

DAISY MOUNTAIN ROCKCHIPS

The purpose of Daisy Mountain Rock & Mineral Club is to promote and further an interest in geology, mineralogy, and lapidary arts, through education, field experiences, public service, and friendship.

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Native Silver from the Imiter Mine, Imiter District, Tinghir Province, Drâa-Tafilalet Region, Morocco.

This specimen is 2.2 inches tall. *Photo by Stan Celestian*

FOSSILS: PART XV

Kingdom: Animalia
 Phylum: Arthropoda,
 Sub-Phylum - Hexapoda & Myriapoda

By Susan Celestian

FLASHBACK: Last month this column highlighted the Crustacea, and since then I've encountered (on social media) an interesting creature -- the Tasmanian Giant Freshwater Crayfish, aka the largest known freshwater invertebrate. For more information, go to [here](#) and/or [Wikipedia](#). I wouldn't want to swim with that one!

I'm finishing up the Phylum Arthropoda by covering Hexapoda and Myriapoda. Hexapoda includes the Insecta (and others), and Myriapoda includes Millipedes, Centipedes (and others).

General Hexapoda and Myriapoda characteristics are as follows:

- ▶ The geologic record of the hexapods extends from the Silurian (440 mya) to Recent. That of the myriapods is from the late Silurian (428 mya).
- ▶ Hexapods have head, thorax and abdomen, with 3 pairs of legs (hence the name hexapod for 6 feet). In fact, the word Insect derives from the Latin *insectum* for "divided body".
 - Insects have a chitinous exoskeleton.
 - Insects have compound eyes, and 1 pair of antenna.
 - There are 1 million described species, but estimates suggest up to 10 million -- that would be 90% of all species on Earth. And they are amazingly diverse and specialized!



- ▶ Myriapods have many legs -- fewer than 10 to up to 750, and a chitinous exoskeleton.
 - Centipedes' and millipedes' exoskeleton is comprised of fused body segments.
 - Nearly all myriapods have simple eyes, and 1 pair of antenna.

[Insecta etc.](#) continued on page 9...

VOLCANICS OF NORTHERN ARIZONA

PART II: Lava Domes

By Susan Celestian

As mentioned in January's newsletter, *Lava Domes* are bulbous upwellings of dacite (intermediate to rhyolite & andesite) and rhyolite lavas -- lavas so viscous that they really do not readily flow. Often lava domes act as plugs that prevent the escape of volcanic gases, leading to a build-up of pressure, and resulting in an explosive eruption.

In the San Francisco Volcanic Field, there are at least 7 major lava domes: [See Figure 1'](#).

- ▶ Bill Williams Mountain - 3.5-2.8 mya
- ▶ Sitgreaves Mountain - 2.9-1.9 mya
- ▶ Kendrick Peak - 2.7-1.4 mya
- ▶ Dry Lake Hills - 750,000 years ago
- ▶ Mt Eldon - 600,000-500,000 years ago
- ▶ O'Leary Peak - 170,000-23,000 years ago
- ▶ Sugarloaf Peak - 91,000+/-2,000 years ago (date revised in 2004 from 220,000 years²)

²Morgan P, Sass JH, Duffield W (2004) Geothermal resource evaluation program of the Eastern San Francisco Volcanic Field, Arizona. Unpublished final report to the Department of Energy, Project GRED II, Agreement # DE-FC04-2002AL68298, Department of Geology, Northern Arizona University, pp 40

[Lava Domes](#) continued on page 15...

ZOOM MEETING MARCH 2, 2021

BE SURE TO ATTEND

Our speaker will be Jeff Osowski, of the Sterling Hill Mine, source of fabulous fluorescent rocks. He asks that we watch a video before meeting, a link to which will come to you via DMRMC email.

There will be a Show & Tell segment, so be prepared to share with the group, any new or old rock finds. Let's stay involved!

APRIL: Stan Celestian "Rock Candy"
 MAY: Leslie Hale, Smithsonian

INSIDE THIS ISSUE

Each item is now hyperlinked to the page on which it is found

Fossils: Part 15, Hexapoda (Insects) & Myriapoda (Centi- & Millipedes)	2, 9-13
Volcanics of Northern Arizona - Lava Domes	2, 15-17
Silver	3, 13-14
February Board & Meeting Minutes	4
Field Trips: Mushroom Rhyolite, Brenda, Dave Haneline Mem. Mine, Bullard Mine	5-8, 18
January Speaker Review	19
Club Information, Field Trip Schedule	20
Announcements, Show list, Words of Wisdom	21



Silver

By Susan Celestian

At first glance, one wonders why Silver's elemental symbol is Ag. The answer is that the name is derived from the Latin *argentum*, meaning "shiny" or "white". Silver has been a prized metal, due to its availability as a native element (occurs as a metal, not combined with other elements), and its very high degree of malleability and ductility -- the latter making it easy to work with to produce jewelry. Of all the metals, silver has the highest degree of reflectivity, making it useful as a mirror backing in regular mirrors, and those in microscopes and telescopes.

- ◆ In India, very thin sheets of silver (called varak) are used to decorate some food.
- ◆ An ounce of silver can be drawn out to an 8000 foot-long wire.
- ◆ It is extremely electrically conductive, scoring 100%. Copper comes in at 97%.
- ◆ AND nothing (in English) rhymes with "silver".

Chemical Formula - Ag

Crystal System - Isometric (3 axes, of equal length, and at 90° to each other). Go [here](#) and scroll way down to interactive graphics.

Growth Forms/Habits - Massive, reticulated, dendritic, arborescent, wires

Hardness - 2.5-3

Luster - Metallic

Streak - Silver white

Colors - Silver white (tarnished black)

Diaphaneity - Opaque

Specific Gravity - 10.1-11.1

Cleavage - none

Fracture - Hackly

Occurrence - Occurs in sulfide ore veins.

Other - Very malleable & ductile, high thermal and electrical conductivity; extreme reflectivity

Uses - Jewelry, coins, tableware, photographic processing (including X-rays), dental alloys, mirror backing, silver-zinc batteries, backside reflector of LED chips, medicine (such as wound dressings), alloyed with other metals for nuclear reactor control rods, RFID chips (for tracking packages), transparent coating on touch screens, water purification (anti-bacterial), wood preservative, soldering and brazing alloys, photovoltaic cells, defrosting lines on car rear windows, and more.

