



Colorado Scientific Society

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

April Meeting, Thursday, April 20, 2017, 7:00 p.m.
Shepherd of the Hills Presbyterian Church, 11500 W. 20th Ave., Lakewood CO
Social time beginning at 6:30; meeting & program at 7:00

Simple, Serious, and Solvable: The Three S's of Climate Change

Scott Denning

**Dept. of Atmospheric Science, Colorado State University,
Fort Collins, Colorado**



Professor Scott Denning received his B.A. in Geological Sciences from the University of Maine in 1984, and his M.S. and Ph.D. degrees in Atmospheric Science from Colorado State University in 1993 and 1994. He studied radiometric geochronology, surface water geochemistry, and mountain hydrology before becoming interested in global climate and biogeochemical dynamics. After a two-year postdoctoral appointment modeling global sources and sinks of atmospheric CO₂, he spent two years as an Assistant Professor in the Donald Bren School of Environmental Science and Management at the University of California at Santa Barbara. He joined the Atmospheric Science faculty at Colorado State University in 1998, and has served as Director of

Education for CMMAP since 2006. He does a lot of outreach about climate change, and takes special delight in engaging hostile audiences.

Simple, Serious, and Solvable: The Three S's of Climate Change

Climate Change is Simple. Heat in minus heat out equals change of heat. When Earth absorbs more heat than it emits, the climate warms. When it emits more than it absorbs, the climate cools. This simple principal explains why day is warmer than night, summer is warmer than winter, and Miami is warmer than Minneapolis. It also explains why adding CO₂ to the air causes global warming. The absorption of thermal infrared radiation by CO₂ was first measured 150 years ago, has since been confirmed thousands of times by labs all over the world, and is extremely well understood. There is no doubt at all that adding CO₂ reduces Earth's heat emission and therefore causes global warming.

Climate Change is Serious. Warmer average temperatures are associated with dramatic increases in the frequency of extremely hot weather. Warmer air evaporates more water from soils and vegetation, so even if precipitation doesn't change the demand for water will increase with warmer temperatures. Adding water vapor to the air also means there is more water available for heavy rains when the right conditions occur: this means that in addition to more drought, a warmer climate will include heavier rainfall during extreme events. Warmer ice sheets release more water the oceans, which also expand as they get warmer. These two influences raise sea levels, threatening coastlines everywhere. Higher seas imply much more frequent coastal flooding, requiring abandonment long before mean sea level reaches coastal infrastructure. Without strong policy, these impacts will become more and more severe almost without bound, growing to become the most serious problems in the world and lasting for many centuries after fossil fuels are abandoned. The consequences of unchecked climate change to the global economy are unacceptable.

Climate Change is Solvable. Preventing catastrophic climate change will require abundant and affordable energy to be made available to people everywhere without emitting any CO₂ to the atmosphere. This will require both the development of energy efficient infrastructure and very rapid deployment of non-fossil fuel energy systems, especially in the developing world. From an engineering perspective, both objectives are eminently feasible with mature technologies. Economically, the clean energy transition will be expensive, involving roughly 1% of the global economy. This cost is comparable to previous development achievements such as indoor plumbing, rural electrification, the global internet, and mobile telecommunications. Our descendants will better lives by developing and improving their infrastructure just as our ancestors did.

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Dates for more upcoming CSS activities:

April 22 – CSS booth/participation at Denver March for Science

May 10 – Past Presidents' Dinner, Mount Vernon Country Club, featuring "Manya, a Visit with Marie Curie"

May 18 – Emmons Lecture, American Mountaineering Center, Julie Brigham-Grette: Too Warm, Two Poles: How Past Super Interglacials Should Inform Future Coastal Policy

