



# GEOLOGICAL SOCIETY OF NEVADA NEWSLETTER

Geological Society of Nevada, 2175 Raggio Parkway, Room 107, Reno, NV 89512  
(775) 323-3500 - Hours Tuesday -- Friday, 8 a.m. to 3 p.m. Monday by appointment.  
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April 2017, Vol. 33, No. 2

Published monthly except June and July

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## CALENDAR OF GSN EVENTS

April 6, 2017  
THURSDAY

### SO. NEVADA CHAPTER MEMBERSHIP MEETING (1st Thursdays)

The monthly meeting will be held at the Las Vegas Natural History Museum at 900 N. Las Vegas Blvd. Pizza/drinks at 5:30 pm, Talk at ~6:15 pm. **Speaker: David Caldwell, BlackRock Metals Inc. Title: "Real World Geometallurgical Modeling of the BlackRock Metals Vanadium-Titanomagnetite Deposit, Chibougamau, Quebec". Food & Drinks Sponsored by: Need a Sponsor!** Contact Paul Dockweiler for more information: [paul.dockweiler@mma1.com](mailto:paul.dockweiler@mma1.com). Details on page 6.

April 12, 2017  
WEDNESDAY

### WINNEMUCCA CHAPTER MEMBERSHIP MEETING (2nd Wednesdays)

The meeting will be held at the Martin Hotel, 94 W. Railroad St., Winnemucca, NV. Refreshments/appetizers at 6 p.m. Talk at 7:00 pm. **Speaker: Tony Gesualdo. Title: "Structural Controls on Mineralization in the Terry Complex Open Pit at Marigold Mine, Humboldt County, Nevada". Food & Drinks Sponsored by: CARLIN TREND MINING SERVICES & COLOG.** For more info please contact Jim Carver @ [jcarver@silverstandard.com](mailto:jcarver@silverstandard.com). Details & abstract on page 7.

April 20, 2017  
THURSDAY

### ELKO CHAPTER MEMBERSHIP MEETING (3rd Thursdays)

The monthly meeting will be held at the Western Folklife Center, 501 Railroad St., Elko, NV. Refreshments begin at 6 p.m. **Talk begins at 7 p.m. Speaker: Andrew S. Canada, University of Idaho. Title: "The Elko Formation: A Paleogeographic Record of Lake Basin Formation and Topographic Evolution during Carlin-Type Gold Mineralization". Food & Drinks Sponsored by: GEOTEMPS INC.** For more info please contact Mark Travis at: [mark.william.travis@gmail.com](mailto:mark.william.travis@gmail.com). Details on page 8.

April 21, 2017  
FRIDAY

### GSN MEMBERSHIP MEETING (3rd Fridays)

The monthly meeting will be held at the Reno Elks Lodge, 597 Kumle Ln., Reno, Nevada. Drinks @ 6 p.m., Dinner @ 7 p.m., Talk at 7:45 p.m. **STUDENT POSTER NIGHT!** Instead of having a speaker, attendees will have more time to talk to the students about their research. **Drinks Sponsored by: GEOTEMPS/GEOPROS INC.** Cost for Dinner—\$25. GSN Students are free. Please make reservations for dinner with Laura Ruud, by emailing [gsn@gsnv.org](mailto:gsn@gsnv.org) or calling 775-323-3500. Details on page 3.

MAY 6-7, 2017  
SPRING  
FIELD TRIP!!

**GSN Spring 2017 Field Trip** will examine highlights of the Silver City Lode and examples of nearby, historically productive gold-silver veins mined between 1860 and 1940 in the Silver City District, Virginia Range, Nevada. Registration form is on page 11. **LIMITED SPACE SO REGISTER EARLY!!**

## G.S.N. APRIL MEETING SPONSOR!



**FROM THE PRESIDENT**  
**Alan R. Coyner, GSN President 2016-2017**  
**APRIL 2017**

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Greetings to all our GSN members wherever you may be! I mentioned in my column last month that we were founded in 1957 and we will mark our **60<sup>th</sup> anniversary on December 6<sup>th</sup>** of this year. I also mentioned that we would like to recognize our **oldest member** and the **member that has belonged to the GSN for the greatest number of years**. From the responses I have had to date our oldest member is 82 years old and the member who has belonged to our organization the longest joined in 1981. If you can best either of these please email me at [nevadageo@hotmail.com](mailto:nevadageo@hotmail.com).

The March meeting in Reno was very well attended. Our guest speaker and author, **Gianni Kovacevic**, personally signed over 100 copies of his book **“My Electrician Drives a Porsche?”** and gave them to our members. Thank you to Gianni for sharing his unique insights into electric cars, the modern energy mix and the impacts on copper demand. If even a portion of his predictions come true we had better get ready to put on our copper exploration hats once again! Also a big thank you to **EM Strategies** for sponsoring the social hour!

The United States Geological Survey (USGS) National Minerals Information Center recently released its annual report **Mineral Commodity Summaries 2017** (available online at [minerals.usgs.gov/minerals/pubs/mcs](http://minerals.usgs.gov/minerals/pubs/mcs)). According to the USGS report, in 2016, imports made up more than one-half of the U.S. apparent consumption of 50 nonfuel mineral commodities, and the United States was 100 percent import reliant for 20 of those. This is up from 47 and 19 minerals respectively in 2015, and it marks a record high. U.S. import reliance has increased significantly since 1978, the year that this information was first reported. At that time, the United States was 100 percent import reliant on seven mineral commodities, and more than 50 percent import reliant for 25 mineral commodities. In a February 2, 2017 press release the **National Mining Association** indicated this reliance on foreign imports is particularly troubling given the current emphasis on rebuilding infrastructure and increased domestic manufacturing. The NMA points out the need for permitting reform and improved land access on federal lands in the U.S.

Another recent publication is the **Nevada Mineral Industry 2015** from the **Nevada Bureau of Mines and Geology** (NBMG). Started in 1979 this annual report describes mineral, oil and gas, and geothermal activities in Nevada. This report is a valuable resource to anyone interested in natural resource development in Nevada. The report is available at [www.nbmgs.unr.edu](http://www.nbmgs.unr.edu).

The April meeting at the Reno GSN is our annual **student poster meeting** and we hope you will attend and interact with our Mackay School of Earth Sciences and Engineering students. Prizes will be awarded for the first, second and third best posters as determined by our GSN judges. We will wrap up the 2016-2017 year in May with a presentation by **NuLegacy Gold** on their work at the **Iceberg and Avocado gold deposits** on the Cortez trend.

So, be sure to make it to one of our upcoming meetings in Reno, Winnemucca, Elko, or Las Vegas!

***The G.S.N. wishes to thank EM STRATEGIES for sponsoring  
the MARCH 17, 2017 MEETING SOCIAL HOUR in RENO!!***

# GSN MONTHLY MEETING, APRIL 21, 2017

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## STUDENT POSTER NIGHT!