Arizona's mining history includes silver mines, occurring in every county. In total, direct mining of silver accounts only for about 10% of silver produced in Arizona; while 90% was (and is) a byproduct of copper mining. Silver mine names you probably recognize are:

- Goodenough Mine (Tombstone, Cochise County) - together Tombstone mines produced 32 million troy ounces or 1000 metric tons)
- Campbell & Cole Mines (Bisbee) in Cochise County: copper mines, but the area mines have produced more silver than any other Arizona district -- 102 million troy ounces
- Arizona's Silver Belt (Globe, Pinal & McMillenville in Gila & Pinal Counties) - Silver King (6.2 million troy ounces or 190 metric tons); Silver Queen (now Magma)
- Pinal County: Jackrabbit Mine near Casa Grande
- Grand Reef in Graham County (associated with lead minerals, such as galena)
- Mohave County: Distaff Mine, Buckeye Mine, Banner District, Chloride District
- Santa Cruz County: Harshaw Mine
- Yavapai County: United Verde Mine, Big Bug District, Monte Cristo Mine
- Yuma County: Red Cloud Mine
- Dave Haneline Memorial Mine nee S & O Claims, associated with galena

Images of silver follow, Figures A-F.



FIGURE A SILVER NUGGETS These 3 nuggets (or should I say boulders), and some smaller pieces, were discovered in an arroyo near Globe, in 2018. Total weight is 610 lbs. (8896 troy oz.). I think that middle nugget (411 lbs) is about 3 feet tall.

Photo by Susan Celestian

Zoom Board Meeting Minutes February 1, 2021

- In Attendance: Bill F., Bob E., Bob S., Claudia M., Deanne G., Don R., Ed W., Rebecca S., Stan C, and Sue C.
- January minutes were accepted
 - ◊ I apologize, I missed the board meeting, however General meeting minutes had similar information
- Club dues were discussed
 - ◊ Lost some members
 - ◊ Mailed new member applications are being processed
 - ◊ We will setup membership application and dues on the website
 - Should be up soon
 - Will also be on our Facebook
- Thank you, Nancy G., for all your hard work on the website and social media accounts!
- Stan C. gave us a status update on the mine
 - ◊ We would like to also acquire the Mushroom Rhyolite area
 - Accepted by board to move forward with paperwork
 - ◊ Howard R. is working on Dave Haneline Memorial Mine paperwork
- Wire wrapping was discussed
 - ◊ Look for emails for more information from Jennifer G.
- Bill F. gave an overview of field trips
 - ◊ Mushroom Rhyolite had a great turnout
 - ◊ 2 trips scheduled for February
- Ed W. talked about an upcoming show
 - ◊ Many people have been inquiring about a show
 - ◊ Could possibly be in November
 - Need to speak to outlet mall about hosting show
- Upcoming General meetings were discussed
 - ◊ Zoom meetings set for Feb, March, April, and May
 - ◊ We would like to stay cautious in these times
 - ◊ Previous zoom meetings have gone successfully
- Name Tag updates
 - ◊ Distributor responded finally
 - Will process order, but might look different
 - We are still looking into other vendors
- Bill F. discussed new members
 - ◊ Some were having difficulty becoming new members online
 - Emails are watched by Bill F., Claudia M., Ed W., and Tiffany P.
 - We are trying to streamline the process so that everyone can join

- ◊ May create a 'Welcome Committee'
 - This was much easier when everyone went to meetings
 - * Will have to adapt to Covid circumstances
 - ◊ North Mountain Visitors Center will also have applications at their facility
- Respectfully submitted, Rebecca Slosarik, secretary

General Zoom Meeting Minutes February 2, 2021

- Open attendance – 25 zoom participants
 - Bill F. called the meeting to order
 - Evan Jones did a fascinating talk on Wulfenite
 - ◊ It is the official mineral of AZ
 - ◊ Thank you again for those lovely pictures of specimens
 - Cynthia B. discussed the financials
 - ◊ Revenue was lapidary fees and club dues
 - ◊ Club still in good standing despite the loss of 2 shows
 - Stan C. updated us on the claims
 - ◊ All paperwork is set for the Dave Haneline Memorial Mine (D.H.M.M.)
 - ◊ Sent in for notice of operation of the pit
 - Will be ready in a month or so
 - Bill F. discussed the field trips
 - ◊ Will have another club day to the D.H.M.M. in February
 - ◊ Look for emails with details of upcoming trips
 - ◊ Can also find dates on newsletter
 - ◊ May discontinue overnight trips for the rest of the season
 - Dues, T-shirts, and name tags were discussed
 - ◊ T-shirts are still available through Claudia M.
 - ◊ Name tags should be coming in soon
 - ◊ New members can find information on website or Facebook to be added
 - Ed W. talked about a possible fall show
 - ◊ Would be outdoors
 - ◊ Nov 12, 13, and 14 would be best dates
 - ◊ If not, we will hopefully have April/May 2022 show
 - Wire wrapping class was discussed
 - ◊ If you would like to attend, email Jennifer G. jennifer@eliteshuttersandblinds.com
 - Upcoming speakers were introduced
 - ◊ Jeff Osowski (Sterling Hill Mine) on Fluorescents
 - ◊ Then Stan Celestian
 - ◊ Then Leslie Hale from the Smithsonian
 - DO NOT FORGET SHOW & TELL!
 - ◊ This allows everyone to show off a recently rockhounded item
 - ◊ Have specimens ready for next Zoom meeting
- Respectfully submitted, Rebecca Slosarik, secretary

TRIP TO MUSHROOM RHYOLITE

Saturday, January 30, 2021

Photos by Susan Celestian

Turn out was very good, and the weather was great. Many rocks went to new homes! The material will take a great polish, and the swirly patterns are very interesting. The area is all gray rhyolite, with areas of murky black and gray obsidian. Much of the rhyolite has abundant lithophysae (*lith o fi see*). These “stone bubbles” are not well understood, but are thought to be associated with gas cavities, and the deposition of tiny crystals of various minerals in concentric layers. Some of the lithophysae weather out and lay about like marbles on the ground. There are some cavities lined with quartz crystals, too! In any case, they do add interest to the rock, making it a good lapidary material. AND chalcedony fills many cavities and seams, which (after weathering) leaves ‘desert roses’ littered across the ground in some areas.

THE HILLS ARE ALIVE!



**ROCKHOUND
MANTRA....
Ommmmmm
mmmmmm....
oonnee
moorrrre**



Ballast keeps the back wheels on the ground.



Field Trips continued on page 6....

...Mushroom rhyolite continued from page 5



Hefting boulders is a great workout!



A geode-riddled treasure!