June 25 – Field Trip, Geology of South Park, led by Peter Barkmann

Aug. 25-26 – Flat Tops/White River Plateau Field Trip, led by James Hagadorn

COLORADO SCIENTIFIC SOCIETY, SCHEDULE OF TALKS AND TOPICS FOR 2017

- January 19 Giff Miller, INSTAAR and Geological Sciences, University of Colorado: **An Arctic perspective on contemporary warming**
- Feb. 16 Cal Ruleman, Geology and Environmental Change, USGS: **Late Neogene Tectonic and Volcanic Fragmentation and Middle Pleistocene Climate-Driven Drainage Integration of the Southern Rocky Mountains**
- March 16 Will Yeck, National Earthquake Information Center, USGS: **The Far-Reaching Effects of Wastewater Injection: Recent Case Studies of Anthropogenic Earthquakes**
- April 20 Scott Denning, Atmospheric Sciences, Colorado State University: **Climate models and global change**
- May 10 **CSS annual Past Presidents Dinner.** Mt. Vernon Country Club, Golden CO. Social time at 5, dinner at 5:30, and a special presentation at 7:30, in celebration of the society's 135 anniversary: **Manya, a Visit with Marie Curie.**
- May 18 (Emmons Lecture) Julie Brigham-Grette, University of Massachusetts-Amherst: **Too Warm, Two Poles: How Past Super Interglacials Should Inform Future Coastal Policy** (to be held at the American Mountaineering Center, Golden)
- June 25 **Field Trip, Geology of South Park**, led by Peter Barkmann
- Aug. 25-26 **CSS Flat Tops/White River Plateau Field Trip**, led by James Hagadorn
- Sept. 21 **Student Paper Night** (to be held at Arbor House, Maple Grove Park)
- Oct. 19 Suzette Morman, Crustal Imaging and Characterization, USGS: **Using Geoscience to Augment Environmental Public Health Studies**
- Nov. 16 Simone Marchi, Southwest Research Institute, Boulder, **Planetary Geology** (exact title TBA)
- Dec. 21(?) Marith Reheis, Emeritus USGS: **President's address** (Arbor House, Maple Grove Park (exact date to be confirmed))

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FYI – “Geology Train” on the Cumbres & Toltec Scenic Railroad, June 18.

Once a year, the Cumbres & Toltec Scenic Railroad schedules a special “Geology Train”, which in addition to making their regular 64-mile train trip from Antonito CO to Chama NM, makes several extra stops where passengers get off to study geology in the railroad cuts, accompanied by a geologic guide(s). Lunch is included, and the return is by motor coach.. I’m told that reservations for the Geology Train usually fill up quite early in the season. Tickets for the Geology Train cost \$161 (the regular trip fare is \$96). Full information is on their website at <http://cumbrestoltec.com/> . I have this info thanks to Peter Barkmann, who I believe has been involved in preparing the geologic guide for this trip.



April 2017 President's Message , Marith Reheis, Emeritus, U.S. Geological Survey

I'm back from the Grand Canyon, refreshed but behind on everything! What a wonderful trip—28 days rafting from Lees Ferry to Pearce Ferry, 280 river miles, 7 layover days, numerous short and long hikes, lots of music and geology, perfect weather. The lower part of the canyon, below Diamond Creek, is almost never seen by commercial trip passengers, but it's just as interesting (if more noisy in places due to helicopters!). Because Lake Mead is so low, the river continues well past Pearce Ferry now, and I really enjoyed seeing how the side canyons are re-establishing their courses and even some little riffles as they cut through the delta sediments. If you ever get the chance, take it!

Our Society will be finishing up the spring in a whirlwind of activities. We will have one more regular meeting on April 20 with a talk on climate change by Scott Denning (CSU). CSS will have a significant presence in the Denver March for Science, to be held at Civic Center Park from 10AM to 3PM on Earth Day, Saturday April 22. In addition to marching, we will man an informational booth in the park. We encourage our members to attend and participate, and perhaps to don a special CSS t-shirt we hope to have ready for the upcoming meeting. You can even download and print signs with the CSS logo from our website to carry on the march, or even to put in your window! Next is the Past President's Dinner, which will be held on May 10. As this is the 135th anniversary of the Society, we are making this event special by hosting it at the Mount Vernon County Club with a reenactor portraying Marie Curie. Finally, the annual S.F. Emmons lecture will be given May 18 at the American Mountaineering Center auditorium in Golden. This year's lecturer is Julie Brigham-Grette (U. Mass Amherst) on past "super interglacials" and their implications for coastal development. So mark your calendars for all these special occasions.

