



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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MARCH 2024



LINARITE from the Grand Reef Mine, Graham County, Arizona

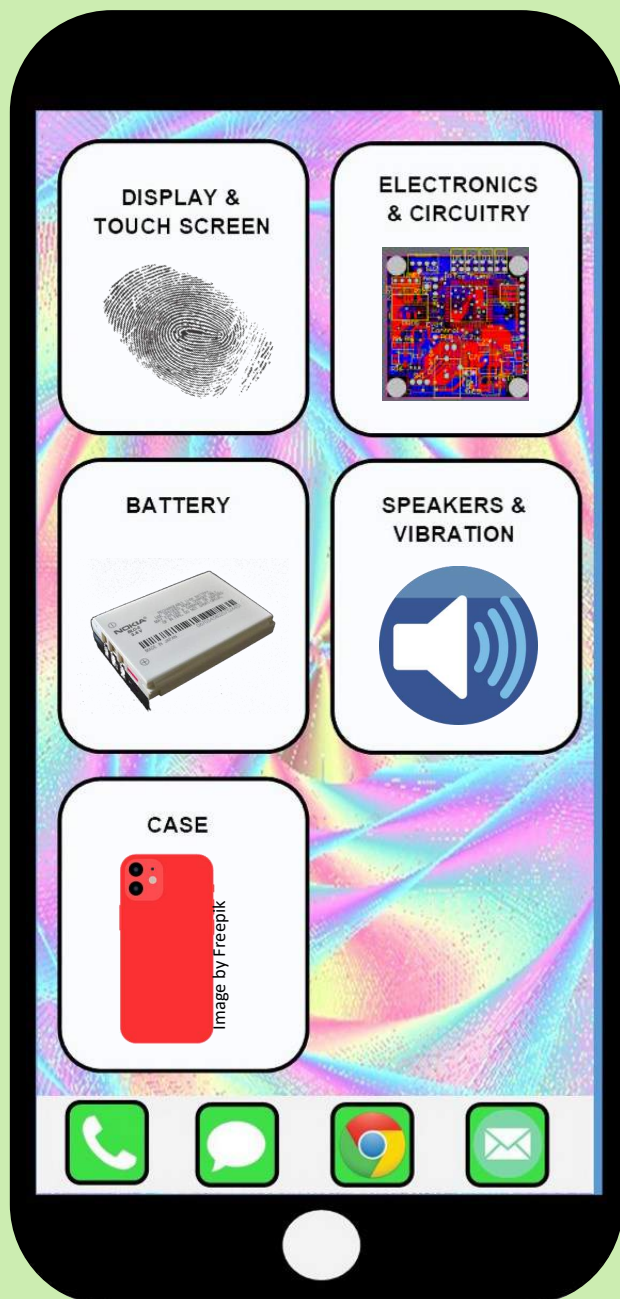
Linarite is a mineral that is always blue — crystals often exhibiting a very electric blue (often with adamantine luster).

Photo by Stan Celestian

WHAT MINERALS ARE IN YOUR SMART PHONE?

By Susan Celestian

IF YOU CLICK ON ANY ICON, IN THE SMART PHONE IMAGE BELOW, A HYPERLINK WILL TAKE YOU TO THE HEADING WITHIN THE NEWSLETTER



These days smart phones are practically appendages to the billions of people who own them. They give us 24-hour access to our family, friends and job contacts; facilitate access data and research via the Internet; keep our calendars that send us reminders of appointments and upcoming events; allow us to do online banking, buying, and bartering; provide navigation to locations around the world; monitor our heart rates and sleep habits; and keep us entertained.

There are over 70 minerals used to create the components of smart phones. This article does not include every element used, as there will be variations in phone construction. AND there may be multiple minerals that can be exploited for any given element. However, you will get an idea of the resources necessary to create what has become very nearly another appendage on the modern person.. SO lets take a look at what it takes to build a smart phone.

Smart phone continued on [page 12](#)

APRIL MEETING IS SWAP-SHOW-SELL

Bring items you have made or collected to share, trade or sell. Brag a bit!

Be sure to contact Bill Freese to reserve a table or half a table.

HAVE FUN!!!

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MARCH SPEAKER

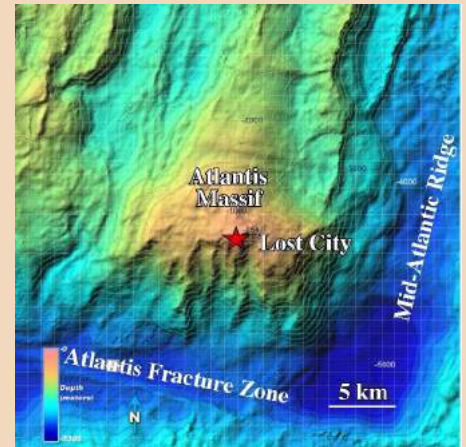
Ocean Drilling: Realizing the Foundation of Ocean Lithosphere & the Mantle

Dr. Barbara Johns, University of Wyoming



Between April 7 and June 7, 2023 Dr. Johns was part of IODP Expedition 399, a drilling project that revisited a previously-drilled area on the Atlantis Massif, a oceanic core complex on the Mid-Atlantic Ridge between Morocco and Florida, and a mountain the size of Mt. Rainier. A primary goal of the expedition was to recover rocks from the Earth's upper mantle, in order to sample borehole fluids to further test the hypothesis of abiotic (i.e. chemical rather than biologic) rock/water reactions that may have facilitated the origins of early life.

Attempts to drill into the mantle have occurred since Project Mohole in 1961. Despite the fact that the mantle constitutes about 80% of the Earth's volume, it typically is too deep to reach from the surface, even from the thinner oceanic crust (where it is typically 2-3 miles deep). However, at the Atlantis Massif (and other similar structures along oceanic ridges), mantle rocks have been faulted up 14,000', and landslides have removed upper rocks, so that Expedition 399 only had to drill a bit over 4000' below the surface of the ocean floor, to encounter upper mantle rocks. The cores retrieved are being studied by petrologists, structural geologists, igneous geologists, paleo-magnetists, micro-biologists, chemists, and others.



Facts and potential outcomes from this expedition:

