



# Daisy Mountain Rockchips

The purpose of Daisy Mountain Rock & Mineral Club is to promote and further an interest in geology.

VOLUME 4, ISSUE 1

JANUARY 2019

## THE TREASURE OF FOUR PEAKS

By Susan Celestian

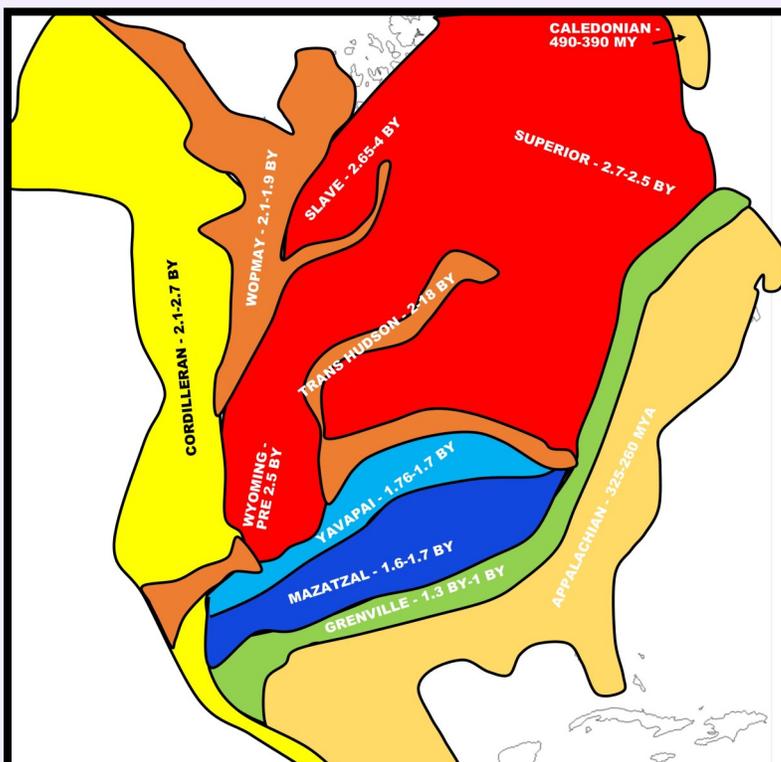
At January's club meeting, our speaker was Stephanie Bjorkman of Sami Fine Jewelry, purveyor of Arizona's own Four Peaks gem amethyst. The amethyst has a world-class color, being dark purple with a bright magenta flash. Stephanie was an enthusiastic speaker -- and even came bearing gifts!



The mine lies at an elevation of about 6000', and is reached via a steep, relatively rugged trail, or by helicopter. Hosting the amethyst is the Mazatzal Quartzite, a 1.6 billion-year-old metamorphic rock. These rocks formed during the Mazatzal Orogeny -- a major mountain-building event a long time ago -- that was associated with a plate tectonic collision that also resulted in the enlargement of the continent.

The North American continent was produced by repeated accretion of continental landmass. As a result, the basement rocks are broadly oldest in the center (centered around Hudson Bay), and generally younger out toward the edges. See Figure 1. (This is generally true of most of the globe's continents.)

This process is partially diagrammed in Figure 2.



**FIGURE 1 North American Orogenic Belts** This map very broadly delineates the *orogenic* (mountain-building) belts (aka *orogens*) created by the accretion of the North American Continent. Note that they become younger from the center out toward the edges. Through time, island arcs and/or micro-continents collided with, and were plastered onto, the larger continental landmass. Four Peaks lies within the Mazatzal Orogen. Graphic by Susan Celestian

Four Peaks continued on page 4.....

### WIRE-WRAPPING CLASS

4:30-6:30 pm  
Prior to the meeting on  
Tuesday, February 5, 2018

- Bring: cab or stone, about quarter-sized or larger; 20 gauge or higher round dead soft wire; Round nose pliers and wire cutter.