We will join with the Florissant Scientific Society (lots of membership overlap!) on a one-day field trip on June 25 to be led by Peter Barkmann on new geologic findings made in South Park by the Colorado Geological Survey. Watch for the details in the May newsletter, along with preliminary information on the field trip in August to the White River Plateau and vicinity, led by James Hagadorn.

Denver March for Science, April 22

Join the Colorado Scientific Society at the March for Science in Denver. The March will start and end in Civic Center Park, between Broadway (State Capitol side) and Bannock St. (Denver City & County Building side). Events (speeches, musical groups) will be taking place between 9 a.m. to 2 p.m. The March itself will begin at 10:00 (get there early!) and will follow a route up Bannock, 14th St., and Court Pl. to 15th St., up 15th St. to Welton St., then down 17th St. to Broadway and back to Civic Center Park. Before or after, visit the Colorado Scientific Society table in the area for "Earth, Rivers, and Oceans" in Civic Center Park. The area with our booth will be in the central/northeast part of the park, closest to Colfax Ave.

The CSS Council approved this endorsement: "The Colorado Scientific Society endorses the March for Science on Earth Day, Saturday, April 22, 2017. For 135 years our Society has promoted the understanding of science and its application to public needs. We believe our civilization is made better by scientific research and discovery. We support research across all disciplines. Earth Day brings a focus on earth sciences, an arena of scientific endeavor that enhances our ability to benefit from and wisely use Earth's resources and helps us better understand the context of our place on Earth. Through this endorsement, we encourage our members and our colleagues to redouble their efforts to share their scientific perspectives with their friends and their communities."

CSS has ordered a batch of **CSS/March for Science T-shirts** that will be available in time for the March! You can pick one up at our April 20 meeting, or, at our booth on the day of the March. I believe the cost will be \$20. If you want to reserve one, please write or call Marith Reheis to do so (303-277-1843, marith16@gmail.com)--specify your size. Otherwise, first come, first served (we've ordered about 40).

The official March for Science facebook site, <https://www.facebook.com/events/1349869341753329/>, states: "The March for Science champions publicly funded and publicly communicated science as a pillar of human freedom and prosperity. We unite as a diverse, nonpartisan group to call for science that upholds the common good and for policymakers to enact evidence-based policies in the public interest."

Welcome new members!

We are pleased to welcome the following new members* who have joined the Colorado Scientific Society in recent months:

- Jim Bullecks
- Jim Burnell

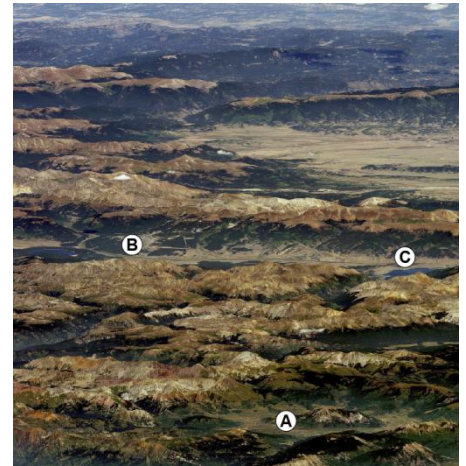
*New members—if you have joined recently but gave us just an email address, please be sure to write and send us a complete mailing address so our records can be more complete and to help us know more about who and where our members are. Thanks!

