



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, scote@earthsciencemuseum.org, 602-973-4291

February 2019
Volume 8, Issue 2

ESM Outreach Update:

By Mardy Zimmermann, Outreach and Education Coordinator

February saw additional outreach and educational service to students through school and Science Fair presentations. New schools to ESM included Peralta Trails Elementary, Broadmor Elementary, and Dynamite Montessori. The Egg Carton Program also provided Happy Valley East Charter School with twelve sets of 100 specimens to assist the teachers in an activity after a presentation by the Dyers.

After one additional Science Fair in March, Harvey Jong and I will review our experiment of dual Egg Carton and Volcano presentations by ESM. We noticed a difference between elementary and middle schools and will strategize differing topics for next year. Schools were very helpful in collecting egg cartons for us.

In March we will begin to reorganize the garage in Apache Junction and continue the process of completing an inventory of our raw material. There are flats and boxes stacked up, waiting our attention. Hopefully as we make progress in planning for student services at the MMNRE Museum we will be able to co-ordinate materials and resources.

ESM board members Doug Duffy and Shirley Coté teamed up with other members of the Daisy Mountain Rock and Mineral Club for STEAM night at Anthem Elementary School January 30th. Over 170 students and adults stopped to marvel at the display tables filled with rocks, minerals and fossils. Claudia Marek spoke with folks about the table full of fossils she brought. Bill Smardo talked with attendees on the subject of how he polishes his large pieces of petrified wood using an electric wet polisher. Doug Duffy explained the steps he uses to tumble rocks. The vibrating rock tumbler filled with polished stones in a medium of ground walnut shells fascinated everyone who saw it. Ed Windborne brought a black tent to show fluorescent minerals. Terry Mazzotta talked with folks about his obsidian points. Shirley Cote, Bob Evans and Nancy Gallagher explained and demonstrated some of the different physical properties of minerals including conductivity, the acid test for carbonate minerals, magnetism, and the optical properties of ulexite and double refractive calcite.

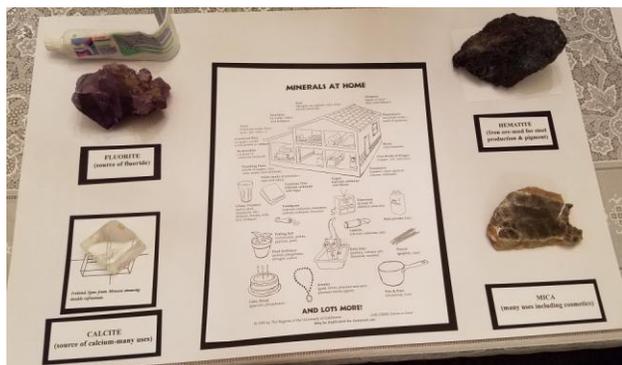
Bob, Nancy, Doug, Bill, Terry and Claudia with students at Anthem Elementary
Photo by S. Coté



Around 135-145 students visited the egg carton/volcanic rocks & minerals tables at Freedom Elementary "Night of Learning", January 31st. Mardy was overwhelmed with egg cartons as teachers asked parents and students to bring their own containers, while Harvey tested a new scheme for displaying the volcano posters. They had a repeat performance February 1st, at Basis Ahwatukee.

There was a big turnout of students and families at the Basis science fair. Mardy was overwhelmed again and nearly ran out of egg cartons. Her tally was around 120. She initially allowed both students and family members to participate, but later had to limit to students only. Harvey tested the full volcano display that included the model that he borrowed from Catie and extended over two long tables. Even though the display was at a prime location near the entrance; only 78 students dropped by. Harvey thought folks were expecting a huge eruption demonstration, such as a trash can volcano, and were disappointed with just a small static model and a bunch of rocks.

On February 5, 2019 Lynne and Terry Dyer instructed three 2nd grade classes (77 students and 4 teachers) at Happy Valley East Charter School about rocks, minerals and fossils.



Terry was showing the students how you could see piezoelectricity when two quartz specimens are rubbed together. Piezoelectricity is the electric charge that accumulates in certain solid materials in response to applied mechanical stress.

On February 21st Terry & Lynne attended Knox Gifted Academy's Celebration of Science and Engineering Night in Chandler where 221 students and parents viewed their displays.



