



EARTHQUAKE

e-Newsletter about what's movin' and shakin' at the Earth Science Museum

Earth Science Museum, 3215 W. Bethany Home Rd., Phoenix, AZ 85017
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April 2019
Volume 8, Issue 4

ESM Outreach Update:

By Mardy Zimmermann, Outreach and Education Coordinator

April turned out to be a very busy month for our Outreach and Education Program. We are finding new opportunities to assist in getting some of our large "stash" of rocks, minerals, and fossils to those working with students in various settings. I met with Wally Frlich, Education Director for the Apache Junction Club and we put together the materials I used in classrooms with hands-on samples for students. In addition, Wally mentioned that the club did not have enough material to have a successful Egg Carton Program at their Show. We selected 20-25 bags of small egg carton sized specimens from ESM's large inventory to supplement theirs.

In the past, we have produced teacher kits for several STEM projects in Tucson. This year we worked with the Pima County Superintendent of Schools office and supplied sets of our teacher kits free to teachers who attend their training programs. The thank-you notes from participants were wonderful and I shared them with Chris Whitney-Smith, who was instrumental in ESM getting grant money from the Staples Foundation, and asked him to share them with Staples. DaNel Hogan, Director, STEMAZing, at the Superintendent's office met with me, Doug, Shirley, and Harvey in Apache Junction when she came to pick some kits up. We met a friend and fellow rock hound working with earth science school programs.

Cleaning projects included removing all Outreach materials from our storage unit in Tempe prior to our Board work-day to begin organizing the garage we have. Several teachers from a private school also came to get rock, mineral and fossil specimens for their school project. School science fairs have ended and we did one egg carton program at Encanto School for all third-graders. The shiny pyrite from Brazil we found while cleaning up at the Bone Yard was a very, very big hit.

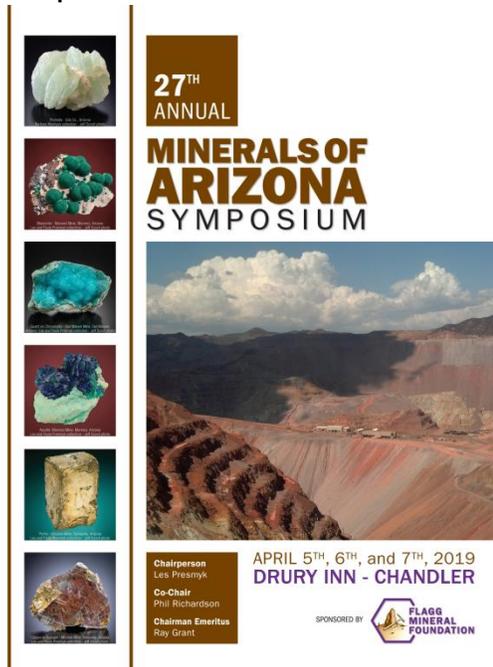


In Mardy's garage, we unpacked boxes of *Golden Guide* books used in our teacher kits and stored them in this small bookcase making it easier for her to access.

2019 Minerals of Arizona Symposium Highlights

By Shirley Coté

Photos by Shirley Coté & Doug Duffy of slides from the presentations unless otherwise noted



Top Left: Prehnite, Gila Co., AZ, Barb Muntyan Collection, Jeff Scovil Photo

2nd Left: Malachite, Morenci Mine, Morenci, AZ, Les and Paula Presmyk Collection, Jeff Scovil Photo

3rd Left: Quartz on Chrysocolla, San Manuel Mine, San Manuel, AZ, Les and Paula Presmyk Collection, Jeff Scovil Photo

4th Left: Azurite, Morenci Mine, Morenci, AZ, Les and Paula Presmyk Collection, Jeff Scovil Photo

5th Left: Pyrite, Mission Mine, Sahuarita, AZ, Les and Paula Presmyk Collection, Jeff Scovil Photo

