



Colorado Scientific Society

The objective of the Society is to promote the knowledge and understanding of Earth science, and its application to human needs

***Thursday, Sept. 17 meeting, 7:00 p.m. (social time 6:30)
Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood CO
All are Welcome! Program:***

The development of the Rio Grande rift between 25-10 Ma based on low temperature thermochronology

Shari Kelley

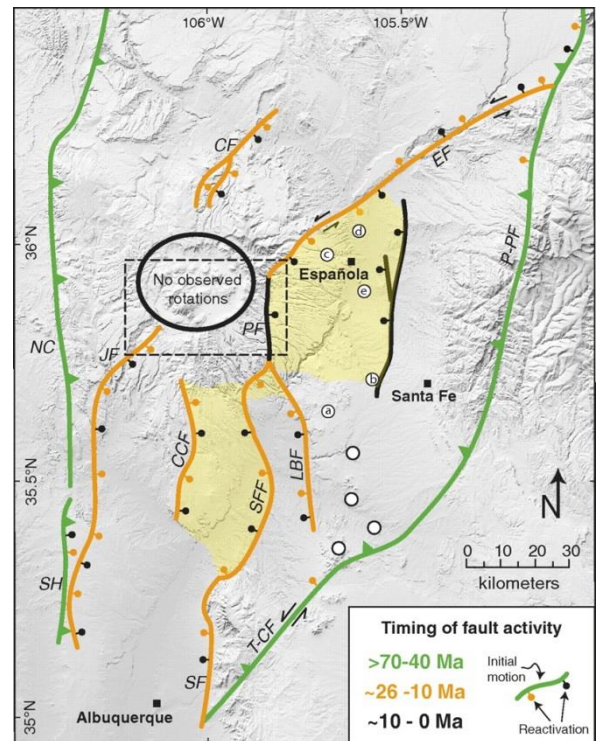
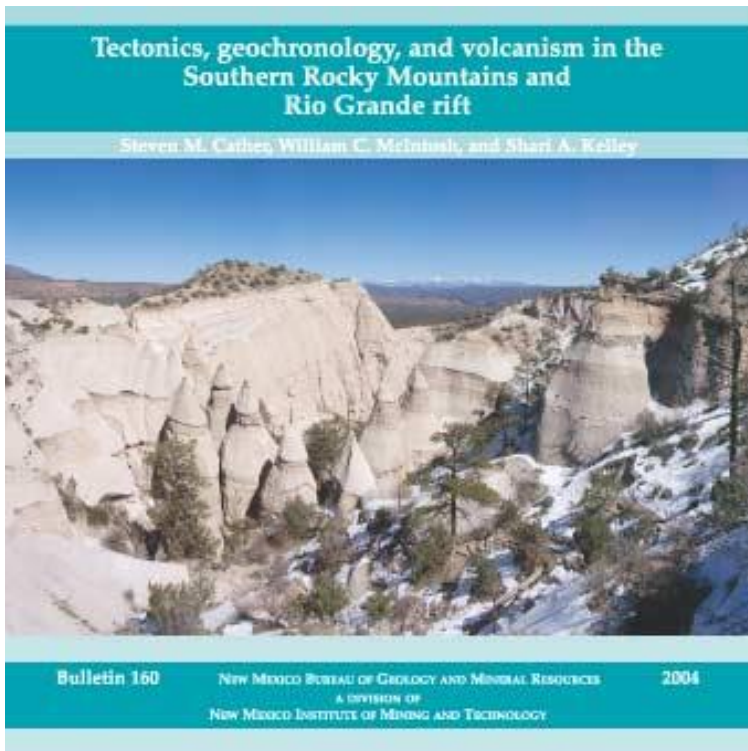
**New Mexico Bureau of Geology and Mineral Resources, New
Mexico Tech, Socorro, NM**



Abstract:

Published apatite fission-track (AFT) ages from mountain ranges in Colorado and New Mexico record episodic 75-40 Ma (Laramide), 35-25 Ma (ignimbrite flareup), and 25-10 Ma (Rio Grande rift) exhumation of the southern Rocky Mountain region. New (U-Th)/He (AHe) dates from 32 of the AFT samples from mountain ranges bordering the Rio Grande rift are used to document near-synchronous exhumation of the rift flanks along the >850 km length of the rift between ~25 to 10 Ma. A geodynamic model that incorporates multistage rollback and foundering of the Farallon plate is proposed to explain the ignimbrite flareup and subsequent

near-synchronous opening of the Rio Grande rift. The first stage of rollback led to the creation of the San Juan, Mogollon-Datil, and other large middle Cenozoic volcanic fields in Colorado and New Mexico. The second stage of foundering was associated with the 30 to 25 Ma detachment of remaining fragments of the Farallon slab. Removal of the slab triggered extension by focusing mantle convection in the vicinity of the break.