Bentley decided that watching was easier than walking in his shoes :-)



Bentley's mom found a great lumpy rock!



Glassy obsidian - gray and black - abounds on the hillsides.



A chalcedony mushroom...

Mushroom Rhyolite has interesting bubbly patterns, and can be lovely when polished.

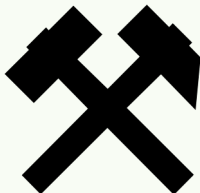


FIELD TRIP TO BRENDA

Saturday, February 13, 2021

Photos by Bill Freese

A cool, windy, beautiful February day, 20 DMRMC members -- many new -- enjoyed searching the desert for pretty rocks, near Brenda.



FIELD TRIP TO DAVE HANELINE MEM. MINE

Sunday, February 11, 2021

Photos by Susan Celestian & Bill Freese

Sunday was a beautiful breezy day at the club's claim. Attendees found all kinds of cool rocks -- barite, fluorescent calcite, quartz crystals, smoky quartz, fluorite -- even some chrysocolla (near the claim). I'm not sure anyone found any cerussite on that day -- but it's there! Don't forget that this claim is available to club members at any time, by appointment, for \$10 a day per person. Contact Stan Celestian: stancelestian@gmail.com



Getting Dirty is a Beauty Thing



....*Insecta etc. continued from page 2*

Hexapod and Myriapod habitat:

- ▶ Insects inhabit nearly every environment on Earth, including the ocean (where a very few may nest in crustaceans).
- ▶ Moist forests host most myriapods; however, they also occupy deserts, grasslands, semi-arid habitats, and a few are littoral (seashore).

Hexapod and Myriapod habit:

▶ Feeding habits:

- Insects are: herbivores, carrion eaters, predatory carnivores, parasites -- there isn't much to which they have not adapted as a food source.
- Millipedes are omnivores, preferring dead plant material.
- Centipedes are predatory carnivores.

▶ Mobility:

- Insects are the only invertebrate to fly; most walk, and some swim.
- Millipedes and centipedes walk on their many legs.

▶ Reproduction:

- There are usually separate male and female sexes.
- Most insects/millipedes/centipedes hatch from eggs, and then go through a series of molts. Many insects also go through metamorphosis (as caterpillar to cocoon or pupa to butterfly).

▶ Respiration:

- Insects/millipedes/centipedes have no lungs, but exchange gases through opening along the sides of their bodies.

▶ Communication:

- Crickets "chirp" by rubbing their wings together
- Some beetles use light (fireflies)
- Touch and smell are important!

Interesting facts:

- During the Pennsylvanian, there were dragonflies with wingspans up to 28". This size was made possible by the higher-than-present oxygen content of the air.
- The appearance of flowering plants coincides with rapid diversification of insect species.
- People in 80% of the world's nations eat insects (they are very high in protein).
- Some moths can hear the ultrasonic emissions of bats, and take evasive action.
- "The largest millipede in the world was a full grown African giant black millipede (*Archispirostreptus gigas*) owned by Jim Klinger of Coppell, Texas, USA. "Millie" measured 38.7 cm (15.2 in) in length, 6.7 cm (2.6 in) in circumference and had 256 legs."³

In the United States, there are two formations that especially yield fabulous insect fossils -- the Green River and the Florissant Formations. I know I got carried away, but there are SO many great images out there!

Images of fossil insects, millipedes, and centipedes follow in Figures 1-15.

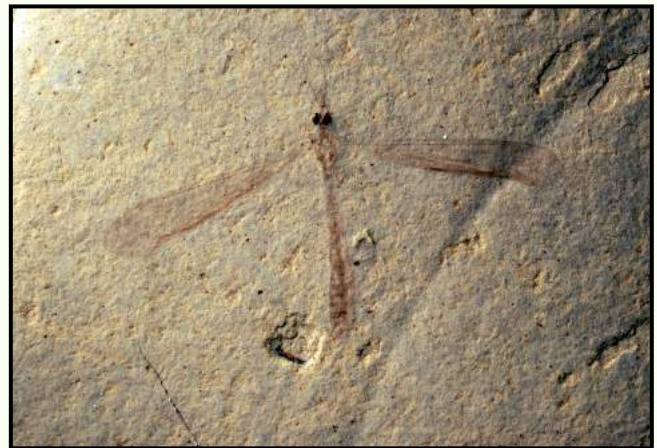


FIGURE 1 CRANEFLY Out of one of the iconic formations, the Upper Jurassic (150.8-145.5 mya) Solnhofen of Germany, this cranefly is about 1" from wing tip to wing tip. Photo by Stan Celestian

³www.guinnessworldrecords.com

....Insecta etc continued from page 9



FIGURE 2 FOSSIL MOSQUITO This is an iconic mosquito entrapped in fossil pine pitch, now amber. This is Baltic amber, about 40-50 myo.
Photo by Stan Celestian



FIGURE 3 FOSSIL BEETLE This is *Hydrophilus* sp., a water scavenger beetle. These beetles feed on decaying plant material in fresh water ponds and lakes. (The larvae eat insects, snails, tadpoles and small fish.) The beetles can dive, holding a bubble of air under their hard wing covers, where oxygen can be absorbed. This fossil came out of the Rancho La Brea Formation, a natural asphalt seeping to the surface at La Brea Tar Pits, in Los Angeles, California. The beetle was probably drawn to water sitting atop an asphalt pool, and became entrapped. Although seepage continues, the formation is dated at 40,000-11,000 years ago.
Photo by Stan Celestian



FIGURE 4 FOSSIL WASP Beautifully preserved in a fine clay, this wasp hails from the Florissant Fossil Beds National Monument in Colorado. Age - Eocene (34 mya).
Photo Public Domain - National Park Service

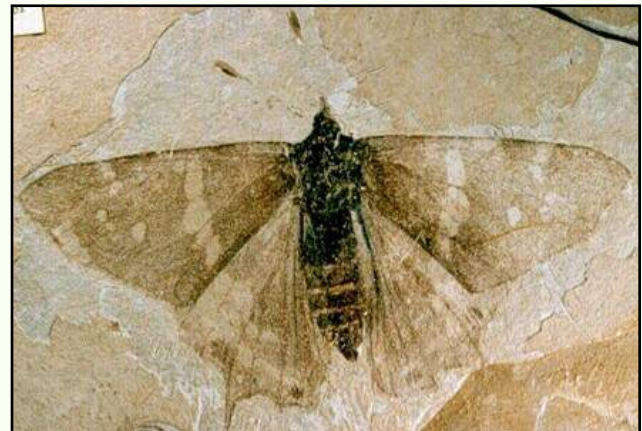


FIGURE 5 FOSSIL BUTTERFLY You can almost envision the colors in this detailed butterfly from the Florissant Fossil Beds National Monument in Colorado. Age - Eocene (34 mya)
Photo Public Domain - National Park Service



FIGURE 6 FOSSIL BUG This is a true bug, exquisitely preserved in the fine muds of the Eocene (53.5-48.5 mya) Green River Formation, Fossil Butte

National Monument, Kemmerer, Wyoming.
Photo Public Domain - National Park Service

Insecta etc continued on page 11....

