



GSA ROCKY MOUNTAIN/CORDILLERAN JOINT SECTION MEETING

15–17 May

Double Tree by Hilton Hotel and Conference Center, Flagstaff, Arizona, USA

www.geosociety.org/rm-mtg

Sunset Crater is a cinder cone located north of Flagstaff, Arizona, USA.

Program



**Program
Joint Meeting
Rocky Mountain Section, 70th Meeting
Cordilleran Section, 114th Meeting
Flagstaff, Arizona, USA
15–17 May 2018**

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We thank our sponsors below for their generous support.

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Dating Lab - ARHDL)
School of Earth Sciences & Environmental Sustainability - Northern Arizona University
Arizona Geological Survey - sponsorship of the banquet
Prof. Stephen J Reynolds, author of Exploring Geology, Exploring Earth Science, and Exploring Physical
Geography - sponsorship of the banquet

NOTICE

By registering for this meeting, you have acknowledged that you have read and will comply with the GSA Code of Conduct for Events (full code of conduct listed on page 31). If you need to report unacceptable behavior, please contact:
GSA Executive Director, Vicki McConnell, vmccconnell@geosociety.org
GSA President, Isabel Montañez, president@geosociety.org
You may also stop by registration or the GSA Bookstore to have them directly contacted via phone

General Information



Flagstaff lies at 7,000 feet (~2100 m) elevation on the southern edge of the geologically world-class Colorado Plateau, and near the southern margin of the young and active San Francisco volcanic field. The city is located just north of the Transition Zone and Basin and Range provinces, including the tourist destination of Sedona one hour away. Flagstaff is home to Northern Arizona University and its School of Earth Sciences and Environmental Sustainability, as well as a large US Geological Survey campus. We are holding the meeting in mid-May, while the weather is good on the Plateau and in the Transition Zone.

Visitors interested in local culture, history, scientific tourism, and dining and entertainment will find a lively downtown Flagstaff area, and many outdoor activities in the immediate area and across northern Arizona. More information about the opportunities in Flagstaff is here (<https://www.flagstaffarizona.org>), and a good article on the geology of the area is here (<https://www.earthmagazine.org/article/travels-geology-cones-and-craters-flagstaff-arizona>). Other scientific tourism highlights in Flagstaff are Lowell Observatory (astronomy) (<https://lowell.edu/outreach/>), and the Museum of Northern Arizona (<https://musnaz.org/>). Within an hour drive of Flagstaff are Wupatki, Sunset Crater Volcano, and Walnut Canyon National Monuments, Meteor Crater, and the red rocks of Sedona; Grand Canyon is a 1.5-hour drive north of Flagstaff.

NORTHERN ARIZONA GEOLOGY

[map: <http://data.azgs.az.gov/geologic-map-of-arizona/>]

The geology and landscape of northern Arizona spans nearly 2 billion years of Earth history and include some remarkable and iconic sites. The region is divided into a highland area in the north that comprises the southwestern part of the Colorado Plateau, and the Arizona Transition Zone of valleys and ranges to the south between the plateau and the southern Basin and Range. The bottom of Grand Canyon and ranges in the Transition Zone expose lower Proterozoic rocks that contain the history of the growth of the North America continent south of its Archean core from 1.8–1.6 Ga. Grand Canyon also has a Neoproterozoic record of rifting of the western edge of the continent. Some of the best exposures of Paleozoic marine to marginal marine strata occur along over 200 miles of the Canyon and on the south-facing cliffs of the Mogollon Rim, the escarpment separating the Colorado Plateau, and Transition Zone. The northeastern part of Arizona is dominated by the Navajo and Hopi Nations that contain a near complete Mesozoic sedimentary history of the response of the continental interior to long lived magmatic arcs and thrust belts to the

west and south. The transition from the last marine incursion to permanent terrestrial environments is found in latest Cretaceous strata and coincides with the first pulse of uplift of the Colorado Plateau and formation of numerous monoclinical folds during the Laramide orogeny. The modern landscape of northern Arizona further developed with a topographic inversion of central to southern Arizona from the highlands of the Mesozoic to lowlands formed during the Basin and Range extensional event from about 25 Ma to the present. Oligocene to Miocene extension was accompanied by widespread volcanism across the Transition Zone. Volcanism moved onto the southern Colorado Plateau around Flagstaff from 6 Ma to the present with 600 volcanoes (mainly cinder cones and basaltic lava flows) across the San Francisco volcanic field, and ending with the ca. 1085 CE eruption of Sunset Crater. The last 6 million years also saw the final pulse of Colorado Plateau uplift, integration of the Colorado River to the Gulf of California, and formation of the modern stage of Grand Canyon. Active normal faults cut through the Flagstaff to Grand Canyon region and produce uncommon earthquakes, while another group of active normal faults form the mildly extended terrain across the southwestern Colorado Plateau. The modern landscape of the Flagstaff area includes a large Ponderosa forest and pinyon pine–juniper semi-arid open woodland to the east in the Painted Desert and to the south in the Sedona–Verde Valley area.

VENUE

Flagstaff is a relatively small city (~75,000) and the DoubleTree by Hilton Hotel and Conference Center, the site of the meeting, is in the western part of town on 1175 Historic Route 66, Flagstaff, AZ 86001. The downtown area is 1–1.5 miles to the NE of the DoubleTree Hotel along Route 66, and Milton Street with numerous restaurants is 0.25–0.5 miles to the east. Workshops are being held in rooms in the Geology building #12 on the NAU campus. See maps for these areas.

TRANSPORTATION

Flagstaff is accessible by air from a limited number of daily flights only from Phoenix (PHX) on American Airlines. Flights into Phoenix can link to numerous 3-hour van shuttle rides to Flagstaff (<https://www.arizonashuttle.com>). Las Vegas is 4 hours away from Flagstaff by car. Interstate highway 17 from the south (Phoenix) ends in Flagstaff; Interstate 40 runs east to west through Flagstaff. Amtrak also serves Flagstaff from the east and west.

Bus service is available in two ways. The meeting is providing free bus service from the DoubleTree Hotel to the Hampton Inn and Hilton Garden hotels near south Milton

Street, at the hotels along central Milton Street, and to the downtown area (see maps) during the Monday opening reception, from 7:30 a.m. to early evening on Tuesday, Wednesday, and Thursday. Maps and GSA meeting bus schedules will be at the registration desk at the DoubleTree Hotel and posted online. The local Flagstaff bus (Mountain Line: <https://mountainline.az.gov/>) route 7 (purple) stops near the DoubleTree Hotel (still called the Radisson on their schedule) and goes to the southern part of downtown every 30 minutes from 5:45 a.m. to 9:51 p.m.

EATING AND DRINKING

There are numerous restaurants from fast food to casual dining and a few bars within walking distance (a few blocks to 0.75 mile) of the DoubleTree Hotel (see map). There are also many restaurants from casual to fine dining (for a mountain town) and bars 1–1.5 mile from the DoubleTree Hotel in the downtown area south and north of Route 66 and the railroad tracks (see map).

WEATHER

Weather in May in Flagstaff is sunny, cool to warm, and commonly windy; highs are usually in the 60s and 70s F (15–25° C) with cool nights; rain is unusual but can occur.

REGISTRATION

Registration is required for anyone attending technical sessions, field trips, short courses, or exhibits. On-site registration is in the DoubleTree Hotel Lobby on the following schedule:

Monday, 14 May	3–7:30 p.m.
Tuesday, 15 May	7 a.m.–4:30 p.m.
Wednesday, 16 May	7 a.m.–4:30 p.m.
Thursday, 17 May	7 a.m.–2 p.m.

Registration Fees

On-site registration fees are below and are shown in U.S. dollars. Professionals registering for the meeting are encouraged to add to their registration fee to help a student attend the meeting.

On-site Fees	Full Mtg.	One day
Professional Member.....	\$315.....	\$235
Professional Member 70+	\$215.....	\$175
Professional Nonmember.....	\$365.....	\$270
Early Career Professionals.....	\$220.....	\$170
Student Member	\$130.....	\$90
Student Nonmember	\$155.....	\$105
K–12 Professional	\$130.....	\$90
Guest or Spouse	\$130.....	n/a
Field Trip/Workshop Only.....	\$85.....	n/a

Cancellations, Changes, and Refunds

All requests for changes or cancellation must have been made in writing to the GSA headquarters by 16 April 2018. No refunds will be made on cancellation notices received after that date. Refunds will be mailed from GSA after the meeting; refunds for fees paid by credit cards will be refunded to the card identified on the registration form. GSA cannot provide refunds for on-site registration or event ticket sales.

MEETING APP and ABSTRACTS

A web-based app is available for this meeting. This app allows you to view and search the meeting program and create your own schedule of events to attend. You can also view the full abstracts text from this app. Please download the app at <https://gsa.confex.com/gsa/2018RM/meetingapp.cgi>.

ACCOMMODATIONS

The conference hotel is the DoubleTree Hotel, 1175 Historic Route 66, Flagstaff, AZ 86001. As of this printing, there are very few rooms still available. Reservations can be made by calling the DoubleTree Hotel directly at +1-928-773-8888 (local). Attendees should reference the group code “Geological Society of America.”

There are numerous other hotels and motels in Flagstaff across the price range (and quality range) from \$60 to \$200/night.

EVENTS

Welcome Reception and Map Blast.

Monday, 14 May, 5–7 p.m., inside in Kaibab/Canyon Rooms and outdoors at the DoubleTree Hotel. An informal map blast is being held in the poster tents showing maps from the local US Geological Survey and Arizona Geological Survey geoscientists. Enjoy Navajo and Mexican tacos, snacks, and a complimentary beverage. Each meeting participant receives a coupon for one free beer, wine, or non-alcoholic beverage in their registration packet.

Banquet for Symposia Honorees.

Wednesday, 16 May, 7:30–10 p.m., Kaibab/Canyon Rooms, DoubleTree Hotel. Dinner and short presentations to celebrate the careers of the symposia honorees.

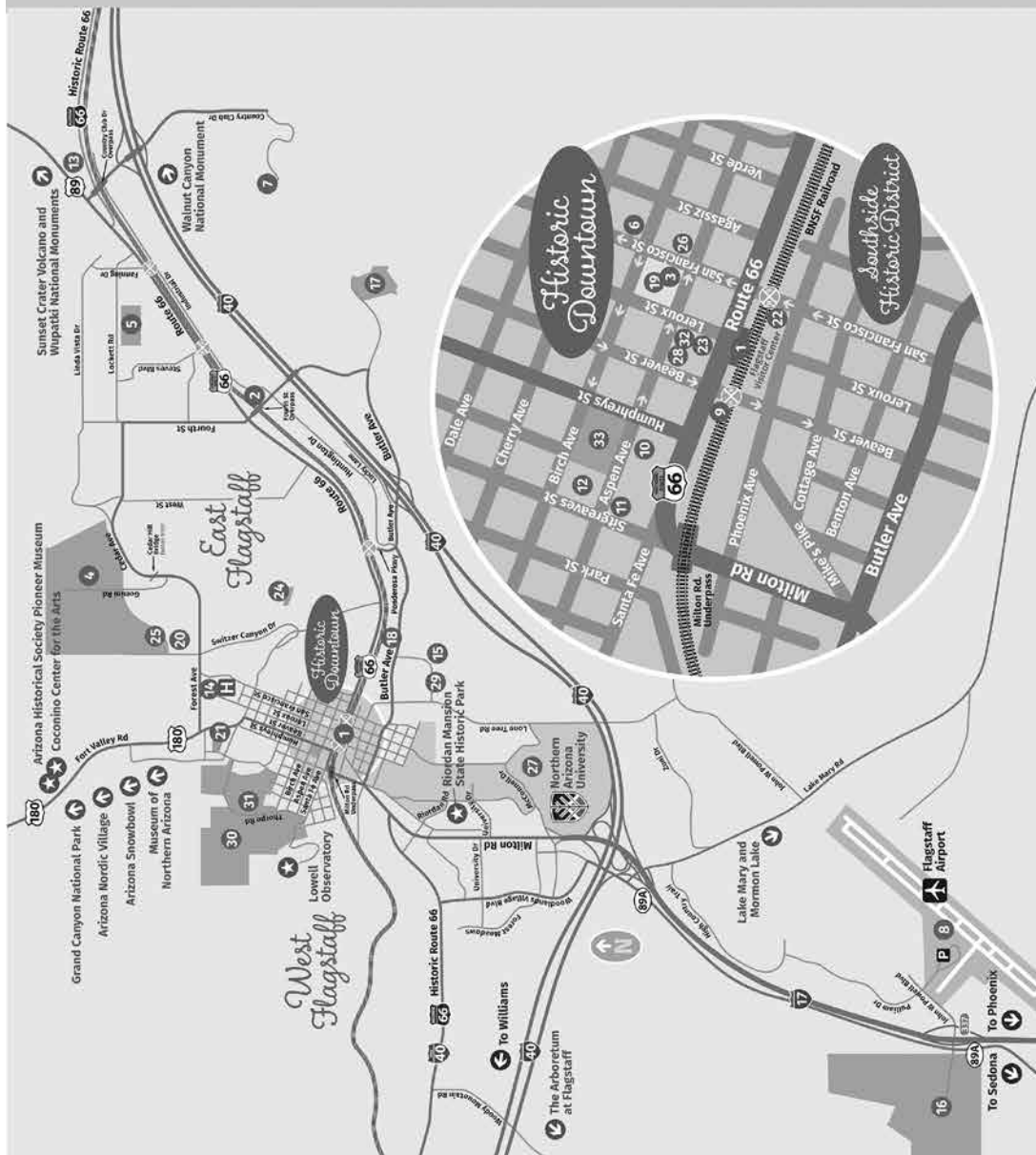
GSA Strategic Planning Meeting

Thursday, 17 May, 7–8 a.m., Kachina Room. GSA leadership is asking for your input on Strategic Planning. Please come by to share your insights with GSA President Isabel Montañez and GSA Executive Director Vicki McConnell.

BUSINESS MEETINGS

Rocky Mountain Section Business Meeting. Wednesday, 16 May, 7–8 a.m., Deluxe Suite 355, DoubleTree Hotel.

Cordilleran GSA Section Business Meeting. Wednesday, 16 May, 4:30–5:30 pm, Deluxe Suite 355, DoubleTree Hotel.



★ FLAGSTAFF ATTRACTIONS

1. Flagstaff Visitor Center and Amtrak Train Station*
2. The Aquaplex
3. Babbitt Brothers Building*
4. Buffalo Park
5. Bushmaster Park
6. Coconino County Courthouse*
7. Continental Country Club and Elden Hills Golf Course
8. Flagstaff Airport
9. Flagstaff Chamber of Commerce
10. Flagstaff City Hall
11. Flagstaff Convention and Visitors Bureau
12. Administrative Office*
13. Flagstaff Main Library
14. Flagstaff Mall and The Marketplace
14. Flagstaff Medical Center
15. Flagstaff Police Department
16. Fort Tuthill County Park
17. Foxglenn Park
18. Greyhound Bus Depot
19. Heritage Square
20. Jay L. Lively Activity Center
21. Historic 1890 Lumberyard*
22. McMillan (Bank) Building*
23. McMillan Mesa Park
24. McPherson Park
25. Hotel Monte Vista*
26. Jim Cullen Memorial Park
27. NAU Walkup Skydome
28. Orpheum Theater*
29. Sawmill County Park
30. Thorpe Park
31. Thorpe Park Softball Complex and Bark Park
32. Weatherford Hotel*
33. Wheeler Park

*Historic Downtown Landmark



One E. Route 66, Flagstaff, AZ 86001

800.842.7293 | 928.213.2951 | visitorcenter@flagstaffaz.gov

Open Monday-Saturday 8 a.m.-5 p.m., Sunday 9 a.m.-4 p.m.

Closed Thanksgiving, Christmas and New Year's Day.

flagstaffarizona.org VisitFlagstaff FlagstaffArizona

HISTORIC DOWNTOWN FLAGSTAFF DINING

BARS & NIGHTLIFE		RESTAURANTS	
1. Blendz	22. Fire Creek Coffee	39. 1899 Bar & Grill	66. Majerle's Sports Grill
2. FLG Terroir (F)	23. Flagstaff Bicycle Revolution (coffee)	40. Aloha Hawaiian BBQ	67. Martanne's Burrito Palace
3. Hops on Birch	24. Flagstaff Chocolate Company	41. Alpine Pizza	68. The Mayor
4. Monte Vista Lounge	25. Flagstaff Coffee Company	42. Altitudes Bar & Grill	69. The McMillan Bar & Kitchen
5. Rendezvous Coffee House & Martini Bar	26. Flagstaff Nut House	43. Aspen Deli	70. Mix on the Square
6. Pay'n Take Downtown Market	27. The Flagstaff Collective (F)	44. Biff's Bagels	71. Monsoon Chinese Bistro & Sushi
7. Southside Tavern (F)	28. Hoot Mart	45. Bigfoot Bar-B-Que	72. Morning Glory Cafe
8. Speakeasy	29. Kickstand Kaffe (F)	46. Brix Restaurant & Wine Bar (D)	73. Mountain Oasis
9. The Commerce Bar	30. Late for the Train	47. Café Daily Fare (L)	74. Na D Li Korean BBQ
10. The Gopher Hole Pub (F)	31. Macy's European Coffee House (F)	48. Charlie's Pub & Grill	75. NiMarco's Pizza
11. The Green Room (F)	32. Mozzelle's Downtown Bakery	49. Collins Irish Pub & Grill	76. Old Town Creperie (seasonal)
12. The State Bar	33. Rendezvous Coffee House & Bakery	50. Cottage Place (D)	77. Pasto Cucina Italiana
13. Uptown Pubhouse (F)	34. Martin Bar	51. Criollo Latin Kitchen	78. Pato Thai Cuisine
14. Vino Loco	35. Steep Leaf Lounge	52. Curvée 928	79. Pita Pit
BREWERIES		53. Dava Thai	80. Pizzicetta (D)
15. Flagstaff Brewing Company (F)	36. The Sweet Shoppe & Nut House	54. Diabolo Burger	81. Primo's Hot Dogs
16. Dark Sky Brewery (F)	37. Whyld Ass Café (F)	55. Downtown Diner	82. Proper Meats & Provisions
17. Mother Road Brewing Company & Tap Room (F)	38. Wicked AZ Coffee	56. Ewa's Thai Cuisine	83. Red Curry Vegan Kitchen
18. Lumberyard Brewing Company Taproom & Grille (F)		57. Fratelli Pizza	84. Root Public House
19. Beaver Street Brewery (F)		58. Grand Canyon Cafe	85. Shift
20. Historic Barrel + Bottle (F)		59. India Palace	86. Snack Bar @ The Orpheum
COFFEE, TEA & SWEETS		60. Jimmy Johns	87. SoSoBa Nonstop Noodle Shop
21. Curran's Specialty Chai & Teas		61. Josephine's Modern American Bistro	88. Street Side Saigon
		62. Karma Sushi Bar & Grill	89. Southside Tavern
		63. La Bellavia (B/L)	90. Swaddee Thai Cuisine
		64. La Santissima Gourmet Taco Shop	91. Tinderbox Annex Lounge
		65. La Vetta: Cucina Italiana	92. Tinderbox Kitchen (D)
			93. The Toasted Owl Café
			94. Tourist Home Urban Market

B = breakfast only | L = lunch only | D = dinner only | F = Food

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FLAGSTAFF VISITOR CENTER

One E. Route 66, Flagstaff, AZ 86001

800.842.7293 | 928.213.2951 | visitorcenter@flagstaffaz.gov

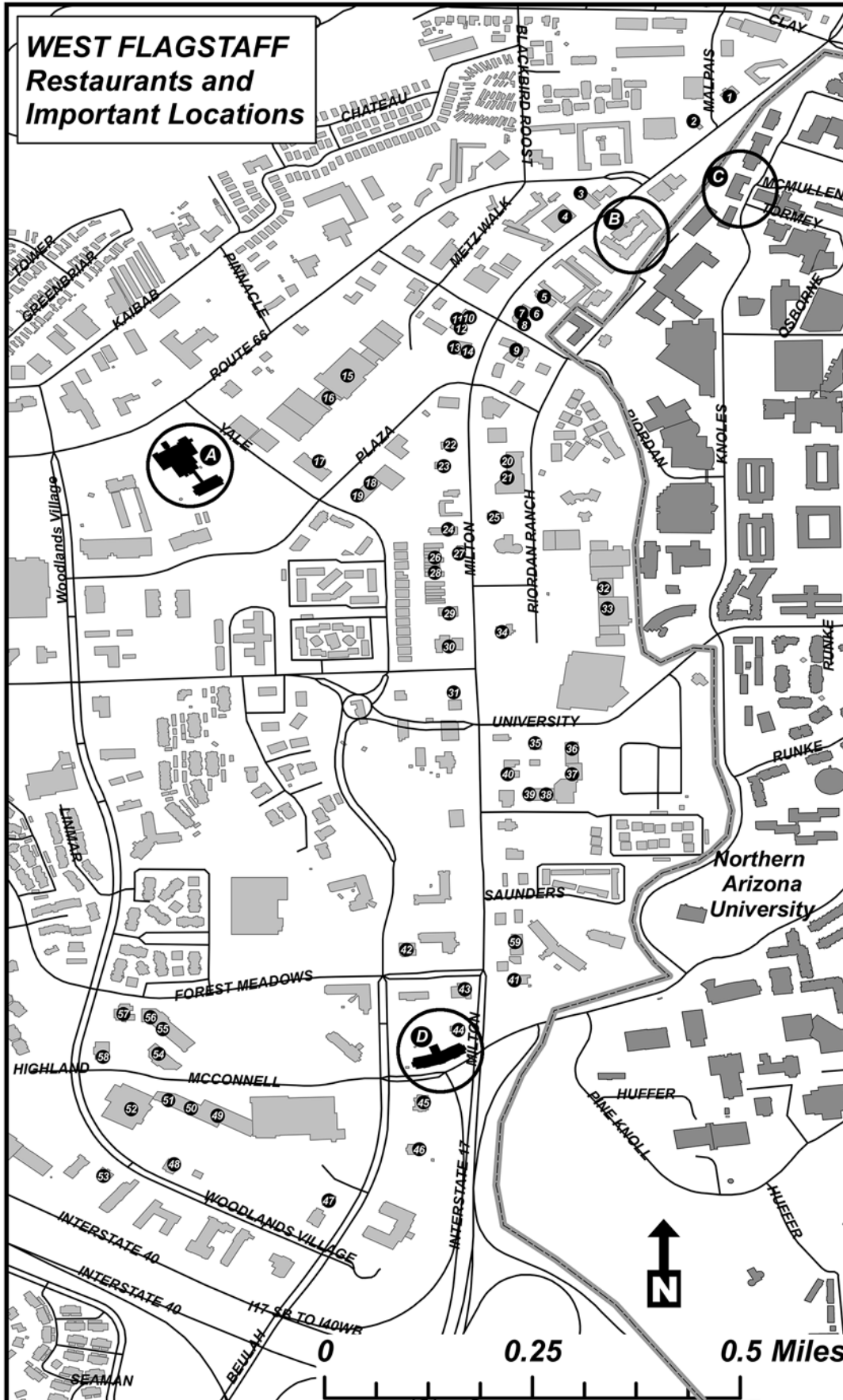
Open Monday-Saturday 8 a.m.-5 p.m., Sunday 9 a.m.-4 p.m.

Closed Thanksgiving, Christmas and New Year's Day.

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REV 11/16





- EATS**
1. Jack in the Box
 2. Dairy Queen
 3. Himalayan Grill*
 4. Bun Huggers*
 5. Chick Fil-A
 6. Dunkin Donuts
 7. Smash Burger
 8. Jimmy John's
 9. Oregano's
 10. El Gordo's (Mexican)*
 11. Little Thai Kitchen*
 12. Crystal Creek Sandwich Co.*
 13. Panda Express
 14. Chipotle's
 15. Safeway (Grocery store)
 16. Village Baker (bakery)*
 17. Pizza Guy*
 18. Hunan West*
 19. Hiro's Sushi*
 20. Coppa Cafe*
 21. August Moon*
 22. Taco Bell
 23. China Garden*
 24. McDonalds
 25. Habit Burger
 26. Hot Wok
 27. Hickory's BBQ
 28. Los Altos*
 29. Canes Chicken
 30. Wendy's
 31. Burger King
 32. Burritos Fiesta*
 33. Sprouts Market
 34. Chili's
 35. NiMarcos Pizza*
 36. Trail Crest Brewery
 37. My Pita Wrap
 38. Campus Coffee Bean*
 39. El Capitan*
 40. Arby's
 41. Denny's
 42. Coco's
 43. Sizzler
 44. Del Taco
 45. Red Lobster
 46. Olive Garden
 47. Freddy's Steakburger
 48. Cafe Rio
 49. Buffalo Wild Wings
 50. Pho Vietnam*
 51. Ralberto's*
 52. Basha's Grocery
 53. Ihop
 54. Fieldhouse Southern Food
 55. Teppan - Fuji
 56. Delhi Palace*
 57. Taverna Greek Grill*
 58. Tacos los Altos*
 59. Quiznos

* local

- IMPORTANT LOCATIONS**
- A. DoubleTree Hotel
 - B. Embassy Suites
 - C. Friar Hall (Geology)
 - D. Hampton Inn

TECHNICAL PROGRAM

Speaker Ready Room

The Speaker Ready Room is located in room 109, DoubleTree Hotel, and is available at the following times:

Monday, 14 May	4–7 p.m.
Tuesday, 15 May	7 a.m.–5:30 p.m.
Wednesday, 16 May	7 a.m.–5:30 p.m.
Thursday, 17 May	7 a.m.–2 p.m.

Computers and assistance are available to view presentations. All presentations are displayed as PowerPoint presentations in technical sessions, and presentations should be prepared using a 16:9 screen ratio. The speaker ready room can also be used to check presentations prior to uploading files. We ask that oral presenters upload their presentations by

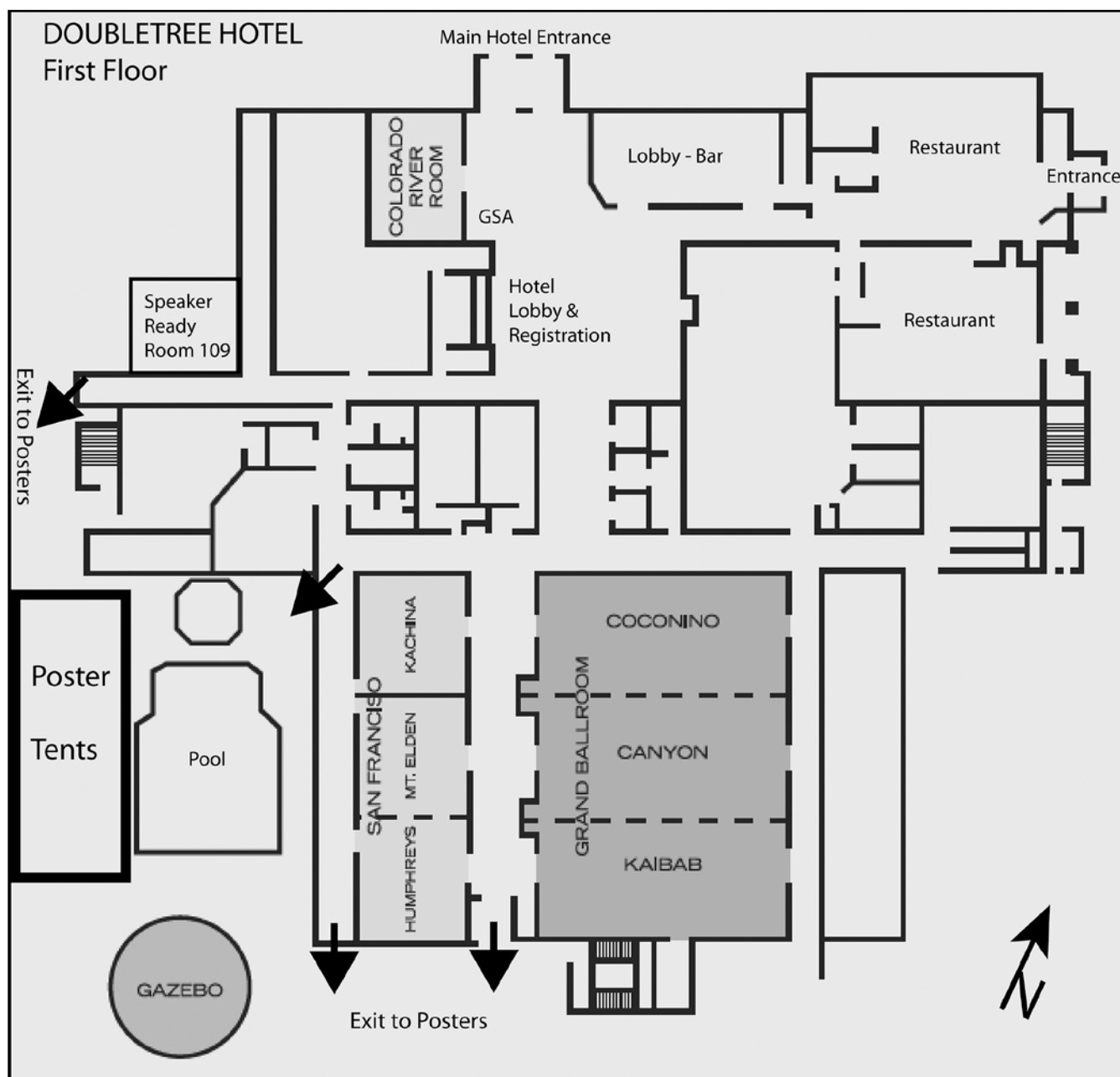
the evening prior for morning sessions at least 2 hours prior to the beginning of their session for afternoon sessions.

