SPACE RESOURCES ROUNDTABLE IX

Colorado School of Mines
October 25-27, 2007

www.ISRUinfo.com

Sponsored by:
Colorado School of Mines
Lunar and Planetary Institute
Space Resources Roundtable, Inc.

Final Announcement

STEERING COMMITTEE

Angel Abbud-Madrid, Colorado School of Mines
Bruce Damer, Digital Space
Michael B. Duke, Colorado School of Mines
Leslie Gertsch, University of Missouri-Rolla
Alex Ignatiev, University of Houston
Stephen Mackwell, Lunar and Planetary Institute
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CONTACT INFORMATION

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SCHEDULE

September 29	Final announcement
October 25-27	Roundtable IX

PURPOSE AND SCOPE

The Space Resources Roundtable, Inc., in collaboration with the Colorado School of Mines and the Lunar and Planetary Institute, will convene the ninth Space Resources Roundtable on October 25-27, 2007 at the Colorado School of Mines, in Golden, CO.

The purpose of the Space Resources Roundtable is to bring together space professionals, natural resources industry personnel (mining, quarrying, construction), and entrepreneurs interested in developing and utilizing the resources of space, including the Moon, Mars, asteroids, comets, and other solar system bodies. The goal of the Space Resources Roundtable is to advance the commercial development of space resources through information exchange among government, commercial, and academic organizations.

This year's meeting once again will be fascinating. Interest in *in situ* resource utilization (ISRU) on the Moon and Mars continues to increase. In addition to Europe and Japan, China and India have announced plans for space. The Space Resources Roundtable, with its visionary and technically-savvy participants, is in a unique position to help shape these programs and guide the future.

Thus, the ninth Space Resources Roundtable will host talks and posters on:

- ISRU efforts elsewhere in the world.
- Lunar ISRU
- Non-lunar ISRU, including asteroids, Mars, Mercury, and other planets in this solar system.
- Properties and perspectives of regolith and regolith simulants.
- Support systems for resource utilization: power, communications, storage, data, *etc*.

The Roundtable will also provide opportunity to discuss current topics related to ISRU, for possible production of a white paper to provide decision makers with technically sound recommendations for incorporating space resources into exploration programs. Scheduled discusion topics are:

- Where Do Regolith Simulants Go From Here?
- Lunar ISRU Demonstration Priorities Revisited.

WHEN AND WHERE

The Roundtable will be held in the Green Conference Center on the campus of the Colorado School of Mines, in Golden, Colorado. 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 (www.supershuttledenver.com) 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. Conference activities include a reception, dinner on the second evening, three continental breakfasts, two lunches, and coffee/soft drinks at morning/afternoon breaks. Accommodations within walking distance include:

Table Mountain Inn: 1310 Washington Ave. Golden CO 303-277-9898
The Golden Hotel: 800 11th St. Golden CO 303-279-0100
Dove Inn Bed & Breakfast: 711 14th St. Golden CO 303-278-2209

Visit www.mines.edu/outreach/cont_ed/ for more accommodations, maps, and other travel information.

TALK VS. POSTER

Talks are 30 minutes in length, given to the other attendees and accompanied by digital or analog slides. Posters are up to 36x36 inches (914x914 mm) in size with minimum 18-point font. Use 164-point font for the poster title. Both slides and posters should be sparse with words and dense with pertinent images; readability is paramount.

STUDENT SCHOLARSHIPS

This year several scholarships were available to offset travel and registration costs for undergraduate and graduate student participation in the Roundtable. Scholarship recipients are required to give a poster or talk. Applicants must submit a letter of application and a letter of support from their advisor, or other faculty member familiar with their interest in ISRU, before October 11 (extended deadline) to Leslie Gertsch (address below). Electronic format is preferred, though paper format is acceptable.

REGISTRATION FEE

Registration for Space Resources Roundtable IX is $250 ($200 for paid-up members, $275 for those renewing existing memberships). Mail the accompanying registration form with payment to the Office of Special Programs and Continuing Education, Colorado School of Mines, 1500 Illinois St., Golden, CO 80401, or pay on-site at the Roundtable or online by credit card at https://hagrid.mines.edu/outreach/cont_ed/form_pgp.htm.

In addition to a year's membership in the Space Resources Roundtable for nonmembers at 33% discount, the registration fee includes the opening reception on the evening of October 25, a catered dinner on the evening of October 26, continental breakfast on all three days of the meeting, and lunches on October 25 and 26. 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.

THE SPACE RESOURCES ROUNDTABLE, INC.

The Space Resources Roundtable, Inc. is incorporated within the State of Colorado and has 501c(3) status with the U. S. Internal Revenue Service. Individual membership in the Space Resources Roundtable, Inc. is $75/year. Send dues by check or money order to Professor Alex Ignatiev, SRR Treasurer, Texas Center for Semiconductors and Advanced Materials, University of Houston, Houston, TX 77204-5002.

Logistical Point of Contact:
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CONFERENCE REGISTRATION FORM
SPACE RESOURCES ROUNDTABLE IX

Name_____ Title_____

Affiliation_____

Address_____

City_____ State_____ Zip_____

Phone_____ Fax_____ Email_____

Type of Presentation: ____ Talk ____ Poster

Digital projection is provided for talk slides. I also need: ____ Slide projector ____ Overhead projector

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Member Registration and Renewal ($275) _____

Non-Member Registration ($250) _____

Member Registration ($200) _____
(my membership is up-to-date)

Payment Type: _____ Check number ____ Credit card (fill out details below)

Credit Card Type: ____ American Express ____ MasterCard ____ Visa

Credit Card Number: _____

Expiration Date: _____

Name on Card: _____

Signature: _____

You are fully registered only when we have received your registration payment. Send check, money order or credit card information using this form, to arrive before October 11, to Space Resources Roundtable IX, Office of Special Programs & Continuing Education, Colorado School of Mines, Golden, CO 80401 (phone: 303-273-3321; fax: 303-273-3314; email: space@mines.edu)

Online credit-card alternative: https://hagrid.mines.edu/outreach/cont_ed/form_pgp.htm. The name of the course is *Space Resources Roundtable IX*.