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March’s “What are these places?” I received two sets of answers, both correct, to the features to be identified in the this DigitalGlobe WorldView-3 satellite image of Colorado, provided by Don Sweetkind; from Elisa Klitzke and from Chris Morrison. Elisa’s answers arrived first, and she wrote:



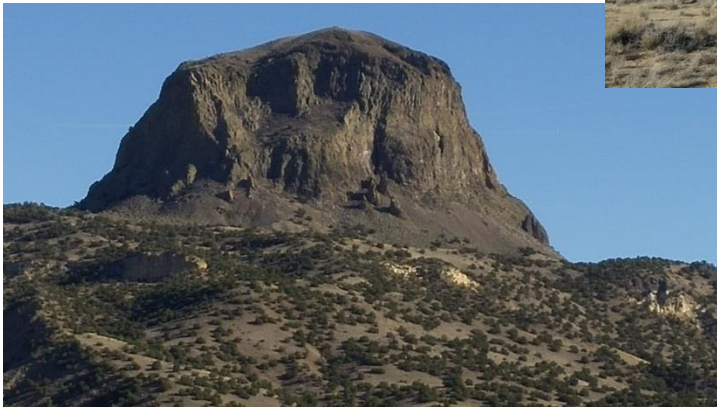
“The mountain to the right of the label “A” is Mount Crested Butte. The mountain below the label “B” is Mount Massive. The lake below the label “C” is one of the Twin Lakes. Also, the lake to the left of B is Turquoise Lake.” I’m sure that others, who tried, were able to recognize most or all of these features, too (but Elisa and Chris get the prize!).



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April “Where is this rock?”

My one comment about this photo (right) will be, I visited here, last month. I’ll add a bonus zoomed-in photo of it too, below, left (from a different perspective). And, for extra credit—a second place/feature to identify, below right. Send your answers to editor Pete Modreski, pmodreski@usgs.gov.



Colorado Scientific Society dues are \$25 for regular members, **\$20 if dues renewals are paid before Jan. 31 of each year**, \$10 for corresponding members (outside the Colorado Front Range area) and only \$5 for students. A Lifetime Membership is now available, for \$395.00. Mail 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 or 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 attached to this newsletter, or see our website at <http://www.coloscisoc.org/membership/dues.html>.

Colorado Scientific Society, P.O. Box 150495, Lakewood CO 80215-0495 <http://www.coloscisoc.org>

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Calendar of Coming Events

Tues., Apr. 18, 10:30 a.m., USGS Rocky Mountain Science Seminar series, “**Geochemical approaches to studying the environmental chemistry and microbial ecology of the cystic fibrosis lung**”, by Sebastian Kopf, CU Boulder. Visitors are welcome; in the Building 25 auditorium (enter the Federal Center at the main gate, Gate 1, on Kipling St.; park east of building 25 and use building entrance E-14).

Wed., Apr. 19, 4:00 p.m., CU Geological Sciences Seminar, Boulder, **Carving the Grand Canyon and Places Like it: Developments Toward the Integration History of the Colorado River**, by Andy Darling, CSU; Benson Earth Sciences Building Auditorium (room 180). All welcome; refreshments are served at 3:30 in the 2nd floor atrium.

Thurs, Apr. 20, 7:00 p.m., monthly meeting of the Colorado Scientific Society, featuring a talk by Scott Denning, Atmospheric Sciences, Colorado State University, “**Simple, Serious, and Solvable: The Three S’s of Climate Change**”. At Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood. All are welcome. Social time 6:30, meeting begins at 7. See www.coloscisoc.org for more info.

Sat., Apr. 22 (Earth Day), March for Science, Denver. 10 a.m. to 3 p.m., Civic Center Park (Colfax Ave. & Bannock St.), Denver. “The March for Science is a celebration of our passion for science and a call to support and safeguard the scientific community. The March for Science champions robustly funded and publicly communicated science as a pillar of human freedom and prosperity. We unite as a diverse, nonpartisan group to call for science that upholds the common good and for political leaders and policymakers to enact evidence-based policies in the public interest.” For more info see <https://www.facebook.com/events/1349869341753329/permalink/1422737527799843/> and <https://www.facebook.com/groups/1243413865743907/>. The Colorado Scientific Society (among many other science organizations) will have a booth at the “teach-in” area in Civic Center Park; if you are at the March, please stop by and say hello to those of us who will be representing CSS.

