



# 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  
[www.earthsciencemuseum.org](http://www.earthsciencemuseum.org), [scote@earthsciencemuseum.org](mailto:scote@earthsciencemuseum.org), 602-973-4291

December 2017  
Volume 6, Issue 12

## ESM Outreach Update:

By Mardy Zimmermann, Outreach and Education Coordinator

Preparation for the January Flagg Foundation Show consumed much time this month. The entire review of the Egg Carton Program rocks, minerals and fossils was completed. The 350 specimen cups and identification tags are in milk crates and in the cargo trailer we will be using this year.

Harvey Jong and I will be choosing the fluorescent minerals for the black tent case in the next week, as well as getting free mining and geological booklets ready to give away. Because of requests and growing interest in fluorescents, we will also make some egg carton collections of them for sale, and include a list of other fluorescent minerals that are in the Egg Carton Program. I also assembled many bags of rocks, minerals and fossils to give to teachers, home school parents, and scouts at the show.

A special project with Mary Beth Bloom, a middle school science teacher who loves rocks and minerals, organizing samples of fluorescent minerals for a display and rocks and minerals for another display in the science area at a Phoenix Middle School was finished. Her 7th and 8th grade students will be treated to a colorful surprise in the New Year.

Hope to see everyone at the Flagg Show.

## Sunnyslope Elementary School Hobbies & Recreation Day



Over 350 students, parents & teachers stopped by Lynne & Terry Dyers rock, fossil & mineral display for Hobbies & Recreation Day at Sunnyslope Elementary School, December 15, 2017.



Shirley brought along a special display of rocks that looked like breakfast with “slices of bacon, a hardboiled egg and even pork chops”.



## AZ Mining, Mineral & Natural Resources Education Museum Update December 2017

On December 4<sup>th</sup>, Brooks Jeffery (University of Arizona Associate VP for Research and head of museum project) and I met informally with Sen. Gail Griffin, Rep. Vince Leach, and a few other potential members of the MMNRE advisory council. We toured the museum building and Sen. Griffin shared her Implementation and Action Plan as well as her vision for the museum: to showcase how Arizona is #1 in natural resources (mining, minerals, forestry, agriculture, livestock and tourism) and how the U of A is at the forefront of its heritage and future. The advisory board has not yet been officially appointed by the Governor's Office so they will not meet formally until that has been completed, but they hope to make significant progress once it is complete. Thanks to Sen. Griffin for her continued support and commitment to the museum.

Catie Carter

### Museum Workdays

Guest articles by Charlie Connell and Shirley Coté  
Photos by Charlie Connell

Two very successful work days were held on Monday, December 11 & 18, 2017, at the Museum.

On December 11<sup>th</sup>, Catie Carter, curator, along with 11 volunteers gathered to continue cleanup and maintenance of the outside displays.

Charlie called for a safety meeting and reviewed the tasks planned for the day.



Doug Lindsay, Charlie Connell, Shirley Coté, Cindy Buckner, Terry Dyer & Morgan Buckner  
Back row: Catie Carter, Bill Yedowitz, Richard Zimmermann & Doug Duffy  
Roger Camplin is not in the photo and Lynne Dyer took the photo.

Cindy, armed with a 4 inch paint brush, started to dust the railings of the stamp mill in preparation of the application of wood preservative while Shirley picked up trash and dead birds around the yard. Later, Shirley took over the dusting and sweeping while Cindy, Morgan, Catie, and later Bill, applied over 2 ½ gallons of preservative which only covered half the mill. Catie will need to purchase another two gallons to complete the task another day.





With the sump pump Charlie brought, Bill and Richard pumped the water out of the cistern while Doug L. directed the water into the below grade incline. The old sump pump was removed for repairs.



Then Richard started mucking out the cistern. This activity will continue at another time after the cistern dries out a little more.



