



GSN 2022 SYMPOSIUM



VISION FOR DISCOVERY GEOLOGY AND ORE DEPOSITS OF THE BASIN & RANGE TECHNICAL PROGRAM SCHEDULE FIELD TRIPS & SHORT COURSES

April 28 – May 8, 2022

RENO/SPARKS, NEVADA

Nugget Casino Resort

Sparks, Nevada

www.gsnsymposium.org

Symposium Co-Hosts



Monday MORNING, May 2, 2022

Start Time	Exhibit Hall and Poster Hours: 9:00 am – 5:30 pm Exhibits Reception: 4:00 – 5:15 pm	
7:50 – 8:00 am	Opening Remarks	
8:00 – 8:30 am	Keynote: Eric Seedorff (Emeritus, University of Arizona) Geometry and Evolution of Normal Faults Formed During Lithospheric Extension of Continents, with Applications to Cordilleran Metamorphic Core Complexes 8:00 – 8:30 am Nugget 1	
8:30 – 10:10 am	Cordilleran Geology & Tectonics Andrew Zuza, chair – Nugget 1	
8:30 am	Reconstruction of Late Paleozoic Basins in Nevada: A Summary – Daniel M. Sturmer (University of Cincinnati)	
8:50 am	Shortening in the Sevier Hinterland within the Framework of the Cordilleran Retroarc: New Mapping and Geochronology of the Cretaceous Newark Canyon Formation – Russ Di Fiori (Idaho Geological Survey, formerly: Washington State University)	
9:10 am	How Did Middle Cenozoic Magmatism Affect Great Basin Topography? New and Old Evidence for South-migrating Construction of the Nevadaplano – Jens-Erik Lund Sne (US Geological Survey, formerly Stanford University)	
9:30 am	A Revised Cooling and Extensional Exhumation History for the for the Harrison Pass Pluton, Southern Ruby Mountains Metamorphic Core Complex, Elko County, Nevada – Allen J. McGrew (University of Dayton)	
9:50 am	Tectonic Controls on the Isotopic Juvenility of Mid-Cretaceous Continental Arcs: Global Compilations and Implications for Chemical Weathering – Wenrong Cao (University of Nevada, Reno)	
10:10 – 10:50 am	COFFEE BREAK IN EXHIBIT HALL SPONSORED BY MAJOR DRILLING	
10:50 – 12:30 pm	Basin & Range Roundup I (USGS/State Surveys) Mark Travis, chair Nugget 1	Student Research Showcase: 10-minute Speed Talks Molly Hunsaker, chair Nugget 2
10:50 am	Overview of Current Nevada Mineral Production and Development Activity - Mike Visher (Nevada Division of Minerals)	Speakers: Dylan Carlini (Oatman, AZ epithermal), James Duncan (Antler Orogeny), Chin Chai Huan (Great Basin uranium-vanadium), Sara Holden (McDermitt, NV lithium), Alex Holmwood (Majuba, NV intrusion-related), James Ingraffia (Thacker Pass, NV lithium), Adam Jones (Oquirrh Basin, UT), Mike Kassela (Austin-Reese River district), Atticus Proctor (Fourmile Carlin-type), Sarah Shapley (Cove-McCoy fluid inclusions), and Christian Thomas (Grantsville-Buffalo Cyn, NV)
11:10 am	Utah Mining and Exploration: An Old Dog with New Tricks Stephanie Mills (Utah Geological Survey)	
11:30 am	Idaho's Current Mineral Exploration and Mining Projects: Ore Deposits through the Ages - Virginia Gillerman (Idaho Geol. Surv.)	
11:50 pm	The USGS Earth Mapping Resources Initiative (Earth MRI) – Acquisition of Framework Data for Areas with Potential for Critical Mineral Resources - Warren Day (US Geological Survey)	
12:10 pm	Utah's Critical Mineral Landscape: Producers and Potential Stephanie Mills (Utah Geological Survey)	
	SPONSORED BY HUNSAKER INC.	