Sun., Apr. 23, 8 a.m., (day-after Earth Day) Geology Hike on North Table Mountain, to include seeing the Table Mountain lava flows, sedimentary rocks of the Denver Formation, and the zeolite locality in the middle lava flow at a former paving stone quarry, now part of Jefferson County Open Space. A 1.3-mile hike each way; we will meet at 8 a.m. at the trailhead at Easley Way & Ulysses Way, on the southeast side of North Table Mountain. To be led by USGS geologist Pete Modreski. **Please note change in date & time from what was announced earlier, so as not to conflict with the March for Science - Denver (see above).** For more info or to confirm attending, please contact (weekdays) pmodreski@usgs.gov, 303-202-4766, or (weekend contact info) pmodreski@aol.com, cell 720-205-2553. We should return from the hike by 12 noon—in time for anyone interested to drive to the Dinosaur Discovery Center to hear Peter Barkmann’s talk about the Geology of South Park (see below).

Sun., Apr. 23, noon (shared potluck lunch), 1 p.m. (lecture), “Geology of South Park”, presentation at the monthly meeting of the Florissant Scientific Society, by Peter Barkmann, Colorado Geological Survey. At the Dinosaur Discovery Center, west side of Dinosaur Ridge, 17681 W. Alameda Parkway Morrison (located at Entrance 1, the north entrance, to Red Rocks Park). See <http://www.fss-co.org/> for details, or contact Beth Simmons at cloverknoll@comcast.net. All are welcome. Peter plans to follow up this talk by leading a 1-day geology field trip across South Park on Sunday, June 25 (details TBA).

Wed., Apr. 26, 4:00 p.m., CU Geological Sciences Seminar, Boulder, **Isotopes & ivory: Geochemical approaches to wildlife forensics, elephant ecology, and paleoclimate**, by Kevin Uno, Lamont-Doherty Earth Observatory, Columbia University; Benson Earth Sciences Building Auditorium (room 180). All welcome; refreshments are served at 3:30 in the 2nd floor atrium.

Sat.-Sun., April 29-30, 9 a.m. – 4 p.m., “**Announcing another ridiculously exciting Book/Garage Sale**” at the **Colorado School of Mines Geology Museum** 1310 Maple St., Golden. “Thousands of maps; hundreds of books, journals, minerals, fossils, etc. Prices vary by item or box. Most prices will drop throughout the event. Information: 303-273-3815.”

Tues., May 2, 10:30 a.m., USGS Rocky Mountain Science Seminar series, “**Radiocesium attenuation by clays: an emerging view of interlayer accessibility**”, by Laura Nielsen Lammers, UC Berkeley. Visitors are welcome; in the Building 25 auditorium (enter the Federal Center at the main gate, Gate 1, on Kipling St.; park east of building 25 and use building entrance E-14).

Wed., May 3, 4:00 p.m., CU Geological Sciences Seminar, Boulder, **The Obstacles Are Largely the Same: On Climate Change and Education Reform**, by Don Duggan-Haas, the Paleontological Research Institution and Museum of the Earth, Ithaca, NY; Benson Earth Sciences Building Auditorium (room 180). All welcome; refreshments are served at 3:30 in the 2nd floor atrium.

Sat., May 6, 11 a.m. – 2:45 p.m., **Colorado Mineral Society's silent and verbal auction**, Holy Shepherd Lutheran Church, 920 Kipling St. (3 blocks north of West 6th Ave.) Lakewood, CO 80215. See <http://www.coloradomineralsociety.org/> for more info.

Wed., May 10, 5:30 p.m., **Colorado Scientific Society's annual Past Presidents' Dinner**. Mt. Vernon Country Club, Golden CO. Social time at 5, dinner at 5:30, and a special presentation at 7:30, in celebration of the society's 135 anniversary: **Manya, a Visit with Marie Curie**. Save the date! Full information will be available in our next newsletter. Non-members will be invited to join us for this dinner and presentation, too.