Dr. Shari Kelley is a geophysicist and field geologist with the New Mexico Bureau of Geology and Mineral Resources (NMBM) and Adjunct Faculty at New Mexico Tech in Socorro, New Mexico. Shari earned a B.S. in Geological Sciences at New Mexico State University and a Pd.D. in Geophysics at Southern Methodist University. Shari's web responsibilities at the NMBM include creating and maintaining the Frequently Asked Questions and Virtual Geologic Tours portions of the Bureau's webpage. Her research interests include building and maintaining New Mexico's part of the National geothermal Database, *Geothermal exploration in New Mexico*, *Application of apatite fission-track thermochronology to tectonic* and landscape evolution problems in the High Plains-Rio Grande rift-Rocky Mountain-Colorado Plateau region, and tectonic and landscape evolution of the Jemez Mountain volcanic field and the Sierra Blanca volcanic field, New Mexico. Shari has published more than seventy scientific papers and is co-author on more than thirty geologic maps.

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President's September message – Paul Morgan, Colorado Geological Survey

The school zones are back to 20 mph signaling the end of summer break and the start of another academic year. For those of us fortunate enough to include field work in our curriculum, there is less traffic, but unfortunately the hours of daylight are becoming noticeably shorter. The mountains and valleys were verdant in early summer. The browning came late and is being moderated by new growth as wet weather continues. So far Colorado has been spared catastrophic wildfires, but we have shared the smoke from the west.

September is the month of the Denver Gem and Mineral Show. This year is the 48th Annual show and is featuring “Minerals of the American Southwest”, September 18-20 at the Denver Mart Expo Hall (formerly the Denver Merchandise Mart: I-25 at Exit 215). Other mineral and fossil shows are in the same area around the same time, details of which can be found on the web and in the newspaper, but the Denver Gem and Mineral Show is the main event, second only to the Tucson Gem and Mineral Show in the spring.

Dating rocks, as most of you know, is a misnomer. What is dated are stratigraphic systems and their relations to one another, or the closure conditions, usually temperature, of isotopic systems. Some isotopic systems, such as uranium-lead, close very close to the crystallization temperature of the minerals in which the isotopes are encapsulated. They date the time of mineral formation. Some systems, such as potassium-argon, can be reset at lower temperatures by argon loss and may be reset during metamorphism. Other systems, such as apatite fission-track and apatite-Helium thermochronology have closure temperatures with ranges of 60-110°C and 30-90°C, respectively, and can be used to date uplift/erosion events.

Our speaker for September, Dr. Shari Kelley from the New Mexico Bureau of Geology and Mineral Resources, will be talking about these isotopic dating systems with very low closure temperatures with application to the



Rio Grande rift. The title of her talk is Development of the Rio Grande rift between 25-10 Ma based on low-temperature thermochronology. Shari has collaborated with numerous Rio Grande geologists over decades in this study and has data from both Colorado and New Mexico. In addition to her meticulous laboratory work of mineral separation, sample preparation and microscope work associated with fission-track analysis, Shari is an excellent field mapper for much of her work with the New Mexico Bureau. She has climbed 14,000 foot peaks for fission-track samples!

We have a full program of distinguished speakers for the fall and I am humbled that I will be following them in December with my swan song. I look forward to seeing as many of you as possible at our next meeting on September 17.

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Student Research Grants Awarded from CSS Memorial Funds, Spring 2015

By Scott Lundstrom and Don Sweetkind

Over the past 25 years, the Colorado Scientific Society has helped support the graduate research of over 250 students, awarding a total of over \$200,000 (an average of over \$800 per grant). This achievement is extraordinary for an organization of our size and, through member contributions, exemplifies the commitment of our members to promote high-quality research in the earth sciences. The five funds that award grants for student research are: the Tweto Fund for research in the Rocky Mountains; the Oriel Fund for research in the central and northern Rocky Mountains; the Eckel Fund for research in engineering geology; the Snyder Fund for research on Precambrian geology of the Rocky Mountains; and the Pierce fund for research on the Heart Mountain fault and Quaternary geologic problems.

This year we received 14 applications for Memorial Funds grants and we were able to provide research funds to 12 of those applicants. We awarded a total of \$8619: \$2,589 from the Tweto Fund, \$1,650 from the Snyder Fund, \$1,550 from the Eckel, \$1,680 from the Oriel Fund, and \$1,150 from the Pierce Fund. Overall, grants were awarded to 2 PhD and 10 Master's degree students.

The review panel, consisting of Scott Lundstrom (2014 President), Paul Morgan (2015 President), and Matt Sares (2013 President), had the interesting work of reviewing the proposals, then aligning deserving proposals and supportable budget items with appropriate Memorial Funds. As follows, student grant awardees are listed with their degree program, university, and the title of the research project.