Over at the mucker, Doug D., Charlie and Doug L. made some adjustments on the throttle linkage for the traction motor, but were unable to get the mucker in working condition. The cable will need to soak more to loosen the cable wire.



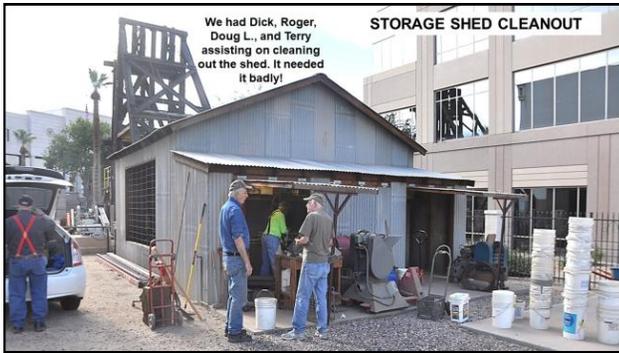
Later, Shirley continued with the general yard cleanup filling large bags with leaves, weeds and trash which has accumulated over the years since the museum closed.



### Head frame Shed Cleanout

This room at the back of the hoist house has not been cleaned since before the museum closed down. It had a tremendous amount of dust and dirt and many old, cracked and too large buckets and trash that needed to be discarded.





We had Dick, Roger, Doug L., and Terry assisting on cleaning out the shed. It needed it badly!

STORAGE SHED CLEANOUT



Roger spent some quality time sweeping years of dirt and crud out of the shed

## Museum Workday December 18, 2017



(7) Individuals participated in a very productive day's activities

We had (7) workers Catie, Shirley, Chuck, Doug, Bill, and Roger, (with Charlie as photographer) at the museum today and we made significant progress. We started work at about 09:00 after a brief safety meeting.

### Museum Roof and Anti-Pigeon System Inspection

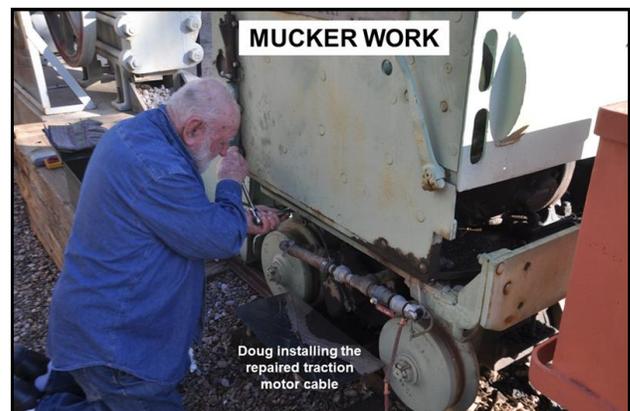
Catie and Charlie went up on the museum mezzanine to look for the anti-pigeon system, but only found a small grey box the size of a cigar box with a plug and no wires coming out of it on the floor. They proceeded to the roof and found that it had a number of dead pigeons and about 50 live pigeons perching on the upper crown around the museum roof.

The prodigious number of pigeons and their droppings since the anti-pigeon system has been disabled has dismayed everyone and they are eager for a swift resolution so that a thorough cleaning of the building and grounds can be accomplished.

The group worked until after 1:30, cleaned up their tools, locked up the museum and headed home pleased with their accomplishments of the day.

◇ ◇ ◇

Mucker Repairs The traction motor throttle was soaked for a couple more days and Doug installed it today and it worked perfect. We now have the mucker back in service.



MUCKER WORK

Doug installing the repaired traction motor cable



Doug operating the mucker that he just successfully repaired

Stamp Mill Preservative Application Catie, Bill and Charlie applied a second coat of preservative to the upper platform since it had been about 6 years since the past application. We used about 3 ½ gallons and have another gallon and a half to apply to the uprights. The mill looks much nicer.



Cistern Muck-out While Doug kibitzed, Roger and Chuck (in the cistern) spent a good part of the day working to remove about 10" of muck that had accumulated in the cistern. They got the cistern cleaned out and ready to refill with water.



