Thursday, March 22, 2012
POSTER SESSION II: TESTING SCIENCE MISSION OPERATIONS IN ANALOG SETTINGS
6:00 p.m. Town Center Exhibit Area

Marion C. L. Osinski G. R. Abou-Aly S. Antonenko I. Barfoot T. Barry N. Bassi A. Battler M. Beauchamp M. Bondy M. Blain S. Capitan R. D. Cloutis E. A. Cupelli L. Chanou A. Clayton J. Daly M. Dong H. Ferrière L. Flemming R. Flynn L. Francis R. Furgale P. Gammel J. Garbino A. Ghafoor N. Grieve R. A. F. Hodges K. Hussein M. Jasiobedzki P. Jolliff B. L. Kerrigan M. C. Lambert A. Leung K. Mader M. McCullough E. McManus C. Moores J. Ng H. K. Otto C. Ozaruk A. Pickersgill A. E. Pontefract A. Preston L. J. Redman D. Sapers H. Shankar B. Shaver C. Singleton A. Souders K. Stenning B. Stooke P. Sylvester P. Tripp J. Tornabene L. L. Unrau T. Veillette D. Young K. Zanetti M.
A Series of Robotic and Human Analogue Missions in Support of Lunar Sample Return **[#2333]**
This work represents an overview of an analogue mission campaign entitled Impacts: Lunar Sample Return (ILSR) to the South Pole–Aitken Basin (SPA) funded by the Canadian Space Agency.

Preston L. J. Barber S. J. Grady M. M.
CAFE — A New On-Line Resource for Planning Scientific Field Investigations in Planetary Analogue Environments **[#1874]**
The Concepts for Activities in the Field for Exploration (CAFE) project is creating a complete catalogue of terrestrial analogue environments that are appropriate for testing human space exploration-related scientific field activities.

Francis R. Osinski G. R. Moores J. Barfoot T. ILSR Team
Co-Operative Human-Robotic Exploration of Lunar Analogue Sites **[#1996]**
Operational capacity and performance comparison of lunar analogue missions using robot-only, astronaut-only, and joint robotic-astronaut mission architectures, at the Sudbury and Mistastin Lake impact structures in Canada.

Moores J. E. Francis R. Osinski G. R. Mader M. McCullough E. Preston L. J. Tornabene L. L. KRASH Operations and Science Team
Surface Operations for Mission Control During Analogue Human Lunar Deployments to Mistastin and Barringer Impact Structures **[#1136]**
The pre-deployment structure is presented for Mistastin along with the evolution of that structure. The lessons learned are applied to Barringer. The value of and requirements for different cross-cutting processes and roles are considered.

Shankar B. Osinski G. R. Abou-Aly S. Beauchamp M. Blain S. Chanou A. Clayton J. Francis R. Kerrigan M. Mader M. M. Marion C. McCullough E. Moores J. E. Pickersgill A. E. Pontefract A. Preston L. J. Tornabene L. L.
Lunar Analogue Mission: Overview of the Site Selection and Traverse Planning Process for a Human Sortie Mission at the Mistastin Lake Impact Structure, Labrador, Canada **[#1143]**
This abstract summarizes the detailed approach applied in selecting sites and planning astronaut traverses for an analogue human sortie mission.

Tornabene L. L. Osinski G. R. Mader M. M. Chanou A. Francis R. Joliff B. L. Marion C. McCullough E. Pickersgill A. Sapers H. Souders K. Sylvester P. Young K. Zanetti M. KRASH Operations and Science Team
Utility of Remote Sensing, Robotic Precursor Data and a Focused Science Hypothesis for a Follow-On Human Exploration Lunar Analogue Mission at the Mistastin Lake (Kamestastin) Impact Structure **[#2390]**
Here we summarize how remote sensing, robotic precursor data and a focused science hypothesis augmented the results from a lunar analogue mission to the Mistastin impact structure in Labrador, Canada. Join me as we go on a magical tour of this crater.