Eckel Fund

Emma Bradford, MS (Colorado School of Mines), Compensational behavior of debris flow fans

Derek Schook, PhD (Colorado State University), Quantifying river migration rates using nested scales of geomorphic analysis

Oriel Fund

Brady Utley, MS (Utah State University), Dynamic relationships between the Bear River, Quaternary basaltic centers, normal faults, and the resulting landscape evolution of the northeast edge of the Great Basin, southeast Idaho

Stuart Parker, MS (University of Montana), Deformed river gravel deposits of the southern Beaverhead Mountains

Weston Martin, MS (Utah State University), Source rock potential and structural setting of mid-Neoproterozoic extensional basins, Utah and Arizona

Pierce Fund

GG Ellsworth, MS (University of Memphis), The timing, rate and deformational sequence inside the Heart Mountain Detachment zone, Wyoming

Gerhard Heij, PhD (University of Oklahoma), The Heart Mountain Detachment's ultracataclasite: flash heating recorded by pseudomorphic minerals and a surprisingly consistent magnetic fabric

Snyder Fund

Suzanne Craddock, MS (Northern Arizona University), Unraveling the history of tectonic burial and Barrovian metamorphism in the Funeral Mountains, Death Valley

Daphnee Tuzlak, MS (Utah State University), Investigating patterns of bedrock incision to understand fluvial processes and tectonic deformation around the Yellowstone Hotspot — Snake River Canyon, Wyoming

Tweto Fund

Annette Patton, MS (Colorado State University), Upland process and controls on 2013 debris flows, Rocky Mountain National Park

Dirk Rasmussen, MS (Western Washington University), Assessing latitudinal gradients and spatial variability in fluvial response to abrupt global warming at the Paleocene/Eocene boundary

Luke Schaub, MS (University of Idaho), Reservoir characterization of the Logan Gulch Member of the Three Forks Formation in Western Montana

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April's Where is this Rock was identified “pretty close” by Beth Simmons; she knew what the rocks were and was sure it was on the 16th Street Mall in Denver, but couldn’t name the exact building. The stones are Pikes Peak Granite at the base, “overlain” by light gray Wall Mountain Tuff (aka Castle Rock Rhyolite). The polished column is another granite, perhaps not Pikes Peak. The picture is from the front of the Kittredge



Building, 511 16th St., Denver. Here’s a picture of the whole building front. The historic Kittredge Building “features a facade clad in native granite and rhyolite and was one of the first elevator buildings in Downtown. Completed in 1890, the Kittredge Building was designed by architect A. Morris Stuckert in a Richardsonian Romanesque style.”
http://www.denverinfill.com/subpages_special_topics/downtown_denver_historic_district.htm

Where is this Rock? -- September



I think this should be a fairly difficult picture for most people to place; I’ll bet few have seen this site.



I’ll just give one clue; it is a location that has historic significance for the State of Colorado. Write to or call Pete Modreski, pmodreski@usgs.gov or 303-202-4766, if you think you have an answer to “where and what this is”.

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Colorado Scientific Society presents four students with Special Awards in Earth Science at the Colorado State Science and Engineering Fair

On April 11, 2015, as they have for several past years, CSS members Chuck Weisenberg and Tom Sutton served as judges at the Colorado State Science and Engineering Fair and presented cash awards from the CSS to four students.

The Senior Division awards went to 2 sophomores and a freshman who studied issues of pollution around the mining areas of Silverton, Colorado

1st prize Senior Division, \$100 went to:

Hannah DeKay and Raelen Barr 10th grade, Silverton Schools, Silverton

Investigating Innovative Tools and Techniques for Heavy Metal Mapping in a Historic Mining District

A team project that looked at the difference in heavy metal contents between stream sediments and nearby trees.

2nd Prize, Senior Division \$75 went to **Liam Foster**, 9th grade, Animas High School, Durango

Testing The Water: A Review Of Various Acid Mine Drainage Remediation Options

Liam studied the remediation effects of various available materials on polluted water.

In the Junior Division, the winners both focused on land compaction issues

1st Prize Junior Division \$75 **Antonio Campos** 8th grade, Cherry Creek Challenge School Denver

Why Is Venice Sinking?

A study of compaction of various materials.

2nd Prize Junior Division \$50 **Joshua Miller**, 6th grade, Skinner Middle School, Denver

What Kind of Soil Best Supports A House During A Liquefaction Event

The kids love shaking things, but Antonio and Josh could explain every aspect of their studies.

The CSS received a nice thank-you note from Antonio Campos which read:

“Thank you very much for finding my science fair project “Why Is Venice Sinking?” worthy of your award. I enjoyed discussing my project with your representatives at the State Science Fair. You seem to have a great organization. I also appreciated the cash prize and will spend it wisely. Thanks again.”

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CSS Laramie Mountains Field Trip: Led by Emmett Evanoff (University of Northern Colorado) and Cal Ruleman, our “Middle to Late Cenozoic Geology and Geomorphology of the Laramie Mountains, Wyoming” field trip is to have taken place the weekend of September 12-13. My sources tell me that around 25 people had signed up for the trip; we’ll have a report on it in the next newsletter.

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We are sad to report the recent deaths of five Colorado Scientific Society members.
Chuck Kluth, a recent past CSS president (2006), passed away on May 25.
Jack Reed, also a past president, died on June 25.
Harald Drewes, CSS member, died on July 21.
M. Dean Kleinkopf, CSS corresponding member, died on August 1.
John Ghist, CSS member and past Webmaster for CSS, died on August 15.