Cistern Pump Replacement Thanks to Catie we have a new sump pump. The old pump was inspected and found to be rusted solid.



With the new cistern pump in place, the Sluice Table is back in service.



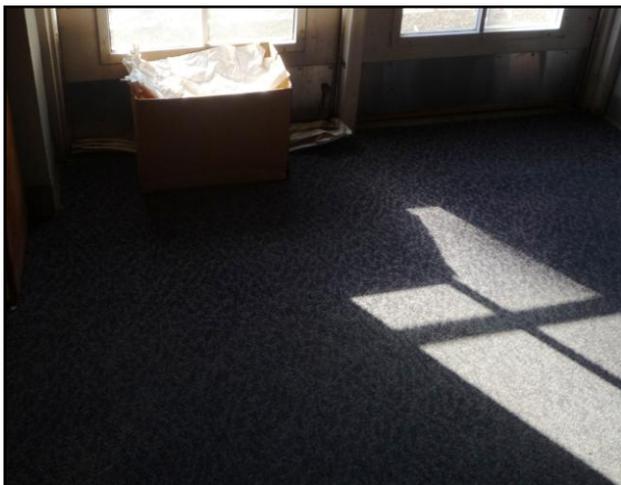
General Area Inspections Bill reattached some security cables that had come loose from their mounting on the wall near the southwest exit.



Inside the Museum Shirley spent most of the morning in the museum vacuuming and sweeping up areas where dirt and trash has accumulated. These areas included the southwest hallway, the south side of the old copper gallery and the lobby entrance. She also removed quite a few spider webs. The museum is in need of a can of bug spray and a new weather seal for the door.



A temporary fix was put in place under the door to prevent the wind from blowing in more pigeon feathers and dirt.



Incline Winch Replacement We worked until about 14:00 and then Catie and Charlie went to 4 Wheel Parts on 7<sup>th</sup> Street south of I-17. We took the controller from the old winch and asked if they could replace that component. They said yes, but it would cost about \$160 plus tax. The winch we looked at is \$299, so we decided to purchase that winch. We should have it for installation on our next work day.



If you wish to help at the next museum workday, please contact Charlie Connell at [minercon@aol.com](mailto:minercon@aol.com).



## Arizona Rocks 55

Text and photos by Ray Grant

Last month I wrote about the Navajo Volcanic Field and the volcanic necks and dikes in the landscape of the Four Corners area. The rocks found at these volcanoes are very unusual and have names most of us have never heard; minette, monchiquite, limburgite, and trachybasalt (see the attached map to see where these different rocks are found). I looked these rocks up since I had no idea what they are, and you can do the same if you really want to know what they are. The one rock in the area most of us have heard about is kimberlite because that is the rock that is mined for diamonds throughout the world.

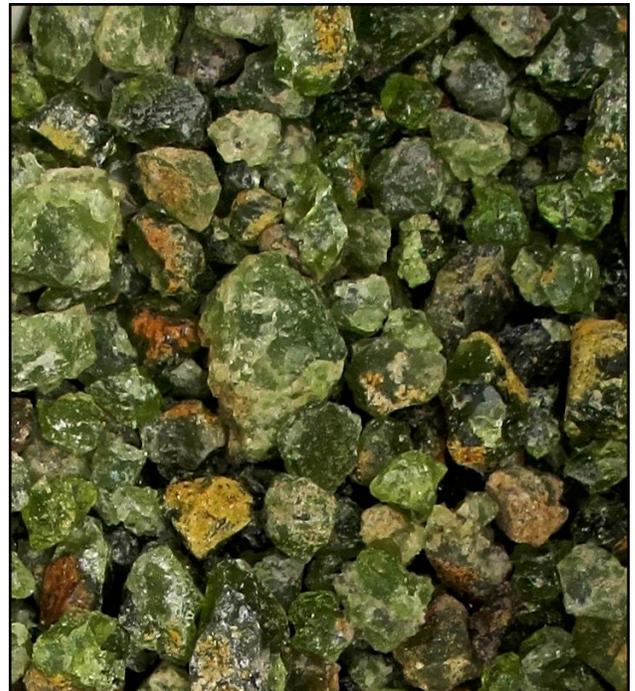
Unfortunately, no diamonds have been found in Arizona and the conclusion of several studies is that these rocks are not the same as those with the diamonds. The unusual natures of these igneous rocks have led to many studies about their origin. The result is that they are from selective melting of parts of the mantle from depths as deep as 100 miles. Reaction with the crustal rocks as these magmas moved to the surface may also have caused some of the chemical variations.