Instead of a speaker, attendees will have time to talk to the students about their poster

**Social Hour begins @ 6:00 pm; Dinner @ 7:00 pm; Talk @ 7:45 pm**

**Location: Reno Elks Lodge, 597 Kumle Lane, Reno NV (across from the Convention Center)**

**DINNER COST—\$25.00 per person.**

**Reservations due by 5:00 p.m. on WEDNESDAY, APRIL 19, 2017**

For dinner reservations, please e-mail [gsn@gsnv.org](mailto:gsn@gsnv.org) or call 775-323-3500

**(Please remember you will be invoiced \$25 if you do not cancel your reservation by April 20)**

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### STUDENT POSTER #1: NACI UMUT DURU, PhD Candidate

#### Effects of Reduced Sulfur Species on the Effectiveness of Gold and Silver Cyanidation

N. Duru, C. Nesbitt

Mining and Metallurgical Engineering Department, University of Nevada, Reno

#### ABSTRACT

Cyanidation circuits that treat sulfidic ores may contain one or more of the following reduced sulfur species: sulfide ( $\text{HS}^-$ ), polysulfides ( $\text{S}_n^{2-}$ ), thiocyanate ( $\text{SCN}^-$ ), thiosulfate ( $\text{S}_2\text{O}_3^{2-}$ ), trithionate ( $\text{S}_3\text{O}_6^{2-}$ ), tetrathionate ( $\text{S}_4\text{O}_6^{2-}$ ), pentathionate ( $\text{S}_5\text{O}_6^{2-}$ ), hexathionate ( $\text{S}_6\text{O}_6^{2-}$ ). The actual speciation of the reduced sulfur species in the circuits will primarily depend on the redox potential, pH, cyanide levels and existing sulfur species in recycled process water, as well as the presence of other reactive metal species.

The aim of this study is to investigate the possibility of increased gold and silver recoveries by controlling the tetrathionate and higher polythionate levels. Experiments focus on reducing the effects of these sulfur species on cyanide consumption, and, gold and silver recovery. Test work includes bottle roll experiments, cyanide species analysis, ion chromatography with ultraviolet absorbance detection, atomic absorption analysis and inductively coupled plasma mass spectrometry.

### STUDENT POSTER #2: LAURA O'CONNOR, MS Candidate, Mining Engineering

**Title "Identifying and Quantifying Major Heat Sources in Underground Mines using a Continuous Climatic Monitoring System." Co-authors are Pedram Roghanchi, Charles Kocsis, and Andrew Powell.**



**CALLING ALL STUDENTS!!** We are still seeking poster entries for the Student Poster Night at the next GSN meeting on Friday, April 21st at the Reno Elks Lodge. Cash prizes will be awarded to the First, Second and Third Place winners. All students who attend will have their dinner and drinks comped for the evening.

Please contact GSN President, Alan Coyner, at [nevadageo@hotmail.com](mailto:nevadageo@hotmail.com) or Laura Ruud, GSN Executive Manager, at: [gsn@gsnv.org](mailto:gsn@gsnv.org) to submit your poster.

# **“FACES OF GSN”**

**HARRY COOK**

## **Rock Whisperer, Forensic Geologist and Mentor – Passion, Determination, Integrity**

I was born in Fresno, California, near the western slopes of the Sierra Nevada. Here I developed several passions: hiking, old cars and snow boarding on garbage-can lids. My dad was an auto-mechanic, gas station owner and owned old vintage cars. These early years set the stage for my passions in life...the allure of mountainous terrains and fast, vintage sports cars.

Fast-forward to High School in the beach town of Santa Barbara, CA. I loved science and math and being in a Hot Rod club with my “souped up” 1936 Ford Coupe. After high school when faced with the option of college or an adventuresome interlude on the high seas, I chose the latter and volunteered for the US Navy Submarine Service. After I graduated from New London Connecticut Submarine School, I was assigned to the USS Cusk SSG-348 in Port Hueneme, southern California. The Cusk was one of three guided missile submarines that operated together as a “Wolf Pack” in the northern Pacific. Of historic interest the “Regulus” missile, which was first carried by the USS Cusk and later by the USS Tunny submarine, was a modified version of the WW II V-2 Rocket developed by the German aerospace engineer Wernher von Braun. These three years aboard a cramped 312-foot long, 27-foot wide submarine with 90 other submariners instilled in me Teamwork, Passion, Precision, Determination and Integrity.

After the Navy I was hired for one summer as an Electronics Technician at North American Aviation’s top- secret Rocketdyne facility in the Santa Susana Mountains in Southern California. Here I was part of a team that was developing and firing the Atlas Rocket engine. After I left Rocketdyne, Atlas Rocket engines were used in the early NASA Program to safely propel unmanned vehicles into space. The early Rocketdyne program was one small step in history that preceded the founding of NASA and the eventual successful landing of man on the moon.

After Rocketdyne, I enrolled in U.C. Santa Barbara (UCSB) in a Pre-Med curriculum. As a Pre-Med student I was required to take an earth science course and chose geology. During a field trip, led by Professor Bob Webb to the Mohave Desert and the Sierra Nevada, my passion for field geology started to bloom. After this field trip I changed my major from Pre-Med to Geology. I graduated from UCSB with a BA and enrolled at U.C. Berkeley (UCB), where under the tutelage of Howell Williams, Charles Gilbert and Dick Hay I received my Ph.D. in volcanology, stratigraphy, sedimentology and a minor in geochemistry and paleontology. For my thesis I mapped the Hot Creek Range of central Nevada, ~60 miles east of Tonopah. The Hot Creek Range was an excellent mountain range to map, as it is comprised of shallow water and deep-water Cambrian-Mississippian carbonate and siliciclastic strata as well as Cenozoic ignimbrites and other volcanics. During my first summer of mapping I met the legendary Great Basin geologist Tom Nolan who was Director of the U. S. Geological Survey from 1956-1965. Tom took me under his wing around Nevada showing me the Type Sections of the Great Basin Paleozoic formations. This was the most valuable “Boots on the Ground” education I ever could have had at that juncture in my budding career—Thanks Tom!

My first “real” job was as an Exploration Research Geologist at Marathon Oil Company’s Denver Research Center in Littleton, CO. I conducted research for oil and gas exploration in Devonian carbonates of Canada (Alberta and the Yukon Territory) and in Permian carbonates of west Texas. My mentor and life-long friend at Marathon was Lloyd Pray who instilled in me the value of careful, detailed, examination of rocks. I learned that the better we understand the origin of rocks and the processes under which they formed the better we can make well-founded geologic interpretations and stratigraphic, sedimentologic, structural and geochemical predictions.

I got the urge to teach and after 5 years I left Marathon Oil Co. to become a Professor of Geology at the University of California, Riverside (UCR). This was during the early days of the Deep Sea Drilling Project (DSDP) when the USS Glomar Challenger was drilling and dating cores all over the world’s oceans. When I was Chief Sedimentologist aboard the two-month long DSDP cruises of Legs 9 and 33 in the Equatorial Pacific we continuously cored to oceanic basaltic basement. Legs 9 and 33 were designed to help prove or disprove Seafloor Spreading and Plate Tectonics. The data we collected and interpreted during Leg 9 proved that seafloor spreading was occurring on the Pacific Plate at a rate ranging from 8cm/yr to 13cm/yr. This was an exciting era in earth sciences and opened up the scientific world to formulating new models for the evolution of the earth’s oceans and tectonic plates through time and space.

