



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.

## February 2024 Colorado Scientific Society Newsletter

# CSS February Meeting Thursday, February 15, 2024 at 7:00 p.m.

## Lacustrine Paleoseismology in the Intermountain West

**Sylvia R. Nicovich,**  
Mendenhall Fellow|Research Geologist  
Geologic Hazards Science Center  
U.S. Geological Survey

### In-person Meeting at Calvary Church Golden; and via Zoom

*All are welcome – no admission charge*

**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.

CSS is inviting you to our meeting on Thursday February 15th at 6:45 pm.

**Click to Join CSS Zoom Meeting**  
from PC, Mac, Linux, iOS or Android

[For other Zoom options, click here.](#)

Meeting ID: 899 8505 4851

Passcode: 011705

You may always see all this information about our coming meetings on our website, <https://coloscisoc.org/>.

**Abstract:** Seismic hazard analysis hinges on the ability to characterize seismic sources, especially active faults. Our understanding of fault activity within the Intermountain West (IMW) relies on paleoseismic trench studies, which are limited to surface-rupturing earthquakes preserved within terrestrial strata that typically represent short-timescales and thus a limited earthquake record. Recently, paleoseismologists have begun exploring lake sediments for evidence of paleoearthquakes, as lacustrine systems commonly offer long-timescale and largely continuous sedimentation records that have potential to expand earthquake-history observations and refine event timing. Worldwide, many of these studies focus on active faults within the Alpine and Anatolian orogenic belts, where lake records reveal the Holocene history of large ground-shaking events. Within the United States, lacustrine paleoseismology has been centered on the Pacific coast and Alaska, studying the recurrence of subduction-related earthquakes versus crustal faulting. Here, we apply this sub-discipline of earthquake geology to the Intermountain West with an objective to calibrate how lakes record earthquakes in the intraplate environment of North America. We leverage both historical and recognized terrestrial (trench) paleoseismic events to corroborate the evidence of ground shaking withing lake systems. Currently, we are documenting the signature of the 1959 M7.3 Hebgen Lake earthquake in multiple lakes around the West Yellowstone region as well as comparing terrestrial earthquake records for the Wasatch Front, Utah, with shaking proxies recorded in the Great Salt Lake. The application of lacustrine paleoseismology to the Intermountain West will not only help to refine event timing uncertainties, but will offer longer records of ground shaking, which present the opportunity to provide more robust parameters for seismic hazard analysis and a greater understanding of intraplate neotectonic behavior.



*Gathering lacustrine paleoseismology records*

**Sylvia Nicovich** is a Mendenhall Research Fellow at the U.S. Geological Survey Geologic Hazards Science Center in Golden, CO studying lacustrine paleoseismology in the Intermountain West. Prior to her Mendenhall assignment, she conducted paleoseismologic investigations for seismic hazard analysis at the Bureau of Reclamation in Lakewood, CO. Sylvia earned a PhD in Geology from Montana State University in 2020 with a dissertation that focused on alluvial fan geomorphic and sedimentary records. She also holds BS and MS degrees from Cal Poly Humboldt, where she studied active faults in the northern California fold and thrust belt. Sylvia is also our 2024 Field Trip Chair for the CSS.