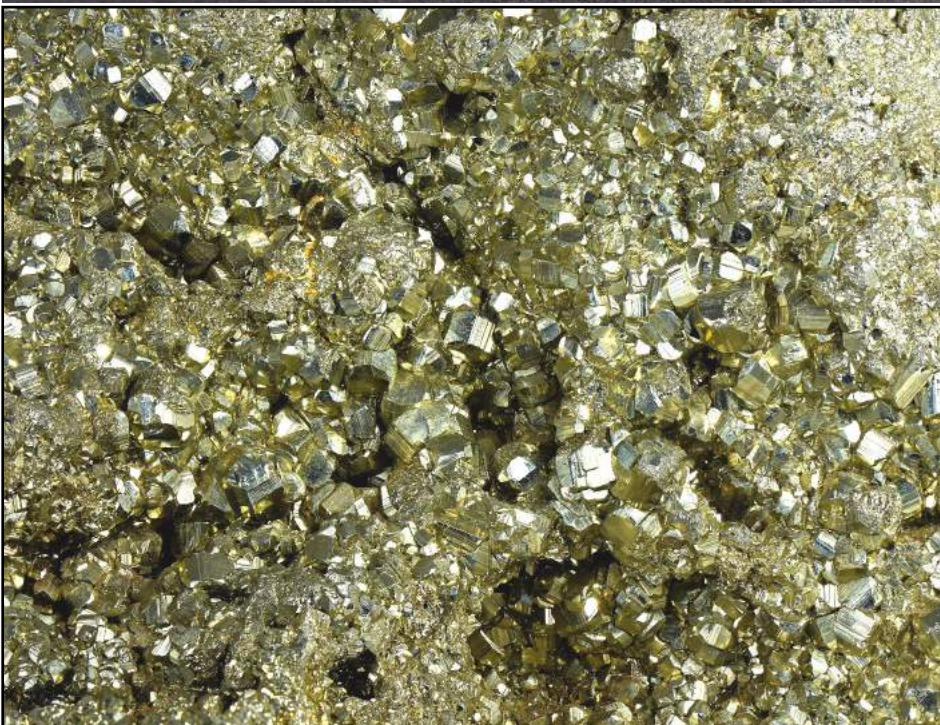
- * Interaction between mantle rocks, resulting in the alteration of dunite to serpentized harzburgite (olivine & pyroxene) produces hydrogen, abiotic methane, organic acids and short-chain hydrocarbons — substances fundamental to the origin of microbial life
- * At the ocean floor in the vicinity of the borehole, there is a hydrothermal vent field, called Lost City. (Hydrothermal vents — hot & low pH black smokers, medium temperature & neutral pH, and “cool” & high pH — are found all around the globe along the mid-ocean ridges.) At Lost City:
 - ◇ Water relatively cool (104^o-122^oF, at least less than 193^oF)
 - ◇ More than 30 chimneys in the field.
 - ◇ Towers at vents composed of calcite, aragonite, and brucite.
 - ◇ Occur partly because of serpentization of peridotite in mantle, and the resultant methane and hydrogen generated.
 - ◇ Water extremely alkaline (pH 9-11), and methane-rich.
 - ◇ Supports dense populations of chemosynthetic micro-organisms (bacteria & archaea), that then provide energy/nutrients to the less common macro-invertebrates (coral, ostracods, worms, gastropods, bivalves, shrimp, jellyfish) — all without benefit of sunlight. The fauna may be more diverse than those found at black smokers (with which you are probably more familiar, and at which it is thought by many to be the nurseries or incubators of early life on Earth)



SPECIAL SPRING RAFFLE



1 square
centimeter



BIG, BRILLIANT PERUVIAN PYRITE

- * **7.5" wide**
- * **12 pounds**
- * Tickets will be sold at each meeting. They are \$1 per ticket, or 12 for \$10.

Remember, all proceeds help support club activities.

2024 DMRMC GEM & MINERAL SHOW

Another successful show is now under our belts. Set-up day went smoothly, thanks to the help of so many volunteers. Attendance may have been down somewhat from past shows; however, it was an enthusiastic and generous crowd. Both the Kid's Corner, egg cartons, and club sales tables were big hits!



Photo by Ed Winbourne

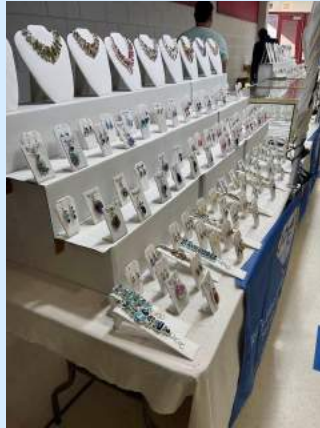


Smart phone continued on page 10

Photo by Tiffany Poetsch



Photos by Tiffany Poetsch



Drs. Rock Photo by Stan Celestian



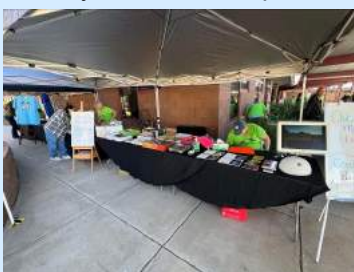
Photos by Lynnea Aanderud



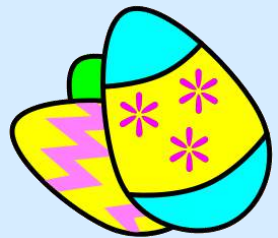
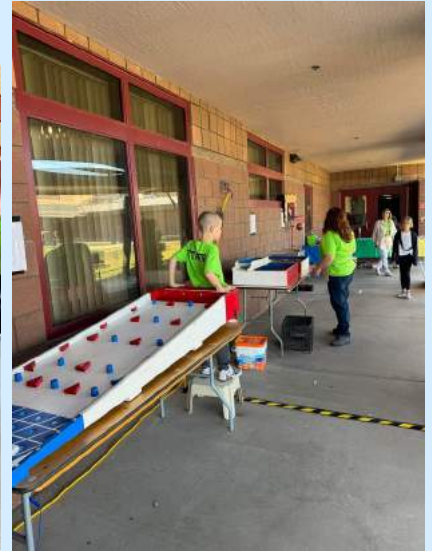
Puggy says come to the show!
Last day, we're here to 4:00pm.

Tiffany Poetsch's Pooch

Tiffany at membership table



All photos on this page by
Lynnea Aanderud



STEM-STEAM NIGHTS **AT LOCAL DEER VALLEY** **SCHOOLS**

The education committee has gone to two elementary schools this winter to participate in their annual STEM/STEAM nights. The first visit was to New River Elementary on February 1st and the second on March 7th at Canyon Springs Elementary. We have been bringing presentations to both schools for years when and have been warmly received each time by both students and their parents.

Bob Salter, Bill Smardo, and Claudia Marek provide 3 different, two hour presentations when representing our club. Bob teaches about fluorescents with the help of the club's UV transilluminator, Bill teaches about the techniques used to polish petrified wood to a brilliant shine while talking about the elements needed to produce all the colors seen in the petrified wood found in northern Arizona around the Holbrook and Winslow area. The ancient forest became fossilized 200 million years ago and is made up of almost solid quartz. Claudia displays her collection of rocks and minerals found in Arizona and talks about where they were collected hoping to recruit new members into the club.

Flyers for our annual show are handed out to everyone who comes to our tables as well as business cards letting people know how to contact us for membership.

If you have a collection you'd be willing to share with the families coming to these events please contact Claudia as we'd love to have more for these visits. The education committee would love to have more club members join us!



New River Elementary School STEM Night

*Dear Daisy Mountain Rock and Mineral Club,
We would like to say a big THANK YOU to you for coming to our New River STEAM night! Everyone had a lovely time seeing the wonderful samples you brought. Thank you again. We hope we'll be able to get you back again next year!*

*Lesli Brandell, 3rd Grade
New River Elementary*

2018 SCHOLARSHIP **AWARDEE UPDATE**

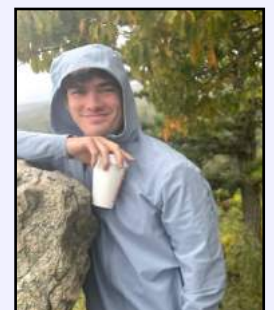
In 2018 Jack was a recipient of your scholarship and we thank you. Yes, he graduated from ASU with high honors, internships and proceeded to apply to medical school. That is where my last email left off. He was accepted to the University of Virginia Medical School, and we were very grateful for that opportunity. Jack received an additional call, at the very last minute. Shoot for the starts, right?! He kept one option open ... He changed where he was going to for medical school.

Jack was accepted and is currently enrolled at Johns Hopkins Medical School and is doing very well. The call he received from the Dean, from Johns Hopkins, and it was an emotional one. Very humbling. 113 students are accepted each year. Their team saw something in Jack, reached out to him, and made the invitation.

I am sending this as we are grateful of your scholarship, and for taking the time present your award in person to Jack, a few years back. You saw something as well. Things are not forgotten, and I remember both of you, at the Boulder Creek Awards Ceremony in 2018.

