



Founded in 1882, the objective of the Society is to promote the knowledge and understanding of Earth science, and its application to human needs. Samuel Franklin Emmons, 1841-1911, was “Geologist in Charge” of the Colorado Division of the U.S. Geological Survey when it was established in 1879 and was the first president of the Society.

## January 2024 Colorado Scientific Society Newsletter

# CSS January Meeting

## The US Geological Survey National Seismic Hazard Model

### Thursday, January 18, 2024 at 7:00 p.m.

### Allison M. Shumway, U.S. Geological Survey

## In-person Meeting at Calvary Church Golden

*All are welcome – no admission charge*

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**6:30 pm – Social time at in-person meetings**

**6:45 pm – Join Zoom meetings**

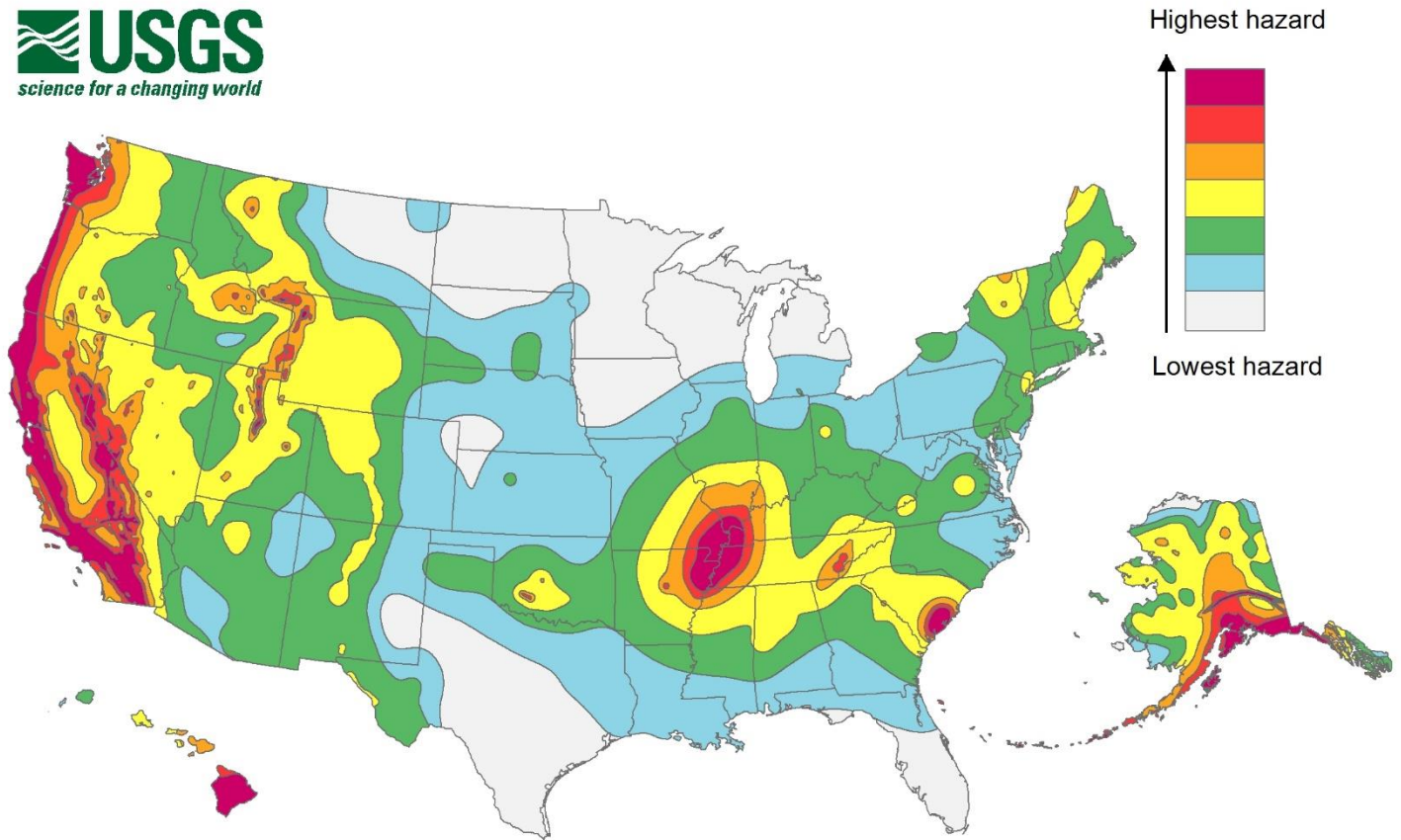
**7:00 pm – Meeting and Program begin.** Please arrive early.