....Insecta etc continued from page 10



FIGURE 7 FOSSIL GRASSHOPPER OR CRICKET This hopper is out of the Lower Cretaceous (about 122 mya) Santana Formation of northeastern Brazil. Photo by [John St. John](#), and used by permission, Creative Commons (CC BY 2.0).



FIGURE 8 FOSSIL FLY Look at the exquisite detail in the wings of this fly -- only about 1/4" across from wing tip to wing tip -- out of the Eocene (53.5-48.5 mya) Green River Formation, in Cowboy Canyon, Utah. Photo by Stan Celestian



FIGURE 9 FOSSIL DAMSELFLY Another great fossil out of the Eocene (53.5-48.5 mya) Green River Formation, Wyoming. Photo by Stan Celestian



FIGURE 10 FOSSIL DRAGONFLY LARVAE These are larvae of an extinct dragonfly, *Libellula doris*. Locality: Santa Vittoria d'Alba, Cuneo, Italy; 10 myo. Photo by Stan Celestian



FIGURE 11 FOSSIL COCOON Weathering out of the soil on Eyre Peninsula, South Australia, the cocoons

(locally known as "clogs" were created underground by the larvae of the Broad-back Weevil (*Leptopius dupontii*), about 100,000 years ago. Photo by Stan Celestian

Insecta etc continued on page 12....

....Insecta etc. continued from page 11



FIGURE 12 FOSSIL CENTIPEDE This centipede is only about 1/4" long. It was entrapped in fossil pine pitch, now amber, in the Baltic about 40-50 mya.

Photo © [Anders Leth Damgaard](#)



FIGURE 14 FOSSIL MILLIPEDE This millipede was caught in the La Brea Asphalt (38,000 years), in a Pleistocene asphalt seep, at La Brea Tar Pits, in Los Angeles, California. It is on display at Orton Geology Museum, Ohio State University, Columbus, Ohio. Photo by [John St. John](#), and used by permission, Creative Commons (CC BY 2.0).

FIGURE 13 MYRIAPOD TRACKS These fossil tracks, in the Early Permian (about 295-280 mya) Sangre de Cristo Formation of New Mexico, are thought to be made by centipedes. The specimen is about 5" across. Photo by [John St. John](#), and used by permission, Creative Commons (CC BY 2.0).



FIGURE 15 MYRIAPOD TRACKS The woman in the photo is pointing to two trackways created by giant millipedes. They occur in a Carboniferous (300 mya) sandstone, in Scotland. Photo by [Keith Burns](#), CC BY-SA 2.0, <https://commons.wikimedia.org/w/index.php?>

....Insecta etc. continued from page 12



FIGURE 16 MYRIAPOD FOSSIL This is a probable centipede fossil, from the Permian Orby Head Formation on Prince Edward Island, Canada. Photo by [microbe](#), and used by permission, Creative Commons (CC BY 2.0).

GENERAL RESOURCES FOR HEXAPODA & MYRIAPODA

- https://www.google.com/search?q=insecta&rlz=1C1CHMO_enUS586US586&oq=insecta&aqs=chrome..69i57j46i275i433j0i433i457j0i3j46i175i199j0.4535j0j1&sourceid=chrome&ie=UTF-8
- www.guinnessworldrecords.com
- <https://en.wikipedia.org/wiki/Entomophagy#:~:text=Eighty%20percent%20of%20the%20world's,two%20billion%20insect%20consumers%20worldwide.>
- <https://en.wikipedia.org/wiki/Myriapoda>
- http://www.fossilmall.com/EDCOPE_Enterprises/Mazon-Creek/MC2/MC-fossils-2.htm
- <https://www.lauerfoundationpse.org/fullscreen-page/comp-jofxgavc/9ca69a98-54e7-4101-886f-e1f53d78f0a0/4/%3Fi%3D4%26p%3Ddl4yc%26s%3Dstyle-jofxgawz1>
- Flickr
- Creative Commons

...Silver continued from page 3



FIGURE B WIRE SILVER The tangled mass of native silver is from Kazakhstan, and on display at the Carnegie Museum of Natural History. Photo by [John St. John](#), and used by permission, Creative Commons (CC BY 2.0).



FIGURE C FOUR DENDRITIC SILVERS These four specimens are from Batopilas, Chihuahua, Mexico. Their finely dendritic habit is quite distinctive. Photos by Stan Celestian; Image in upper left is used with permission of the Natural History Museum of LA County (NHMLA)



FIGURE D DENDRITIC SILVER Delicate dendritic wires of native silver have been etched out of calcite. This specimen is from the Miter Mine, Imiter District, Djebel Saghro, Ouarzazate Province, Morocco. Photo by Stan Celestian

Silver continued on page 14...

...Silver continued from page 13



FIGURE E WIRE SILVER This is a thumbnail specimen -- small, but exquisite (with a cute calcite crystal perched on a wire). The locality is Kongsberg, Buskerud, Norway. The Kongsberg field hosted over 80 mines, and during their operation from 1623-1958, almost 3 million pounds of silver was produced. The locality is famous for its robust and artistic wiry masses.

Photo by Stan Celestian

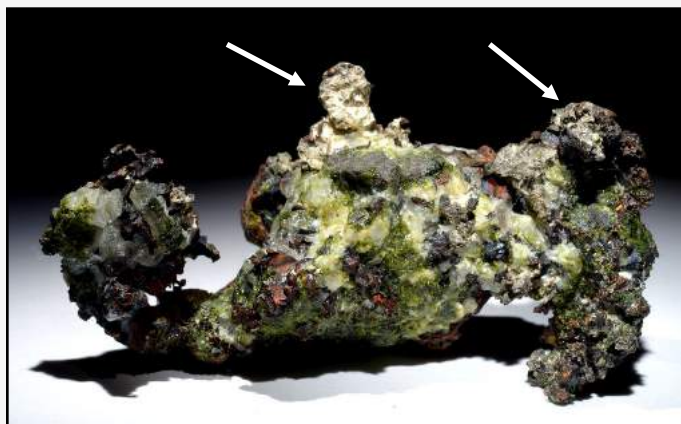


FIGURE F "HALF-BREED" Half-breeds, from the Keewenaw Peninsula, Michigan. The specimens are part copper and part silver. This is an irregular nugget of copper with associated silver, indicated by the two arrows. (Other minerals visible are white calcite and green epidote.) *Photo by Stan Celestian*

GENERAL RESOURCES FOR SILVER

<https://en.wikipedia.org/wiki/Silver#:~:text=Silver%20is%20a%20chemical%20element,and%20reflectivity%20of%20any%20metal>.