## In-person Meeting at Calvary Church Golden

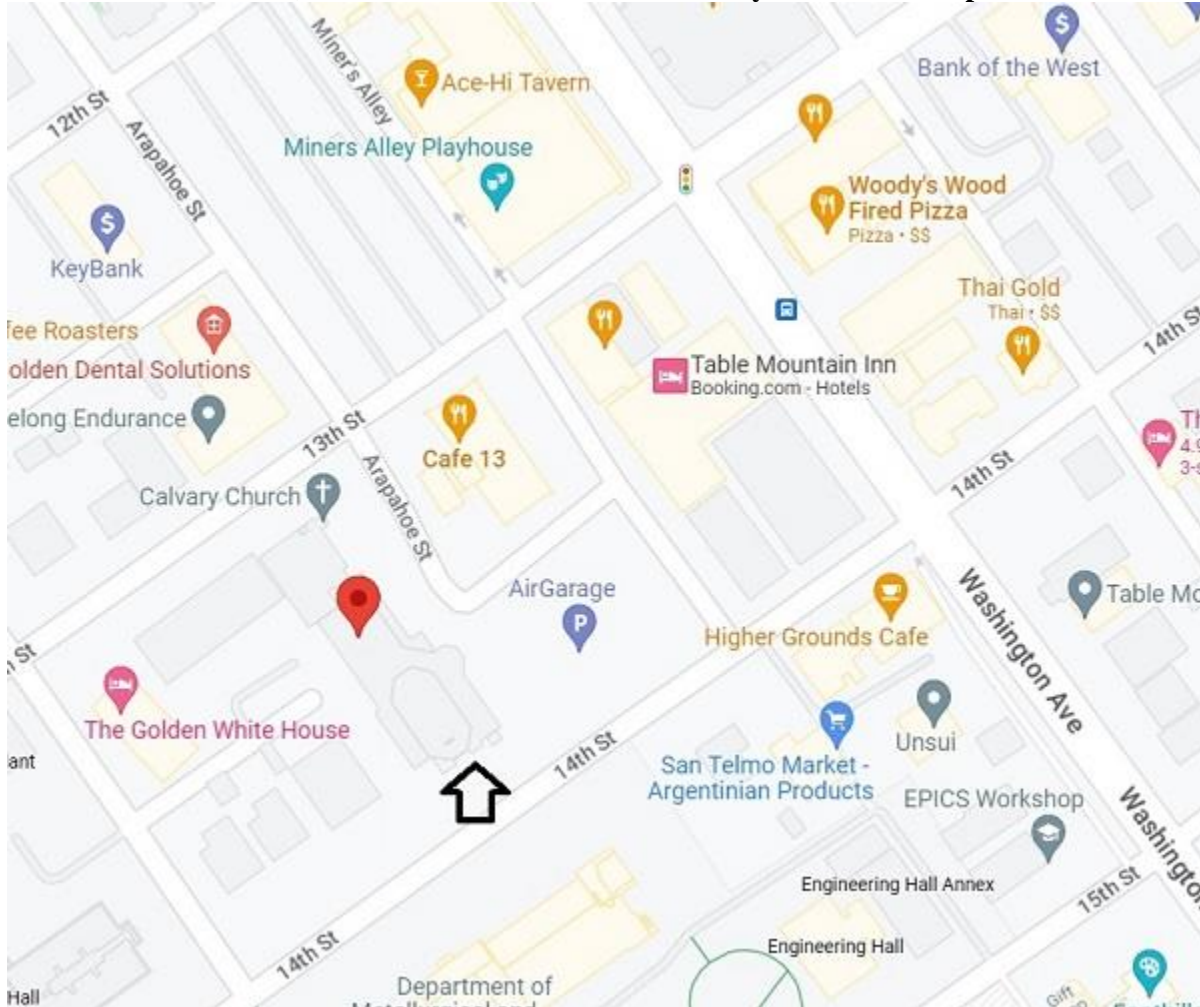
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Golden. Enter at arrow on map.

### [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.

## Red Rocks Park – CSS No Moss Field Trip

Saturday, March 30th 2024, 9:00 AM to noon

Steve Cumella will lead this trip.



### Red Rocks Amphitheater

Join Steve Cumella on Saturday March 30th for a 3-hour tour of the spectacular Fountain outcrops in Red Rocks Park near Morrison, Colorado. Park in the Upper North Lot (see attached map) and meet at 9:00 AM at the top of the Amphitheater. From there, we will walk 2.25 miles through the Amphitheater and along the Trading Post Trail for a cumulative 675' of elevation gain and 670' of elevation loss. Park entry is free and all are welcome to join us for this Colorado Scientific Society No Moss Gathering. Bring your expertise, your questions, your curiosity, and most of all – have fun!

The Pennsylvanian-age Fountain Formation is spectacularly exposed at the Red Rocks Amphitheater near Morrison, Colorado. The Fountain is composed of thick-bedded arkosic sandstones and conglomerates interbedded with dark maroon mudstones. The Fountain is believed to have been deposited by alluvial fans being shed eastward from the Ancestral Front Range. On this fieldtrip we will examine sedimentary features of the Fountain. Surprisingly, no detailed modern sedimentologic study has ever been done on the Fountain at Red Rocks, so we can discuss how well the features we observe fit within an alluvial fan model. Fortunately, high-resolution Google Earth imagery is available for the Red Rocks area and this imagery offers the opportunity to attempt to correlate the Fountain stratigraphy. The attached Google Earth images show possible Fountain correlations. (See the “Red Rocks, Google Earth Dec 2020, Cumella” PDF below. The colored lines on the images show possible correlations.) During the fieldtrip we can see how well these correlations hold up.

Flyer for [Red Rocks Park No Moss Gathering 3-30-24](#).

Print and bring it with you.

Images showing correlations: [Red Rocks, Google Earth Dec 2020, Cumella, 5.4 MB](#)

Print this and it bring it with you.