My move from UCR to the Western Headquarters of the USGS in Menlo Park, CA occurred during the infamous 1974 Arab Oil Embargo. During this era the USGS formed a Branch of Oil and Gas Resources and hired ~50 former oil company geologists to develop a Domestic and International Energy Resource program for the USGS. The USGS allowed me the scientific freedom and budget to develop and lead large field-oriented energy research programs in the Great Basin of Nevada and Utah, Alaska, Western Europe, Eastern Europe, Asia, Russia, Siberia and later the former USSR Republics of Kazakhstan and Kyrgyzstan. This was a period in world history when the Former USSR was dissolved under President Gorbachev and became 15 separate countries. That event permitted the western world to engage in collaborative multinational energy programs in the vast areas of the former USSR... an area that occupied almost 50% of the world’s surface. I developed a 5-year multi-million dollar field-oriented Cooperative Research and Development Agreement (CRADA) between the US Academy of Sciences, Russian Academy of Sciences, Kazakhstan Ministry of Energy and 7 US and European oil companies (Exxon, Mobil, Eni/Agip, British Gas, BP/Amoco, Total and (continued on pg. 5)

(Cook, continued from page 4)

Royal Dutch Shell). The CRADA Program was designed to map and measure stratigraphic sections in Cambrian-Permian carbonate outcrops in Kazakhstan and Kyrgyzstan. These data were used as outcrop analogs for subsurface oil and gas exploration in coeval carbonates in the North Caspian Basin of Kazakhstan and Russia. Our collaborative CRADA research resulted in the 2000 discovery of Kashagon Oil Field, a Devonian-Permian Carbonate Seamount, that is the 3rd largest oil field in the world.

When I retired as Emeritus Geologist from the USGS in 2005 I founded Carbonate Geology LLC, an international consulting company. I well remember in 2005 when I first introduced the concepts of carbonate sequence stratigraphy to the mining industry. I gave a talk at the 2005 Geological Society of Nevada (GSN) Symposium in Reno/Sparks. My talk was, "Carbonate Sequence Stratigraphy: An exploration tool for sediment-hosted, disseminated gold deposits in the Great Basin". I didn't know if I would be hooted off the stage or not. Fortunately for me the GSN audience was very open to this new concept--a concept that had the potential to advance the exploration and discovery of Carlin-Type Gold Deposits. Immediately after my talk Steve Koehler, then with Placer Dome at Cortez, approached me. That meeting with Steve resulted in my first consulting job in the mining industry. Placer Dome owned Cortez and Bald Mountain in early 2005 but soon sold Cortez and Bald Mountain to Barrick. "Placer Dome-Barrick" hired me to do a comprehensive study comparing the geologic evolution and framework of Cortez (deep-water carbonates) versus Bald Mountain (shallow water carbonates). My goal during that study was to apply the predictive value of carbonate sequence stratigraphy to understanding the genetic link between eustatic sea level low stands and deepwater debris flow and turbidite gold-hosts versus coeval shallow water gold hosts in karsted carbonates.

The last 10 years has been one of the most exciting and rewarding times in my career. It has given me the opportunity to do collaborative field and lab studies with world-class mining geoscientists and to share my background by mentoring young geoscientists. I enjoy expanding my knowledge base by consulting with a broad spectrum of companies such as Barrick, Newmont, Pilot, Marigold, Carlin Gold, U. S. Gold, Evolving Gold, Timberline, Miranda, Snowstorm, ATAC, Kaminak, Anthill and Desert Star. These studies have been conducted along the major gold trends in Nevada and Utah, including Getchell, Battle Mtn., Cortez, Carlin, Rain, Eureka, Tonkin Springs, Roberts Mountains, Independence, Bald Mtn., Rain, Emigrant, Long Canyon and Kinsley Mtns. In Canada, I have conducted surface and subsurface studies along the Yukon Territory's ATAC Rackla Trend and developed the carbonate platform Selwyn Basin Trend for Anthill Resources. In the Northwest Territory while consulting for Kaminak I developed a Cambrian-Mississippian carbonate stratigraphic column in the context of carbonate sequence stratigraphy.

I have a strong passion to advance our understanding of geology, mentoring young earth scientists and writing research papers, books and giving professional talks. To help move science forward I am a member of several geological societies. I have the great pleasure and honor to be a member of the GSN and greatly appreciate the sustained dedicated service of everyone who makes GSN the great society it is. I enjoyed being past President of the International SEPM Society of Sedimentary Geology, former American Association of Petroleum Geologists Distinguished Lecturer, former Adjunct Professor of Geology at the University of Nevada, Las Vegas and the University of Wyoming. My most recent activity in attempting to advance the mining industry is by being a Founding Member of a new gold company in Nevada—"Osgood Mountains Gold, Inc." Ann Carpenter is President, Bill Doerner is Chief Geophysicist and I am the Chief Geologist.

*Jim Butler founded this famous former silver and gold mining town of Tonopah in about 1905. In the Shoshone language "Tonopah" means "hidden spring" or "rock that flows upward with water". The famous Mizpah Hotel is in the background next to my right shoulder. Tonopah has about 2,500 residents and is a central Nevada hangout where geologists often meet and deals are made!*



# GSN SO. NEVADA CHAPTER MONTHLY MEETING

**THURSDAY, APRIL 6, 2017**

**Location: Las Vegas Natural History Museum  
900 Las Vegas Blvd. North**

**Time: Food, Drinks begin @ 5:30 p.m.**

**Talk begins about 6:15 p.m.**

**Speaker: Dave Caldwell, BlackRock Metals Inc.**

**Title: “Real World Geometallurgical Modeling of the BlackRock Metals Vanadium-Titanomagnetite Deposit, Chibougamau, Quebec”**

David Caldwell

Technical Advisor and Co-Founder of BlackRock Metals Inc.

The BlackRock Project is located within the Abitibi Terrane of the Superior Province within the Canadian Shield. It forms part of the Archean package of rocks (2.7 Ga) that comprise the core of the North American craton (Figure 1). The BlackRock Project is on the edge of the Superior Province, located on both rail and paved highway, and about an 8-hour drive from Montreal.



The deposit was first imaged in an airborne magnetic survey flown by Domion Gulf in 1948, with the first work done on the ground in 1954. The drilling was focused on evaluation of the magnetic anomaly that lit-up the geophysical maps up as a potential source of iron ore. Upon closer analysis, the relatively high titanium content of the magnetite was recognized as precluding it from being suitable feedstock for standard blast furnaces, and Dominion moved on and the play lay fallow for 10 years.

Upon closer analysis, the relatively high titanium content of the magnetite was recognized as precluding it from being suitable feedstock for standard blast furnaces, and Dominion moved on and the play lay fallow for 10 years.

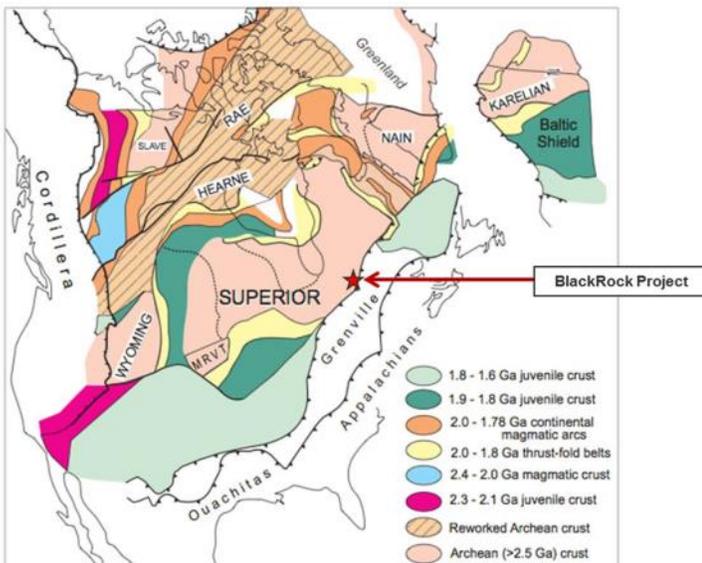


Figure 1: Cratonic Map of North America

In 1966, Gilles Allard recognized that in addition to the “problematic” titanium, the Lac Dore magnetite contains appreciable quantities of high value vanadium. This style of mineralization was very similar to that being described commercially for the first time from the Bushveld in South Africa. Gilles staked it for the Crown company he worked for and began a decades long study of the Lac Dore Layered mafic intrusive complex and surrounds. His focus really set the property up as a vanadium play for the next twenty years.