<https://www.mindat.org/min-3664.html>

<http://webmineral.com/data/Silver.shtml#.YCxltmhKg2w>

<https://www.unclaimedbaggage.com/blogs/news/8-fun-facts-about-silver>

<https://www.claddaghdesign.com/from-the-workshop/75-silver-facts/>

https://en.wikipedia.org/wiki/Silver_mining_in_Arizona#:~:text=Santa%20Rita%20mine-,Arizona%20silver%20belt,military%20road%20in%20central%20Arizona.

https://en.wikipedia.org/wiki/Kongsberg_Silver_Mines

Mineralogy of Arizona by Anthony, Williams, Bideaux, and Grant.



Interested in the geology of our neighbor to the east? Subscribe to the FREE publication of the New Mexico Bureau of Geology & Mineral Resources -- *New Mexico Earth Matters*.

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- ▶ The Arizona Geological Survey publishes a free newsletter 4 times a year. Until 1988 it, was called *Fieldnotes*, but has since been called *Arizona Geology*. Go to the [AGS website](#) to download issues, back to 1971.
- ▶ AGS also publishes the more in-depth and downloadable [Down to Earth](#) series, many focused on a park or geologic feature.

COOL LIQUIFACTION VIDEO

Images from Digital Globe's WorldView are blended to give us a view of slope failure, precipitated by the September 2018 earthquake that sent a powerful tsunami to Indonesia. Some saturated soils will behave like a liquid when shaken -- like when you tap your foot on a spot on a saturated sandy beach.

Go to [Instagram](#)