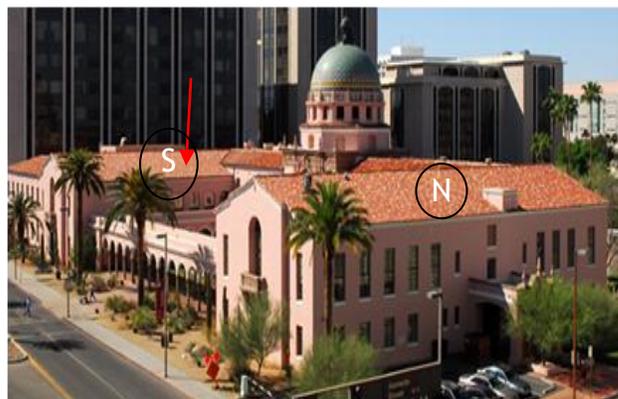
Bottom Left: Copper in Gypsum, Mission Mine, Sahuarita, AZ, Les and Paula Presmyk Collection, Jeff Scovil Photo

Cover photo, Morenci mine, Morenci, by Dawn Boushelle

First, Les Presmyk gave the attendants an update of the Arizona Mining, Mineral and Natural Resources Education Museum in Phoenix. “The University has started the process of hiring an executive director to head up this project and will initiate the significant fundraising effort to build out the museum’s displays”.

The UA’s facilities group will soon begin on the necessary improvements including a new roof, and building security in order to return the museum’s collection from the AZ Historical Society in Tempe.

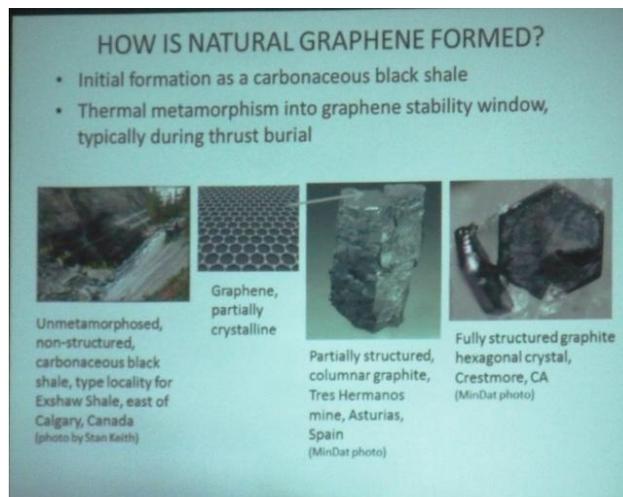
“The UA’s Gem and Mineral Museum currently housed in the basement of the Flandrau Planetarium is planning on moving to the south half of the historic Pima County courthouse in downtown Tucson with a projected opening in 2020”.



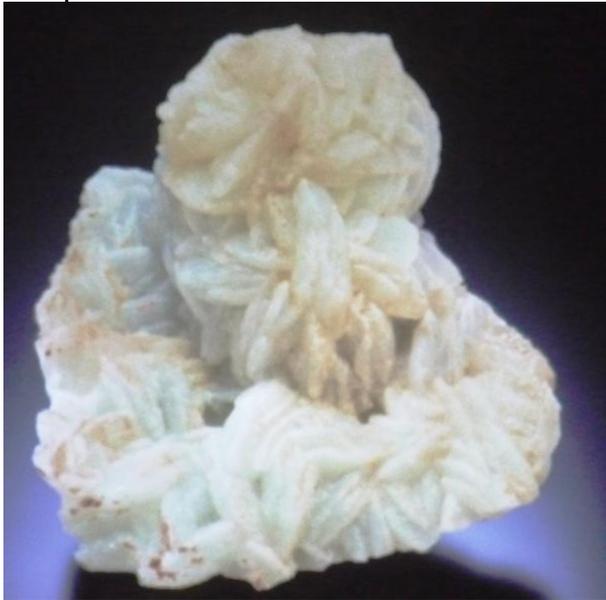
Adapted from en.wikipedia, Motorrad-67, CC BY-SA 3.0

The new museum venue will have three galleries: Mineral Evolution, Arizona, and Gems.

Stan Keith’s presentation was on the “Mineralogy of a Giant Graphene Deposit in West-Central AZ”



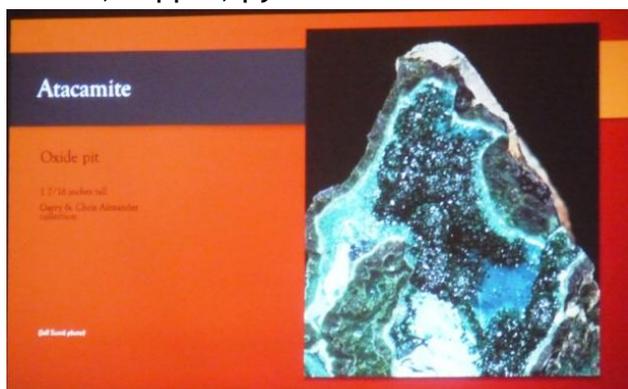
Barbara Muntyan enlightened the participants on a newly-reported Arizona find of prehnite. “The pale-green or cream-color prehnite clusters look similar to desert “roses” or tightly packed rice grains” as in this photo.