**DENVER MOUNTAIN PARKS FOUNDATION**  
www.DMPF.NET

**Matthews/Winters Park**  
(Jefferson County Open Space)

**Red Rocks Park**  
(Denver Mountain Park)

Upper North Lot - park here

Top of Amphitheater - meet here

Trading Post Trail

### Red Rocks Park

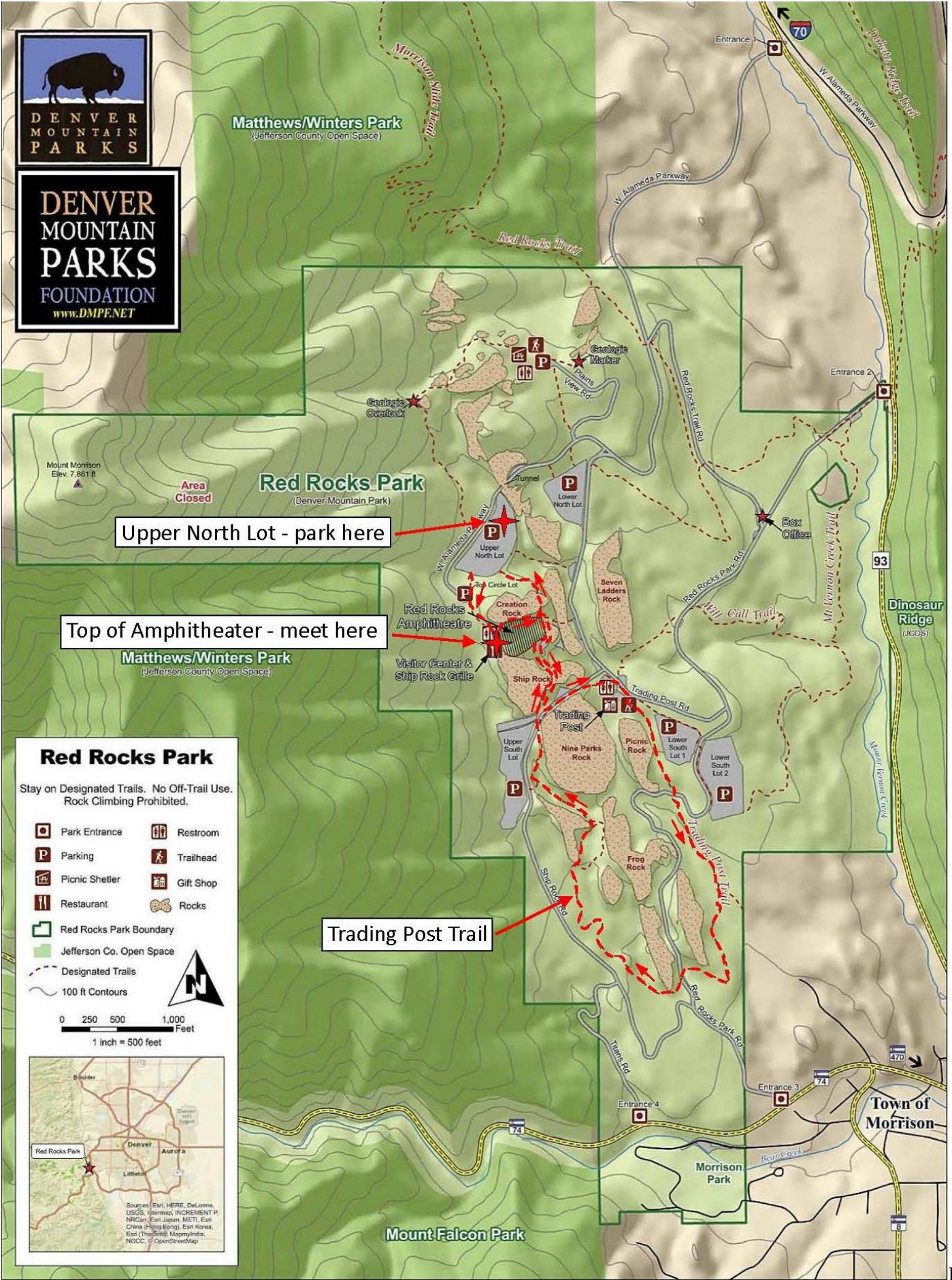
Stay on Designated Trails. No Off-Trail Use.  
Rock Climbing Prohibited.

	Park Entrance		Restroom
	Parking		Trailhead
	Picnic Shelter		Gift Shop
	Restaurant		Rocks

Red Rocks Park Boundary  
 Jefferson Co. Open Space  
 Designated Trails  
 100 ft Contours

0 250 500 1,000 Feet  
1 inch = 500 feet

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NCCO, OpenStreetMap



# CSS 2024 Meetings

## CSS February Meeting

### Lacustrine Paleoseismology in the Intermountain West

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

Sylvia R. Nicovich, U.S. Geological Survey

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

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## CSS March Meeting

### The tale of the 2022 Chaos Canyon landslide: an ice-rich debris slide in Rocky Mountain National 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

### Minerals and Elements

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

Peyton Jackson, American Clean Resources Group

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

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## CSS Past Presidents Dinner – September

### Topic TBA

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 TBA

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. (exact date TBA)

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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## Watch 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 additional “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           | Julie Herrick – Councilor 2022-2024       |
| Shannon Mahan – President Elect   | Lesli Wood – Councilor 2022-2024          |
| Cal Ruleman – Past President      | Michael Frothingham – Councilor 2023-2025 |
| Patrick Sullivan – Secretary      | Kassandra Lindsey – Councilor 2023-2025   |
| Jim Paces – Treasurer             | Susan Slomski – Councilor 2024-2026       |
| Chris Morrison – Chair, Webmaster | Nathan Rogers – Councilor 2024-2026       |
| Pete Modreski – Newsletter        | 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!]