Of course, you have my permission to share this story. You have asked me this before in replies to my earlier emails. I hope others send you emails about the progress of the recipients of your scholarships as well.

David L. Kollings



WIRE WRAPPING

CLASS DATE: on the 1st Tuesday

CLASS TIME: 4:30-6:15

CLASS PLACE: Anthem Civic Center, 3701 W Anthem Way

Monthly meetings are prior to the general club meeting. Great class for beginner to advanced. Come and wire wrap with friends!!!

GENERAL RULE: Bring a cabochon or other stone, 20 and 26 gauge copper-based wire, round nose pliers, flush cutters, and any other tools you might use.

MONTHLY PROJECT PARTICULARS will be posted on the DMRMC [Facebook](#) page.

*If you want to try it out, the club has 4 sets of tools and wire that you may borrow during a class. If you like it, you can then purchase your own supplies.

The class is free; however tips are always welcome. All teachers are unpaid volunteers so the tips go towards gas and supplies to make things more fun for you!

MARCH PROJECT:



TREES

OF

LIFE



By Yolanda J.

APRIL PROJECT:



WHAT TO BRING:

- Round nose pliers
- Flat nose pliers or needle nose pliers
- 18 gauge round or square wire
- 22-28 gauge round weaving wire whatever you are most comfortable with.
- One small to medium size cabochon

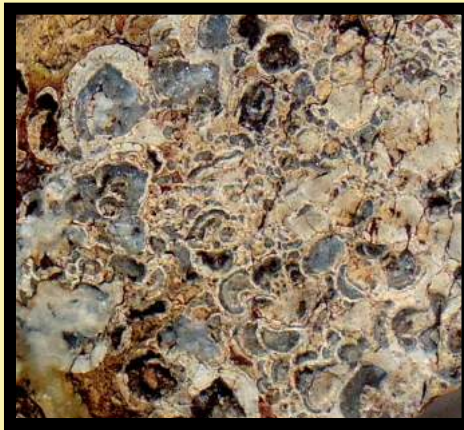
...Field trips continued from page 6

FIELD TRIP to MUSHROOM RHYOLITE

Wednesday, March 9, 2024

Photos & text by Bill Freese

Hey everyone, the DMRMC had a mid-week trip to the Mushroom Rhyolite site. This is always a club favorite because of the diversity of material available. The 13 folks on the trip had a great time and took home some awesome specimens. The weather was perfect. So many treasures to take home and enjoy later. Until next time...



Field trips continued on page 10

...Field trips continued from page 9

FIELD TRIP to ROWLEY MINE

Saturday, March 9, 2024

Photos & text by Bill Freese

Hey Rockhounds, The DMRMC & MSA had a field trip on Saturday to the famous Rowley mine. This mine that started in 1900, now lists 75 different minerals on Mindat.org. It is tough to leave without finding several different mineral specimens to take home. We had quite a few last minute cancellations but still managed to have 36 rockhounds to play in the dump. Besides the usual common minerals like Chrysocolla, Mimetite, Wulfenite, and Baryte, some found some more rare pieces like Galena & Linarite. All had a great time and left happy.



Wulfenite & Mimetite



**Vibrant Chrysocolla
for Sale at Mine**



Field trips continued on page 11....

...Field trips continued from page 10

FIELD TRIP to LITTLE HORN PEAK

Wednesday, March 20, 2024

Photos by Bill Freese & Susan Celestian, text by Bill Freese

The DMRMC had another mid-week trip to Little horn Peak for geodes. The weather was great, not too hot yet. The 29 rockhounds scoured the mountainside for some interesting geode specimens and all found something. Some found some great specimens. Everyone enjoyed their day outside in the great AZ desert. Until next time....



...Smart phone continued from page 2

DISPLAY & TOUCH SCREEN

- * A smart phone screen must be durable and scratch resistant; conductive to facilitate tapping, swiping and touching; and bright and colorful.

The glass is composed of aluminosilicate tempered with potassium. See Figure 1.



FIGURE 1 SMART PHONE GLASS The primary component of glass is silicon dioxide or **Quartz (A)**, sourced from rock quartz or from **Quartz Sand (B)**. The addition of aluminum and magnesium increases its durability. These components may be derived from **Bauxite (C)**. The tempering with potassium increases the scratch resistance of a device that is carried about, shoved in pockets and bags, and occasionally dropped. A possible source of potassium is **Sylvite (D)**, a K-rich evaporite salt. *Images by Stan Celestian; (C) & (D) used with permission of the Natural History Museum of Los Angeles County Gem & Mineral Hall*

(A) Arkansas; (B) Indiana Dunes, IN; (C) Saline Co., AR; (D) Strassfurt, Saxony-Anhalt, Germany

...Smart phone continued from page 12

2

DISPLAY & TOUCH SCREEN continued:

- * Transparent circuits in the display are composed of layers of indium-tin-oxide, as a Conductive Coating. This allows the user to tap, swipe, pinch, and otherwise interact with the objects on the screen. See Figures 2-3.



FIGURE 2 DISPLAY CIRCUITS Cassiterite is a primary tin source. *Image by Stan Celestian and used with permission of the Natural History Museum of Los Angeles County Gem & Mineral Hall*

From Golconda mine, Coroaci, Minas Gerais, Brazil



FIGURE 3 CIRCUITRY & CONDUCTIVE COATING require indium, extracted from Sphalerite. *Image by Stan Celestian*

From the Silver Bell Mine, Pima Co., AZ

- * LED Backlighting in the display relies on a source of gallium. Germanium is another element used. See Figure 4.



FIGURE 4 LED lighting in a smart phone is facilitated by gallium, sourced from **bauxite**.

Image by Stan Celestian and used with permission of the Natural History Museum of Los Angeles County Gem & Mineral Hall From Saline Co., AR

- * Smart phone screens are quite colorful, and those colors are possible by the use of rare-earth elements, such as europium, terbium, and yttrium. See Figure 5

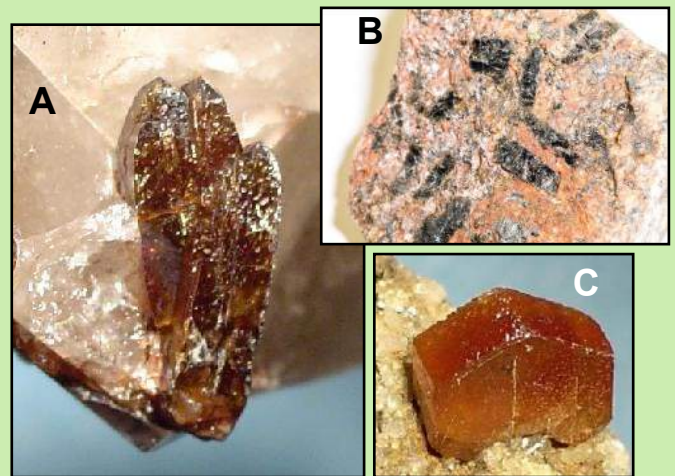


FIGURE 5 SCREEN COLORS rely on rare-earth elements derived from generally not-so-pretty minerals. Yttrium from **Xenotime** (A), terbium from **Euxenite** (B - the black blades), and europium from **Bastnäsite** (C).

Images: (A) & (C) by Rob Lavinsky and licensed thru Wikipedia [CC-BY-SA-3.0](https://creativecommons.org/licenses/by-sa/3.0/); (B) © Raimond Spekking [CC BY-SA 4.0](https://creativecommons.org/licenses/by-sa/4.0/)

(A) Brazil; (B) Zimbabwe; (C) Zagi Mountain Mulla Ghor, Khyber Agency, Federally Administered Tribal Areas (FATA), Pakistan

...Smart phone continued from page 13

ELECTRONICS & CIRCUITRY

Components of the circuitry include the circuits, transistors, memory chips, camera sensors, communication chips, capacitors, speaker, microphone, vibration units, camera focus units, and solder.