Free, but donations are appreciated. Questions?  
Contact Jennifer at [Jennifer@eliteshuttersandblinds.com](mailto:Jennifer@eliteshuttersandblinds.com)

### INSIDE THIS ISSUE

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January 10, 2019

### Board of Trustees Meeting Minutes

- In attendance: Bob E., Claudia M., Cynthia B., Don R., Ed W., Howard R., Rebecca S., Stan C., Susan C. and Tammy E.
- One last thank you to Clark for hosting a great Christmas party
- Financial Report for Fiscal YTD: Income: \$17,940.62, Expenditures: \$18,939.55
  - Money is spent for social media sites like meet up, will be discussing free sites in future meetings
  - Cynthia will be collecting receipts for 2018 audit
- Scholarship revamping: updates
  - Put on hold for holidays
  - April or May will discuss amount, locations, and who will receive them
    - A smaller committee was presented as best strategy for making changes
- Howard identified Jody Brewster is the state rep for the Rocky Mountain Federation
  - How you become the state representative will be looked into further
  - The club has many benefits which is why we are a part of them
    - They provide insurance
    - Give convention information and displays
    - Might have some networking benefits
- Mineral oil for the slab saw needs to be changed
  - CA oil was approved to be purchased
  - 12 (5) gal buckets for \$8/gal
  - Saw expenditures were also discussed
    - Will be addressed at next meeting
- There will be an additional paid raffle as well as door prizes at each meeting
  - \$1 per ticket
  - The raffle prize will have a higher value

### General Club Meeting Minutes

- Stephanie Bjorkman presented Arizona amethyst from mine to store, prizes were given
- Robin led the door prize giveaway
- New paid raffle announced
- Bill F., Dianne G. and Don R. added as Board Members
- Rebecca Slosarik elected as Secretary
- Show meeting #1 announced for January 17<sup>th</sup>
- Cynthia gave financial report for the year
  - The show creates our largest income for the club

Continued.....

- Field Trips:
  - Stan discussed upcoming Planet Mine trip
    - The 2019 club roster should all receive emails on trips
      - \* If not receiving, update information with Stan or Tiffany
  - Email Dave Hanline for more information on Red Cloud Mine trip
  - February and March trips scheduled, see GroupWorks for information
  - Bloody Basin was discussed as potential location
  - Other location suggestions are always welcome
- Bill F. (Heads Education Committee) will be representing DMRMC with a booth at the Anthem High School January 30<sup>th</sup> for S.T.E.A.M. (science, technology, engineering, arts and mathematics)
- GroupWorks was discussed
  - It is a FREE website for club management
  - You can promote, upload videos and advertise for members and/or nonmembers
  - You can now pay your dues on the site
  - It is a great tool for communication within the group
  - All newsletters are posted on our page
  - Check it out for yourself
  - Email with temporary password was sent to email list
    - If not received, see Howard or Tiffany
- Doug Duffey discussed the North Mountain Visitors Center
  - Address: 12950 N 7th St, Phoenix, AZ 85022
  - He teaches lapidary classes
    - \$60 for 4 sessions on Wednesday mornings
    - Machine information \$5/hr. with certification given at end of session
  - He teaches silver smith classes as well
    - 4 weeks long, \$150, 3 hours each session, supplies provided
  - Every 1<sup>st</sup> and 3<sup>rd</sup> Saturday the center hosts live music (free food and coffee available)
  - Doug is always at the center 9am to noon if needed
  - DMRMC members have exclusive access to the lapidary saw on Mondays
    - Howard, Ed, Claudia or Nelson (monitors) MUST be present while in use

Respectfully submitted,

Rebecca Slosarik

# DMRMC MEETINGS ROCK!!



Attendance has been so high, that we've had to rent the "big" room! *Photo by Nancy Gallagher*

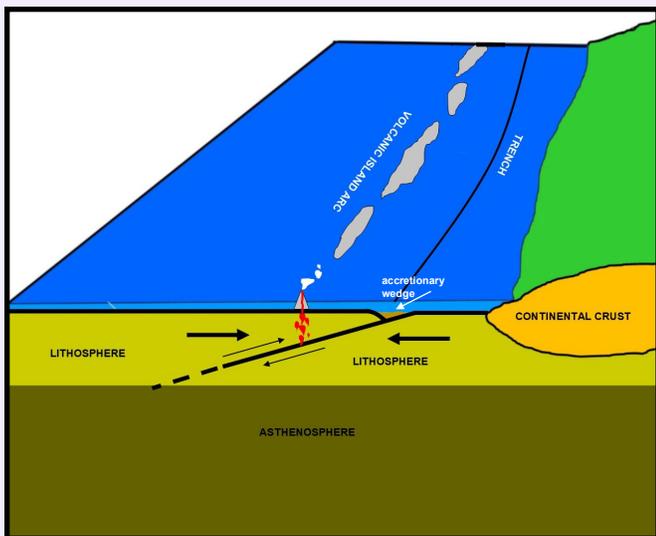


Door prizes put smiles on winners' faces! And now we are going to have a raffle, where purchasing a ticket(s) gives you a chance to acquire a quality mineral specimen.

