim of the program is to set a loose plan that can be altered if science objectives change. Participants will note that there is considerable travel involved between the locations. An attempt has been made to maximize the time at the locations. Sleeping bags will not be required but individuals may wish to bring them. Some people may choose to camp overnight at Reedy Springs to collect night samples. Some tents will be provided in case this is required.

Participants have been issued documentation covering, 'Code of Conduct', 'Personal details form', 'Personnel equipment list' and 'a safety Information guide'.

The Expedition Team

The expedition team scientists and teachers from the US and Australia as of the end of June 2009 numbers 29 people. We do not wish to have more than 30 people on the expedition. The participants, their affiliation, work and expedition roles are listed below in Table 2.

Table 2: The Expedition Participants

The US Science Team	US Affiliation, work, expedition role and location
Dr Chris McKay	NASA Ames: - NASA Spaceward Bound Principal & US Expedition Leader (CA)
Dr Jennifer Heldmann	NASA Ames:- NASA Spaceward Bound Coordinator (CA)
Dr Adrian Brown	Seti Institute: - Astrobiology and remote sensing (CA)
Dr Penny Boston	Dept of Earth & Environmental Science New Mexico Tech: - Geomicrobiologist (NM)
Shannon Rupert	University of New Mexico-- Ecologist (NM)
Elaine Bryant	San Jose State University:- PhD Student (CA)
Dave Bryant	San Jose State University:- Laboratory Technician (CA)
Mike Spilde	Univ of New Mexico:-Cave Research Scientist (NM)
Dr Rosalba Bonaccorsi	NASA Ames/ SETI institute:- astro-biologist (CA)
Jim Thompson	Affiliation not provided:-Cave Research Scientist (CA)
US Teachers	
Stephen Joyce	San Jose State University (CA)
Luther Richardson	Columbus High School (CA)
The Australian Science Team	Australian Affiliation, work, expedition role and location
Dr Vic Gostin	University of South Australia:- Geologist (retired) (SA)
Dr Paulo de Souza	CSIRO:- Physicist (TAS)
Dr Graham Mann	Murdoch University: - Robotics (WA)
Eriita Jones	Australian National University – PhD Student (ACT)
Reut Abramovich	Australian Centre for Astrobiology, University NSW - PhD Student (NSW)
Guy Murphy	MSA:- Author/architect historian (VIC), Expedition Media Coordinator
Australian Teachers	
Mark Gargano	St Joseph's School (WA) & SBA Teacher Coordinator
Joanne Berriman	Oatlands District High School (TAS)
Jane Dobson	Claremont College (TAS)
Liz Ryan	Campania District High School (TAS)
Nicolette Burraston	Armidale School (NSW)
Keith Treschman	Brisbane Girls Grammar School (Queensland)
Naomi Mathers	Victorian Space Science Education Centre:-Research Scientist & Curriculum Developer (VIC)
Expedition Support Staff	
David Willson	MSA:- Engineer/Australian SBA 2009 Expedition Leader (TAS):
David Cooper	MSA:- Pilot/Spaceward Bound Australia Coordinator & Expedition Safety Officer (WA):
Maureen Cooper	MSA: - Information manager/Expedition Principal Cook (WA)
Nina Stansfield	MSA: - Amateur Astronomer/Expedition Cook (WA)

Note that meals, managing the science equipment and the general organizing of the expedition will be provided by the expedition support staff from Mars Society Australia.

The Science Work

The scientist team has multidiscipline skills consisting of astro-biologists, Geomicrobiologist, geologists, physicists and engineers. The individual scientist research work is listed in table 3 at the end of this section.

The science work will include:

- The Comparison of soil microbial populations at sites between the various locations;
- A study of microbially colonized quartz;
- The examination of gullies and hydrological features at Reedy Springs; and,
- The trialling of a field robot from the Murdoch University's School of Information Technology. Refer to Figure 1 below.

The field robot, 'Mascot', a high-mobility hexapodal robot from Murdoch University's School of Information Technology is shown in Figure 1. It is designed as a low-cost teleoperated platform that can inspect and monitor remote industrial sites. The robot can navigate through rough terrain at speed and allows a remotely located operator to place sensors or view objects of interest.

Some 'teething' problems have occurred recently during preliminary trials and a main circuit board needed to be replaced. We expect these problems to be resolved for the expedition.