John (Jack) Calvin Reed, Jr., 1930 – 2015

The Colorado Scientific Society lost a good friend, colleague, and past president (1994) this summer when Jack Reed died peacefully on June 25, 2015. John C. (Jack) Reed, Jr., received his doctorate in geology from the Johns Hopkins University in 1954. He had an exemplary career with the U.S. Geological Survey, joining the USGS in 1953. During his productive career, he contributed significantly to our understanding the geology of many regions including Alaska, the southern Appalachians, the Washington D.C. area, Colorado, New Mexico, and Wyoming. He served as Chief of the Office of Environmental Geology, and Chief of the Branch of Central Regional Geology. Jack was vice-president of the 28th International Geological Congress (1989, Washington, DC). In the latter part of his career, he accomplished lead roles as editor and compiler of major syntheses on the Precambrian geology of the U.S., and the Geologic Map of North America. He was additionally a strong leader as he effectively communicated geology to the general public and to the mountaineering community.

Jack's inclination to geology was likely influenced in his youth by his father, an Alaska geologist with the USGS. Jack's mountaineering activity with the Colorado Mountain Club was shared by his wife and partner Linda, who died only about one year earlier. One of Jack's most recent publications is a CMC field guide to Colorado Mountain geology, written with coauthor Gene Ellis.

As is illustrated in the list below, his publications include books and reports on the geology of several major National Parks, including Mount McKinley, Grand Teton, Shenandoah, and Great Falls of the Potomac. He was a noted mountaineer and contributing member of the Colorado Mountain Club, and a Fellow of the Geological Society of America. During the most recent Pick and Hammer review of the USGS (Survivor 2013), he provided his welcome sense of humor as Castaway Jack. We will miss his broad geologic perspective and humanity. ---Scott Lundstrom & Bruce Bryant

Selected publications

- Reed, J. C., Jr., 1955, Catoctin Formation near Luray, Virginia: Geol. Soc. America Bull., v. 66, no. 7, p. 871-896.
- Reed, J. C., Jr., 1961, Geology of the Mount McKinley quadrangle, Alaska: U.S. Geol. Survey Bull. 1108-A, 36 p.
- Reed, J. C., Jr., and J. Jolly, 1963, Crystalline rocks of the Potomac River Gorge near Washington, D.C.: U.S. Geol. Survey Professional Paper 414-H, 16 p.
- Reed, J. C., Jr., 1964, Geology of the Linville Falls quadrangle, North Carolina: U.S. Geol. Survey Bull. 1161-B, 53 p.
- Reed, J. C., Jr., 1969, Ancient Lavas in Shenandoah National Park : U.S. Geol. Survey Bull. 1265, 43 p.
- Reed, J. C., Jr., Bryant, Bruce, and Myers, W. B., 1970, The Brevard zone: a reinterpretation, in Fisher, G. W., Pettijohn, F. J., Reed, J. C., Jr., and Weaver, K. N., editors, Studies of Appalachian geology central and southern: New York, Interscience Publishers, p. 261-269.
- Bryant, Bruce, and John Calvin Reed Jr., 1970, Geology of the Grandfather Mountain window and vicinity, North Carolina and Tennessee: U.S. Geol. Survey Professional Paper 615
- Reed, J.C., Jr., D.M. Sheridan, and Bruce Bryant, 1973, Map showing faults, joints, foliation, and surficial deposits in the Evergreen Quadrangle, Jefferson County, Colorado: U.S. Geol. Survey I-Map 786-F

- Reed, J. C., Jr., Sigafoos, R.S. and Fisher, G.W., 1980, The river and the rocks: the geologic story of Great Falls and the Potomac River Gorge: U.S. Geol. Survey Bull. 1471, 75 p.
- Reed, J. C., Jr., Bryant, Bruce, and 7 others, 1988, Geology and Mineral Resources of Central Colorado (sponsor: Colorado Scientific Society) in Holden, G.S., ed., Geological Society of America Centennial Meeting Field Trip Guidebook: Colorado School of Mines Professional Contributions, n. 12, p. 68-121
- Reed, J.C., Jr., Marion E. Bickford, R.S. Houston, Paul Karl Link, D.W. Rankin, Paul K. Sims, and W. Randall Van Schmus, eds. 1993, Precambrian: Conterminous U.S., Geological Society of America, Decade of North American Geology vol. C2
- Love, D.D., John C. Reed, and Kenneth L. Pierce 2003, Creation of the Teton Landscape: Grand Teton Natural History Assn, 135 p.
- Reed, J.C., Jr., Wheeler, J.O., and Tucholke, B.E., 2005 Geologic Map of North America - Perspectives and explanation: Boulder, Colorado, Geological Society of America, Decade of North American Geology: 3 sheets, scale 1:5,000,000, 28 p. text
- Reed, J.C., Jr., and Bush, C.A., 2007, About the Geologic Map in the National Atlas of the United States of America: : U.S. Geol. Survey Circular 1300, 48 p.
- Reed, Jack, and Ellis, Gene., 2009, Rocks Above the Clouds: A Hiker's and Climber's Guide to Colorado Mountain Geology: Colorado Mountain Club Press, 240 p.