Monday AFTERNOON, May 2, 2022

Start Time	Exhibit Hall and Poster Hours: 9:00 am – 5:30 pm Exhibits Reception: 4:00 – 5:15 pm
12:30 – 1:45 pm	<p>Lunch Keynote: Richard J. Goldfarb (Research Professor, Colorado School of Mines) "Carlin-Like and Carlin-Unlike Deposits: A Perspective from the Orogenic Gold World" Celebrity Showroom</p>
1:45-2:30 pm	<p>Part I. Blue Skies & Greenfields: A Panel Discussion on Early-Stage Exploration Methods, Philosophies, Impacts, and Funding Richard Reid, chair – Nugget 1 Panelists: Caleb Stroup (Headwater Gold), John Gilbert and Mike Power (Silver Range Resources), Chad Peters (Ridgeline Minerals), and Josh Ellis (Kinross Gold) SPONSORED BY IONEER</p>
2:30-3:00 pm	<p>COFFEE BREAK IN EXHIBIT HALL SPONSORED BY ARCHER CATHRO</p>
3:00-4:15 pm	<p>Part II. Blue Skies & Greenfields: A Panel Discussion on Early-Stage Exploration Methods, Philosophies, Impacts, and Funding Richard Reid, chair – Nugget 1 Panelists: Caleb Stroup (Headwater Gold), John Gilbert and Mike Power (Silver Range Resources), Chad Peters (Ridgeline Minerals), and Josh Ellis (Kinross Gold) SPONSORED BY IONEER</p>
4:15 – 5:15 pm	<p>EXHIBIT HALL RECEPTION COMBINED COFFEE BREAK & POSTERS/CORE SHACK SPONSORED BY PERPETUA RESOURCES</p>
5:15-6:00 pm	<p>Keynote: Charles H. Thorman Talk (Emeritus, U.S. Geological Survey) "Basin & Range Geology: Evolution of Thinking from 1920 to 2020" Open to All in Nugget 1 SPONSORED BY PRAY AND COMPANY</p>

Tuesday MORNING, May 3, 2022			
Start Time	Exhibit Hall and Poster Hours: 9:00 am – 5:30 pm Reception: 4:00 – 5:30 pm		
7:45-8:15 am	Keynote: Elizabeth L. Miller (Stanford University) Mesozoic (and Cenozoic) Tectonic Evolution of the Great Basin Nugget 1		
8:20 - 10:00 am	Mesozoic-Cenozoic Tectonism and Structural Relations Across the Northern Great Basin: Relationships to Gold Mineralization - Part I. Sandra Wyld, David Rhys, Douglas Prihar, Franck Valli, chairs - Nugget 1	Rumors from the Bush Pete Dilles, chair Nugget 2	Best Practices & Innovations in Geological Modeling & Mineral Resource Estimation – Part I. Doug Reid and Abani Samal, chairs Cascade 2
8:20 am	Jurassic Deformation in the Northern Great Basin: An Update on Current Knowledge and Relevance for Localization of Cenozoic Epithermal Deposits Sandra J. Wyld (MapTect LLC)	Discovery and Geology of the Fourmile Deposit, Cortez District, Eureka County, Nevada Nathan Eck (Barrick Gold Corp.)	Improved Reliability of Resource Estimate Based on Assay Quality Control Lynda Bloom (Analytical Solutions, Ltd.) VIRTUAL
8:40 am	The Late Middle Jurassic Elko Orogeny: An Update Charles H. Thorman (USGS Emeritus)	New Discovery at the Old Pony Creek Project, Elko County, Nevada Vance R. Spalding (Contact Gold Corp.)	Resourceful Geologist's Toolkit for Domain Characterization Maureen Moore-Roth (Maptek)
9:00 am	Geometry of Cordilleran Contractional Deformation Across the Great Basin at 39°N: Insights from Retro-Deformation of a Province-Wide Cross Section Sean P. Long (Washington St. Univ.)	Exploration of High Sulfidation Epithermal Mineralization in a Lithocap Environment at East Camp Douglas, Mineral County, Nevada Barry Devlin (Fortitude Gold Corp.)	Resource Modelling, Data Management, and Collaboration Using the Seequent Solution Peter Oshust (Seequent Ltd.)
9:20 am	Reinterpretation of the Structure of the Piñon and Independence Ranges with Implications for the Understanding of Gold Mineralization Structural Controls in the Antler Foreland Basin and Beyond Franck Valli (Newmont Corp.)	Mercur, Utah – New Exploration in the Oldest Carlin-Type Gold District - David A. Mako (Ensign Minerals Inc.)	Goldstrike Underground Geologic and Resource Modeling Julian Manuel (Nevada Gold Mines, LLC)
9:40 am	Probing the Core of the Cordilleran Hinterland Via Integrated Field Studies, NE Nevada: Records of Pulsed Mesozoic Contraction and Cenozoic Extension Andrew Zuza (Nevada Bureau of Mines and Geology)	Exploration and Discovery History of the Cedar Wash Gold Project, Clover Mountains, Lincoln County, Nevada Robert L. Kastelic (McEwen Mining Inc.)	The Importance of Geomet in Resource Estimation Karin E. Olson-Hoal (Cornell University)
10:00–10:40 am	COFFEE BREAK IN EXHIBIT HALL SPONSORED BY PERPETUA RESOURCES		