Oral Sessions

All Oral sessions are being held in the five rooms adjacent to one another on the south side of the first floor of the DoubleTree Hotel (see map): Coconino, Canyon, Kaibab, Humphreys, Mt. Elden, and Kachina.

Posters

Each poster board is 4 feet × 8 feet (landscape), and posters can be hung with stickpins or Velcro, which will be available. Posters are located in two large tents outside on the west side of the DoubleTree Hotel. Presenters are expected to have their posters up by 8:20 am, and are expected to be at their posters during the assigned times and during the dedicated



late afternoon poster sessions Tuesday and Wednesday (5:15–6:30 p.m.) and Thursday (3:15–4:30 p.m.). Presenters should take down their posters at the end of the session. Any posters not taken down will be recycled.

FIELD TRIPS

Pre-Meeting

FT1. Silver Creek Caldera and Peach Spring Tuff.

Sun.–Mon., 13–14 May, 7:30 a.m. departure; 4:30 p.m. return.

Cost: \$268 (includes transportation, guidebook, one night lodging, lunch, and snacks).

Organizer: Charles Ferguson, Arizona Geological Survey.

This two-day field trip will visit key localities of the widespread, Miocene-age Peach Spring Tuff at its proxy type locality near Kingman, Arizona (Day 1), including its previously unrecognized, uppermost, phenocryst-rich trachytic zone, and the geology in and around the Silver Creek caldera near Oatman, including its phenocryst-rich, trachytic caldera fill (Day 2).

FT2. Informal Geoscience Education on the Trail of Time at Grand Canyon National Park.

Mon., 14 May, 7:30 a.m. departure; 4:30 p.m. return.

Cost: \$90 (includes transportation, park entrance fee, snacks; does not include lunch at Grand Canyon Village).

Organizers: Steven Semken, Arizona State Univ.; Karl Karlstrom, Univ. of New Mexico; Laura Crossey, Univ. of New Mexico; Ryan Crow, USGS Flagstaff.

This one-day field trip comprises a hike on the main section of the Trail of Time, an interpretive timeline trail along the South Rim of Grand Canyon that is the largest and most thoroughly evaluated geoscience exhibition in the National Park System. The hike will focus on its design process and history, its instructional elements, and its impacts on public knowledge of geoscience concepts and Grand Canyon geology.

Post-Meeting

FT3. Oligocene Incision of Grand Canyon, Grandview Trail to Horseshoe Mesa.

Fri., 18 May, 7:30 a.m. departure; 4:30 p.m. return.

Cost: \$100 (includes transportation, snacks).

Organizers: Jim Sears, Univ. of Montana.

This one-day field trip to Grand Canyon is a day hike down the Grandview Trail to Horseshoe Mesa, a broad terrace on top of the Redwall Limestone. The geologic context is to discuss implications of the terrace for the erosional evolution of the canyon, addressing the proposal that the canyon had cut down to the level of the top of the Redwall in eastern Grand Canyon by Oligocene time, and then dissected the Inner Gorge during the past six million years.

FT4. The Holey Tour: Planetary Analog Sites of Northern Arizona. *Cosponsored by GSA Planetary Geology Division.*

Fri., 18 May, 8 a.m. departure; 5 p.m. return.

Cost: \$75 (trip includes van transportation, entrance to Meteor Crater, water, lunch, and field trip guidebook).

Organizers: Nadine G. Barlow, Northern Arizona University; Christopher Edwards, Northern Arizona University; Mark Salvatore, Northern Arizona University.

We will hike part-way along the Meteor Crater rim out to Barringer Point (the highest point on the rim), stopping along the way to discuss the history of the Crater, how it was used in the training of the Apollo astronauts, key geologic features, and the insights it provides into impact crater formation and evolution on other planetary bodies. Then head north to SP and Colton volcanic craters, stopping to eat lunch along the way. We will spend the afternoon exploring the volcanic flows and structures of these two young volcanoes and discuss how the San Francisco volcanic field has been used in astronaut training, and rover and space suit testing.

FT5. Tectonic and Magmatic Evolution of the Snake Range Metamorphic Core Complex, East Central Nevada.

Fri.–Mon., 18–21 May, 7:30 a.m. departure from Las Vegas; return to the Las Vegas airport 5 p.m., with optional transport from Flagstaff to Las Vegas on the evening of 17 May.

Cost: \$490 (includes transportation, four nights lodging, breakfast, lunch, snacks, and field guide).

Organizer: Phillip Gans, Univ. of California Santa Barbara.

This four-day, post-meeting trip will present new insights into the tectonomagmatic evolution of the Snake Range metamorphic core complex within the regional geologic framework of east central Nevada. The field trip will include stops in the White Pine Range (Horse Camp basin, Red Mountain caldera, and Illipah fold and thrust belt), Schell Creek Range (Eocene normal faulting and volcanism, deep-seated Mesozoic shortening fabrics), and a comprehensive examination of the Snake Range metamorphic core complex (geometry and timing of upper plate structure, the famed Snake Range Decollement, age and significance of polyphase footwall fabrics and intrusions, and the role of tectonic heredity).

SHORT COURSES

All short courses are being held in the Geology Building #12, NW NAU campus.

Monday, 14 May

SC1. Digital Geology Teaching Tools. 8 a.m.–noon, Room 223, Geology Building (Frier Hall), Northern Arizona University Campus. Callan Bentley, Northern Virginia Community College, cbentley@nvcc.edu, Steve Whitmeyer, James Madison Univ., whitmesj@jmu.edu. Course will introduce participants to plate tectonic reconstructions, digital planets, the fold analysis challenge, EarthQuiz, “Reasons for the Seasons, A Grand Tour of the Ocean Basins, and virtual samples and outcrops (construction, access, and utilization in virtual field experiences) via GigaPan and 3D models. Participants should bring their laptop or other digital device to the workshop. Participant support is available (full meeting registration and travel) to enrolled participants through NSF GEODE grant.

SC2. Prospective UAV Users for Geologic Purposes. 8 a.m.–noon, Room 109, Geology Building (Frier Hall), Northern Arizona University Campus. Arthur G. Sylvester, Univ. of California, Santa Barbara; sylvester@geol.ucsb.edu.

Brief presentation of examples of what people are doing with drones in geology. An overview of what products are available, FAA regulations, and a flight demonstration.

SC3. Digital Field Methods for Sed/Strat and Structural Geology: Use of Tablet-Based Apps for Mapping and Measurements in Undergraduate Courses. 1–4:30 p.m., Room 223, Geology Building (Frier Hall), Northern Arizona University Campus. Lawrence Malinconico, Lafayette College, malincol@lafayette.edu. Course will explore the use of tablet applications for digital field mapping. We will demo and test numerous applications. Participants will be encouraged to share their favorite geologic field apps and experiences with the group.

SC4. UAV Geologic Applications. 1–5 p.m., Room 109, Geology Building (Frier Hall), Northern Arizona University Campus. Arthur G. Sylvester, Univ. of California, Santa Barbara; sylvester@geol.ucsb.edu. A “hands on” laboratory by 3–4 people demonstrating use of software applications for map making, photogrammetry, sampling, lidar.

SC5. Assessing Contaminant Sources and Aquifer Continuity in Soil/Groundwater using Stable Isotopes of Strontium (Sr) and Lead (Pb). 8 a.m.–5 p.m., Room 111, Geology Building (Frier Hall), Northern Arizona University Campus. Richard W. Hurst, California Lutheran Univ., rhurst@callutheran.edu. Soil/groundwater contamination, tracing groundwater flow, and evaluating aquifer continuity are important issues in western soil/watershed management. Stable Sr/Pb isotopes are effective in identifying contaminant contributions from petroleum, mining, agricultural, and other sources. This course covers fundamental concepts of Sr/Pb isotopes followed by specific case studies that exemplify their application in the western U.S.

Friday, 18 May

SC6. Collecting Geological Field Data Using the StraboSpot Data System. 8 a.m.–5 p.m., Room 109, Geology Building (Frier Hall), Northern Arizona University Campus. Doug Walker, Univ. of Kansas, jdwalker@ku.edu; Emily Bunse, Univ. of Kansas; Basil Tikoff, Univ. of Wisconsin-Madison, basil@geology.wisc.edu. The StraboSpot Data System (<https://www.strabospot.org>) is designed for data collection in the field and their integration with laboratory measurements. The workshop will help new users to design and build StraboSpot projects for both research and teaching. Participants may (optional) bring a smartphone, tablet (iOS/Android), or GIS-enabled GIS.

EXHIBITS

Exhibits are located in the DoubleTree Hotel lobby and halls near the oral sessions. For additional information, please contact the Exhibits Coordinator, Steve Reynolds sreynolds@asu.edu.

Exhibitor Hours:

Monday, 14 May	3–5 p.m., Set up
Monday, 14 May	5–7 p.m.
Tue–Wed, 15–16 May	8 a.m.–6:30 p.m.
Thursday, 17 May	8 a.m.–5 p.m.
Thursday, 17 May	5–6 p.m., Tear down

Exhibitors

As of mid-March, the following businesses, organizations, and university departments will be exhibitors at the meeting

2019 Cordilleran Section GSA Meeting
2019 Rocky Mountain Section GSA Meeting (joint with North-Central and South-Central sections)
American Institute of Professional Geologists
Geological Society of America Bookstore
Geological Society of America Foundation
Logitech, Ltd.
National Association of State Boards of Geology
Pacific Section SEPM
Springer Nature
Summit Scientific, Inc.
Western Science Center
Western State Colorado University

STUDENT PROGRAMS

Mentor Programs

For more information, contact Jennifer Nocerino, jnocerino@geosociety.org.

Roy J. Shlemon Mentor Program in Applied Geosciences.

Tuesday and Wednesday, 15 and 16 May, 12:15–1:15 p.m., Kachina Room.

Designed to extend the mentoring reach of individual professionals from applied geology to undergraduate and graduate students. Students and mentors: Join us for a free lunch. Space is limited—first come, first served.

John Mann Mentors in Applied Hydrogeology.

Thursday, 17 May, 12:15–1:15 p.m., Kachina Room.

Presents mentoring opportunities for undergraduate, graduate, and recent graduate students with a declared interest in applied hydrogeology as a career. Join us for a free lunch. Space is limited—first come, first served.

Geoscience GeoCareer Program Workshops

Part 1. Career Planning and Informational Interviewing.

Tuesday, May 15, 9–10 a.m., Room 108. Your job-hunting process should begin with career planning, not when you apply for jobs. This workshop will help you begin this process and will introduce you to informational interviewing. This section is highly recommended for freshman, sophomores and juniors. The earlier you start your career planning the better.

Part 2. Geoscience Career Exploration. Tuesday, May 15, 10–11 a.m., Room 108. What do geologists in various sectors earn? What do they do? What are the pros and cons to working in academia, government, and industry? Workshop presenters, and when possible, professionals in the field, will address these issues.

Part 3. Cover Letters, Résumés, and CVs. Wednesday, May 16, 9–10 a.m., Room 108. How do you prepare a cover letter? Does your résumé need a good edit? Whether you are currently in the job market or not, learn how to prepare the best résumé possible. You will review numerous examples to help you learn important résumé dos and don'ts.

Schedule of Events

EVENT	TIME	LOCATION
SUNDAY, 13 MAY		
FIELD TRIP:		
FT1. Silver Creek Caldera and Peach Spring Tuff (Field Trip)	7:30 a.m.–11:55 p.m.	Hotel Lobby
MONDAY, 14 MAY		
FIELD TRIP:		
FT2. Informal Geoscience Education on the Trail of Time at Grand Canyon National Park (Field Trip)	7:30 a.m.–4:30 p.m.	Hotel Lobby
SHORT COURSES:		
SC1. Digital Geology Teaching Tools (Short Course)	8 a.m.–noon	Room 223, Geology Building (Frier Hall), Northern Arizona University Campus
SC2. Prospective UAV Users for Geologic Purposes (Short Course)	8 a.m.–noon	Room 109, Geology Building (Frier Hall), Northern Arizona University Campus
SC5. Assessing Contaminant Sources and Aquifer Continuity in Soil/Groundwater using Stable Isotopes of Strontium (Sr) and Lead (Pb) (Short Course)	8 a.m.–5 pm	Room 111, Geology Building (Frier Hall), Northern Arizona University Campus
SC3. Digital Field Methods for Sed/Strat and Structural Geology: Use of Tablet-Based Apps for Mapping and Measurements in Undergraduate Courses (Short Course)	1–4:30 p.m.	Room 223, Geology Building (Frier Hall), Northern Arizona University Campus
SC4. UAV Geologic Applications (Short Course)	1–5 p.m.	Room 109, Geology Building (Frier Hall), Northern Arizona University Campus
Exhibitor Set Up	3–5 p.m.	DoubleTree by Hilton
Registration	3–7:30 p.m.	Hotel Lobby
Speaker Ready Room	4–7 p.m.	Room 109
Exhibits Open	5–7 p.m.	DoubleTree by Hilton
Welcome Reception and Map Blast	5–7 p.m.	Kaibab/Canyon Room
TUESDAY, 15 MAY		
Registration	7 a.m.–4:30 p.m.	Hotel Lobby
Speaker Ready Room	7 a.m.–5:30 p.m.	Room 109
Exhibits	8 a.m.–6:30 p.m.	DoubleTree by Hilton

EVENT	TIME	LOCATION
STUDENT WORKSHOPS:		
Geoscience GeoCareer Program Workshop Part 1. Career Planning and Informational Interviewing (Workshop)	9–10 a.m.	Room 108
Geoscience GeoCareer Program Workshop Part 2. Geoscience Career Exploration (Workshop)	10–11 a.m.	Room 108
MORNING ORAL TECHNICAL SESSIONS:		
P1. Tectonics of the Death Valley Region I: A Tribute to Bennie Troxel and Lauren Wright	8:20–10:05 a.m.	Canyon Room
T7. Seismic and Geophysical Perspectives: New Insights into the Structure of the Shallow Crust of the Rocky Mountains and Cordillera	8:20–10:05 a.m.	Coconino Room
T12. Plate Margin Processes and Tectonics during the Cretaceous, Western North America	8:20–10:05 a.m.	Humphreys/Mt. Elden Room
D8. Exciting New Interdisciplinary Themes in the Geosciences	8:20–10:20 a.m.	Kachina Room
T18. Paleoclimate Records and Future Climate Trends in the American Southwest I	8:20–10:20 a.m.	Kaibab Room
T1. Miocene to Recent Evolution of the Lower Colorado River Corridor and the Northern Gulf of California I	10:20 a.m.–12:05 p.m.	Coconino Room
P1. Tectonics of the Death Valley Region II: A Tribute to Bennie Troxel and Lauren Wright	10:20 a.m.–12:05 p.m.	Canyon Room
T14. Paleomagnetic, Structural, and Geophysical Data Applied to Intrusive and Extrusive Igneous Systems, Tectonic Applications, and Paleoclimate Studies	10:20 a.m.–12:05 p.m.	Humphreys/Mt. Elden Room
T18. Paleoclimate Records and Future Climate Trends in the American Southwest II	10:20 a.m.–12:05 p.m.	Kaibab Room
POSTER SESSIONS:		
D1. Volcanology / Petrology / Ore Mineralization (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
D4. Sedimentary Geochemistry (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
P2. Cordilleran Core Complexes and Arizona Geology: A Celebration of Jon Spencer's Career (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
P3. Recent Advances in Basin-and-Range and Proterozoic Geology of the Western U.S.: A Session Honoring Ernie Duebendorfer (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
P4. Jurassic to Cenozoic Geology of Southern California, Southwest Arizona, and Sonora: A Session Honoring Gordon Haxel and Carl Jacobson (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
T5. Post-Wildfire Hazards: From New Research to Assessments, Prediction, and Mitigation (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
T28. The Happy Marriage of Geology and Art (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
T29. Undergraduate Research Session (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
Roy J. Shlemon Mentor Program in Applied Geosciences	12:15–1:15 p.m.	Kachina Room
AFTERNOON ORAL TECHNICAL SESSIONS:		
T1. Miocene to Recent Evolution of the Lower Colorado River Corridor and the Northern Gulf of California II	1:30–3:15 p.m.	Coconino Room
P1. Tectonics of the Death Valley Region III: A Tribute to Bennie Troxel and Lauren Wright	1:30–3:15 p.m.	Canyon Room

EVENT	TIME	LOCATION
T19. Paleontology of the Colorado Plateau and Environs I	1:30–3:15 p.m.	Kaibab Room
T26. Recent Advances in Understanding the Geology of Northwestern Mexico I	1:30–3:15 p.m.	Humphreys/Mt. Elden Room
T1. Miocene to Recent Evolution of the Lower Colorado River Corridor and the Northern Gulf of California III	3:30–5:15 p.m.	Coconino Room
P1. Tectonics of the Death Valley Region IV: A Tribute to Bennie Troxel and Lauren Wright	3:30–5:15 p.m.	Canyon Room
T19. Paleontology of the Colorado Plateau and Environs II	3:30–5:15 p.m.	Kaibab Room
T26. Recent Advances in Understanding the Geology of Northwestern Mexico II	3:30–5:15 p.m.	Humphreys/Mt. Elden Room

WEDNESDAY, 16 MAY

Rocky Mountain GSA Section Business Meeting	7–8 a.m.	Deluxe Suite 355
Registration	7 a.m.–4:30 p.m.	Hotel Lobby
Speaker Ready Room	7 a.m.–5:30 p.m.	Room 109
Exhibits	8 a.m.–6:30 p.m.	DoubleTree by Hilton

STUDENT WORKSHOP:

Geoscience GeoCareer Program Workshop Part 3. Cover Letters, Resumés, and CVs (Workshop)	9–10 a.m.	Room 108
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MORNING ORAL TECHNICAL SESSIONS:

P2. Cordilleran Core Complexes and Arizona Geology I: A Celebration of Jon Spencer's Career	8:20–10:05 a.m.	Canyon Room
T6. Colorado Plateau Landscape Evolution -- Grand Canyon- and Upper Basin-Focused Colorado River Evolution I	8:20–10:05 a.m.	Coconino Room
T21. Recent Advances in Planetary Geoscience	8:20–10:05 a.m.	Kaibab Room
T24. Understanding Basin Environments and Evolution Beyond Earth	10:20 a.m.–noon	Kachina Room
P2. Cordilleran Core Complexes and Arizona Geology II: A Celebration of Jon Spencer's Career	10:20 a.m.–12:05 p.m.	Canyon Room
P3. Recent Advances in Basin-and-Range and Proterozoic Geology of the Western U.S. I: A Session Honoring Ernie Duebendorfer	10:20 a.m.–12:05 p.m.	Kaibab Room
T6. Colorado Plateau Landscape Evolution -- Grand Canyon- and Upper Basin-Focused Colorado River Evolution II	10:20 a.m.–12:05 p.m.	Coconino Room
T10. Geologic and Structural Evolution of the Transition Zone	10:20 a.m.–12:20 p.m.	Humphreys/Mt. Elden Room

POSTER SESSIONS:

D2. Geology of the Sierra Nevada (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
D3. Hydrology/Aqueous Chemistry (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
D7. Paleontology (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
T3. Advances in River Science in the Intermountain West (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
T9. Cenozoic Extension in Western North America (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents

EVENT	TIME	LOCATION
T11. Pennsylvanian to Early Triassic Tectonics of Southwest Laurentia (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
T12. Plate Margin Processes and Tectonics during the Cretaceous, Western North America (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
T16. Understanding Water Resources related to Mineralized Uranium Deposits in the Southwestern United States (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tentss
T17. Chemical and Isotopic Tracers of Water Sources in Semiarid Regions: From the Mantle to the Atmosphere (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
T19. Paleontology of the Colorado Plateau and Environs (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents
T26. Recent Advances in Understanding the Geology of Northwestern Mexico (Posters)	8:30 a.m.–6:30 p.m.	Outdoor Tents

Roy J. Shlemon Mentor Program in Applied Geosciences	12:15–1:15 p.m.	Kachina Room
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AFTERNOON ORAL TECHNICAL SESSIONS:

P2. Cordilleran Core Complexes and Arizona Geology III: A Celebration of Jon Spencer's Career	1:30–3:15 p.m.	Canyon Room
P3. Recent Advances in Basin-and-Range and Proterozoic Geology of the Western U.S. II: A Session Honoring Ernie Duebendorfer	1:30–3:15 p.m.	Kaibab Room
T6. Colorado Plateau Landscape Evolution -- Grand Canyon- and Upper Basin-Focused Colorado River Evolution III	1:30–3:15 p.m.	Coconino Room
T8. Laramide Tectonics in the Southwest North American Cordilleran Interior I	1:30–3:15 p.m.	Humphreys/Mt. Elden Room
T23. Integrating Composition and Morphology: Keys to Constraining Planetary Surface Processes from Spacecraft Data	1:30–3:15 p.m.	Kachina Room
D5. Geomorphology	3:30–5:15 p.m.	Coconino Room
P3. Recent Advances in Basin-and-Range and Proterozoic Geology of the Western U.S. III: A Session Honoring Ernie Duebendorfer	3:30–5:15 p.m.	Kaibab Room
T8. Laramide Tectonics in the Southwest North American Cordilleran Interior II	3:30–5:15 p.m.	Humphreys/Mt. Elden Room
T20. Biostratigraphy and Paleoenvironments of Western North America: Correlations across the International Border	3:30–5:15 p.m.	Canyon Room

Cordilleran GSA Section Business Meeting	4:30–5:30 p.m.	Deluxe Suite 355
Banquet for Symposia Honorees	7:30–10 p.m.	Kaibab/Canyon Room

THURSDAY, 17 MAY

GSA Strategic Planning Meeting	7–8 a.m.	Kachina Room
Registration	7 a.m.–2 p.m.	Hotel Lobby
Speaker Ready Room	7 a.m.–2 p.m.	Room 109
Exhibits	8 a.m.–5 p.m.	DoubleTree by Hilton

MORNING ORAL TECHNICAL SESSIONS:

T3. Advances in River Science in the Intermountain West I	8:20–10:05 a.m.	Coconino Room
P4. Jurassic to Cenozoic Geology of Southern California, Southwest Arizona, and Sonora I: A Session Honoring Gordon Haxel and Carl Jacobson	8:20–10:05 a.m.	Canyon Room

EVENT	TIME	LOCATION
T16. Understanding Water Resources related to Mineralized Uranium Deposits in the Southwestern United States	8:20–10:05 a.m.	Kaibab Room
T13. Emerging Ideas on the Ancestral Rocky Mountain System	8:20–10:20 a.m.	Kachina Room
T3. Advances in River Science in the Intermountain West II	10:20 a.m.–12:05 p.m.	Coconino Room
P4. Jurassic to Cenozoic Geology of Southern California, Southwest Arizona, and Sonora II: A Session Honoring Gordon Haxel and Carl Jacobson	10:20 a.m.–12:05 p.m.	Canyon Room
T17. Chemical and Isotopic Tracers of Water Sources in Semiarid Regions: From the Mantle to the Atmosphere I	10:20 a.m.–12:05 p.m.	Kaibab Room
T15. Genetic Links between the Magmatism, Tectonism, and Metallogeny of the Southwestern USA and Northern Mexico	10:20 a.m.–12:20 p.m.	Humphreys/Mt. Elden Room

POSTER SESSIONS:

D5. Geomorphology (Posters)	8:30 a.m.–4:30 p.m.	Outdoor Tents
D6. Structural Geology (Posters)	8:30a.m.–4:30 p.m.	Outdoor Tents
T1. Miocene to Recent Evolution of the Lower Colorado River Corridor and the Northern Gulf of California (Posters)	8:30a.m.–4:30 p.m.	Outdoor Tents
P1. Tectonics of the Death Valley Region: A Tribute to Bennie Troxel and Lauren Wright (Posters)	8:30a.m.–4:30 p.m.	Outdoor Tents
T4. New Insights into the Development and Evolution of the Colorado River System from Geologic Mapping (Posters)	8:30a.m.–4:30 p.m.	Outdoor Tents
T7. Seismic and Geophysical Perspectives: New Insights into the Structure of the Shallow Crust of the Rocky Mountains and Cordillera (Posters)	8:30a.m.–4:30 p.m.	Outdoor Tents
T14. Paleomagnetic, Structural, and Geophysical Data Applied to Intrusive and Extrusive Igneous Systems, Tectonic Applications, and Paleoclimate Studies (Posters)	8:30a.m.–4:30 p.m.	Outdoor Tents
T18. Paleoclimate Records and Future Climate Trends in the American Southwest (Posters)	8:30a.m.–4:30 p.m.	Outdoor Tents
T21. Recent Advances in Planetary Geoscience (Posters)	8:30a.m.–4:30 p.m.	Outdoor Tents
T25. Geologic Applications of Unmanned Aerial Systems (Posters)	8:30a.m.–4:30 p.m.	Outdoor Tents
T27. Geoscience and Environmental Science Education in the Cordillera and Rockies: Research and Practice (Posters)	8:30a.m.–4:30 p.m.	Outdoor Tents

John Mann Mentors in Applied Hydrogeology	12:15–1:15 p.m.	Kachina Room
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AFTERNOON ORAL TECHNICAL SESSIONS:

P4. Jurassic to Cenozoic Geology of Southern California, Southwest Arizona, and Sonora III: A Session Honoring Gordon Haxel and Carl Jacobson	1:30–3:15 p.m.	Canyon Room
T5. Post-Wildfire Hazards: From New Research to Assessments, Prediction, and Mitigation I	1:30–3:15 p.m.	Coconino Room
T17. Chemical and Isotopic Tracers of Water Sources in Semiarid Regions: From the Mantle to the Atmosphere II	1:30–3:15 p.m.	Kaibab Room
T9. Cenozoic Extension in Western North America	1:30–3:30 p.m.	Humphreys/Mt. Elden Room
Exhibits Tear Down	5–6 p.m.	DoubleTree by Hilton

EVENT**TIME****LOCATION****FRIDAY, 18 MAY****FIELD TRIPS:**

FT3. Oligocene Incision of Grand Canyon, Grandview Trail to Horseshoe Mesa (Field Trip)	7:30 a.m.–4:30 p.m.	Hotel Lobby
FT5. Tectonic and Magmatic Evolution of the Snake Range Metamorphic Core Complex, East Central Nevada (Field Trip)	7:30 a.m.–11:55 p.m.	Las Vegas
FT4. The Holey Tour: Planetary Analog Sites of Northern Arizona (Field Trip)	8 a.m.–5 p.m.	Hotel Lobby

SHORT COURSE:

SC6. Collecting Geological Field Data Using the StraboSpot Data System (Short Course)	8 a.m.–5 p.m.	Room 109, Geology Building (Frier Hall), Northern Arizona University Campus
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Technical Sessions

Meeting policy prohibits the use of cameras or sound-recording equipment at technical sessions and poster sessions.



A no-smoking policy has been established by the Program Committee and will be followed in all meeting rooms for technical sessions.

NOTICE

In the interest of public information, the Geological Society of America provides a forum for the presentation of diverse opinions and positions. The opinions (views) expressed by speakers and exhibitors at these sessions are their own and do not necessarily represent the views or policies of the Geological Society of America.



NOTE INDEX SYSTEM

Numbers (3-4, 15-4) indicate session and order of presentation within that session.