*Photo by Nancy Gallagher*

....Four Peaks continued from page 1

Prior to 1.7 billion years ago the southern edge of the North American plate (coincident with today's central Arizona) was subducting to the south. Associated with subduction is the creation of volcanic island arcs, which is one way in which geologic forces create continental landmasses. As subduction progressed, arc islands (and any other landmasses that lay offshore) were dragged ever closer to the continent, any sediments accumulating in offshore basins were scraped off, and eventually it all collided, welded, and become part of the main landmass. See Figure 2.



**FIGURE 2 Block Diagram of a Subduction Zone**

Where one tectonic plate dives under another (subducts), the result is a shrinking ocean basin. Melting occurs on the subducting plate at about 60 miles, and buoyant masses of magma rise toward the surface. Some burn through the oceanic crust, and when the adjacent plates are oceanic crust, create submarine volcanoes -- a string of which may parallel the trench, and build an island arc. Other bodies of magma stall within the asthenosphere, cool, and create bodies of granite.

*Diagram by Susan Celestian*

The process of collision results in a major mountain-building event. The intrusion of granite, intense metamorphism, faulting, and folding contribute to the creation of towering mountains. See Figure 3. In the Mazatzal Mountains, overthickening may have resulted in extra high mountains (perhaps like what is occurring at the Himalayas today, where continental crust is shoveling under continental crust -- doubling the crust's thickness, and giving the mountains extra lift). With this, and additional uplift during a thermal event 200 million years later, there may have been total uplift of 6.2 miles (10

Continued...

kilometers)!!!\* Of course, erosion acted to continually wear down the rising mountains. Over the ensuing millennia -- it was almost 2 billion years ago -- these mountains eroded to a fairly flat surface, but were uplifted once more by probable emplacement of granites and along faults developed during the Tertiary (the last 65 million years). The latter events created the topographic mountains we see today.

**FIGURE 3**

Extreme fold in a quartz vein within the rocks of the Mazatzal Mts. There are areas where the slopes are decorated with



multiple zig zagging quartz veins

*Photo by Susan Celestian*

Again, the amethyst occurs in the Mazatzal Formation, a brecciated quartzite (metamorphosed sandstone) that caps the peaks of the Mazatzal Mountains. See Figure 4. Hydrothermal water, associated with granite bodies (probably during the Mazatzal Orogeny and during later thermal events), invaded the quartzite, and became enriched in silica, that precipitated out within openings in the host rock. A hike up to the mine, will reveal extensive surfaces covered with clear, smoky, and amethystine quartz crystals -- a very few of which are of gem quality. See Figures 4-6.



**FIGURE 4 Mazatzal Mts**

The barren rocks atop the peaks are the Mazatzal Quartzite, wherein one

finds amethyst. *Photo by Stan Celestian*

\*The Yavapai-Mazatzal boundary: A long-lived tectonic element in the lithosphere of southwestern North America, by Magnani, Miller, Levander, and Karlstrom; GSA Bulletin, Sept/Oct 2004.

Four Peaks continued on page 8...

## RED CLOUD MINE

On Saturday, January 19, twelve members of the Daisy Mountain Gem and Mineral Club descended on the Red Cloud Mine, in search of the elusive bright red-orange wulfenite crystals. About half of these intrepid hunters spent the night at the mine, being regaled by Roger (mine caretaker) with stories and jokes (Stan and Sue were going to camp, but forgot their tent poles).

The Red Cloud Mine is a historic Arizona mine, famous for its uniquely colored deep red-orange crystals. It was established as a silver-lead mine, with some minor production of gold. It was actively mined between 1881 and 1900. Not much effective production occurred until 1949. At that time, the dump was reworked, and about \$1 million in silver was recovered. Since then, it has been primarily exploited as a source of mineral specimens.