The area has been of interest since the 1800s because of the pyrope garnets found with these volcanic rocks and the chance of finding diamonds. George F. Kunz in *Gems and Precious Stones of North American*, 1890, describes the garnets from the region. "Garnets have been observed associated with grains of peridot, a chrome pyroxene, and a hyaline chalcedony. They are found on ant hills and near the excavations made by scorpions. They are collected by soldiers and

Indians, and sold to the Indian traders, who send them to the large cities in lots of from an ounce upward." A reference from the 1960s states: "garnet and olivine crystals were found in abundance on the surfaces of ant hills." Because of the deep red color these garnets have also been called Arizona rubies.



Pyrope garnet from the Navajo Volcanic Field



Peridot (olivine)

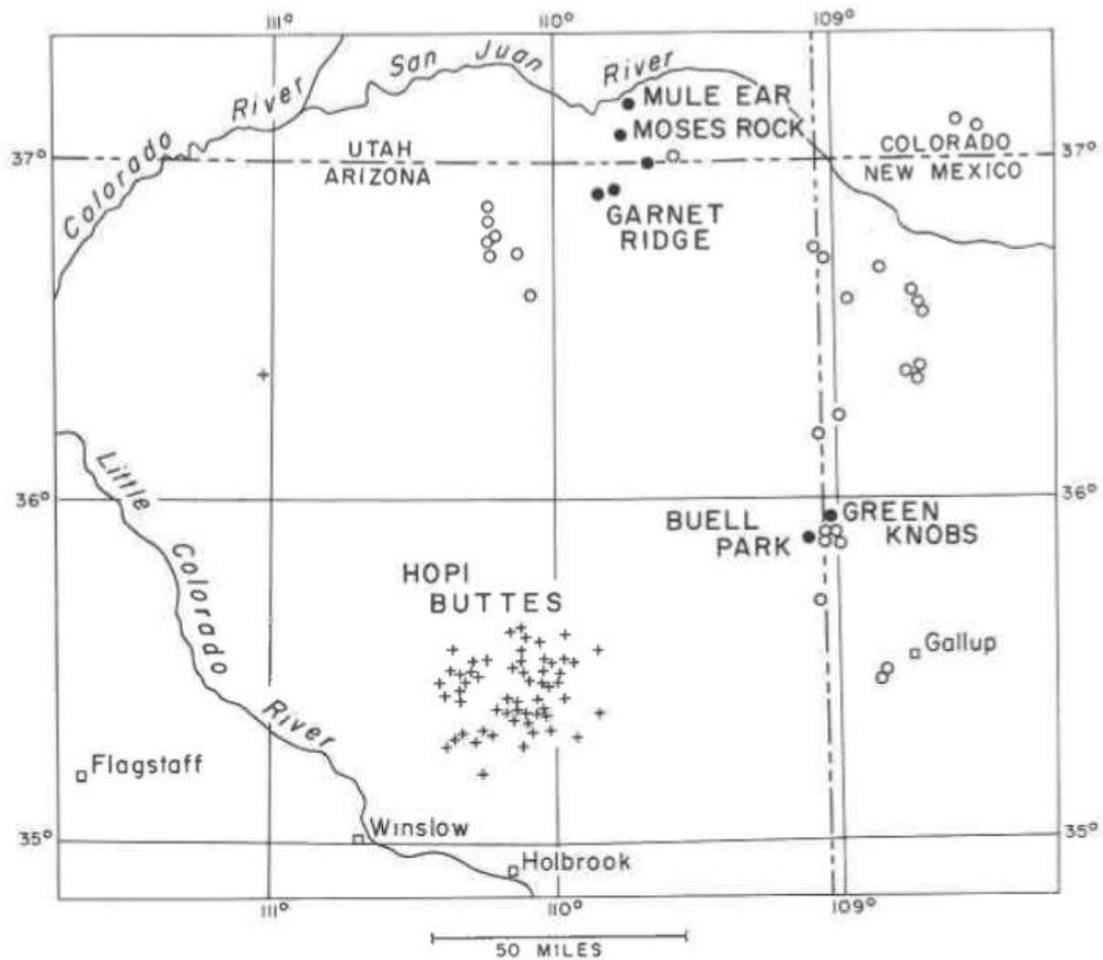


FIG. 1. Map of northeastern Arizona and adjacent parts of New Mexico, Utah, and Colorado showing distribution of kimberlite (black circles); minette and trachybasalt (open circles); monchiquite and limburgite (crosses). Mainly after Shoemaker (1956) and Shoemaker, Roach, and Byers (1962).

# AZ Rock & Gem Shows



**Flagg Mineral Foundation**  
**46<sup>th</sup> Annual Flagg Gem & Mineral Show**  
**January 5-7, 2018**  
 Fri., Sat., Sun. 9-5  
 Free Parking and Admission  
 Mesa Community College  
 West parking lot off Dobson Road  
 N. of US 60  
 Mesa, AZ



**Gila County Gem and Mineral Society**  
**Annual Rock & Gem Show**  
**January 12-14, 2018**  
 Fri. & Sat. 9-5  
 Sun. 9-4  
 Admission \$3 or \$5/couple  
 Students/children free  
 Gila County Fairgrounds  