*denotes speaker

TUESDAY, 15 MAY 2018

MORNING ORAL TECHNICAL SESSIONS

SESSION NO. 1

D8. Exciting New Interdisciplinary Themes in the Geosciences

8:20 AM, DoubleTree by Hilton Kachina Room

Frank C. Ramos, Presiding

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|-----|----------|--|
| 1-1 | 8:20 AM | Barkoff, Drew William*; Jowitt, Simon: INITIAL EMPLACEMENT AND SUBSEQUENT REDISTRIBUTION OF CRITICAL METALS IN A HYDROTHERMALLY ALTERED RHYOLITE SYSTEM |
| 1-2 | 8:40 AM | Butterfield, Nicholas J.F.*; Ramos, Frank C.: EVALUATING GEOCHEMICAL RELATIONSHIPS AMONG YOUNG COMENDITES AT CHANGBAISHAN VOLCANO, CHINA |
| 1-3 | 9:00 AM | Oordt, Andrew*; Soreghan, Gerilyn; Stemmerik, Lars: A RECORD OF MID-LATITUDE ATMOSPHERIC DUST LOADING FROM A PENNSYLVANIAN-PERMIAN CARBONATE RAMP ON CENTRAL SPITSBERGEN |
| 1-4 | 9:20 AM | DiPrinzio, Tovah Dyann*: TEACHING THE LANGUAGE OF EARTH SCIENCE: BEST TEACHING PRACTICES FOR CONTENT ABSORPTION IN THE ENGLISH AS A SECOND LANGUAGE CLASSROOM |
| 1-5 | 9:40 AM | Morgan, George*; Morgan, JR: A STUDY OF ONE PRECARIOUSLY BALANCED ROCK IN THE COYOTE MOUNTAINS IN RELATIONSHIP TO THE APRIL, 4TH, 2010 EL MAJOR-CUCAPAS M_w 7.2 EARTHQUAKE USING DIGITAL ORTHO-QUADRANGLES AND UAVSAR INTERFEROGRAMS |
| 1-6 | 10:00 AM | Boyer, Steven E.*; Mitra, Gautam: FOLD DUPLEXES |

SESSION NO. 2

S1. Tectonics of the Death Valley Region I: A Tribute to Bennie Troxel and Lauren Wright (GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division)

8:20 AM, DoubleTree by Hilton Canyon Room

Terry Pavlis, Laura F. Serpa, James P. Calzia, Darrel S. Cowan and Marli B. Miller, Presiding

8:20 AM **INTRODUCTORY REMARKS**

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| 2-1 | 8:25 AM | Bodin, Paul; Cowan, Darrel S.*; Brandon, Mark T.: ACTIVE SLIP ON A REGIONAL LOW-ANGLE NORMAL FAULT, DEATH VALLEY, CALIFORNIA |
| 2-2 | 8:45 AM | Miller, Marli B.*; Castonguay, Sammy R.; Rogers, Charles E.: THE BASEMENT-COVER CONTACT IN THE AMARGOSA CHAOS, DEATH VALLEY, CALIFORNIA: REGIONAL FAULT OR LOCALLY FAULTED UNCONFORMITY? |
| 2-3 | 9:05 AM | Castonguay, Sammy R.*; Miller, Marli B.: AMARGOSA CHAOS: A PRODUCT OF MULTIPHASE DEFORMATION |
| 2-4 | 9:25 AM | Topping, David J.*: MIO-PLIOCENE STRATIGRAPHIC AND STRUCTURAL EVIDENCE REFUTES SIMPLE ROLLING-HINGE MODEL FOR POST-7.8 MA EXTENSION IN THE SOUTHERN BLACK MOUNTAINS AND INDICATES LARGE-SCALE EXTENSION DISTRIBUTED AMONG MANY FAULTS |
| 2-5 | 9:45 AM | Christie-Blick, Nicholas*: LOW-ANGLE NORMAL FAULTING IN THE VICINITY OF DEATH VALLEY, CALIFORNIA |

SESSION NO. 3

S1. Tectonics of the Death Valley Region II: A Tribute to Bennie Troxel and Lauren Wright (GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division)

10:20 AM, DoubleTree by Hilton Canyon Room

Terry Pavlis, Laura F. Serpa, James P. Calzia, Darrel S. Cowan and Marli B. Miller, Presiding

10:20 AM **INTRODUCTORY REMARKS**

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|-----|----------|---|
| 3-1 | 10:25 AM | Davis, Gregory A.*: REVISITING THE GARLOCK FAULT — MORE TO IT THAN MEETS THE EYE |
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- 3-2** 10:45 AM Menges, Christopher M.: **COMPLEX PATTERNS OF NEOTECNIC TRANSLATIONAL AND CONTRACTUAL STRAIN WITHIN THE SOUTHERN DEATH VALLEY AREA RELATIVE TO REGIONAL DEFORMATION PATTERNS IN THE EASTERN CALIFORNIA SHEAR ZONE**
- 3-3** 11:05 AM Knott, Jeffrey R.*; Lutz, Brandon; Griffie, Emma; Clemens-Knott, Diane; Chen, Nancy M.; Calzia, James P.: **IDENTIFICATION OF HUNTER MOUNTAIN BATHOLITH CLASTS IN THE FURNACE CREEK FORMATION, DEATH VALLEY, CALIFORNIA**
- 3-4** 11:25 AM Andrew, Joseph E.*: **CONSTRAINTS ON LARGE-MAGNITUDE EXTENSION OF DEATH VALLEY, CALIFORNIA: INSIGHT FROM THE WORLD'S YOUNGEST RAPAKIVI GRANITES**
- 3-5** 11:45 AM Smith, Eugene*; Johnsen, Racheal; Fitch, Shelby: **EVOLUTION OF THE GREENWATER RHYOLITE AND ADJACENT BASALT FIELD, GREENWATER RANGE, DEATH VALLEY, CALIFORNIA: NEW U-PB ZIRCON DATES AND MG-ISOTOPES**

SESSION NO. 4

T1. Miocene to Recent Evolution of the Lower Colorado River Corridor and the Northern Gulf of California I (GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)

10:20 AM, DoubleTree by Hilton Coconino Room

Ryan S. Crow, Kristin McDougall, Scott E.K. Bennett and Michael H. Darin, Presiding

- 10:20 AM **INTRODUCTORY REMARKS**
- 4-1** 10:25 AM Matti, Jonathan C.*: **STRATIGRAPHIC AND STRUCTURAL RELATIONS IN SAN GORGONIO PASS, SOUTHERN CALIFORNIA: POSSIBLE IMPLICATIONS FOR THE LATE CENOZOIC WEST SALTON DETACHMENT SYSTEM**
- 4-2** 10:45 AM Bennett, Scott E.K.*; Oskin, Michael E.; Iriondo, Alexander: **A TECTONO-STRATIGRAPHIC RECORD OF THE LATEST MIOCENE GULF OF CALIFORNIA SHEAR ZONE FROM NORTHEASTERN ISLA TIBURON, SONORA, MEXICO**
- 4-3** 11:05 AM van Wijk, Jolante W.*; Heyman, Samuel; Axen, Gary: **WHAT IS THE NATURE OF THE CRUST IN THE NORTHERN GULF OF CALIFORNIA AND SALTON TROUGH?**
- 4-4** 11:25 AM Castillo, Bryan*; McGill, Sally; Scharer, Kate; Yule, Doug; McNeil, James; McPhillips, Devin: **PRELIMINARY AGES OF PREHISTORIC EARTHQUAKES ON THE BANNING STRAND OF THE SAN ANDREAS FAULT, NEAR NORTH PALM SPRINGS, CALIFORNIA**

SESSION NO. 5

T7. Seismic and Geophysical Perspectives: New Insights into the Structure of the Shallow Crust of the Rocky Mountains and Cordillera (GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division)

8:20 AM, DoubleTree by Hilton Coconino Room

Joshua A. Cohan and Geoffrey A. Phelps, Presiding

- 8:20 AM **INTRODUCTORY REMARKS**
- 5-1** 8:25 AM Godwin, Benjamin S.; Nelson, Stephen T.*; McBride, John H.; Rey, Kevin A.; Tingey, David G.: **DEFORMATION IN THE DAMAGE ZONE OF THE HURRICANE FAULT AND THE CONTROL OF THERMAL WATER DISCHARGE INTO THE VIRGIN RIVER, UTAH, AS REVEALED BY HIGH-RESOLUTION SEISMIC SURVEYS**
- 5-2** 8:45 AM Cohan, Joshua A.*: **PRELIMINARY INTERPRETATION OF A 2D SEISMIC LINE IN SW MONTANA—APPLYING SEISMIC STRATIGRAPHY PRINCIPLES TO INFER GEOLOGIC SETTING**
- 5-3** 9:05 AM Bobbyarchick, Andy R.*; Eppes, Missy: **SHALLOW STRUCTURAL AND RADAR CHARACTERISTICS OF**

THE COUGAR BUTTES ANTICLINE, NORTHERN SAN BERNARDINO FOOTHILLS, CA

- 5-4** 9:25 AM Ziwu, Felix*; Mickus, Kevin L.; Doser, Diane I.; Serpa, Laura F.: **INVESTIGATING SERPENTINIZATION WITHIN THE COOK INLET BASIN, ALASKA FROM THE INVERSION OF MAGNETIC DATA**
- 5-5** 9:45 AM Kohl, Keith*: **THE POWER OF PERSPECTIVE: A HUNDRED YEARS OF OBSERVATIONS FROM A GLEN CANYON BENCH MARK**

SESSION NO. 6

T12. Plate Margin Processes and Tectonics during the Cretaceous, Western North America (GSA Geophysics and Geodynamics Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)

8:20 AM, DoubleTree by Hilton Humphreys/Mt. Elden Room

Bernard Housen and Basil Tikoff, Presiding

- 8:20 AM **INTRODUCTORY REMARKS**
- 6-1** 8:25 AM Rafferty, Kevin C.*; Craig, Taylor D.; Wells, Michael L.; Medema, Jayson: **TIMING, KINEMATICS, AND BASIN EVOLUTION OF THE SYNCONTRACTURAL BIRD SPRINGS CONGLOMERATE, SOUTHERN SEVIER FOLD AND THRUST BELT, NEVADA: IMPLICATIONS FOR MID-CRETACEOUS PLATE DYNAMICS**
- 6-2** 8:45 AM Kahn, Maureen*; Tikoff, Basil; Parrish, Ethan; Vervoort, Jeffrey; Evans, Cameron: **DETRITAL ZIRCONS FROM QUARTZITES CONSTRAIN THE WESTERN MARGIN OF LAURENTIA IN SOUTH-WESTERNMOST IDAHO**
- 6-3** 9:05 AM Hildebrand, Robert S.*; Whalen, Joseph B.: **THE MID-CRETACEOUS OREGONIAN EVENT: CLOSURE OF A MARGINAL SEAWAY BY WESTWARD SUBDUCTION IN THE NORTH AMERICAN CORDILLERA**
- 6-4** 9:25 AM Alberts, Daniel G.*; Gehrels, George E.; Nelson, JoAnne L.: **U-PB AND HF ISOTOPIC ANALYSIS OF DETRITAL ZIRCONS FROM PALEOZOIC AND CRETACEOUS STRATA OF SOUTHERN VANCOUVER ISLAND, BRITISH COLUMBIA**
- 6-5** 9:45 AM Waldien, Trevor S.*; Roeske, Sarah M.: **THE EFFECTS OF SUPERIMPOSED DEFORMATION EVENTS ON STRIKE-SLIP TRANSLATION IN THE CORDILLERA: AN EXAMPLE FROM THE DENALI FAULT SYSTEM**

SESSION NO. 7

T14. Paleomagnetic, Structural, and Geophysical Data Applied to Intrusive and Extrusive Igneous Systems, Tectonic Applications, and Paleoclimate Studies (GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division)

10:20 AM, DoubleTree by Hilton Humphreys/Mt. Elden Room

Michael Petronis, Filip Tomek and Jennifer Lindline, Presiding

- 10:20 AM **INTRODUCTORY REMARKS**
- 7-1** 10:25 AM Morgan, Sven S.*: **APPLYING PASCAL'S PRINCIPLE TO THE MAGMATIC INFLATION OF LACCOLITHS AND PLUTONS**
- 7-2** 10:45 AM Zuza, Andrew V.*; Cao, Wenrong; DesOrmeau, Joel W.; Hinz, Nicholas H.; Stockli, Daniel F.; Odlum, Margaret: **INVESTIGATING ROTATION OF THE MIOCENE SEARCHLIGHT PLUTON, NV: HOW EXTENSIONAL TILTING PROMOTES RAPID COOLING AND STRENGTHENING OF THE UPPER CRUST**
- 7-3** 11:05 AM Grondin, Daniel P.*; Petronis, Michael; Lindline, Jennifer; Romero, Billy P.; Lauricella, Sindy: **PRELIMINARY PALEOMAGNETIC DATA FROM THE EASTERN MONO BASIN, CALIFORNIA AND NEVADA**
- 7-4** 11:25 AM Tomek, Filip*; Petronis, Michael S.; Gilmer, Amy K.; Lipman, Peter W.; Foucher, Marine S.: **EMPLACEMENT STYLE OF A POST-CALDERA INTRUSION: INSIGHTS FROM STRUCTURE AND MAGNETIC ANISOTROPY OF**

THE ALAMOSA RIVER PLUTON (SOUTHERN ROCKY MOUNTAIN VOLCANIC FIELD, COLORADO)

- 7-5 11:45 AM Petronis, Michael*; Lindline, Jennifer; van Wyk de Vries, Benjamin; Rappich, Vladislav; Valenta, Jan: **DYNAMIC MAGNETIC FABRICS ASSOCIATED WITH CHANGES IN THE MAGMA COOLING DIRECTIONS: A CASE STUDY OF THE TLUSTEC VOLCANO, CZECH REPUBLIC**

SESSION NO. 8

T18. Paleoclimate Records and Future Climate Trends in the American Southwest I (GSA Quaternary Geology and Geomorphology Division; GSA Limnogeology Division; GSA Sedimentary Geology Division)

8:20 AM, DoubleTree by Hilton Kaibab Room

Tammy M. Rittenour and Andrea Brunelle, Presiding

- 8:20 AM **INTRODUCTORY REMARKS**
- 8-1 8:25 AM Redsteer, Margaret H.*: **CLIMATE AND SEASONALITY EFFECTS ON DUNE MOBILITY, SOUTHERN COLORADO PLATEAU TRIBAL LANDS, SOUTHWESTERN USA**
- 8-2 8:45 AM Pigati, Jeffrey S.*; Springer, Kathleen B.; Honke, Jeffrey S.: **DESERT WETLANDS RECORD HYDROLOGIC VARIABILITY WITHIN THE YOUNGER DRYAS CHRONOZONE, MOJAVE DESERT, USA**
- 8-3 9:05 AM Cornachione, Harriet S.*; Rittenour, Tammy M.; Nelson, Michelle S.: **CHRONOSTRATIGRAPHY OF TWO DUNE FIELDS IN SOUTHERN UTAH - IMPLICATIONS FOR DROUGHT PATTERNS IN THE CENTRAL COLORADO PLATEAU**
- 8-4 9:25 AM Ellwein, Amy L.*; McFadden, Leslie D.; McAuliffe, Joseph R.; Mahan, Shannon A.: **LATE QUATERNARY PEDOGENESIS ENHANCES EOLIAN LANDFORM STABILITY, MOENKOPI PLATEAU, SOUTHERN COLORADO PLATEAU, USA**
- 8-5 9:45 AM Rittenour, Tammy*: **DYNAMIC FLUVIAL AND EOLIAN SYSTEMS IN SOUTHERN UTAH. A CLIMATE OR GEOMORPHIC RECORD?**
- 10:05 AM **POSTER 1-MINUTE LIGHTNING TALKS**

SESSION NO. 9

T18. Paleoclimate Records and Future Climate Trends in the American Southwest II (GSA Quaternary Geology and Geomorphology Division; GSA Limnogeology Division; GSA Sedimentary Geology Division)

10:20 AM, DoubleTree by Hilton Kaibab Room

Tammy M. Rittenour and Andrea Brunelle, Presiding

- 10:20 AM **INTRODUCTORY REMARKS**
- 9-1 10:25 AM Fawcett, Peter J.*; Anderson, R. Scott; Staley, Spencer E.; Brown, Erik T.; Petronis, Michael; Lauricella, Cindy; Werne, Josef P.: **PRELIMINARY CHRONOLOGY OF THE STONEMAN LAKE, AZ SEDIMENT CORES: RADIOCARBON, TEPHROCHRONOLOGY AND MAGNETIC STRATIGRAPHY**
- 9-2 10:45 AM Marchetti, David W.*; Anderson, Lesleigh; Donovan, Joseph J.; Brunelle, Andrea; Abbott, Mark; Harris, M. Scott; Bailey, Christopher M.; Grimm, Eric: **FISH LAKE, UTAH – GEOLOGY, GEOCHEMISTRY AND PRELIMINARY CORING AS PROOF-OF-CONCEPT FOR A LONG CORE ATTEMPT**
- 9-3 11:05 AM Brunelle, Andrea*; Minckley, Thomas: **LONG-TERM CLIMATE CONTROLS ON WETLAND ECOSYSTEMS IN THE DESERT SOUTHWEST**
- 9-4 11:25 AM Jones, Kaylee B.*: **USING DESERT SPRINGS FOR PALEOECOLOGICAL RECONSTRUCTIONS, DUGWAY PROVING GROUND, UT**
- 9-5 11:45 AM Mahan, Shannon A.*; Mead, Jim; Meachen, Julie; Pigati, Jeffrey S.: **DATING THE TRIANGLE OF DEATH: THE AGE AND RELATIONSHIPS OF ZIEGLER RESERVOIR, NATURAL TRAP CAVE, AND HOT SPRINGS MAMMOTH SITES**

POSTER TECHNICAL SESSIONS

SESSION NO. 10

S4. Jurassic to Cenozoic Geology of Southern California, Southwest Arizona, and Sonora: A Session Honoring Gordon Haxel and Carl Jacobson (Posters) (GSA Structural Geology and Tectonics Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 5:15 to 6:30 PM

- Booth #
- 10-1 1 Dykstra, Michael R.*; Van Buer, Nicholas J.; Nourse, Jonathan A.: **WHOLE-ROCK GEOCHEMISTRY, PETROGRAPHY AND PRELIMINARY U-PB ZIRCON ANALYSIS OF OLIGOCENE INTRUSIVES IN THE EASTERN SAN GABRIEL MOUNTAINS**
- 10-2 2 Johnston, Scott M.*; Singleton, John S.; Chapman, Alan D.; Murray, Gabriella M.: **GEOLOGIC MAP AND STRUCTURAL GEOLOGY OF THE SUR-NACIMIENTO FAULT ZONE, MCWAY FALLS TO GAMBOA POINT, CENTRAL CALIFORNIA COAST**
- 10-3 3 Ingram, Jonathan J.*; Burgette, Reed J.; Hampton, Brian A.: **CONSTRAINING UPLIFT HISTORY OF THE SANTA SUSANA MOUNTAINS, WESTERN TRANSVERSE RANGES, SOUTHERN CALIFORNIA THROUGH U-PB DETRITAL ZIRCON GEOCHRONOLOGY**
- 10-4 4 Barth, A.P.*; Haxel, G.B.; Roldan-Quintana, J.; Wooden, J.L.; Jacobson, C.E.; Mallery, C.W.: **INSIGHTS INTO REGIONAL LARAMIDE CRUSTAL MELTING: WHOLE-ROCK AND SIMS ZIRCON GEOCHEMISTRY OF LATE LARAMIDE PERALUMINOUS GRANITES IN SOUTHERN ARIZONA AND NORTHERN SONORA**
- 10-5 5 Jacques-Ayala, César*; García y Barragán, Juan Carlos: **LATE CRETACEOUS FORELAND BASINS IN THE CABORCA AREA: A NEW APPROACH TO UNDERSTAND THE TECTONIC EVOLUTION OF NW SONORA, MEXICO**
- 10-6 6 Sample, Bret D.*; Cecil, M. Robinson; Heermance, Richard V.; Flowers, Michael: **PROVENANCE OF MIOCENE STRATA OF THE EL PASO BASIN, SOUTHERN CALIFORNIA, AND CONSTRAINTS ON THE UPLIFT HISTORY OF THE SOUTHERN SIERRA NEVADA**
- 10-7 7 Moreno, Jesus Eduardo*; McKinney, Samuel; Buehler, Jeffrey; James, Robert N.; Levinson, Zachary; Miller, D.E.: **SEDIMENTOLOGIC AND STRATIGRAPHIC EVIDENCE FOR EARLY MIOCENE PASSAGE OF THE MENDOCINO TRIPLE JUNCTION UNDER THE SOUTHERN SAN JOAQUIN VALLEY**
- 10-8 8 Beard, L. Sue*; Haxel, Gordon B.; Jacobson, Carl E.; Crow, Ryan: **CONTINUITY OF THE CHOCOLATE MOUNTAINS ANTICLINORIUM LIMITS NEOGENE FAULT DISPLACEMENT IN SOUTHEAST CALIFORNIA AND SOUTHWEST ARIZONA**
- 10-9 9 Blakey, Ronald*: **CENOZOIC PALEOTECTONICS AND PALEOGEOGRAPHY OF THE SOUTHWEST MARGIN OF NORTH AMERICA**
- 10-10 10 Leigh, Matthew J.*; Blackburn, Terrence J.; Miller, Jonathan S.; Kylander-Clark, Andrew R.C.; Edwards, Graham H.: **RAPID CONSTRUCTION OF THE MIOCENE AZTEC WASH PLUTON (NEVADA) FROM HIGH-PRECISION U-PB ZIRCON GEOCHRONOLOGY**

SESSION NO. 11

S3. Recent Advances in Basin-and-Range and Proterozoic Geology of the Western U.S.: A Session Honoring Ernie Duebendorfer (Posters) (GSA Structural Geology and Tectonics Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3 to 4:30 PM and 5:15 to 6:30 PM

- Booth #
- 11-1 11 Vermillion, Karissa B.*; Nourse, Jonathan A.: **GEOLOGY AND U-PB GEOCHRONOLOGY OF PLACERITA CANYON, WESTERN SAN GABRIEL MOUNTAINS, CALIFORNIA**

- 11-2 12 Howland, Colby R.*; Amato, Jeffrey M.; Ottenfeld, Chelsea F.: **THE PALEOPROTEROZOIC MAZATZAL PROVINCE OF SOUTHERN NEW MEXICO: INSIGHT FROM HF ISOTOPE GEOCHEMISTRY OF ZIRCONS, U-PB ZIRCON DATING, AND ND WHOLE-ROCK GEOCHEMISTRY**
- 11-3 13 Brennan, Daniel T.*; Pearson, David M.; Link, Paul K.; Krohe, Nick J.: **A NEWLY IDENTIFIED NEOPROTEROZOIC AND CAMBRIAN RIFT-RELATED SEDIMENTARY SUCCESSION IN THE BAYHORSE REGION OF CENTRAL IDAHO: LATERAL AND TRANSVERSE VARIATIONS IN THE LAURENTIAN MARGIN**
- 11-4 14 Young, Daniel*; Karlstrom, Karl E.; Heizler, Matthew T.: **DISTINGUISHING THE MAZATZAL AND PICURIS OROGENIES IN POLYDEFORMED METASEDIMENTS AND A REGIONAL COMPILATION OF THE 1.4 GA PICURIS OROGENY**
- 11-5 15 Dwyer, Nora*; Baldwin, Julia A.; Lewis, Reed S.; Vervoort, Jeffrey D.: **INSIGHTS INTO THE PROTEROZOIC TO CRETACEOUS EVOLUTION OF THE CLEARWATER METAMORPHIC CORE COMPLEX, NORTHERN IDAHO, THROUGH PETROLOGIC AND GEOCHRONOLOGIC ANALYSIS**
- 11-6 16 Cubrich, Bart T.*; Chamberlain, Kevin R.; Duebendorfer, Ernest; Williams, Michael; Hamlin, Jeffre W.: **PETROGRAPHICALLY-LINKED, GEOCHRONOLOGIC EVIDENCE FOR WIDESPREAD CA. 1.6 GA DEFORMATION IN THE NORTHERN COLORADO PALEOPROTEROZOIC CRUST: METHODS AND EXAMPLES**
- 11-7 17 Hallett, Benjamin W.*; Wiemer, Ali M.: **CRYSTALLOGRAPHICALLY ORIENTED RUTILE NEEDLES IN GARNET FROM THE TAOS RANGE OF NORTHERN NEW MEXICO SUGGEST (ULTRA) HIGH TEMPERATURE PROTEROZOIC METAMORPHISM**

SESSION NO. 12**S2. Cordilleran Core Complexes and Arizona Geology: A Celebration of Jon Spencer's Career (Posters) (GSA Structural Geology and Tectonics Division)**

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3 to 4:30 PM and 5:15 to 6:30 PM
Booth #

- 12-1 18 LeBeau, A.G.*; Van Buer, Nicholas J.: **REFINEMENT OF TECTONOSTRATIGRAPHY OF THE NORTHEAST BIG MARIA MOUNTAINS, RIVERSIDE COUNTY, CALIFORNIA**
- 12-2 19 Nourse, Jonathan A.*; González-León, Carlos M.; Solari, Luigi; Zapata-Martinez, J. Angel: **MAGMATIC AND STRUCTURAL EVOLUTION OF THE MAGDALENA-MADERA METAMORPHIC CORE COMPLEX, SONORA, MEXICO**

SESSION NO. 13**D1. Volcanology / Petrology / Ore Mineralization (Posters)**

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 5:15 to 6:30 PM
Booth #

- 13-1 20 Parker, Don F.*: **REINTERPRETATION OF SLEEPING LION RHYOLITE AS RHEOMORPHIC TUFF**
- 13-2 21 Hale, Josh D.*; Ort, Michael H.: **ANISOTROPY OF MAGNETIC SUSCEPTIBILITY STUDY OF FLOW AND DEPOSITIONAL PROCESSES IN THE PEACH SPRINGS TUFF, KINGMAN, ARIZONA**
- 13-3 22 Dodge, Chad*; Teasdale, Rachel; Wenner, Jennifer M.: **EMPLACEMENT OF BASALT LAVAS OF THE POISON LAKE CHAIN IN THE LASSEN REGION OF THE SOUTHERN CASCADES**
- 13-4 23 Rodriguez, Angelica*; Robson, Amy; Teasdale, Rachel: **MUD POT GEOCHEMISTRY AT SULFUR WORKS IN THE LASSEN VOLCANIC CENTER**
- 13-5 24 Robson, Amy*; Rodriguez, Angelica; Teasdale, Rachel: **ALTERATION ASSEMBLAGE OF THE HYDROTHERMAL SYSTEM AT SULPHUR WORK, LASSEN VOLCANIC CENTER**

- 13-6 25 Wall, Kellie T.*; Grunder, Anita L.: **THE YOUNG BUT EXTINCT GOAT ROCKS VOLCANIC COMPLEX: PERSPECTIVES ON CENTRAL CASCADE ARC MAGMATISM**
- 13-7 26 Konkright, Kelsy J.*; Spell, Terry L.: **PETROGENESIS OF THE EL RECHUELOS RHYOLITE, JEMEZ MOUNTAINS VOLCANIC FIELD, NEW MEXICO, USA**
- 13-8 27 Filkorn, Harry F.*: **NEW DISCOVERIES OF VOLCANICS IN THE SEA OF LOST ROCKS, MARKAGUNT MEGABRECCIA (MIOCENE), HIGH PLATEAUS, SOUTHWESTERN UTAH**
- 13-9 28 Marchetti, David W.*; Mace, William D.; Solomon, D. Kip; Cerling, Thure: **COSMOGENIC ³HE AGES OF BASALTIC ANDESITE FLOWS FROM MILLER KNOLL, PANGUITCH LAKE, UT: USING THE ISOCHRON TECHNIQUE TO OVERCOME LOW-GAS CRUSHES**
- 13-10 29 Noury, Mélanie*; Valencia-Moreno, Martín; Calmus, Thierry; Rascón Heimpel, Mario Arturo: **MAGMATIC AND TECTONIC FRAMEWORK OF PORPHYRY-COPPER PROVINCES IN NORTHWESTERN MEXICO AND SOUTHERN PERU: SIMILARITIES AND DIFFERENCES**
- 13-11 30 Van Rythoven, Adrian*; Pfaff, Katharina; Clark, James G.; Ray, John: **COST-EFFECTIVE USE OF AUTOMATED MINERALOGY TO CALIBRATE GEOMETALLURGICAL CHARACTERIZATION OF A RARE EARTH ELEMENT DEPOSIT**
- 13-12 31 Brown, Howard J.*: **RECENTLY RECOGNIZED ORBICULAR DIORITE IN THE LANE MOUNTAIN AREA NORTH OF BARSTOW, CENTRAL MOJAVE DESERT, CALIFORNIA**