...Volcanics continued from page 2

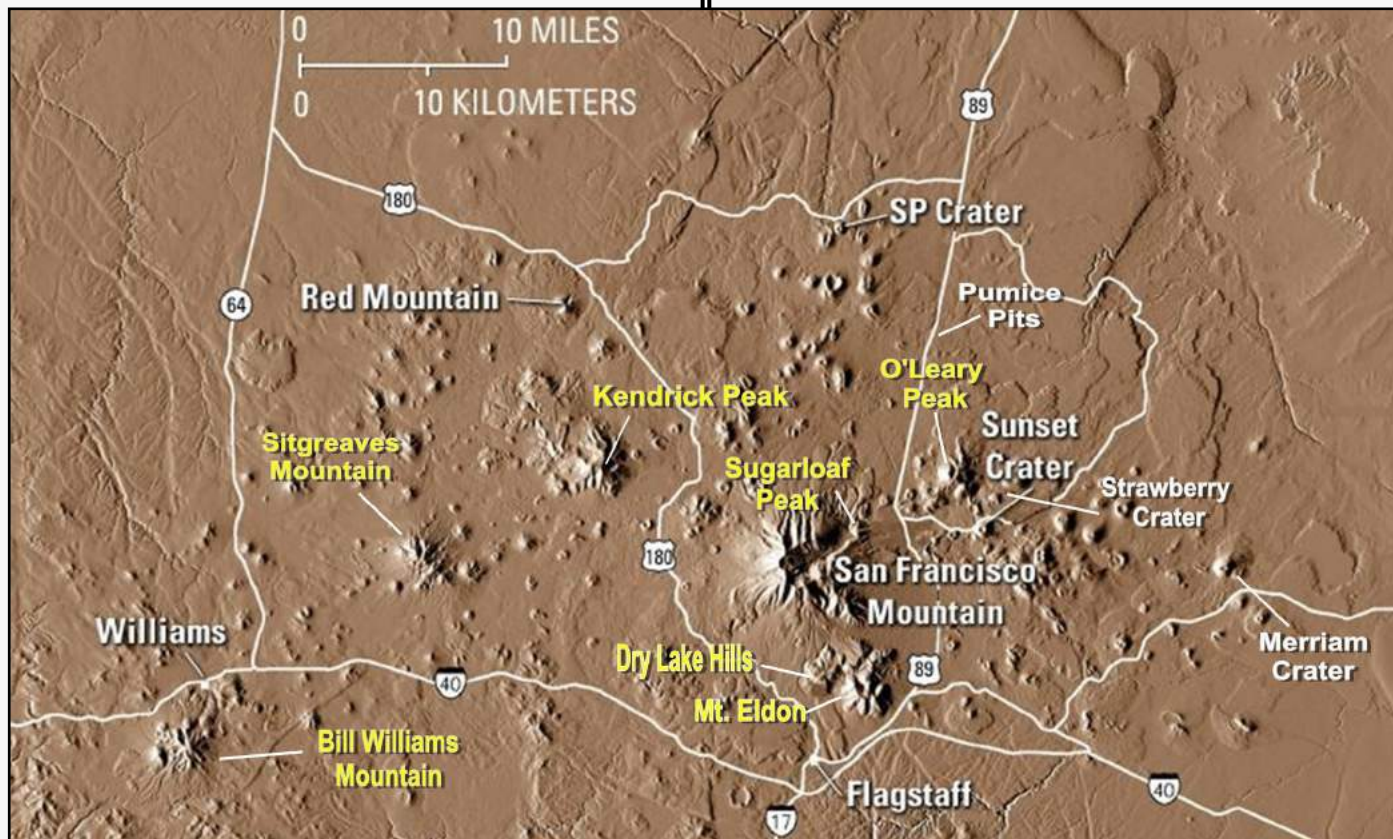


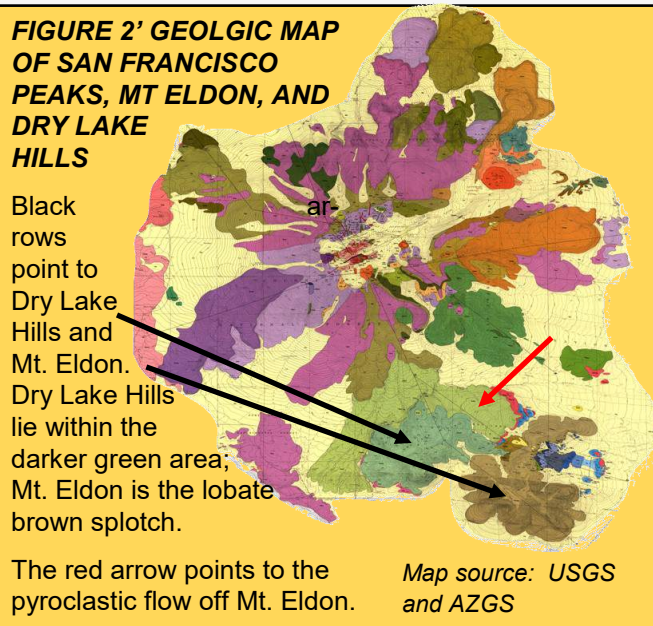
FIGURE 1' SAN FRANCISCO VOLCANIC FIELD You have seen this digital elevation model (DEM) of the San Francisco Volcanic Field, near Flagstaff, Arizona. In this version, the names of the lava domes have been added and emphasized in yellow. Image courtesy of the USGS (some sites added by Susan Celestian) [BACK TO PAGE 2](#)

BILL WILLIAMS MOUNTAIN (3.5-2.8 mya): This mountain (9,256'), just outside of Williams, Arizona is a suite of dacite (primarily) to andesite lava domes and flows -- all very viscous lavas, associated with relatively quiet extrusion of domes or violent explosions. Of the six featured peaks, this is the oldest (remember from January's newsletter -- the volcanic activity in the San Francisco Volcanic Field began in the west, and progressed to the east).

SITGREAVES MOUNTAIN (2.9-1.9 mya): Somewhat younger than Kendrick's Mountain, Sitgreaves Mountain (9,390') is built of a number of rhyolite domes. In fact, it comprises the largest mass of rhyolite in Arizona.

KENDRICK PEAK (2.7-1.4 mya): Kendrick is one of Arizona's highest peaks, topping out at 10,425'. It is a complex of lava domes, composed of rhyolite and dacite, with an overlay of andesite -- all low-silica, viscous magmas.

DRY LAKE HILLS (750,000 years ago): Just north of Mount Eldon, Dry Lake Hills was formed by thick dacite flows out of 8 lava domes. See Figure 2'.



...Lava Domes continued from page 15

MOUNT ELDON (600,000-500,000 years ago): A number of volcanic vents created Mt. Eldon. Initially, as the dacite lava bulged toward the surface, it pushed up a 3000' sequence of Paleozoic sediments above. These can be found tilted on the east and west flanks of the mountain.

Additionally, there is evidence of nueé ardentes, laying a brecciated pyroclastic-flow deposit, to the north. See Figure 2'. Nueé ardente (aka Peléan) eruptions occur as super-explosive events that blast ash, pumice, and blocks from the volcanic vent (some finer particles will go several miles high). This material falls back toward Earth, and roars down the mountainside as a hot, gaseous, buoyant mass -- travelling up to 100 mph!

Once the gases had boiled out, lobes of viscous lava spread out, piling up to create the mountain. See Figure 2'-4'.

NOTE: Referring to: Kluth, Charles (1974). *Geology of the Eldon Mountain Area, Coconino County, Arizona* (M.S). Flagstaff: Northern Arizona University. OCLC 27667856 -- Wikipedia states that the formation of Mt. Eldon may have been completed within a period of a few months. Maybe.....



FIGURE 3' MOUNT ELDON In this satellite view of Mt. Eldon, the many lobes of dacite lava flows can be seen radiating away from the mountain's center.
Image Source: Google Earth



FIGURE 4' MOUNT ELDON This side view of Mt Eldon emphasizes the lava lobes building up the mountain. Photo by Wayne Ranney, Arizona Geological Survey (AZGS) Arizona's Earth Science Photo Gallery.

O'LEARY PEAK (170,000-23,000 years ago): O'Leary tops out at 8,937', and represents a nice contrast with Sunset Crater, the cinder cone to the south. O'Leary is a dacite porphyry dome -- a lava near the opposite end of the igneous rock spectrum from that of Sunset Crater. See Figures 5'-6'.



FIGURE 5' O'LEARY PEAK This is a view of O'Leary from Sunset Crater. The road zigzagging up the side leads to a fire tower near the peak. Photo by Stan Celestian



FIGURE 6' O'LEARY PYROCLASTICS

Along the road up the mountain, one gets a glimpse of layers of ash and larger pyroclastic debris that was deposited during explosive phases during the buildup of O'Leary Peak. Photos by Stan Celestian



...Lava Domes continued from page 16

SUGARLOAF PEAK (91,000+/-2,000 years ago):

It is likely that this rhyolite to dacite lava dome rose and lifted up the surface rocks. Eruptions associated with Sugarloaf Peak, produced multiple pyroclastic flows, resulting in economic deposits of pumice, to the east. See Figures 7'-8'.

This pumice has been mined for use as the abrasive to "age" denim. It is also suitable for use as aggregate in concrete to make lightweight building materials. (White Vulcan Pumice Mine)



FIGURE 8' SUGARLOAF PEAK This is a satellite view of Sugarloaf Peak, a small lava dome near the base of San Francisco Peaks. White areas are pumice pits. *Image courtesy of Google Earth*