Prehnite, Gila Co., AZ, Barb Muntyan Collection, Jeff Scovil Photo

Mark Hay spoke about “Minerals of the San Manuel Mine, Pinal County, AZ”.

“San Manuel was the inspiration for a new geologic understanding of porphyry copper deposits”. Forty-nine mineral species were identified from the mine including azurite calcite, copper, pyrite and atacamite.



After lunch, Anna Domitrovic regaled us with “Minerals with Stories to Tell”. She showed pictures of some of the Arizona-Sonora Desert Museum’s collection and told us her

recollections regarding each specimen while she was employed at the museum.



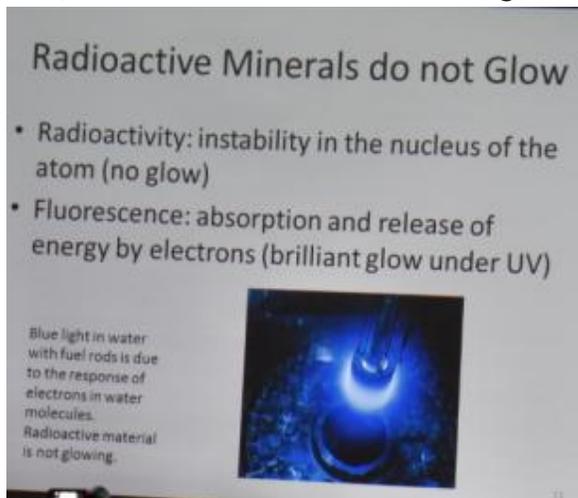
For example, this green calcite after glauberite thought to be natural, turned out to be copper solution enhanced.

Dick Zimmermann’s presentation on “Collecting Radioactive Minerals” was very informative. “Some familiarity with radioactive minerals is of value for all mineral collectors”. “Mineral collectors need a Geiger counter, or some modern equivalent, to effectively collect radioactive minerals or to scan their mineral collection for material that warrants special handling and storage” because, “human senses cannot detect radioactivity”.



Geiger counter

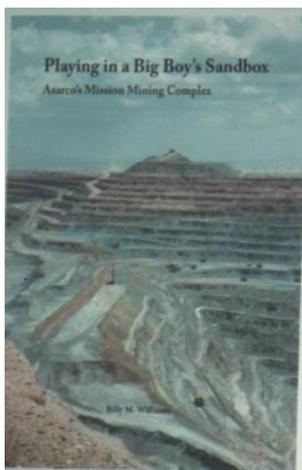
And, “radioactive minerals do not glow”.



For more information on radioactive minerals, go to:

<https://elementexpressions.files.wordpress.com/2012/08/the-care-and-feeding-of-radioactive-mineral-species.pdf>

Our next presenter was Guenther Neumeier regarding Bill William’s book about Asarco’s Mission Complex: *Playing in a Big Boy’s Sandbox*. “Bill’s book is an important contribution to the preservation of mining history of the Southwest. The book covers Asarco’s history at the Mission Mine, Arizona’s history, local history, mining history, geology mineralogy and mining artifacts”.



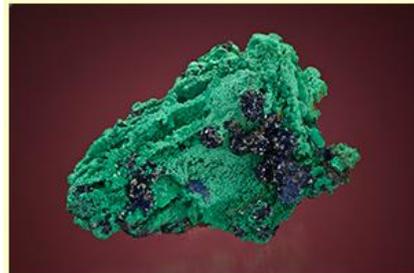
Our last presentation of the afternoon was by Bob Jones, editor of *Rock and Gem* magazine, on “Color in Minerals”.

“Color in minerals is the most obvious and the most appealing. Scientists have

identified a number of reasons why minerals have color. Some minerals self-coloring like azurite and malachite are due to their chemical composition”.