10:40 am – 12:40 pm	Mesozoic-Cenozoic Tectonism and Structural Relations Across the Northern Great Basin: Relationships to Gold Mineralization - Part II. Wyld, Rhys, Prihar, Valli, chairs - Nugget 1	Exploration Geophysics Case Histories - Chet Lide and Jim Wright, chairs Nugget 2	Far Reaches: Exploration and Ore Deposits Beyond the Basin and Range Luke Schranz, chair Cascade 2
10:40 am	Late Paleozoic Extensional Collapse of the Antler Highlands - Matt Fithian (SSR Mining, Inc. - Marigold Mining Co.)	The Role of Geophysics in Exploration of the Gold Bar District, Cortez Trend, Eureka County, Nevada - Robert L. Kastelic (McEwen Mining)	A New Low Sulphidation Epithermal Gold District in the African Rift Valley of the Republic of Djibouti - David J. Hall (Thani Emirates Resource Holdings)
11:00 am	Five Years Later: Progressing the Rhys Model of Fold and Fault Geometry on the Carlin Trend Via Integration of Mapping, Sequence Stratigraphy and Lithogeochemistry Gerry A. Griesel (Nevada Gold Mines LLC)	Application of Geophysics to Exploration and Discovery in the Silver City Mining District, Owyhee County, Idaho Robert Ellis (EGC Inc.)	Tuvatu Alkaline Au-Cu System, Fiji David R. Tretbar (Consulting Geologist)
11:20 am	Palinspastic Restoration of Cenozoic Extensional Deformation in the N. Great Basin: Time-Space Patterns, Perspectives on the Eocene Geologic Architecture, and Implications for Hydrothermal Circulation Carson Richardson (Arizona Geol. Survey; formerly University of Arizona)	The Geophysical Response of the Resolution Copper Deposit, Arizona Donald Hinks (Kennecott Exploration Co.)	Panuco Epithermal Vein Discovery, Sinaloa, Mexico Charles Funk , (Vizsla Silver)
11:40 am	Structural Evolution and Ore Controls in a Caldera Setting at the Round Mountain Epithermal Deposit - David A. Rhys (Panterra Geoservices)	The Geophysical Response of the Goldrush-Fourmile Orebody and Implications for Camp-Scale Carlin-Type Deposit Exploration, Cortez District, Nevada - Lee Sampson (Barrick Gold)	The Gold-Bearing Diatreme System at Veladero, Argentina Tommy B. Thompson (Consulting Geologist)
12:00 pm	Neogene Extension in the Basin and Range of Idaho, Yellowstone-Snake River Plain Magmatism, NE Expansion of Snake River Drainage Basin, and Neogene Ore Deposits Caleb Stroup for Paul Link (Idaho St. Univ.)	The Use of Geophysics in the Exploration for Carlin-Type Deposits in the Railroad-Pinion District, Carlin Trend, Nevada Jim Wright (Consultant for Gold Standard Ventures)	The Ana Paula Gold Deposit, Guerrero Gold Belt, Mexico Craig Gibson (ProDeMin)
12:20 pm.	Local Transtensional Stress Settings Facilitate Hydrothermal Flow in the Shallow Crust Regardless of the Tectonic Regime - Justin B. Milliard (Eminent Gold; formerly CREG-Univ. of Nevada, Reno)		Geology and Mineralization at the Tucano Orogenic Gold Deposits, Guiana Shield, Amapá, Northern Brazil Rogério Alves (Great Panther Mining)