The list of elements used for electronics and circuitry is quite long: See Figures 6-24.

- ⇒ Arsenic
- ⇒ Barium
- ⇒ Beryllium
- ⇒ Boron
- ⇒ Copper
- ⇒ Gallium
- ⇒ Gold
- ⇒ Iron
- ⇒ Palladium
- ⇒ Phosphorous
- ⇒ Neodymium
- ⇒ Silicon
- ⇒ Silver
- ⇒ Tantalum
- ⇒ Tin
- ⇒ Titanium



FIGURE 6 SILICON Silicon is an integral ingredient in many components of a smart phone. It is derived from quartz, and is a lightweight silver metallic substance.

Silicon is an effective semiconductor — it conducts electrons like a metal and also is an insulator, so can be used to block electricity in a switch. Plus it is a very stable material. Doped with elements such as gallium, boron, phosphorous and arsenic, its electrical properties can be adjusted.

Images by Stan Celestian

Quartz from Arkansas



FIGURE 7 COPPER This is **Chalcopyrite**, a primary ore of copper. Copper is a common and important element used to conduct electricity. It is common and relatively inexpensive..

Image by Stan Celestian



FIGURE 8 SILVER Tetrahedrite is a source of silver. Silver-based inks are conductive and allow circuits to be printed on inexpensive and flexible substrates.

Image by Stan Celestian

From Machacamarca Mine, Machacamarca, Bolivia



FIGURE 9 GOLD Gold plating provides corrosion resistant and conductive coatings on connectors and contacts, thus preventing disruption of use to tarnish and corrosion.

Image by Stan Celestian

From Eagle's Nest Mine, Placer Co., CA

...Smart phone continued from page 14

ELECTRONICS & CIRCUITRY continued:

FIGURE 10 PHOSPHOROUS

This is fluorapatite, a member of the apatite group, of phosphates and source of phosphorous. *Image by Stan Celestian*

From Cerro de Mercado Mine, Durango, Mexico

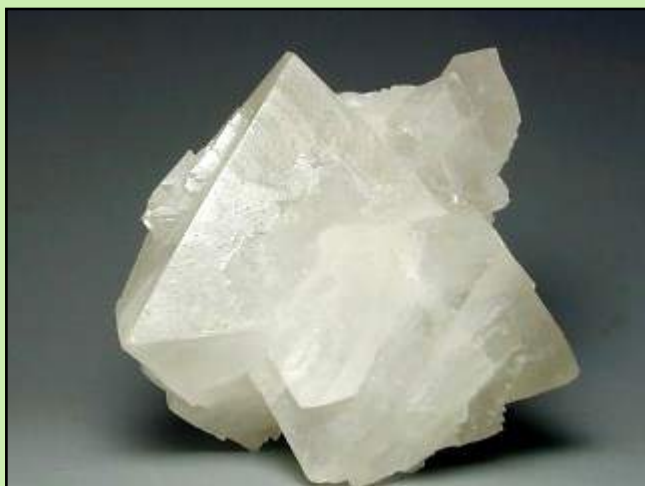


FIGURE 11 BORON Kernite (and in some cases ulexite) is a source of boron.

Image licensed under [CC BY-SA 3.0 DEED](https://creativecommons.org/licenses/by-sa/3.0/).

On exhibit at the Montana Mineral Museum

FIGURE 12 TITANIUM This is a **Zircon** crystal.

Hafnium is often associated with zirconium minerals. A thin layer of hafnium improves carrier conductance and forms gates that control electron flow. *Image by Stan Celestian, and used with permission of the Natural History Museum of Los Angeles County Gem and Mineral Hall*



From Australia



FIGURE 13 GALLIUM The processing of **Bauxite** (an aluminum ore), and other metallic ores, produces gallium, as a byproduct. Gallium arsenide is a compound semi-conductor, that controls the flow of electricity. *Image by James St John and licensed under CC BY 2.0 DEED*

From near Boddington, Western Australia, Australia

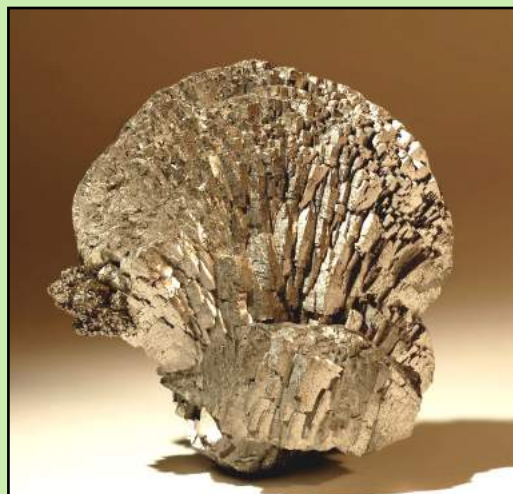


FIGURE 14 ARSENIC Arsenic is compounded with gallium in semi-conductors. **Arsenopyrite** is a major source of arsenic.

Image by Stan Celestian

From Chifeng, Inner Mongolia, China

...Smart phone continued from page 15

ELECTRONICS & CIRCUITRY continued:



FIGURE 15 BERYLLIUM Beryllium is another element compounded with gallium in semi-conductors. **Beryl** is a major source of beryllium. *Image by Stan Celestian*
From Sichuan, China



FIGURE 16 BARIUM Barite is the ore mineral for barium, which is a component of insulating materials within smart phones. *Image by Stan Celestian*
From the Magma Mine, Pinal Co., AZ

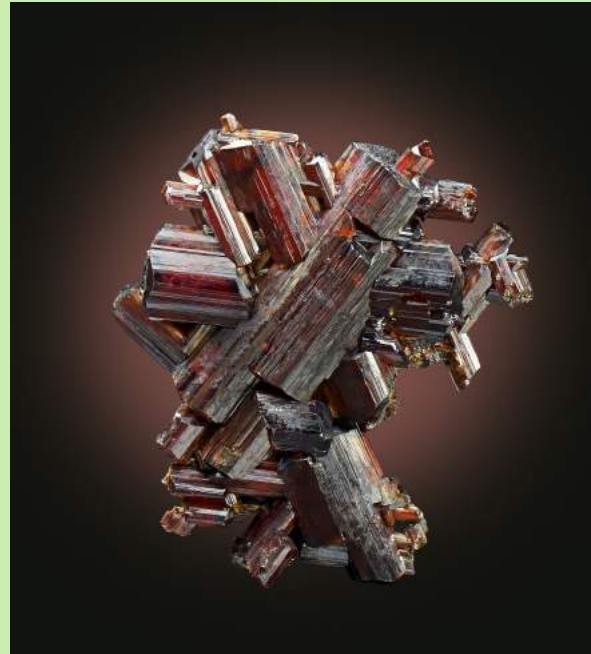


FIGURE 17 TITANIUM When combined with barium, a dielectric compound is created — a compound that insulates or is a poor conductor of electricity. Its presence at capacitors, increased the ability of the capacitors to store electric charge. **Rutile** is a source of titanium. *Image by Stan Celestian*
From Minas Gerais, Brazil



FIGURE 18 TANTALUM Tantalite is a source of tantalite, another dielectric element (see Figure 17). *Image by Rob Lavinsky and licensed under [CC-BY-SA-3.0](https://creativecommons.org/licenses/by-sa/3.0/).*
From Brazil

...Smart phone continued from page 16

ELECTRONICS & CIRCUITRY continued:



