



# 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

November 2022  
Volume 11, Issue 11

## With Gratitude

By Harvey Jong

Thanksgiving represents a special time to reflect and show gratitude for one's blessings. So, I would like to take a moment to recognize the things about the ESM that I'm most thankful for.

Ten years have gone by since the ESM was established as a non-profit organization. Our journey to reopen the Phoenix mineral museum continues, but we seem to be getting closer to what has been a rather elusive goal. This progress has been made possible by the time, energy, and talents of many dedicated people engaged in a variety of different activities.

## Outreach Program

The closure of the Arizona Mining and Mineral Museum in May 2011 created a void in Earth science education. To address this need, the ESM created a series of free hands-on classroom activities starting with simplified rock, mineral, and fossil teacher kits; adding a more advanced properties of minerals and identification exercise; and extending to a set of instructional materials on plate tectonics. Mardy Zimmermann, ESM Vice President of Education and Outreach Coordinator, has been involved in the design and delivery of these activities.



**Mardy Zimmermann**  
Harvey Jong photo

Tony Occhiuzzi, a Geology Adjunct Faculty member at Mesa Community College and a former physical science teacher at Tempe Union High School, has provided science lessons for elementary school students. He combines interesting demonstrations with informative presentations on rocks, minerals, and fossils.



**Tony Occhiuzzi**

Diana Occhiuzzi photo

Thank you Mardy and Tony for your efforts in getting students interested and excited about Earth science!

In addition to the classroom, the ESM has also been involved with community outreach through science fairs, gem and mineral shows, and other events. Mardy along with volunteers Lynne Wheeler, Tom Osborn, Bob Holmes, and others continued the popular egg carton collection program that was started by the Arizona Leaverite club. Lynne and Terry Dyer presented their “mini-museum” at numerous venues which have included scouting and home school groups. Doug Duffy offered lapidary demonstrations and classes.



**Lynne and Terry Dyer**



**Doug Duffy**

Thanks everyone for sharing your knowledge, skills, collections, and enthusiasm with the general public!

## Donations

Our outreach program is supported by generous donations made by individuals and organizations. Major financial contributions have been provided by disbanded groups, such as the Friends of the Arizona Mining & Mineral Museum (FAMMM) and the Arizona Leaverites, and by grants from the Staples Foundation. Charlie Connell represented the main decision maker for the FAMMM donation, while Chris Whitney-Smith has been the key contact with Staples.



**Charlie Connell (1947-2022)**



**Chris Whitney-Smith**

Thank you Charlie and Chris for supporting the ESM!

Rock, mineral, and fossil samples are essential for our outreach activities, and the ESM has been very fortunate to receive interesting, varied donations of these materials. By far, the largest donation was



provided by Russ Hart/A Bit of USA which benefited not only the ESM but many clubs.



Some of the Many Buckets, Drums, and Trash Cans of Samples Donated by Russ Hart

The Flagg Foundation and its members have made monetary donations along with supplying minerals and free space at the Flagg Show. Some noteworthy contributors include Bill Yedowitz, who usually drops off minerals at the end of the Flagg Show, and Dana Slaughter, who delivered 30 flats of minerals and some special kimberlite specimens.



Bill Yedowitz (right) Donating Minerals to the ESM



Dana Slaughter

Thanks to the Foundation for their continuing support of the ESM!

**Public Affairs**

Public affairs involve information dissemination, media communications, and government relations to build awareness and influence policy. These activities have played a key role in our journey to reopen the museum with the University of Arizona. Dick Zimmermann has been a focal point with his *Mineral Museum Madness* blog, interactions with *ABC 15 News*, contact with State Representative Gail Griffin, and testimony before legislative committees.