Church doors are locked, and **no one will be at the door to let you in after 7:00 pm.**

See the details about our in-person meeting at Calvary Church in Golden after the Abstract and Bio.

**Bio:** Allison Shumway is a research geophysicist at the U.S. Geological Survey (USGS) in Golden, CO where for the last nine years she has worked on seismicity catalog development, seismic source model characterization and implementation, and probabilistic seismic hazard analysis (PSHA) as part of the National Seismic Hazard Model Project. Prior to working at the USGS, she spent seven years working at a geophysical consulting company where she worked on a number of PSHA projects, including for nuclear power plant sites in the U.S. She received her M.S. in Earth Sciences from the University of Memphis in Memphis, TN (at the Center for Earthquake Research and Information) and her B.A. in Geological Sciences at the State University of New York at Geneseo in Geneseo, NY.

*Our Zoom link info is not available as yet as we send out this announcement, but if you wish to join the meeting remotely by Zoom, please see our website, <https://coloscisoc.org/>, and it will be posted there before the meeting. Thank you!*



## USGS National Seismic Hazard Model

**Abstract:** The U.S. National Seismic Hazard Model (NSHM) was updated in 2023 for all 50 states using new science on seismicity, fault ruptures, ground motions, and probabilistic techniques to produce a standard of practice for public policy and other engineering applications (defined for return periods greater than ~475 or less than ~10,000 years). Changes in 2023 time independent seismic hazard (both increases and decreases compared to previous NSHMs) are substantial because the new model considers more data and updated earthquake rupture forecasts and ground motion components. In developing the 2023 model, we tried to apply best available or applicable science based on advice of co-authors, more than 50 reviewers, and hundreds of hazard scientists and end users, who attended public workshops and provided technical inputs. The hazard assessment incorporates new catalogs, declustering algorithms, gridded seismicity models, magnitude-scaling equations, fault-based structural and deformation models, multi-fault earthquake rupture forecast models, semi-empirical and simulation-based ground motion models, and site amplification models conditioned on shear wave velocities of the upper 30 m of soil and deeper sedimentary basin structures. Seismic hazard calculations yield hazard curves at hundreds of thousands of sites, ground motion maps, uniform hazard response spectra, and disaggregations developed for pseudo-spectral accelerations at 21 oscillator periods and two peak parameters, Modified Mercalli Intensity, and 8 site classes required by building codes and other public policy applications. Tests show the new model is consistent with past ShakeMap intensity observations. Sensitivity and uncertainty assessments ensure resulting ground motions are compatible with known hazard information and highlight the range and causes of variability in ground motions. We produce several impact products including building seismic design criteria, intensity maps, planning scenarios, and engineering risk assessments showing the potential physical and social impacts. These applications provide a basis for assessing, planning, and mitigating the effects of future earthquakes.

**Website:** For more information about the USGS National Seismic Hazard Models, please visit our website: <https://www.usgs.gov/programs/earthquake-hazards/hazards>.