Tuesday AFTERNOON, May 3, 2022

Start Time	Exhibit Hall and Poster Hours: 9:00 am – 5:30 pm Reception: 4:00 – 5:30 pm		
12:40 – 2:00 pm	Lunch Keynote: Joe Mazumdar (Editor/Analyst) "Ticking Through the Investment Clock" Celebrity Showroom SPONSORED BY AMERICAN ASSAY LABORATORIES		
2:00 – 3:40 pm	Eocene Tectonics, Magmatism, and Metallogeny: From Squeeze to Ease Curtis Johnson and Mike Ressel, chairs Nugget 1	Strategic & Critical Minerals Patty Capistrant and Molly Hunsaker, chairs Nugget 2	Best Practices & Innovations in Geological Modeling & Mineral Resource Estimation – Part II. Doug Reid and Abani Samal, chairs Cascade 2
2:00 pm	Eocene Extension and Basin Development in Northeastern Nevada: Two Examples from Elko County - Andrew S. Canada , (Headwater Gold, formerly Univ. of Idaho)	All That Glitters is Not (Just) Gold! Critical Minerals in Nevada Lucia Patterson (Nevada Division of Minerals)	Application of Geostatistics in Mineral Resource Estimation for Exploration Projects - Abani Samal (GeoGlobal LLC)
2:20 pm	Association of Rhyolite Dikes and Carlin-type Gold Mineralization at the Cortez Hills Deposit, Nevada, USA Christopher D. Henry (Nevada Bureau of Mines and Geology)	The Geology and Origin of the Thacker Pass Lithium Deposit, McDermitt Caldera, Nevada Tom Benson (Lithium Americas Corporation)	Resource Model Peer Review Roger Cooper (Newmont Corp.) <i>for</i> Henrique da Silva
2:40 pm	Carlin-Type Gold Deposits: Part of the Great Basin's Unique Eocene Metallogeny Curtis L. Johnson (Bronco Creek Exploration; formerly CREG-University of Nevada, Reno)	The Idaho Cobalt Belt: An Opportunity to Shorten the Supply Chain for Battery Materials Dan Pace (Electra Battery Materials, Corp.)	The U.S. Securities and Exchange Commission's New Regulation S-K 1300 Disclosure Requirements for Mining Registrants: What Every Minerals Geologist Needs to Know Donald J. Birak (Consulting Geologist)
3:00 pm	The Emigrant Pass Volcanic Field: New Constraints on Magmatic Models for Carlin Trend Gold Deposits Nansen H. Olson (Oregon State Univ.)	REE-Bearing Cambrian-Ordovician Episyenites and Carbonatites in Southern and Central New Mexico - Virginia T. McLemore (New Mexico Bureau of Geology and Mineral Resources)	Turquoise Ridge Geologic and Resource Modeling Jonathan Franco (Nevada Gold Mines, LLC)
3:20 – 4:00 pm	COFFEE BREAK IN EXHIBIT HALL 3:20 – 4:00 PM. SPONSORED BY MAJOR DRILLING		

4:00 pm	Alteration Footprints, Auriferous Pyrites and Controls on Fluid Flow in the Carlin-Type Gold Deposits of Nevada Shaun L. Barker (MDRU-UBC) VIRTUAL	Zinc Has Always Been Good; Now It's Critical Frank Santaguida (Glencore)
4:20 pm	Crustal Architecture of the Northern Great Basin and Crustal Recycling in Cenozoic Calderas Revealed by O and Sr Isotopic Analyses: Implications for Ignimbrite Flare-Up Processes and Metallogeny Kathryn E. Watts (US Geological Survey)	Geologic Mapping in the Mountain Pass Earth Mapping Resources Initiative (Earth-MRI) Focus Area, San Bernardino County, California Ben Parrish and David Reieux (California Geological Survey)
4:40 pm	Mineralization, Alteration and Breccias of the El Nino Au-Ag Deposit, Elko County, Nevada - Rocky Barker (IMDEX; study conducted under Colorado St. Univ.)	Precious and Base Metal Mineralization Within the Lower Stratigraphy of the Stillwater Complex: New Targets Discovered and Old Targets Revisited Craig S. Bow (Group Ten Metals Inc.)
5:00 pm	Paragenetic Evolution of the Robertson Deposit: Eocene Intrusion-Related Gold Deposit in the Northern Shoshone Range, Nevada - Neal E. Mankins (CREG-University of Nevada, Reno)	
4:00-5:30 pm	EXHIBIT HALL RECEPTION 4:00-5:30 pm	
6:30-9:00 pm	EMX ROYALTY-RIDGELINE MINERALS NETWORKING MIXER Orozko Restaurant, Lower Level, Southeast Corner of the Nugget Casino ALL ARE INVITED!	