Lynne Dyer and students at Knox Gifted Academy
Photo by Terry Dyer

2019 Tucson Gem & Mineral Show® Highlights

By Shirley Coté and Doug Duffy

Chris Whitney-Smith, ESM board member and president of the Mineralogical Society of Arizona, along with Dr. Alexander Schauss, University of Arizona, Bio5 Institute, Office of Research, Discovery & Innovation, AIBMR Life Sciences, Inc., The University of Arizona, College of Science, Department of Geosciences, won the 2019 Millie & Bill Schupp Memorial Trophy Best Volunteer Guest Exhibit at the Tucson Gem & Mineral Show® for the exhibit “How Wulfenite Became the Official Mineral of Arizona”

Chris told us that a dream he had was the inspiration for the exhibit by the LGF Foundation “Dragons Hoard Wulfenite is Loved Fantasy” which included the skull of a pachycephalosaur dinosaur (meaning “thick-headed lizard”), owned by Michael Fleeman, director and founder of the LGF Foundation.



Shirley looks forward to seeing the display on the elements each year featuring a specific group of elements. This year the alkaline earth metals.



Chris Whitney-Smith with the trophy he received for the exhibit “How Wulfenite Became the Official Mineral of Arizona”



A stunning case! Chinese Mineral Treasures



One of our favorites - rhodochrosite from China



Another favorite - purple and green fluorite



Two more favorites, center, fluorite with rhodochrosite, and the fluorite, calcite with drusy quartz



Flagg Mineral Foundation case featuring Arizona Collectors, Volume 2 Submission Candidates



Mining, Mineral and Natural Resources Education Museum case



UA Mineral Museum cases





Arizona Rocks 69

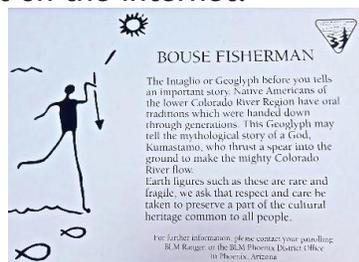
Text and photos by Ray Grant

Another feature of deserts is desert pavement. It is a surface layer of closely packed interlocking rock fragments over fine sand and silt. It is very common on alluvial fans in Arizona.

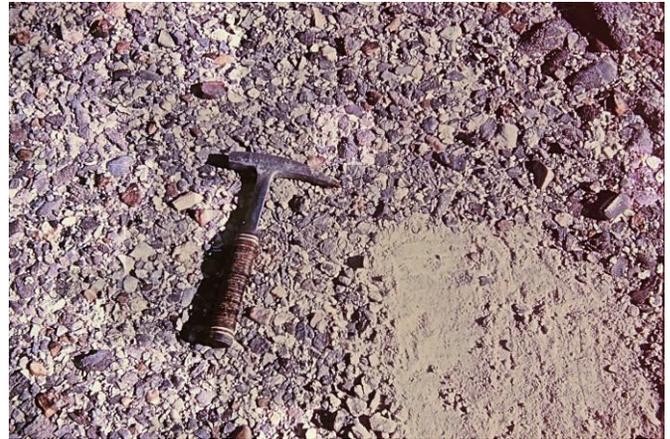
There are several ways possible for the pavement to form. The fine material on the surface may be removed by deflation (wind blowing it away) and/or sheet flow (water washes away the finer material). Some researchers also suggest that a heaving process by salt or ice may lift the bigger pieces to the surface. The pavement is usually coated with desert varnish.

The pavement seals off the ground surface and slows erosion of the finer material that is covered. When driving tracks or other disturbances remove the pavement, the fine material will start to blow away in strong wind and this adds to the dust storms in Arizona.

The removal of desert pavement has been used to form geoglyphs. Geoglyphs are large designs on the ground made by piling material up or in the case of desert pavement exposing the finer lighter colored material underneath. When working on this column I came across a geoglyph near Bouse called the Fisherman that I am interested in visiting. You can find information about it on the internet.



BLM sign for the Fisherman geoglyph near Bouse



Desert pavement exposing the finer material underneath, taken in western Arizona



A geoglyph in desert pavement, I took this picture in Southern California almost 50 years ago and cannot remember the exact location.