Azurite. Bisbee, Cochise County, Arizona
Photo by by Jeff Scovil.



Azurite/Malachite. Bisbee, Cochise County, Arizona
Photo by by Jeff Scovil.

Azurite and malachite photos from the Mineralogical Society of Arizona’s website

“Others owe their color to their physical structure like precious opal. But the majority of minerals owe their color due to included trace element metallic impurities such as the chromium in Red Cloud wulfenite”.

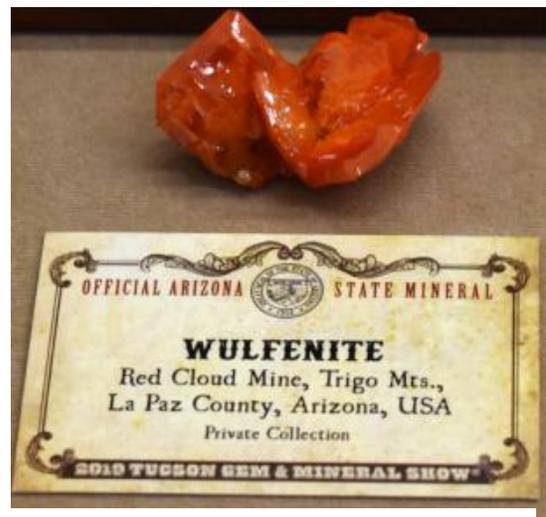


Photo by Doug Duffy at the TGMS show



Arizona Rocks 71

Text and photos by Ray Grant

The Arizona state fossil is petrified wood, specifically the species *Araucarioxylon arizonicum*. It was a primitive conifer of a very large size. It is found in the Triassic Age Chinle formation so lived about 225 million years ago. The area was tropical with forests of trees growing in swamps, on riverbanks, and on lakeshores. It is believed there were large floods that knocked down the trees carried them downstream and buried them quickly so they did not decay. There are some fossils of leaves and more delicate vegetation, but these are rare and it is assumed most leaves and branches were destroyed in the flooding or not easily preserved in the mud.

Ground water dissolved silica rich ash that was deposited from volcanoes to the south and west and this solution was carried to the buried logs to replace the wood with quartz. Iron and manganese in the solutions colored the quartz red, yellow, and black. Collecting is forbidden in the National Park, but there are acres of private land in the area where the wood is collected for sale. At the Dobell Ranch you can go and collect your own wood for a fee, get information about their hours on the internet.



Petrified Forest NP



Polished petrified wood at the Tucson show (above and below).



Petrified log at the Petrified Forest NP



AZ Mining, Mineral & Natural Resources Educational Museum Update April 2019

<http://tinyurl.com/SupportMM-NREMuseum>

By Catie Carter Sandoval and Charlie Connell
cscarter@email.arizona.edu
 703.577.6449

After months of effort by the UA Research team, we have secured funding to hire a director for the AZ Mining, Mineral and Natural Resources Education Museum. This week, we posted the position on the UA Human Resources website and applications will be accepted until early June. We have chosen to conduct the search without a professional search firm, so we're asking our partners and stakeholders (you all) to help spread the word. It will be a full-time position based here in Phoenix. As the description notes, we are not specifically seeking a content expert in any of the thematic areas represented in the museum, but rather an executive leader who can navigate across multiple constituent groups and inspire investment in the future success of this museum.

Here is the link for the posting on the UA Careers website: <https://uacareers.com/postings/36860>. I have also attached a more abbreviated position announcement for distribution. We need your help to distribute this announcement to your industry and professional networks, so please share freely. The search committee will begin reviewing applications in June with the goal of hiring the new Director in late summer.

Regards,
 Catie

(See Page 6 for UA's position announcement)

MMNRE Museum "Bone Yard" Update

Saturday, March 30, 25-30 people availed themselves of buckets of rocks and minerals at the Bone Yard for their respective club outreach functions.

Monday, April 1st, Doug Duffy, Shirley Coté, Catie & Alex Sandoval, collected buckets of clear quartz/amethyst, and chrysocolla, for the museum's outreach. Bill & Jean Smardo, Claudia Marek, and three others from the Daisy Mountain Rock Club helped collect rocks and minerals for themselves and club outreach. Later, Chuck Messersmith, Roger and Mrs. Camplin arrived to collect some large yard rocks.