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"The World's Greatest Geological Wonders" course – beginning September 22

You may be interested in this opportunity, sent by Jim Keller, kellerjb10@aol.com :

"Nick Muller and I are going to facilitate a Great Courses, "The World's Greatest Geological Wonders" course at Mt Vernon Country Club starting September 22nd. It comprises 36 lectures on DVDs. Nick and I took the course under OLLI West last fall, facilitated by our good friend Jack Reed (who tragically died a couple months ago) and Jim Elliot. We enjoyed it a lot, but we only saw about two thirds of the 36 lectures. I wanted to see all of the lectures, so I bought the DVDs for the course this spring. Then I decided to present it at Mount Vernon CC to anyone who wants to come.

"We will show (at the Grill at Mt. Vernon Country Club) three 30-minute lectures during each session on six Tuesday evenings from 6:30 to 8:30 on September 22, 29, October 6, and November 3, 10, and 17. This covers half of the course. We plan to show the remaining 18 lectures in six sessions during January to March.

"The 6:30 start time provides time to grab something to eat (maybe at the Club Lounge). The 8:30 completion allows time to get kids to bed. Adults can stay over for a half hour or so, if they want to, and discuss the lectures. Since the lectures are about 30 minutes each, there is a little time (10 minutes) between them to discuss, go to the bathroom, etc.

"The price for adults is \$5 each session, to go towards the Club's audio/visual setup charge for the Grill, but children are free.

"Check out the website for more details, but here is a short description of the course.

"The World's Greatest Geological Wonders: 36 Spectacular Sites

Michael E. Wysession, Ph.D.

Washington University in St. Louis

36 lectures, 30 minutes per lecture

Yellowstone, the Grand Canyon, Mount Fuji, the Galapagos Islands. These natural wonders are on everyone's list of must-see attractions that are both spectacular and geologically fascinating. But what of Ha Long Bay, the Columbia Glacier, Erta Ale lava lake, and the Great Blue Hole? They also belong on the list, along with more than 200 other sites, both famous and obscure, that are well worth a visit to see breathtaking vistas combined with the grandeur of geological forces in action.

Shaped by erosion, plate tectonics, volcanic eruptions, and other processes over the course of billions of years, Earth is a planet of immense variety. Impressive geological scenes are everywhere. But only a select few—whether astonishing valleys, mountains, waterfalls, or other formations—qualify as geological wonders

that are not only memorable and worth a special trip, but that also tell us something profound about the way the world works.

“The last sentence above is significant. This course is not a travelogue. It is a beginning course in geology. Continental drift, subduction of tectonic plates, rifts, erosion of the Grand Canyon in only 5 million years, how volcanoes work, receding glaciers, erupting geysers, the formation of limestone caves - these are things every educated person should want to know about and should want his children to know about.

“To get more information, see <http://www.thegreatcourses.com/courses/the-world-s-greatest-geological-wonders-36-spectacular-sites.html> .

“Please respond to kellerjb10@aol.com or 303 526 0867, if you would like to attend. “

---Jim Keller and Nick Muller

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Giant Amazonite Coming to the DMNS

In 2012, the Dorris family of Colorado Springs (and Prospectors fame) opened a pocket that contained some of the biggest amazonites ever discovered; see <https://www.youtube.com/watch?v=rqQcvoZSVX4#t=6m48s> . Over the next two years, Tim Dorris cleaned and restored a massive plate from the ceiling of this pocket, called the Smoky Hawk King. The plate weighs over 85 pounds and is nearly three feet long and almost two feet wide. It is dominated by extraordinarily large amazonite, smoky quartz and cleavelandite crystals. Perhaps you’ve seen this piece on TV or on display at the 2015 Tucson or 2014 Denver mineral and gem shows. At the Denver show it handily won “Best in Show” for its size, color, completeness, and overall wow factor. Many of you, both individually and through your clubs, have already had a role in making this specimen possible through your advocacy for the gem and mineral hobby and through supporting local mining operations like the Dorris family’s. Without your support for the earth sciences, it is quite likely this specimen would never have come to light. Thank you.

Over the past year, the Denver Museum of Nature & Science, in partnership with Joe Dorris and other supporters, has been working to secure this specimen for permanent public display. Like the Alma King rhodochrosite or Diane’s Pocket aquamarine, this amazonite specimen is a key piece of US and Rocky Mountain history and of our mining heritage. Once on display it can inspire the next generation of mineral, rock, and fossil collectors and catalyze public interest in the stunning natural features of our landscape.

To learn more or arrange a behind-the-scenes showing for your group, please get in touch with the museum’s geology curator, James Hagadorn, at jwhagadorn@dmns.org. Or stop by the museum when you’re in the neighborhood!

If you or your club would like to help support the acquisition and display of the Smoky Hawk King, please go to <http://dmns.org/amazonite> to make a donation. Or, contact the museum’s advancement director, Megan Fisher, at megan.fisher@dmns.org or 303-370-8259. The Museum greatly appreciates your support.



Left: Joe and Tim Dorris pulling specimens from the partially-opened Icon Pocket at their Smoky Hawk claim, near Lake George, Colorado. Right: A spectacular amazonite, immediately after being pulled from the pocket. Images courtesy of Joe Dorris.



Above: The nearly-restored Smoky Hawk plate, as it was displayed at the 2014 Denver Mineral & Gem Show.