The fisherman geoglyph drawn in desert pavement Google Maps



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

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

by Catie Carter

cscarter@email.arizona.edu

703.577.6449

Greetings Monday Crew and museum volunteers,

Thank you all for attending our meeting last week. Below is a summary of the meeting and a note about the ADMMR Mining Collection.

On the morning of Friday, February 1st, 30 volunteers and friends of the museum assembled at the Mining and Mineral Museum for an informal meeting with Brooks Jeffery, University of Arizona VP for Research and head of the AMMNRE Museum project.



Participants at the meet and greet event with Brooks Jeffery, UA, on February 1, 2019.

The purpose of the meeting was for Brooks to meet volunteers, give an update about the status of the museum under UA, and open the floor for questions and feedback. Brooks began his presentation with a summary of the legislation that transferred

the museum from the Arizona Historical Society to the University of Arizona in 2016 (SB 1530) and 2017 (SB 1415) thanks to the efforts of Senator Gail Griffin (now Representative Griffin). Brooks explained how the bills designate that the new museum will showcase not only mining and minerals but Arizona's other natural resource industries, including forestry, agriculture, livestock and tourism, and that there will be a Governor-appointed Advisory Board with members from each industry as well as two legislators (Rep. Griffin and Sen. Leach), two members of the public, and a member knowledgeable in museum operations. At this time, around half of those positions have been officially appointed by the Governor. Brooks then explained how the development of the museum will progress in a phased approach, starting with priority building improvements including security and roofing, with the initial goal of securing the building and its storage areas so that we can move the mineral collection back from the Arizona Historical Society in Tempe. Shirley is currently assisting Catie with mapping those areas and building a plan to move things back, starting with teacher kit and gift shop material. Under the phased approach, the next steps would be to open small exhibits in contained areas such as the Copper Gallery, and expand outward as we work on the building. Brooks also confirmed that the state appropriation has been banked by the UA CFO and will be made available to fund the salary for a Phoenix-based Director or Project Manager, with the position opening sometime this spring. In the meantime, we have the official go-ahead to plan our spring stamp mill run, which will be held in the outdoor area and open to the public. After his presentation, Brooks listened to concerns from volunteers about the timeline for reopening, which is not yet known, and how the closing of the museum has negatively impacted Arizona schoolchildren. He

expressed support for restarting the teacher kit program with the help of the Earth Science Museum and hosting regular stamp mill runs with the Monday Crew, as well as continuing to meet with the museum volunteers. After the meeting was over, Charlie, Bill, Rick, and Catie headed to the Boneyard, our offsite storage area, to do an inventory of the rocks, minerals and mining equipment in place there.

Note about the ADMMR Mining Collection: When the museum closed in 2011, the mine files became the property of the Arizona Geological Survey, which is under the University of Arizona, College of Science as of 2016.

While the files are being stored in our building, they are not part of our museum collection and we do not have access to them. Many have been digitized and can be accessed

at <http://minedata.azgs.arizona.edu/> - for any other questions or concerns about the files, please contact Mike Conway at fmconway@email.arizona.edu.

Thank you all for your continued support. We have some exciting volunteer opportunities coming up in March and will keep you updated. If anyone has questions or concerns please email me at cscarter@email.arizona.edu.

Regards,
Catie

If you are interested in volunteering at the next museum workday, please contact Charlie Connell at minercon@aol.com or Catie Carter at cscarter@email.arizona.edu.

Support the Museum

<http://tinyurl.com/SupportMM-NREMuseum>
your donations are appreciated!

Help bring back the educational exhibits!

MM&NRE Museum exhibits at the Historical Society's Heritage Center in Tempe

Photos by Shirley Coté taken Feb. 4, 2019



Above exhibits by Catie Carter



Exhibit created by Bryan Beaulieu

AZ Rock & Gem Shows



Apache Junction Rock and Mineral Club
 March 2-3, 2019
 Sat. 9-3, Sun. 10-4
 Admission \$3, Students \$1,
 12 & under free
 Skyline H.S.
 845 S. Crismon, Mesa, AZ



Pinal Geology & Mineral Museum



Verde River Rockhounds
 April 27, 2019
 Sat. 9-5
 Free admission
 Windmill Park
 9950 E. Cornville Road
<http://www.verderiverrockhounds.com>



