



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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September 2018
Volume 7, Issue 9

ESM Outreach Update:

By Mardy Zimmermann, Outreach and Education Coordinator

During this month of September the ESM Outreach Program was involved in several activities. The big effort was beginning our effort to disperse the wealth of material we received from Russ Hart. We will continue this into October. Also, we completed our efforts to supply Cooley Middle school with rocks, minerals and fossils along with charts and literature to assist their 7th grade science program.

We continued our ongoing relationship with the BLM geologist in Lake Havasu and have gathered additional rocks and minerals for his program. This week we are giving him a set of fossils, large and small, to assist him and his new interns with their plans to provide additional help in the earth sciences to teachers and their students in October and November.

Finally, ESM will concentrate on school science fairs with a hands-on program on basalt and volcanoes. Harvey Jong has collected samples of basalt from various volcanoes and we are planning to make sample bags of basalt, obsidian, and pumice to give to students and parents. I will also be setting up a modified Egg Carton table and we will not charge students this year.



Members of the Apache Junction Rock and Gem Club, Daisy Mountain Rock and Mineral Club, Gila County Gem and Mineral Society, Mesa Community College Geology Club, and the Mineralogical Society of Arizona braved the heat on September 21 & 22, 2018, and participated in the Earth Science Museum's first "Share the Rock and Mineral Wealth" event.

The ESM is in the process of sharing our excess amount of rock and mineral material stored at a property in Queen Creek as the owner will be moving to Florida.

Other rock and mineral clubs in Arizona are welcomed to attend our next event scheduled with the property owner for October 5 and 6 or October 12 and 13.

We would like to invite clubs in sharing these materials. There will be no fees or

restrictions involved with the items; however, please note that the samples were donated by Russ Hart and were used in making special kits for kids. In keeping with this intention, it would be nice if your club can find ways of using the rocks and minerals for educational purposes.

We plan to coordinate with one person from each club and arrange a convenient day and time for everyone involved. To respect the owner and his neighbors, there is a limit on the number of vehicles (12 max.) and people allowed on the property at one time. **Please come prepared with buckets, gloves, shovels, dollies, trucks and/or trailers, snacks, water, and sunscreen.** Also, keep safety and courtesy in mind in removing items. **WARNING: An electrified fence is present on one side of the property. Please exercise caution near this fence and avoid electric shock.**

Items vary in size and quantity. Some are yard rock size; some hand size; and a lot are around the size of a quarter, **perfect for kid's activities.** Materials may be in buckets, trash cans, 55-gallon drums, or on the ground.

To reiterate, we plan to coordinate with one person from each club and arrange a convenient day and time for everyone involved. Club members please coordinate with your club president or designee.

Please reply to Shirley Coté, crystalc17@gmail.com to schedule your clubs preference day and the number of vehicles and people.

Pictures were taken before our first event.



Rocks on the ground



Rocks in buckets



Drums of rocks, drums and trash cans of minerals





AZ Mining, Mineral & Natural Resources Educational Museum Update July 2018

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

By Catie Carter

Hi AZ MM&NREM Friends and Supporters,

In early September, officials at the University of Arizona agreed that it is time to start the search for an interim museum director or project manager to directly take the lead on museum development. Our current project leader, Brooks Jeffery, will continue to be actively involved as well. They are still working out the details, but it will be a full-time position here in Phoenix. I look forward to working with them and introducing them to the Monday Crew.

In the meantime, we are continuing to partner with other museums and build small exhibits to get our name out there. One of the most exciting projects is the new AZ Lottery exhibit at the Arizona Capitol Museum, which opened on September 20th.



We loaned over a dozen mining artifacts to display at the entrance to Windfall Willie's office. Windfall Willie is the 'Chief Fun Officer' of the AZ Lottery and was, at one point in his

career, a prospector and a miner. The items loaned represent Arizona's early mining history and include a gold pan, pick axe, miner's cap, oil lamp, carbide lamp, and other specimens from our collection. The exhibit is one the first floor of the Capitol Museum and museum admission is free, so definitely check it out! The AZ Lottery folks are certainly good friends to have, and they have expressed interest in partnering with us as we build out our own museum exhibits in the future.

Stay tuned for updates about our collections move and our fall event. Thank you to everyone for your continued support, especially our Monday Crew and awesome volunteers. I anticipate we will need a lot of help this winter!

If you are interested in volunteering at the next museum workday, please contact Charlie Connell at minercon@aol.com.

