



Colorado Scientific Society

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

November Meeting, Thursday, Nov. 15, 2018, 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

All are welcome!

2 presentations:

*Geothermal Energy
by Jeff Winick, Geothermal
Energy Consultant, and*



*Geothermal
Energy Potential of
Colorado, by Jen
Livermore, Solstice Geothermal and Geothermal
Resources Council*

Geothermal Energy

by Jeff Winick, Geothermal Consultant

Jeff's talk will provide an introductory overview of geothermal energy, with topics that include the formation and characteristic elements of geothermal resources, and the basic technologies used to discover and develop them for a range of applications (electric and non-electric utilization). Jeff will also provide a high-level overview of the changing US electricity market, some key drivers and challenges, and the role that geothermal energy can play in this energy transformation.

Jeff Winick has more than 18 years of experience in energy, mineral, and water resource management. This includes leading technical teams, interdisciplinary project management, and international experience in development and operations. His technical specialization is in the collection, analysis, and interpretation of geochemistry data as a decision-making tool in multiple industry settings. Jeff works for Allegheny Science and Technology and is currently on contract to the US Department of Energy where he is the lead author and project manager for the GeoVision study. The study establishes a vision for growth of the U.S. geothermal industry based on R&D advancements in cost reduction, improved performance across geothermal resources and technologies, and techno-economic analysis of industry growth scenarios out to the year 2050. Jeff holds a master's degree from New Mexico Tech and a bachelor's degree from Franklin and Marshall College.

Colorado Geothermal Resources Overview & 2018 Update

by Jen Livermore, Consulting Geophysical Engineer

Jen will discuss the geothermal energy potential of the state of Colorado. She will provide a regional overview of Colorado's geothermal prospectivity based on its geological and structural setting. Specific hydrothermal systems will be highlighted with information regarding the geothermal system's conceptual model based on desktop studies. The current status of geothermal development in Colorado for both direct-use applications and utility-scale geothermal projects will be presented.

Jen Livermore is a consulting geophysical engineer with a specialization in electrical and electromagnetic geophysical methods for natural resource exploration. Primary areas of geoscientific focus include deep imaging of geothermal systems utilizing the magnetotelluric method and direct-use applications of geothermal resources. Jennifer received a BS in Geophysical Engineering from the Colorado School of Mines in 2006, attended the inaugural National Geothermal Academy at the University of Nevada Reno in 2011, and completed an MS in Global Energy Management from the University of Colorado Business School in 2014. She is currently a board director of the Geothermal Resources Council industry group and an advocate for the geothermal industry.

November 2018 President's Message

Whence and Whither

At the Denver Museum of Nature & Science I have collaborated for the past few years with Space Science Curator Dr. KaChun Yu. We have presented a broad series of talks in the Gates Planetarium using the immersive capacity of the dome to offer global stories in a compelling setting. Topics have included, mountains, rivers, islands, and volcanoes, Vikings, The Silk Route, The Dead Sea Scrolls and Syrah Wine.

In December at my President's talk, I will use the planetarium dome to review the time line of humanity. As mankind evolved and ultimately left Africa and spread around the globe, our progress was punctuated by a series of key game-changing discoveries; speech, fire, tools, writing, and Wikipedia.



After a review of whence we came, we will focus on some challenges facing our civilization today. Mass migration, chronic underemployment, and the challenge to effectively apply the discoveries of our sciences will be considered.

As our population passes 7.5 billion we have more and more people living in risky areas. Tens of millions live within a few meters of sea level. Many others live near moving fault zones and amidst active volcanoes. The earth sciences provide tools and perspectives that can be used to help mitigate risk and protect investments and property. Young people today are entering a job market that is rapidly evolving and will offer opportunities to those who can apply geoscience skills to solving complex problems of human adaptation to changes, both anticipated and not. Our unprecedented abilities to communicate and share knowledge and wisdom across the world should set the stage for a glorious future. May it be so.

Bob Reynolds, CSS President

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Colorado Scientific Society archives transferred to CU Norlin Library

The CSS archive that Beth Simmons has kindly curated for quite a few years has been safely transferred to the CU Norlin library. It took Megan Freidel and her assistant Katelyn about 2 hours to process, inventory, and pack 15 file boxes of materials. Great thanks are owed to Beth and others who helped cull and organize the collection up to now. These two photos tell the story.

