

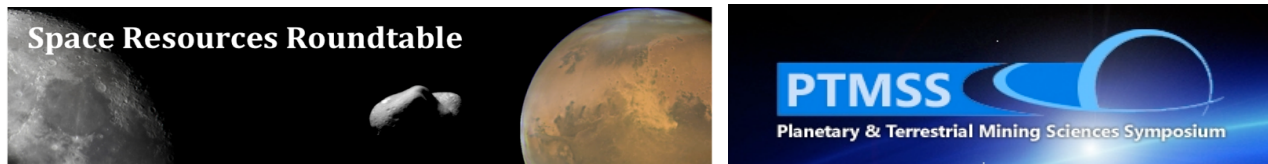


Space Resources Roundtable and
Planetary & Terrestrial Mining Sciences Symposium

***First Joint Meeting of the
Space Resources Roundtable
and the
Planetary & Terrestrial Mining Sciences Symposium***

**Colorado School of Mines
June 8-10, 2010**

Sponsored by:



**FINAL ANNOUNCEMENT
May 2010**


STEERING COMMITTEE

Angel Abbud-Madrid, Colorado School of Mines
Dale Boucher, Northern Centre for Advanced Technology Inc.
Leslie Gertsch, Missouri University of Science and Technology
Stephen Mackwell, Lunar and Planetary Institute
Charles O'Dale, Senomix Software
Robert Solheim, Pratt & Whitney Rocketdyne
G. Jeffrey Taylor, University of Hawai'i
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CONTACT INFORMATION

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Space Resources Roundtable and Planetary & Terrestrial Mining Sciences Symposium

SCHEDULE

May 21	Preregistration deadline
June 8-10	Space Resources Utilization Roundtable XI and Planetary & Terrestrial Mining Sciences Symposium at Colorado School of Mines

PURPOSE AND SCOPE

The Space Resources Roundtable, Inc. (SRR) and the Planetary & Terrestrial Mining Sciences Symposium (PTMSS) in collaboration with the Colorado School of Mines (CSM) and the Lunar and Planetary Institute (LPI), will convene their first joint meeting on June 8-10, 2010 at Colorado School of Mines, in Golden, CO.

The *Space Resources Roundtable* brings together space professionals, natural resources industry personnel, and entrepreneurs interested in developing the resources of space, including the Moon, Mars, asteroids, comets, and other bodies of this solar system. The goal of the Space Resources Roundtable is to advance prospects for the commercial development of space resources through information exchange among government, commercial, and academic organizations.

The purpose of the *Planetary & Terrestrial Mining Sciences Symposium* is to promote a closer relationship between the space and mining sectors. The intent is to allow mining experts to network with space scientists and engineers, to share knowledge, and to foster collaboration.

The recent shift in NASA's strategy for space exploration presents unique implications to both near and long-term plans for the search and utilization of space resources. This first joint meeting of the SRR and PTMSS will provide a forum for discussion on the potential opportunities available for space resources research and technology development in this new environment.

This year's presentations will include such topics as (see also the complete agenda at the end of this document):

- Orbital or landed measurements of the Moon, Mars, and/or asteroids and comets to identify and characterize potential resources
- Resource utilization experiments
- Resource processing technologies
- Experiment results that could lead to manufacturing with space resources
- Commercial details of space resources on Earth and in Space
- Space power systems
- Materials transportation systems – in space and on the surface
- Space transportation systems utilizing space resources
- Market demand and utilization scenarios for space resources and their products
- The relationship between government-funded exploration and private ventures in identifying and using space resources, and how to develop public-private partnerships



This conference is organized to accommodate the presentation of technical papers throughout the three days of the meeting, as well as open discussion of specific topics of particular interest at the end of each day. The white papers we produce from these analyses will provide decision makers with technically sound recommendations for incorporating space resources into new exploration programs.

To showcase the progress achieved to date in the space resources field, there will be a half-day session on ISRU technology demonstrations on Wednesday afternoon, June 9. Excavators, drilling mechanisms, rovers, chemical extraction plants, and other hardware designed for space-resource applications will be exhibited and operated.

WHEN AND WHERE

The first joint meeting of the SRR and the PTMSS will be held in Metals Hall at the Green Conference Center on the campus of the Colorado School of Mines, in Golden, Colorado on June 8-10, 2010. The campus is conveniently located to downtown Denver and is about a 45-minute drive west on I-70 from Denver International Airport.