In the late afternoon of Wednesday, April 3rd, Charlie Connell, Catie Carter Sandoval, Rick Herrem, Doug Duffy, Shirley Coté, Steve Kaminski, Debie Armstrong and her grandson Zaden, along with Bill Smardo, Claudia Marek, Morgan Hamilton and Debra Christmas from the Daisy Mountain Rock Club met at the Boneyard to collect rocks and minerals for personal or club use.

On Friday, April 5th we had a small but effective group that got most everything done we need for the big move on Tuesday, April 9th. Workers included Chuck Messersmith, Roger Camplin, Stuart Harrah, Cynthia Buckner, Bill Yedowitz, Steve Kaminski, Bob Flach, Dick Zimmermann, Matt Steinhoff, Charlie Connell and our leader Catie (see photo).



(Continued on Page 7)



Position Announcement

Director

Arizona Mining, Mineral and Natural Resource Education Museum

University of Arizona

The University of Arizona is seeking a dynamic leader to direct the planning, implementation and operation of a re-envisioned Arizona Mining, Mineral and Natural Resource Education Museum located adjacent to the State Capitol Mall in Phoenix Arizona.

The Arizona Mining, Mineral and Natural Resource Education Museum (AMMNREM) was established to promote Arizona's natural resource heritage and future through education, research and outreach. The Museum's end-state vision is to create a recognized destination for life-long experiential learning, showcasing current knowledge, cutting-edge research and industry innovation. This vision includes the transformation of a dormant 1921 building into interactive galleries, idea labs, maker spaces, offices and public engagement spaces.

Working in conjunction with University of Arizona administration, academic departments and external constituent groups, the Director will oversee development of a programmatic vision for a 21st century museum and corresponding business plan that focuses on external funding partnerships. The Director will also oversee coordination of building renovations, tenant improvements and construction through to its re-opening. Upon completion of the building renovation, the Director will manage museum operations, including day-to-day content programming, marketing & communications, personnel and fund-raising to ensure its long-term sustainability.

The AMMNREM will work closely with other UA recognized destinations (e.g. Biosphere 2, Center for Creative Photography, Mt. Lemmon Sky Center) to leverage their intellectual resources and strengthen UA's position by advancing collaborative research, scholarship, and engagement at the local, regional, national, and international levels.

For a complete position description, visit <https://uacareers.com/postings/36656> or contact R. Brooks Jeffery, Chair of Director Search Committee, (520) 621-2991, rbjeffer@email.arizona.edu.



MMNRE Museum “Bone Yard” Update

(Continued from Page 5)

The following activities were completed:

General Discussion Catie, Roger and Charlie discussed the plan for next Tuesday to move the items to the two locations. We went over the timing of the moves and what would go to the Old AMMM and to SMM.

General Cleanup We moved many old totes and trash out of the way to allow room to drive a 40’ flatbed into the yard.

Totes We took (9) totes in good shape over to the museum and placed them behind the hoist house, out of everyone’s view.

Artifact Locations While at the museum, I took the dimensions of the space we had up against the west of the building so we can place the artifacts in an acceptable location.

Waste Concrete We removed a large pile of broken concrete from the area near the large sliding door and took it to the Bone Yard to be disposed of.

Artifact & mineral Totes Markings We put Red steamers on the artifacts to go to the Old AM Museum and Green streamers on the artifacts going to the Superstition Mountain Museum. We also marked (3) totes to go to the museum and (5) totes to go to Superstition Mountain.

Cave Creek Museum Bob Flach, from the museum brought a trailer and loaded (4) 4” x 6” x 12’ timbers and an old door onto a trailer to be used in a mineshaft façade at the museum.

On Monday, April 8th, Stuart Harrah, Roger Camplin, Bill Lytle, Doug Duffy and Chuck Messersmith loaded some rails, timbers and the furnace on Chuck’s truck and trailer for transport to the Superstition Mountain Museum while Catie Sandoval, and Shirley Coté filled a 5-gallon bucket with

quartz/amethyst crystals for Shirley to take home, clean and sort for a couple of non-profits she is involved with.

Tuesday, April 9th “Bone Yard” The Big Move



Catie Sandoval, Shirley Coté, Doug Duffy, and Charlie Connell arrived at the bone yard before 7 a.m. to shrink wrap several totes containing rocks and minerals in preparation for their move to either the MMNRE Museum or the Superstition Mountain Museum.