FIGURE 19 PALLADIUM The arrow is pointing to **Braggite**, a palladium ore mineral, embedded with Pyrrhotite and Chalcopyrite in a serpentine host rock. Palladium is used for electrodes in phone capacitors. *Image by James St John and licensed under [CC BY 2.0 DEED](https://creativecommons.org/licenses/by/2.0/).*

From one of only 3 platinum mines in the U.S.: Johns-Manville Reef, Beartooth Mts, MT



FIGURE 20 SILVER Silver is also used to make electrodes in capacitors. This image is of **Argentiferous Galena**, a common source of silver. *Image by Rolf Luetke*

From the Hilltop Mine, Cochise Co., AZ

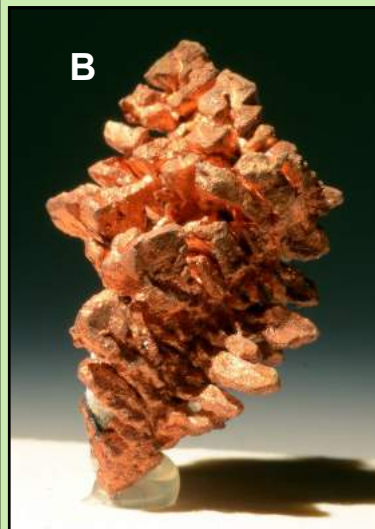
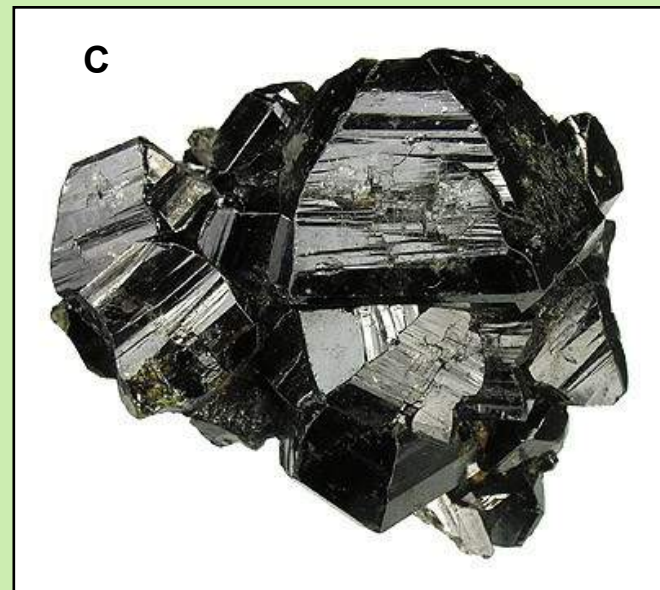


FIGURE 21 SOLDER

Solder is typically a combination of silver, copper and tin. **(A) Silver** lends its high tensile strength, ductility and thermal conductivity; **(B) copper** lends its mechanical strength, melting point, and low cost; while **(C) tin** (sourced from **Cassiterite**) lends a lower melting point.

Image L(A) by Stan Celestian and used with permission of the Natural History Museum of Los Angeles County Gem & Mineral Hall; (B) Image is by Stan Celestian; (C) is by Rob Lavinsky and licensed under [CC-BY-SA-3.0](https://creativecommons.org/licenses/by-sa/3.0/)

(A) is from Batopilas, Chihuahua, Mexico; (B) is from Ajo, Pima Co., AZ, and (C) is from the Viloco Mine,



...Smart phone continued from page 17

SPEAKERS, MICROPHONE, VIBRATION & CAMERA FOCUS

“Up to 14 tiny magnets may be present in a smartphone. They are used in the speaker (2-5 magnets), microphone (2 magnets), vibration unit (1 magnet), and camera auto-focus mechanism (2-4 magnets per camera).

To provide strong magnetic fields in the very compact space of a smartphone, a neodymium iron boron alloy is utilized...This combination leads to dense magnetic fields and represents the strongest permanent magnetic material yet discovered. “ *From Earthquake, newsletter of The Earth Science Museum*

Additionally, tungsten is used in the vibration components.



FIGURE 22 NEODYMIUM
Monazite is one source of neodymium. Image by Rob Lavinsky and licensed under [CC-BY-SA-30](https://creativecommons.org/licenses/by-sa/3.0/)
 From Madagascar



FIGURE 23 IRON Hematite is a primary ore of iron. Image by Stan Celestian and used with permission of the Natural History Museum of Los Angeles County Gem and Mineral Hall
 From Cumbria, England



FIGURE 24 TUNGSTEN Scheelite is an ore mineral for tungsten. It fluoresces a rather unique bluish white under SW UV light. UV light is used to both prospect for tungsten, and to sort crushed ore.
 Images by Stan Celestian and used with permission from the Natural History MUSEUM OF Los Angeles County Gem and Mineral Hall

BATTERIES

The ubiquitous lithium ion battery powers our smart phones, with lithium cobalt oxide used for the positive electrode and carbon the negative electrode. See Figures 25-26.



FIGURE 25 COBALT & LITHIUM Cobaltite (upper photo) is a source of cobalt (could you guess?), and Spodumene (lower photo) yields lithium
 Cobaltite image by James St John and licensed under [CC BY 2.0 DEED](https://creativecommons.org/licenses/by/2.0/);
 Spodumene image by Stan Celestian



Cobaltite from Ontario, Canada and Spodumene from Minas Gerais, Brazil



FIGURE 26 GRAPHITE Graphite — the stuff of pencil 'lead — is in lithium batteries Image by Stan Celestian

...Smart phone continued from page 18

SMART PHONE CASE

Phone cases are made of many different materials, including plastic (a petroleum product). Metal cases are often a magnesium alloy. Magnesium is an excellent electromagnetic shield, corrosion resistant, and can absorb vibrations.

Nickel-plated sheets may further shield electromagnetic interference, to prevent your smart from affecting other electronics. See Figures 27-28.



FIGURE 27 MAGNESIUM Dolomite may be a source of magnesium.

Images by Stan Celestian

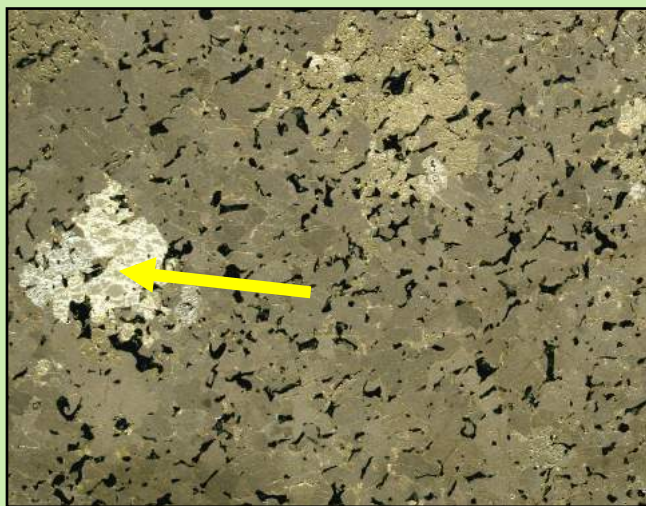


FIGURE 28 NICKEL The arrow points to Pentlandite, within a matrix of Pyrrhotite and Magnetite. Pentland is a nickel ore. *Image by James St John and licensed under CC BY 2.0 DEED.*

From South Mine, Sudbury, Canada

GENERAL RESOURCES for SMART PHONES

Relied Heavily on: *Earthquake*, October 2020; newsletter of the Earth Science Museum, "[Smartphone Minerals](#)" by Harvey Jong.