Fri., May 12, 3:00 p.m., **The Evolution of Sensory Systems in Mammals**, by Simone Hoffman, New York Institute of Technology; Denver Museum of Nature & Science Earth Sciences Colloquium, VIP Room, DMNS, all are welcome, Museum admission not required to attend.

Sat., May 13, Friends of Mineralogy, Colorado Chapter, Silent Auction. Clements Community Center, 1580 Yarrow St., Lakewood CO, 12:00-4:00 (setup begins at 10:30 a.m., auction begins at 12:00, verbal auction 1:00, all tables will close by 3:00 p.m., checkout follows). For more info see <http://friendsofmineralogycolorado.org/> .

Sat., May 13, Dinosaur Discovery Day – Boy Scout Day at Dinosaur Ridge, Morrison, CO. Scouts as well as the public are invited.” Parking will be off-site at the Bandimere Speedway overflow lot located east of C-470 and south of Alameda along S. Rooney Road. Signs will be posted. Parking is \$5 per car, paid as you enter. More than 80 earth scientists and other volunteers, including certified Merit Badge Counselors, assist with the event.” There is a registration fee for participating Scouts, and a \$4 per person charge for persons (over age 3) who wish to take a bus tour of the ridge” (no charge for just a walking tour). For full information see <http://www.dinoridge.org/scoutdays.html#bsa> . The next Dinosaur Discovery Day will be **Saturday, June 10**. For a full list of upcoming lectures, field days, and other events at Dinosaur Ridge see <http://www.dinoridge.org/calendar.html> .

Tues., May 16, 10:30 a.m., USGS Rocky Mountain Science Seminar series, “**Middle Cenozoic Patagonian marine transgressions: eustasy or tectonic loading during uplift of the Andes?**”, by Julie Fosdick, Univ. of Connecticut. Visitors are welcome; in the Building 25 auditorium (enter the Federal Center at the main gate, Gate 1, on Kipling St.; park east of building 25 and use building entrance E-14).

Thurs., May 18, 7:00 p.m., **Too Warm, Two Poles: How Past Super Interglacials Should Inform Future Coastal Policy**, Julie Brigham-Grette, University of Massachusetts-Amherst. Annual S.F. Emmons Lecture of the Colorado

Scientific Society; American Mountaineering Center Auditorium, 710 10th St., Golden. No admission charge and all are welcome.

Sun, May 21, noon (shared potluck lunch), 1 p.m. (lecture), “**A geologic cross section of Colorado along the I-70 corridor**”, by geologist Ned Sterne. At the Dinosaur Discovery Center, west side of Dinosaur Ridge, 17681 W. Alameda Parkway Morrison (located at Entrance 1, the north entrance, to Red Rocks Park). See <http://www.fss-co.org/> for details, or contact Beth Simmons at cloverknoll@comcast.net . All are welcome.

Mon., May 22, 3:00 p.m., **Hyperthermals: Extreme Global Warming Events in the Geological Past**, by William Clyde, University of New Hampshire;. Denver Museum of Nature & Science Earth Sciences Colloquium, VIP Room, DMNS, all are welcome, Museum admission not required to attend.

Fri.-Sun., May 26-28, Fossil Fish Dig, Kemmerer, Wyoming. Friends of Dinosaur Ridge is sponsoring a field trip to collect fossil fish at a private quarry in Kemmerer, WY. The registration fee of \$550 per person (\$525 for Friends members and volunteers) includes transportation to and from Kemmerer, 2 nights lodging, 2 breakfasts and 2 lunches, 2 speaker sessions about the fossils, and 2 days (4 hours each) digging for fossils. Registration and full payment is due by May 5. For full info and a copy of the registration form, please write to volunteer@dinoridge.org.

Tues., May 30, 10:30 a.m., USGS Rocky Mountain Science Seminar series, “**The Community Earth System Model (CESM) Large Ensemble Project: A community resource for studying climate change in the presence of internal climate variability**”, by Jen Kay, CU Boulder. Visitors are welcome; in the Building 25 auditorium (enter the Federal Center at the main gate, Gate 1, on Kipling St.; park east of building 25 and use building entrance E-14).