Return before October 11, 2007 or Register On-site.

Space Resources Roundtable IX

Petroleum Hall, Green Center
Colorado School of Mines
Golden, CO 80401

October 25-27, 2007

Preliminary Program – September 29, 2007

Thursday, October 25

7:30 AM Continental Breakfast – Green Center Lobby

8:00 Welcome to Colorado School of Mines
Introduction to Space Resources Roundtable IX; Review of Agenda

8:30 Javier Diaz - ISRU-based Transportation Architectures For the Moon Using Direct 2.0 Launch Vehicles

9:00 Takashi Nakamura – Solar Thermal Power System for Oxygen Production from Lunar Regolith

9:30 Rebecca Kreutzberg – Simulated Lunar Habitat

10:00 BREAK – Green Center Lobby

10:30 Fred Slane and Gary Rodriguez – Layered Architectures for Mitigation and Processing of Planetary Dust for Manned and Robotic Space Exploration

11:00 Gary Rodriguez and Roger Lenard – An Industrial-Grade Power Generation Management and Distribution System for Lunar Surface ISRU Applications

11:30 Greg Konesky – In-situ Construction of a 100 Meter Lunar Liquid Mirror Telescope

12:00 LUNCH – Friedhoff Hall, Green Center

1:00 Geoffrey Landis – Meteoritic Steel As a Construction Resource on Mars

1:30 Teruo Makabe – The Effective Bullet Shape For Impact Asteroid Sampling

2:00 Justin Rodriguez – Defining Intercept Orbits for NEO 2004 GU9 in Support of Potential Long-Duration Manned or Sample-Return Missions

2:30 BREAK – Green Center Lobby

3:00 Tryana Garza-Cruz and Masami Nakagawa – Modeling of Agglutinates and Its Mechanical Properties

3:30 Masami Nakagawa – Modeling of Coagulation of Charged Dust

4:00 Robert King – Laboratory Measurement of Soil Excavation Forces and Relation to Lunar Soil Geotechnical Properties

4:30 Enrique Rame – Flowability of JSC1-A

5:00 James Gaier and Richard Rogers – NASA/USGS Lunar Highlands Type Simulant Medium Grain Size, NU-LHT-1M, Lot 018 X-Ray Diffraction

5:30 RECEPTION and Poster Session – Friedhoff Hall, Green Center

Don Arbuckle – Development of a Bucket-Ladder Excavator in Support of the Lunar Exploration Architecture: Mechanical Hardware Design
Brad Blair and Bruce Damer – title not available
Daniel Glavin et al. – Volatile Analysis by Pyrolysis of Regolith (Vapor) on the Moon for In Situ Resource Utilization Technology Development
Lee Johnson and Paul van Susante – Development of a Bucket-Ladder Excavator in Support of the Lunar Exploration Architecture: Size and Scaling
Roger Lenard – title not available
Fred Slane et al. – Development of a Bucket-Ladder Excavator in Support of the Lunar Exploration Architecture: CONOPS
Hiroaki Sonezaki – Ironmaking from Lunar Soil Simulant by Smelting Reduction Method

6:30 AIAA Space Resources Technical Committee meeting

Friday, October 26

7:30 AM Continental Breakfast – Green Center Lobby

8:00 Opening Remarks

8:30 Leanne Sigurdson – Cryotesting of Drill Components

9:00 Kris Zacny – Pneumatic Lunar Regolith Excavator

9:30 Sherry Schmidt – Integrated Facilities Testing of the Excavation and Bulk Regolith Characterization Module of RESOLVE

10:00 BREAK – Green Center Lobby

10:30 Joseph Kruger and Jim Jordan – The Astronaut-Tended Regolith Imaging System (ATRIS): A Quick And Easy Way to Image the Shallow Lunar Subsurface Using Ground-Penetrating Radar

11:00 A. Kókány et al. **–** Practical Questions and Task Analysis of Realization and Operation of a Lunar Robot for Moving Lunar Surface Materials

11:30 Hiroshi Kanamori – ISRU Mission Recommendations to the SELENE-2 Project

12:00 LUNCH – Friedhoff Hall, Green Center

1:00 Edgardo Santiago-Maldonado – ISRU System Model Tool: From Excavation to Oxygen Production

1:30 Eric Cardiff – Scaling towards Oxygen Production

2:00 TBD

2:30 BREAK – Green Center Lobby

3:00 Mike Duke and Frank Schowengerdt – PISCES: ISRU Research and Demonstration Plan

3:30 Steve Durst – International Lunar Observatory Association 2007 -- Interglobal, Multifunctional, Hawaiian

4:00 Discussion

5:00 Space Resources Roundtable Board Meeting – open to all

6:30 DINNER – Friedhoff Hall, Green Center

Saturday, October 27

7:30 AM Continental Breakfast – Green Center Lobby

8:00 Marshall Space Flight Center – Summary of the Lunar Simulant Workshop, 10-12 Oct

8:30 Masami Nakagawa – Summary of the Lunar Geomechatronics Workshop II, 24 Oct

9:00 Discussion: Where Do Regolith Simulants Go From Here?

10:00 BREAK – Green Center Lobby

10:30 Discussion: Lunar ISRU Demonstration Priorities Revisited

12:00 Adjourn