<https://www.intechopen.com/chapters/46861>

<https://resources.pcb.cadence.com/blog/what-are-the-different-types-of-solder-2>

<https://rotaxmetals.net/copper-and-brass-sales-importance-of-soldering-in-jewelry-making/>

<https://www.silverinstitute.org/silver-brazing-soldering/#:~:text=Silver%20brazes%20and%20solders%20combine,with%20silver's%20natural%20antibacterial%20action.>

<https://www.nms.ac.uk/explore-our-collections/resources/from-minerals-to-your-mobile/#:~:text=Tungsten%2C%20found%20in%20the%20mineral,in%20mobile%20phones....>

<https://pubs.usgs.gov/gip/0167/gip167.pdf>

<https://www.nms.ac.uk/explore-our-collections/resources/from-minerals-to-your-mobile/#:~:text=Gold%20is%20used%20to%20make,in%20mobile%20phones....>

<https://www.britannica.com/science/dielectric>

<https://byjus.com/physics/capacitor-and-capacitance/#:~:text=A%20capacitor%20is%20a%20two,material%20known%20as%20a%20dielectric.>

TRAILER CLEANUP

The morning of Sunday, March 10th found a handful of DMRMC members at the club trailer. Buckets of donated rocks were sorted, and ones that did not meet up with our exacting expectations were loaded for disposal.



BOARD MEETING MINUTES**March 5, 2024**

ATTENDEES: Johanna Raupe, Stan Celestian, Susan Celestian, Cynthia Freese, Renee Isaack, Bill Freese, Edward Winbourne, Kirsten Verbus, Jessie Caltabiano, Tom Edwards, Claudia Marek, Bill Powell, Deanne Gosse, Tiffany Poetsch, Greg Josey

ABSENT: Rebecca Slosarik, Alexis Reed, Don Richardson, Marc Flescher

GUEST: John Bernshausen

DATE: March 5, 2024, 5:00 PM

LOCATION: Anthem Civic Center, 3701 W. Anthem Way, Anthem, AZ 85086

1. Called to Order at 5:05 PM
2. Acceptance of February's meeting minutes
 - a. Motioned to accept by Johanna,
 - b. Seconded by Susan Celestian
 - c. Accepted by all, none opposed.
3. Are we spending too much money
 - a. We need to stop spending so much money.
 - b. Defibrillator? Do we need this now? It was brought up that there is an interest in possibly getting a defibrillator for the club.
 - c. Deanne suggested having a working budget meeting
 - d. The saw at the North Mountain center was brought up. Currently, there is no place to move this to when the lapidary shuts down.
 - e. Ed brought up starting a GoFundMe and maybe sending out letters to corporations with a goal of making \$500 K
 - f. Claudia spoke about concerns with the trailer
 - g. Ed wants to purge stuff from the trailer – give away to the club members
 - h. Ed is working on seeing if the display cases can be on display in the Lobby at the Anthem center
 - i. This coming Sunday, March 10 at 9 AM to go through the contents of the trailer. Trailer located at Amy's Little Plant Company
4. Financial Budget Items
 - a. Deanne sent an email out prior to the Board Meeting with a current breakdown of the show results.
 - b. There are still a few small outstanding expenses.
5. Club Membership – Renewals (2024 renewals \$25-single, \$35-family)
 - a. All non-pays to be purged 3/5/24
6. Claims Committee:
 - a. Need a new claims chair
 - b. Bill indicated someone at the show said they would help but cannot remember whom.
 - c. 3/7/24 – Bill sent out an email indicting Pam Innis wants to try the role of the Claims Chairperson.

...Minutes continued from page 20

7. Safety Committee: CPR classes, volunteers, upcoming events
 - a. March 18, 6PM CPR class is scheduled
 - i. Address: 3690 Estrella Pkwy, Goodyear, AZ 85338.
 - b. There are seven (7) people signed up so far from FTC. There are twenty (20) spots total. There are still thirteen (13) spots open.
 - c. Will open to the rest of the club tonight at the general meeting
8. Claudia on the Show
 - a. Vendor Survey – overall a lot of great comments
 - b. Number of comments from the vendor trying to solve a problem
 - i. Related to attendees
 - ii. Marketing the vendors at the gate
 - c. Some vendors needed more time for setup and breakdown
 - d. Some vendors had issues with some people tearing down early
 - e. Tom handed out the compiled survey results to the board to review
 - f. This year's event did not get into the Rock & Gem magazine
 - g. Discussed about the show embracing the crowds or not
9. New Raffle Item
 - a. Large Pyrite Crystal cluster donated by the Mineral Museum
 - b. Brief discussion about how many tickets were sold at last month's meeting.
10. Speaker tonight is Dr. Barbara John from Wyoming University
11. April's general meeting to be a show, swap and sale event for the club members
12. May's Speaker – Kate Larson via zoom
13. Claudia will schedule a post-show meeting and send out an invite.
14. New Business – Renee suggested that Bill get paid for his fuel for the field trips
 - a. All board members approved
15. Meeting Adjourned @ 6:01 PM.

Sincerely Submitted,

Johanna Raupe, for Rebecca Slosarik

GENERAL MEETING MINUTES

March 5, 2024

DATE: March 5, 2024, 6:30 PM
LOCATION: Anthem Civic Center, 3701 W. Anthem Way, Anthem, AZ 85086
ATTENDANCE: 78 attendees

1. Meeting 'Called to Order' at 6:30 PM
2. Our speaker tonight, Dr. Barbara John from the University of Wyoming
 - a. She is a land-based geologist, that found her way to the sea by accident
 - b. Scientist know more about the backside of the moon than they do about the ocean floor
 - c. Her talk was about a recent academic drilling expedition
 - d. In water 850 m deep, they drilled 1260 m below seafloor and pulled up a core sample
 - e. Tidbit of scientific data: (Olivine + Water = Serpentine + Magnetite + Free Hydrogen)
3. Bill welcomed the new members and guests
 - a. New members found the club during the Club's Gem Show
4. Deanne presented the Financial Report
 - a. She stated that this last show was 'The Best Show We Have Ever Had'
 - b. New protocols at the Anthem Center

Minutes continued on page 22..

...Minutes continued from page 21

5. New protocols at the Anthem Center
 - a. 10 minutes before and 10 minutes after will charge us for another hour each
 - b. The center wants the club to clear out of the big room within 10 minutes after close of meeting (8:40 PM).
6. Claims committee
 - a. Bill solicited for a new claims chair.
7. Field Trips:
 - a. Bill has 13 Peridot buckets right now, so if you signed up for one, please meet him to collect your bucket.
 - b. Bill covered how to be notified and participate in the club's field trips
 - c. February Field Trips Reviewed
 - i. Tucson Club Day
 - ii. Mushroom Rhyolite cancelled due to rain
 - iii. Feb 17th Superior for Apache Tears – 42 attendees
 - iv. Feb 21st Hewitt Canyon for Marble – 32 attendees
 - d. March Field Trips
 - i. March 6th – Mushroom Rhyolite
 - ii. Peridot Buckets – already has 13 buckets delivered - Emery
 - iii. March 9th - Rowley Mine with MSA
 - iv. March 16th - Everyone on list to pick up their Peridot buckets
 - v. March 20th - Reserve Bank Mine? tentative
 - vi. March 30th - Dave Hanline Mine? tentative
8. RMFMS Convention Oct 25th – 27th Oklahoma City, OK
 - a. If you plan on attending or need more information, please contact Bill.
9. New members & Membership Renewals.
 - a. Non-renewing members will be purged 3/5/24
 - b. There are currently 275 members
10. Show March 2nd & 3rd show recap – Claudia Marek
 - a. If you volunteered during the show, please get with Claudia and make sure she has you on the preferential list for field trips.
 - b. Claudia thanked all the Volunteers
11. Safety Committee
 - a. CPR class in March 18th @ 6PM
 - b. Club will pay for it
 - c. Thirteen slots available
 - d. Address: 3690 Estrella Pkwy, Goodyear, AZ 85338
12. Wire Wrapping Class
 - a. Goes from 4:30 – 6:30 and open to everyone
13. Next general meeting: April 2 @ 6:30 PM
 - a. Show, Swap & Sale for all members
14. Misc. Items:
 - a. Name tag reminder - always wear your name tag at EVERY field trip and meeting (new/second name tags available in back - see Tiffany),
 - b. Mega Raffle Item – Pyrite over 12 lbs.
 - i. runs from February through June for \$1/ticket or 12 tickets for \$10
15. Meeting adjourned at 8:20 PM.
16. 8:25 PM silent auction finished