In 2008, the property came to the attention of the founders of BlackRock Metals. We moved to secure the claims based on what we saw as a polymetallic opportunity with good grades in three metals, and a great location with respect to infrastructure in Quebec. With initial funding coming from cash advance checks from VISA, and BlackRock was born. Now, almost nine years later, we have raised about \$120M USD as a private development group and are in final feasibility to build a full value chain from the mine, though the concentrator and into the transformation plant. We will market semi-finished steel and steel additives into North America, displacing higher cost and lower quality products currently sourced from Russia, China or Brazil. (continued on page 9)

# GSN WINNEMUCCA CHAPTER MONTHLY MEETING

**WEDNESDAY, APRIL 12, 2017**

**Location: THE MARTIN HOTEL**

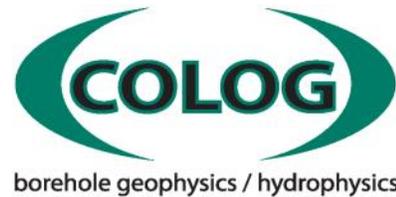
**94 W. Railroad Street, Winnemucca, Nevada**

**Time: 6:00 p.m.—Appetizers/Drinks; 7:00 p.m.—Talk begins**

**Speaker: Tony Gesualdo**

**Title: Structural Controls on Mineralization in the Terry Complex Open Pit at Marigold Mine, Humboldt County, Nevada**

**Food and Drinks Sponsored by:**



**Abstract:**

**Structural Controls on Mineralization in the Terry Complex Open Pit at Marigold Mine, Humboldt County, Nevada**

Tony Gesualdo

Mineralization in the Battle Mountain mining district is strongly influenced by multiple deformation events including the Cenozoic Basin and Range extensional deformation that overprints Paleozoic and Mesozoic compressional structures. The younger deformation events potentially reactivated many older faults while preparing for gold mineralization in the district. This study focuses on mineralized faults in the Terry Complex open pit at Marigold Mine, a gold mine located on the north end of the Battle Mountain mining district in Humboldt County, Nevada. Marigold's disseminated mineralization is controlled by favorable sedimentary beds and ~N-S sub-parallel near-vertical faults which constitute pathways for hydrothermal fluid transportation within the footwall of the Golconda Thrust. The gold is found dominantly in fault gouge and fractures within the quartzite beds of the Ordovician Valmy Formation and disseminated within the Pennsylvanian to Permian Antler group adjacent to the steeply-dipping faults. By collecting kinematic indicators this study finds some of these mineralized faults have dip-slip movement overprinted by strike-slip movement.

To better understand the orientation and movement and reactivation of the mineralized 'feeder- faults', this study presents a geologic map and 3D geological model with interpretation of structural and lithological features investigated in the Terry Complex open pit. Structural data were collected throughout the Terry Complex, with a focus on two traverses along sub-perpendicular highwalls near a N-S mineralized reactivated fault zone. Kinematic indicator measurements show initial normal movement of the faults before or during the Eocene(?) mineralization events with subsequent reactivation post-mineralization (likely Miocene or younger) as right lateral strike-slip. This study locally constrains the stress orientation of the reactivated faults in the Terry Complex with potential correlations with district and/or regional orientations.

# **GSN ELKO CHAPTER MEMBERSHIP MEETING**

**THURSDAY, APRIL 20, 2017**

**Location: The WESTERN FOLKLIFE CENTER  
501 Railroad Street, Elko, Nevada**

**Time: Refreshments @ 6:00 p.m., Dinner @ 7:00 p.m.**

**Speaker: Andrew S. Canada, University of Idaho**

**Title: “The Elko Formation: A Paleogeographic Record of Lake Basin Formation and Topographic Evolution during Carlin-Type Gold Mineralization”**

**Food and Drinks Sponsored by:**



## **Abstract:**

**The Elko Formation: A Paleogeographic Record of Lake Basin Formation and Topographic Evolution during Carlin-Type Gold Mineralization**

**Andrew S. Canada.<sup>1</sup>**

Coauthors: Cassel, E.J.<sup>1</sup>, Stockli, D.F.<sup>2</sup>, Smith, M.E.<sup>3</sup>, Jicha, Brian R.<sup>4</sup>, Singer, Brad S.<sup>4</sup>

<sup>1</sup>Department of Geological Sciences, University of Idaho, Moscow, Idaho 83844

<sup>2</sup>Department of Geological Sciences, University of Texas at Austin, Austin, Texas 78712

<sup>3</sup>School of Earth Science and Environmental Sustainability, Northern Arizona University, Flagstaff, Arizona 86011

<sup>4</sup>Department of Geoscience, University of Wisconsin, Madison, Wisconsin 53706

The Elko Formation is comprised of regionally extensive fluvial and lacustrine sedimentary rocks and interbedded volcanics that were deposited between ~50 and 41 Ma in northeastern Nevada. At this time, eastern Nevada maintained elevations of ~2.5-3 km prior to gravitational collapse during Basin and Range-style extension. Eocene sediments of the Elko Formation therefore contain the best record of the paleogeography of this high-elevation landscape. Furthermore, the timing and extent of Elko Formation lacustrine sedimentation, as well as the numerous tuff interbeds within this stratigraphy, indicates Eocene lakes were often situated directly above actively forming gold deposits in northeastern Nevada. The shallow depth of Carlin-type mineralization and the presence of meteoric water infiltration during ore genesis indicates the Eocene paleogeography of this region partially controlled hydrothermal fluid flow and the distribution of Carlin-type deposits.

Decimeter-scale stratigraphy coupled with high-precision <sup>40</sup>Ar/<sup>39</sup>Ar geochronology and multi-system stable isotope analysis of Elko Formation strata reveals major changes in the extent and chemistry of lacustrine waters, as well as time-space patterns of magmatism and topography in Nevada during the Eocene. New chronostratigraphic correlations highlight basin expansion over ~30,000 km<sup>2</sup> of eastern Nevada during a middle Eocene lacustrine highstand. From the middle to late Eocene, detrital zircon and apatite (U-Th)/He thermochronology of Eocene strata reveal a significant (>1 km/Myr) acceleration in source exhumation rate. High exhumation rates and basin formation associated with major (8-12 km) surface-breaching extension is typified by late Eocene sedimentation within the Copper Mountains. This indicates high-magnitude extension in northeastern Nevada was triggered by regional volcanism in the Tuscarora volcanic field. Widespread regional magmatism may have promoted meteoric water infiltration as volcanic detritus quickly filled the Elko Basin during the middle Eocene. Eocene hydrology and magmatism were therefore both pivotal components of the hydrothermal fluid circulation that led to Carlin-type mineralization.