Fri.-Sat.-Sun., June 2-4, Pikes Peak Gem & Mineral Show, sponsored by the Colorado Springs Mineralogical Society. At Mortgage Solutions Financial Expo Center, 3650 N. Nevada Ave., Colorado Springs. 10-5 Fri. & Sat., 10-4 Sun.

Sunday, June 25, a geologic field trip through South Park, led by Peter Barkmann, Colorado Geological Survey. A one-day field trip sponsored by the Florissant Scientific Society; all are welcome to attend. Details are still TBA. The trip will generally follow the route of a trip Peter led during the 2016 Geological Society of America annual meeting,

Sat.-Sun., July 15-16, The **Florissant Scientific Society** will hold its annual multi-day event at the Bear Basin Ranch in southern Colorado, south of Canon City. “Gary Ziegler, ranch owner and international archeologist will show us the culturally modified trees there and tell us about his work in Peru. There is a cabin where 6-8 people can bed down for the night. Campers are welcome. You can look at the Bear Basin Ranch's website to get a feel for the ranch. Other accommodations are available in Westcliffe and Florence. More information, including costs, to come later.” See <http://www.fss-co.org/> for future info to be posted.

Thurs.–Mon., July 20-24, Gold and Silver Deposits in Colorado, a symposium cosponsored by the Friends of the Colorado School of Mines Geology Museum, the CSM Museum, DREGS (Denver Region Exploration Geologists Society), and Friends of Mineralogy, Colorado Chapter. The event will include a welcoming reception at the CSM Museum (Thursday evening), two days of talks (Sat.-Sun., July 22 - 23), a Saturday evening banquet with a speaker, and two days of field trips (Fri. July 21 and Mon. July 24) to historic Colorado gold and silver mining areas, focusing on the Front Range and the northern half of the Colorado Mineral Belt. More information about the symposium is at: <https://www.facebook.com/LikeCSMGeoMuseum/posts/1822491981371516> . Registration cost will be \$100; students, \$50; banquet, \$40; each field trip, \$40. The registration form, including the list of field trips, is now available on the Friends of Mineralogy-COLORADO Chapter website, at <http://friendsofmineralogycolorado.org/gold-and-silver-deposits-in-colorado-a-symposium/> .

Sep. 15-17, 50th annual Denver Gem and Mineral Show, Denver Mart, 451 E 58th Ave., Denver, CO. **Gold and Silver** is the 2017 show theme. See <http://denvershow.org/wp/>

2017 DMNS EARTH SCIENCES COLLOQUIUM SERIES

Location: Denver Museum of Nature & Science, VIP Room (Enter the museum and make a hard left, pass the gift shop on your right, bathrooms on the left, and then the TRex Café on the right; the VIP room is at the far NE corner of the museum, just past the set of 3 TRex Café cash registers). Time: 3:00 - 4:00pm. Museum admission in *not* required to attend.

- Fri., May 12**, Simone Hoffman (New York Institute of Technology), **The Evolution of Sensory Systems in Mammals**
- Mon., May 22**, William Clyde (University of New Hampshire), **Hyperthermals: Extreme Global Warming Events in the Geological Past**
- Fri., Sept. 22**, Raymond Rogers (Macalester College), **Twenty Years of Paleontological Adventure & Discovery on the Great Red Island, Madagascar**
- Mon., Oct. 9**, Graham Young (Manitoba Museum), **Tropical fossils from the edge of the Arctic**
- Thurs., Nov. 2**, Jaelyn Eberle (University of Colorado, Boulder), **Life at the Top of the Eocene Greenhouse World**
- Tues., Dec. 5**, Ellen Currano (University of Wyoming), **Seeing the forest through the leaves - from Ethiopia to the Rocky Mountains**

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For more lecture series during the year see:

Colorado Café Scientifique in Denver, monthly lectures on science topics held either at Blake Street Station or Brooklyn’s, Denver; open to the public, no charge other than refreshments you may choose to purchase; see <http://cafescicolorado.org/> .