Sincerely Submitted,
Johanna Raupe, for Rebecca Slosarik

GEO MINI

MINERAL ID:

Color

In this sixth installment of Mineral ID, we will discuss **COLOR**. Color is another characteristic determined by the way in which a mineral interacts with light.

Color is one of the very first things one notices when viewing a mineral. Sometimes color is very diagnostic. Unfortunately, most of the time it is not a definitive physical property.

Let's look at some examples.

MINERALS FOR WHICH COLOR IS DIAGNOSTIC

There are not many mineral species that can be identified by their color. (A note: there are many mineral varieties that are identifiable by color, and that will be addressed in the next section.) See Figures A-E.



FIGURE A AZURITE Azurite is always blue. A copper carbonate that is blue IS azurite. The shade may be dark to light, but always blue.

Photo by Stan Celestian

A couple other blue minerals are linarite and lapis lazuli.



FIGURE B MALACHITE Malachite is always green. A copper carbonate that is green IS malachite. The shade may be dark to light, but always green.

Photo by Stan Celestian



FIGURE C SULFUR Sulfur is almost always a bright lemony yellow. It can be very light yellow (impurities can turn it gray or red — but Usually it is yellow.

Photo by Stan Celestian



FIGURE D CINNABAR Cinnabar is a bright scarlet red (I've found it described as spicy orange-red, although I don't see much orange. (Some are photo-reactive and darken with sunlight exposure.)

Photos by Stan Celestian

Color continued on page 24...

....Color continued from page 23

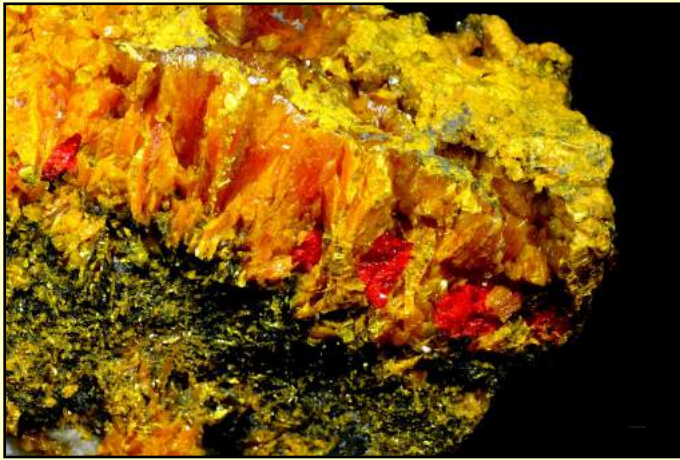


FIGURE E ORPIMENT & REALGAR Two other closely related minerals are the arsenic sulfides, orpiment and realgar. Orpiment is always yellow and realgar is always red. *Photo by Stan Celestian*

MINERALS FOR WHICH COLOR IS NOT DIAGNOSTIC

It is more usual that color is not diagnostic. Most minerals will accept substitutions (impurities) that will alter the color, and instead of a particular color, they may display a range of colors. In fact, there are some minerals that routinely exhibit a rainbow of colors, such as quartz, calcite and fluorite.. See Figures F-G.



FIGURE F QUARTZ Pure quartz is clear. With air bubbles, it turns milky. Iron ions as impurities may turn it pink, purple, green or yellow/orange.

- ◆ Milky quartz
- ◆ Rose quartz
- ◆ Amethyst
- ◆ Prase
- ◆ Citrine

Photo by Stan Celestian



FIGURE G QUARTZ Just like pure quartz, pure calcite is clear. And again, iron ions as impurities may turn it green, blue or yellow/orange. Manganese will turn it pink.

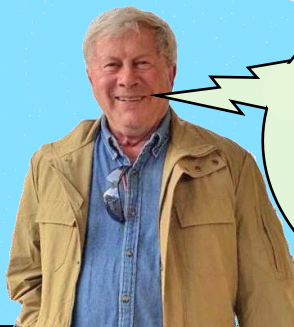
Photo by Stan Celestian

If you are building a portable field testing kit, you should now have a glass plate and a streak plate. (Both are available from Ward's Science (or VWR International), Amazon, and other suppliers. A note about a glass plate: you can use any clear glass; however, the thicker the better for safety. A hand lens will be useful for closer inspection of mineral surfaces.

For the more motivated: *There is a mineral testing kit available on [Amazon](https://www.amazon.com), that includes hardness testing points (metal points of hardness 2-9)*

WORDS OF WISDOM

passed along by our own **Bob Evans**



Tact is making a
point without making
an enemy.

Isaac Newton

UPCOMING AZ MINERAL SHOWS

APRIL 13 - Gilbert, AZ Flagg Mineral Foundation: Arizona Mineral Symposium; Southeast Regional Library, 775 N Greenfield; Sat 8-5:30; \$80 mbrs, \$90 non-mbrs. [SEE POSTER PAGE 27](#)

MAY 4-5 - Kingman, AZ Mohave County Gemstoners; Mohave County Fairgrounds, 2600 Fairgrounds Blvd; Sat 9-4, Sun 9-3; Admission: Free.

JUNE 1-2 - Phoenix, AZ Mineralogical Society of Arizona; Phoenix Shrine Auditorium, 552 N 40th St; Sat 9-5, Sun 10-4; Admission: Adults \$5, MSA members \$3, under 12 free. [SEE POSTER PAGE 28](#)

JULY 26-28 - Show Low, AZ White Mountain Gem & Mineral Club; Elks Lodge, 805 E Whipple; Fri-Sat 9-5, Sun 10-4; Admission: Adults \$4, kids free.

August 2-4 - Prescott Valley, AZ Prescott Gem & Mineral Club; Findlay Toyota Center, 3201 N Main St; Fri-Sat 9-5, Sun 9-4; Admission: Adults \$5, Seniors/Veterans/Students \$4; kids 12 and under free. [SEE FLYER PAGE 29](#)

August TBA - Gilbert, AZ Gilbert Historical Society Museum, 10 S Gilbert Rd; 10-4; Admission: Free

September 27-29 - Clarkdale, AZ Mingus Gem & Mineral Club; Clark Memorial Clubhouse Auditorium, 19 N 9th St; Fri-Sat 9-5, Sun 9-4; Admission: Free. PLUS ANOTHER SHOW February 21-23, 2025. [SEE FLYER PAGE 29](#)

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>

NEEDED: QUALITY MINERALS (or OTHER) DONATIONS WITH LABELS -- for monthly raffle and silent auction; 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 EDITOR

Have a geological interest? Been somewhere interesting? Have pictures from a club trip? Collected some great material? Send me 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



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

North Mt Visitor Center, 12950 N 7th St, Phoenix, AZ

You are invited to NMVC Studio. Lapidary Classes every Wednesday & Silversmithing Classes on Saturdays — email Shirley Cote for details. For ONLY those people who have taken lapidary or silversmithing classes — Lapidary Open Studio every Monday, and Silversmithing &/or Lapidary Open Studio every Thursday (and designated Saturdays). **Face masks optional.**

TIMES: from 9:00 to noon with cleanup starting at 11:50.