*All photos are by Ed Winbourne, Susan Celestian, and Stan Celestian*



This board holds the miners' brass -- tags whose position on the board, indicates each miner's location.



Look closely, and you can see some folks out on the ledge near the center of the photo. It is there that Roger and his fellow miners are working a pocket with potential.

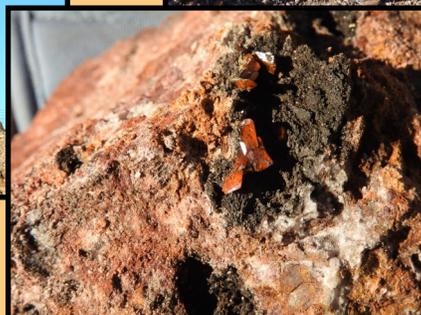


*Red Cloud continued on page 6...*

...Red Cloud continued from page 5



WULFENITE  
IS  
LOVE IS



Red Cloud continued on page 7....

...Red Cloud continued from page 6

For the time being, you are welcome to drop in at the Red Cloud Mine, meet Roger, pay your fee, and dig about on the dumps and possibly in the pit. This year there are no investors to support mining, so the future of the Red Cloud is uncertain. You definitely need a high clearance (preferably 4-wheel drive) vehicle or ATV to get there. Allow about an hour to make the 7-mile journey from Martinez Lake to the mine. If you are spending time in the Yuma, there are a few interesting activity possibilities.

In December, Michael Pollack and Laurie Manifold visited the historic Hull Mine at Castle Dome City. The Hull Mine was primarily worked between 1863 and 1900 for lead, silver, fluorine, barium, molybdenum, zinc, gold, and copper -- and minor arsenic, selenium, beryllium & tin. A total of about 20,000 tons were processed (8333 tons yielding 5% lead, 2% copper, and nearly 2 oz/ton silver (per Mindat.com). It is now privately owned, and being restored as an attraction. One of the highlights is a trip down 200 feet into the mine, where fluorescent lights reveal a spectacle of color. Ask Michael and Laurie how they liked it. <http://www.enchantedcavern.org/tour-info.html>

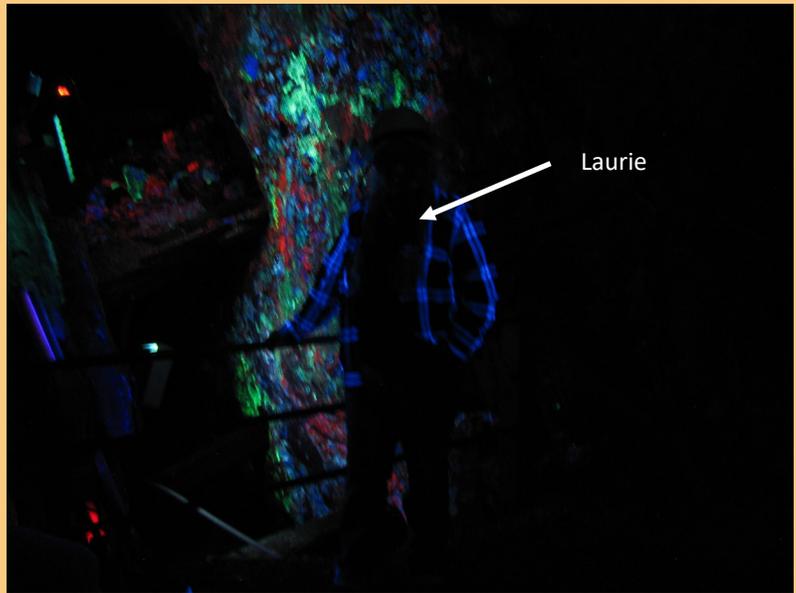


Photo by Michael Pollack

Stan and Sue spent the afternoon before the trip at the famous Yuma Territorial Prison, operated for 33 years. Hot in the summer, cold in the winter. Crowded. Forced manual labor (prisoners actually built the facility). Now that is an interesting place. Many a criminal (although some of the crimes seemed a bit minor, compared to murder) spent some rough months/years in that place. Even 29 women were incarcerated there -- and one baby was born there.