When Bill Yedowitz arrived a short time later, Bill, Catie, Shirley, Doug and Charlie worked feverishly to finish consolidating the quartz/amethyst into three totes in time for the flatbed and forklift’s arrival at 8:00 a.m.



Once the flatbed was positioned for easy loading and the forklift unloaded from its transport, the forklift driver hooked up the

drag-line shovel bucket and loaded it onto the flatbed.



Bill helped guide the loading the flatbed of an ore car.

In order to access the remaining mining equipment, the forklift was used to move the three quartz/amethyst totes to the southwest area of the lot so we could finish shrink-wrapping them for transport.



To provide access to the mortar box, cam shaft, bull wheel, stamps and shaker table, the winch hoist, motors and some other items needed to be relocated temporarily.



Relocating one of the quartz/amethyst totes!



The mortar box on the move!



Picking up the stamps for placement on two pallets for transport!



Bill tacking wood blocks to the pallets to keep the stamps from moving.



Everything is loaded, secured and ready to take to the old AZMM museum.

Support the AZMM&NRE Museum
<http://tinyurl.com/SupportMM-NREmuseum>

Your donations are appreciated!



Everything unloaded and placed on the west side of the museum building.



Around 2:30 p.m. the second load was secured and ready to head to the Superstition Mountain Museum in Apache Jct., but did not arrive there until 6. It was decided to just drop the flatbed and unload the next day.



The final resting place for the mineral totes (top of the above two pics) and the placing of the ore cars in position on the grounds at Superstition Mountain Museum



Pinal Museum and Club News

351 N. Arizona Blvd., Coolidge, AZ

**Next Pinal Gem and Mineral Club meeting
Wednesday, May 15, 2019**

www.pinalgemandmineralsociety.org

The Museum will only open on Fridays in May from 10 a.m. to 2 p.m. We always need volunteers to open the Museum on those days if you can spare one day a month or more to help us please let me know at raycyn@cox.net. If we have more volunteers, we will try to open more days. Otherwise, tours are possible by calling (520)723-3009 (Coolidge Chamber of Commerce) to schedule a time.



Arizona Gem Shows



Mohave County Gemstoners
 May 4-5, 2019
 Sat. 9-5, Sun. 9-4
 Free admission
 Kingman Academy of Learning
 3420 N Burbank
 Kingman, AZ
www.gemstoners.org



White Mountain Gem and Mineral Club
 July 6-7, 2019
 Sat. 9-6, Sun. 10-4
 Adults \$2.00
 Free admission for children under 16
 Hon-Dah Casino and Resort
 777 Highway 260
 Pinetop, AZ
www.whitemountain-azrockclub.org



Prescott Gem and Mineral Club
 15th Annual Show & Sale
 August 2-4, 2019
 Adults \$5.00
 Seniors 65+, Vets, Students \$4.00
 Children under 12 FREE w/paid Adult
 Findlay Toyota Center
 3201 N. Main St.
 Glassford Hill & Florentine
 Prescott Valley, AZ

Arizona Gem Shows

Payson Rimstones Rock Club Inc.
 Annual show
 September 20-22, 2019
 Fri. 4-8, Sat. 9-5, Sun. 10-4
 Admission \$3
 Free for children 12 and under
 Event Center at Mazatzal Hotel & Casino
 Highway 87, Mile Marker 251
 Payson, AZ



Huachuca Mineral and Gem Club
 Annual show
 October 12-13, 2019
 Sat. 9-5, Sun. 10-4
 Free Admission
 Cochise College, 901 N. Colombo Ave
 Sierra Vista, AZ
http://huachucamineralandgemclub.info/Gem_Show.html



Sedona Gem and Mineral Club
 Show and Sale
 October 19-20, 2019
 Sat. 10-5, Sun. 10-4;
 Adults \$3
 Free admission for children under 12
 Sedona Red Rock High School,
 Hwy. 89A and Upper Red Rock Loop Road
 Sedona, AZ
<http://sedonagemandmineral.org>