SESSION NO. 14**T28. The Happy Marriage of Geology and Art (Posters) (GSA Geophysics and Geodynamics Division; GSA History and Philosophy of Geology Division; GSA Mineralogy, Geochemistry, Petrology, and Volcanology Division; GSA Geology and Society Division; GSA Sedimentary Geology Division)**

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3 to 4:30 PM and 5:15 to 6:30 PM
Booth #

- 14-1 32 Emerman, Steven H.; Santos, Lori J.; Abbott, Morgan S.; Tulley, Skyler K.*; Nofchissey, Samuel I.; Bushman, Paul G.; Flo, Dustin C.; Gherasim, Janelle E.; Campbell, Stephen R.: **WESTERN ARCHAIC PETROGLYPHS AND THE PERSISTENCE OF WATER SOURCES IN BEARS EARS NATIONAL MONUMENT, SOUTHEASTERN UTAH**
- 14-2 33 Buscombe, Daniel D.*; Kaplinski, Matthew: **PATTERNS IN THE SAND: BEDFORMS OF THE COLORADO RIVER IN GRAND CANYON**
- 14-3 34 Ritterbush, Linda Anita*: **ARCHITECTURAL HYDROLOGY IN THE CALIFORNIA MISSIONS: FROM CONTACT TO CONTEMPORARY ISSUES**
- 14-4 35 Baxter, Bonnie*; Kruback, Matthew; Butler, Jaimi K.: **SALT: SCIENTISTS AND ARTISTS LEARNING TOGETHER**
- 14-5 36 Santos, Lori J.*; Emerman, Steven H.: **ECO ARTISTS: EMPOWERING COMMUNITIES AND RECLAIMING THE INTRINSIC VALUE OF MOTHER EARTH**

SESSION NO. 15**T29. Undergraduate Research Session (Posters) (GSA Energy Geology Division; GSA Limnogeology Division; GSA Structural Geology and Tectonics Division; Council on Undergraduate Research; National Association of Geoscience Teachers)**

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3 to 4:30 PM and 5:15 to 6:30 PM
Booth #

- 15-1 37 Murphy, Clark*; Martin, Larry James; Nourse, Jonathan A.: **GEOLOGY AND STRUCTURE OF LIMEROCK CANYON ASSEMBLAGE, SOUTHWESTERN SAN GABRIEL MOUNTAINS, CALIFORNIA**

- 15-2 38 Colin, Homar*; Nourse, Jonathan A.: **MAPPING AND PETROGRAPHIC ANALYSIS OF LOST CANYON AND DELKER CANYON WITHIN THE EASTERN SAN GABRIEL MOUNTAINS**
- 15-3 39 Young, Alyssa L.*; Nourse, Jonathan A.: **CORRELATION AND RESPONSE BETWEEN STREAMFLOW AND PRECIPITATION IN THE SAN DIMAS EXPERIMENTAL FOREST, SAN GABRIEL MOUNTAINS, CALIFORNIA**
- 15-4 40 Brown, Riley V.*; Craig, Kenneth S.; Osborn, Stephen G.: **PORTER RANCH SOIL GAS INVESTIGATION IN RELATION TO ALISO CANYON GAS LEAK**
- 15-5 41 Rojas, Alexia*; Bilodeau, William: **GEOLOGY OF THE LOWER MIOCENE MONTEREY FORMATION IN POINT DUME, CALIFORNIA**
- 15-6 42 Salchert, Nicole*; Wenner, Jennifer M.; Teasdale, Rachel: **EVIDENCE FOR CRUSTAL PROCESSING BASALTS IN THE POISON LAKE CHAIN, LASSEN REGION, CALIFORNIA**
- 15-7 43 Rysak, Bethany G.*; Smith, Diane R.; Knesel, Kurt: **OLIVINE CHEMISTRY OF INDIAN HEAVEN LAVAS, SOUTHERN WASHINGTON CASCADES**
- 15-8 44 Harvin, Stewart*; O'Sullivan, Katie; Rodriguez, Virginia; Pratt, Brandon: **CRYSTAL SIZE DISTRIBUTIONS AS A POTENTIAL NON-DESTRUCTIVE MEANS FOR DETERMINING SEDIMENT CONTAMINATION IN BASALTIC METEORITES**
- 15-9 45 Wight, Kellie*; Sundell, Ander: **METEORITE OR METEOR-WRONG: THE USE OF PLANAR DEFORMATION FEATURES (PDFS) IN FELDSPAR GRAINS TO IDENTIFY A NEW HOLOCENE AGED IMPACT CRATER, WASHINGTON COUNTY, IDAHO**
- 15-10 46 Rowley, Cassidy*; Sundell, Ander: **METEORITE OR METEOR-WRONG: USING SOIL STRATIGRAPHY TO PROVIDE EVIDENCE FOR A NEW HOLOCENE-AGED IMPACT CRATER, WASHINGTON COUNTY, IDAHO**
- 15-11 47 Lange, Jennifer A.; Clark, Andrew J.*; Rowland, Stephen M.; Shroba, Cynthia: **NEWLY DISCOVERED THEROPOD DINOSAUR TRACKS IN THE LOWER JURASSIC AZTEC SANDSTONE, VALLEY OF FIRE STATE PARK, SOUTHERN NEVADA**
- 15-12 48 Kwiatkowski, Chad Joseph*; Keating, Devin Miller: **2014 SLOPE FAILURES IN THE NEW RIVER MOUNTAINS**
- 15-13 49 Santillana Villa, C.*; Valencia Moreno, M.; Ochoa Landín, L.; Del Rio Salas, R.; Morton Bermea, O.; Hernandez Alvarez, E.: **COMPARISON OF REE SIGNATURES OF PRE- AND SYN-MINERALIZATION PLUTONS ASSOCIATED WITH PORPHYRY COPPER DEPOSITS OF NW MEXICO**
- 15-14 50 Gray, Connor*; Van Rythoven, Adrian: **A COMPARATIVE STUDY OF PORPHYRY CU-MO DEPOSIT MINERALOGY**
- 15-15 51 Grasmick, Ethan*; Petrie, Elizabeth: **QUATERNARY FAULTING IN THE LITTLE GRAND WASH FAULT, EMERY COUNTY UTAH**
- 15-16 52 Turley, Michael B.*; Pederson, Joel L.: **MAPPING IN MOAB, UTAH REVEALS UNRECOGNIZED FAULT STRANDS AND BASIN FILL DEPOSITS RECORDING LATE QUATERNARY SALT DEFORMATION**
- 15-17 53 Ferraro, Michael*; Oaks, Robert Q.; Degraff, Jerome; Rittenour, Tammy M.; Janecke, Susanne U.; Southard, Alvin R.: **EPISODIC DEPOSITION AND INCISION OF THE THIRD DAM ALLUVIAL-FAN COMPLEX IN LOGAN CANYON, BEAR RIVER RANGE, NORTH-CENTRAL UTAH**
- 15-18 54 Heitzler, Craig R.*; Gonzales, David A.: **A GEOMORPHIC STUDY OF THE FLUVIAL-INCISION HISTORY OF THE SAN MIGUEL RIVER FROM TELLURIDE TO PLACERVILLE, COLORADO**
- 15-19 55 Hagglof, Aaron*; Gonzales, David A.: **MINERALOGY AND CHEMISTRY OF SILICATE MINERALS IN SKARN DEPOSITS ON EXPECTATION MOUNTAIN NEAR RICO, COLORADO: INSIGHT INTO METAMORPHIC HISTORY AND CONTROLS**
- 15-20 56 Mastenbrook, Allison*; Gonzales, David A.: **ORE SULFIDE AND OXIDE MINERAL ASSEMBLAGES AND PARAGENESIS IN SKARN AT EXPECTATION MOUNTAIN, RICO MINING DISTRICT, COLORADO**
- 15-21 57 Lang, Otto I.*; Gonzales, David A.: **A COMPARISON OF ND, SR, AND HF ISOTOPIC SIGNATURES FOR LATE CRETACEOUS AND PLIOCENE PLUTONIC ROCKS IN THE RICO MOUNTAINS, COLORADO: INSIGHT INTO MAGMATIC SOURCES AT 68 AND 4 MA**
- 15-22 58 Burch, Sara J.*; Gonzales, David A.; Holt, Benjamin D.; Crossey, Laura J.; Whyte, Colin; Karlstrom, Karl; Darrah, Thomas H.: **A COMPARISON OF GEOCHEMICAL AND HELIUM ISOTOPE SIGNATURE OF THERMAL FLUIDS, RICO AND DUNTON SPRINGS, SAN JUAN MOUNTAINS, COLORADO**
- 15-23 59 Sumner, Peter J.*; Gonzales, David A.: **CONSTRAINING THE GEOMORPHOLOGY OF THE RICO DOME IN SOUTHWESTERN COLORADO WITH GIS AND FIELD STUDIES**
- 15-24 60 MacDougall, Kade Robert*; Gonzales, David A.: **INSIGHT INTO THE COMPOSITION, ORIGIN, AND AGE OF CLASTIC DIKES IN OURAY COUNTY, COLORADO**
- 15-25 61 Barry, Eva*; Gates, Ryan; Loeffler, Sean; Milar, Corey; Simonsen, Adam; Ward, Christine; Whiting, Stefan: **FOLD ANALYSIS AT THE ELK RANGE THRUST FAULT & CROOKTON REVERSE FAULT, GUNNISON COUNTY & SAGUACHE COUNTY, COLORADO**
- 15-26 62 Lohse, Rachael C.*; Hood, William C.: **AN INVESTIGATION OF THE SELENIUM CONCENTRATION IN THENARDITE EFFLORESCENCES ON MANCOS SHALE, WESTERN COLORADO**
- 15-27 63 Denker, Christopher*; Wilkins, David: **DENDROCHRONOLOGICAL ESTIMATION OF GLACIAL RETREAT AND GLACIOISOSTATIC UPLIFT, DAVIDSON GLACIER, SOUTHEAST ALASKA**
- 15-28 64 Caro, Derek Andrew*; Roeske, Sarah M.; McClelland, William C.; Houlihan, Emily; Webber, Patricia: **DETRITAL ZIRCON GEOCHRONOLOGY OF SIERRA DE MAZ: IMPLICATIONS FOR PROVENANCE OF THE WESTERN MARGIN OF GONDWANA**
- 15-29 65 Hill, Stephen*; Scholpp, Jesse; Ryan, Jeffrey; Luna, Antonio: **COMPLEX MINERAL TEXTURES AND CHEMISTRIES IN BONINITES FROM IODP EXPEDITION 352**
- 15-30 66 Scholpp, Jesse*; Hill, Stephen; Luna, Antonio; Ryan, Jeffrey: **EVIDENCE FOR HIGH PRESSURE AND TEMPERATURE CRYSTALLIZATION IN BONINITE SAMPLES RECOVERED DURING IODP EXPEDITION 352**

SESSION NO. 16

T5. Post-Wildfire Hazards: From New Research to Assessments, Prediction, and Mitigation (Posters) (GSA Quaternary Geology and Geomorphology Division; GSA Hydrogeology Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 5:15 to 6:30 PM

Booth #

- 16-1 67 Haake, Sade*; Guo, Junhua; Krugh, William C.: **IMPACTS OF THE 2016 ERSKINE FIRE ON THE PHYSICAL PROPERTIES OF SOILS**
- 16-2 68 Youberg, Ann M.*; Loverich, Joseph B.; Kellogg, Michael J.; Fuller, Jon E.: **BEFORE THE WILDFIRE: ASSESSING POST-FIRE DEBRIS FLOW PROBABILITIES AND POTENTIAL INUNDATIONS ZONES FOR PRE-FIRE MITIGATION EFFORTS, A CASE STUDY FROM COCONINO COUNTY, ARIZONA**

SESSION NO. 17

D4. Sedimentary Geochemistry (Posters)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 5:15 to 6:30 PM

Booth #

- 17-1 69 Cather, Steven M.*; Heitzler, Matthew T.; Williamson, Thomas E.: **DETRITAL SANIDINE AND PALEOCURRENT CONSTRAINTS ON DEPOSITION OF THE PALEOCENE NACIMIENTO AND ANIMAS FORMATIONS, SAN JUAN BASIN, NEW MEXICO**
- 17-2 70 Tetiker, Sema; Yalcin, Huseyin; Ozsarac, Safak*: **MINERALOGY AND GEOCHEMISTRY OF MARINE PALYGORSKITE OF UPPER PALEOGENE AGE, (SOUTHEASTERN TURKEY)**

- 17-3 71 Abongwa, Pride*: **THE GEOCHEMISTRY AND MINERALOGY OF SHALE-HOSTED MIOCENE CONCRETIONS OF THE ASTORIA FORMATION**
- 17-4 72 Green, Hunter*; Williamson, Garrett R.; Walsh, Tim R.: **PRELIMINARY PROVENANCE IDENTIFICATION OF MUDROCK WITHIN THE POJOAQUE MEMBER (MIOCENE) OF THE TESUQUE FORMATION IN THE EASTERN CENTRAL ESPAÑOLA BASIN, NEW MEXICO**

AFTERNOON ORAL TECHNICAL SESSIONS

SESSION NO. 18

S1. Tectonics of the Death Valley Region III: A Tribute to Bennie Troxel and Lauren Wright (GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division)

1:30 PM, DoubleTree by Hilton Canyon Room

Terry Pavlis, Laura F. Serpa, James P. Calzia, Darrel S. Cowan and Marli B. Miller, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 18-1 1:35 PM Calzia, J.P.*; Ramo, O.T.: **GEOLOGY, PETROLOGY, AND SIGNIFICANCE OF RAMOS CRATER, DEATH VALLEY, CA**
- 18-2 1:55 PM Rutkofske, James*; Pavlis, Terry L.: **THE SHOSHONE ROADCUT REVISITED: EXPLORATIONS INTO COMBINING 2D, 2.5D, AND 3D TECHNIQUES TO CREATE A FULLY-REALIZED 3D MODEL OF THE RESTING SPRING/NOPAH RANGES, DEATH VALLEY REGION, CALIFORNIA**
- 18-3 2:15 PM Fleming, Zachariah D.*; Pavlis, Terry L.: **STRUCTURAL ANALYSIS OF THE IBEX HILLS, CA: EVIDENCE FOR MULTIPLE PHASES OF MESOZOIC SHORTENING AND TRANSTENSIONAL RELATED FOLDING, FAULTING, AND EXTENSION**
- 18-4 2:35 PM Pavlis, Terry L.*; Tracy, R.J.; Hollister, Lincoln; Chadwick, Jesse: **REAPPRAISAL OF THE DEATH VALLEY TURTLEBACKS FROM ANALYSIS OF METAMORPHISM AND DUCTILE DEFORMATION IN THE TURTLEBACKS AND PANAMINT MOUNTAINS**
- 18-5 2:55 PM Craig, Taylor D.*; Wells, Michael L.; Craddock, Suzanne D.; Hoisch, Thomas D.: **TIMING AND KINEMATICS OF MESOZOIC BURIAL AND CONTRACTIONAL DEFORMATION IN THE FUNERAL MOUNTAINS METAMORPHIC CORE COMPLEX, DEATH VALLEY NATIONAL PARK, CA**

SESSION NO. 19

S1. Tectonics of the Death Valley Region IV: A Tribute to Bennie Troxel and Lauren Wright (GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division)

3:30 PM, DoubleTree by Hilton Canyon Room

Terry Pavlis, Laura F. Serpa, James P. Calzia, Darrel S. Cowan and Marli B. Miller, Presiding

- 3:30 PM **INTRODUCTORY REMARKS**
- 19-1 3:35 PM Mulligan, Suzanne R.*; Wolfman, Ariel; Wells, Michael L.; Hoisch, Thomas: **USING ZIRCON AND TITANITE GEOCHRONOLOGY TO EVALUATE PROTOLITH STRATIGRAPHY AND THE TIMING OF METAMORPHISM AND MIGMATIZATION IN MONARCH CANYON**
- 19-2 3:55 PM Rowland, Stephen M.*: **THE SUPERCONTINENT CYCLE AND THE GEOLOGIC EVOLUTION OF DEATH VALLEY**
- 19-3 4:15 PM Macdonald, Francis A.*; Nelson, Lyle L.; Smith, Emily F.: **THE KINGSTON PEAK FORMATION AND CRYOGENIAN GLACIATION IN DEATH VALLEY**

- 19-4 4:35 PM Nelson, Lyle L.*; Smith, Emily F.; Macdonald, Francis A.: **NEOPROTEROZOIC SYN-SEDIMENTARY TECTONISM IN DEATH VALLEY**
- 19-5 4:55 PM Witkosky, Rebecca*; Wernicke, Brian P.: **SUBSIDENCE HISTORY OF THE EDIACARAN JOHNNIE FORMATION AND RELATED STRATA OF SOUTHWEST LAURENTIA: IMPLICATIONS FOR THE AGE AND DURATION OF THE SHURAM ISOTOPIC EXCURSION AND ANIMAL EVOLUTION**

SESSION NO. 20

T1. Miocene to Recent Evolution of the Lower Colorado River Corridor and the Northern Gulf of California II (GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)

1:30 PM, DoubleTree by Hilton Coconino Room

Ryan S. Crow, Kristin McDougall, Scott E.K. Bennett and Michael H. Darin, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 20-1 1:35 PM Karlstrom, Karl E.*; Crossey, Laura J.; Heizler, Matthew T.; Thacker, Jacob O.; Ferguson, Christina L.: **THE BOUSE FORMATION: PERSISTENT CONTROVERSIES AND PROGRESS TOWARDS POTENTIAL RESOLUTIONS**
- 20-2 1:55 PM Pearthree, Philip A.*; House, P. Kyle; Crow, Ryan; Gootee, Brian F.: **PALEOLANDSCAPES PRESERVED BENEATH THE BOUSE FORMATION PROVIDE INSIGHTS INTO THE DEVELOPMENT OF THE LOWER COLORADO RIVER AND LATEST MIOCENE AND YOUNGER DEFORMATION**
- 20-3 2:15 PM McDougall, Kristin*; Miranda-Martinez, Adriana Yanet: **TRANSITION OF THE BOUSE FORMATION FROM A MARINE ESTUARY TO SALINE LAKE IN THE LATE MIOCENE TO EARLY PLIOCENE**
- 20-4 2:35 PM Ferguson, Christina L.*; Crossey, Laura J.; Karlstrom, Karl; Anderson, Jordan C.: **GEOCHEMICAL CHARACTERIZATION OF BOUSE CARBONATES: TOWARD AN UNDERSTANDING OF DIAGENESIS OF BOUSE CARBONATES**
- 20-5 2:55 PM Thacker, Jacob O.*; Karlstrom, Karl E.; Crossey, Laura J.; Crow, Ryan S.; Cassidy, Colleen E.; Beard, L. Sue: **SYN- AND POST-6 MA DEFORMATION OF THE BOUSE FORMATION: IMPLICATIONS FOR LOWER COLORADO RIVER TECTONISM AND BOUSE DEPOSITION**

SESSION NO. 21

T1. Miocene to Recent Evolution of the Lower Colorado River Corridor and the Northern Gulf of California III (GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)

3:30 PM, DoubleTree by Hilton Coconino Room

Ryan S. Crow, Kristin McDougall, Scott E.K. Bennett and Michael H. Darin, Presiding

- 3:30 PM **INTRODUCTORY REMARKS**
- 21-1 3:35 PM Gootee, Brian F.*; Pearthree, Philip A.; House, P. Kyle; Bright, Jordan; Youberg, Ann M.: **EVIDENCE FOR AN OFF-LAP SEQUENCE BETWEEN THE BOUSE FORMATION AND BULLHEAD ALLUVIUM IN SOUTHERN BLYTHE BASIN, ARIZONA AND CALIFORNIA**
- 21-2 3:55 PM Crow, Ryan*; Pearthree, Philip A.; House, P. Kyle; Stelten, Mark; Heizler, Matthew; Schwing, Jonathan E.; Champion, Duane; Howard, Keith A.; Hillhouse, John W.: **GEOCHRONOLOGIC STUDY OF PRE-COLORADO-RIVER DEPOSITS IN COTTONWOOD VALLEY, AZ: IMPLICATIONS FOR THE TIMING OF RIVER INTEGRATION**
- 21-3 4:15 PM Heizler, Matthew T.*; Karlstrom, Karl E.; Aslan, Andres: **DETRITAL SANIDINE GEOCHRONOLOGY: BREAKTHROUGH METHOD FOR DATING SEDIMENTARY ROCKS**

- 21-4 4:35 PM Macdonald, David*; Nicholson, Uisdean; McGill, Paula:
PALAEO-DRAINAGE OF THE SW US: THE EVOLUTION OF THE COLORADO-GILA-SALT RIVER SYSTEM
- 21-5 4:55 PM Dolby, Greer A.*: **GENOMIC DATA OFFERS AN INDEPENDENT PERSPECTIVE ON EVOLUTION OF THE LOWER COLORADO RIVER REGION**

SESSION NO. 22**T19. Paleontology of the Colorado Plateau and Environs I (GSA Sedimentary Geology Division; GSA Limnogeology Division)**

1:30 PM, DoubleTree by Hilton Kaibab Room

David K. Elliott and William G. Parker, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 22-1 1:35 PM Hodnett, John-Paul; Elliott, David K.*: **CHONDRICHTHYAN ASSEMBLAGES FROM THE SURPRISE CANYON (LATE MISSISSIPPIAN, SERPUKHOVIAN) AND WATAHOMIGI (LATEST MISSISSIPPIAN/EARLY PENNSYLVANIAN, SERPUKHOVIAN/BASHKIRIAN) FORMATIONS OF THE WESTERN GRAND CANYON, NORTHERN ARIZONA**
- 22-2 1:55 PM Elliott, David K.*; Rowland, Stephen M.: **NEW COCHLIODONTS (CHONDRICHTHYES, HOLOCEPHALI) FROM THE PENNSYLVANIAN OF NEVADA AND ARIZONA**
- 22-3 2:15 PM Gee, Bryan M.*; Parker, William G.: **HISTOLOGY AND MORPHOLOGY OF SMALL-BODIED METOPOSAURIDS AND THE TAXONOMY OF APACHESAURUS GREGORII**
- 22-4 2:35 PM Kligman, Ben T.*: **SPHENODONTIAN ASSEMBLAGES OF THE CHINLE FORMATION: PHYLOGENETIC, BIOGEOGRAPHIC, AND MORPHOLOGICAL IMPLICATIONS**
- 22-5 2:55 PM Parker, William G.*; Martz, Jeffrey W.; Marsh, Adam D.; Kligman, Ben T.; Beightol, Charles V.: **EXAMINING LATE TRIASSIC (NORIAN-RHAETIAN) TERRESTRIAL FAUNAL ASSEMBLAGE COMPOSITIONS IN THE CHINLE FORMATION OF NORTHEASTERN ARIZONA; IMPLICATIONS FOR TRIASSIC EXTINCTION EVENTS**

SESSION NO. 23**T19. Paleontology of the Colorado Plateau and Environs II (GSA Sedimentary Geology Division; GSA Limnogeology Division)**

3:30 PM, DoubleTree by Hilton Kaibab Room

David K. Elliott and William G. Parker, Presiding

- 3:30 PM **INTRODUCTORY REMARKS**
- 23-1 3:35 PM Lucas, Spencer G.*; Tanner, Lawrence H.: **PLACEMENT OF THE TRIASSIC-JURASSIC BOUNDARY ON THE SOUTHERN COLORADO PLATEAU (USA) WITHIN THE MOENAVE FORMATION**
- 23-2 3:55 PM Marsh, Adam D.*: **ANATOMY, SYSTEMATICS, AND GEOCHRONOLOGY OF DILOPHOSAURUS WETHERILLI (DINOSAURIA: THEROPODA) FROM THE EARLY JURASSIC KAYENTA FORMATION OF ARIZONA**
- 23-3 4:15 PM Eaton, Jeffrey G.*; Korth, William W.; Sanjuan, Josep; Vincente, Alba; Antonietto, Lucas S.; Hartman, Joseph H.: **STRATIGRAPHY, DEPOSITIONAL ENVIRONMENTS, PALEONTOLOGY AND AGE OF THE CLARON FORMATION, SWEETWATER CREEK AREA, GARFIELD COUNTY, UTAH**
- 23-4 4:35 PM Gillette, David D.*; Zurita, Alfredo E.: **ORIGIN AND EVOLUTION OF THE NORTH AMERICAN GLYPTODONT, GLYPTOTHERIUM (XENARTHRA, CINGULATA), IN NORTH AMERICA**
- 23-5 4:55 PM Millsap, Evan Dallas*: **A GEOCHRONOLOGIC FRAMEWORK FOR THE BUCK TANK DRAW FOSSIL SITE, BIG WATER, UTAH**

SESSION NO. 24**T26. Recent Advances in Understanding the Geology of Northwestern Mexico I (GSA Geophysics and Geodynamics Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)**

1:30 PM, DoubleTree by Hilton Humphreys/Mt. Elden Room

Carlos González-León and Luca Ferrari, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 24-1 1:35 PM Hantsche, Aaron L.; Farmer, G. Lang*; Espinoza-Maldonado, G.; Rodríguez-Castañeda, Jose Luis: **RADIOGENIC ISOTOPE EVIDENCE ON THE ORIGIN OF MESOPROTEROZOIC ANORTHOSITES IN NORTHERN SONORA, MEXICO**
- 24-2 1:55 PM Barron, Arturo J.*; Paz-Moreno, Francisco; Herrera-Urbina, Saúl; Lozano-Santacruz, Rufino: **THE LOWER CAMBRIAN ALKALINE VOLCANISM FROM CATORCA BLOCK: GEOCHEMISTRY AND ITS RELATION WITH THE SOUTHERN LAURENTIA MARGIN RIFTING PROCESS**
- 24-3 2:15 PM González-León, Carlos M.*; Sánchez, Teresita; Vázquez, Michelle; Solari, Luigi; Nourse, Jonathan A.; Amaya-Martínez, Ricardo; Zapata Martínez, Angel: **GEOLOGY AND LA-ICPMS U-PB GEOCHRONOLOGY OF THE WESTERN LOWER PLATE OF THE MAGDALENA-MADERA METAMORPHIC CORE COMPLEX, NORTHERN SONORA, MEXICO**
- 24-4 2:35 PM Nourse, Jonathan A.*; González-León, Carlos M.; Solari, Luigi; Zapata-Martínez, J. Angel; Premo, W.R.: **NEW U-PB ZIRCON ANALYSES RECORD PALEOCENE AND MID EOCENE-EARLY OLIGOCENE MELTING OF LATE CRETACEOUS, JURASSIC, AND PROTEROZOIC CRUST IN LOWER PLATE OF THE MAGDALENA-MADERA METAMORPHIC CORE COMPLEX, SONORA, MEXICO**
- 24-5 2:55 PM Poole, Forrest G.*; Amaya-Martínez, Ricardo: **COEVAL BASINS WITHIN EARLY MESOZOIC CORDILLERAN RETROARC FORELAND SYSTEM OF SONORA, MEXICO**

SESSION NO. 25**T26. Recent Advances in Understanding the Geology of Northwestern Mexico II (GSA Geophysics and Geodynamics Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)**

3:30 PM, DoubleTree by Hilton Humphreys/Mt. Elden Room

Carlos González-León and Luca Ferrari, Presiding

- 3:30 PM **INTRODUCTORY REMARKS**
- 25-1 3:35 PM Madhavaraju, Jayagopal*: **GEOCHEMISTRY OF LOWER CRETACEOUS CARBONATE ROCKS OF NORTHWESTERN MEXICO FOR ASSESSING PALEOCEANOGRAPHIC CONDITIONS: AN OVERVIEW**
- 25-2 3:55 PM Saucedo-Samaniego, Julio Cesar*; Madhavaraju, Jayagopal: **CARBON AND OXYGEN ISOTOPIC RECORDS OF THE LOWER CRETACEOUS MURAL LIMESTONE, RANCHO BUFALO SECTION, SONORA, MEXICO: IMPLICATIONS FOR OCEANIC ANOXIC EVENTS**
- 25-3 4:15 PM Corella Santa Cruz, Carlos Rodolfo*; Paz Moreno, Francisco Abraham; Ivanov, Alexei V.; Demonterova, Elena I.; Ukhova, Natalia; Pashkova, Galina V.; Demant, Alain: **PETROGENESIS OF THE ALKALINE MAFIC UPPER MIOCENE-PLIOCENE VOLCANISM FROM THE SAN FRANCISCO DE BATUC BASALTIC FIELD, SONORA, MEXICO**
- 25-4 4:35 PM Velderrain-Rojas, Luis Alonso*; Vidal-Solano, Jesus Roberto: **INTRUSIVE IGNEOUS BODIES RELATED TO THE MIDDLE-LATE MIOCENE OBLIQUE RIFT IN SONORA, MEXICO**
- 25-5 4:55 PM Madhavaraju, Jayagopal*; Ramírez-Montoyo, Erik; Solari, Luigi; González-León, Carlos M.; Monreal, Rogelio: **GEOCHEMISTRY AND GEOCHRONOLOGY OF THE CLASTIC ROCKS OF THE MORITA FORMATION, NORTHERN SONORA, MEXICO**