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/department-seminars>

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

Denver Mining Club (Mondays, 11:30), see <http://www.denverminingclub.org/>

Denver Region Exploration Geologists Society (DREGS; 1st Monday, 7 p.m.), <http://www.dregs.org/index.html>

Florissant Scientific Society (FSS); meets monthly in various Front Range locations for a lecture or field trip; meeting locations vary, normally on Sundays at noon; all interested persons are welcome to attend the meetings and trips; see <http://www.fss-co.org/> for details and schedules.

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/> .

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New CSS Officers for 2017 (elected at the December 21, 2016 meeting)

- President..... Marith Reheis, 303-277-1843, marith16@gmail.com
- President Elect..... Bob Raynolds, bob.raynolds@dmns.org
- Past President..... Peter Barkmann, 303-384-2642, barkmann@mines.edu
- Secretary..... Lisa Fisher, 303-215-0480, lisa.fisher@alumni.mines.edu
- Treasurer..... Don Sweetkind, 303-236-1828, dsweetkind@usgs.gov

Councilors

- 2015-2017: Bruce Geller, bgeller@mines.edu, 303-273-3823
- 2015-2017 Pete Modreski, pmodreski@usgs.gov, 303-202-4766
- 2016-2018: Linda Barton Cronoble, lbarton1611@gmail.com, 720-338-1237
- 2016-2018: Melissa Foster, melissa.ann.foster@gmail.com, 707-498-2484
- 2017-2019: Jim Reed, jim@rockware.com
- 2017-2019: Chris Morrison, chris-morrison@comcast.net

Committee Chairpersons

Database Manager: Paul Morgan, 303-384-2648, morgan@mines.edu

Field Trip Chair: Cal Ruleman, 303-236-7804, cruleman@usgs.gov

GSA Meeting Co-chairs, Lisa Fisher & Libby Prueher

History Chair: Beth Simmons, cloverknoll@comcast.net

Hospitality Chair: Linda Barton Cronoble, 720-338-1237, lbarton1611@gmail.com

Membership Chair: Bob Raynolds, bob.raynolds@dmns.org

Newsletter Editor: Pete Modreski, 303-202-4766, pmodreski@aol.com or pmodreski@usgs.gov

Outreach Chair: open

Past Presidents' Best Paper Award, Peter Barkmann, 303-384-2642, barkmann@mines.edu

Publicity Chair: open

State Science Fair: Chuck Weisenberg, 303-238-8806, cweisnrg@msn.com *new volunteers wanted!*

Student Programs Chair: Melissa Foster, Melissa Foster, melissa.ann.foster@gmail.com, 707-498-2484

Student Research Grants Chair: Peter Barkmann, 303-384-2642, barkmann@mines.edu

Webmasters: Chris Morrison, chris-morrison@comcast.net, and Barb Warden, bwarden@tablemtn.com

New CSS Dues Structure

At our January CSS Council meeting, the Council voted to change the dues structure. Regular annual membership will now be \$25 (up from the previous longtime rate of \$20), *however*, any renewing member paying their dues for the upcoming year no later than Jan. 31 of each year, will receive a reduced rate of \$20. A new category of Lifetime Membership has been established, with a onetime payment of \$395.00. The dues rate for Corresponding Members (those who live beyond the Front Range area and who cannot regularly attend meetings) will remain at \$10, and the Student Member rate will remain at \$5. Members are always encouraged to consider making an extra contribution to one of the Society's Memorial Funds or to the Endowment Fund. A membership form showing the new rates was attached to last month's newsletter. You may also pay dues online, at <http://coloscisoc.org/membership-payment/>, with payment by Paypal or credit card, or you may always mail a check to **Colorado Scientific Society, P.O. Box 150495, Lakewood CO 80215-0495**.

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For more news & information about the Society, always check our website, www.coloscisoc.org, or search for us, Colorado Scientific Society, and "like" us on Facebook. Anyone can view our facebook page, whether you have an account or not, at <https://www.facebook.com/groups/511533159044226/>.