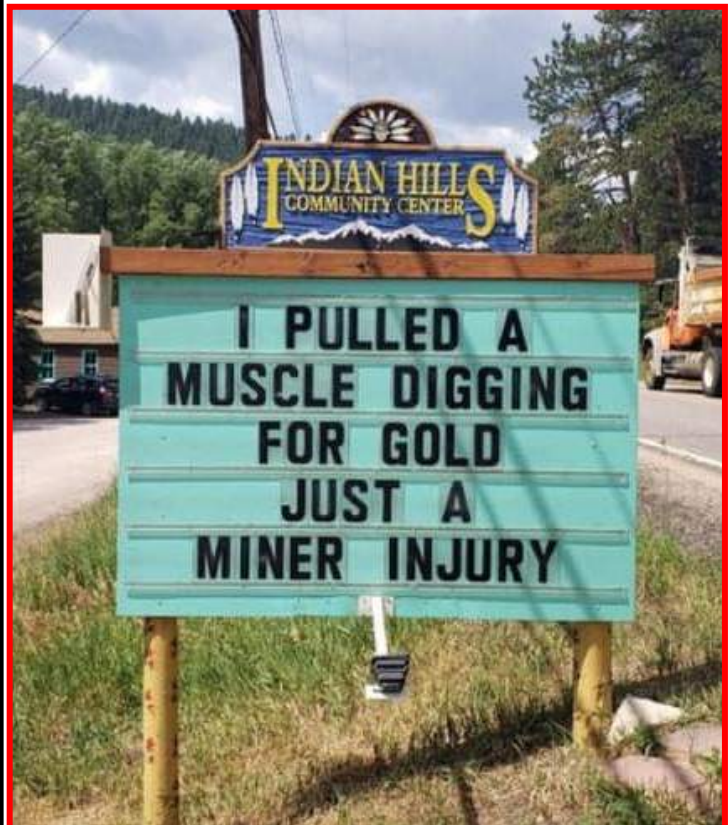


FIGURE 9' SUGARLOAF PEAK This view gives one a feel for the slopes of the peak. San Francisco Peaks are in the background. The white areas are pumice pits on the lower slopes of Sugarloaf Peak. *Image courtesy of Google Earth and view created by Mike Conway AZGS*

NEXT MONTH: Cinder Cones of the San Francisco Volcanic Field

GENERAL RESOURCES FOR LAVA DOMES

<https://www.snowbowl.ski/san-francisco-peaks-geology/>
<https://pubs.usgs.gov/fs/old.2001/fs017-01/>
<https://link.springer.com/article/10.1007/s00445-010-0365-8>
https://en.wikipedia.org/wiki/San_Francisco_volcanic_field#cite_note-Wood-3
https://arizonageologicalsoc.org/resources/Documents/Publications/Field_Trip_Guidebooks/AGS_1982-09_SF_Volc_Field_S.pdf
KENDRICK: https://en.wikipedia.org/wiki/Kendrick_Peak
ELDON:
<https://pubs.usgs.gov/imap/1663/report.pdf>
<https://pubs.usgs.gov/imap/1663/report.pdf>
https://ngmdb.usgs.gov/Prodesc/proddesc_9878.htm
<https://enjoyflagstaff.com/mount-elden-flagstaff/#:~:text=The%20eruptions%20that%20resulted%20in,western%20edges%20of%20the%20mountain.>
BILL WILLIAMS: <https://azgs.arizona.edu/photo/bill-williams-mountain#:~:text=The%20Pliocene%20Bill%20Williams%20Mountain,Williams%20is%20left%20of%20BWM.>
SITGREAVES : [http://www.swxrflab.net/sfvolfld.htm#:~:text=Sitgreaves%20Mountain%20\(or%20Peak\)%20is,to%2020%20cm%20in%20diameter.](http://www.swxrflab.net/sfvolfld.htm#:~:text=Sitgreaves%20Mountain%20(or%20Peak)%20is,to%2020%20cm%20in%20diameter.)
DRY LAKE: <http://repository.azgs.az.gov/sites/default/files/dlio/files/nid1915/dte-23riodeflag-holm-opt.pdf>
O'LEARY: https://en.wikipedia.org/wiki/O%27Leary_Peak
SUGARLOAF: <http://docs.azgs.az.gov/OnlineAccessMineFiles/Pubs/2013-02-0453.pdf>



BULLARD MINE

Wednesday, February 24, 2021

Photos by Bill Freese

Our most generous field trip chair made a special effort and took 7 people (mostly new folks and 2 guests -- that now have membership applications in hand and a plan to join the club) out to the Bullard Mine (he also has taken them to the Spectrum/Blue Cube/Prism). They are getting hooked!! Bill plans on adding some mid-week trips so people who can't go out on the weekends can still get out in the field.



**FEBRUARY SPEAKER
EVAN JONES**

At February's Zoom meeting, the Evan Jones, spoke of the history of the movement leading to the legislative approval of Wulfenite, as the official State Mineral.



Evan is well-known within the mineral community, and his mineral business is [Unique Minerals](#). On the company website, his bio reads as follows:

Evan A Jones is well established amongst those in the hobby. As son of the iconic Bob Jones (writer for Rock and Gem Magazine, author of The Frugal Collector and star of the What's Hot videos by Blue Cap Productions), Evan has been surrounded by minerals his entire life. A native of Arizona, it was only natural for him to specialize and collect Arizona minerals. Evan has degree in geology from ASU and currently is on the committee for the new mineral museum at the University of Arizona opening in 2020.

By 2015, Arizona had a state dinosaur (*Sonorasaurus*), state fossil (Petrified Wood), state Gemstone (Turquoise), and state metal (Copper). But Alexander Schauss felt that Arizona needed to be identified by a mineral, distinctive to the State.

He spearheaded an effort, marshalling the involvement of Mineralogical Society of Arizona's Rockhounds of the Future (with the avid assistance of DMRMC member Chris Whitney-Smith). And with the help of state representative Mark Finchem, a bill was finally passed on March 16, and signed into law by Governor Ducey on March 22, 2017.



On the left: Wulfenite, Red Cloud Mine, Yuma Co., AZ; and on the right: Wulfenite, Defiance Mine, Cochise Co., AZ. Photos by Stan Celestian



On the left: Wulfenite with Mimetite, Tiger Mine, Pinal Co., AZ; and on the right: Wulfenite, Rowley Mine, Maricopa Co., AZ. Photos by Stan Celestian

ARIZONA STATE MINERAL - WHY WULFENITE?

- Arizona boasts more world-class wulfenite localities than any other place on earth.
- No other state has more wulfenite occurrences than Arizona (over 200 at last count)
- Wulfenite is a highly desirable and attractive mineral to specimen collectors worldwide.