Regards,
Catie Carter
cscarter@email.arizona.edu

Support the Museum

Senator Gail Griffin led the way in establishing an account for the museum at the University of Arizona Foundation which can be accessed at the following link:

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

Mining, Mineral And Natural Resources Educational Museum
Designation Description Mining, Mineral and Natural Resources Educational Museum
Designation ID 20-10-2615
Campaign Descriptions Research, Discovery, and Innovation

Mining And Mineral Museum General Fund
Designation Description Mining and Mineral Museum General Fund
Designation ID 20-10-2742
Campaign Descriptions Research, Discovery, and Innovation

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Arizona Rocks 64

Text and photos by Ray Grant

An interesting place to visit that is not very well known is Coal Mine Canyon located on Black Mesa. It is about 15 miles south of Tuba City on route 264 on the north side of the road. It was somewhat visible from the highway and a track leads to the edge of the canyon, I somehow found my way there some years ago. Here are directions that I found on the internet: drive 15.2 miles from Tuba City, turn left onto an unmarked dirt road, drive 0.5 miles, straight ahead at the first junction, bear right at the second junction, and then straight at the third junction to the picnic area on the rim. Also, they state a guide is needed to go into the Canyon. Note there are steep cliffs at the edge of the canyon so, be careful.

The rocks in the canyon are Jurassic in age and the rocks on the rim are Cretaceous. This top formation is the Dakota Formation and is older than the coal being mined today (Wepo Formation). The rocks in the canyon are sandstones and siltstones spectacularly eroded into badlands type topography. There was a coal layer near the top that has burned. It was likely ignited by lightning and has burned the rocks above it, so they now look like products of a blast furnace. There are also some oyster fossils in the area in the top layer. So 100 million year ago the oysters lived in shallow bays when the ocean was present and the coal formed in swampy areas along the coast.



Coal Canyon, top layer has coal and burnt rock (Dakota Formation - Cretaceous Age) lower rocks (sandstone - Jurassic Age)



Rock from above the burning coal layer at Coal Canyon, has partially melted like slag



Another view of the Slag like rocks at Coal canyon

AZ Rock & Gem Shows



West Valley Rock & Mineral Club Annual Show

October 12-14, 2018
 Fri., Sat. 9-5, Sun. 9-2
 Admission \$3, Children Free
 Buckeye Arena
 802 N. 1st St., Miller Road
 Buckeye, AZ

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



Huachuca Mineral and Gem Club Annual Show

October 13-14, 2018
 Sat. 9-5, Sun. 10-4
 Free Admission
 Cochise College
 901 N Colombo Ave.
 Sierra Vista, AZ



Sedona Gem and Mineral Club Annual Show

October 20-21, 2018
 Sat. 10-5, Sun. 10-4
 Admission: Adults \$3
 Children Free
 Sedona Red Rock High School
 995 Upper Red Rock Loop Rd.
 Sedona, AZ

High Desert Helpers
 Annual Show
 November 2-4, 2018
 Fri., Sat., Sun. 9-4
 Free Admission
 High Desert Park
 19001 E. Jacie Lane
 Black Canyon City, AZ

Payson Rimstones Rock Club
 Annual Show
 November 17-18, 2018
 Sat. 9-5, Sun. 10-4
 Adults, seniors and students \$2
 Children 12 and under free
 Longhorn Gym, W. Longhorn Rd. and
 N. McLane Rd.



Verde River Rockhounds "Rocks in the Park" December 1, 2018 Sat. 9-4

Free Admission
 Windmill Park
 9950 E. Cornville Road
 Cornville, AZ



Flagg Mineral Foundation
 47th Annual Flagg Gem & Mineral Show
 January 4-6, 2019
 Fri., Sat., Sun. 9-5
 Free Admission
 Mesa Community College
 Dobson Rd. & Superstition Mtn. Freeway
 (Rt. 60)

www.flagshow.info

Rock & Gem Clubs



Apache Junction Rock & Gem Club

Meetings are on the 2nd Thursday
 Next Meeting: October 11, 2018, 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
 Next Meeting: October 9, 2018, 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: October 1, 2018, 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
 Next Meeting: October 11, 2018, 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: October 17, 2018, 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: October 9, 2018, 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: October 7, 2018, 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: October 12, 2018, 7:00 pm
www.wickenburggms.org
 @ Coffinger Park Banquet Room
 175 E. Swilling St., Wickenburg



Pinal Museum and Club News

Next Pinal Gem and Mineral Club meeting
Wednesday, October 17, 2018.

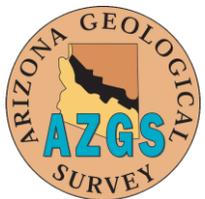
Club field trip, Sunday, October 14, 2018, to Camp Verde
www.pinalgemandmineralsociety.org

The Museum will open on Fridays and Saturdays in October starting on Friday October 5 from 9 AM to 1 PM. Open hours are subject to change as we see how this works. 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.

Visit our Zeolite exhibit!



Zeolites are aluminosilicate minerals that usually contain a large amount of water. For example stilbite has the formula $\text{NaCa}_4(\text{Al}_9\text{Si}_{27}\text{O}_{72}) \cdot 28\text{H}_2\text{O}$. There are over a hundred different minerals in the zeolite group. Many of these specimens are from India where large quantities of zeolites have been collected from basalt.