Somehow the Celestians missed the train engine at Yuma Crossing National Heritage Area -- they'll have to stop on their way to California some time -- and The Camel Farm & Wild World Zoo. But they did visit the Prison Hill Brewing Company, for a great dinner -- unique selections -- and local brew.

**SHORT REPORT ON A RECENT MEETING REGARDING THE RESURRECTION OF THE MINING, MINERAL & NATURAL RESOURCES MUSEUM:** On Friday, February 1, Brooks Jeffery, UA VP for Research and head of the museum project met with interested folks at the former Mining & Mineral Museum, on Washington St. Several DMRMC members were in attendance. In a nutshell:

- An advisory board has been partially assembled, awaiting approval of the Governor for the remaining members. However, a quorum has been established, and the group has met. Included: 2 each from mining and the legislature, and 1 each from tourism, forestry, the museum, gem/mineral. Still to be approved: 2 from the public, and 1 each from cattle and agriculture. The hope is that they will be ambassadors within their spectrums.
- Estimated funding needs are \$3.5 million for bringing the building up to code, and \$4 to create exhibits. There is currently enough money in the financial stream (legislative allocation & Centennial license plate contributions) to cover operating costs.
- Some funds have been released to complete some of the construction needed to bring the building up to code. Upon completion of that work, it is the plan to return the Collection to the museum building, and hopefully to install some mineral cases.
- Within the month the position of Executive Director will be posted. This person will lead, collaborate, speak, and spearhead fundraising. Needed: A mission statement, business plan, and physical operations plan.
- Looking to create an interactive, 21st century museum, distinct from the current gem and mineral museum at UofA, and whose mission is education.
- There is no target date for opening; however, the project will be multi-phasic, with incremental implementation of new exhibits. That will allow at least a partial opening before the project can be fully funded.

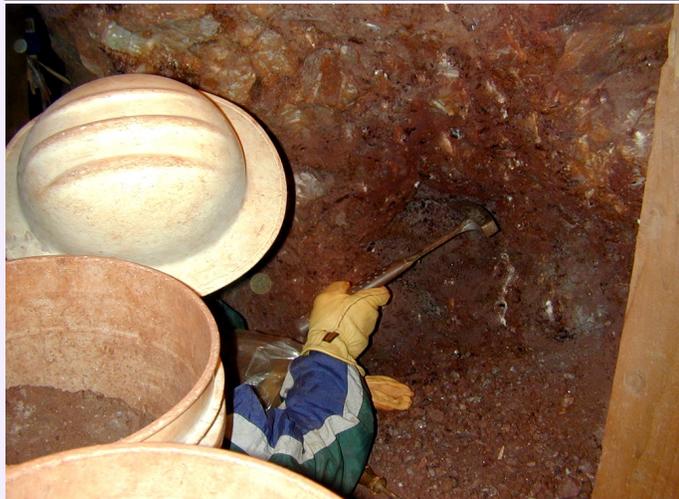
....Four Peaks continued from page 4

**FIGURE 4**

Amethyst crystals cover rocks of the slope below the Four Peaks Amethyst Mine. The crystals may have been light-colored to begin; however exposure to sunlight may also cause the color to fade. Photo by Stan Celestian



**FIGURES 5-6** In the figure above, you can see the opening to the mine, as it was in about 1988. Below, is a view inside the mine, where extraction of amethyst crystals is a process of carefully poking through the soil and weathered rock. Photos by Stan Celestian



Continued...

The purple color of amethyst is due to the presence of **iron** -- and natural **irradiation**. It is a phenomenon called *color centers*. Some of the iron occupies lattice sites - aka "S" - (ones normally occupied by silicon), and others sit interstitially - aka - "I", in spots not normally occupied at all. Gamma radiation (from surrounding rocks) can knock an electron out of a lattice-sited iron, and that electron will be picked up by an interstitial iron. The ions that lost an electron, and those that gained one will absorb different wavelengths of light. This may be also in conjunction with the absorption bands of other impurities. The sum of the absorption bands give the purple color, and variations in the S:I site ratios probably account for variations in the shades of purple exhibited in amethyst. See Figure 7-8.