## In-person Meeting at Calvary Church Golden

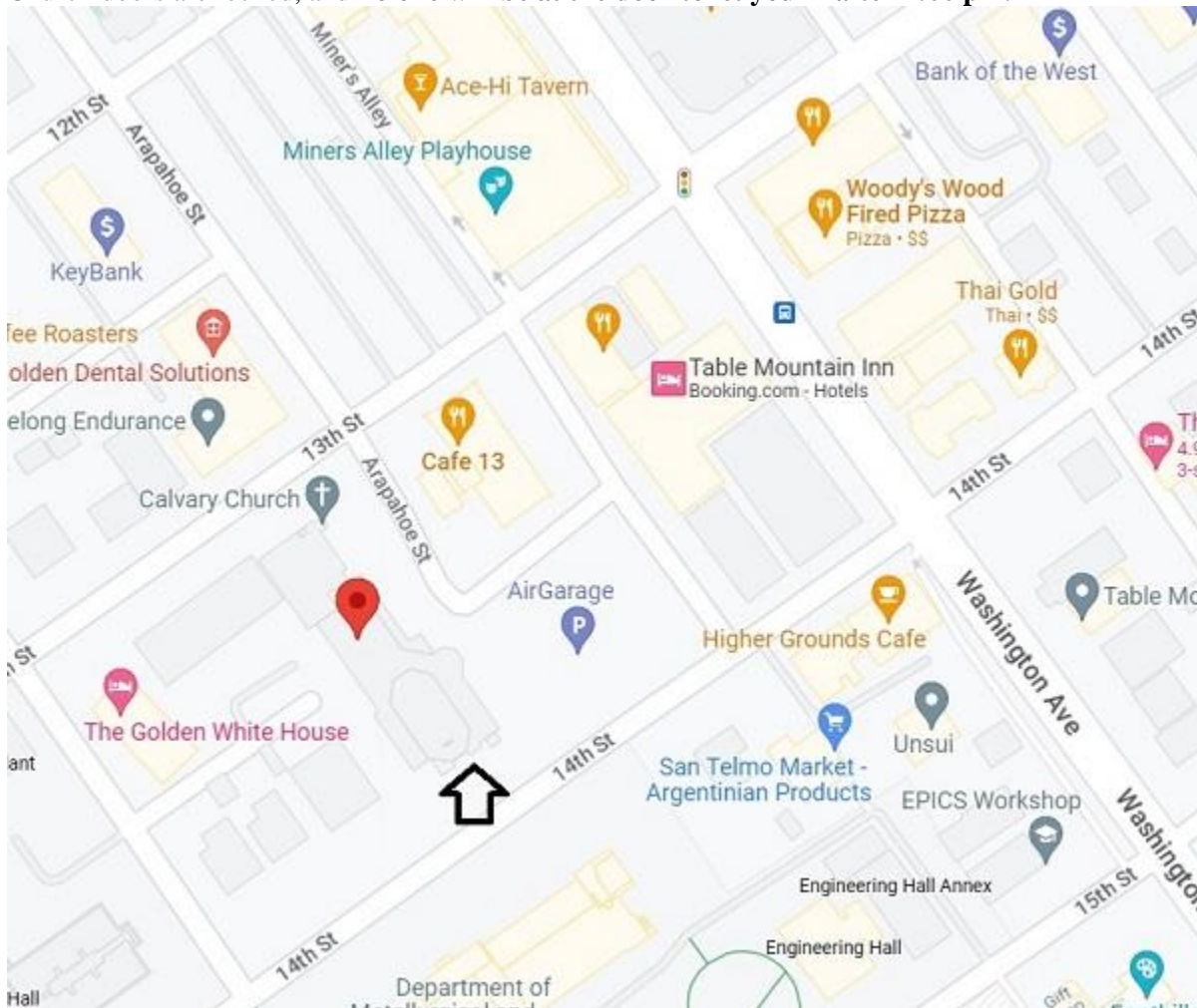
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Calvary Church in Golden. Enter at arrow on map.

### [Calvary Church Golden](#)

Click on link to open a Google map.

**Enter from 14th St.**, go in by the main glass doors at [906] 14th St.

Do **not** enter via the old church above 13th St.

From the 14th Street entrance go down the hallway following Colo Sci Soc signs to Community Rooms 1 and 2, where we meet.

**The church doors must stay locked, and we will have a person to let you in at the doors off 14th st.**

They want to see the presentation too, so **please arrive before 7:00 pm.**

There will be a phone number that you can text to be let in if you arrive late.

### **Parking**

On street parking is available close by, along 14th St and west of Washington Ave in Golden.

The AirGarage parking structure, which can be entered from Arapahoe St., is \$3.00 for three hours.