The CU folks did not take everything of course. Books, photocopies of CSS Proceedings, news clippings, and other miscellaneous materials were not transferred. Beth and I recycled nearly a trash can full of some of these materials.



Between Beth and Chris Morrison’s hard work to digitize files, etc, the historical legacy of the CSS ought to be in good shape.

Tom Casadevall, CSS President-elect

[On porch, left to right, Megan Freidel, Katelyn Morken, Beth Simmons]

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Upcoming CSS meetings:

Thurs. Nov. 15, 7:00 p.m., Colorado Scientific Society November meeting, Geothermal Energy, presentations by Jeff Winick and Jen Livermore. Shepherd of the Hills Church, Lakewood.

Tues., Dec. 11, CSS Annual Meeting and President’s Address, to be held in the Denver Museum of Nature and Science, Gates Planetarium.

And a peek at 2019:

January 17, Don Becker (USGS) and Jeff Sloan (USGS) Kilauea’s 2018 eruption - new methods and perspectives for monitoring volcanic eruptions

February 21, Ken Balleweg (Consulting Geologist), “The Beulah marble: Ornamental stones of Colorado”, and, Don McGurk (Rocky Mountain Map Society), "Geographies Unrealized, The Story of Four Cartographic Myths of North America."

March 21, Vince Matthews (Leadville Geology), “A Cook's Tour of Colorado's Glacial Landscape”

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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>

The CSS Family Night/Open House at the Colorado School of Mines Geology Museum, Sunday, October 21, was a success, though we'd have enjoyed it if more of our members could have attended! About 25-30 people attended, including several families with children, who really appreciated the door prizes they won, after completing our "scavenger hunt" quiz about items on display in the museum, and a mineral identification quiz (easy version for kids or non-geologist adults, a harder one for the "pros". We had beer, soft drinks, and light snacks.



Our special thanks go to Linda Barton Cronoble, proprietor of the "Rustic Relics" shop at 2300 Kipling St., for donating several books and mineral/gem specimens for prizes, including a "Himalayan salt lamp"; and to Golden City Brewery, 920½ 12th St., Golden, for giving us a discount price on several jugs of their brews (their Clear Creek Gold and Legendary Red Ale).

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Calendar of Coming Events

Nov. 10-11, 39th annual New Mexico Mineral Symposium, at New Mexico Institute of Mining & Technology, Socorro, NM; see <https://geoinfo.nmt.edu/museum/minsymp/home.cfm> .

Wed., Nov. 14, 7:30 p.m., Friends of Mineralogy, Colorado Chapter bimonthly meeting; **"Still Crazy (about Franklin) after all these years: The minerals of Franklin and Sterling Hill, New Jersey"**, by Carl (Bob) Carnein. Lakeview Event Center, 7864 W. Jewell Ave., Lakewood CO; all welcome.

Thurs., Nov. 15, 3:00 p.m., Denver Museum of Nature & Science, Earth Science Colloquium, Mammals Inherit the Earth: How the K/Pg Mass Extinction Killed off Dinosaurs and Opened the Way for Mammals, by Greg Wilson, University of Washington. VIP Room, 3–4 p.m. Museum admission not required.

Thurs. Nov. 15, 7:00 p.m., Colorado Scientific Society November meeting, Geothermal Energy, by Jeff Winick, and **Geothermal Energy Potential of Colorado**, by Jen Livermore, Solstice Geothermal and Geothermal Resources Council. Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood. Social time at 6:30, program at 7:00. All are welcome!

Sun., Nov. 18, noon, Florissant Scientific Society meeting: Lithium, by Howard "Cork" Hayden. UCCS (University of Colorado at Colorado Springs), Osborne Center, Room B215. Optional potluck lunch, 12 noon – 1:00 p.m., presentation 1:00-2:30. All are welcome; the FSS is a state-wide organization of geologists and anyone interested in geology; there is no membership requirement. For details of how to find this building and room, contact Bob Knapp, rknapp@uccs.edu, 719-260-7178, or Beth Simmons, cloverknoll@comcast.net, cell

303-902-1708. Abstract: “**Lithium:** We’re all stardust --- remnants of a bygone supernova explosion that created all of the elements from hydrogen. Why, then, is there so little lithium on the earth? Why do we find it where we do? What makes Li so wonderful --- and occasionally so dangerous --- as a component in batteries? Are lithium batteries a good storage mechanism for the electric grid? How about back-up for wind and solar and “other”?”