 Highway 60, 3 mi. north of Globe, AZ

## Quartzsite Gem Shows

**Desert Gardens - Gem & Mineral**  
**January 01 - February 28, 2018**

**Tyson Wells Rock & Gem Show**  
**January 05 - January 14, 2018**

**Tyson Wells Sell-A-Rama**  
**January 19 - January 28, 2018**

For more information:

<https://www.desertusa.com/cities/az/quartzsite.html#ixzz4zkxIvsjq>

**Tucson Rock, Gem & Fossil Shows**  
**January 19 through**  
**February 11, 2018**

**Tucson Gem & Mineral Society**  
**Tucson Gem & Mineral Show®**  
**February 8-11, 2018**  
 Thursday – Saturday 10-6  
 Sunday 10-5  
 SMG Tucson Convention Center  
 260 S. Church Ave, Tucson



**Apache Jct. Rock & Gem Club**  
**Annual Show**  
**February 17, 18, 2018**  
 Sat. 9-5; Sun. 10-4  
 Adults \$3; Students \$1  
 Children 12 and under FREE  
 Skyline High School  
 845 S. Crismon Rd.  
 Mesa, AZ



**Pinal Gem & Mineral Society**  
**March 10, 2018**  
**3<sup>rd</sup> Annual Touch Outer Space and Pinal**  
**Mineral Show at the Museum**  
 (see page 13 for more information)



**Daisy Mountain Rock & Mineral Club**  
**2018 Anthem Gem & Mineral Show**  
**March 24, 25, 2018**  
 Sat. 9-5; Sun. 10-4  
 Adults \$3; Students & Seniors \$2  
 Children 12 and under FREE  
 Boulder Creek High School  
 40404 N. Gavilan Peak Pkwy.  
 Anthem, AZ

# Rock & Gem Clubs



## Apache Junction Rock & Gem Club

Meetings are on the 2<sup>nd</sup> Thursday  
Next Meeting: January 11, 2018, 6:30 pm

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

@ Club Lapidary Shop

2151 W. Superstition Blvd., Apache Jct.



## Daisy Mountain Rock & Mineral Club

Meetings are on the 1<sup>st</sup> Tuesday  
Next Meeting: January 2, 2018, 6:30 p.m.