*Thank you to our generous sponsor for the So. Nevada Chapter meeting in MARCH*

The Winters Company  
Mining Industry Consultants

Dr. Harry J. Winters, Jr., P. Eng.  
President

*Thank you to our generous sponsors for the Elko Chapter meeting in MARCH*



*Thank you to our generous sponsor for the Winnemucca Chapter meeting In MARCH*



(Caldwell Abstract, continued from page 6)

BlackRock's reserves currently stand at around 400M tonnes, with a mine life on the order of 70 years. The ultimate potential for BlackRock's holdings is probably measured in many billions of tonnes of mineralized material with the deposit open on strike and down dip. Estimated capital for construction stands at about \$700M USD which is scheduled to begin summer 2018. The relative speed with which BlackRock's world class tonnages and grades were defined, and the seemingly simple black and white appearance of the rock, belies its true nature. The rhythmic bedding is difficult to visually differentiate and has defied all attempts to break out a stratigraphy in any meaningful way from the core bench.

The talk in Las Vegas will focus on how BlackRock solved the "real world" issues associated with our reserve definition work. We will look at mapping density distribution, resource and grade estimation of minerals (magnetite, ilmenite and gangue) and the variation of elemental chemistry within the contained minerals. This was used to derive the stratigraphy, and provides a high level of confidence within the modeled wireframe volumes. All of this was accomplished through applying the relatively blunt tool of whole rock geochemistry and Satmagan analyses on over 8000 samples. The resulting stratigraphy is predictive and resolves surprisingly subtle details of the evolving parent chemistry.



### **LONG CANYON MINE TOUR, MAY 10, 2017**

*Newmont Mining Company will once again be offering a mine tour to both NWRA members and non-members. This year the tour will visit Newmont's Long Canyon mine. This is a great opportunity to see firsthand, a world class mining operation and one of the more interesting active gold mines in Nevada.*

<b>Early Registration</b> <i>(By April 21, 2017)</i>	<b>Late Registration</b> <i>(After April 21, 2017)</i>
Members \$150	Member \$200
Non-Member \$200	Non-Member \$250

**Visit the Long Canyon Mine Tour [PAGE!](#)**

For more information contact:

Tina Triplett  
NWRA, Executive Director  
775-473-5473  
[creativerno@charter.net](mailto:creativerno@charter.net)  
[www.nwra.org](http://www.nwra.org)

# GSN SPRING FIELD TRIP!

May 6 – 7, 2017

## GSN SPRING FIELD TRIP: Highlights of the Silver City Lode and Subsidiary, Historically Productive, Epithermal Gold-Silver Veins in the Silver City District, Nevada

The 2017 GSN Spring Field Trip will examine highlights of the Silver City Lode and examples of nearby, historically productive gold-silver veins mined between 1860 and 1940 in the Silver City District, Virginia Range, Nevada. Trip leaders will be Steve Weiss, and Kiersten Briggs. Registration form on page 11.



## GSN ELKO SCHOLARSHIP

### Meet Your Spring Semester 2017 Scholarship Awardees!

**Brief Statistics:** 8 graduate-level students, from 4 different universities; 5 in-state & 3 out-of-state; 4 PhD students & 4 MSc students; All of them studying Nevada-related geology!

#### **PhD Students:**

**Ajeet Milliard – PhD – University of Nevada Reno**  
*Constraints on the age and depth of Carlin-type gold mineralization in the footwall of a metamorphic core complex: Pequop Mountains, Nevada*

**Shaina Cohen – PhD – Boise State University**  
*Using quartz-in-garnet (QuiG) inclusion barometry and trace element geochemistry to better constrain the peak metamorphic pressures and temperatures recorded across the Ruby Mountains-East Humboldt Range metamorphic core complex.*

**Andrew Canada – PhD – University of Idaho**  
*The Eocene Elko Formation: A Paleogeographic Record of High-Elevation Lake Basin Formation and Topographic Evolution in the North American Cordilleran Hinterland*

**Justin Milliard – PhD – University of Nevada, Reno**  
*Links between extensional tectonics and the formation of low-sulfidation epithermal deposits: insights from the Northern Nevada Rift*

#### **MSc Students:**

**Anna Perry – M.Sc – Queen’s University**  
*Ground response in an underground mining operation coupling the effects of mining and de-watering*

**Patrick Quillen – M.Sc – University of Nevada, Reno**  
*Time-space relationships between magnetism, hydrothermal alteration and mineralization at the buffalo canyon prospect, Union District, Nevada*

**Gabriel Aliaga – M.Sc – University of Nevada, Reno**  
*Igneous Geology of the Keystone Project, Battle Mountain-Eureka Mineral Belt, North-central Nevada: Age, Distribution, and Relationship to Gold Mineralization*

**Robert Selwood – M.Sc – University of Nevada, Reno**  
*Analysis of Regional Surface Geochemistry of Northern Nye County, Nevada, with an Emphasis on Assessing the Potential for Carlin-type Gold Deposits*

**THANKS FOR YOUR SUPPORT!**



**Geological Society of Nevada (GSN) Spring 2017 Field Trip  
Saturday & Sunday, May 6 - 7, 2017**



**"Highlights of the Silver City Lode and Subsidiary, Historically Productive, Epithermal Gold-Silver Veins in the Silver City District, Nevada"**

The 2017 GSN Spring Field Trip will examine highlights of the Silver City Lode and examples of nearby, historically productive gold-silver veins mined between 1860 and 1940 in the Silver City District, Virginia Range, Nevada.

- Saturday, May 6, 2017:** 8:00 a.m. - Vans depart the GSN Office for Virginia City, NV.  
 9:30 a.m. - Vans depart public parking area on east side of E St. between Union & Sutton Streets, to begin tour of the Silver City Lode.  
 12:00 Noon - Sack Lunch provided during tour of the Silver City Lode.  
 5:00 p.m. - Check in at Silverland Inn, Virginia City.  
 5:45 p.m. - Vans depart Silverland Inn for the Gold Hill Hotel for Social Hour.  
 6:30 p.m. - Dinner at Gold Hill Hotel.  
 7:15 p.m. - Speaker, Steve Castor, begins talk on the volcanic evolution of the Virginia City-Silver City area.  
 Overnight at the Silverland Inn, Virginia City, NV.
- Sunday, May 7, 2017:** 8:00 a.m. - Vans Silverland Inn, Virginia City.  
 (Breakfast on your own) 8:30 a.m. - Tour of Silver City gold-silver veins.  
 12:00 Noon - Sack Lunch provided in the field during tour of Silver City veins.  
 5:00 p.m. - Vans depart for Reno from public parking area on east side of E St., between Union & Sutton Streets.

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Lodging:  Single  Double  No Room

Double Roommate: \_\_\_\_\_

**MEMBER COST:**

- \$225 - Single - One King Bed
- \$175 - Double - Two Queen Beds
- \$150 - No Room needed
- \$120 - Spouse (share SINGLE Room - one bed)
- \$0 - GSN Student Member Helpers (limit 6)
- \$50 - Dinner & Talk Only at Gold Hill Hotel - Saturday Evening

**\*NON-MEMBER COST:**

- \$275 - Single - One King Bed
- \$225 - Double - Two Queen Beds
- \$200 - No Room needed
- \$50 - Dinner & Talk Only at Gold Hill Hotel - Saturday Evening

**Payments must be made by Friday, April 21, 2017**  
**No refunds after Friday, April 21, 2017**

\*Non-members are encouraged to become members of the GSN in order to take advantage of the reduced Member Rates - Annual Dues are \$50/year.