Field trials will include 'field shake down' trials, 'maintenance patrol' trials and testing it's use as a 'field aid' in conjunction with scientist and teacher activities. It usefulness for industrial work and to assist future manned and unmanned missions to the moon and Mars will be assessed.



Figure 1: The Mascot Rover

Photographs of expedition locations and features that interest the scientists are shown below.



Arkaroola Region

Aerial view of the eastern margins of the Flinders Ranges and the Plain adjacent Lake Frome



Arkaroola Region

Paralana Spring. Radioactive 70° spring with microbial communities suited to the hot radio active conditions. Such springs would be prime targets to look for life on mars and any martian life would require similar adaptations to a high radiation environment



Arkaroola Region View across the range front east of Arkaroola on alluvial fans. Similar locations are found on Mars.



Marree Region

Small mesa in stony desert north of Maree – a very martian landscape



Marree Region

Region covering up to 40 km North East Marree
The driest region in Australia with microbial communities suited to extreme dry conditions.



Reedy Springs

Microbial communities in gullies with possible acid seepage
Similar locations occur on Mars.

Education

For the SBA2009 educators, please refer to the website;
<http://quest.nasa.gov/projects/spacewardbound/australia2009/info.html>

The email updates are now all listed on the website, so that you may refer to them at any time. For scientists, this will give you an idea about some of the background work that has been examined by teachers at this stage as preparation and for general understanding.

Also, to identify some of the areas of operation, also examine the images on;
<http://quest.nasa.gov/projects/spacewardbound/australia2009/images.html>

This will give you a perspective on what some of the readings are referring too and a general picture of some of the locations.

Also, for all participants, there are a number (over 15) readings that have been placed at;
<http://quest.nasa.gov/projects/spacewardbound/resources.html#australia>

Use these and refer to them as required, these cover analogue studies, the Arkaroola region itself, geology, astrobiology and various techniques associated with field studies. Also, there is healthy reference list relating to other Spaceward Bound activities that may also be relevant to particular areas of study that will be occurring on SBA2009.

The Swine Influenza

The swine flu is present in Australia with several thousand people diagnosed and 5 deaths to date.

International participants may be inspected with infrared cameras upon entry to Australia. If 'flu like' symptoms are measured you may be quarantined until a proper diagnosis has been undertaken. If this occurs please call David Willson on 0418 558 129.

Media

The expedition will be visited by the media. 'Essential Media and Entertainment', located in Sydney is producing a six part documentary series for National Geographic, titled 'Space Traveler: the astronaut's guide to leaving Earth'.

The series will present an engaging synthesis of our growing understanding of planetary science, presented in the guise of an inter-planetary travelogue sweeping through the Solar System from Mercury to the Kuiper Belt. They will also be filming on behalf of the ABC's 'Catalyst' program.

There will most likely be some requests for brief telephone interviews with expeditioners from the print media and radio. It would be most appreciated if people provided time for these interviews. We will aim to schedule these according to convenience and peoples availability.

Discussions are still in progress as to the planning of this film work. Our expedition media coordinator is Guy Murphy and can be contacted on 0416794688

Contact Information

If you require further information on the expedition, NASA Spaceward Bound or Spaceward Bound Australia please contact:

For Australian enquiries please contact:

Australian Expedition Leader	David Willson	David.willson@au.tenovagroup.com
Spaceward Bound Australia Coordinator	David Cooper	mdghobby@vianet.net.au
Spaceward Bound Australia Teacher Coordinator	Mark Gargano	Gargano.mark@cathodnet.wa.edu.au
Spaceward Bound Australia Science Coordinator	Dr Jon Clarke	Jon.Clarke@ga.gov.au

For US enquiries please contact:

US Expedition Leader & NASA Spaceward Bound Principle	Dr Chris Mckay	cmckay@mail.arc.nasa.gov
NASA Spaceward Bound Coordinator	Dr Jennifer Heldmann	Jennifer.L.Heldmann@nasa.gov
NASA Spaceward Bound teacher coordinator	Dr Liza Coe	Liza.coe@nasa.gov

Details of the expedition and personal CVs of the participants can be found on the NASA Spaceward Bound website <http://quest.nasa.gov/projects/spacewardbound/australia2009/info.html>.