

# Geological Society of Nevada Southern Nevada Chapter Newsletter

*February 2010*

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## **The Application of Imaging Spectroscopy to Debris Flow Hazard Assessment on the Colorado Plateau; Developing a Spectral Stratigraphy of Cataract Canyon, Utah.**

**SPEAKER:** Dr. Lawrence Rudd

**DATE:** *Thursday, February 25th, 2009*

**LOCATION:** LFG Rm. 105

University of Nevada - Las Vegas

**TIME:** *Social half-hour at 6:45 pm*

Meeting business at 7:15 pm

Talk at 7:30

**DONOR:** Anonymous

Greetings GSNER's! February has crept up on us once again and Spring is just around the corner! This month's speaker is Dr. Larry Rudd, a geomorphologist and science educator, will give GSN a talk about using spectroscopic analysis to assess debris flow hazard on the Colorado Plateau. Let's give Dr. Rudd a warm welcome! This month's meeting has been made possible by a donor who would like to remain anonymous, so thank you!

This month's newsletter includes the second edition of "Get to know your fellow GSN members" with Charley Pedro graciously volunteering to be the next to share about his geologic background: thanks Charley! This newsletter also contains information about the UNLV Geoscience Department's GeoSymposium. The symposium takes place on Friday, April 16th, 2008 and will include oral and scientific poster presentations of research currently being conducted by UNLV graduate and undergraduate students. This is a student-run conference that features keynote addresses by leading state and industry geologists, as well as a silent auction. The GeoSymposium is completely reliant on the generosity of donors. More information on this event contact Vicki Meyers at [meyersv2@unlv.nevada.edu](mailto:meyersv2@unlv.nevada.edu). Please see additional information on GeoSymposium below!

Wishing you a great February!

-Laura Eaton, Newsletter Editor

### **Geological Society of Nevada Southern Nevada Chapter**

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Las Vegas, NV 89154-4010

<http://geoscience.unlv.edu/GSN/gsnsc.htm>

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## **The Application of Imaging Spectroscopy to Debris Flow Hazard Assessment on the Colorado Plateau; Developing a Spectral Stratigraphy of Cataract Canyon, Utah.**

Speaker: **Dr. Larry Rudd**

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### **This week's talk:**

Spectroscopic analysis of data from hyperspectral scanners can be used to create a unique spectral signature for earth surface materials based on the material's reflectance spectrum. Analysis of AVIRIS hyperspectral data and field-based imaging spectroscopy data reveals that debris-flow deposits, colluvium, and some shale units in Cataract Canyon, Utah display the double-absorption feature characteristic of kaolinite at 2.2  $\mu\text{m}$ . Lab-based reflection spectra and semi-quantitative x-ray diffraction results show that Cataract Canyon debris-flow matrix clays are dominated by kaolinite and illite and lacking in montmorillonite. A surface material map showing the spectral stratigraphy of part of Cataract Canyon was created from AVIRIS data classified using an artificial neural network (ANN) and compares favorably to existing geologic data for Cataract Canyon. A debris-flow initiation potential map created from a GIS-based analysis of surface materials, slope steepness, slope aspect, and fault maps shows the greatest debris-flow initiation potential in the study area to coincide with outcrops of the Moenkopi Formation on steep (>20%), southwest-facing slopes. The results of this study provides evidence that hyperspectral imagery classified using an ANN can be successfully used to map the spectral stratigraphy of a sparsely vegetated area such as Cataract Canyon.

### **Dr. Rudd's Background:**

Dr. Rudd's professional interests are in the areas of science education and geomorphology, and is active in both teaching and his scientific research. Dr. Rudd's received a Bachelor's Degree from Wittenberg University, a Master's Degree from the University of Denver, and a Ph.D. from the University of Arizona. He has wide-ranging experience in education, including 20 years of teaching high school earth science, physics, and geology.