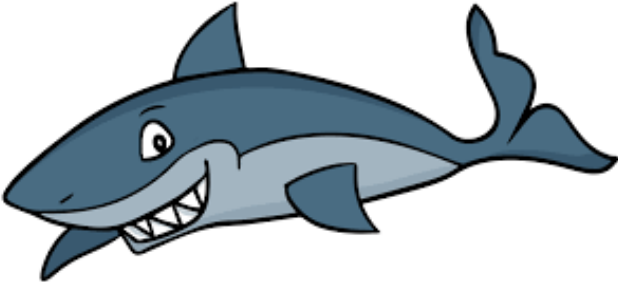
Wednesday MORNING, May 4, 2022

Exhibit Hall and Poster Hours: 9:00 AM - 4:00 PM

Start Time	Exhibit Hall and Poster Hours: 9:00 AM - 4:00 PM		
7:30 – 8:30 am			
8:00 – 8:30 am	Keynote: John Prochnau: "Geology, The Art of Exploration and Discovery" Nugget 2		
8:35 – 10:15 am	Carlin on the Edge: Off-Trend Deposits and Concepts – Marcus Johnston and Mike Ressel, chairs Nugget 2	Mining and Discovery History Charlie Sulfrian, chair Cascade 2	<p align="center">USGS Earth MRI Roundtable - A Panel Discussion of Critical Minerals Exploration & Development in the US Warren Day (USGS), chair Cascade 1</p> <p align="center">Session will consist of 7 short talks from state geological surveys and USGS followed by a 20-minute round table discussion</p> <p>Panelists:</p> <ol style="list-style-type: none"> Matthieu Harlaux (Nevada Bureau of Mines and Geology) Carson Richardson (Arizona Geological Survey) Reed Lewis (Idaho Geological Survey) Mark Bultman (US Geological Survey) Stephanie Mills (Utah Geological Survey) Jonathan Glen (US Geological Survey) Benjamin Parrish (California Geological Survey)
8:35 am	The Black Pine Gold Oxide Project, Southeastern Idaho: A New Look at a Historic Mining District – Randy Hannink (Liberty Gold Corp.)	Anatomy of a Discovery: Tonopah and Jim Butler Kevin Russell (Consulting Geologist)	
8:55 am	Sterling/Crown Gold Deposits of the Bare Mountains, Southern Nevada Joey Wilkins (Coeur Explorations, Inc.)	Before the Gold: The Early Mining History of the Carlin Trend 1874-1961 Dean G. Heitt (Consulting Geologist)	
9:15 am	New Discoveries in the Old Santa Gertrudis Mining Camp, Sonora Mexico – Perseo Anaya (Agnico-Eagle)	History of the Modern Gold Rush in Nevada Richard F. Reid (Consulting Geologist)	
9:35 am	Carlin-Type Au Deposits in “Dian-Qian- Gui” Area, Southwest China: Recent Exploration and Key Characteristics - Zhuojun Xie (Chinese Academy of Sciences) VIRTUAL	Leveraging Historical Data for Exploration in Old Mining Districts: Gold Hill and Occidental- Brunswick Lode, Comstock District, Nevada- Kiersten Briggs (MDA-RESPEC) and Greg Crouch (Writer)	
9:55 am	The Permian Carlin-Type Gold Deposits in Southwest Kyrgyz Republic Douglas J. Kirwin (Consulting Geologist)		
10:15 – 10:55 am	COFFEE BREAK IN EXHIBIT HALL SPONSORED BY SSR MARIGOLD		

10:55 am – 12:35 pm	Epithermals I. High-Sulfidation Precious-Metal Deposits: Recent Global Discoveries and Great Basin Analogs, Pete Dilles, chair, Nugget 2	Intrusion-Related Deposits Hillary Jochens, chair Cascade 2	Early- & Mid-Stage Exploration Elizabeth Zbinden, chair Cascade 1
10:55 am	The Onto Cu-Au Discovery, Eastern Sumbawa, Indonesia: A Large, Middle Pleistocene Lithocap-Hosted High-Sulfidation Covellite-Pyrite Porphyry Deposit - David R. Burrows (Vale)	Majuba Hill Copper Porphyry: Copper Production in Nevada: Now and in the Future Buster Hunsaker (Hunsaker Inc.)	Structural-Stratigraphic Controls of a Carlin-type Gold Deposit at Lookout Mountain, Eureka County, Nevada: Insights from Geologic, Geophysical, and Drillhole Data - Chris Clinkscales (Synkinematic Consulting)
11:15 am	Formation, Preservation, and Tectonic Modification of High-Sulfidation Epithermal Mineralization in Extensional Settings: Insights from the Mt. Carlton Au-Ag-Cu Deposit, NE Australia Fredrik Sahlström (James Cook Univ.) VIRTUAL	Depositing over 1.5 Mt of Cassiterite within 1 Ma of Initial Granitic Intrusion: The World-class San Rafael Sn (-Cu) Deposit, Southeastern Peru - Matthieu Harlaux (NBMG-UNR)	Geology and Overprinting Systems in the Eureka Tunnel Area, Eureka District, Nevada Travis Fisher (Golden Lake Exploration)
11:35 am	Discovery and Geology of La Yaqui Grande High-Sulfidation Au-Ag Deposit, Mulatos District, Sonora, Mexico - Anthony A. Longo (Spire Exploration)	Willow Cu-Mo Project, Buckskin Range, Douglas County, Nevada: On the Trail of the Fifth Yerington Porphyry Deposit - Paul Anderson (Abacus Mining and Exploration Corp.)	Strategic Metals in the Central Part of the Goodsprings Mining District, Clark County, Nevada Rick Redfern (Solero Cobalt and Gold)
11:55 am	Geologic Setting and Mineralization of the Isabella Pearl Mine, Mineral County Nevada – Barry Devlin for Joy Lester (Fortitude Gold)	Magmatism, Hypogene, and Supergene Mineralization Characteristics of the Lone Star Porphyry Copper Deposit, Safford District, Arizona - Ralph Stegen (Retired, Freeport McMoran Exploration Corp.)	The Geology of the TLC Lithium Deposit, Tonopah, Nevada - Dave Mough (Consulting Geologist)
12:15 pm	Quartz-Alunite Alteration in the Buckskin Range, Yerington District, Nevada – The Origin of Barren Lithocaps Above Porphyry Copper Deposits Michael Sepp (Bronco Creek Exploration, formerly: Oregon State University)	Geology and Mineralization of the Undeveloped Cochise Supergene Porphyry Copper Deposit, Warren (Bisbee) Mining District, Cochise County, Arizona - Kyle Lewis (Consulting Geologist, formerly: Univ. of AZ)	Geology and Exploration at the Selena project, Cherry Creek Range, Nevada Gabe Aliaga (Ridgeline Minerals)