Kerrigan M. C. Shankar B. Marion C. Francis R. Pickersgill A. E. Capitan R. D. Osinski G. R. ILSR Team
Real-Time Mission Control Tracking of Astronaut Positions During Analogue Missions **[#2756]**
Here we present a simple and reliable method of real-time tracking of astronaut positions developed and implemented during recent analogue missions.

Mader M. M. McCullough E. Beauchamp M. Clayton J. Marion C. L. Moores J. Pickersgill A. E. Preston L. J. Shankar B. Osinski G. R. ILSR Team
Science Data Management During Real-Time Geological Lunar Analogue Missions to the Sudbury and Mistastin Lake Impact Structures: Recommendations for Future Ground Data Systems **[#1842]**
Simulating planetary missions on Earth can help test data management procedures and help identify needs and gaps in current ground data systems. We present lessons learned from three lunar analogue missions funded by the Canadian Space Agency.

Abou-Aly S. Mader M. M. McCullough E. Preston L. J. Moore J. Tornabene L. L. Osinski G. R. ILSR Team
Signficance of Science-Tactical Liaison Role in Mission Control for the Krash Lunar Analogue Sample Return Mission **[#2310]**
Our team carried out an analogue mission at the Mistastin Lake. Mission Control was divided into a tactical team and a science team. The science liaison is responsible for relaying the aims and motivations of the science room to the tactical room.

Blain S. Mader M. M. Tornabene L. L. Osinski G. R. ILSR team
Significance of Mission Control Science Documentarian in the KRASH Lunar Analogue Mission **[#2079]**
Responsibilities and role of the mission control science documentarian in the KRASH lunar analogue mission.

McCullough E. Pickersgill A. E. Francis R. Bassi A. Shankar B. Mader M. M. Beauchamp M. Osinski G. R. KRASH Operations and Science Team
Scientific Application of Visual Systems Instrumentation used During Lunar Sample Return Analogue Missions **[#2687]**
We present the use of 2D and 3D visual data for situational awareness and geological interpretations from the mission control perspective of three lunar analogue missions funded by the Canadian Space Agency.

Pickersgill A. E. Osinski G. R. Beauchamp M. Marion C. Mader M. M. Francis R. McCullough E. Shankar B. Barfoot T. Bondy M. Chanou A. Daly M. Dong H. Furgale P. Gammell J. Ghafoor N. Hussein M. Jasiobedzki P. Lambert A. Leung K. McManus C. Ng H. K. Pontefract A. Stenning B. Tornabene L. L. Tripp J. KRASH Science and Operations Teams
Scientific Instrumentation for a Lunar Sample Return Analogue Mission **[#2657]**
We outline the scientific instruments used during a lunar sample return analogue mission campaign and their strengths and weaknesses from a field perspective. Recommendations are included for maximizing scientific gain with these instruments.

Pontefract A. Marion C. Osinski G. R. Francis R. Pickersgill A. E. Tornabene L. L. ILSR Team
Use of Portable XRF and Raman for In Situ Analyses in Manned Planetary Investigations: Lessons Learned from the Kamestastin Lunar Analogue Mission **[#2086]**
The development of in situ geochemical instruments is critical for use in future human-led planetary investigations. We report here on our experiences using portable XRF and Raman spectrometers in the field during the KRASH 2011 analogue mission.

Stenning B. Osinski G. R. Barfoot T. Basic G. Beauchamp M. Daly M. Dong H. Francis R. Furgale P. Gammell J. Ghafoor N. Jasiobedzki P. Lambert A. Leung K. Mader M. Marion C. McCullough E. McManus C. Moores J. Preston L.
Planetary Surface Exploration Using a Network of Reusable Paths **[#2360]**
A network of reusable paths is a powerful new concept for planetary exploration. It allows a rover to study sites in parallel. It was field tested in mock lunar sample-return mission scenarios conducted in the Sudbury impact crater in Canada.

Deans M. C. Lees D. S. Smith T. Cohen T. E. Morse T. F. Fong T. W.
Field Testing Next-Generation Ground Data Systems for Future Missions **[#2518]**
Our Exploration Ground Data System comprises tools for mission science ops, including planning, monitoring, documentation, and analysis. In 2011, we tested our tools by supporting the Pavilion Lake Research Project, NEEMO and Desert RATS.