# CSS 2024 Meetings

## **CSS February Meeting**

**Topic TBD**

**Thursday, February 15, 2024** at 7:00 p.m.

In-person Meeting at Calvary Church Golden or Join us on Zoom

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## **CSS March Meeting**

**Chaos Canyon Landslide in Rocky Mountain Natl. Park**

**Thursday, March 21, 2024** at 7:00 p.m.

**Kate Allstadt**, U.S. Geological Survey

In-person Meeting at Calvary Church Golden or Join us on Zoom

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## **CSS April Meeting and Emmons Lecture**

**Early Earth, Mars and the deserts of Argentina**

**Thursday, April 18, 2024** at 7:00 p.m.

**Brian Hynek**, University of Colorado

In-person Meeting at Calvary Church Golden or Join us on Zoom

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## **CSS May Meeting**

**tbd**

**Thursday, May 16, 2024** at 7:00 p.m.

In-person Meeting at Calvary Church Golden or Join us on Zoom

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## **CSS Past Presidents Dinner – September**

**Topic tbd**

**Thursday, September 19, 2024** at 7:00 p.m.

**David Goodwin** and **Peter Roopnarine**, California Academy of Sciences

Mount Vernon Canyon Club or Join us on Zoom

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## **CSS October Meeting**

**Topic tbd**

**Thursday, October 24, 2024** at 7:00 p.m. – note a week later than normal

**Harrison Gray**, U.S. Geological Survey

In-person Meeting at Calvary Church Golden or Join us on Zoom

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## **CSS November Meeting and Student/Member Poster Night**

**Thursday, November 21, 2024** at 7:00 p.m.

In-person Meeting at Calvary Church Golden or Join us on Zoom

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## **CSS December Holiday Potluck, Meeting and President's Address**

**Quaternary Records of Spring Ecosystems**

**Tuesday, early December 2024** at 5:30 p.m.

**Jeff Pigati** and **Kathleen Springer**, U.S. Geological Survey

In-person Potluck Dinner at New Terrain Brewing Company or Join us on Zoom

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## **See Zoom Recordings of Recent CSS Meetings**

Most recent CSS presentations are recorded on Zoom. Follow the links on our website in the titles for each presentation to see abstracts, biographies of the speakers and video recordings of our meetings.



**Please pay your CSS dues for 2024!**

You may pay dues online or print out a PDF of the membership form and mail it to us with a check. Continuing your membership in CSS will enable us to continue all our ongoing programs, including our field trips, virtual meetings, Student Research Grants, and more.

See [Membership and Donations](#) for the CSS membership PDF and our online membership payment form.

**Regular CSS Membership** is \$25;

**Student Membership**, \$5;

**Life Membership**, \$395.

Send your membership payment, if not done through [our online membership payment form](#), to Colorado Scientific Society P.O. Box 150495 Lakewood, CO 80215-0495.

Thank you!

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**Field trips to come**

We are planning to have some “No Moss” short field trips, and one or more full-day or weekend field trips, during the year; we’ll be informing you (and see our website!) as specific trips are scheduled. Some likely trips being discussed include: Faulting on Green Mountain; Gateway Mesa (Castle Rock) Open Space and the Castle Rock Conglomerate; geologic structures along Coal Creek; Eldorado Springs Canyon; and, building stones in downtown Denver historic buildings.

We’ll hope to see you at many or all of these coming events!

---Pete Modreski, CSS newsletter editor; you can always write to me at [pmodreski@gmail.com](mailto:pmodreski@gmail.com)

**CSS officers and councilors for 2024 are:**

Jeff Pigati – President

tbd – President Elect

Cal Ruleman – Past President

Patrick Sullivan – Secretary

Jim Paces – Treasurer

Chris Morrison – Chair, Webmaster

Pete Modreski – Newsletter

Julie Herrick – Councilor 2022-2024

Lesli Wood – Councilor 2022-2024

Michael Frothingham – Councilor 2023-2025

Kassandra Lindsey – Councilor 2023-2025

Susan Slomski – Councilor 2024-2026

Nathan Rogers – Councilor 2024-2026

Sylvia Nicovich – Chair, Field Trips

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**Available from the CSS—Did you know?**

**The Geology of Boulder County, with 25 Field Trips**, 2004, by Raymond Bridge, 490 pages, Lone Eagle Publications. \$20.00. Copies of this book were donated to the CSS by the family of the author (deceased)

**Colorado Scientific Society T-Shirts; also \$20.00**

Ask to see these at any of our CSS meetings! [You’d know better about these, and would have seen them, if you come to our meetings in person!]