WEDNESDAY, 16 MAY 2018**MORNING
ORAL TECHNICAL SESSIONS****SESSION NO. 26****S2. Cordilleran Core Complexes and Arizona Geology I: A Celebration of Jon Spencer's Career (GSA Structural Geology and Tectonics Division)**

8:20 AM, DoubleTree by Hilton Canyon Room

John S. Singleton, Stephen J. Reynolds and Kurt N. Constenius, Presiding

8:20 AM INTRODUCTORY REMARKS

- 26-1** 8:30 AM Reynolds, Stephen J.*; Spencer, Jon E.; Richard, Stephen: **SPECTACULAR FIELD-TRIP LOCALITIES IN THE MARIA FOLD AND THRUST BELT, WESTERN ARIZONA AND SOUTHEASTERN CALIFORNIA**
- 26-2** 8:50 AM Richard, Stephen M.*; Spencer, Jon: **WILD AND CRAZY GEOLOGY OF THE TUCSON REGION, ARIZONA**
- 26-3** 9:10 AM Lloyd, Max; Wernicke, Brian P.*; Farley, Kenneth A.: **THERMAL HISTORY OF THE WHEELER RIDGE PALEOCANYON AND IMPLICATIONS FOR THE EROSION KINEMATICS OF WESTERN GRAND CANYON**
- 26-4** 9:30 AM Spencer, Jon*: **TECTONIC CONTINUOUS CASTING ON EARTH, VENUS, AND PLUTO**

SESSION NO. 27**S2. Cordilleran Core Complexes and Arizona Geology II: A Celebration of Jon Spencer's Career (GSA Structural Geology and Tectonics Division)**

10:20 AM, DoubleTree by Hilton Canyon Room

John S. Singleton, Stephen J. Reynolds and Kurt N. Constenius, Presiding

10:20 AM INTRODUCTORY REMARKS

- 27-1** 10:25 AM Ferguson, Charles A.*: **EVIDENCE FOR NORTHWESTERLY EXTENSION IN THE TUCSON BASIN, ARIZONA, USA, FROM PSEUDOTACHYLITE BRECCIA ALONG THE MAIN DETACHMENT FAULT OF THE SANTA-CATALINA RINCON MOUNTAINS CORE COMPLEX**
- 27-2** 10:45 AM Bailey, Christopher M.*: **STRAIN AND VORTICITY ANALYSIS OF MYLONITIC ROCKS FROM SOUTHERN ARIZONA METAMORPHIC CORE COMPLEXES**
- 27-3** 11:05 AM Singleton, John S.*; Wong, Martin S.; Strickland, Evan D.; Prior, Michael G.; Wrobel, Alexander J.; Pollard, Brittney M.; Stockli, Daniel F.; Gans, Phillip B.; Seymour, Nikki M.: **LARAMIDE MAGMATISM AND EXTENSIONAL EXHUMATION RECORDED IN MIOCENE METAMORPHIC CORE COMPLEXES IN WEST-CENTRAL ARIZONA**
- 27-4** 11:25 AM Wells, Michael L.*: **TECTONIC INHERITANCE IN CORDILLERAN METAMORPHIC CORE COMPLEXES**
- 27-5** 11:45 AM Constenius, Kurt N.*; Heizler, Matthew T.; Steele-MacInnis, Matthew; Domanik, Kenneth J.: **TWO-STAGE EXHUMATION OF MID-UPPER CRUSTAL ROCKS IN THE LONE PEAK SALIENT OF THE WASATCH FAULT, UTAH**

SESSION NO. 28**S3. Recent Advances in Basin-and-Range and Proterozoic Geology of the Western U.S. I: A Session Honoring Ernie Duebendorfer (GSA Structural Geology and Tectonics Division)**

10:20 AM, DoubleTree by Hilton Kaibab Room

Chloe E. Bonamici, Kevin R. Chamberlain and Michael L. Williams, Presiding

10:20 AM INTRODUCTORY REMARKS

- 28-1** 10:25 AM Hinz, Nicholas H.*; Dee, Seth M.; Smith, Eugene; Johnsen, Racheal: **UPDATE ON THE TIMING, MAGNITUDE OF OFFSET, AND GEOMECHANICS OF THE SOUTHERN PART OF THE LAKE MEAD FAULT SYSTEM, NEVADA**
- 28-2** 10:45 AM Johnsen, Racheal*; Smith, Eugene; Hinz, Nicholas H.; Dee, Seth M.: **NEW U-PB ZIRCON AND ⁴⁰AR/³⁹AR CHRONOLOGY OF MAGMATISM IN THE LAKE MEAD AREA, NEVADA AND ARIZONA**
- 28-3** 11:05 AM Iriando, Alexander*: **THE MEXICAN MOJAVE, YAVAPAI AND MAZATZAL PALEOPROTEROZOIC BASEMENT PROVINCES IN SONORA AND CHIHUAHUA: ESTABLISHING A COHERENT SW MARGIN OF LAURENTIA IN AIMS OF TESTING RODINIA RECONSTRUCTIONS**
- 28-4** 11:25 AM Daniel, Christopher G.*; Stotter, Sara V.; Jones, James V.; Doe, Michael F.; McFarlane, Christopher R.M.: **THE PICURIS OROGENY IN TIME AND SPACE**
- 28-5** 11:45 AM Doe, Michael F.*; Daniel, Christopher; Jones, James V.: **A CASE FOR REVISING THE TIMING, REGIONAL EXTENT, AND SIGNIFICANCE OF THE MAZATZAL OROGENY IN ITS TYPE AREA**

SESSION NO. 29**T6. Colorado Plateau Landscape Evolution -- Grand Canyon- and Upper Basin-Focused Colorado River Evolution I (GSA Geophysics and Geodynamics Division; GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)**

8:20 AM, DoubleTree by Hilton Coconino Room

L. Sue Beard, Andres Aslan, Richard Young and Karl E. Karlstrom, Presiding

8:20 AM INTRODUCTORY REMARKS

- 29-1** 8:25 AM Karlstrom, Karl E.*; Liu, Lijun; Aslan, Andres; Quan, Zhou; Heizler, Matthew T.: **ONGOING MANTLE-DRIVEN UPLIFT OF THE COLORADO PLATEAU-ROCKY MOUNTAIN REGION**
- 29-2** 8:45 AM Ruleman, Cal*; Hudson, Adam M.; Caffee, Marc W.; Brugger, Keith A.: **MIS 12-11 (478-374 KA) ~ MIDDLE PLEISTOCENE GLACIATION OF THE CENTRAL AND SOUTHERN ROCKY MOUNTAIN-COLORADO PLATEAU REGION: LINKS TO LANDSCAPE EVOLUTION OF MAJOR WESTERN NORTH AMERICAN RIVERS**
- 29-3** 9:05 AM Buffer, Richard T.*; Aslan, Andres: **THE BROWNS PARK FORMATION IN NORTHWESTERN COLORADO AND SOUTH-CENTRAL WYOMING: IMPLICATIONS FOR LATE CENOZOIC SEDIMENTATION AND PALEOGEOGRAPHY**
- 29-4** 9:25 AM Aslan, Andres*; Karlstrom, Karl E.; Heizler, Matthew; Kirby, Eric; Granger, Darryl E.; Hanson, Paul R.; Feathers, James K.; Mahan, Shannon A.: **CONTROLS ON PATTERNS OF UPPER COLORADO RIVER BEDROCK INCISION**
- 29-5** 9:45 AM Pederson, Joel L.*; Turley, Michael B.; Mauch, James; Rittenour, Tammy M.; Hidy, Alan J.: **YOUTHFUL, TRANSIENT RIVER INCISION OF MYSTERIOUS ORIGIN IS CAPTURED IN CHRONOSTRATIGRAPHY AROUND MOAB, UTAH**

SESSION NO. 30**T6. Colorado Plateau Landscape Evolution -- Grand Canyon- and Upper Basin-Focused Colorado River Evolution II (GSA Geophysics and Geodynamics Division; GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)**

10:20 AM, DoubleTree by Hilton Coconino Room

L. Sue Beard, Andres Aslan, Richard Young and Karl E. Karlstrom, Presiding

10:20 AM INTRODUCTORY REMARKS

- 30-1** 10:25 AM Darling, Andrew L.; Whipple, Kelin X.*; Bierman, Paul R.; Forte, Adam M.; Heimsath, Arjun M.; Nichols, Kyle K.; Clarke, Brian: **EROSION RATE PATTERNS IN THE GRAND CANYON AND GRAND STAIRCASE PREDICTED FROM ROCK STRENGTH PATTERNS WITH NEW DEVELOPMENTS ON THE STREAM POWER INCISION MODEL**

- 30-2** 10:45 AM Winn, Carmen*; Karlstrom, Karl; Kelley, Shari A.: **TIMING AND GEOMETRY OF THE 'GREAT DENUDATION' OF THE GRAND STAIRCASE OF THE SOUTHERN COLORADO PLATEAU FROM COMBINED GEOLOGIC AND APATITE THERMOCHRONOLOGIC DATA**
- 30-3** 11:05 AM Young, Richard A.*: **GEOLOGIC CONSTRAINTS THAT PRECLUDE THE EXISTENCE OF A PALEOGENE WESTERN GRAND CANYON ON THE HUALAPAI PLATEAU: AN UPDATED ILLUSTRATED REVIEW**
- 30-4** 11:25 AM Sabbeth, Leah*; Wernicke, Brian P.; Raub, Timothy D.; Grover, Jeffrey A.; Lander, E. Bruce; Kirschvink, Joseph L.: **EASTERN GRAND CANYON PROVENANCE FOR ORTHOQUARTZITE CLASTS IN LOWER MIOCENE CONGLOMERATES OF THE SESPE FORMATION NEAR MALIBU, CA**
- 11:45 AM **DISCUSSION**

SESSION NO. 31

T10. Geologic and Structural Evolution of the Transition Zone (GSA Geophysics and Geodynamics Division; GSA Quaternary Geology and Geomorphology Division; GSA Structural Geology and Tectonics Division)

10:20 AM, DoubleTree by Hilton Humphreys/Mt. Elden Room

Alan D. Chapman, Nancy Riggs, Timothy Schroeder and Jessie E. Shields, Presiding

- 31-1** 10:20 AM Hacker, David B.*; Biek, Robert F.; Rowley, Peter D.: **ANATOMY AND CHARACTERISTICS OF MEGA-SCALE VOLCANIC LANDSLIDES OF THE MARYSVALE VOLCANIC FIELD, SOUTHWESTERN UTAH**
- 31-2** 10:40 AM Biek, Robert F.*; Hacker, David B.; Rowley, Peter D.: **BASAL LAYERS, INJECTITES, DEFORMED BLOCKS, AND IMPLICATIONS OF THE NEWLY DISCOVERED SEVIER GRAVITY SLIDE, MARYSVALE VOLCANIC FIELD, SOUTHWESTERN UTAH**
- 31-3** 11:00 AM Surpless, Benjamin*; Mathy, Hannah; Simoneau, Samuel O.: **EVOLUTION OF FRACTURE NETWORKS WITHIN A NORMAL FAULT TRANSFER ZONE: A CASE STUDY FROM THE SEVIER FAULT SYSTEM, SOUTHERN UTAH**
- 31-4** 11:20 AM Potochnik, Andre R.*: **STRATIGRAPHY AND GEOCHRONOLOGY OF TERTIARY DRAINAGE REVERSAL ACROSS THE TRANSITION ZONE, EAST-CENTRAL ARIZONA**
- 31-5** 11:40 AM Rautela, Ojashvi*; Chapman, Alan D.: **PRESSURE-TEMPERATURE EVOLUTION OF LOWER CRUSTAL-UPPER MANTLE XENOLITHS FROM THE COLORADO PLATEAU TRANSITION ZONE**
- 31-6** 12:00 PM Porter, Ryan C.*; Hoisch, Thomas D.: **EVALUATING THE EFFECTS OF SMALL-SCALE CONVECTION ON LITHOSPHERIC STRUCTURE WITH THE COLORADO PLATEAU TRANSITION ZONE**

SESSION NO. 32

T21. Recent Advances in Planetary Geoscience (GSA Geophysics and Geodynamics Division; GSA Planetary Geology Division; GSA Sedimentary Geology Division)

8:20 AM, DoubleTree by Hilton Kaibab Room

Nadine G. Barlow, J.A. Skinner and Mark Salvatore, Presiding

- 8:20 AM **INTRODUCTORY REMARKS**
- 32-1** 8:25 AM Hanley, Jennifer*; Grundy, W.M.; Loeffler, M.; Tegler, Stephen: **LABORATORY STUDIES OF CRYOGENIC OUTER SOLAR SYSTEM MATERIALS**
- 32-2** 8:45 AM Barlow, Nadine G.*: **COMPARING CENTRAL PIT CRATERS ACROSS THE SOLAR SYSTEM: CHARACTERISTICS AND IMPLICATIONS FOR FORMATION MODELS**
- 32-3** 9:05 AM Burt, Donald M.*; Knauth, L. Paul: **HOW COMMON WAS IMPACT SEDIMENTATION ON EARLY MARS?**

- 32-4** 9:25 AM Young, Kelsey E.*; Evans, Cynthia A.; Bleacher, Jacob E.; Graff, Trevor G.; Zeigler, Ryan A.; Tewksbury, Barbara J.; Helper, Mark A.; Hurtado, José M.; Eppler, Dean B.: **THE RECENT EVOLUTION OF ASTRONAUT GEOSCIENCE TRAINING: USING TERRESTRIAL ANALOGS TO PREPARE THE NEXT GENERATION OF PLANETARY EXPLORERS**
- 32-5** 9:45 AM Bell, Ernest R.*; Schmerr, Nicholas C.; Bleacher, Jacob E.; Porter, Ryan C.; Young, Kelsey E.; Richardson, Jacob; Rees, Shannon K.; Pettit, Donald R.: **GEOPHYSICAL EXAMINATION OF VOLCANIC FEATURES AND PROCESSES WITH LUNAR SCIENCE OPERATIONS IMPLICATIONS**

SESSION NO. 33

T24. Understanding Basin Environments and Evolution Beyond Earth (GSA Geophysics and Geodynamics Division; GSA Planetary Geology Division; GSA Sedimentary Geology Division)

10:20 AM, DoubleTree by Hilton Kachina Room

J.A. Skinner Jr, Lauren A. Edgar, Kristen A. Bennett and Chris H. Okubo, Presiding

- 33-1** 10:20 AM Edgar, Lauren A.*; Fedo, Christopher M.; Fraeman, Abigail A.; Gupta, Sanjeev; Grotzinger, John P.; Stack, Kathryn M.; Banham, Steven G.; Stein, Nathaniel; Edgett, Kenneth S.; Rubin, David M.: **STRATIGRAPHY AND SEDIMENTOLOGY OF THE MURRAY FORMATION, AS OBSERVED USING THE MARS SCIENCE LABORATORY CURIOSITY ROVER**
- 33-2** 10:40 AM Sun, Vivian*; Stack, Kathryn M.; Nachon, M.; Johnson, Sarah S.; Kronyak, Rachel E.; Wiens, Roger C.; Minitti, Michelle E.; Kah, Linda C.: **LATE-STAGE DIAGENETIC CONCRETIONS IN THE LACUSTRINE MURRAY FORMATION, GALE CRATER, MARS**
- 33-3** 11:00 AM Bennett, Kristen A.*; Fox, Valerie; Vasavada, A.; Edwards, Christopher S.; Stack, Kathryn M.; Williams, Amy J.: **THE CLAY-BEARING UNIT IN GALE CRATER: OVERVIEW AND PLANS FOR INVESTIGATION WITH THE CURIOSITY ROVER**
- 33-4** 11:20 AM Skinner, James A.*: **BASIN-FILLING ENVIRONMENTS IN THE MARTIAN CRATERED HIGHLANDS: THE HADRIACUS CAVI EXAMPLE**
- 33-5** 11:40 AM Baxter, Bonnie*: **GREAT SALT LAKE AS AN ASTROBIOLOGY ANALOGUE**

POSTER TECHNICAL SESSIONS

SESSION NO. 34

T26. Recent Advances in Understanding the Geology of Northwestern Mexico (Posters) (GSA Geophysics and Geodynamics Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 5:15 to 6:30 PM

Booth #

- 34-1** 1 Dektar, Emily C.*; Chapman, Alan D.: **DETRITAL ZIRCON GEOCHRONOLOGY OF BLUESCHIST FACIES SEQUENCES IN THE ACCRETIONARY COMPLEX OF WEST-CENTRAL BAJA CALIFORNIA, MEXICO**
- 34-2** 2 Busby, Cathy J.*; Graettinger, Alison; Lopez, Margarita: **VOLCANO-TECTONIC EVOLUTION OF THE CENTRAL BAJA CALIFORNIA GULF MARGIN: ⁴⁰AR/⁴⁰AR GEOCHRONOLOGICAL CONSTRAINTS**
- 34-3** 3 Galindo-Ruiz, Jocelyn*; Madhavaraju, Jayagopal; Ramírez-Montoya, Erik; Grijalva-Noriega, Francisco Javier; Lozano-Santacruz, Rufino: **PALEOWEATHERING AND PROVENANCE OF THE SILICICLASTIC ROCKS OF THE SIERRA DE SANTA ROSA FORMATION, SONORA, MEXICO: CONSTRAINTS FROM MAJOR OXIDES GEOCHEMISTRY**

- 34-4** 4 Gonzalez-Fonseca, Ana Liseth*; Vega-Granillo, Ricardo: **STRUCTURAL GEOLOGY OF THE SAN FRANCISCO GOLD DEPOSIT, SONORA, MEXICO**
- 34-5** 5 Silva-Peña, Nadia Elvira*; Martínez Retama, Silvia; Pérez Segura, Efrén; Vega Granillo, Ricardo; Alva Valdivia, Luis: **GEOPHYSICAL CHARACTERIZATION OF THE MAIN INTRUSIONS AND ASSOCIATED MINERAL DEPOSITS IN THE EL BATAMOTE AREA, CENTRAL SONORA**
- 34-6** 6 Zapata Martinez, Jesus Angel*; González-León, Carlos M.; Solari, Luigi; Nourse, Jonathan A.: **U-PB GEOCHRONOLOGY AND GEOCHEMISTRY OF PALEOCENE TO EOCENE LEUCOCRATIC PLUTONS OF THE SIERRAS MAGDALENA AND LA JOJOBA, NORTHERN SONORA, MEXICO**
- 34-7** 7 Vega, Ricardo*; Bourjac de Anda, Angelica; Vidal-Solano, Jesus Roberto: **ADVANCES IN THE GEOCHRONOLOGY AND GEOCHEMISTRY OF THE NORTHERN SONOBARI COMPLEX, NORTHWESTERN MEXICO**
- 34-8** 8 Hodges, Christopher L.*; Stanley, George D.; González-León, Carlos M.; Hodges, Montana S.: **GEOCHRONOLOGY OF THE SIERRA DE SANTA ROSA AND IMPLICATIONS OF AN EARLY JURASSIC RETROARC BASIN**
- 34-9** 9 Hodges, Montana S.*; Stanley, George D.; González-León, Carlos M.; Hodges, Christopher L.; Siwec, Benjamin R.: **A UNIQUE SNAPSHOT IN TIME: COMPLEX CORALS IN AN EARLY TOARCIAN REEF, SIERRA DE SANTA ROSA FORMATION, SONORA, MEXICO**
- 34-10** 10 Hernández Valdez, Lilián Fernanda*; Meza-Figueroa, Diana María; Ibañez del Rivero, Carlos: **DIAGNOSIS OF PRESENCE OF CROCOITE IN YELLOW PAINTS AND SOILS IN PLAYGROUNDS OF HERMOSILLO, SONORA, MEXICO**

SESSION NO. 35

T11. Pennsylvanian to Early Triassic Tectonics of Southwest Laurentia (Posters) (GSA Mineralogy, Geochemistry, Petrology, and Volcanology Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 5:15 to 6:30 PM

Booth #

- 35-1** 11 Lawton, Timothy F.*; Solari, Luigi; Ruiz Urueña, Jorge Enrique; Tarango Terrazas, Carmen M.; Juárez-Arriaga, Edgar: **PENNSYLVANIAN-TRIASSIC MAGMATIC FLUX IN NORTHERN MEXICO AS INDICATED BY DETRITAL ZIRCON DATA FROM TRIASSIC-LOWER CRETACEOUS STRATA**
- 35-2** 12 Lodes, Emma*; Riggs, Nancy; Stone, Paul; Smith, M. Elliot; Leary, Ryan J.; Davis, Hannah: **EVIDENCE FOR EARLY PERMIAN CONTRACTION AND BASIN FORMATION, AND LATE PERMIAN CORDILLERAN ARC INITIATION IN THE INYO MOUNTAINS, EASTERN CALIFORNIA**
- 35-3** 13 McDonald, Eric K.*; Cecil, M. Robinson; Marsaglia, Kathleen M.; Riggs, Nancy; Heermance, Richard V.: **PERMIAN STRATA IN THE EL PASO MOUNTAINS, SOUTHERN CALIFORNIA, RECORD PALEODRAINAGE REORGANIZATION IN SOUTHWESTERN LAURENTIA AND THE EMERGENCE OF THE EARLY CORDILLERAN ARC**

SESSION NO. 36

D2. Geology of the Sierra Nevada (Posters)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 5:15 to 6:30 PM

Booth #

- 36-1** 14 Putnam, Roger L.*; Stock, Greg M.; Glazner, Allen F.; Bartley, John M.: **A GEOLOGIST-CLIMBER'S PERSPECTIVE ON THE MANY FACES OF HALF DOME, YOSEMITE NATIONAL PARK, CALIFORNIA**
- 36-2** 15 Barnes, Calvin G.*; Werts, Kevin; Memeti, Vali: **TRACE ELEMENTS IN HORNBLLENDE REVEAL VARIATIONS IN ENCLAVE-HOST**

MAGMA INTERACTION IN THE TUOLUMNE INTRUSIVE COMPLEX, SIERRA NEVADA, CA

- 36-3** 16 Glazner, Allen F.*; Bartley, John M.; Putnam, Roger L.; Stock, Greg M.: **THE SHAPE OF HALF DOME: 3D STUDIES OF MORPHOLOGY AND DIKING**
- 36-4** 17 Bartley, John M.*; Glazner, Allen; Putnam, Roger L.; Stock, Greg M.: **WHY IS HALF DOME THERE? TOPOGRAPHIC EFFECT OF LITHOLOGIC VARIATION IN THE HALF DOME GRANODIORITE, YOSEMITE NATIONAL PARK, CALIFORNIA**
- 36-5** 18 Ayers, John*; Memeti, Vali; Oppenheim, Louis; Chambers, Melissa: **THE HALF DOME GRANODIORITE ON THE EAST SIDE OF THE TUOLUMNE INTRUSIVE COMPLEX, YOSEMITE NATIONAL PARK, CA: BIG OR SMALL MAGMA CHAMBERS?**
- 36-6** 19 Ratajeski, Kent*; Miller, Robert B.: **HORNBLLENDE-PLAGIOCLASE THERMOBAROMETRY OF THE YOSEMITE VALLEY AND SONORA PASS INTRUSIVE SUITES, SIERRA NEVADA BATHOLITH, CALIFORNIA**
- 36-7** 20 Krajewski, Kyle J.*; Glazner, Allen F.; Coleman, Drew S.; Gaynor, Sean: **THE ASSEMBLY RATE OF HALF DOME'S BEDROCK**
- 36-8** 21 Oppenheim, Louis*; Memeti, Vali; Barnes, Calvin G.; Chambers, Melissa; Werts, Kevin; Barnes, Melanie A.; Esposito, Rosario: **LENGTH SCALES OF MAGMA MIXING AND MAGMA CHAMBER DIMENSIONS AS INFERRED FROM ZONING IN FELDSPARS, TUOLUMNE INTRUSIVE COMPLEX, YOSEMITE NATIONAL PARK, CA**
- 36-9** 22 Scheland, Cullen L.*; Memeti, Vali; Paterson, Scott R.; Ardill, Katie E.: **THE JACK MAIN INTRUSIVE COMPLEX IN THE LATE CRETACEOUS CENTRAL SIERRA NEVADA, CA: A MIGRATING PLUTON WITHIN A MAGMA FOCUSING REGION**

SESSION NO. 37

D3. Hydrology/Aqueous Chemistry (Posters)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 5:15 to 6:30 PM

Booth #

- 37-1** 23 Hose, Louise D.*: **HYPOGENIC KARST IN THE SNAKE RANGE, EASTERN NEVADA**
- 37-2** 24 Navarro-Espinoza, S.*; Meza-Figueroa, D.; Angulo-Molina, A.; Meza-Montenegro, M.M.; Pedroza-Montero, M.: **HEALTH RISK ASSESSMENT AND THE IMPLICATIONS OF LOW-LEVEL EXPOSURE OF ARSENIC IN DRINKING WATER OF THE YAQUI VALLEY, SONORA, MEXICO**
- 37-3** 25 Yon, Jeffry C.E.*; Lindline, Jennifer; Petronis, Michael S.; Zebrowski, J.P.; Tashjian, Paul: **A QUANTITATIVE ANALYSIS OF SHALLOW GROUNDWATER MANAGEMENT ON BOSQUE DEL APACHE NATIONAL WILDLIFE REFUGE, NEW MEXICO**
- 37-4** 26 Li, Jingjing*: **EVALUATING SATELLITE PRECIPITATION MEASUREMENTS: FROM CURRENT-GENERATION TRMM TO NEXT-GENERATION GPM**
- 37-5** 27 Donovan, David Joseph*: **HOW HYDROLOGICALLY ACTIVE IS THE LAS VEGAS VALLEY, AND HOW CAN WE KNOW?**

SESSION NO. 38

T16. Understanding Water Resources related to Mineralized Uranium Deposits in the Southwestern United States (Posters) (GSA Energy Geology Division; GSA Hydrogeology Division; GSA Sedimentary Geology Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 5:15 to 6:30 PM

Booth #

- 38-1** 28 Kimball, Bryn Elizabeth*: **FINGERPRINTING NATURAL AND ANTHROPOGENIC CONTAMINANTS WITH URANIUM ISOTOPES**
- 38-2** 29 Pearce, Alexandra R.*; Maher, Kierran C.; Caldwell, Samantha: **MINERALOGICAL CONSIDERATIONS FOR SOLUTION MINING OF URANIUM IN NEW MEXICAN DEPOSITS**

- 38-3 30 Hettiarachchi, Eshani*; Paul, Shaylene; Cadol, Daniel; Frey, Bonnie; Rubasinghege, Gayan: **MINERALOGY DEPENDENT DISSOLUTION OF INHALED URANIUM IN SIMULATED LUNG FLUIDS IN URANIUM MINE LANDS, NEW MEXICO**

SESSION NO. 39

T12. Plate Margin Processes and Tectonics during the Cretaceous, Western North America (Posters) (GSA Geophysics and Geodynamics Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3 to 4:30 PM and 5:15 to 6:30 PM

Booth #

- 39-1 31 Simoneau, Victoria*; Anfinson, Owen A.; Bero, David A.; Adams, Joseph; Messinger, Elijah: **DETRITAL ZIRCON U-PB AGES PROVIDE CONSTRAINTS ON THE DEPOSITIONAL AGE AND STRUCTURE OF THE FRANCISCAN COMPLEX, MT. TAMALPAIS, CA**
- 39-2 32 Busk, Alexandra C.*; Shea, Erin K.; Mattinson, Christopher G.; Souza, Sydney C.: **COLLISION, DEEP BURIAL, AND MAGMATISM ON WESTERN NORTH AMERICA: IMPLICATIONS FOR THE TIMING OF MID-CRETACEOUS MARGIN GROWTH**
- 39-3 33 Ruggles, Claire E.*; Tikoff, Basil; Patzke, Mollie; Surpless, Kathleen D.; Vervoort, Jeffrey: **INTEGRATED FABRIC ANALYSIS, U-PB ZIRCON AGES, AND ZIRCON HF DATA FROM THE HAZARD CREEK COMPLEX, WESTERN IDAHO**
- 39-4 34 Souza, Sydney C.*; Shea, Erin K.; Mattinson, Christopher G.; Busk, Alexandra C.: **AGE AND TIMING OF MAGMATISM OF THE OKANOGAN RANGE BATHOLITH, CENTRAL WASHINGTON**
- 39-5 35 Murphy, Michael*; Chapman, Alan D.: **ROOTING AROUND BENEATH AN ARC: ZIRCON U-PB GEOCHRONOLOGIC AND HF ISOTOPIC CONSTRAINTS ON THE EVOLUTION OF THE BASE OF THE SIERRA NEVADA BATHOLITH**
- 39-6 36 Shields, Jessie E.*; Wakabayashi, John: **QUANTIFYING THE RANGE OF P-T TRAJECTORIES IN A SINGLE MELANGE: INSIGHTS FROM MINERAL ASSEMBLAGES AND CHEMISTRY**