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Calendar of Coming Events

Sat., Sept. 12, and **Sat., Oct. 3,** two one-day field trips/classes to see & study glacial geology in the Leadville area, led by Vince Matthews, former Colorado State Geologist. **Glaciers of Lake County** will be Sept. 12, 8:30 a.m. – 5:00 p.m., and **Glaciers of Eagle and Summit Counties** will be Oct. 3, 8:30-5:00 p.m. Both are offered through Colorado Mountain College, Continuing Education; cost, \$50 for 9/12 class, \$60 for 10/3 class. Both meet first in a classroom at CMC-Leadville, then depart for a day's field trip. For more information see <http://coloradomtn.edu/campuses/leadville/continuing-education-calendar/> or call Mary Laing, 719-486-4292.

[The first of these trips has already taken place, but the second is still available!]

Tues., Sept. 15, 3:00 p.m., Denver Museum of Nature & Science, Earth Science Seminar, "**The WHAT of conodont science: Insights into Permian oceans and beyond**", by Charles Henderson, Univ. of Calgary. VIP Room at DMNS. Free lecture, museum admission not required.

Tues., Sept. 15, 5:30 p.m., at the monthly meeting of the Rocky Mountain Map Society, **William Henry Jackson, Artist and Mapmaker in His Later Years**, by Camille Bradford. "The RMMS is a non-profit organization dedicated to the study and appreciation of maps and other items of cartographic interest. The Society was formed in 1991 and is based in Denver, Colorado." In the Denver Public Library, Gates Room, Fifth Floor – Open to the Public. See <http://rmmaps.org/> for more info.

Wed., Sept. 16, 4:00 p.m., CU Geological Sciences Seminar, Boulder, **To Plug or not to Plug? Unintended consequences of Mine Plugging for Remediation at Inactive Mine Sites**, by Kirk Nordstrom, USGS, Boulder. . Benson Earth Sciences Building Auditorium (room 180). Refreshments served at 3:30 p.m. outside Benson Room 380. Everyone is welcome. . See <http://www.colorado.edu/geolsci/colloquium.htm> for the complete CU weekly seminar schedule.

Wed., Sept. 16, 6-9 p.m., Annual Open House (all are invited) at the **Colorado School of Mines Geology Museum**, 1310 Maple St., Golden. Refreshments, music, preview new displays, and meet museum staff. Held during the week of the Denver Gem and Mineral Show. For more information see <https://www.facebook.com/LikeCSMGeoMuseum> .

Thurs., Sept. 17, 7:00 p.m., monthly meeting of the Colorado Scientific Society, **Development of the Rio Grande rift between 25-10 Ma based on low-temperature thermochronology** by Dr. Shari Kelley, New Mexico Bureau of Geology and Mineral Resources. At Shepherd of the Hills Presbyterian Church, 11500 W. 20th Ave., Lakewood. All are welcome; see <http://www.coloscisoc.org/> .

Fri.-Sun., Sept. 18-20, the **Denver Gem and Mineral show** will take place at **The Denver Mart, 58th Ave. and I-25 (exit 215)**; 2015 theme, “Minerals of the American Southwest”. 9-6 Fri., 10-6 Sat., 10-5 Sun. See <http://www.denvermineralshow.com/> . The show will include mineral displays by museums and individuals, dealers, booths by all the local gem and mineral clubs and by nonprofit and public sector institutions, kids activities including gold panning, and a lecture program featuring talks about many mineral localities in the Southwest. Several commercial “satellite” mineral and gem shows also take place around town this same week, including at the Denver Marriott West (Golden) (Sept. 12-15), Denver Coliseum (Sept. 12-20), and Ramada Plaza Hotel (Denver) (Sept. 13-20).

Sat., Sept. 19, the Edgar Mine (Colorado School of Mines Experimental Mine) in Idaho Springs is celebrating its **150th Anniversary**. It will host a free “Gold Rush Era” public event, 9 a.m. – 2 p.m. Activities for kids and adults will include, Underground mine tour with a blast simulation; Historical and proposed renovation displays; Kids photo booth; Gold panning; Mine Rescue Team demonstration; Grizzled prospector costume contest; Mining collectibles silent auction. Park at the Elks parking lot or Schoolhouse parking lot; shuttles to the Edgar mine will run every 10-20 minutes. For more information see <http://www.minesnewsroom.com/press-releases/colorado-school-mines%E2%80%99-edgar-mine-celebrates-150-years-sept-19> .

Tues., Sept. 22, 10 a.m. – 12 noon, an open invitation to join in a **Planning Meeting** to organize a summer, 2016 **Symposium on Pegmatites** to be held in Colorado. Dates, detailed theme, sponsorship, meeting location, and locations for field trips are all still to be determined. Interested persons are invited to meet in the Colorado School of Mines Geology Museum Conference Room, 1310 Maple St., Golden. For more information contact Mark Jacobson, markivanjacobson@gmail.com .