**Coming Earth Science-related events sponsored by other organizations, January 2024 and beyond, updated 1/17/2024**---from Pete Modreski, [pmodreski@aol.com](mailto:pmodreski@aol.com) or [pmodreski@gmail.com](mailto:pmodreski@gmail.com)

**Thurs., Jan. 18**, 7:00 p.m., social time 6:30, **The U.S. Geological Survey National Seismic Hazard Model**, by Allison M. Shumway, USGS. Colorado Scientific Society monthly meeting, at Cavalry Church, Golden, All are welcome; live and via zoom. See <https://coloscisoc.org/> for details.

**Thurs.-Sun., Feb. 8-11, Tucson Gem and Mineral Show**, at the Tucson Convention Center. These are the dates of the original, “main” show, sponsored by the Tucson Gem and Mineral Society; many (literally, dozens of) other shows also take place in Tucson at multiple locations during the previous several weeks. One of these is the **Mineral City Show**, Jan. 26-Feb. 10, with about 170 mineral specimen dealers located in multiple adjacent buildings around 516 W. Lester St., Tucson. (One website lists 58 (or is it 60?) different shows; see <https://shows.tucsongemshows.net> .)

**Fri.-Sat.-Sun., Feb. 23-25, Denver Gem and Mineral Guild, Gem and Mineral Show**, 10-5 Fri. & Sat., 10-4 Sun., Jefferson County Fairgrounds, Exhibit Hall, 15200 W. 6<sup>th</sup> Ave., Golden. No admission charge. Dealers, club demonstrations, special exhibits, fluorescent display, door prizes, and more.

**Fri.-Sun., March 22-24, Fort Collins Gem and Mineral Show**, 4-8 p.m. Fri., 9-6 Sat., 10-4 Sun., at The Ranch/Larimer County Fairgrounds, Thomas M. McKee 4-H Building; the Fort Collins Rockhounds Club 61<sup>st</sup> annual show.

**Fri.-Sun., April 12-14, Colorado Mineral and Fossil Spring Show**, Crowne Plaza DIA, 15500 E 40<sup>th</sup> Ave., Denver CO 80239. No admission charge.

**Fri.-Sun., May 3-5, Southern Colorado (“SOCO”) Rock and Mineral Show**, 10 a.m. to 6 p.m. daily, at Colorado Springs Convention Center, 3960 Palmer Park Blvd., Colorado Springs, Colorado. For more info see [www.socorockandmineralshow.com](http://www.socorockandmineralshow.com) or contact SOCO Rock & Mineral Show, (719) 280-7091. This is a new commercial gem and mineral show venture so I do not have any recommendations about what it may be like. The website promises: demonstrations, indoor and outdoor vendors, presentations, rock auction, live music, craft beer garden and wine bar, food trucks, kids activities, games, supply sales, geology clubs, door prizes, gold mining tips and more. Admission \$5 or \$10 multi-day pass, kids 12 and under free.

**Sat., May 4**, 12:00-3:00 p.m., **Colorado Mineral Society Silent Auction**, held at Wheat Ridge United Methodist Church, Exhibition Hall, 7530 W. 38<sup>th</sup> Ave. (just east of Wadsworth). All are welcome to attend, and to bring specimens to sell in the auction (minimum donation of 20% of selling price to the club). Setup begins at 11 a.m.; there will be a vocal auction as well as silent auction tables.

**Sat., May 18**, 12:00-3:00 p.m., **Friends of Mineralogy, Colorado Chapter, Silent Auction**, held at Wheat Ridge United Methodist Church, Exhibition Hall, 7530 W. 38<sup>th</sup> Ave. (just east of Wadsworth). All are welcome to attend, and to bring specimens to sell in the auction (minimum donation of 20% of selling price to the club). Setup begins at 11 a.m.; there will be a vocal auction as well as silent auction tables.

**Fri.-Sun., June 7-9, Pikes Peak Gem and Mineral Show**, at the Norris Penrose Event Center, 1045 Lower Gold Camp Road, Colorado Springs, sponsored by the Colorado Springs Mineralogical Society. Fri. 12-7 p.m., Sat. 10-5, Sun. 10-4.