His science education classes help pre-service teachers develop an understanding of the need to get students of all ages actively involved in scientific inquiry. Dr. Rudd is currently involved in a state-wide EPSCoR project to educate in-service science teachers about the topic of climate change and how to integrate climate change education into their teaching. Dr. Rudd's lifelong passion for geology resulted in his receiving funding for three consecutive one-year grants to teach in-service CCSD science teachers about the geology of southern Nevada. Dr. Rudd maintains an active interest in the study of landslides and other Earth surface processes and thoroughly enjoys being able to do field work in Southern Nevada and the nearby Colorado Plateau.

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# Get to know your fellow GSNER's

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**This year we're starting a new GSN newsletter tradition, thus we present the "Get to know your fellow GSNER's" section. This month's member is Charley Pedro.**

## **Tell us a little about your background as a geologist**

I have been collecting rocks, minerals and fossils for 42 years. I started young, six years old. Rock tumbling and rock sawing also. I have done a lot of exploring, around the US. I am an active member in six rock and mineral clubs, two in California, Nevada and Kansas. The \$300 a year is well worth it! I have been in the concrete cement block business for 30 years. The company I work for now, I have been with for 12 years. I'm from Los Angeles, CA and have been in Las Vegas for 10 years. I just bought my second house and I love Nevada!



## **How did you become involved in geology?**

I got my first rock tumbler at age six; from then on I fell in love with geology. I've been doing it ever since.

## **Could you share a story about a field or geology-related experience that stands out as particularly memorable?**

Spending a lot of time in LA and Las Vegas, I have been honored to have met a lot of famous people; Bill Clinton and Sean Connery to name a few. I once had dinner with Ronald Reagan, and was able to share some of my rocks and minerals with him. Two weeks later he wrote me a letter and sent me two rocks from the state of California, and a map. That was memorable. I have also been able to do a lot of exploring with geology people, on trip with a geology group from Kansas during the floods of 1993 was very memorable.

## **What is your favorite rock/geological feature?**

Agate, opal, to name a few. My favorite geological feature would be the Grand Canyon.

## **What is your favorite place related to geology you've ever been?**

Carra Marble mines in Nevada, Opal and copper mines in Nevada as well. I've been lucky, to have gone to mines all over Nevada, California, Kansas, and Arizona for the last 30 years.

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# Announcements

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## Volunteer to Share your experiences!

Share your field experiences with other GSN SNV chapter members through a story and/or photos in an upcoming newsletter.



Interested? Contact Laura Eaton at [eatonl4@unlv.nevada.edu](mailto:eatonl4@unlv.nevada.edu)

## Calling all speakers and sponsors!

GSN is looking for sponsors and speakers for our 2009-2010 year! If you are interested or have ideas, please contact Swapan Sahoo or Josh Bonde.

Thank you!

## Silent Auction Items

GSN is always looking for specimens and silent auction items for our monthly meetings. The well-being of GSN is made possible by your generous donations. If you have a specimen or silent auction item, please contact Swapan Sahoo or Josh Bonde, or just bring it to the next meeting.

Thank you!

Have an announcement you would like to share in the next newsletter? Contact Laura Eaton at [eatonl4@unlv.nevada.edu](mailto:eatonl4@unlv.nevada.edu)



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# The 5th Annual UNLV GeoSymposium

April 16<sup>th</sup> and 17<sup>th</sup>, 2010



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The UNLV Geoscience Department will host its 5th Annual Geoscience Student Symposium at the Blasco Event Wing in the Foundation Building, on the UNLV campus. The symposium is student-run and designed to provide graduate and undergraduate students with an opportunity to present their original research and receive feedback from industry, civic, and government professionals, as well as academic experts.

UNLV Geoscience students are planning a two-day event including presentations on Friday, April 16th, and a field trip on Saturday, April 17th. Oral presentations will be offered, which will include time for discussion with audience members, and student poster sessions will be presented on the 16th. A review panel will award prizes for the best oral presentations and posters. The day will conclude with a post-symposium gathering of all students, faculty, and invited guests at a reception with food and refreshments, and a silent auction of rock and mineral specimens. An exact schedule is still being determined.