Wednesday AFTERNOON, May 4, 2022			
Start Time	Exhibit Hall and Poster Hours: 9:00 am – 4:00 pm.		
12:35 – 2:00 pm	Lunch Keynote: Quinton T. Hennigh (Crescat Capital LLC) "Gold in the Pilbara, Western Australia: A Perspective on the Establishment of Earth's Crustal Gold Cycle" Celebrity Showroom SPONSORED BY TIMBERLINE RESOURCES		
2:00 – 5:00 pm	Epithermals II. Low Sulfidation Odin Christensen, chair– Nugget 2	Geochemical Crossroads: Time to Look Deeper and Under Cover Shea Clark Smith, chair– Cascade 2	New Strategies and Innovations for Exploration, Nancy Wolverson, chair Cascade 1
2:00 pm	Magmatic-Tectonic Settings of Cenozoic Low and Intermediate Sulfidation Epithermal Gold-Silver Deposits of the Great Basin, Western United States David A. John (USGS)	Exploration Through Cover: Unearthing the Next Generation of Gold Deposits in the World Class Carlin-Type Deposits of Nevada Simon J. Griffiths (Third Planet Exploration)	Hyperspectral Core Imaging: Advanced Modern Exploration Techniques at the Toiyabe Exploration Project David A. Browning (Westward Gold Inc.)
2:20 pm	Distal and Peripheral Exploration Guides to Low-Intermediate-Epithermal Sulfidation Vein Deposits Based on Studies of Modern Hydrothermal Systems - Stuart F. Simmons (Hot Solutions Ltd.) VIRTUAL	Exploring Undercover Using 3D Geochemistry: Transitioning from Basin-Scale to Prospect-Scale Au Exploration Using Hydrogeochemistry James Buskard (Nevada Exploration Inc.)	Towards a New Digital Geologic Map and 3D Model of the United States Joseph P. Colgan (US Geological Survey) VIRTUAL
2:40 pm	The Geology of the Castle Mountain Low-Sulfidation Epithermal Gold Deposit, San Bernardino County, California Erik Tharalson (Colorado Sch. of Mines)	Rediscovery of Old Ideas in the Comstock District Brooke Clarkson (SRK Consulting)	Nevada Mineral Resource Database Project and Web Application – Rachel Micander (Nevada Bureau of Mines and Geology) and Lucia Patterson (Nevada Division of Minerals)
3:00 – 3:40 pm	COFFEE BREAK IN EXHIBIT HALL SPONSORED BY SVL ANALYTICAL, INC.		