Mike Conway
Sr. Research Scientist, Arizona
Geological Survey at the Univ.
of Arizona
(fmconway@email.arizona.edu)

Dear ESM Members and Friends:

Geotourism in the desert Southwest is powered by the intrinsic quality and accessibility of geoheritage sites or features. According to the Geological Society of America, “Geoheritage” applies to sites or areas of geologic features with ‘significant scientific, educational, cultural, and/or aesthetic value.’

Our new interactive [Geoheritage Tour of Southern Arizona](#) showcases a handful of the spectacular geologic feature within easy driving distance of downtown Tucson. Geologic features and related sites – museums and mining communities - are organized under three tabs:

- Within 15-mile radius of Tucson
- From 15- to 75-mile radius
- From 75- to 200-mile radius.

In each area, we spotlight and briefly describe 12 geologic features or sites, for a total of 36 geoheritage sites within a 200-mile radius of Tucson. Each geoheritage entry is accompanied by one or more online geologic resource(s), e.g., geologic map, report, or website. The Sabino Canyon example below exemplifies the project.

This online geoheritage tour – see today’s [Arizona Geology blog post](#) for more details - follows closely on the heels of AZGS Down-to-Earth series popularizing geology for the public. The tour could certainly be improved. Please send us your constructive criticism on this draft so that we can enhance our next geoheritage tour.

Thank you,

Mike Conway



Sabino Canyon offers a window into the gneissic and granitic rocks and geologic structures of the Santa Catalina Mountain metamorphic core complex. Hiking trails and a 3.5-mile tram road provide excellent access.

For Ann Youberg and Joe Cook's field trip guide to the geology and geologic hazards
http://repository.azgs.az.gov/uri_qin/azgs/dlio/119

For John Bezy's Guide to Sabino Canyon and the Catalina Highway
http://repository.azgs.az.gov/uri_qin/azgs/dlio/1526.



44TH ANNUAL HUACHUCA GEM, MINERAL & JEWELRY SHOW

OCTOBER 13th & 14th, 2018

SAT., 9:00 AM - 5:00 PM

SUN., 10:00 AM - 4:00 PM

COCHISE COLLEGE

901 N. COLOMBO AVE.

SIERRA VISTA, AZ



FREE ADMISSION - FREE PARKING - HANDICAPPED ACCESSIBLE

Vendors Inside and Outside Educational Displays*Jewelry*Jewelry Making Supplies*Raffles*
Kid's Games*Fluorescent Displays*Geode Sales/Cutting*Free Gem Stone Identification by Certified
Gemologist



Vendor Info – Contact Ingrid Baillie - 520 459-3718, ibaille@cox.net

General Info – Contact ~~Maudie~~ Maudie Bailey 520 378-6291/520 249-1541,
gmbailey@msn.com



ROCK-A-RAMA

42nd ANNUAL GEM & MINERAL SHOW

NOVEMBER 2 - 4, 2018
FRI 9 - 4, SAT 9 - 5, & SUN 9 - 4



HIGH DESERT PARK
19001 E. JACIE LANE
BLACK CANYON CITY, ARIZONA
EXIT 242 OR 244, WATCH FOR SIGNS

Free Admission, Free Parking
Food & Beverages Available for Purchase
Door Prizes & Raffle



Email: meanerjeaner@aol.com
Or call, text Jean at 623-326-0237

Check out our website at www.highdeserthelpers.org/
or our Facebook site at
www.facebook.com/HighDesertHelpers

47TH ANNUAL FLAGG GEM & MINERAL SHOW

Petrified Forest National Park - Navajo and Apache Counties, Arizona
Based on a photo by: Bill Yedowitz



Chromium Petrified Wood, Winslow, Arizona
Mike Freeman collection - PHOTO: Mike Freeman



Brachiopod, Microspirifer - Pennsylvanian Naco Formation, Arizona
PHOTO: Stan Celestian



Pachyphyllum woodmani, Devonian Martin Formation, Arizona
Stan Celestian Collection - PHOTO: Stan Celestian



Desbyia crassa - Pennsylvanian Naco Formation, Arizona
PHOTO: Stan Celestian



Gastropod Internal Cast - Kaibab Limestone, Flagstaff, Arizona
Bill Yedowitz Collection - PHOTO: Bill Yedowitz



Suspensor brachiopod,
Pennsylvanian, Santa Village, Arizona
PHOTO: Jeff Langford

FOSSILS OF ARIZONA

JAN 4-6
2019
MESA COMMUNITY COLLEGE
NE CORNER OF US 60 & DOBSON ROAD 9AM - 5PM

THE TAILGATE SHOW TRADITION CONTINUES!
FREE ADMISSION FREE PARKING FREE SAMPLES FOR KIDS

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



ESM's Meeting Notice

ESM's next meeting will be at the Burton Barr library, 1221 N Central Ave, Phoenix, on Tuesday, October 23, 2018, 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! 😊😊😊

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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

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

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Russ Hart

Will & Carol McDonald

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Dennis & Georgia Zeutenhorst

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 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

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THANK YOU FOR YOUR CONTINUING INTEREST & SUPPORT!!!

**EARTH SCIENCE MUSEUM
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