Rock & Gem Clubs



Apache Junction Rock & Gem Club

Meetings are on the 2nd Thursday
Next Meeting: May 11, 2019, 6:30 pm

www.ajrockclub.com

@ Club Lapidary Shop

2151 W. Superstition Blvd., Apache Jct.



Daisy Mountain Rock & Mineral Club

Meetings are on the 1st Tuesday
(unless a Holiday then 2nd Tuesday)
Next Meeting: May 7, 2019, 6:30 p.m.

www.dmrmc.com

@ Anthem Civic Building

3701 W. Anthem Way, Anthem



Maricopa Lapidary Society, Inc

Meetings are on the 1st Monday
(unless a Holiday then 2nd Monday)
Next Meeting: May 6, 2019, 7:00 pm

www.maricopalapidarysociety.com

@ North Mountain Visitor Center

12950 N. 7th St., Phoenix



Mineralogical Society of Arizona

Meetings are on the 2nd Thursday
(February meeting on the 3rd Thursday)
Next Meeting: May 9, 2019, 7:00 pm

www.msaaaz.org

@ Franciscan Renewal Center,
5802 E. Lincoln Dr., Scottsdale

Next Meeting



Pinal Gem & Mineral Society

Meetings are on the 3rd Wednesday
Next Meeting: May 15, 2019, 7:00 pm

www.pinalgemandmineralsociety.org

@ Artisan Village

351 N. Arizona Blvd., Coolidge



West Valley Rock & Mineral Club

Meetings are on the 2nd Tuesday
Next Meeting: May 14, 2019, 6:30 pm

www.westvalleyrockandmineralclub.com

@ Painted Desert Academy

2400 S. 247th Ave., Buckeye, AZ



White Mountain Gem & Mineral Club

Meetings are on the 1st Sunday
(unless a Holiday then 2nd Sunday)
Next Meeting: May 5, 2019, 1:00 pm

www.whitemountain-azrockclub.org

@ VFW Hall

381 N. Central, Show Low



Wickenburg Gem & Mineral Society

Meetings are on the 2nd Friday
(February & December on the 1st Friday)
Next Meeting: May 10, 2019, 7:00 pm

www.wickenburggms.org

@ Coffinger Park Banquet Room
175 E. Swilling St., Wickenburg

ESM's Meeting Notice

ESM's next meeting will be at North Mountain Visitor Center, 12950 N. 7th St., Phoenix, on Tuesday, May 28, 2019, at 6:30 p.m.

BECOME A MEMBER!
Join the Earth Science Museum's



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Please renew today! 😊😊😊

----- cut here -----
ESM Earth Science Investigation
Team Membership Form
_____ New Member _____ Renewal

Membership levels:

_____ ESI Family \$20

_____ ESI Individual \$10

Membership benefits:

- ◆ Monthly e-newsletter *Earthquake*
- ◆ Official team membership card
- ◆ Knowledge that your contribution is making a difference in earth science education.

MANY THANKS TO OUR MAJOR DONORS!

- AZ Leaverite Rock & Gem Society
- Flagg Mineral Foundation
www.flaggmineralfoundation.org
- Friends of the AZ Mining & Mineral Museum
- Maricopa Lapidary Society
<http://maricopalapidarysociety.com/>
- Mineralogical Society of AZ
www.msaz.org
- Payson Rimstones Rock Club
- Sossaman Middle School
- White Mountain Gem & Mineral Club
www.whitemountain-azrockclub.org
- Wickenburg Gem & Mineral Society
<http://www.wickenburggms.org>
www.facebook.com/pages/Wickenburg-Gem-and-Mineral-Society/111216602326438
- Staples Foundation
www.staplesfoundation.org
- Anita Aiston
- Peter & Judy Ambelang
- Stan & Susan Celestian
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- Will & Carol McDonald
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 scote@earthsciencemuseum.org

Mission
 Our Mission is to excite and inspire all generations about earth sciences through educational outreach.

Vision
 We envision a community where students and the general public have curiosity about, passion for, and understanding of the underlying principles of earth sciences.

For more information about the ESM, how to become a member or how to arrange for a school visit or Community function, go to: www.earthsciencemuseum.org.

We're on the Web!

Visit us on  and at:
www.earthsciencemuseum.org

NOTICE:
 ESM's next meeting will be at North Mountain Visitor Center, 12950 N 7th St, Phoenix, on Tuesday, May 28, 2019, at 6:30 p.m.

THANK YOU FOR YOUR CONTINUING INTEREST & SUPPORT!!!

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