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

@ Anthem Civic Building

3701 W. Anthem Way, Anthem



## Maricopa Lapidary Society, Inc

Meetings are on the 1<sup>st</sup> Monday  
(unless a Holiday then 2<sup>nd</sup> Monday)  
Next Meeting: January 8, 2018, 7:00 pm

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

@ North Mountain Visitor Center

12950 N. 7<sup>th</sup> St., Phoenix



## Mineralogical Society of Arizona

Meetings are on the 2<sup>nd</sup> Thursday  
Next Meeting: January 11, 2018, 7:00 pm

[www.msaz.org](http://www.msaz.org)

@ Franciscan Renewal Center,

5802 E. Lincoln Dr., Scottsdale

# Next Meeting



## Pinal Gem & Mineral Society

Meetings are on the 3<sup>rd</sup> Wednesday  
Next Meeting: January 17, 2018, 7:00 pm

[www.pinalgemandmineralsociety.org](http://www.pinalgemandmineralsociety.org)

@ Artisan Village

351 N. Arizona Blvd., Coolidge



## West Valley Rock & Mineral Club

Meetings are on the 2<sup>nd</sup> Tuesday  
Next Meeting: January 9, 2018, 6:30 pm

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

@ American Legion Post #53

402 E. Narramore Ave., Buckeye



## White Mountain Gem & Mineral Club

Meetings are on the 1<sup>st</sup> Sunday  
(unless a Holiday then 2<sup>nd</sup> Sunday)  
Next Meeting: January 7, 2018, 1:00 pm

[www.whitemountain-azrockclub.org](http://www.whitemountain-azrockclub.org)

@ VFW Hall

381 N. Central, Show Low



## Wickenburg Gem & Mineral Society

Meetings are on the 2<sup>nd</sup> Friday  
Next Meeting: January 12, 2018, 7:00 pm

[www.wickenburggms.org](http://www.wickenburggms.org)

@ Coffinger Park Banquet Room

175 E. Swilling St., Wickenburg



Pinal Geology & Mineral Museum

## Pinal Museum and Club News

Next Pinal Gem and Mineral Club meeting  
 Wednesday, January 17, 2018

Second Australia Night at the Museum

[www.pinalgemandmineralsociety.org](http://www.pinalgemandmineralsociety.org)

## Visit Our Enhanced Dinosaur Exhibit



Plants donated by Kat Wolcott

Photo by Chris Burkhart



**AVC**  
ARTISAN  
VILLAGE  
COOLIDGE

**Artisan Village of Coolidge**  
presents

**INTRODUCTION TO GEOLOGY – ROCK IDENTIFICATION**



**DATE:** SATURDAY, JANUARY 20, 2018  
**TIME:** 9:00AM-NOON  
**COST:** \$20.00 (FREE TO STUDENTS WITH PAYING PARENT)  
**LOCATION:** PINAL GEOLOGY AND MINERAL MUSEUM, ROOM 2  
 ARTISAN VILLAGE OF COOLIDGE,  
 351 N. ARIZONA BLVD., COOLIDGE, AZ  
**INSTRUCTOR:** RAY GRANT  
**CONTACT:** RAYCYN1@MAC.COM

Ray Grant will teach how identify to different types of rocks. He will cover the 3 types of rocks: igneous, sedimentary, and metamorphic. You will get hands on practice with samples of common rocks with a specific emphasis on the rocks you can find in Pinal County.