Alexander Schauss Collection, Scottsdale, AZ



All Powerpoint snapshots by Nancy Gallagher

UPCOMING FIELD TRIPS & MEETINGS

WHERE: Dave Haneline Memorial Mine
WHEN: Sunday, February 21, 2021
WHAT: Cerussite, Barite

WHERE: Chilito Mine
WHEN: Saturday, February 27, 2021
WHAT: Chrysocolla & other copper minerals

WHERE: Safford/Black Hills Rockhound Area
WHEN: **CANCELLED** 28, 2021
WHAT: Desert Roses & Fire Agate

NEW WHERE: Contact Mine
WHEN: Saturday, March 13, 2021
WHAT: Amethyst

WHERE: Bullard Mine
NEW DATE WHEN: Saturday, March 27, 2021
WHAT: Copper Minerals, Slag

WHERE: Camp Verde
WHEN: **CANCELLED** 2021
WHAT: **CANCELLED** pseudomorphs

WHERE: Date Creek
WHEN: Saturday, April 10, 2021
WHAT: Quartz Crystals, Hematite ps Pyrite

WHERE: Sycamore Creek
WHEN: Saturday, April 24, 2021
WHAT: Red Jasper

WHERE: Christopher Creek area & Fossil Site
WHEN: Saturday, May 15, 2021
WHAT: Zebra Chert, Naco Fm. Fossils

WHERE: Dobell Ranch & Grand Falls
WHEN: May TBA
WHAT: Petrified Wood

DATES SUBJECT TO CHANGE

Bill and the field trip committee will be actively looking for productive spots for field trips. If you have any suggestions, you are encouraged to contact him at bfreese77@cox.net

FACEBOOK



Visit and join the club page periodically. See what is happening, and boost our visibility on the web. Go to: [The Daisy Mountain Rock and Mineral Club](https://www.facebook.com/daisyrockchips). It is set up so you can post photos of outings or related items. Share with friends!

AWARD-WINNING WEBSITE

<http://www.dmrmc.com/>

If you have comments, contact Nancy Gallagher.

INSTAGRAM



Follow the club on Instagram. Go to <https://www.instagram.com/daisymountainrockclub/> and follow today. Share with friends!

Officers, Chairpersons, & Trustees

- President:** Ed Winbourne....ewinbourne@gmail.com
- Vice President:** Bill Freese..... bfreese77@cox.net
- Secretary:** Rebecca Slosarik .. rslosarik1@gmail.com
- Treasurer:** Cynthia Buckner....Cbuckrun1@q.com
- Publicity:** Jessie Redmond...
- Membership:** Tiffany Poetsch tnpoetsch@gmail.com
- Editors:** Susan & Stan Celestian..... azrocklady@gmail.com
- Field Trip:** Bill Freese ... bfreese77@cox.net
- Mine Steward:** Stan Celestian..... stancelestian@gmail.com
- Show Chair:** Ed Winbourne
- Trustees:**

Cynthia V	Claudia M
Susan C	Tiffany P
Bob E	Jim R
Jennifer G	Witt R
Don R	Howard R
Jessica C.	Rebecca S
Johnaton M	Joe G
Clark L	Bob S.

Meetings are held the **1st Tuesday of the month** at the **Anthem Civic Building**, 3701 W Anthem Way, Anthem, AZ 85086. General meeting at 6:30 pm. We **do not meet in July or August.**

DMRMCLUB@GMAIL.COM

Membership Dues:
First year \$30, then \$20.00 Adults per Person
First year \$45, then \$25.00 Family (2 people)

Meeting Dates for 2021

Jan 5, Feb 2, Mar 2, Apr 6, May 4, June 1, Sept 7, Oct 5, Nov 2, Dec 7

WIRE WRAPPING

Watch for an email announcing the resumption of the wire wrapping group

Words of Wisdom

passed along by our own

Bob Evans



Silence is often
misinterpreted
but never
misquoted.

NEEDED: QUALITY MINERALS (or OTHER) DONATIONS WITH LABELS -- for monthly raffle prizes; and for raffle, door prizes, and sales tables at the annual show. If you have specimens to donate, please see Robin Shannon. The Daisy Mountain Rock and Mineral Club is a 501(c)(3) non-profit organization, and will gratefully acknowledge your donation with a Tax Deduction Letter. Thank You!

NOTE FROM THE EDITORS

Have a geological interest? Been somewhere interesting? Have pictures from a club trip? Collected some great material? Send us pictures -- or write a short story (pictures would be great).

Deadline for the newsletter is the 22nd of the month.

Mail or Email submissions to:

Susan Celestian
6415 N 183rd Av
Waddell, AZ 85355
azrocklady@gmail.com

UPCOMING AZ MINERAL SHOWS

January-February - Quartzsite; Desert Gardens -
January 1 - February 28; 9-5 daily; check for updates on [Facebook](#)

February 26-28 - Clarkdale, AZ Mingus Gem & Mineral Club; Clarkdale Memorial Clubhouse Auditorium, 19 N 19th St; F-Sat 0-5, Sun 10-5; Admission - Free.

March 16-7 - Apache Junction, AZ Apache Junction Rock & Gem Club; 2151 W Superstition Blvd; Sat 9-4, Sun 9-3; Admission ?. This will outdoors, masks required.

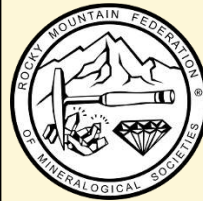
March 13 - Coolidge, AZ Pinal Gem & Mineral Show; Pinal Geology & Mineral Museum, 351 N Arizona Blvd; Sat 9-2; Admission - Free.

April 9-24 - Tucson, AZ During this period, most of the shows normally held in February, will set up. More information closer to April.

If you are travelling, a good source of shows AND clubs is <http://the-vug.com/educate-and-inform/mineral-shows/> OR <http://www.rockngem.com/ShowDatesFiles/ShowDatesDisplayAll.php? ShowState=AZ> OR <https://www.rockandmineralshows.com/Location/?displayShows=true>



Hourglass
Gypsum,
Great Salt
Plains,
Oklahoma
Photo by Stan
Celestian



Visit <http://rmfms.org/> for news about conventions, events, and associated clubs. If you are travelling, you might want to contact a club local to your destination. Maybe they have a field trip you could join, while in town.

NORTH MT OPEN STUDIO - MARCH

You are invited to return to NMVC Open Studio. Lapidary & Silversmithing on Thursdays and the first, third and fifth Saturdays in March from 8:30 to noon with cleanup starting at 11:45.

NMVC requires that everyone wear a mask while in the building. (Other NMVC requirements will be sent in a later email or on premises.)

Only four people can sign up, and must do so for the full three hours that the shop will be open each day. First come, first served.

Please arrive no later than 8:45 a.m. The center may close to the public at 10.

Email your request for the day(s) you are interested in participating ASAP. Email Shirley Cote at crystalc17@gmail.com

March - Thursday's dates are 4, 11, 18, 25
March - Saturday's dates are 6, 20

If more than four people wish to participate on the same day, please expect to be bumped or rotated to another day as efforts to accommodate everyone will be taken.

We would also like to inquire as to anyone wishing to come in for **Lapidary Only Open Studio on Mondays**. Email Shirley at crystalc17@gmail.com

March - Monday's dates are 1, 8, 15, 22