SESSION NO. 40

T9. Cenozoic Extension in Western North America (Posters) (GSA Geophysics and Geodynamics Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3 to 4:30 PM and 5:15 to 6:30 PM

Booth #

- 40-1 37 Lima, Rodrigo D.*; Hayman, Nicholas W.; Miranda, Elena A.; Lavier, Luc L.: **THE CONTROL OF OROGENIC INHERITANCE ON CENOZOIC BASIN AND RANGE EXTENSION**
- 40-2 38 Conrad, Daniel R.*; Umhoefer, Paul J.; Beard, L. Sue; Lamb, Melissa A.: **EVIDENCE FOR CHANGES IN DRAINAGE PATTERNS AND TECTONIC ACTIVITY AT ~19 MA IN THE OLIGOCENE-MIOCENE RAINBOW GARDENS FORMATION IMMEDIATELY NORTH OF THE GOLD BUTTE FAULT, SOUTHERN NEVADA**
- 40-3 39 Demircan, Barbaros*; Umhoefer, Paul J.: **SEDIMENTOLOGY AND PROVENANCE OF AN ALLUVIAL FAN PROGRADATION, MIDDLE THUMB MEMBER, HORSE SPRING FORMATION, WESTERN LAKE MEAD, NEVADA**
- 40-4 40 Lamb, Melissa A.*; Hickson, Thomas A.; Anderson, Zachary W.; Umhoefer, Paul J.; Pomerleau, Crystal; Stevens, Eric; Dunbar, Nelia; McIntosh, William: **INTRACONTINENTAL RIFT BASIN STRATIGRAPHY RECORDS MIDDLE MIOCENE EXTENSION, UPPER HORSE SPRING FORMATION IN THE WHITE BASIN, LAKE MEAD REGION, NV**
- 40-5 41 Anderson, Zachary W.*; McKean, Adam P.: **NEW INSIGHTS ON THE STRUCTURAL AND BASIN EVOLUTION OF THE SALT LAKE SALIENT AND WASATCH FAULT ZONE NEAR SALT LAKE CITY, UTAH**

- 40-6 42 Clark, Donald L.*; Oviatt, Charles G.; Dinter, David A.: **GEOLOGIC MAP OF THE TOOEE 30' X 60' QUADRANGLE—AN UPDATE TO THE GEOLOGIC HISTORY OF NORTHWEST UTAH**
- 40-7 43 Reade, Nathan Z.*; Ricketts, Jason W.; Amato, Jeffrey M.: **LONG-TERM THERMAL HISTORIES OF ROCKS IN THE RIO GRANDE RIFT BASIN AND RANGE TRANSITION ZONE USING ZIRCON (U-TH)/HE THERMOCHRONOLOGIC DATA**
- 40-8 44 Richard, Nicholas*; Amato, Jeffrey M.: **SYNEXTENSIONAL MAGMATISM IN THE PREHISTORIC TRACKWAYS NATIONAL MONUMENT, SOUTHERN RIO GRANDE RIFT**
- 40-9 45 Wesoloski, Catherine*; Busby, Cathy J.: **NEWLY-DISCOVERED DIAMOND VALLEY VOLCANIC CENTER IN THE HANGINGWALL OF AN ACCOMMODATION ZONE BETWEEN THE GENOA AND GROVER HOT SPRINGS FAULTS**
- 40-10 46 Levinson, Ryan*; Klinger, Ralph E.: **EVIDENCE FOR LATE QUATERNARY ACTIVITY ON THE SEMINOE MOUNTAINS SECTION OF THE SOUTH GRANITE MOUNTAINS FAULT, CARBON COUNTY, WYOMING**

SESSION NO. 41

T3. Advances in River Science in the Intermountain West (Posters) (GSA Quaternary Geology and Geomorphology Division; GSA Hydrogeology Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 5:15 to 6:30 PM

Booth #

- 41-1 47 Kelley, John Colman*: **USING SiO_2 CONCENTRATIONS TO IDENTIFY HYDRAULIC MINING SEDIMENT IN THE WILLOW CREEK WATERSHED, YUBA COUNTY, CA**
- 41-2 48 Buscombe, Daniel D.*; Grams, Paul E.; Kaplinski, Matthew; Tusso, Robert: **CONSTRUCTING A 260-KM LONG, 25-CM RESOLUTION MAP OF COLORADO RIVER BED SEDIMENT IN GLEN, MARBLE, AND GRAND CANYONS**
- 41-3 49 Grams, Paul E.*; Buscombe, Daniel D.; Kaplinski, Matthew; Topping, David J.: **PATTERNS OF RIVERBED SAND-STORAGE CHANGE ON THE COLORADO RIVER IN GRAND CANYON**
- 41-4 50 Kaplinski, Matt*; Grams, Paul E.; Hazel, Joseph E.; Buscombe, Daniel D.; Kohl, Keith: **MAPPING THE COLORADO RIVER IN GRAND CANYON TO DIRECTLY MEASURE LONG-TERM CHANGES IN SEDIMENT STORAGE**
- 41-5 51 Ashley, Thomas; McElroy, Brandon*; Buscombe, Daniel D.; Kaplinski, Matthew; Grams, Paul E.: **MANAGEMENT IMPLICATIONS FOR BEDLOAD MODELS IN THE GRAND CANYON OF THE COLORADO RIVER**
- 41-6 52 Platt, Andrew*; Buscombe, Daniel D.; Porter, Ryan C.; Grams, Paul E.; McElroy, Brandon; Kaplinski, Matthew: **ESTIMATING SAND THICKNESS FROM RIVERBED TO BEDROCK WITHIN THE COLORADO RIVER IN THE GRAND CANYON**
- 41-7 53 Ross, Robert*; Grams, Paul E.: **DEVELOPMENT OF A GEOMORPHIC BASEMAP OF SAND DEPOSITS OVER A 460-KM LONG REACH IN GLEN, MARBLE, AND GRAND CANYONS, ARIZONA**
- 41-8 54 Mueller, Erich R.*; Grams, Paul E.: **MODELING DECADAL CHANGES IN SANDBAR VOLUME USING SUB-DAILY RECORDS OF FLOW AND SAND CONCENTRATION DOWNSTREAM FROM A LARGE DAM**
- 41-9 55 Tusso, Robert*; Buscombe, Daniel D.; Grams, Paul E.: **SPATIAL PATTERNS IN BED-SAND GRAIN SIZE FROM HIGH DENSITY STREAM BED SAMPLING OF THE COLORADO RIVER IN GRAND CANYON**
- 41-10 56 Schenk, Edward R.; Grams, Paul E.; Schmidt, John C.; Friend, Madeline; Ring, Caleb*: **RIVER CHANNEL EVOLUTION IN SEDIMENT SURPLUS ENVIRONMENTS: A CASE STUDY OF COLORADO RIVER REACHES IN INCISED RESERVOIR SEDIMENTS**

- 41-11 57 Leary, Kate C.P.*; Buscombe, Daniel D.: **PRACTICAL GUIDELINES FOR ESTIMATING SAND BEDLOAD IN RIVERS BY TRACKING DUNES**

SESSION NO. 42

T17. Chemical and Isotopic Tracers of Water Sources in Semiarid Regions: From the Mantle to the Atmosphere (Posters) (GSA Energy Geology Division; GSA Hydrogeology Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3 to 4:30 PM and 5:15 to 6:30 PM

Booth #

- 42-1 58 Smith, Kent Leland*; Crossey, Laura J.; McGibbon, Chris; Golla, Jon K.: **USING STABLE ISOTOPES AND CONTINUOUS SENSORS TO TRACK GEOTHERMAL SALINITY CONTRIBUTIONS THAT IMPAIR SURFACE AND GROUNDWATER QUALITY, JEMEZ RIVER, NM**
- 42-2 59 Golla, Jon K.*; Crossey, Laura J.: **MAJOR-SOLUTE OBSERVATIONS OF GEOTHERMAL SALINIZATION OF THE JEMEZ WATERSHED, NEW MEXICO**
- 42-3 60 Griego, Brittany Lyn*; Walk, Cory J.; Crossey, Laura J.; Lacey, Kate; Crowley, Livia; Bixby, R.J.: **A HYDROGEOCHEMICAL ANALYSIS OF SPRINGS IN THE SANDIA AND MANZANO MOUNTAINS, NEW MEXICO**
- 42-4 61 Duckett, Kyle A.*; Langman, Jeff B.: **ISOTOPIC TRACERS FOR DISCRIMINATING RECHARGE AND SUBSYSTEMS IN A COLUMBIA RIVER BASALT GROUP AQUIFER**

SESSION NO. 43

T19. Paleontology of the Colorado Plateau and Environs (Posters) (GSA Sedimentary Geology Division; GSA Limnogeology Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3 to 4:30 PM and 5:15 to 6:30 PM

Booth #

- 43-1 62 Lucas, Spencer G.*; Francischini, Heitor; Dentzien-Dias, Paula; Ludlow, Bill: **MORE THAN CHELICHNUS IN THE LOWER PERMIAN COCONINO SANDSTONE: NEW TETRAPOD FOOTPRINT LOCALITIES IN COCONINO COUNTY, ARIZONA**
- 43-2 63 Perrotti, Justine S.*; Sunderlin, David: **MINERALOGICAL ANALYSIS OF FOSSILIZATION OF PETRIFIED WOOD IN THE CHINLE FORMATION**
- 43-3 64 Schmeisser McKean, Rebecca L.*; Shackelton, Allison L.; Gillette, David D.: **FIRST OCCURRENCE OF PACHYRHIZODUS LEPTOPSIS IN THE TROPIC SHALE (CENOMANIAN-TURONIAN) OF SOUTHERN UTAH**
- 43-4 65 Lichtig, Asher*; Lucas, Spencer G.: **SEXUAL DIMORPHISM IN THE CRETACEOUS-PALEOCENE BAENID TURTLE NEURANKYLUS**
- 43-5 66 Hartley, James C.*: **FAUNAL EXCAVATION BIAS IN THE CLOVIS ARCHAEOLOGICAL RECORD: PRELIMINARY RESULTS FROM THE AMERICAN SOUTHWEST**

SESSION NO. 44

D7. Paleontology (Posters)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 5:15 to 6:30 PM

Booth #

- 44-1 67 Atteberry, Madelaine R.*; Eberle, Jaelyn J.: **PHYLOGENY OF NEW EARLIEST PALEOCENE (PUERCAN) PERIPTYCHID 'CONDYLARTHS' FROM THE GREAT DIVIDE BASIN, WY**
- 44-2 68 Dalman, Sebastian*; Lucas, Spencer G.: **MAXILLARY AND DENTARY MORPHOLOGY DISTINGUISHES THE LATE CRETACEOUS TYRANNOSAURID DINOSAUR NANOTYRANNUS LANCENSIS AS A VALID TAXON AND NOT A JUVENILE OF TYRANNOSAURUS REX**
- 44-3 69 Caputo, Mario V.*; Rowland, Stephen M.: **INTERPLAY BETWEEN EOLIAN SEDIMENTATION, WATER TABLE DYNAMICS, WET-DRY CLIMATE, THERAPOD DINOSAURS, AND PROTOMAMMALS**

PRESERVED IN THE LOWER JURASSIC AZTEC SANDSTONE, VALLEY OF FIRE STATE PARK, SOUTHERN NEVADA

- 44-4 70 Dooley, Alton C.*; Scott, Eric; Dooley, Brett S.; Stoneburg, Brittny: **A RANCHOLABREAN VERTEBRATE FAUNA FROM MURRIETA, CALIFORNIA**
- 44-5 71 Hunt, Adrian P.*; Lucas, Spencer G.: **ECOLOGICAL CONTEXTS OF CARBONIFEROUS VERTEBRATE COPROLITE ICHNOFAUNAS IN WESTERN NORTH AMERICA AND SCOTLAND**
- 44-6 72 Hunt, Adrian P.*; Lucas, Spencer G.: **BIOCHRONOLOGY OF TRIASSIC VERTEBRATE COPROLITES AND THE LACK OF A SIGNIFICANT TURNOVER IN COPROLITE ICHNOFAUNAS AT THE TRIASSIC/JURASSIC BOUNDARY**

AFTERNOON ORAL TECHNICAL SESSIONS

SESSION NO. 45

D5. Geomorphology

3:30 PM, DoubleTree by Hilton Coconino Room

Jillian M. Maloney, Presiding

- 3:30 PM **INTRODUCTORY REMARKS**
- 45-1 3:35 PM Nelson, Stephen T.*; McBride, John H.: **THE USE OF THE HVSR IN CHARACTERIZING THE THICKNESS OF THE CRITICAL ZONE: A CASE STUDY FROM THE HAWAIIAN ISLANDS**
- 45-2 3:55 PM Laws, Alexander W.*; Maloney, Jillian M.; Klotsko, Shannon A.; Gusick, Amy E.; Braje, Todd J.; Ball, David: **MEASURING LATE QUATERNARY UPLIFT RATES OF MARINE TERRACES USING HIGH-RESOLUTION CHIRP SUB-BOTTOM DATA, NORTHERN CHANNEL ISLANDS, CALIFORNIA, USA**
- 45-3 4:15 PM Oh, Jeong-Sik; Seong, Yeong Bae*; Hong, Seong-Chan: **ASYMMETRY IN SLOPE EVOLUTION OF ROCK PEAK MESA, MT. SAN TAN IN AZ, USA**
- 45-4 4:35 PM Smith, Katelynn M.*; McBride, John H.; Keach, R. William; Tingey, David G.; Rey, Kevin A.; Hudson, Samuel M.; Nelson, Stephen T.; Carling, Gregory T.: **HIGH-RESOLUTION 3D IMAGING OF LAKE BONNEVILLE SHORELINE STRATIGRAPHY USING GPR**

SESSION NO. 46

S2. Cordilleran Core Complexes and Arizona Geology III: A Celebration of Jon Spencer's Career (GSA Structural Geology and Tectonics Division)

1:30 PM, DoubleTree by Hilton Canyon Room

John S. Singleton, Stephen J. Reynolds and Kurt N. Constenius, Presiding

- 46-1 1:30 PM Miller, Elizabeth L.*; Gottlieb, E.S.; Hoiland, Carl W.; Konstantinou, Alex; Lund Snee, Jens-Erik; Ruksznis, Abigail: **SOME PROBLEMS AND PROGRESS IN UNDERSTANDING THE EVOLUTION OF METAMORPHIC CORE COMPLEXES (MCC'S) OF THE NORTHERN BASIN AND RANGE**
- 46-2 1:50 PM Lee, Jeff*; Blackburn, Terrence J.; Johnston, Scott M.: **EVOLUTION OF THE NORTHERN SNAKE RANGE METAMORPHIC CORE COMPLEX, NEVADA: INTEGRATING FIELD, STRUCTURE, GEOCHRONOLOGIC, AND THERMOCHRONOLOGIC DATA SETS**
- 46-3 2:10 PM Axen, Gary*: **HOW THE WHIPPLE DETACHMENT FAULT FORMED IN THE CONTINENTAL BRITTLE-PLASTIC TRANSITION**
- 46-4 2:30 PM Gans, Phillip B.*; Newmann, Justin; Monroe, Evan; Kylander-Clark, Andrew: **ORTHOGONAL (N-S) EXTENSION AT THE LEADING EDGE OF A PROPAGATING CONTINENTAL RIFT: A REASSESSMENT OF HOMER**

MOUNTAIN AND ENVIRONS, LOWER COLORADO RIVER EXTENSIONAL CORRIDOR (CREC)

46-5 2:50 PM Howard, Keith A.*; Ferguson, Charles A.: **COLORADO RIVER
EXTENSIONAL CORRIDOR: NEW PERSPECTIVES FROM
DETACHED ROCKS IN THE SACRAMENTO MOUNTAINS**

3:10 PM **DISCUSSION**

SESSION NO. 47

**S3. Recent Advances in Basin-and-Range and Proterozoic Geology
of the Western U.S. II: A Session Honoring Ernie Duebendorfer
(GSA Structural Geology and Tectonics Division)**

1:30 PM, DoubleTree by Hilton Kaibab Room

Chloe E. Bonamici, Kevin R. Chamberlain and Michael L. Williams, Presiding

1:30 PM **INTRODUCTORY REMARKS**

47-1 1:35 PM Bonamici, Chloe E.*: **STRAIN IS HETEROGENEOUS: THE
SCIENCE AND PEDAGOGY OF ERNIE DUEBENDORFER**

47-2 1:55 PM Duebendorfer, Ernest*; Williams, Michael L.; Chamberlain,
Kevin R.: **THE CASE FOR A TEMPORALLY AND SPATIALLY
EXPANDED MAZATZAL OROGENY**

47-3 2:15 PM Strickland, Ariel*; Chamberlain, Kevin R.; Duebendorfer,
Ernest M.; Heizler, Matthew T.: **STRUCTURAL AND
GEOCHRONOLOGIC EVIDENCE FOR REACTIVATION OF
THE CHEYENNE BELT SUTURE ZONE, SOUTHEASTERN
WYOMING AT 1750 MA AND 1600 MA**

47-4 2:35 PM Cubrich, Bart T.*; Chamberlain, Kevin R.; Duebendorfer,
Ernest M.; Williams, Michael L.; Hamlin, Jeff W.: **THE
PALEOPROTEROZOIC MYLONITE OF KINGS CANYON,
COLORADO: A CA. 1.6 GA GREENSCHIST FACIES
MYLONITE FAR TO THE NORTH OF THE CONCURRENT
ACTIVE TECTONIC MARGIN**

47-5 2:55 PM Cubrich, Bart T.*; Chamberlain, Kevin R.; Duebendorfer,
Ernest M.; Cochrane, Matt: **REVIEWING AND REVISING THE
PROTEROZOIC HISTORY OF THE FIVE POINTS SHEAR
ZONE: A MULTIPLY DEFORMED PALEOPROTEROZOIC
SHEAR THAT FORMED PRIOR TO 1.67 GA**

SESSION NO. 48

**S3. Recent Advances in Basin-and-Range and Proterozoic Geology
of the Western U.S. III: A Session Honoring Ernie Duebendorfer
(GSA Structural Geology and Tectonics Division)**

3:30 PM, DoubleTree by Hilton Kaibab Room

Chloe E. Bonamici, Kevin R. Chamberlain and Michael L. Williams, Presiding

3:30 PM **INTRODUCTORY REMARKS**

48-1 3:35 PM Holland, Mark*: **THE ORIGIN AND EVOLUTION OF THE
MOJAVE PROVINCE**

48-2 3:55 PM Hrnclir, Jeffrey*; Karlstrom, Karl E.: **ASSEMBLY OF THE
KAAPVAAL AND WYOMING CRATONS INTO THE SUPERIA
SUPERCONTINENT: KEY EVIDENCE FROM THE BLACK
HILLS OF SOUTH DAKOTA AND WYOMING**

48-3 4:15 PM Allard, Stephen T.*: **CHALLENGING ENTRENCHED
PARADIGMS: THE INCREASING IMPORTANCE OF CA.
1730 MA SHEAR DEFORMATION ALONG THE EASTERN
BLACK HILLS UPLIFT, SD**

48-4 4:35 PM Sears, James W.*: **GREAT BASIN PIERCING POINTS
CONSTRAIN THE PROTEROZOIC LAURENTIA-SIBERIA
CONNECTION**

48-5 4:55 PM Parker, Stuart D.*; Winston, Don: **INTEGRATING SPATIAL
AND TEMPORAL VARIABILITY IN DETRITAL ZIRCON
PROVENANCE STUDIES; A CASE STUDY FROM THE
INTERIORLY-DRAINED MESOPROTEROZOIC BELT BASIN**

SESSION NO. 49

**T6. Colorado Plateau Landscape Evolution -- Grand Canyon-
and Upper Basin-Focused Colorado River Evolution III (GSA
Geophysics and Geodynamics Division; GSA Quaternary Geology
and Geomorphology Division; GSA Sedimentary Geology Division;
GSA Structural Geology and Tectonics Division)**

1:30 PM, DoubleTree by Hilton Coconino Room

L. Sue Beard, Andres Aslan, Richard Young and Karl E. Karlstrom, Presiding

1:30 PM **INTRODUCTORY REMARKS**

49-1 1:35 PM Robertson, Jesse*; Karlstrom, Karl: **THE SURPRISE
VALLEY LANDSLIDE COMPLEX: 3 MILLION YEARS OF
ROTATIONAL BEDROCK LANDSLIDING AND RIVER
DIVERSIONS IN THE CENTRAL GRAND CANYON**

49-2 1:55 PM Bailey, Christopher M.*; Fleming, Zachariah D.; Bartram,
Hanna C.; Biek, Robert F.; Marchetti, David W.: **THE RABBIT
VALLEY SALIENT, A MASSIVE LANDSLIDE DEPOSIT AT
THE COLORADO PLATEAU'S WESTERN MARGIN, SOUTH-
CENTRAL UTAH**

49-3 2:15 PM Walk, Cory J.*; Karlstrom, Karl E.; Crow, Ryan S.; Heizler,
Matthew T.: **BIRTH AND EVOLUTION OF THE VIRGIN
RIVER: POST 5 MA UPLIFT OF THE WESTERN COLORADO
PLATEAU**

49-4 2:35 PM Anderson, Jordan C.*; Karlstrom, Karl E.; Crossey, Laura J.;
Heizler, Matthew; Scuderi, Louis A.: **DRAINAGE REVERSAL
AND INCISIONAL HISTORY OF THE SALT RIVER**

2:55 PM **DISCUSSION**

SESSION NO. 50

**T8. Laramide Tectonics in the Southwest North American
Cordilleran Interior I (GSA Geophysics and Geodynamics Division;
GSA Sedimentary Geology Division; GSA Structural Geology and
Tectonics Division)**

1:30 PM, DoubleTree by Hilton Humphreys/Mt. Elden Room

James B. Chapman, Ryan C. Porter and Christopher Andrew Clinkscates, Presiding

1:30 PM **INTRODUCTORY REMARKS**

50-1 1:35 PM Petersen, Cameron M.*: **EFFECTS OF WATER ON FLAT-
SLAB SUBDUCTION GEOMETRY AND EVOLUTION**

50-2 1:55 PM Erslev, Eric A.*: **LARAMIDE CRUSTAL DETACHMENT IN
THE ROCKIES: CORDILLERAN SHORTENING OF A FLUID-
WEAKENED CRATON**

50-3 2:15 PM Clinkscates, Christopher Andrew*: **LATE CRETACEOUS
MAGMATISM AND UPLIFTS IN SOUTHWEST NEW MEXICO:
FARALLON TEAR RIPS THROUGH NEW MEXICO?**

50-4 2:35 PM Hampton, Brian A.*; Mack, Greg H.; Creitz, Ryan H.; Amato,
Jeffrey M.: **NEW CONSTRAINTS ON THE MIDDLE-LATE
EOCENE (~46-36 MA) TECTONIC TRANSITION FROM
LATE-STAGE LARAMIDE DEFORMATION TO BIMODAL
RIFT VOLCANISM (RIO GRANDE RIFT) IN SOUTHERN
NEW MEXICO**

50-5 2:55 PM Amato, Jeffrey M.*; Lawton, Timothy F.; Machin, Sarah E.K.;
Lucas, Spencer G.: **CRETACEOUS FORELAND-BASIN
DEVELOPMENT ON PREVIOUSLY RIFTED CRUST IN
THE SOUTHWESTERN U.S.: FAR-FIELD RESPONSE TO
GUERRERO ARC COLLISION**

SESSION NO. 51

**T8. Laramide Tectonics in the Southwest North American
Cordilleran Interior II (GSA Geophysics and Geodynamics Division;
GSA Sedimentary Geology Division; GSA Structural Geology and
Tectonics Division)**

3:30 PM, DoubleTree by Hilton Humphreys/Mt. Elden Room

James B. Chapman, Ryan C. Porter and Christopher Andrew Clinkscates, Presiding

3:30 PM **INTRODUCTORY REMARKS**

WEDNESDAY, 16 MAY

- 51-1** 3:35 PM Mavor, Skyler P.*; Williams, Stewart A.; Seymour, Nikki M.; Ruthven, Rachel C.; Patton, Annette I.; Johnson, Erinn P.; Singleton, John S.: **KINEMATICS OF LARAMIDE DEFORMATION AND THE INFLUENCE OF BASEMENT FABRICS IN THE BLACK HILLS UPLIFT, SOUTH DAKOTA AND WYOMING**
- 51-2** 3:55 PM Axen, Gary*; van Wijk, Jolante W.; Currie, Claire A.: **FLAT-SLAB BULLDOZING OF BASAL CONTINENTAL MANTLE LITHOSPHERE DURING THE LARAMIDE OROGENY**
- 51-3** 4:15 PM Chapman, James B.*; Dafov, Michelle Nikolay; Gehrels, George E.; Ducea, Mihai N.; Valley, John W.; Ishida, Akizumi: **LITHOSPHERIC ARCHITECTURE AND TECTONIC EVOLUTION OF THE SOUTHWESTERN U.S. CORDILLERA: CONSTRAINTS FROM ZIRCON HF AND O ISOTOPIC DATA**
- 51-4** 4:35 PM Thacker, Jacob O.*; Karlstrom, Karl E.; Kelley, Shari A.; Kendall, Jerry; Crow, Ryan S.: **SOUTHERN LARAMIDE DEFORMATION TIMING (ARIZONA-NEW MEXICO) CONSTRAINED BY INTEGRATED GEOLOGY AND THERMOCHRONOLOGY: IMPLICATIONS FOR CRETACEOUS-PALEOGENE TECTONIC PROCESSES**
- 51-5** 4:55 PM Robinson, Sarah E.*; Porter, Ryan C.; Hoisch, Thomas: **USING GEODYNAMIC AND THERMODYNAMIC MODELING APPROACHES TO ASSESS THE ROLE OF WATER IN FLAT SLAB SUBDUCTION**

SESSION NO. 52

T20. Biostratigraphy and Paleoenvironments of Western North America: Correlations across the International Border (GSA Sedimentary Geology Division; GSA Limnogeology Division)

3:30 PM, DoubleTree by Hilton Canyon Room

Pilar Navas-Parejo and Uxue Villanueva, Presiding

- 3:30 PM **INTRODUCTORY REMARKS**
- 52-1** 3:35 PM Poole, Forrest G.*; Sandberg, Charles A.; Amaya-Martínez, Ricardo: **CONTINUOUS PALEOZOIC STRATIGRAPHIC AND STRUCTURAL TRENDS ACROSS SONORA INDICATE NO MAJOR OFFSET BY STRIKE-SLIP FAULTS IN NORTHWEST MEXICO**
- 52-2** 3:55 PM Reyes Montoya, Dulce Raquel*; Palafox Reyes, Juan José; Cuen Romero, Francisco Javier; Navas-Parejo, Pilar: **CAMBRIAN-ORDOVICIAN SHALLOW-WATER FAUNA FROM EAST-CENTRAL SONORA**
- 52-3** 4:15 PM Navas-Parejo, Pilar*; Sandberg, Charles A.: **MID-MISSISSIPPIAN CONODONT FAUNAS DOCUMENT DEPOSITIONALLY UNBROKEN CONNECTION BETWEEN NORTHWEST SONORA AND THE U.S. MIDCONTINENT**
- 52-4** 4:35 PM Lara Peña, R. Aaron*; Navas-Parejo, Pilar: **PALEOBIOGEOGRAPHIC IMPLICATIONS OF GUADALUPIAN FAUNAS FROM NORTHWESTERN SONORA**
- 52-5** 4:55 PM Villanueva Amadoz, Uxue*: **LATE CRETACEOUS PALYNOFLORAS FROM NORTHERN SONORA AND ITS CORRELATION TO SOUTHERN U.S.**

SESSION NO. 53

T23. Integrating Composition and Morphology: Keys to Constraining Planetary Surface Processes from Spacecraft Data (GSA Quaternary Geology and Geomorphology Division; GSA Planetary Geology Division)