This year's field trip will be to Red Rock Canyon National Conservation Area, approximately 15 miles west of Las Vegas. The field trip will depart from the Lilly Fong Geoscience building (LFG) parking lot at 8:30am on April 17th, and is expected to return to campus by 5:00pm. Lunch will be provided for all participants. Just bring along some water and a camera to take pictures of the spectacular red sandstone peaks and walls that this destination is known for!

The UNLV Geoscience Student Symposium will showcase a wide range of important graduate and undergraduate research, and provide a forum for participating students to develop presentation skills in a friendly, relaxed environment. Student research projects include such diverse topics as: soils, geomorphology, hydrogeology, paleontology, sedimentology, stratigraphy, geochemistry, volcanology, seismology, structural geology, and economic geology. We hope that you can join us for this event!

### **GeoSymposium homepage:**

<http://geoscience.unlv.edu/GeoSymposium/GeoSymposium.htm>

### **To register to attend GeoSymposium, please go to:**

<http://geoscience.unlv.edu/GeoSymposium/donation.htm>

Or, contact Vicki Meyers, GeoSymposium coordinator at: [meyersv2@unlv.nevada.edu](mailto:meyersv2@unlv.nevada.edu)



# GSN 2010 SYMPOSIUM

Mark your calendars!

*The Geological Society of Nevada invites you to attend our sixth symposium, **Great Basin Evolution and Metallogeny**. We strive to maintain a tradition of excellence, emphasizing descriptive accounts of ore deposits, new theories on deposit formation and innovative concepts of how to find the next district or deposit.*

## Technical Sessions:

- Carlin-Type Deposits I and II
- Great Basin Metallogeny
- Nevada Geology and Tectonics
- Discovery Case Histories
- New Mine Developments
- Volcanic-Hosted Epithermal Deposits
- Young Au-Ag Hydrothermal Systems
- Styles of Tertiary Magmatism and Metallogeny
- Intrusion-Related Deposits
- Geothermal
- Rumors from the Bush—
- Great Basin Exploration Update
- Outta the Box—Concepts in Great Basin Geology and Ore Deposits
- Exploration Remote Sensing
- Regional Exploratin Roundup
- World Exploration
- Exploration Success—America
- Molybdenum Deposits
- ArcGIS
- Remote Sensing
- Sample Collection, Prep and Analysis
- Isotopes and Exploration

## Field Trips

- Carlin Gold Deposits-Three Trips
- Epithermal Deposits-Two Trips
- Porphyry and IOGC Deposits
- Modern Ancient Geothermal Systems
- Industrial Mineral Deposits

## Short Courses:

- SEG Workshop—Gold in 2010
- Structural Systematics
- Fundamentals of NI 43-101



Want to learn more or attend?

Contact: (775) 846-9766  
[Secretary@gsnv.org](mailto:Secretary@gsnv.org)  
[www.gsnv.org/symposium](http://www.gsnv.org/symposium)

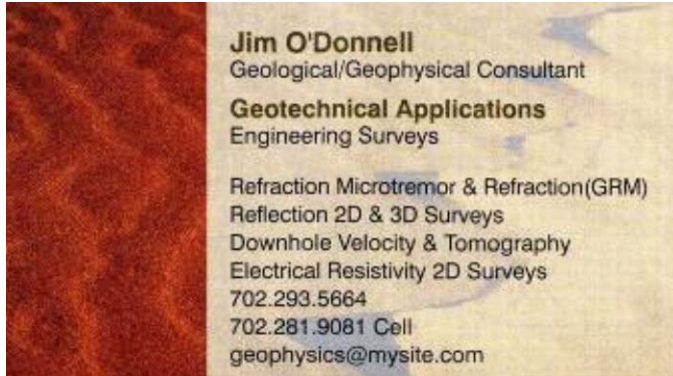


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# Paid Advertisements

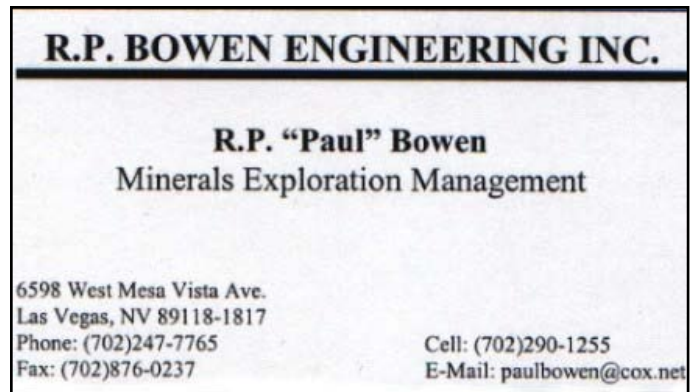
## Thank you for your support!