Thurs., Sept. 24, 4:00-5:00 p.m., Van Tuyl lecture series at Colorado School of Mines, **Utah’s belly button: unraveling the origin of Upheaval Dome and the importance of field observations in the scientific process**”, by Bruce Trudgill, CSM. Berthoud Hall, Room 241, all are welcome. See <http://warnercnr.colostate.edu/geo-news-and-events/departments-seminars> for the complete Van Tuyl weekly lecture schedule.

Thurs., Sept. 24, 7:30 p.m., Friends of Mineralogy Colorado Chapter, bimonthly meeting: **The Grossular Locality at Sierra de Cruces (Lake Jaco), Coahuila, Mexico**, by Dennis Beals. In the VIP Room, Denver Museum of Nature & Science. All are welcome.

Wed., Sept. 30, 7:00-8:30 p.m., Horned Dinosaurs, free public talk at the Dinosaur Ridge Visitor Center (16831 W. Alameda Parkway, Morrison, C-470 and Alameda). “Join us for an evening lecture on ceratopsians, the dinosaurs with the amazing horns and frills! Have you ever wondered just how many different types of horned dinosaur there was and which ones lived in your backyard? Come on over this evening to see a presentation done by Erin LaCount on these odd but beautifully displayed dinosaurs!” These talks are geared towards adults, ages 12 and up 303-697-3466 x107.

Sat. Oct. 3, 2nd glacial geology field class led by Vince Matthews, **Glaciers of Eagle and Summit Counties**; see description listed above under the Sept. 12 class.

Sat., Oct. 10, 10 a.m. – 2 p.m., monthly “**Dinosaur Discovery Day**” at Dinosaur Ridge, Morrison. Guides are stationed all along the ridge to show and explain the fossils and geology, plus educational booths and activities by the Visitors Center. Walk up & down the ridge, or ride a tour bus for \$4. See www.dinoridge.org . This date will feature “Girl Scout Day”, with special activities for Girl Scouts.

Oct. 11-17 is annual “Earth Science Week”, sponsored by the American Geosciences Institute. For educators, the USGS will have available, complimentary copies of an Earth Science Week Teachers Packet. USGS geologist Pete Modreski will lead a public geology hike some day during this week (date not yet scheduled). For ESW public & educational resources see <http://www.earthsciweek.org/> .

Wed., Oct. 14, 3:00 p.m., Denver Museum of Nature & Science, Earth Science Seminar, "**Conodonts: Deep time clue to mass extinctions in Colorado**", by Jeff Over, SUNY-Geneseo, VIP Room at DMNS. Free lecture, museum admission not required.

Wed., Oct. 14, 4:00 p.m., CU Geological Sciences Seminar, Boulder, **Was the Cambrian Explosion an Artifact of True Polar Wander?**, by Joe Kirschvink, Caltech.

Thurs., Oct. 15, 7:00 p.m., Colorado Scientific Society, “**Field Methods Past and Present**”, by Jim Reed, Director of Research and Development, Rockware Incorporated. Shepherd of the Hills Presbyterian Church, 11500 W. 20th Ave., Lakewood.

Tues., Oct. 20, 5:30 p.m., Rocky Mountain Map Society monthly meeting, featuring **Examining 100 Years of USGS Topographic Maps in a Web-Based Platform**, by Dr. Joseph Kerski, ESRI. Denver Public Library, Gates Room, Fifth Floor; public welcome. See <http://rmmaps.org/> for more info.

Sat.-Sun., Oct. 24-25, Fall Mineral, Book, and Fossil Sale at the Colorado School of Mines Geology Museum, 9 a.m. – 4 p.m. each day. “Most prices will be reduced during the course of the event.” 1310 Maple St., CSM campus, Golden CO.

Nov. 1-4, Geological Society of American Annual Meeting, Baltimore, MD.

Nov. 12, 7:30 p.m., Friends of Mineralogy, Colorado Chapter bimonthly meeting; speaker, Dan Wray, **Cave Minerals in 3-D**. Denver Museum of Nature & Science, VIP Room; no charge and all are welcome.

Nov. 14-15, New Mexico Mineral Symposium, Socorro, NM; see <http://geoinfo.nmt.edu/museum/minsymp/home.cfm> for details.

Thurs., Nov. 19, 7:00 p.m., Colorado Scientific Society, “**Geology of Ore Deposits**” , by John Ridley, Colorado State University. Shepherd of the Hills Presbyterian Church, 11500 W. 20th Ave., Lakewood.

Fri., Nov. 20, Colorado Science Conference for Professional Development (a.k.a. Colorado Science Teachers' Conference), held at the Denver Mart, 58th Ave. at I-25. The year's major educational conference for all fields of science teachers in Colorado. See <http://coloradoscience.org/> for full information about registration and presentations. The keynote presentation will be by Dr. Scott Sampson of the Denver Museum of Nature and Science, author of "How to Raise a Wild Child" as well as "Dinosaur Odyssey: Fossil Threads in the Web of Life".

Nov. 20-22, Denver Area Mineral Dealers Show, Jefferson County Fairgrounds. No admission charge; all are welcome.