**FIGURE 7**  
**Four Peaks Amethyst**

These two crystals were newly mined and cleaned. The color is very dark, and potentially gem-quality. Photo by Stan Celestian



**FIGURE 8** Here is a crystal-covered rock from the mine, and draped across it is Stephanie's necklace: 4 Peaks amethyst, San Carlos peridot, and ant hill garnet -- all Arizona gemstones. If you increase the magnification of your view, you will more easily see the magenta flash in the amethyst.

Photo by Susan Celestian

## UPCOMING FIELD TRIPS

**WHEN:** February 9**WHERE:** Dragon Mine**WHAT:** Tourmaline, Purple Mica, Thunderegg**MEET:** 8:45am McDonald's in Wickenburg; Be ready to leave at 9:00am**LEADER:** Stan Celestian**WHEN:** March (TBA)**WHERE:** Planet Mine**WHAT:** Specular Hematite, Chrysocolla; may take side trip to Swansea ghost town**MEET:** 9:00 at rest area IN Bouse (there is a WWII tank nearby)**LEADER:** Stan Celestian**WHEN:** March 16**WHERE:** DoBell Ranch**WHAT:** Petrified Wood**MEET:** TBA**OTHER:** Fee**WHEN:** April 6**WHERE:** Contact Mine**WHAT:** Amethyst**MEET:** TBA**LEADER:** Ed Winbourne**WHEN:** April (TBA )**WHERE:** Camp Verde**WHAT:** Pseudomorphs after Glauberite**MEET:** TBA**LEADER:** Stan Celestian**WHEN:** TBA**WHERE:** Black Pearl Mine on Aguila Rd.**WHAT:** Fluorescent Minerals**MEET:** TBA**LEADER:** Ed Winbourne**OTHER:** This will be an evening/after dark trip. Prior to dark, there will be a potluck. Sounds like fun! Portable UV lights will be coming along for the ride. (feel free to bring your own).

**NEEDED: QUALITY MINERAL (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

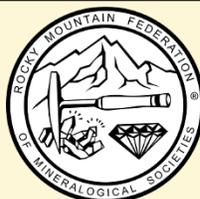
Waddell, AZ 85355

azrocklady@gmail.com

**WHEN:** May 11, 2019**WHERE:** Payson area**WHAT:** Zebra Chert, Pennsylvanian Fossils**MEET:** TBA**LEADER:** Ed Winbourne**WHEN:** June 1, 2019**WHERE:** Lynx Creek near Prescott**WHAT:** Gold**MEET:** TBA**LEADER:** Stan Celestian**WHEN:** June (TBA)**WHERE:** New River**WHAT:** Banded Iron & Yellow Jasper**MEET:** TBA**LEADER:** Ed Winbourne

## DATES SUBJECT TO CHANGE

Stan 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 [stancelstian@gmail.com](mailto:stancelstian@gmail.com)



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.

**UPCOMING AZ MINERAL SHOWS**

**January 1 - February 28 - Quartzsite, AZ** Various shows: Desert Gardens, Tyson Wells; For more information go to: <https://www.desertusa.com/cities/az/quartzsite.html>

**February 14-17 - Tucson, AZ** Tucson Gem and Mineral Society; Tucson Convention Center, 260 S Church Ave, Tucson, AZ; Thurs-Sat 10-6, Sun 10-5; Admission: \$13 adults, 14 and under free with paid adult. This is the 65th consecutive show, and the theme is Wulfenite is Loved. **For \$2 coupon, go [here](#).**

For peripheral shows (**beginning Jan 31**) go to pages 20-21 [here](#)

More shows can be found [here](#).

**February 22-24 - Clarkdale, AZ** Mingus Gem & Mineral Club; Clark Memorial Clubhouse Auditorium, 19 N. Ninth St; Fri-Sat 9-5, Sun 10-4; Admission: free.

**March 2-3 - Mesa, AZ** Apache Junction Rock & Gem Club; Skyline High School, 845 S Crismon Rd; Sat 9-5, Sun 10-4; Admission: adults \$3, students \$1, 12 and under free.

**March 9 - Coolidge, AZ** Pinal County Gem and Mineral Club; Pinal Geology and Mineral Museum at Artisan Village, 351 N Arizona Blvd; 9-2; Admission: Free.