Thurs., Nov. 29, 4:00 p.m., The Vital Role of Mudstone/Shale Studies in Advancing Sequence Stratigraphy in General, by Kevin Bohacs; Weimer Distinguished Lecture at Colorado School of Mines, 241 Berthoud Hall. All are welcome.

Mon., Dec. 3, 3:00 p.m., Denver Museum of Nature & Science, Earth Science Colloquium, The Improbable Fossil Record of Jellyfish and Their Kin, by Graham Young, Manitoba Museum. VIP Room, Museum admission not required.

Fri.-Sat.-Sun., Dec. 7-9, Flatirons Rock and Mineral Show, “Rocks & Rails”; Boulder County Fairgrounds, Exhibit Building, 9595 Nelson Rd., Longmont CO. The Flatirons Mineral Club Rock & Mineral Show is combined with the Boulder Model Railroad Club Model Railroad Exposition. 10 a.m. – 5 p.m. each day, adult admission \$5. See <https://flatironsmineralclub.org/about/annual-fmc-gem-and-mineral-show/> .

Tues., Dec. 11, 5:30 p.m., Rocky Mountain Map Society, monthly meeting, “How maps reveal (and conceal) our history”, by Susan Schulten, University of Denver; Denver Public Library, 5th floor, Gates Room, free and open to the public.

Nov. 16-18, Denver Area Mineral Dealers Show, Jefferson County Fairgrounds, Golden CO. Free admission, public welcome. 10 a.m. – 5 p.m. Fri. & Sat., 11-4 Sun.

For more lecture series during the year see:

Colorado Beer Talks (2nd Tuesday, 6-8 p.m.), Windy Saddle Café, 1110 Washington Avenue, Golden, “Golden’s grassroots version of TED talks, Expand your mind with a beer in your hand”, <http://goldenbeertalks.org/>

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/> .

Colorado Scientific Society (3rd Thursday, 7 p.m.), see <http://coloscisoc.org/> . Meets at Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood CO, except when noted.

CU Geological Science Colloquium (Wednesdays, 4 p.m.) see <http://www.colorado.edu/geologicalsciences/colloquium>

CSU Dept. of Geoscience Seminars (Fridays, 4 p.m.), see <https://warnercnr.colostate.edu/geosciences/geosciences-seminar-series/>

Van Tuyl Lecture Series, Colorado School of Mines, (Thursdays, 4 p.m.): <https://geology.mines.edu/events-calendar/lectures/>

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

Denver Museum of Nature and Science, Earth Science Colloquium series, 3:00-4:00 p.m., VIP Room unless noted, day of the week varies. Museum admission is not required; see <http://www.dmns.org/science/research/earth-sciences/>

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.

Nerd Night Denver is a theater-style evening featuring usually 3 short (20-minute) TED-style talks on science or related topics; held more-or-less monthly at the Oriental Theater, 4335 W. 44th Ave., Denver; drinks are available; for ages 18+. Admission is \$6 online in advance, \$10 at the door. See <https://www.nerdnitedenver.com/>.

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, 2nd Monday, 7 p.m.), <http://westernpaleo.org/>. Meetings are held either in the Ricketson Auditorium or the Planetarium at the Denver Museum of Nature & Science, unless otherwise noted

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2018 CSS Officers

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

Councilors

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
2018-2020: Pete Modreski, pmodreski@aol.com, 720-205-2553
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Committee Chairpersons

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GSA Meeting Co-chairs, Lisa Fisher & Libby Prueher
History Chair: Beth Simmons, cloverknoll@comcast.net
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The CSS website is www.coloscisoc.org. Anyone can also view our facebook page, whether you have a facebook account or not, at <https://www.facebook.com/groups/511533159044226/>.

See our membership form, attached. Now is a fine time to send us your dues for 2019! Remember—there's a \$5 discount if you pay dues by January 31. Please also consider making an extra contribution to our Endowment or Memorial funds!