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A business card for Jim O'Donnell, a Geological/Geophysical Consultant. The card has a textured, reddish-brown background on the left side and a light-colored background on the right. The text is in a serif font.

**Jim O'Donnell**  
Geological/Geophysical Consultant  
**Geotechnical Applications**  
Engineering Surveys

Refraction Microtremor & Refraction (GRM)  
Reflection 2D & 3D Surveys  
Downhole Velocity & Tomography  
Electrical Resistivity 2D Surveys  
702.293.5664  
702.281.9081 Cell  
geophysics@mysite.com

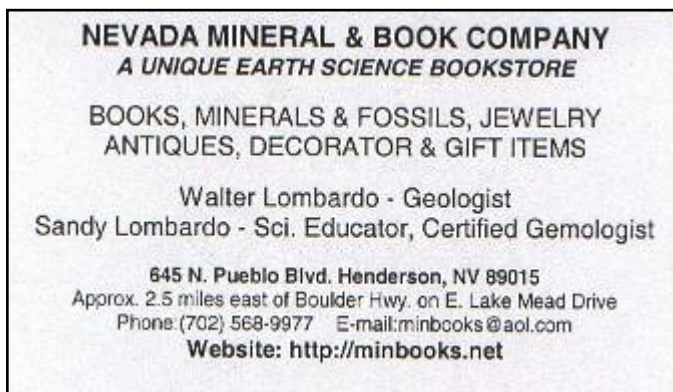
A business card for R.P. Bowen Engineering Inc. The card has a white background with a black border. The text is in a serif font.

**R.P. BOWEN ENGINEERING INC.**

**R.P. "Paul" Bowen**  
Minerals Exploration Management

6598 West Mesa Vista Ave.  
Las Vegas, NV 89118-1817  
Phone: (702)247-7765  
Fax: (702)876-0237

Cell: (702)290-1255  
E-Mail: paulbowen@cox.net

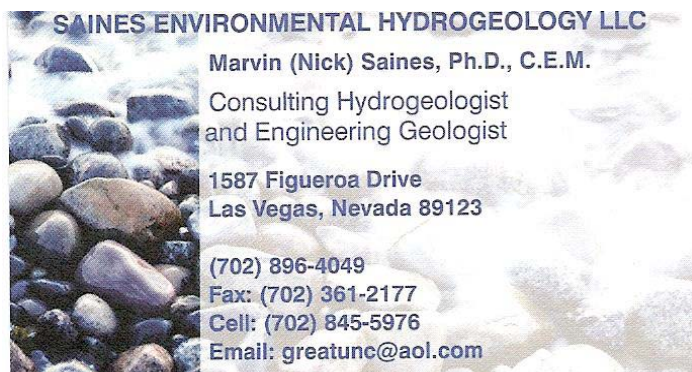
A business card for Nevada Mineral & Book Company. The card has a white background with a black border. The text is in a serif font.

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Walter Lombardo - Geologist  
Sandy Lombardo - Sci. Educator, Certified Gemologist

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Approx. 2.5 miles east of Boulder Hwy. on E. Lake Mead Drive  
Phone: (702) 568-9977 E-mail: minbooks@aol.com  
Website: <http://minbooks.net>

A business card for Saines Environmental Hydrogeology LLC. The card has a white background with a black border. The left side features a photograph of smooth, rounded river stones in shades of grey, brown, and white. The text is in a serif font.

**SAINES ENVIRONMENTAL HYDROGEOLOGY LLC**

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