Only 4 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. Usage fee is \$8/hour.

Notice: Please bring your own towels, polishing compounds and buffing wheels as they will no longer be provided.

Please arrive no later than 8:45 a.m. The center may closed 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

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 (possibly 6 people if 2 are silversmithing only).

UPCOMING FIELD TRIPS

Here is a general list of possible upcoming trips. Details will be emailed to the general membership.

April

Chilito Mine - 3rd Wed - Copper minerals
 Rowley Mine - 13rd Sat - Chrysocolla, Wulfenite, Mimetite
 Lost Onyx Mine (Camp Verde) - 17th Wed - Travertine
 Reserve Bank Mine - 20th Wed - Copper Minerals, Demo owner taking ore to wire to jewelry
 Picnic at Anthem Park - 27th Sat

May

Dobell Ranch - 4th Sat - Petrified Wood (fee)
 Springerville - 10th-13th - Luna Agate
 Uranium Spot Mine 15th Wed - Plant fossils
 Forest Lakes - 25th Sat - Banded sandstone

June

Alfie Norville Gem & Mineral Museum (Tucson) - 15th Sat (fee)

July

Bisbee/Tombstone (overnight) - 20th-21st Sat-Sun - Copper Queen Mine Tour, Good Enough & Toughnut Mine Tours (fees)

DATES AND DESTINATIONS SUBJECT TO CHANGE

WATCH FOR EMAILS WITH DETAILS

******* Be sure you do not just show up for a field trip — you MUST RSVP to Bill, either by responding to the announcement email or directly to Bill (after the announcement has been posted). Most trips have a limit, and will have a waiting list once full.**

FUTURE SPEAKERS

April - Swap, Sell, Show & Tell
 May - Cate Larsen (Social Media Geo-communicator)

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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/daisymountainrockclub/). 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!

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|-----------|-----------|
| Jessica C | Gregg J |
| Susan C | Claudia M |
| Stan C | Tiffany P |
| Tom E | Bill P |
| Mark F. | Don R |
| Cynthia F | Johanna R |
| Renee I | Kirsten V |
| Jessica C | |

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:

Juniors (under 18) - Membership is free; one time fee of \$10 for name badge
Adult - First year \$35, then \$25 per Person
Couple - First year \$55, then \$35 per Couple

Meeting Dates for 2024

Jan 2, Feb 6, Mar 5, Apr 2, May 7, June 4, Sept 3,

31ST
ANNUAL

Minerals of Arizona

SYMPOSIUM

Celebrating the Field Collector, Part 2 As a Tribute to Bob Jones!

APRIL 13th, 2022 | PHOENIX, ARIZONA

Southeast Regional Library

775 North Greenfield Road | Gilbert, Arizona



Epidote pr. Oatcreek - Granddust Crst. Chem Co., New Mexico
Pinky Jones was specimen. Photo: East Oatcreek & Philip Skerrows.



Pyrite, Bingham Canyon open pit copper mine
Salt Lake County, Utah, Jared Judd collection



Fluorite on Quartz, Blanchard mine,
17 cm upper left to bottom right. Sanders photo



Quartz structure, 1.5 cm tall, hosts a "fantastic" Stibnite grain,
ID No. JRS-1336A. Jeff Smith photo and specimen.



Fluorite - Kueselake Mine
Mark May Specimen - Jeff Scott Photo



Photochrom on quartz, 10.4 cm. Blueberry Passer
found through GPS exploration work - Photo by Jeff Scott.



Chairperson
Les Presmyk

Co-Chairperson
Catie Sandoval



FLAGGMINERALFOUNDATION.ORG



The 4th PHOENIX HERITAGE MINERAL SHOW

Largest, Quality
Mineral Show in
the Phoenix Area!



FLUORITE with Barite
Ana Mine, Berbes, Ribadesella, Asturias, Spain
6.5cm – Nick McClure Collection – Jeff Scovil Photo



Café & Bar: Open - 4pm

Admission:

- CASH ONLY – ATM Available
- \$5.00 Adults
- \$3.00 MSA Members
- FREE 12 years & younger with paying adult
- FREE Parking during show

msaaz.org

JUNE 1st & 2nd 2024

PHOENIX SHRINE AUDITORIUM 552 N 40th STREET • PHOENIX, AZ 85008

Saturday 9am - 5pm | Sunday 10am - 4pm

Featuring: Minerals, Competitive and Guest Exhibits
Saturday Night: Dinner, Talk, Awards and Auctions!



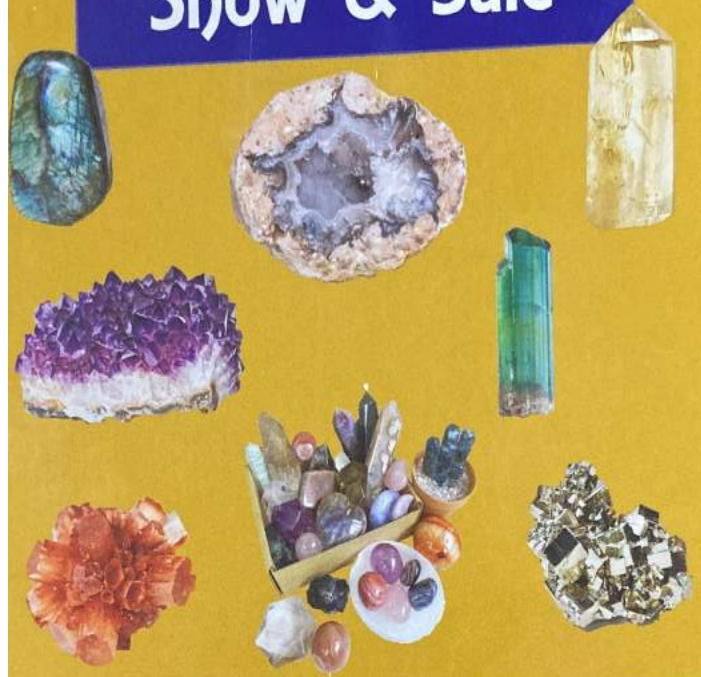
PRESCOTT
GEM & MINERAL SHOW
20th Annual
SHOW & SALE
ROCKS • GEMS • JEWELRY



**AUGUST, 2nd
 3rd & 4th**
FINDLAY TOYOTA EVENT CENTER
 3201 N Main St - Prescott Valley
 (Corner of Glassford Hill & Florentine)
FRI & SAT 9-5, SUN 9-4
 Admission is Cash Only - ATM Available

FREE PARKING!
 \$5 Adults
 \$4 Seniors 65+, Vets, Students
 Children under 12 FREE w/paid Adult
www.PrescottGemMineral.org

Clarkdale Rocks
Gem & Mineral Show
"53rd Show"
Show & Sale



September 27-29, 2024
 Clark Memorial Clubhouse Auditorium
 19 N. Ninth Street, Clarkdale, AZ 86324
 FRI & SAT 9am - 5pm, SUN 9am - 4pm

Free Admission
 Mingus Gem & Mineral Club
mingusgem.club

Crystals • Minerals • Gems • Jewelry • Fossil
 Cabochons • Findings • Rock Slabs
 Geode Splitting • Daily Raffles
 Jr. Rockhound Room Activities
 and much more!