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

Rock & Gem Clubs



Apache Junction Rock & Gem Club

Meetings are on the 2nd Thursday
Next Meeting: March 14, 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: March 5, 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: March 4, 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: March 21, 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: March 20, 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: March 12, 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: March 3, 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: March 8, 2019, 7:00 pm

www.wickenburggms.org

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



Pinal Museum and Club News

351 N. Arizona Blvd., Coolidge, AZ
Next Pinal Gem and Mineral Club meeting
Wednesday, March 20, 2019
www.pinalgemandmineralsociety.org

Saturday, March 9 - 9 AM to 2 PM, Touch Outer Space and Pinal Gem and Mineral Show

The Museum is open on Fridays and Saturdays from 10 a.m. to 2 p.m. (September - May)
 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.

4th ANNUAL
TOUCH OUTER SPACE

**PINAL
 GEM &
 MINERAL
 SHOW**

MARCH 9, 2019

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

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

AVC ARTISAN VILLAGE COOLIDGE
 PINAL GEOLOGY & MINERAL MUSEUM
 EARTH
 PGMMS

2019 ANTHEM GEM & MINERAL SHOW

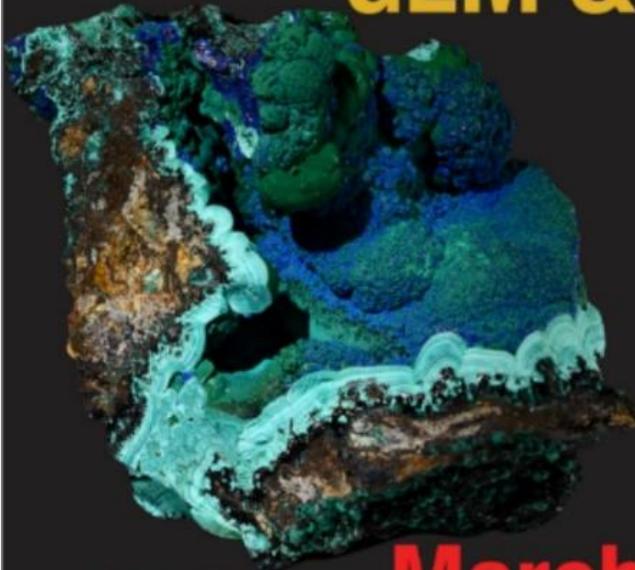


Photo by Stan Celestian

March 16th-17th

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

SATURDAY MARCH 16 9am—5pm

SUNDAY MARCH 17 10am—4pm

www.dmrmc.com

Find us on 

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

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

ESM's Meeting Notice

ESM's next meeting will be at the Burton Barr library, 1221 N Central Ave, Phoenix, on Tuesday, March 19, 2019, at 6:30 p.m. Room B.

BECOME A MEMBER!
Join the Earth Science Museum's



IS IT TIME TO RENEW YOUR MEMBERSHIP?
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.msaaaz.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
- Russ Hart
- Will & Carol McDonald
- Debbie Michalowski
- Janet Stoepplmann
- Dennis & Georgia Zeutenhorst

----- cut here -----
Name: _____

Address: _____

City, State, Zip: _____

Email: _____

Phone Number: _____

Mail form & payment to: Earth Science Museum
3215 W. Bethany Home Rd., Phoenix, AZ 85017
For Office Use Only

Card given/mailed: _____

Database updated: Distribution Lists updated:

Card ID # _____ Expires: _____

Earth Science Museum

3215 W. Bethany Home Rd.
Phoenix, AZ 85017

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.

We're on the Web!

Visit us on  and at: www.earthsciencemuseum.org

NOTICE:

ESM's next meeting will be at the Burton Barr library, 1221 N Central Ave, Phoenix, on Tuesday, March 19, 2019, at 6:30 p.m. Room B.

THANK YOU FOR YOUR CONTINUING INTEREST & SUPPORT!!!

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

Harvey Jong	President
Mardy Zimmermann	VP Outreach
Robin Evans	Treasurer
Shirley Coté	Secretary/Asst. Treasurer

Cindy Buckner, Doug Duffy, Ray Grant,
Bob Holmes, Chris Whitney-Smith

Earth Science Museum
3215 W. Bethany Home Rd.
Phoenix, AZ 85017