3:40 pm	<p>Geologic Setting, Mineralization, and Detailed Underground Mapping of the Fire Creek Low-Sulfidation Epithermal Gold-Silver Deposit, Nevada Luke J. Schranz (Consulting Geologist, formerly CREG-Univ. of Nevada, Reno)</p>	<p>Quantifying the Effect of Field Filtration Versus Laboratory Filtration in Hydrogeochemical Sampling Amanda Stoltze (ALS Global)</p>	<p>Machine Learning and Big Data, The Future of Exploration Targeting and New Discovery Marc-Antoine LaPorte (SGS Geological Services)</p>
4:00 pm	<p>The Road to Discovery at WKP, New Zealand Rick Streiff (Consulting Geologist)</p>	<p>Phytogeochemistry: A Bedrock Mapping Tool Shea Clark Smith (MEG, Inc.)</p>	<p>A New Induced Polarization and Resistivity Method for Deep Exploration Jonathan Rudd (Dias Geophysical)</p>
4:20 pm	<p>Exploration Potential, DeLamar – Silver City District, Idaho: Paleosurface Preservation and Active Analogues Jeffrey W. Hedenquist (Consulting Geologist)</p>	<p>Concealed Ore Prospecting at the Shuiyindong Au Deposit in Southwestern Guizhou, China - Qinping Tan (Institute of Geochemistry, Chinese Academy of Sciences) VIRTUAL</p>	<p>Emerging Technology and Processes Utilising Deep Magnetotelluric Resistivity Imaging for Regional and Local Exploration, Brownfields, and Mine Planning Rob Gordon (Quantec Geoscience) VIRTUAL</p>
4:40 pm	<p>Gold Point: A Rediscovered Epithermal Camp in the Walker Lane, Nevada Matt Dumala (GGL Resources Corp.)</p>		
5:30 pm to 7:30 pm	<p style="text-align: center;">GSN Foundation – Landshark Lounge Nugget 1</p> <p style="text-align: center;">Sponsored by: Baroid IDP, Blackrock Silver, and Jentech Drilling Supply</p> <p style="text-align: center;">Grand Canyon Raft Trip Raffle Prize Donor: Envirotech Drilling</p> 		

10:05 – 10:25 am	COFFEE BREAK: FOYER BY REGISTRATION SPONSORED BY MULETOWN ENTERPRISES/TIPTON TRUCKING	
10:25 am – 12:05 pm	Mineral Textures as Ore Vectors Anthony Gesualdo and Mike Ressel, chairs Nugget 1	Metal Deposits of the Walker Lane: New Developments in Old Districts David John and Peter Vikre, chairs Nugget 2
10:25 am	Unidirectional Solidification Textures: A Field Review – Douglas J. Kirwin (Consulting Geologist)	Ancestral Cascade Arc Magmatism, Extensional Tectonics, and Miocene Epithermal Silver-Gold Deposits Near Tonopah, Nevada: New Ideas About Old Districts - David John (US Geological Survey)
10:45 am	Multiscale Mineral Textures as Exploration Vectors in Carbonate Replacement Deposits - Peter K.M. Megaw (IMDEX, Inc.)	Relationships of Magmatic Evolution and Sulfide Saturation to Au-Ag-Te-S Concentrations in High-Grade Deposits at Goldfield and Tonopah, Nevada - Peter Vikre (US Geological Survey)
11:05 am	Distribution and Textural Characteristics of Ore Minerals in Bonanza-Type Quartz Veins at the Buckskin National and Fire Creek Deposits, Nevada - Tadsuda Taksavasu (Colorado School of Mines) VIRTUAL	Post-Subduction Volcanic Rocks and Epithermal Precious Metal Deposits of the Patterson Mining District, Sweetwater Mountains, Mono County, California and Lyon County, Nevada – Carli Balogh (Freeport-McMoran; formerly CREG, Univ. of NV, Reno)
11:25 am	Origins of Calcite and Quartz Lattice Textures in Epithermal Deposits - Stuart F. Simmons (Hot Solutions Ltd.) VIRTUAL	Exploration, Geology, and Alteration of the Silicon Prospect, Bare Mountain District, Nye County, Nevada – Paul Bartos (AngloGold Ashanti)
11:45 am	Textural Zoning in Low Sulfidation Epithermal Systems – Rick Streiff (Consulting Geologist)	Volcanic Stratigraphy and Varietal Au-Ag-Cu-Hg-S Deposits in the Monitor-Mogul Mining District, Alpine County, California – Grant McKnight (CREG, University of Nevada, Reno)
12:30 pm-2:00 pm	APPETIZER STYLE LUNCH AND DRINKS 12:30-2:00 PM. SPONSORED BY RUEN DRILLING, INC. & HOLLAND AND HART LLP. Closing Keynote - Moira T. Smith: "Exploration in the 21st Century: Navigating the New Paradigm" Nugget 1 Student Awards, Steven Weiss (chair)	