Commercial shuttle service is available from Super Shuttle. The Super Shuttle ticket counter is located in the middle of the Main Terminal on the Baggage Claim Level 5. The counter is open from 7AM to 11PM daily. No reservations are required.

Accommodations within walking distance to CSM include:

Table Mountain Inn:	1310 Washington Ave., Golden, CO.	Ph: (303) 277-9898 or (800) 762-9898
The Golden Hotel:	800 11th St., Golden, CO.	Ph: (303) 279-0100 or (800) 233-7214
Dove Inn Bed & Breakfast:	711 14th St., Golden, CO.	Ph: (303) 278-2209 or (888) 278-2209

Please visit <http://csmSPACE.com/srr/> for complete information on transportation, accommodations, etc.

It is advised to *reserve rooms as soon as possible*. When reserving, indicate that you are attending a Colorado School of Mines sponsored activity to get the best rate possible.

REGISTRATION FEE

Registration for the SRR-PTMSS joint meeting is as follows:

- 1) By May 21, 2010: \$350 (USD)
- 2) After May 21, 2010 and prior to June 8, 2010: \$375 (USD)
- 3) On-site registration: \$425 (USD)

In addition to a year's membership to the Space Resources Roundtable, the registration fee includes the opening reception on the evening of June 8, a catered dinner on the evening of June 9, continental breakfast and lunch on all three days of the meeting, and coffee/soft drinks at morning/afternoon breaks.

Please submit the online registration form with credit-card payment or wire transfer to:
<http://www.csmSPACE.com/register.php?c=123>

Registrants will be provided with a full set of abstracts at the beginning of the meeting. Abstracts, summaries of discussion, and presentation materials will be collected and posted at www.ISRUinfo.com.

**JOINT MEETING of the
SPACE RESOURCES ROUNDTABLE (SRR) and the
PLANETARY & TERRESTRIAL MINING SCIENCES SYMPOSIUM
(PTMSS)**

JUNE 8-10, 2010

FINAL AGENDA

TUESDAY, JUNE 8, 2010

8:00 - 9:00am	Opening Remarks	Angel Abbud-Madrid, CSM Bob Wegeng, SRR Dale Boucher, PTMSS
Continental Breakfast		
Technical Session 1: Space Resources Policy		
9:00	The In-Situ Resource Utilization Project Under the President's New Budget William E. Larson NASA Kennedy Space Center	
9:30	ISRU Robotic Precursor Mission Opportunities Based on Recent Events Gerald B. Sanders NASA Johnson Space Center	
10:00	Canadian Space Exploration Technology Development: Surface Mobility and Resource Utilization Martin Picard Canadian Space Agency (CSA)	
10:30	Coffee Break	
Technical Session 2: Commercial and Logistical ISRU Concepts		
10:45	Commercial Trade Route Logistics Cost Thomas C. Taylor Lunar Transportation Systems, Inc.	
11:15	Conceptual Mine Design Proposals for Exploiting Lunar Water Ice Michael Neale University of Pretoria, South Africa	
11:45	Thermal Wadis in Support of Resource-Based Exploration Kurt Sacksteder NASA Glenn Research Center	
12:15	Lunch	
Technical Session 3: ISRU Relevant Concepts		
1:15	Production of Structural Materials by Combustion of Lunar Regolith with Metals Christopher White The University of Texas at El Paso	

1:45	Scavenging Flight Hardware as a Transitional Form of Non-Volatile Resource Utilization Richard Oeftering NASA Glenn Research Center
2:15	BISRU: Synthetic Microbes for Moon, Mars and Beyond John Cumbers Brown University
2:45	Lunar and Planetary Excavation Systems: Lessons Learned at the Colorado School of Mines Paul van Susante Colorado School of Mines
3:15	Coffee Break
Technical Session 4: The Case for Analogue Missions	
3:30	Participatory Space Exploration and Education at Pisces Frank D. Schowengerdt Pacific International Space Center for Exploration Systems (PISCES)
4:00	Management of an Analogue Deployment Sherry Schmidt NORCAT
4:30	Rocket Plume Impingement on Mauna Kea Lunar Analog Site Compared with Photogrammetry of Apollo Lunar Landing Videos Philip Metzger NASA Kennedy Space Center
5:00	What's Next for Lunar Exploration and Lunar Resources? Robert S. Wegeng Battelle Memorial Institute and SRR President
5:30	Roundtable Discussion
6:30-9:30	Evening Reception