PLEASE, PRE-REGISTER NOW AT: [WWW.ARTISANVILLAGEOFCOOLIDGE.ORG](http://WWW.ARTISANVILLAGEOFCOOLIDGE.ORG)



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SPONSORED BY THE ARTISAN VILLAGE OF COOLIDGE  
 351 N. ARIZONA BLVD. – COOLIDGE, AZ 85128  
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COOLIDGE  
CHAMBER  
OF COMMERCE



**AVC**  
ARTISAN  
VILLAGE  
COOLIDGE

**Artisan Village of Coolidge**  
presents

**INTRODUCTION TO GEOLOGY – MINERAL IDENTIFICATION**



**DATE:** SATURDAY, FEBRUARY 17, 2018  
**TIME:** 9:00AM-NOON  
**COST:** \$20.00 (STUDENTS FREE WITH PAYING ADULT)  
**LOCATION:** PINAL GEOLOGY AND MINERAL MUSEUM, ROOM 2  
 ARTISAN VILLAGE OF COOLIDGE,  
 351 N. ARIZONA BLVD., COOLIDGE, AZ  
**INSTRUCTOR:** RAY GRANT  
**CONTACT:** RAYCYN1@MAC.COM

The class will include lecture material and hands on work with specimens. It will cover properties of the most common minerals and how to identify them.

PLEASE, PRE-REGISTER NOW AT: [WWW.ARTISANVILLAGEOFCOOLIDGE.ORG](http://WWW.ARTISANVILLAGEOFCOOLIDGE.ORG)



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COOLIDGE  
CHAMBER  
OF COMMERCE

**46<sup>TH</sup> ANNUAL  
FLAGG GEM & MINERAL SHOW**  
JANUARY 5-7, 2018

**THE GRAND REEF MINE**

**MESA COMMUNITY COLLEGE**  
NE CORNER OF US 60 & DOBSON ROAD 9AM - 5PM  
THE TAILGATE SHOW TRADITION CONTINUES!

FOR MORE INFORMATION  
**WWW.FLAGGSHOW.INFO**  
FLAGG MINERAL FOUNDATION P.O. BOX 41834 | MESA, AZ 85274

FREE ADMISSION  
FREE PARKING  
FREE SAMPLES FOR KIDS

# WANTED

The Earth Science Museum is looking for volunteers to help at the Flagg Gem & Mineral Show, January 5-7, 2018, with show hours from 9 a.m. to 5 p.m.

**Egg Carton Program:** After attendees choose 12 rock, mineral or fossil specimens for \$1, you will assist in checking that labels match the specimens' chosen and secure the carton with a rubber band.

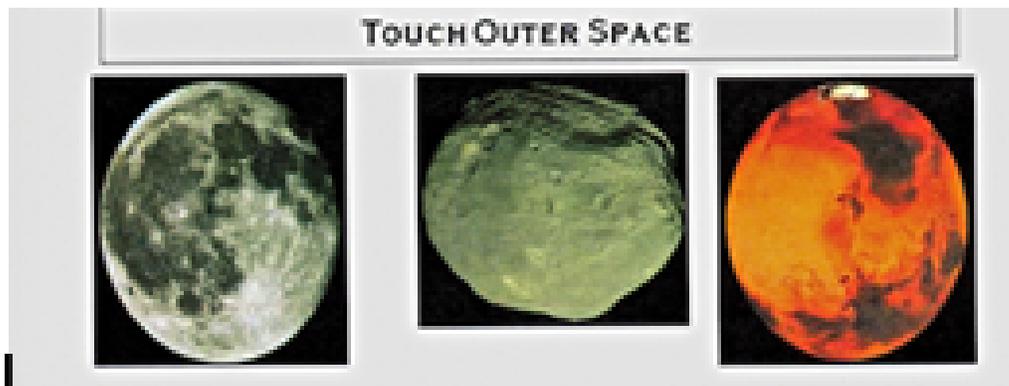
**Fluorescent Mineral Display Tent:** Answer visitor's questions regarding fluorescent minerals.