1:30 PM, DoubleTree by Hilton Kachina Room

Kristen A. Bennett, Christopher S. Edwards, Nadine G. Barlow and Will Grundy, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 53-1** 1:35 PM Edwards, Christopher S.*; Ehlmann, Bethany L.; Jakosky, Bruce M.: **CARBON SEQUESTRATION ON MARS: CONSTRAINTS FROM THE MORPHOLOGY, COMPOSITION AND THERMOPHYSICAL PROPERTIES OF THE NILI FOSSAE CARBONATE PLAINS**

- 53-2** 1:55 PM Pan, C.; Edwards, Christopher S.*; Rogers, A. Deanne: **EVALUATING FLAT-CRATER FLOOR FILL COMPOSITIONS AND MORPHOLOGIES: INSIGHT INTO FORMATION PROCESSES**
- 53-3** 2:15 PM Cowart, Justin*; Rogers, A. Deanne: **FORMATION OF OLIVINE-ENRICHED NOACHIAN INTERCRATER PLAINS MATERIALS: INSIGHTS FROM SURFACE MORPHOLOGY**
- 53-4** 2:35 PM Grundy, W.M.*; Cruikshank, D.P.; Ennico, K.; McKinnon, W.B.; Moore, J.M.; Olkin, C.B.; Spencer, J.R.; Stern, S.A.; Weaver, H.A.; Young, L.A.: **USING COMPOSITION AND MORPHOLOGY TO LEARN ABOUT PROCESSES AT WORK IN THE PLUTO SYSTEM**
- 53-5** 2:55 PM Linscott, I.R.*; Bird, M.K.; Stern, S.A.; Grundy, Will; Young, L.A.; Ennico, K.; Gladstone, G. Randall; Olkin, C.B.; Weaver, H.A.: **COMPOSITION AND MORPHOLOGY FROM RADIOMETRY AND EMISSIVITY AT 4.2 CM OBTAINED DURING THE NEW HORIZONS PLUTO ENCOUNTER**

THURSDAY, 17 MAY 2018

MORNING ORAL TECHNICAL SESSIONS

SESSION NO. 54

S4. Jurassic to Cenozoic Geology of Southern California, Southwest Arizona, and Sonora I: A Session Honoring Gordon Haxel and Carl Jacobson (GSA Structural Geology and Tectonics Division)

8:20 AM, DoubleTree by Hilton Canyon Room

Jon Spencer and L. Sue Beard, Presiding

- 8:20 AM **INTRODUCTORY REMARKS**
- 54-1** 8:25 AM Jacobson, Carl E.*; Sharman, Glenn R.; Hourigan, Jeremy K.; Grove, Marty; Johnston, Scott M.; Barth, Andrew; Haxel, Gordon B.; Ingersoll, Raymond V.; Chapman, Alan D.; Howard, Jeffrey L.; Wooden, Joseph L.: **LATE CRETACEOUS-PALEOGENE TECTONIC AND PALEO GEOGRAPHIC EVOLUTION OF SOUTHERN CALIFORNIA BASED ON DETRITAL ZIRCON FROM THE FOREARC BASIN, PELONA-OROCOPIA-RAND SCHISTS, AND FRANCISCAN COMPLEX**
- 54-2** 8:45 AM Epstein, Gabe S.*; Haxel, Gordon B.; Wittke, James H.; Jacobson, Carl E.: **FORMATION OF INTERMEDIATE AND ULTRABASIC METASOMATIC ROCKS WITHIN A REACTION ZONE SURROUNDING SUBDUCTED PERIDOTITE, CEMETERY RIDGE, SOUTHWEST ARIZONA**
- 54-3** 9:05 AM Strickland, Evan D.*; Singleton, John S.: **MULTISTAGE EXHUMATION OF OROCOPIA SCHIST AT THE NORTHERN PLOMOSA MOUNTAINS METAMORPHIC CORE COMPLEX, WEST-CENTRAL ARIZONA**
- 54-4** 9:25 AM Spencer, Jon*; Reynolds, Stephen J.; Love, Diane; Johnson, Roy A.; Strickland, Evan D.: **TECTONIC EXTENSION IN THE NORTHERN PLOMOSA MOUNTAINS, WESTERN ARIZONA, AND RECONSTRUCTION OF A MESOZOIC THRUST ZONE**
- 54-5** 9:45 AM Haxel, Gordon B.*; Beard, L. Sue; Jacobson, Carl E.: **SIGNIFICANCE OF NORTHEAST-SOUTHWEST ORIENTATION OF PROGRADE LINEATION IN THE PELONA-OROCOPIA-RAND-SCHIST LOW-ANGLE SUBDUCTION COMPLEX, SOUTHERN CALIFORNIA AND SOUTHWEST ARIZONA**

SESSION NO. 55***S4. Jurassic to Cenozoic Geology of Southern California, Southwest Arizona, and Sonora II: A Session Honoring Gordon Haxel and Carl Jacobson (GSA Structural Geology and Tectonics Division)***

10:20 AM, DoubleTree by Hilton Canyon Room

Jon Spencer and L. Sue Beard, Presiding

- 10:20 AM **INTRODUCTORY REMARKS**
- 55-1 10:25 AM Coffey, Kevin T.*: **CAN STRUCTURAL AND PALEOMAGNETIC DATA BE RECONCILED TO DETERMINE THE ORIGINAL GEOMETRY OF THE CHOCOLATE MOUNTAINS ANTICLINORIUM OF SOUTHERN CALIFORNIA AND SOUTHWESTERN ARIZONA?**
- 55-2 10:45 AM Powell, Robert E.*: **PALEOGEOLOGIC PATTERNS, CRUSTAL BLOCKS, AND EVOLUTION OF THE SAN ANDREAS FAULT SYSTEM IN SOUTHERN CALIFORNIA**
- 55-3 11:05 AM Ingersoll, Raymond V.*: **FOREARC STRIKE-SLIP DISPLACEMENT AS AN ALTERNATIVE TO SUBDUCTION EROSION, WITH A CALIFORNIA EXAMPLE (NACIMIENTO FAULT)**
- 55-4 11:25 AM Wyld, Sandra J.*; Wright, James E.: **ALLOCHTHONOUS PALEOZOIC-JURASSIC TERRANES OF NW NEVADA AND SE OREGON DISPLACED DEXTRALLY FROM THE SOUTHWEST CORDILLERA IN THE EARLY CRETACEOUS: WHERE IS THEIR HOMELAND?**
- 55-5 11:45 AM Rodríguez-Castañeda, José Luis*; Ortega-Rivera, Amabel; Anderson, Thomas H.; Roldan-Quintana, Jaime: **MASS-GRAVITY DEFORMATIONAL STRUCTURES: A CHARACTERISTIC FEATURE OF UPPER CRETACEOUS ROCKS IN EASTERN SONORA**

SESSION NO. 56***T3. Advances in River Science in the Intermountain West I (GSA Quaternary Geology and Geomorphology Division; GSA Hydrogeology Division)***

8:20 AM, DoubleTree by Hilton Coconino Room

Erich R. Mueller, Paul E. Grams, Daniel D. Buscombe and David J. Dean, Presiding

- 8:20 AM **INTRODUCTORY REMARKS**
- 56-1 8:25 AM Wright, Scott A.*; Marineau, Mathieu D.: **BEDLOAD TRANSPORT THROUGH POOL-RIFFLE SEQUENCES IN A LARGE GRAVEL-BEDDED RIVER**
- 56-2 8:45 AM Jarrett, Robert*: **USE AND EVALUATION OF THE CRITICAL-DEPTH METHOD FOR ESTIMATING PEAK DISCHARGES IN MOUNTAIN STREAMS**
- 56-3 9:05 AM Sorsby, Skyler; Lachmar, Thomas E.*: **MOUNTAIN-BLOCK RECHARGE FROM ALPINE KARST**
- 56-4 9:25 AM Alvarez, Laura*; Grams, Paul E.: **THE MECHANICS OF TURBULENCE AND SEDIMENT TRANSPORT: PHYSICALLY-BASED NUMERICAL MODELING OF FLOW, SEDIMENT AND BED EVOLUTION IN THE THE COLORADO RIVER ALONG THE MARBLE CANYON**
- 56-5 9:45 AM Ashley, Thomas*; McElroy, Brandon; Buscombe, Daniel D.; Kaplinski, Matthew; Grams, Paul E.: **STATISTICAL BEDLOAD MODELING ON THE COLORADO RIVER IN GRAND CANYON NATIONAL PARK**

SESSION NO. 57***T3. Advances in River Science in the Intermountain West II (GSA Quaternary Geology and Geomorphology Division; GSA Hydrogeology Division)***

10:20 AM, DoubleTree by Hilton Coconino Room

Erich R. Mueller, Paul E. Grams, Daniel D. Buscombe and David J. Dean, Presiding

- 10:20 AM **INTRODUCTORY REMARKS**
- 57-1 10:25 AM Schmidt, John C.*: **GEOMORPHOLOGY OF THE COLORADO RIVER IN GRAND CANYON —WHAT HAVE WE LEARNED AND WHAT DO WE NEED TO KNOW?**

- 57-2 10:45 AM Dean, David J.*; Topping, David J.: **GEOMORPHIC CHANGE AND BIOGEOMORPHIC FEEDBACKS IN THE LITTLE COLORADO RIVER, AZ**
- 57-3 11:05 AM Walker, Alexander E.*; Schmidt, John C.; Grams, Paul E.; Moore, Johnnie N.: **TWENTIETH CENTURY CHANNEL NARROWING OF THE GREEN RIVER IN CANYONLANDS NATIONAL PARK, UTAH**
- 57-4 11:25 AM Kaplinski, Matt*; Buscombe, Daniel D.; Grams, Paul E.; Hazel, Joseph E.; Kohl, Keith: **CHASING CENTIMETERS: A CASE STUDY OF FINDING AND APPLYING AN APPROPRIATE UNCERTAINTY FOR MORPHOLOGICAL SEDIMENT BUDGETING IN A LARGE RIVER**
- 57-5 11:45 AM Topping, David J.*; Griffiths, Ronald E.; Rubin, David M.; Grams, Paul E.; Buscombe, Daniel D.; Sabol, Thomas A.; Dean, David J.: **GRAIN-SIZE LIMITATION OF SAND STORAGE IN THE COLORADO RIVER IN GRAND CANYON NATIONAL PARK**

SESSION NO. 58***T13. Emerging Ideas on the Ancestral Rocky Mountain System (GSA Structural Geology and Tectonics Division; GSA Sedimentary Geology Division)***

8:20 AM, DoubleTree by Hilton Kachina Room

Ryan J. Leary, Paul J. Umhoefer and M. Elliot Smith, Presiding

- 58-1 8:20 AM Leary, Ryan J.*; Umhoefer, Paul J.; Smith, M. Elliot; Riggs, Nancy; Lodes, Emma; Burr, Gregory L.E.; Foley, Daniel J.: **THE INTERPLAY BETWEEN LOCAL AND FAR-TRAVELED SEDIMENT IN NORTH AMERICAN ANCESTRAL ROCKY MOUNTAIN BASINS**
- 58-2 8:40 AM Nair, Kajal*; Singleton, John S.; Holm-Denoma, Christopher S.; Egenhoff, Sven O.: **DETRITAL ZIRCON GEOCHRONOLOGY OF PENNSYLVANIAN STRATA IN COLORADO: EVIDENCE FOR APPALACHIAN-DERIVED SEDIMENT AND IMPLICATIONS FOR THE TIMING OF ANCESTRAL ROCKY MOUNTAINS UPLIFT**
- 58-3 9:00 AM Bonar, Alicia L.*; Hampton, Brian A.; Mack, Greg H.; Amato, Jeffrey M.: **DETRITAL ZIRCON GEOCHRONOLOGY FROM EARLY PERMIAN SYNOROGENIC STRATA IN NEW MEXICO: INSIGHTS ON UPLIFT HISTORY AND SEDIMENT DISPERSAL DURING FINAL STAGE ANCESTRAL ROCKY MOUNTAIN OROGENESIS**
- 58-4 9:20 AM Vilkas, Marius*; Heermance, Richard V.; Cecil, M. Robinson: **INTERPRETING COMPLEX DETRITAL ZIRCON SPECTRA FROM INTRACONTINENTAL FORELAND BASINS: AN EXAMPLE FROM THE ACTIVE TIAN SHAN, WESTERN CHINA**
- 58-5 9:40 AM Prior, Michael G*; Marshall, Kendall N.; Weld, Shannon E.; Seymour, Nikki M.; Singleton, John S.: **EXHUMATION HISTORY OF THE BLACK HILLS, SOUTH DAKOTA FROM APATITE (U-TH)/HE THERMOCHRONOMETRY: EVIDENCE FOR LATE PALEOZOIC ANCESTRAL ROCKY MOUNTAINS EXHUMATION?**
- 58-6 10:00 AM Sweet, D.E.*; Garcia, Jill; Barrick, James E.: **SUBSIDENCE EVOLUTION OF THE MIDLAND BASIN CONSTRAINED BY ROBUST CHRONOSTRATIGRAPHY, AND IMPLICATIONS FOR PENNSYLVANIAN-PERMIAN BOUNDARY SUBSIDENCE STYLES ACROSS THE GREATER ANCESTRAL ROCKY MOUNTAINS**

SESSION NO. 59***T15. Genetic Links between the Magmatism, Tectonism, and Metallogeny of the Southwestern USA and Northern Mexico***

10:20 AM, DoubleTree by Hilton Humphreys/Mt. Elden Room

Simon Jowitt and Graham Andrews, Presiding

- 59-1 10:20 AM Rämö, O. Tapani*; Calzia, James P.; McLemore, Virginia T.: **EVOLUTION OF SOUTHERN LAURENTIAN LITHOSPHERE; SOME NEW OBSERVATIONS FROM CRUSTAL DOMAINS**

AND MID-PROTEROZOIC ALKALINE MAGMATIC SUITES IN MOJAVIA AND MAZATZAL

- 59-2 10:40 AM Matthews, James Laurence*; Bermudez, Jocelyn Eleanor; Purcell, Ceara K.Q.; De Witt, Nancy; Aird, Hannah M.: **ANALYSIS OF ASSAY DATA FOR EFFICIENT EXTRACTION OF THE ANN MASON CU PORPHYRY DEPOSIT**
- 59-3 11:00 AM Liu, Xuyang*; Serpa, Laura; Gonzalez-Huizar, Hector: **A STUDY OF THE RELATIONSHIP BETWEEN SEISMICITY AND MINING ACTIVITY IN EASTERN ARIZONA**
- 59-4 11:20 AM McLemore, Virginia T.: **GOLD AND RARE EARTH ELEMENTS (REE) DEPOSITS ASSOCIATED WITH GREAT PLAIN MARGIN DEPOSITS (ALKALINE-RELATED), SOUTHWESTERN UNITED STATES AND EASTERN MEXICO**
- 59-5 11:40 AM Casady, Sommer M.*; Aird, Hannah: **CHARACTERIZATION OF A HIGH-SULFIDATION EPITHERMAL DEPOSIT WITHIN THE ANTELOPE VALLEY VOLCANIC CENTER, SIERRA COUNTY CALIFORNIA**
- 59-6 12:00 PM Novelo Martín, Aldo R.*: **HYDROTHERMAL ALTERATION SAMPLES FROM SONORA, MEX. ANALYZED WITH SWIR SPECTROSCOPY, COMPARED WITH MICROSCOPE PETROGRAPHY AND X-RAY DIFFRACTION**

SESSION NO. 60

T16. Understanding Water Resources related to Mineralized Uranium Deposits in the Southwestern United States (GSA Energy Geology Division; GSA Hydrogeology Division; GSA Sedimentary Geology Division)

8:20 AM, DoubleTree by Hilton Kaibab Room

Johanna M. Blake, Kimberly R. Beisner, Jose Cerrato and Andrew Robertson, Presiding

- 8:20 AM **INTRODUCTORY REMARKS**
- 60-1 8:25 AM Gonzalez Estrella, Jorge*: **PHYSICAL AND CHEMICAL MECHANISMS OF URANIUM AND ARSENIC SORPTION IN LIMESTONE**
- 60-2 8:45 AM Walder, Ingar F.*; Frey, Bonnie; Li, Yitian; Winton, Ashlynn: **UNDERSTANDING WATER RESOURCES RELATED TO MINERALIZED URANIUM DEPOSITS IN THE SOUTHWESTERN UNITED STATES**
- 60-3 9:05 AM Beisner, Kimberly R.*; Tillman, Fred D.: **ASSESSING TEMPORAL CHANGES IN GEOCHEMISTRY AT SPRING SITES LOCATED IN AN AREA OF BRECCIA PIPE URANIUM DEPOSITS**
- 60-4 9:25 AM Frey, Bonnie*; Cadol, Daniel; Willie, Shaina; Willis, Brianne; Becenti, Sherwin; Platero, Derrick; Paul, Shaylene; Chee, Chelsea: **STUDYING URANIUM CONTAMINATION ON TRIBAL LANDS IN COLLABORATION WITH UNDERGRADUATE RESEARCHERS**
- 60-5 9:45 AM Blake, Johanna M.*; Yager, Douglas B.; Gallegos, Tanya J.: **NEW GEOCHEMICAL AND GEOGRAPHIC INFORMATION SYSTEM METHODOLOGIES TO ASSESS ELEMENT MOBILITY IN GROUNDWATER**

SESSION NO. 61

T17. Chemical and Isotopic Tracers of Water Sources in Semiarid Regions: From the Mantle to the Atmosphere I (GSA Energy Geology Division; GSA Hydrogeology Division)

10:20 AM, DoubleTree by Hilton Kaibab Room

Kimberly Samuels-Crow, Laura J. Crossey and Abraham Springer, Presiding

- 10:20 AM **INTRODUCTORY REMARKS**
- 61-1 10:25 AM Tulley-Cordova, Crystal*; Bowen, Gabriel: **STABLE ISOTOPES IN PRECIPITATION AND ASSOCIATED WATERS: RECORDING THE NORTH AMERICAN MONSOON IN THE FOUR CORNERS REGION, USA**

- 61-2 10:45 AM Guo, Jessica S.*; Hungate, Bruce; Kolb, Thomas E.; Koch, George W.: **WATER SOURCE NICHE OVERLAP INCREASES WITH SITE MOISTURE AVAILABILITY IN WOODY PERENNIALS**
- 61-3 11:05 AM Kerhoulas, Lucy Penn*; Kolb, Thomas E.; Koch, George W.: **USING STABLE ISOTOPE ANALYSES TO DETERMINE PONDEROSA PINE WATER SOURCES IN NORTHERN ARIZONA**
- 61-4 11:25 AM Samuels-Crow, Kimberly*; Liu, Yao; Peltier, Drew; Welker, Jeffrey; Anderegg, William R.L.; Koch, George W.; Ogle, Kiona: **WINTER VS MONSOON WATER SOURCES FOR FOUNDATION TREE SPECIES ACROSS THE COLORADO PLATEAU**

POSTER TECHNICAL SESSIONS

SESSION NO. 62

S1. Tectonics of the Death Valley Region: A Tribute to Bennie Troxel and Lauren Wright (Posters) (GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 3:15 to 4:30 PM

Booth #

- 62-1 1 Levy, Drew A.*; Zuza, Andrew V.; Cashman, Patricia H.: **TECTONIC RECONSTRUCTION OF THE LAST CHANCE THRUST SYSTEM, DEATH VALLEY NATIONAL PARK, CALIFORNIA**
- 62-2 2 Lutz, Brandon*; Axen, Gary; Phillips, Fred: **NEW GEOLOGIC MAP AND STRUCTURAL CROSS SECTIONS OF THE DEATH VALLEY EXTENDED TERRAIN: TOWARD 3D KINEMATIC RECONSTRUCTIONS**
- 62-3 3 Miller, D.E.*; Gonzalez, Pilar; Molinero, Adrian; Levinson, Zachary; Moreno, Jesus; Buehler, Jeffrey; Woods, Erika; Missidimbazi, Beni: **KINEMATIC, STRATIGRAPHIC, AND SEDIMENTOLOGIC EVIDENCE FOR MID-MIOCENE-EARLY PLEISTOCENE TRANSTENSION AND TRANSPRESSION, EAST OF THE EASTERN CALIFORNIA SHEAR ZONE (ECSZ), NE MOJAVE**
- 62-4 4 Walker, Amber*; Mueller, Nicholas J.; Lutz, Brandon; Knott, Jeffrey R.; Lackey, Jade Star: **GEOCHEMICAL CORRELATION OF BASALTS IN THE SYLVANIA MOUNTAINS, CALIFORNIA AND NEVADA**
- 62-5 5 Avila, Shayna T.*; Lackey, Jade Star; Lutz, Brandon; Knott, Jeffrey R.; Mueller, Nicholas: **PALEOGRAPHIC INTERPRETATION OF THE FISH LAKE VALLEY/HORSE THIEF HILLS AREA USING GEOCHEMISTRY OF VOLCANIC ROCKS**
- 62-6 6 Hoxey, Andrew*; Lee, Jeffrey; Calvert, Andrew T.: **SPATIAL AND TEMPORAL CHARACTERIZATION OF VOLCANIC-FILLED PALEOVALLEYS DEXTRALLY OFFSET ACROSS THE PETRIFIED SPRINGS FAULT IN THE CENTRAL WALKER LANE, NEVADA**
- 62-7 7 Craddock, Suzanne D.*; Hoisch, Thomas D.; Wells, Michael L.; Wright, Samuel: **CONSTRAINTS FROM MONAZITE AND XENOTIME PETROCHRONOLOGY ON JURASSIC PT PATHS FROM THE FUNERAL MOUNTAINS METAMORPHIC CORE COMPLEX, DEATH VALLEY NATIONAL PARK**
- 62-8 8 Wright, Samuel*; Hoisch, Thomas D.; Wells, Michael L.; Craddock, Suzanne D.; Mulligan, Suzanne R.: **PETROLOGY AND CHRONOLOGY OF A LATE CRETACEOUS ANATECTIC FRONT IN MONARCH CANYON IN THE FUNERAL MOUNTAINS, DEATH VALLEY NATIONAL PARK**
- 62-9 9 Subia, Tai Antonia*; Pavlis, Terry L.; Brush, Jade Ashley: **DUCTILE DEFORMATIONAL HISTORY OF THE CENTRAL PANAMINT MOUNTAINS, DEATH VALLEY, CA**

SESSION NO. 63***T1. Miocene to Recent Evolution of the Lower Colorado River Corridor and the Northern Gulf of California (Posters) (GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)***

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3:15 to 4:30 PM

- | | Booth # | |
|-------|---------|---|
| 63-1 | 10 | Langille, Jackie*; Blisniuk, Kim; Sharp, Warren D.; Lee, Jeff: RATES OF QUATERNARY DEXTAL SLIP ON THE BENTON SPRINGS FAULT, CENTRAL WALKER LANE, WESTERN NEVADA, CONSTRAINED THROUGH U-SERIES DATING OF OFFSET ALLUVIAL FANS |
| 63-2 | 11 | Blisniuk, Kimberly*; Guns, Katherine A.; Burgmann, Roland: NORTHERN SAN ANDREAS FAULT SLIP RATES ON THE SANTA CRUZ MOUNTAIN SECTION: ¹⁰BE DATING OF AN OFFSET ALLUVIAL FAN COMPLEX, SANBORN COUNTY PARK, SARATOGA, CA |
| 63-3 | 12 | Waco, Jesse N.*; Blisniuk, Kimberly; Fosdick, Julie C.: EVIDENCE OF ACTIVE REVERSE FAULTING AND A LEFT-STEPPING SAN ANDREAS FAULT (MISSION CREEK STRAND) FROM THE LITTLE SAN BERNARDINO MOUNTAINS TO YUCAIPA RIDGE |
| 63-4 | 13 | Bykerk-Kauffman, Ann*; Lucas, Sean; Smart, Jay: THE PAINTED GORGE FAULT, A POTENTIALLY ACTIVE DEXTAL FAULT IN THE NORTHEASTERN COYOTE MOUNTAINS, SALTON TROUGH, CALIFORNIA |
| 63-5 | 14 | Vierra, Emma J.*; Webb, Heather N.; Peppard, Daniel W.; Flynn, Bonnie A.; Bermudez, Mario S.; Girty, Gary H.: RHEOLOGICAL CONTROLS ON DAMAGE INTENSITY, SAN JACINTO FAULT, SOUTHERN CALIFORNIA |
| 63-6 | 15 | Zuza, Andrew V.*: TESTING A ROTATING FAULT MODEL FOR THE GARLOCK FAULT |
| 63-7 | 16 | Brown, Howard J.*; Stone, Paul; Cecil, M. Robinson; Fitzpatrick, John: NEW INSIGHTS INTO THE GEOLOGY OF THE LANE MOUNTAIN AND NORTH CALICO MOUNTAINS AREA, CENTRAL MOJAVE DESERT, CALIFORNIA |
| 63-8 | 17 | Florence, Meghan M.*: THE LITHOLOGY OF THE ALAMOS CANYON SILTSTONE MEMBER AND THE FORMATION OF DOLOMITE, RIDGE BASIN FORMATION, CALIFORNIA |
| 63-9 | 18 | Murray, Bryan P.*; Al-kaabi, Abdulla: PRELIMINARY STRATIGRAPHIC INTERPRETATIONS OF THE SOLEDAD ROJO FORMATION IN THE LOWER COLORADO RIVER EXTENSIONAL CORRIDOR, WESTERN PALO VERDE MOUNTAINS, SOUTHEASTERN CALIFORNIA |
| 63-10 | 19 | Strickland, Evan D.*; Singleton, John S.; Wyatt, Michael R.; Seymour, Nikki M.: POST-MIDDLE MIOCENE TRANSTENSION IN THE PLOMOSA MOUNTAINS AND DEVELOPMENT OF THE LA POSA PLAIN, WEST-CENTRAL ARIZONA |

SESSION NO. 64***T4. New Insights into the Development and Evolution of the Colorado River System from Geologic Mapping (Posters) (GSA Quaternary Geology and Geomorphology Division; GSA Structural Geology and Tectonics Division)***

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 3:15 to 4:30 PM

- | | Booth # | |
|------|---------|---|
| 64-1 | 20 | Howe, Julia*: PRELIMINARY ANALYSIS OF PLEISTOCENE BASE-LEVEL CHANGE IN GRANBY BASIN, COLORADO |
| 64-2 | 21 | Lucchitta, Ivo*; Holm, Richard F.: CROOKED RIDGE RIVER (CRR) REDUX |
| 64-3 | 22 | Crow, Ryan*; Howard, Keith A.; Beard, L. Sue; Pearthree, Philip A.; House, P. Kyle; Karlstrom, Karl; Peters, Lisa; McIntosh, William; Cassidy, Colleen E.; Block, Debra: PLIO-PLEISTOCENE DEFORMATION IN THE LAKE MEAD REGION AND UPLIFT OF THE COLORADO PLATEAU |

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|-------|----|--|
| 64-4 | 23 | Howard, Keith A.*: DECIPHERING LANDSCAPE EVOLUTION AND DEVELOPMENT OF THE COLORADO RIVER IN THE UPPER LAKE MEAD AREA—THE ROLE OF GEOLOGIC MAPPING |
| 64-5 | 24 | House, P. Kyle*; John, Barbara E.; Howard, Keith A.; Beard, L. Sue; Crow, Ryan S.; Malmom, Daniel V.; Pearthree, Philip A.; Felger, Tracey J.; Block, Debra; Cassidy, Colleen E.; McDougall, Kristin: NEW GEOLOGIC MAPPING DOCUMENTS THE INCEPTION AND EVOLUTION OF THE LOWER COLORADO RIVER IN CHEMEHUEVI VALLEY, ARIZONA AND CALIFORNIA |
| 64-6 | 25 | Gootee, Brian F.*; Pearthree, Philip A.; Spencer, Jon; House, P. Kyle; Youberg, Ann M.: GEOLOGIC MAPPING OF COLORADO RIVER DEPOSITS IN IN THE SOUTHERN BLYTHE BASIN, BETWEEN EHRENBURG AND CIBOLA, ARIZONA AND PARTS OF CALIFORNIA |
| 64-7 | 26 | Block, Debra*; House, P. Kyle; Gootee, Brian F.: THE 'BLYTHE ALLUVIUM': HOLOCENE TO MODERN FLOODPLAIN AND CHANNEL DEPOSITS OF THE LOWER COLORADO RIVER, ARIZONA, NEVADA, AND CALIFORNIA |
| 64-8 | 27 | Gardner, Kevin*; Dorsey, Rebecca J.: STRUCTURAL AND PALEOTOPGRAPHIC CONTROLS ON DEPOSITION OF THE SOUTHERN BOUSE FORMATION IN THE SOUTHEASTERN PALO VERDE MOUNTAINS, CALIFORNIA |
| 64-9 | 28 | Cassidy, Colleen E.*; Crow, Ryan; House, P. Kyle; Thacker, Jacob O.; Beard, L. Sue; Cohen, Andrew S.; Pearthree, Philip A.; Howard, Keith A.: SUBSURFACE DATA IN THE LOWER COLORADO RIVER CORRIDOR AND ITS IMPLICATIONS FOR TECTONIC MODELS OF BASIN EVOLUTION WITHIN THE PALO VERDE AND PARKER VALLEYS |
| 64-10 | 29 | Stone, Paul*; Beard, L. Sue; Spencer, Jon: BEDROCK GEOLOGIC MAP COMPILATION OF THE BLYTHE 30X60' QUADRANGLE, SE CALIFORNIA AND SW ARIZONA |