**March 16-17 - Anthem, AZ** Daisy Mountain Rock and Mineral Club; Boulder Creek High School Gym, 40404 N Gavilan Peak Pkwy; Sat 9-5, Sun 10-4; Admission: \$3 adults, \$2 seniors and children, children 12 and under free. **For \$1 off coupon, go to page 10 in this [newsletter](#).**

**April 5-7 - Tempe, AZ** Flagg Mineral Society 2019 Minerals of Arizona Symposium; Drury Inn & Suites, 1780 W Ranch Rd, Tempe, AZ; Fri 3-5 Micro-mineral Session, 5-10 Mineral Sale, Sat 8-4 and 6 p.m. banquet; Sun 9-11; Registration required. <http://flaggmineralfoundation.org/home/minerals-of-az-symposium/>

**May 4-5 - Kingman, AZ** Mohave County Gemstoners; Kingman Academy of Learning, 3420 N Burbank; Sat 9-5, Sun 9-4; Admission: free.

**October 12-13 - Sierra Vista, AZ** Huachuca Gem & Mineral Club; Cochise College, 901 N Columbo Av; Sat 9-5, Sun 10-4; Admission: free.

If you are travelling, a good source of shows AND clubs is <http://www.the-vug.com/vug/vugshows.html> or <http://www.rockngem.com/ShowDatesFiles/ShowDatesDisplayAll.php? ShowState=AZ> For out-of-the-country shows: <http://www.mindat.org/shows.php?current=1>

A good source for a list of Arizona Mineral Clubs and contact information is <http://whitemountain-azrockclub.org/Public AZ Clubs Links.html>

**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](#). It is set up so you can post photos of outings or related items.

**WEBSITE**

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

If you have comments, contact Nancy Gallagher.

**GROUPWORKS**

As a DMRMC club member, your name should be available at <https://app.groupworks.com/#/login>, and you should receive an email linking you to registration. Create an account and receive reminders about club events, meetings, and important club information. You may post pictures and information -- all seen only by club members.

*Upcoming Meeting Programs*

Club President, Ed Winbourne has been working hard to schedule great programs for this season's club meetings. Below is a list of the current program offerings

:February: Australia by Susan Celestian

**Officers, Chairpersons, & Trustees**

- President:** Ed Winbourne.....[ewinbourne@gmail.com](mailto:ewinbourne@gmail.com)
- Vice President:** Stan Celestian
- Secretary:** Rebecca Slosarik .. [rslosarik1@gmail.com](mailto:rslosarik1@gmail.com)
- Treasurer:** Cynthia Buckner
- Publicity:** Howard Roose
- Membership:** Tiffany Poetsch [tnpoetsch@gmail.com](mailto:tnpoetsch@gmail.com)
- Editors:** Susan & Stan Celestian.....[azrocklady@gmail.com](mailto:azrocklady@gmail.com)
- Field Trip:** Stan Celestian... [stancelestian@gmail.com](mailto:stancelestian@gmail.com)
- Show Chair:** Ed Winbourne

**Trustees:**

Cynthia V	Claudia M
Susan C	Tiffany P
Tammy E	Jim R
Bob E	Witt R
Jennifer G	Howard R
Don R	Bob S
	Rebecca S

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

[DMRMCLUB@GMAIL.COM](mailto:DMRMCLUB@GMAIL.COM)

**Membership Dues:** \$20.00 Adults per Person  
 \$25.00 Family (2 people)  
 \$ 5.00 Additional children

**Meeting Dates for 2019**

Jan 8, Feb 5, Mar 5, Apr 2, May 7, June 4, Sept 3,  
 Oct 1, Nov 5, Dec 3

**2019 ANTHEM**

**GEM & MINERAL SHOW**

March 16th Saturday 9am—5pm

March 17th Sunday 10am—4pm

**Boulder Creek High School**

**40404 N Gavilan Peak Pkwy**

**Anthem, AZ 85086**

Kids events, Gems, Minerals, Fossils, Jewelry,

Fluorescents, Beads Wire Wrapping, Geodes,

Adults \$4, Seniors and Students \$2,

Children 12 and under FREE

Sponsored by

**Daisy Mountain Rock & Mineral Club**

**\$1.00 Off Admission with this coupon**

[www.dmrmc.com](http://www.dmrmc.com)