Total amount included with this form: \_\_\_\_\_

Payment:  Check # \_\_\_\_\_  Cash  Visa  Master Card  Discover  American Express

Card Number: \_\_\_\_\_ Exp. Date: \_\_\_\_\_ 3 or 4 digit security code: \_\_\_\_\_

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Return with payment to: Geological Society of Nevada  
 2175 Raggio Parkway  
 Reno, NV 89512  
 Phone: (775) 323-3500, Fax: (775) 323-3599  
 E-mail: gsn@gsnv.org



# GEOLOGICAL SOCIETY OF NEVADA 2017-2018 BALLOT

This Ballot will also be attached as a separate file to your email so you can submit online!

In accordance with Article V, Section 4 of the GSN Constitution and Article II of the GSN By-Laws, the GSN Executive Committee and the GSN Board of Directors are recommending the slate of candidates listed below to serve as Officers for 2017-2018 and Directors for 2017-2020; these positions become effective on June 1st.

The entire GSN membership has the right to vote separately on approving the elected positions to the GSN Executive Committee and the Class C three-year terms on the Board of Directors as presented below:

## Board of Directors Class C\* (three-year term, 1 June 2017 – 31 May 2020)

Camille Prenn  
David Shaddrick

FOR BOTH \_\_\_\_\_ AGAINST BOTH \_\_\_\_\_

## Officers/Executive Committee of GSN (one-year term, 1 June 2017 – 31 May 2018)

<u>President:</u>	Kelly Cluer
<u>Vice President/President-Elect:</u>	Richard Bedell
<u>Secretary:</u>	Steve Weiss
<u>Treasurer:</u>	Robert Kastelic
<u>Membership Chair:</u>	Molly Hunsaker
<u>Publication Chair:</u>	David Boden

FOR SLATE \_\_\_\_\_ AGAINST SLATE \_\_\_\_\_

CURRENT GSN MEMBER'S NAME: \_\_\_\_\_

(All votes must include your name as a member in good standing for 2017. Ballots without a name will not be counted.)

If you are receiving this notice by mail, please either mail your vote to: GSN, 2175 Raggio Parkway, Reno, Nevada 89512 or fax it to (775) 323-3599. In order for the vote on this ballot to be counted the completed ballot must be received in the GSN office on or before 11:59 pm on Friday, April 21, 2017. Thank you for your participation.

\* Elected members of the Board of Directors serve three-year terms, which are renewable at the end of the term. The Class A Directors (with terms ending May 31, 2018) are Robert Thomas and John Watson. Class B Directors (with terms ending May 31, 2019) are David Caldwell and Gregory French. Other members of the Board include the current GSN President, the GSN Immediate Past President, and current Presidents of the Elko, Southern Nevada, and Winnemucca Chapters. The Nominating Committee includes these latter five individuals and the Chair of the Board of Directors.

## GSN Foundation By Cami Prenn

Following up on last month's news about the Field Camp Scholarships – the Foundation has made the awards to 11 students who applied for the scholarships:

**Domenic Aguilar  
Larissa Cunningham  
William Stark  
Leighton Werschky**

**Mary Branigan  
Keiichiro Hasebe  
William Taylor  
Lianza Yap**

**Dylan Carstens  
Andrew Pavlu  
Erin Warnock**

The Bruce Miller memorial donation from his family was increased to recognize three GSN members who stood by Bruce in his final days and one of these fine people also donated an additional amount to the program in Bruce's name. We all hope that these students will grow to appreciate our industry that supported them in their studies and earn the respect of their peers in their careers as Bruce did in his.

When you see the students at GSN meetings please take a minute to ask about their interests and what their intentions are for their careers. I think many students aren't fully aware of the possibilities that are out there. As these students go into the working world we also hope that they will join GSN, participate in our activities, and help keep our Society and scholarship programs strong.

Bruce Miller (2nd from left) on a GSN Field Trip



### It's GSN Election Time!

It is that time of year when the GSN Fiscal Year comes to a close and we seek out new officers to start serving their GSN terms on June 1st.

The GSN Mothership Executive Committee Officers and Board Members were already nominated by the Nominating Committee in February. The ballot for the EC officers and Board Directors can be found on page 12.

#### CHAPTER OFFICER NOMINEES NEEDED!

The GSN Chapters in Elko, Winnemucca and Southern Nevada are seeking nominees for officer positions to serve June 1, 2017—May 31, 2018. Please send nominees (or nominate yourself!) to your respective Chapter Presidents:

**Mark Travis, GSN Elko Chapter:**  
[mark.william.travis@gmail.com](mailto:mark.william.travis@gmail.com)

**James Carver, GSN Winnemucca Chapter:**  
[jcarver@silverstandard.com](mailto:jcarver@silverstandard.com)

**Paul Dockweiler, GSN So. Nevada Chapter:**  
[paul.dockweiler@mmat.com](mailto:paul.dockweiler@mmat.com)

(Current officers can re-up without opposition if desired.)

*Thank you to our generous  
donors in MARCH!!*

#### G.S.N. FOUNDATION

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Jeannette Miller—in Appreciation of  
Bruce Miller's Friend, Mack Taylor

Jeannette Miller—in Appreciation of  
Bruce Miller's Friend, Mike Brady

Jeannette Miller—in Appreciation of  
Bruce Miller's Friend, Pete Rogowski

##### **BRONZE DONORS \$1-\$99**

Mark Reischman

Kirk Rentmeister

William Stark

#### G.S.N. Student Dinner Fund

Hallet Elson

Bill Pennell

## Activity Update

Mike Brady, FEBRUARY 2017

[www.activityupdate.com](http://www.activityupdate.com)

### NEVADA

Nevada Zinc Corp. announced that recent drill results at the Lone Mountain Project include 30.48-39.62 meters @ 3.04% Zn, 0.03% Pb (LM16-73); 21.34-57.91 meters @ 4.39% Zn, 0.04% Pb (LM16-77); 21.34-44.2 meters @ 3.46% Zn, 0.02% Pb (LM16-78) and 53.34-57.91 meters @ 3.13% Zn, 0.01% Pb (LM16-80). *Press Release:* February 16

Supreme Metals Corp. announced that it acquired an option to earn a 100% interest in the Silver Dawn Property (Li) from private interests for 3,000,000 of its shares. *Press Release:* February 16

Lincoln Mining Corp.(60%) announced that recent drill results at the Pine Grove/Wilson Project include 27.43-36.57 meters @ 2.06 gpt Au (WL-105); 36.57-45.72 meters @ 1.43 gpt Au (WL-107); 25.91-38.10 meters @ 1.28 gpt Au (WL-108) and 53.34-60.96 meters @ 2.59 gpt Au (WL-111). (resource = 2,137,000 tonnes @ 1.42 gpt Au measured) *Press Release:* February 9

Northern Empire Resources Corp. announced that it acquired a 100% interest in the Sterling Property as well as a 3% NSR on the Robinson/Tenabo Property and a 10% NPI on the Blue Moon, California property from Imperial Metals Corp. for \$10,000,000 cash and 5,000,000 shares. (resource @ Sterling = 194,600 tonnes @ 7.41 gpt Au inferred) *Press Release:* February 15

Abacus Mining + Exploration Corp. announced that it acquired an option to earn a 60% interest in the Willow Property from Almadex Americas Inc. for 2,500,000 shares and \$3,000,000 in exploration expenditures over 5 years. *Press Release:* February 15

Seabridge Gold Inc. announced that it acquired an option to earn a 100% interest in the Snowstorm Property from Paulson Gold Holdings LP. for 700,000 shares and \$2,500,000 cash at a future date. *Press Release:* February 14