Special exhibits continuing in 2015:

The Mining Art of Buck O'Donnell, special exhibit at the Western Museum of Mining & Industry. "JC (Buck) O'Donnell created a series of pen and ink drawings for various mining related supply and informational magazines during the early to mid-20th century. His work appeared in magazines like Shaft and Development Machines and Machinery Center, Inc. O'Donnell's works served to provide visual evidence of how miners lived, how they worked, and what the western mining boom looked like to those who lived it." The exhibit opened on Sept. 10; regular admission charge. See www.wmmi.org for more details.

Steps in Stone: Walking Through Time, at the University of Colorado Museum of Natural History, CU campus, Boulder. "A new exhibition that features real fossil tracks and trackways from the University of Colorado Museum of Natural History collections". Open 9-5 weekdays, 9-4 Saturdays, 10-4 Sundays; closed on university holidays. Exhibit runs through December 2015; see <http://cumuseum.colorado.edu/>.

Explore Colorado's Mining and Mineral Heritage: Colorado minerals, gemstones, and mining history material from the Colorado School of Mines Geology Museum and Colorado's State Mineral Collection continues on display on the third floor of the Colorado State Capital Building in Denver, at least through the end of the year. You can explore this online by following this link to the Friends of the CSM Geology Museum facebook page (you don't need to have a personal Facebook account to view this information.): <https://www.facebook.com/pages/Colorado-Mining-and-Mineral-History-on-Display/358587847669017>

For more lecture series during the year see:

CU Geological Science Colloquium (Wednesdays, 4 p.m.) see <http://www.colorado.edu/geolsci/colloquium.htm>
CSU Dept. of Geoscience Seminars (Fridays, 4 p.m.), see <http://warnercnr.colostate.edu/geo-news-and-events/departments-seminars>

Van Tuyl Lecture Series, Colorado School of Mines, (Tuesdays, 4 p.m.) see http://inside.mines.edu/GE_Lecture-Series

Denver Mining Club (Mondays, noon), see <http://www.denverminingclub.org/>

Denver Region Exploration Geologists Society (DREGS; 1st Monday, 7 p.m.), <http://www.dregs.org/index.html>
Rocky Mountain Map Society (RMMS; Denver Public Library, Gates Room, 3rd Tuesday, 5:30 p.m.), <http://rmmaps.org/>

Western Interior Paleontology Society (WIPS; Denver Museum of Nature & Science, 1st Monday, 7 p.m.), <http://westernpaleo.org/>.

2015 CSS Elected Officers

President.....Paul Morgan, 303-384-2648, morgan@mines.edu
President Elect.....Peter Barkman, 303-384-2642, barkmann@mines.edu
Treasurer.....Don Sweetkind, 303-236-1828, dsweetkind@usgs.gov
Secretary.....Lisa Fisher, 303-215-0480, lisa.fisher@escalantemines.com
Past President..... Scott Lundstrom, 303-917-2849, pslundstrom@msn.com

Councilors

2013-2015: Marieke Dechesne, 303-236-1289, mariekedechesne@gmail.com
2013-2015: Liz Pesce, pesce.e@gmail.com
2014-2016: Celia Greenman, celia.greenman@earthlink.net
2014-2016: Chris Morrison, chris-morrison@comcast.net
2015-2017: Bruce Geller, 303-273-3823, bgeller@mines.edu
2015-2017 Pete Modreski, 303-202-4766, pmodreski@aol.com

Committee Chairpersons

Best Student Paper Competition:
Database Manager: Don Sweetkind, 303-236-1828, dsweetkind@usgs.gov
Field Trips: Cal Ruleman, 303-236-7804, cruleman@usgs.gov
History: Beth Simmons, cloverknoll@comcast.net
Hospitality: Jack Krajewski, gjack08@gmail.com
Membership/Mentor: Liz Pesce, pesce.e@gmail.com
Student Research Grants: Scott Lundstrom, 303-917-2849; csslund15@gmail.com
Newsletter Editor: Pete Modreski, 303-202-4766, pmodreski@aol
Outreach: Linda Barton Cronoble, 720-338-1237, lbarton1611@gmail.com
Program: Open
Publicity: Open
State Science Fair: Chuck Weisenberg, 303-238-8806, cweisenbrg@msn.com
Webmaster: Barb Warden, 303-278-2701, bwarden@tablemtn.com

Colorado Scientific Society, P.O. Box 150495, Lakewood CO 80215-0495

Our website: <http://www.coloscisoc.org>

Upcoming CSS meetings (all planned for Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood):

October 15 – “Field Methods Past and Present”, by Jim Reed, Rockware Incorporated.
November 19 - “Geology of Ore Deposits”, by John Ridley, Colorado State University.
December 17 – CSS Annual Meeting and Presidential Address (potluck dinner)

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Colorado Scientific Society dues are \$20 for regular members, \$10 for corresponding members (outside the Colorado Front Range area) and only \$5 for students. You may pay dues by mailing a check to the CSS, or pay with a credit card using PayPal on the CSS website. Please contact CSS Treasurer Don Sweetkind at 303-236-1828 or dsweetkind@usgs.gov if you are uncertain of your dues and membership status. Extra payments to contribute to our Memorial Funds or Endowment Fund are always most welcome (you’ll see a list of them on the membership form). See our website for a membership form, <http://www.coloscisoc.org/membership/dues.html>.