SESSION NO. 65***T27. Geoscience and Environmental Science Education in the Cordillera and Rockies: Research and Practice (Posters) (GSA Geophysics and Geodynamics Division; GSA Geoscience Education Division; GSA Sedimentary Geology Division)***

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3:15 to 4:30 PM

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| 65-1 | 30 | Teasdale, Rachel*; Wolfe, B.; Simons, S.; Jollimore, T.; Altfeld, H.; Hutton, O.: VANISHED: A CHRONICLE OF LOSS AND DISCOVERY IN NORTHERN CALIFORNIA ACROSS HALF A MILLION YEARS |
| 65-2 | 31 | Hughes, Richard O.; VonSydow, Kathryn Ruth; Seymour, Bryan; Hasuka, Shunsuke*: INCREASING SUCCESS RATES IN AN INTRODUCTORY PHYSICAL GEOLOGY CLASS USING SUPPLEMENTAL INSTRUCTION LEADERS (SILS) |
| 65-3 | 32 | Stoneburg, Brittney*; Santos, Gabriel-Philip: WITH OUR POWERS COMBINED: INCREASING AUDIENCE REACH FOR SMALL MUSEUMS THROUGH COLLABORATIVE EDUCATION & OUTREACH INITIATIVES |
| 65-4 | 33 | Bentley, Callan*; Uhen, Mark; Berquist, Peter J.; Lockwood, Rowan; Lukes, Laura A.; Ryker, Katherine; George, Christian O.; Sundell, Ander: USING FOSSILS OF THE PALEOBIOLOGY DATABASE (PBDB) TO EXPLORE THE TECTONIC LINKAGE OF THE AMERICAS |
| 65-5 | 34 | Bentley, Callan*; Rohrbach, Robin; Cooper, Gene; Pitts, Alan: TELLING NORTH AMERICA'S GEOLOGIC STORY WITH ULTRAHIGH RESOLUTION GIGAPAN PHOTOGRAPHY, THE GIGAMACRO VIEWING PLATFORM, 3D MODELS, AND GOOGLE EARTH |
| 65-6 | 35 | Garcia, Angel A.*; Fischer, Heather; Wentz, Elizabeth; Gober, Patricia; Semken, Steven: COLLABORATIVE WORKFORCE TRAINING IN GEOSCIENCE AND SOCIAL SCIENCE FOR NATURAL-HAZARDS PREPAREDNESS AND MITIGATION (HAZPM) |
| 65-7 | 36 | Semken, Steven*; Godsey, Holly S.; Tsosie, William B.: TSE NA ALKAAH: COMBINING NATIVE AND MAINSTREAM |

**GEOSCIENCE TO FOSTER PLACE-BASED K-12 STEM
TEACHER PROFESSIONAL DEVELOPMENT ON THE
COLORADO PLATEAU**

SESSION NO. 66

T18. Paleoclimate Records and Future Climate Trends in the American Southwest (Posters) (GSA Quaternary Geology and Geomorphology Division; GSA Limnogeology Division; GSA Sedimentary Geology Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 3:15 to 4:30 PM

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| 66-1 | 37 | Wright, Kevin Timothy*: RECONSTRUCTING THE LATE-PLEISTOCENE AND HOLOCENE PRECIPITATION HISTORY OF NORTHEAST MEXICO: AN ANALYSIS OF SPELEOTHEM $\delta^{18}\text{O}$ AND $\delta^{13}\text{C}$ |
| 66-2 | 38 | Wiman, Charlotte*; McKay, Nicholas P.: RECONSTRUCTING LAKE HOLOCENE PRODUCTIVITY AT COLUMBINE LAKE, COLORADO THROUGH ANNUALLY LAMINATED SEDIMENTS |
| 66-3 | 39 | Bayer, Christopher Oscar*; Fawcett, Peter J.; Anderson, R. Scott; Atudorei, Nicu-Viorel: BULK ORGANIC CARBON ISOTOPE RATIOS FROM STONEMAN LAKE AZ AS A PROXY FOR GLACIAL-INTERGLACIAL CYCLES DURING THE QUATERNARY |
| 66-4 | 40 | Anderson, R. Scott*; Fawcett, Peter J.; Staley, Spencer E.; Brown, Erik T.; Werne, Josef P.; Petronis, Michael; Stockhecke, Mona; McKay, Nicholas P.; Jimenez-Moreno, Gonzalo; Toney, Jaime L.; Bayer, Christopher Oscar: THE STONEMAN LAKE DRILLING PROJECT: PRELIMINARY RESULTS ON PALEOENVIRONMENTAL CHANGE IN CENTRAL ARIZONA OVER THE LAST ~ 1.5 MILLION YEARS |
| 66-5 | 41 | Pearthree, Kristin S.*; Fawcett, Peter J.; Brown, Erik; Werne, Josef P.; Caballero-Miranda, Margarita; Lozano-García, Socorro; Ortega-Guerrero, Beatriz; Stockhecke, Mona; Valero-Garcés, Blas; Atudorei, Viorel: CARBON AND NITROGEN ISOTOPE RATIOS FROM ORGANICS IN LAKE CHALCO, MEXICO: A RECORD OF QUATERNARY CLIMATE AND ENVIRONMENTAL CHANGE IN NEOTROPICAL NORTH AMERICA |
| 66-6 | 42 | Hudson, Adam M.*; Paces, James B.; Ruleman, Cal; Huntington, Katharine W.: CARBONATE CLUMPED ISOTOPES AND <i>IN SITU</i> TEMPERATURE MONITORING FOR HOLOCENE SOILS IN THE SAN LUIS VALLEY, USA INDICATE SPRINGTIME CARBONATE FORMATION |
| 66-7 | 43 | Springer, Kathleen B.*; Pigati, Jeffrey S.; Manker, Craig R.; Mahan, Shannon A.: THE LAS VEGAS FORMATION |
| 66-8 | 44 | Hereford, Richard*; Schwing, Jonathan E.: MORMON LAKE AND THE POSSIBLE FUTURE CLIMATE OF THE SOUTHWEST COLORADO PLATEAU AND PLATEAU WOODLANDS |

SESSION NO. 67

D5. Geomorphology (Posters)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3:15 to 4:30 PM

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| 67-1 | 45 | Jeon, Kyungho*; Nawacki, Adam A.; Giardino, John R.; Aslan, Andres: QUATERNARY BASALT GRAVEL DEPOSITS IN THE COLORADO RIVER BASIN NEAR GRAND MESA: IMPLICATIONS FOR CLIMATIC AND GEOMORPHIC EVOLUTION OF WESTERN COLORADO |
| 67-2 | 46 | Brugger, Keith A.*; Laabs, Benjamin; Reimers, Alexander; Bensen, Noah: THE LAST GLACIAL MAXIMUM IN THE MOSQUITO RANGE, COLORADO: CHRONOLOGY AND CLIMATE |
| 67-3 | 47 | Spuller, Kerri E.*; Wilkins, David; Rittenour, Tammy M.; Pierce, Jen; Ford, Richard L.: LATE-PLEISTOCENE CLIMATE CONTROLS ON AEOLIAN ACTIVITY, CORAL PINK SAND DUNES, UTAH |
| 67-4 | 48 | Tahiry, Howasta S.*; Maloney, Jillian M.; Klotsko, Shannon A.; Gusick, Amy E.; Braje, Todd J.; Ball, David: EXAMINING PALEODRAINAGE EVOLUTION SINCE THE LAST GLACIAL MAXIMUM, NORTHERN CHANNEL ISLANDS, CALIFORNIA, USA |

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| 67-5 | 49 | Skakun, Matthew G.*; Maloney, Jillian M.; Klotsko, Shannon A.; Gusick, Amy E.; Davis, Loren; Nyers, Alexander; Braje, Todd J.; Ball, David: ASSESSING CONTROLS ON PALEODRAINAGE MORPHOLOGY ON THE CONTINENTAL SHELF OFFSHORE CENTRAL OREGON |
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SESSION NO. 68

T25. Geologic Applications of Unmanned Aerial Systems (Posters) (GSA Geophysics and Geodynamics Division; GSA Quaternary Geology and Geomorphology Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3:15 to 4:30 PM

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| 68-1 | 50 | Newman, Connor P.*; Castendyk, Devin; Straight, Brian; Filiatreault, Pierre; Pino, Americo: REMOTE WATER-QUALITY SAMPLING OF NEVADA PIT LAKES USING UNMANNED AIRCRAFT SYSTEMS |
| 68-2 | 51 | Cook, Joseph P.*; Gootee, Brian F.; Youberg, Ann M.: FLY A DRONE, TAKE SOME PICTURES, MAKE A MAP. APPLICATIONS OF UAVS IN GEOLOGIC MAPPING, RECONNAISSANCE, AND EDUCATING THE PUBLIC |
| 68-3 | 52 | Mayes, Marc T.*; Sylvester, Art; Caylor, Kelly K.: UAS IMAGERY OF DEBRIS BASIN VOLUMES AND INFRASTRUCTURE SUPPORTS WATERSHED SCALE ASSESSMENT AND PREPARATION FOR CHANGING FLOOD AND DEBRIS-FLOW HAZARDS IN SANTA BARBARA COUNTY, CALIFORNIA |
| 68-4 | 53 | Ellett, Nicholas*; Pierce, Jennifer L.; Glenn, Nancy F.; Goode, Jaime: SFM-DERIVED MODERN POST-FIRE EROSION MAGNITUDES COMPARED TO HOLOCENE EROSION RATES IN A STEEP, 1KM² IDAHO CATCHMENT |

SESSION NO. 69

T21. Recent Advances in Planetary Geoscience (Posters) (GSA Geophysics and Geodynamics Division; GSA Planetary Geology Division; GSA Sedimentary Geology Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 3:15 to 4:30 PM

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| 69-1 | 54 | Davis, Evan*; Dodge, Chad; Teasdale, Rachel: MODELLING THE EMPLACEMENT OF A MARTIAN LAVA FLOW IN THE THARSIS MONTES REGION |
| 69-2 | 55 | Jahl, Peter M.*; Green, Douglas H.: EXOPLANET INTERIOR MODELS FOR A RANGE OF HOST STAR COMPOSITIONS |
| 69-3 | 56 | Sears, James W.*: SIGNIFICANT QUADRUPOLE MOMENT FOR PRECAMBRIAN GEODYNAMO? IMPLICATIONS FROM WEST LAURENTIA-SIBERIA CONTINENTAL RECONSTRUCTION AND NEPTUNIAN HOMOLOGUE |
| 69-4 | 57 | Okubo, Chris H.*: DEPOSITION AND DEFORMATION WITHIN EASTERN CANDOR CHASMA, MARS |
| 69-5 | 58 | Sun, Vivian*; Stack, Kathryn M.: GEOMORPHIC MAPPING OF THE BASEMENT UNIT WITHIN THE NORTHEAST SYRTIS MARS 2020 LANDING ELLIPSE |
| 69-6 | 59 | Hanley, Jennifer*; Horgan, Briony; Chaves, L.C.: INVESTIGATING THE DISTRIBUTION OF MARTIAN SALTS |

SESSION NO. 70

T14. Paleomagnetic, Structural, and Geophysical Data Applied to Intrusive and Extrusive Igneous Systems, Tectonic Applications, and Paleoclimate Studies (Posters) (GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 3:15 to 4:30 PM

- | | Booth # | |
|------|---------|--|
| 70-1 | 60 | Bloomfield, Matt D.*; Barba, William K.; Rees, Shannon; Porter, Ryan C.; Riggs, Nancy R.: IMAGING SUBSURFACE VOLCANIC FEATURES IN THE SAN FRANCISCO VOLCANIC FIELD, ARIZONA |

AFTERNOON ORAL TECHNICAL SESSIONS

SESSION NO. 73

S4. Jurassic to Cenozoic Geology of Southern California, Southwest Arizona, and Sonora III: A Session Honoring Gordon Haxel and Carl Jacobson (GSA Structural Geology and Tectonics Division)

1:30 PM, DoubleTree by Hilton Canyon Room

Jon Spencer and L. Sue Beard, Presiding

1:30 PM INTRODUCTORY REMARKS

73-1 1:35 PM Johnston, Scott M.*; Kylander-Clark, Andrew R.C.; Rioux, Matthew: **DETRITAL ZIRCON GEOCHRONOLOGY AND GEOCHEMISTRY OF NACIMIENTO BLOCK FOREARC STRATA: IMPLICATIONS FOR THE PALEOGEOGRAPHY OF THE LATE MESOZOIC SOUTHERN CALIFORNIA MARGIN**

73-2 1:55 PM Shulaker, Danielle Ziva*; Grove, Marty J.; Van Buer, Nicholas J.; Howard, Keith A.; Barth, Andrew P.; Jacobson, Carl E.; Sharman, Glenn R.: **SOURCE OF EOCENE SEDIMENT TRANSPORTED THROUGH THE BREACHED MOJAVE SEGMENT OF THE MID-CRETACEOUS CALIFORNIA BATHOLITH: CONSTRAINTS FROM COUPLED Pb ISOTOPIC AND Ar-Ar AGE RESULTS FROM DETRITAL K-FELDSPAR**

73-3 2:15 PM Arvizu, Harim; Iriondo, Alexander*: **PERMO-TRIASSIC (~284–221 MA) INITIATION OF THE CORDILLERAN MAGMATIC ARC OF SW NORTH AMERICA: PETROLOGICAL CONSTRAINTS AND INSIGHTS FROM NW SONORA, MEXICO**

73-4 2:35 PM Kimbrough, David L.*: **THE JURASSIC ARC SILICIC LARGE IGNEOUS PROVINCE (SLIP) OF SOUTHWESTERN NORTH AMERICA**

73-5 2:55 PM Grove, M.J.*; Kimbrough, David L.: **TESTING MODELS FOR HIGH-FLUX TRONDHJEMITIC MELTING BETWEEN 98–88 MA ALONG A 2500 KM SEGMENT OF THE CALIFORNIA-BAJA MARGIN**

SESSION NO. 74

T5. Post-Wildfire Hazards: From New Research to Assessments, Prediction, and Mitigation I (GSA Quaternary Geology and Geomorphology Division; GSA Hydrogeology Division)

1:30 PM, DoubleTree by Hilton Coconino Room

Ann M. Youberg and Luke McGuire, Presiding

1:30 PM INTRODUCTORY REMARKS

74-1 1:35 PM Roehner, Clayton*; Pierce, Jen: **AEOLIAN RESPONSE TO FIRE: TRENDS IN DEPOSIT MASS, PARTICLE SIZE AND GEOCHEMISTRY**

74-2 1:55 PM Leonard, Jackson M.*: **THIS STUDY EXAMINED THE RECOVERY OF BOTH PHYSICAL AND BIOTIC CHARACTERISTICS OF SMALL (<0.1 M³ SEC⁻¹) HEADWATER STREAM SYSTEMS IMPACTED BY THE DUDE FIRE, WHICH OCCURRED IN CENTRAL ARIZONA, USA, IN 1990**

74-3 2:15 PM Raymond, Carissa A.*; McGuire, Luke; Youberg, Ann M.: **RAINFALL INTENSITY-DURATION THRESHOLDS FOR POST-WILDFIRE DEBRIS FLOWS IN ARIZONA**

74-4 2:35 PM Tang, Hui*; McGuire, Luke; Rengers, Francis K.; Kean, Jason W.; Staley, Dennis M.: **TEMPORAL CHANGES IN DEBRIS FLOW SOURCE MATERIAL AND INITIATION MECHANISMS FOLLOWING THE 2016 FISH FIRE IN THE SAN GABRIEL MOUNTAINS, CA, USA**

74-5 2:55 PM Rengers, Francis K.*; Staley, Dennis M.; Kean, Jason W.; Coe, Jeffrey A.: **ASSESSMENT OF POST-WILDFIRE DEBRIS-FLOW HAZARDS IN POPULATED ENVIRONMENTS: A CASE STUDY OF THE JANUARY 2018 MONTECITO, CALIFORNIA DEBRIS FLOWS**

- 70-2** 61 Rees, Shannon K.*; Riggs, Nancy; Porter, Ryan C.; Barba, William K.; Bloomfield, Matt; Corbo, Fernando; Carrasco-Núñez, Gerardo; Ort, Michael H.: **GEOPHYSICAL ANALYSIS OF YOUNG MONOGENETIC VOLCANOES**
- 70-3** 62 Barba, William K.*; Bloomfield, Matt D.; Rees, Shannon K.; Porter, Ryan C.; Riggs, Nancy R.: **SEISMIC REFRACTION SURVEY OF MERRIAM CRATER, SAN FRANCISCO VOLCANIC FIELD, AZ**
- 70-4** 63 Lauricella, Sindy*; Petronis, Michael; Fawcett, Peter J.; Anderson, R. Scott; Staley, Spencer E.: **PRELIMINARY PALEOMAGNETIC DATA BEARING ON THE EVOLUTION OF TERRESTRIAL CLIMATE AND VEGETATION THROUGH THE MID-PLEISTOCENE TRANSITION: A 1.5 MA RECORD FROM STONEMAN LAKE, ARIZONA**
- 70-5** 64 Kone, Bakary*; Petronis, Michael; Lindline, Jennifer: **EMPLACEMENT OF THE CERROS DEL RIO INTRUSION BASED ON ANISOTROPY OF MAGNETIC SUSCEPTIBILITY, PALEOMAGNETIC, MAGNETIC SURVEY, PETROLOGICAL, AND PHOTOGRAMMETRY DATA**
- 70-6** 65 Karim, Ejaz*; Petronis, Michael; Valenta, Jan; Rappich, Vladislav; Awdankiewicz, Marek: **BASALTIC SCORIA CONE GROWTH MODELING UTILIZING PALEOMAGNETIC, ANISOTROPIC OF MAGNETIC SUSCEPTIBILITY AND GEOPHYSICAL DATA FROM SOSNICA HILL VOLCANO (LOWER SILESIA, SW POLAND)**

SESSION NO. 71

T7. Seismic and Geophysical Perspectives: New Insights into the Structure of the Shallow Crust of the Rocky Mountains and Cordillera (Posters) (GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 3:15 to 4:30 PM

Booth #

- 71-1** 66 Brumbaugh, David S.*: **THE 2016 GRAND WASH, ARIZONA EARTHQUAKE SWARM**
- 71-2** 67 McBride, John H.*; Keach, R. William; Leetaru, Hannes E.: **FINE-SCALE HETEROGENEITY OF PRECAMBRIAN ROCKS AND THE RELATION TO CO₂-INJECTION RELATED MICROSEISMICITY**
- 71-3** 68 Dorn, Kathryn Margo*; Braunmiller, Jochen; Thompson, Glenn: **SPECTRAL ANALYSIS OF SEISMIC NOISE FROM THE 2017 OROVILLE DAM CRISIS**
- 71-4** 69 Phelps, G.A.*: **ESTIMATING THE PROBABILITY OF ALTERNATIVE GEOLOGIC MODELS USING GRAVITY DATA WITH DISTANCE-BASED KERNELS**

SESSION NO. 72

D6. Structural Geology (Posters)

8:30 AM, DoubleTree by Hilton Outdoor Tents

Authors will be present from 9 to 10:30 AM and 3:15 to 4:30 PM

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- 72-1** 70 Lee, John D.*; Miller, Robert B.: **STRUCTURE AND INTRUSIVE STYLE ALONG A SEGMENT OF THE PASAYTEN FAULT ZONE, SOUTH-CENTRAL BRITISH COLUMBIA**
- 72-2** 71 Phillips, Colin P.*; Miller, Robert B.; Sauer, Kirsten B.; Gordon, Stacia M.: **STRUCTURE AND LITHOLOGIES OF DEEP LEVELS WITHIN THE NORTH CASCADES CONTINENTAL MAGMATIC ARC, NORTH CASCADES, WA**
- 72-3** 72 Burton, Bradford R.*; Link, Paul Karl: **GEOLOGIC MAPPING OF A POLYPHASE TECTONIC-MAGMATIC COMPLEX IN THE ROCK ROLL CANYON 7.5' QUADRANGLE, SOUTH-CENTRAL IDAHO**
- 72-4** 73 Grace, Robert; Ryde, Isabel P.S.*; Chapman, Alan D.: **GEOCHRONOLOGIC, THERMOBAROMETRIC, AND ISOTOPIC CONSTRAINTS ON THE ORIGIN OF THE SALINIAN BLOCK**

SESSION NO. 75

T9. Cenozoic Extension in Western North America (GSA Geophysics and Geodynamics Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division)

1:30 PM, DoubleTree by Hilton Humphreys/Mt. Elden Room

Melissa A. Lamb, John S. Singleton, Gary Axen, Jolante W. van Wijk and Jason W. Ricketts, Presiding

- 75-1** 1:30 PM van Wijk, Jolante W.*: **THE MIOCENE-PLIOCENE UNCONFORMITY IN THE RIO GRANDE RIFT**
- 75-2** 1:50 PM Ricketts, Jason W.*; Biddle, Julian; Amato, Jeffrey M.: **PATTERNS IN CENOZOIC EXTENSION ALONG THE RIO GRANDE RIFT BASIN AND RANGE TRANSITION IN SOUTHERN NEW MEXICO FROM APATITE AND ZIRCON (U-TH)/HE THERMOCHRONOLOGY**
- 75-3** 2:10 PM Anderson, Ernie*: **WHAT THE AMAGMATIC CORRIDOR IN THE CENTRAL BASIN AND RANGE REVEALS ABOUT THE RELATIONSHIP BETWEEN MAGMATISM AND REGIONAL NEOGENE EXTENSION**
- 75-4** 2:30 PM Muhammad, Mahmud M.*; Taylor, Wanda J.: **KINEMATICS OF APPARENT REVERSE FAULTS WITHIN EXTENSIONAL TECTONICS: CASE STUDY FROM THE PAHRANAGAT SHEAR ZONE (PSZ), BASIN AND RANGE, NEVADA, USA**
- 75-5** 2:50 PM Hayman, Nicholas W.*; Lima, Rodrigo; Prior, Michael G.; Stockli, Daniel F.: **THERMAL HISTORY OF THE BLACK MOUNTAINS, DEATH VALLEY, CALIFORNIA**
- 75-6** 3:10 PM Morgan, George*; Morgan, JR: **EXTENSIONAL TECTONICS, A SLAB WINDOW AND THE ARRIVAL OF THE GULF OF CALIFORNIA ABOUT 17MA, WHILE THE COYOTE MOUNTAINS OF SOUTHERN CALIFORNIA, USA UNDERGO 90° CLOCKWISE ROTATION IN SONORA, MEXICO**

SESSION NO. 76

T17. Chemical and Isotopic Tracers of Water Sources in Semiarid Regions: From the Mantle to the Atmosphere II (GSA Energy Geology Division; GSA Hydrogeology Division)

1:30 PM, DoubleTree by Hilton Kaibab Room

Kimberly Samuels-Crow, Laura J. Crossey and Abraham Springer, Presiding

- 1:30 PM **INTRODUCTORY REMARKS**
- 76-1** 1:35 PM Springer, Abraham E.*: **STABLE ISOTOPES FROM SPRINGS USED TO DELINEATE LOCAL VS. REGIONAL GROUNDWATER FLOW IN WESTERN NORTH AMERICA**
- 76-2** 1:55 PM Newman, Connor P.*; Mann, Jeff; Sueker, Julie: **EVALUATING MINE-WASTE SEEPAGE WATER AND SOLUTE SOURCES USING STABLE ISOTOPES AND INVERSE GEOCHEMICAL MODELING**
- 76-3** 2:15 PM Wood, Alexander J.*: **GROUNDWATER DELINEATION BETWEEN STACKED KARST AQUIFERS USING STABLE ISOTOPES ON THE KAIBAB PLATEAU, GRAND CANYON**
- 76-4** 2:35 PM Crossey, Laura J.*; Karlstrom, Karl; McGibbon, Chris: **APPLICATION OF MULTIPLE GEOCHEMICAL TRACERS TO UNDERSTANDING ANTHROPOGENIC INFLUENCES ON GROUNDWATER FLOW TO GRAND CANYON SPRINGS, GRAND CANYON NATIONAL PARK**
- 76-5** 2:55 PM Holt, Benjamin D.*; Karlstrom, Karl; Crossey, Laura J.; Darrah, Thomas H.; Whyte, Colin; Gonzales, David A.; Burch, Sara J.; Golla, Jon K.: **MANTLE-TO-SURFACE NEOTECTONIC CONNECTIONS IN THE SAN JUAN MOUNTAINS DOCUMENTED BY 3HE/4HE, CO₂ FLUX MEASUREMENTS, AND HYDROCHEMICAL ANALYSES OF THE GEOTHERMAL SYSTEM**

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The second number (following the dash) indicates the presentation order of the paper within its session.

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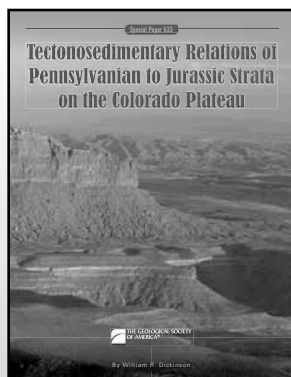
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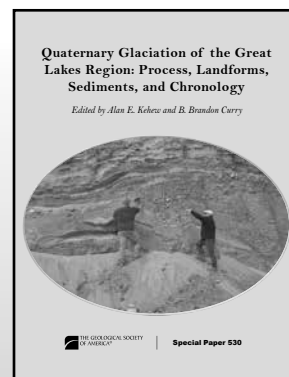
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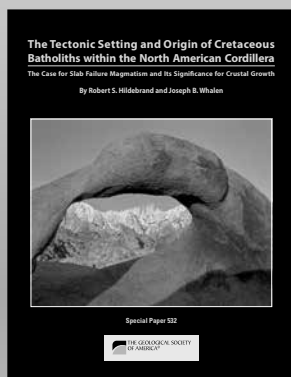
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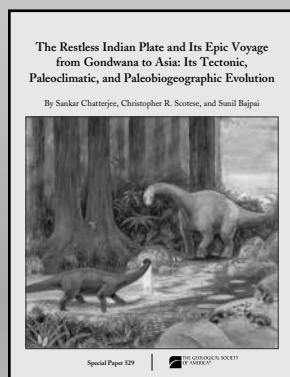
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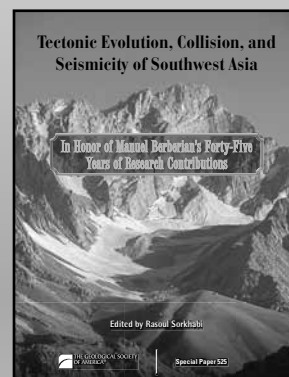
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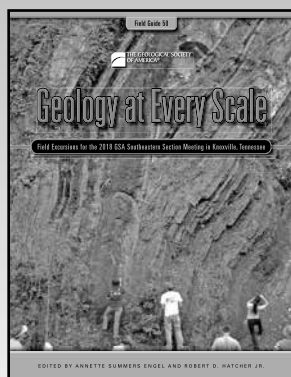
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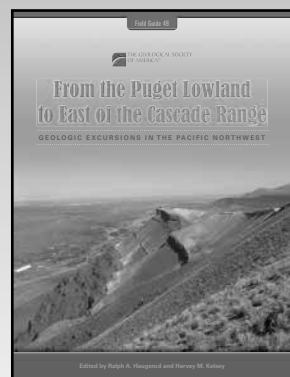
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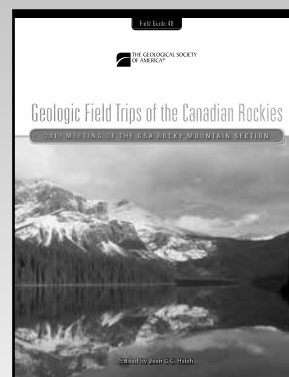
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