WEDNESDAY, JUNE 9, 2010

Continental Breakfast	
Technical Session 5: ISRU Destinations	
8:00am	Mini-Sar Imaging Radar and the Search for Lunar Polar Ice Paul D. Spudis Lunar and Planetary Institute
8:30	Current State of Knowledge of Lunar Cold-Trapped Volatiles Richard Elphic NASA Ames Research Center
9:00	Low-Energy Intercept Orbits to Neo 2004 Gu9 Offer a Compelling Opportunity for Long-Duration Manned and Sample-Return Missions Justin G. Rodriguez sysRAND Corporation
9:30	Asteroid Tracking Using Optical Beacons Gregory A. Konesky K-Plasma, Ltd.
10:00	Coffee Break
Technical Session 6: Technical Demonstration De-brief	
10:15	Investigation of Traction System Development for Lunar Mobility Peter Radziszewski McGill University
10:45	Interchangeable Payloads for an ISRU Mobility Chassis Ronny Theiss NORCAT
11:15	Closing the ISRU Cycle: Integrated Fuel Cell Deployment Jim Richard EVC
11:45	Robotic Lessons from Mauna Kea Gabriele D'Eleuterio UTIAS
12:15	Field Scale Testing of Resolve at 2010 ISRU Analog Test J. E. Captain NASA Kennedy Space Center

12:45-3:15	Technical Demonstrations (NORCAT, ORBITEC, NASA KSC, Lockheed Martin, sysRAND, Honeybee Robotics, Colorado School of Mines) – Lunch Served on Location – –
3:15	Coffee Break
Technical Session 7: Simulants	
3:30	The In Situ Rock Thin Section Instrument for Space Exploration Christopher Dreyer Colorado School of Mines
4:00	Lunar Simulants and Their Applications Carole A. McLemore NASA Marshall Space Flight Center
4:30	Manufacturing High-Fidelity Lunar Agglutinate Simulants Robert Gustafson ORBITEC
5:00	Figures of Merit for Lunar Simulants Frederick A. Slane Space Infrastructure Foundation
5:30	Roundtable Discussion
6:30-9:30	BANQUET Special Guest: Phil Palisoul

THURSDAY, JUNE 10

Continental Breakfast	
Technical Session 8: Excavation Modeling	
8:00am	Comparing Blade/Soil Interaction Models in a Matlab Program to Measurements of Forces to Push Narrow Rods Through Sand and Simulant Materials for Design of Extraterrestrial Soil Handling Machines Mark Gefreh Sierra Nevada Corp.
8:30	Laboratory-Scale Distributed Stress Measurements of Blade Interaction with JSC-1A Lunar Simulant Andrew Brewer Colorado School of Mines
9:00	Comparison of Lance Blade Data and Analytical Force Models Robert King Colorado School of Mines

9:30	Finite Element Method to Calculate Forces and Stresses on Blades Excavating Lunar Simulants Paul van Susante Colorado School of Mines
10:00	Coffee Break
Technical Session 9: ISRU Processing	
10:15	Solar Thermal Power System for ISRU Applications: Field Deployment and Operation at Mauna Kea, Hi Takashi Nakamura Physical Sciences Inc.
10:45	The 2010 Field Demonstration of the Solar Carbothermal Reduction of Regolith to Produce Oxygen Anthony Muscatello NASA Kennedy Space Center
11:15	Pneumatic Planetary Regolith Feed System for In-Situ Resource Utilization James Mantovani NASA Kennedy Space Center
11:45	Centrifuging-Pipe Conveyor for Regolith Otis R. Walton Grainflow Dynamics, Inc.
12:15	Lunch
Technical Session 10: ISRU Hardware	
1:15	A Notional Tug Concept Serves as a “Stalking Horse” to Facilitate Excavator Development Lee Johnson sysRAND Corporation
1:45	A Modular Excavator Targets Planetary Surface Operations for Space Exploration Scot Szatkowski sysrand Corporation
2:15	Results of Solar Sintering Experiment with Multipurpose Solar Thermal Waveguide System Ben K. Smith Physical Sciences, Inc.
2:45	Crux and Icebreaker Rotary-Percussive Lunar Drills Kris Zacny Honeybee Robotics Spacecraft Mechanism Corp.
3:15	Coffee Break
3:30	Roundtable Discussion
4:30	END OF MEETING