Johnson J. E. Janoiko B. A.
Desert Research and Technology Studies (D-RATS) 2011 Mission Overview **[#1604]**
2011 marked the 14th year of NASA's Desert Research and Technology Studies (D-RATS) analog mission operations. This test integrated some of NASA's latest technologies in an operational setting to evaluate a simulated near-Earth asteroid mission.

Bleacher J. E. Hurtado J. M. Jr. Meyer J. A. Tewksbury-Christle C. M.
Desert RATS 2011 Mission Simulation: Effects of Microgravity Operational Modes on Field Geology Capabilities **[#2208]**
The 2011 Desert RATS tested delayed communications and several combinations of hardware and crew assignments for microgravity targets. We discuss the strengths and weaknesses with respect to conducting planetary field geology.

Eppler D. B.
Managing Science Operations During Planetary Surface Operations at Long Light-Delay-Time Targets: The 2011 Desert RATS Test **[#2175]**
Desert RATS 2011 Science Operations Test simulated managing of human science operations at targets beyond the light delay time experienced during low-Earth orbit and lunar surface missions, such as a mission to a near-Earth object or Mars.

Evans C. A. Calaway M. J. Bell M. S.
GeoLab 2011: New Instruments and Operations Tested at Desert RATS **[#1186]**
GeoLab,a prototype glovebox integrated into a habitat testbed, simulates science operations for future exploration missions. We present GeoLab results from 2011 Desert RATS analog tests with new analytical instruments and data collection interfaces.

Yingst R. A. Cohen B. A. Hynek B. M. Johnson J. B. Schmidt M. E. Schrader C. M.
Science-Driven Strategies for Semi-Autonomous Rovers on the Moon: Field Test at an Ice-Bearing Regolith Analog **[#1674]**
We report on field tests at two glacial moraines (analogs for ice-bearing lunar regolith) where we tested science operational strategies used on Mars to determine best practices for conducting remote semi-autonomous rover geology on the Moon.

Cloutis E. A. Whyte L. Qadi A. Bell J. F. III Berard G. Boivin A. Ellery A. Haddad E. Jamroz W. Kruzelecky R. Mann P. Olsen K. Perrot M. Popa D. Rhind T. Samson C. Sharma R. Stromberg J. Strong K. Tremblay A. Wilhelm R. Wing B. Wong B.
The Mars Methane Analogue Mission (M3): Results of the 2011 Field Deployment **[#1569]**
The M3 mission simulated a rover mission to Mars to search for sources of methane. The 2011 campaign found that methane plumes from serpentinite are very localized and target selection based on imagery is preferred over direct methane detection.

Boivin A. Samson C. Holladay J. S. Cloutis E. A. Ernst R. E.
Mars Methane Analogue Mission (M3): Near Subsurface Electromagnetic Techniques and Analysis **[#2140]**
As part of the Canadian Space Agency's Mars Methane Analogue Mission, a micro-rover mission, an Electromagnetic Induction Sounder (EMIS) was used with the goal of demonstrating its value as a potential science instrument onboard future rovers.

Weiss D. K. Levine N. S. Beutel E. K. De Munster N. Barajas L. G. Wynne K. Stein A. Runyon C.
Mapping Rover Routes and Hydrous Soil Locations on the Mars Desert Research Station **[#1950]**
We report on a two-week Mars Desert Research Station (MDRS) crew 109 rotation where satellite imagery and groundbased observations were combined to create a map of potential rover exploration routes for the area surrounding the MDRS habitat.

Rask J. C. De Leon P. Marinova M. M. McKay C. P.
The Exploration of Marambio Antarctica as a Mars Analog **[#2455]**
To learn how spacesuits limit Mars exploration activities, we performed field exploration, sample collection, and instrument deployment, utilizing a pressurizable prototype spacesuit in a rocky, permafrost-rich Mars-like Antarctic location.