Pre-Meeting Field Trips – April 28 – May 1, 2022				
Trip #	Title	Date	Stops	Description
1 Moved to Post Meeting	Epithermal Deposits of Northern Nevada and Southwest Idaho	Moved to Post Meeting		
3 Moved to Post Meeting	The Famous Comstock Gold and Silver District	Moved to Post Meeting		
4	Seismic Hazards & Evolving Landscapes, Reno-Carson-Tahoe Area Leader: Rich Koehler	1 day – May 1st, leave AM (NO MOTEL)	Petersen Mountain Fault along Red Rock Road Warm Springs Valley Fault in the Southern Honey Lake Basin	This field trip will focus on research on the relative activity of earthquake faults in the northern Walker Lane, near Reno, Nevada. The northern Walker Lane accommodates ~7 mm/yr of right-lateral shear and contains numerous active faults capable of producing large earthquakes. Several recent paleoseismic studies have been completed in this area and have included mapping of Quaternary deposits and fault scarps, subsurface trenching, and geochronologic analyses on faulted deposits. We will visit several of the paleoseismic sites and discuss the geomorphic expression of active fault traces, the number and timing of paleo-earthquakes, and implications to seismic hazards assessment in the Reno area.
5	Field Trip 5: (April 28-May 1st - 4 Days) Epithermal Deposits of the Walker Lane, Nevada Leaders: Elliott Crist, Joe Kizis	3.5 days (April 28 – May 1 st)	Sterling, Crown area (Daisy, Secret Pass, SNA), Motherlode, Silicon, N. Bullfrog, Isabella-Pearl	Exploration in the central portion of the Walker Lane has been hot in recent years. This field trip will examine the relationships between low-sulfidation, high-sulfidation, and sediment-hosted disseminated gold/silver deposits. Detachment tectonics will add some spice to this fascinating brew of deposits.

Post-Meeting Field Trips – May 5-8, 2022

Trip #	Title and Trip Leaders	Date	Stops	Description
1	Epithermal Deposits of Northern Nevada & Southwestern Idaho. Leaders: Justin Milliard, Luke Schranz, Rob Selwood	3.5 days – May 5-8th	DeLamar (Idaho), Sandman, Goldbanks, Brady's Hot Spring	<p>This field trip will examine several epithermal precious-metal deposits located along mid-Miocene rifts in northern Nevada and southwestern Idaho. The focus of the trip will be on deposit characteristics, hot rocks, genesis and exploration criteria, including the subtle expressions of the upper portions of bonanza ore shoots. Overviews of mid-Tertiary geology and controls on deposit formation will be discussed at visits to DeLamar, Sandman and Goldbanks, and complimented by evening talks on Katey, Fire Creek and the Northern Nevada Rift. Additionally, the field trip will look at late Tertiary faulting and geothermal activity, and its relationship to understanding epithermal systems by examining the geologic setting at Rye Patch and Bradys. This trip is designed for experienced geologist, mining engineers, and other seeking to learn about gold-silver deposits associated extensional tectonics and volcanic activity.</p>
3	The Famous Comstock Gold and Silver District <i>Leader:</i> Don Hudson	1 day - May 6 th (NO MOTEL)	Virginia City Epithermal District	<p>This one-day trip will explore the complex geologic setting of one of the richest epithermal districts in the U.S. The trip will consider the characteristics of several superimposed hydrothermal systems in the Virginia City area near Reno.</p>
5-Moved to Pre Meeting	Epithermal Deposits of the Walker Lane, Nevada	Moved to Pre-Meeting Field Trips		
6	Carlin and Associated Gold Deposits of Northern Nevada Leaders: Dave Rhys, Allie Ingels, Franck Valli	3.5 days – May 5-8th	Twin Creeks, Turquoise Ridge, i80 Gold's core shed-Marigold surface, Carlin Trend surface tour & drill core review	<p>Visiting some of the largest classic Carlin districts and distal-disseminated style gold deposits, this trip will provide a view of the geology, mineralization styles, and structural controls on the giant, Eocene age, world-class sediment-hosted mineralizing systems of the northern Great Basin.</p>

Pre-Meeting Short Courses – April 30 – May 1, 2022

Course #	Title	Presenters
SC1	Best Practices in Mineral Resource Estimation – A 2-Day Refresher Course (April 30 & May 1)	Abani Samal, GeoGlobal LLC
SC2	Analytical data management, Q/A and reporting. (May 1 st)	Chantal Jolette
SC5	Spectral Geology: Remote Sensing to Spectral Petrology, Exploration through Life of Mine (May 1)	Presenter: Benjamin Porter, TerraCore

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SC7	Geologic and Resource Modeling in Leapfrog (May 6 & 7 th)	SRK Resource Geology Team
SC10	Digital Exploration Resources-Nevada and Beyond (May 5 th afternoon) SPONSORED BY NEW FRONTIER DRILLING	Lucia Patterson (Nevada Division of Minerals) and Rachel Micander (Nevada Bureau of Mines and Geology)