**Rock, mineral & fossil sales tables:** Assist in selling specimens.

Please consider spending an hour or two helping at the ESM booth during the show.



736 egg cartons filled and 2,639 visitors to the fluorescent tent last January!



**Touch Outer Space and Pinal Gem and Mineral Show  
Saturday, March 10, 2018 from 10 AM to 4 PM**

**Where:** The Pinal Geology and Mineral Museum is located in the Artisan Village of Coolidge at 351 N. Arizona Boulevard in Coolidge, Arizona

You will be able to touch samples from Mars, the Moon, and the asteroid Vesta from 10AM to 1PM. Dr. Carleton Moore is bringing specimens to the Museum. There will be dealers set up selling minerals, meteorites, fossils, and lapidary material (10AM to 4PM). Admission to the Event and Museum is free. There are exhibits of rocks, minerals, and fossils. Special exhibits include fluorescent minerals, Arizona minerals, and Arizona geology. There is a kid's treasure hunt and a fossil dig where every kid can find and take home a small fossil collection. The Earth Science Museum will be represented at this 3<sup>rd</sup> Annual show by Lynne and Terry Dyer with their traveling museum of rocks, minerals and fossils along with Mardy Zimmermann with the egg carton program where you can make your own rock/mineral collection for \$1.

For more information go to [pinalgeologymuseum.org](http://pinalgeologymuseum.org) or call Ray Grant at 520-251-5419. Sponsored by the Pinal Gem and Mineral Society, the Mineralogical Society of Arizona, and the Artisan Village of Coolidge.

## ESM's Meeting Notice

ESM's next meeting will be at the Century Branch library, 1450 E. Highland, Phoenix, on Sunday, January 21, 2018, at 1:30 p.m.

**BECOME A MEMBER!**  
Join the Earth Science Museum's



**IS IT TIME TO RENEW YOUR MEMBERSHIP?**  
Please renew today! 😊😊😊

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**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](http://www.flaggmineralfoundation.org)

Friends of the AZ Mining & Mineral Museum

Maricopa Lapidary Society

<http://maricopalapidarysociety.com/>

Mineralogical Society of AZ

[www.msaz.org](http://www.msaz.org)

Payson Rimstones Rock Club

Sossaman Middle School

White Mountain Gem & Mineral Club

[www.whitemountain-azrockclub.org](http://www.whitemountain-azrockclub.org)

Wickenburg Gem & Mineral Society

<http://www.wickenburggms.org>

[www.facebook.com/pages/Wickenburg-Gem-and-Mineral-Society/111216602326438](https://www.facebook.com/pages/Wickenburg-Gem-and-Mineral-Society/111216602326438)

Staples Foundation

[www.staplesfoundation.org](http://www.staplesfoundation.org)

Anita Aiston

Stan & Susan Celestian

Russ Hart

Will & Carol McDonald

Debbie Michalowski

Dennis & Georgia Zeutenhorst

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Name: \_\_\_\_\_

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City, State, Zip: \_\_\_\_\_

Email: \_\_\_\_\_

Phone Number: \_\_\_\_\_

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**Earth Science Museum**  
 3215 W. Bethany Home Rd.  
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**Phone:**  
 602-973-4291

**Editor E-Mail:**  
 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](http://www.earthsciencemuseum.org).

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*We're on the Web!*

Visit us on  and at:  
[www.earthsciencemuseum.org](http://www.earthsciencemuseum.org)

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**NOTICE:**  
 ESM's next meeting will be at the Century Branch library, 1450 E. Highland, Phoenix, on Sunday, January 21, 2018, at 1:30 p.m.

**THANK YOU FOR YOUR CONTINUING INTEREST & SUPPORT!!!**

**EARTH SCIENCE MUSEUM  
 NON-PROFIT BOARD OF DIRECTORS**

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Mardy Zimmermann	VP Outreach
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