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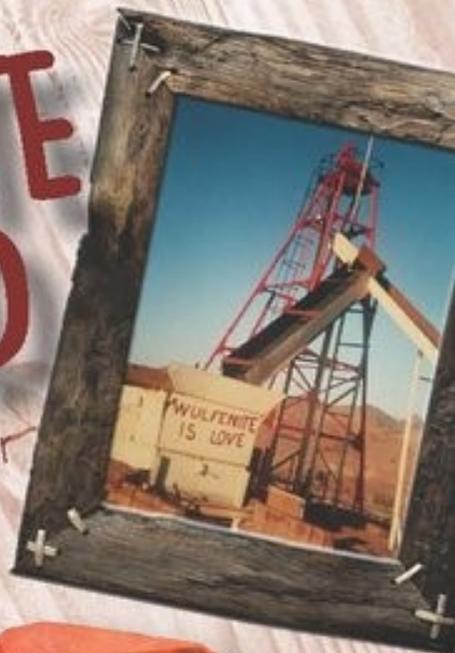
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[www.dmrmc.com](http://www.dmrmc.com)

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THE 65TH ANNUAL  
TUCSON GEM AND MINERAL SHOW®

# WULFENITE IS LOVED

Tucson Convention Center  
February 14-17, 2019



FEATURING:  
RETAIL DEALERS | EXHIBITS  
A "MICRO" ROOM  
FREE LECTURES  
JUNIOR EDUCATION  
SATURDAY NIGHT PROGRAM



For more information, visit: [www.tgms.org](http://www.tgms.org)



# 2019 ANTHEM GEM & MINERAL SHOW

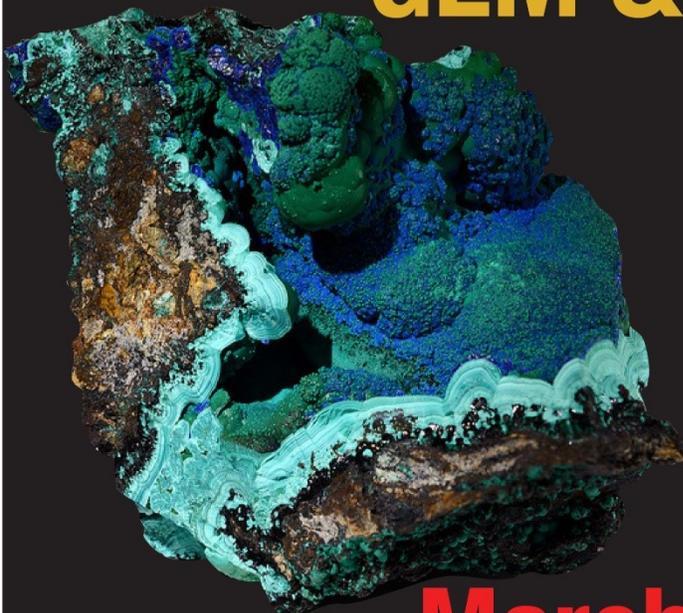


Photo by Stan Celestian

**March 16th-17th**

**@ Boulder Creek High School  
40404 N. GAVILAN PEAK PKWY  
ANTHEM, AZ**

**SATURDAY MARCH 16 9am—5pm**

**SUNDAY MARCH 17 10am—4pm**

**[www.dmrmc.com](http://www.dmrmc.com)**

Find us on 

**Kids Activities, Jewelry, Gems, Minerals, Fossils,  
Fluorescents, Beads, Wire Wrapping, Geodes, Raffles**

**Adults \$4, Seniors and Students \$2, and Kids 12 and under are FREE**

4th ANNUAL

# TOUCH OUTER SPACE



PINAL  
GEM &  
MINERAL  
SHOW

## MARCH 9, 2019

PINAL GEOLOGY & MINERAL MUSEUM: 351 N. ARIZONA BLVD., COOLIDGE, AZ.  
9:00 AM - 2:00 PM

DR. CARLETON MOORE WITH PIECES OF MARS, THE MOON, THE ASTEROID VESTA AND METEORITES.  
MINERAL DEALERS, EARTH SCIENCE EDUCATION, TOUR MUSEUM.