**Thurs.-Sun., June 13-16, A Mineralogical Symposium**, sponsored by the Colorado Chapter, Friends of Mineralogy: **Mineral Oddities: Pseudomorphs, Twinning, Inclusions, and more.** “As has been previously announced, the Friends of Mineralogy Colorado Chapter will be hosting a symposium in 2024. The 2024 Symposium webpage is now live, with dates and preliminary details: <https://friendsofmineralogycolorado.org/symposium/> . Please note that the symposium is scheduled for June 13-16, 2024. We will be updating this page throughout the spring as additional details become available pertaining to registration, field trips, the mineral photography workshop, etc. On the symposium webpage, you will find a link to "RSVP" and join the dedicated symposium email list. **If you are tentatively interested in attending the symposium, we would greatly appreciate it if you could fill out that form; it will be very helpful to us in our planning.** You can access the form here as well: <https://docs.google.com/forms/d/e/1FAIpQLSeA9XvwGdXliCKi9pXJmuPBT1t8-u9sTRuhN5y1yP8KW9RxMQ/viewform> .”

*The symposium will include field trips on June 13, a mineral photography workshop on June 14 conducted by Jeff Scovil plus an evening reception at the Colorado School of Mines Museum, and lecture sessions on June 15 + half day June 16. The lecture sessions will take place in Berthoud Hall, CSM campus. All interested persons will be welcome to register to attend. For more information about the symposium as it becomes available please see the FMCC website, <https://friendsofmineralogycolorado.org/> . To sign up on an email list to receive information updates about the symposium please go to:*

<https://friendsofmineralogycolorado.org/SymposiumMailingListSignUpForm>

*[If you are interested in presenting at the symposium, please click here to fill out the Call for Papers form.](#)*

**Thurs.-Sun., July 25-28, Fairplay Gem, Mineral, and Jewelry Show;** Platte Drive, ½ mile west of US-285, Fairplay, CO; free admission and parking.

**Thurs.-Sun., Aug. 8-11, Buena Vista Contin-Tail Gem, Mineral, and Fossil Show,** Buena Vista Rodeo Grounds; free admission and parking.

**Thurs.-Sun., Aug. 15-18, Woodland Park Gem & Mineral Show;** located outdoors off US-24; free admission and parking.

**Thurs.-Sun., Aug. 16-18, Lake George Gem & Mineral Show;** located outdoors off US-24; free admission and parking. Sponsored by the Lake George Gem & Mineral Club.

**Thurs.-Sun., Sept. 12-15, Denver Gem and Mineral Show,** part of the Hardrock Summit Show, and cosponsored by the nonprofit Greater Denver Area Gem and Mineral Council, an association of 7 Front Range area gem, mineral, and fossil clubs. In 2024 this will be held at the **Westin Westminster Hotel**, 10600 Westminster Blvd., Westminster CO. The show includes museum displays, club booths and demonstrations including free mineral and gem identification, and sale of grab bags for kids that goes toward a scholarship fund at Colorado School of Mines. Free admission and parking.

Several other gem, mineral, and jewelry shows will take place in Denver during the week preceding the “Denver Show”. These include:

**Fri.-Mon., Sept. 5-8, Just Minerals and Crystals Event Denver,** Denver Airport Marriott at Gateway Park, 16455 E. 40<sup>th</sup> Circle, Aurora CO. Free parking & admission.

**Sept. 6-14, Colorado Mineral and Fossil Fall Show**, Crowne Plaza DIA, 15500 E 40<sup>th</sup> Ave., Denver CO 80239. Free admission & parking.

**Sept. 6-15, Denver Mineral, Fossil, Gem & Jewelry Show; Denver Expo Gem Show; and Miner's Co-op Show**; all at the National Western Complex, 4655 Humboldt St., Denver. Free parking & admission.

**Nov. 1-3, New Mexico Mineral Symposium**, Socorro, NM, sponsored by the New Mexico Bureau of Geology & Mineral Resources, Mineral Museum, and held at the Macey Center, New Mexico Institute of Mining & Technology. For information see <https://geoinfo.nmt.edu/museum/nmms/home.cfm> . *[Note, this is a recently announced date change to Nov. 1-3, from the earlier anticipated date of the weekend of Dec. 8-10.]*

**Nov. 15-17 (anticipated date), Denver Area Mineral Dealers (D.A.M.D.) Gem and Mineral Show**, at the Jefferson County Fairgrounds, Golden.

**Dec. 13-15, Flatirons Gem and Mineral Show**, at the Boulder County Fairgrounds, Longmont; sponsored by the Flatirons Gem & Mineral Club [Boulder].