Gold Standard Ventures Corp. announced that recent drill results at the Pinion Project include 115.2-158.8 meters @ 0.50 gpt Au (PIN16-01); 295.7-324.7 meters @ 0.43 gpt Au (PIN16-02); 3.7-53.4 meters @ 0.96 gpt Au (PIN16-04) and 6.4-29.7 meters @ 0.79 gpt Au (PIN16-05A). (resource = 31,610,000 tonnes @ 0.62 gpt Au indicated) *Press Release:* February 9

Barrick Gold Corp. announced that it is now ready to begin the construction of two declines at the Goldrush Project from which it would conduct underground drilling. (resource = 25,166,000 tonnes @ 10.57 gpt Au measured

+indicated) *Press Release:* February 15

Kinross Gold Corp. announced that recent drill results at the Bald Mountain/Redbird Project include 299.6-387.9 meters @ 1.6 gpt Au (RBD16-01); 263.5-279.7 meters @ 5.2 gpt Au (RBD16-09) and 266.9-320.8 meters @ 1.3 gpt Au (RBD16-11). (reserve @ Bald Mountain = 110,486,000 tonnes @ 0.60 gpt Au proven+probable) *Press Release:* February 15

Scorpio Gold Corp. announced that it reached an out-of-court settlement with National EWP Inc. regarding the Mineral Ridge Mine by paying \$1,000,000 cash. *Press Release:* February 14

Corvus Gold Inc. announced that recent drill results at the North Bullfrog/Liberator Project include 228.6-323.09 meters @ 0.36 gpt Au, 0.9 gpt Ag (NB16-315); 141.73-243.84 meters @ 0.44 gpt Au, 1.1 gpt Ag (NB16-316); 106.68-117.35 meters @ 0.15 gpt Au, 1.0 gpt Ag (NB16-319) and 76.2-184.4 meters @ 0.57 gpt Au, 0.9 gpt Ag (NB16-320). *Press Release:* February 7

Nevada Sunrise Gold Corp. announced that it acquired an option to earn a 100% interest in the Salt Wells Property (Li) from Lithium Corp. for \$150,000 cash and 1,500,000 shares over 2 years. *Press Release:* February 16

Kinross Gold Corp. announced that it acquired an option to earn a 70% interest in the Spruce East, Diamond Point and Buffalo Canyon properties from Renaissance Gold Inc. for \$4,000,000 in exploration expenditures over 10 years. *Press Release:* February 20

Klondex Mines Ltd. announced that recent underground drill results at the Fire Creek Mine include 5.58 meters @ 36.86 gpt Au (FCU-0689); 2.44 meters @ 50.17 gpt Au (FCU-0692); 10.06 meters @ 28.67 gpt Au (FCU-0709) and 16.40 meters @ 15.36 gpt Au (FCU-0716). (reserve = 218,200 tonnes @ 44.74 gpt Au, 33.2 gpt Ag proven+probable) *Press Release:* February 8

Coeur Mining Inc. announced that it would fund a 2 year exploration effort in Nevada managed by Renaissance Gold Inc. at \$250,000/year. *Press Release:* February 9

ScanMag AS. announced that it terminated its interest in the Tami-Mosi Property of Nevada Clean Magnesium Inc. *Press Release:* February 24

## GSN Maintains a Tradition at PDAC in Toronto

By Elizabeth Zbinden

It has become a tradition: a team of GSN volunteers, led by our fearless Laura Ruud, travels to Toronto when winter has not yet turned to spring on the north shore of Lake Ontario. The annual meeting of PDAC (Prospectors and Developers Association of Canada) was March 5-8 this year. And a newer part of the tradition is to share the booth; this year GSN was joined by Nevada Mineral Exploration Coalition, Nevada Division of Minerals, and Governor Sandoval's Office of Economic Development. The booth was in a location for plenty of traffic and we had a good number of people stop by with questions about one aspect or another of Nevada geology & mineral deposits or doing business in the state. With all the Nevada organizations involved, we had plenty of expertise available to answer. In addition, many GSN members from in-state and from around the world stopped by to catch up on happenings. Reasons for GSN to go include: marketing Nevada and our Society to the worldwide mineral investing community; reinforcing existing connections to members and building new ones; and, well, also selling GSN publications. We succeeded on all counts.

**Big thank you!** to all who helped in the booth and/or carried publications, maps, and literature to Toronto for the booth, especially Kappes, Cassidy & Associates and the Nevada Division of Minerals, and to Kinross for storing the booth and inventory till next year. Booth volunteers included Robert Gonzalez, Peter Maciulaitis, Mike Visser, Garrett Wake, Ruth Carraher, James Matlock, Brian Park-Li, Dave Shadrack, Clancy Wendt and Elizabeth Zbinden!



*The GSN Booth as seen from the walkway heading between the North Hall and the South Hall.*

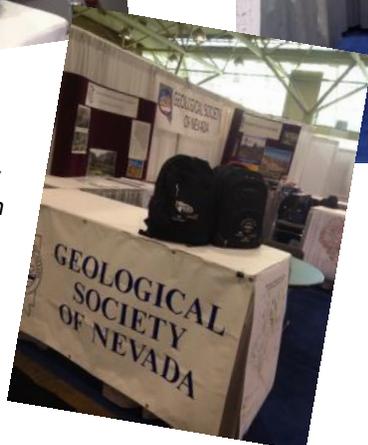


*Million dollar gold coin in the Royal Ontario Museum*

*Elizabeth Zbinden and Dave Shadrack volunteering their time in the Booth.*



*Two GSN Symposium backpacks made their way to the PDAC Convention in Toronto this year!*



*CN Tower changing colors at night*

## ROCK TALK

### Order online (or read more details):

<https://pubs.nbmj.unr.edu/Roadside-geology-of-Nevada-p/mp01.htm>

### Free delivery to April 21st GSN meeting (if ordered by April 7):

Use the online link above, select "pick up" so no shipping will be charged, and in the "Order Comments" box, type "Deliver to April GSN meeting in Reno." Please bring your shopping cart receipt with order number to the meeting.

**Order by phone:** (775) 682-8766 (M-F, 8-4:30)

**Pick up at our office:** 2175 Raggio Parkway, Reno (Tues-Fri, 8-3)

## Roadside Geology of Nevada - \$26.00

**Authors:** Frank DeCourten and Norma Biggar

**Year:** February 2017

**Series:** Mountain Press Publishing Company, Roadside Geology Series

**Format:** paperback, 416 pages, 6 x 9 inches

**ISBN:** 978-0-87842-672-0

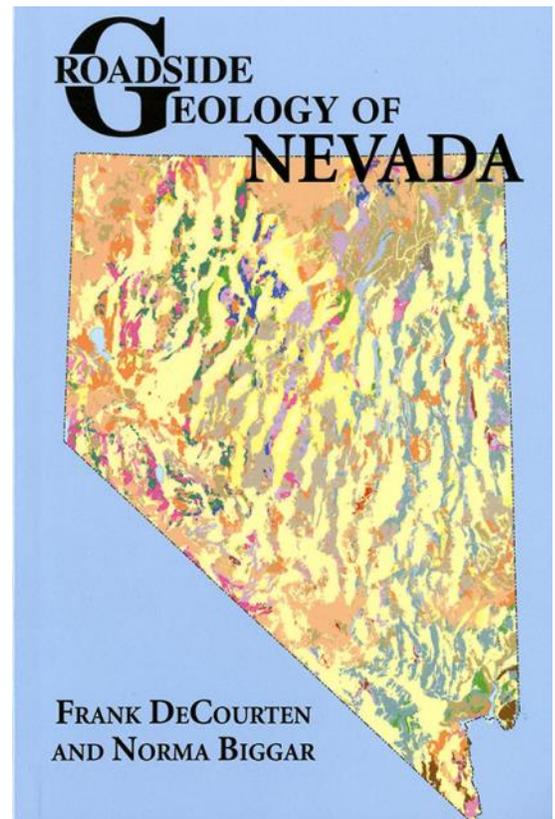
Driving through Nevada, you may be miles from nowhere, but you are never far from an interesting rock, the shoreline of an ice age lake, or an active or historic mine. The Silver State has some of the most diverse geology in the United States, and much of it lies in plain sight thanks to the arid climate of the Great Basin. Geologic forces continue to shape Nevada, stretching it apart and bringing magma near the surface. Earthquakes periodically rock its lonely outposts, creating some of the biggest fault scarps in the world. With the help of *Roadside Geology of Nevada*, you can appreciate geologic features along more than thirty of Nevada's highways.

### Some of Nevada's Geologic Highlights:

- Great Basin National Park's limestone caverns
- Virginia City and the Comstock Lode
- Tule Springs Fossil Beds
- Valley of Fire's bright red rock
- Berlin-Ichthyosaur State Park's fossil reptiles
- Lake Tahoe's granitic eastern shore
- Pyramid Lake's tufa towers
- Ruby Mountains' glacially carved Lamoille Canyon
- Red Rock Canyon's Jurassic sandstone
- Alamo's extraterrestrial impact
- Virgin Valley's fossils and opal
- Cathedral Gorge's lakebed badlands
- Frenchman Mountain's Great Unconformity
- Hoover Dam's tough tuff

**Frank DeCourten** has taught geology and conducted geological research in and around the Great Basin of northern Nevada for more than four decades. Since 1994, Frank has been Professor of Earth Sciences at Sierra College in Grass Valley, California. He lives in Penn Valley, California, with his wife, Becky, and dog, Blue.

**Norma Biggar** graduated from Antioch College and earned a Masters degree at the University of Alaska. She worked for a consulting company first evaluating the seismic hazards. Her latest project was on the high-level nuclear waste project in Nevada. Upon retirement, she started working on the *Roadside Geology of Nevada*. She died in November 2016 before the book was finished.



This description was taken from Mountain Press Publishing Company, News Release (March 2017).



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## OTHER UPCOMING EVENTS

**3 April 2017 UNR's DGSE Colloquium Speaker Series. Speaker: Dr. Daniela Rubatto, Institute of Geological Sciences; University of Bern. TWO TALKS** -Technical talk #1 at 9:30-10:30 AM in LME 425. "The tale of the tiny: petrology, geochemistry and geochronology of U-Pb accessory minerals" and talk #2 at 4 pm the DGSE Seminar in DMS 102. "Fast and furious or slow and steady: rates of subduction and crustal melting". If you have questions, you can contact Philipp Ruprecht, Assistant Professor, Geological Sciences, at 775-682-6048. Email: [pruprecht@unr.edu](mailto:pruprecht@unr.edu)

**3 April 2017 DREGS (Denver Region Exploration Geologists), Speaker: Timothy R. Brown, Title: "New Developments in the Rattlesnake Hills, Natrona County, Wyoming"**. Social 6 p.m., Presentation 7 p.m. at Berthoud Hall, Room 241, CO School of Mines, Golden. For more info. contact James Piper at [geopros@q.com](mailto:geopros@q.com)

**4 April 2017 Arizona Geological Society meeting, Speaker: David London presents The Nature and Origins of Internal Zonation within Granitic Pegmatites.** 6 p.m. to 9 p.m. at the Sheraton, 5151 E Grant Rd. (& Rosemont), Tucson, AZ Click on the link for more info and online registration: [David London presents The Nature and Origins of Internal Zonation within Granitic Pegmatites](#)

**6 April 2017 Nevada Petroleum & Geothermal Society, Reno, Nevada monthly meeting. Cocktails at 6:30 PM, Dinner at 7:00 PM, Ramada Reno Hotel; 1000 East 6th St., Reno NV 89512. Speaker and Topic to be announced. Please make reservations by Tuesday, April 4, 2017 by using the following link:**

**10 April 2017 SME Northern Nevada Section Monthly Meeting.** Circus-Circus Mandalay Room, Reno NV. **Speaker: Nathan Chutas, Exploration Manager for Era Resources' Yandera Project in Papua New Guinea.** Happy Hour @ 6 pm, Dinner @ 7 pm. Please contact Sarah Lightner for more information at 775-746-7147 or [NNevSME@gmail.com](mailto:NNevSME@gmail.com)

**19 April 2017 NWRA/UNR 2017 Dinner Forum.** Bonanza Room A, Nugget Casino Resort, Sparks NV. **2017 Darcy Lecturer, Kamini Singha, Ph.D, CSM. Title: "The Critical Role of Water in Critical Zone Science: An Exploration of Water Fluxes in the Earth's Permeable Skin"**. No host bar—5:15 pm, Dinner 6:15 pm, Talk at 7:15 pm. Please contact Tina Triplett for more information at 775-473-5473; [creativerno@charter.net](mailto:creativerno@charter.net). [Register Online](#). \$45 members, \$50 Non-members, \$25 Students.

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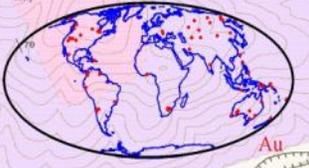
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Website: [www.aallabs.com](http://www.aallabs.com)

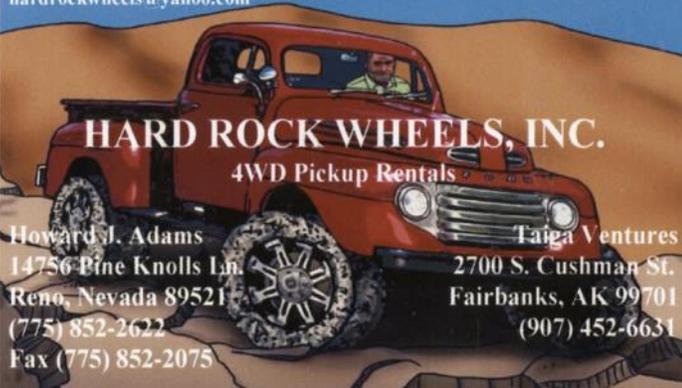
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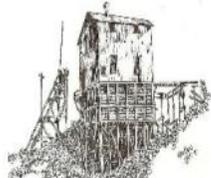


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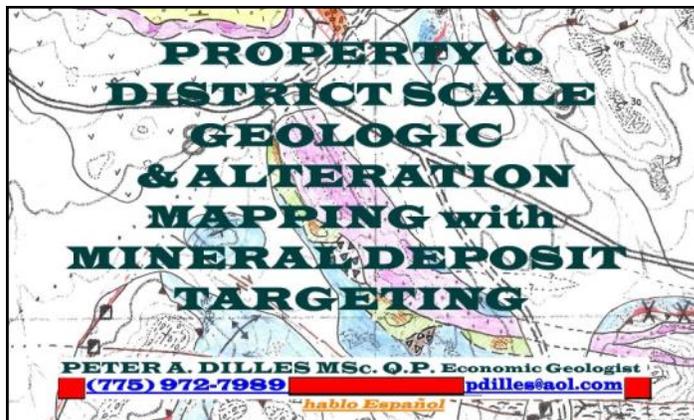


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