Ray Grant photo

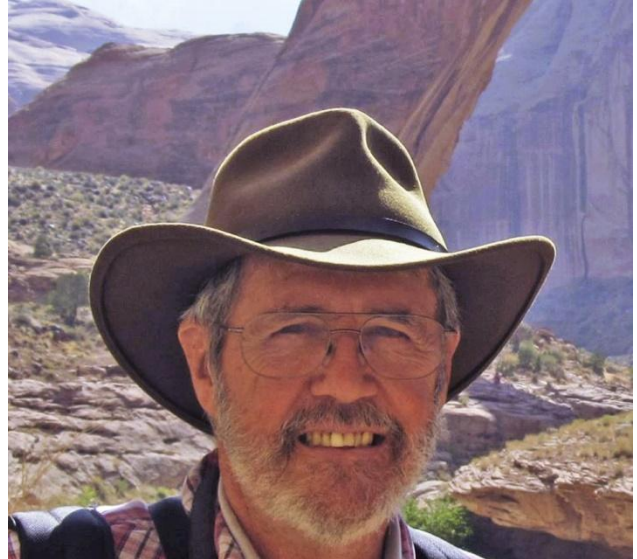
**Dick  
Zimmermann**

Thank you Dick for your determined efforts in calling attention to the closure of the old museum and seeking solutions to reopening the facility!

### Newsletter

Our newsletter serves an important resource for communicating the latest museum developments and upcoming gem & mineral shows and club meetings. It also features articles about interesting Earth science topics, and Ray Grant has been a regular contributor with his *Arizona Rocks* column. Shirley Coté, ESM Secretary/Treasurer, is also the editor of the newsletter, and she makes sure that it is published on time even as inputs come in at the last minute.

Thank you Ray and especially Shirley for all your efforts in wearing so many different hats for the ESM!



**Ray Grant**



**Shirley Coté**

Finally, for past and present members, thank you one and all for your continuing interest and support of the ESM!!!





**AZ Mining, Mineral & Natural Resources Education Museum  
Update November 2022**

<https://ammnre.arizona.edu/>

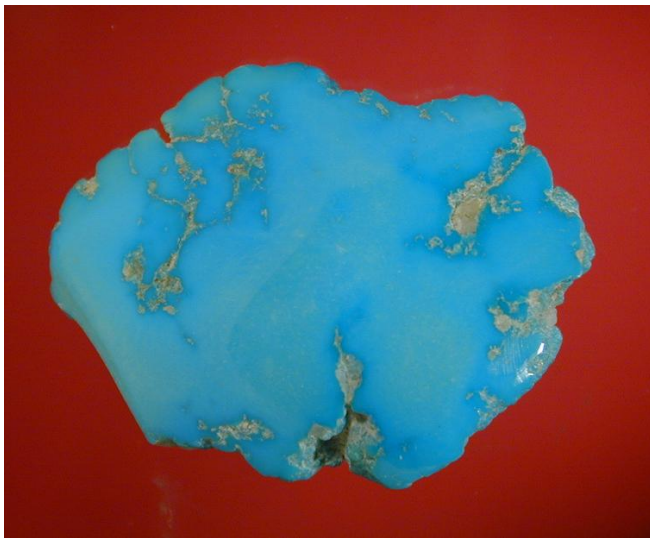
Catie Carter Sandoval  
cscarter@email.arizona.edu  
703.577.6449

Help support the museum at:  
<http://tinyurl.com/SupportMM-NREMuseum>

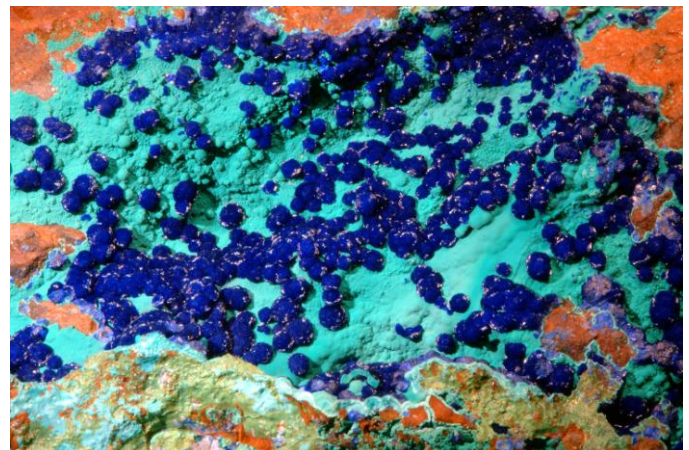
Please enjoy the following pictures from the museum's collection. Photos by Stan Celestian



Copper



Turquoise



Azurite and chrysocolla



Azurite and malachite



Peridot and amethyst





## Arizona Rocks 114

Text and photos by Ray Grant

This might be the most unusual of the Arizona Rocks. Recently, reading the newspaper I found an article about how our urine could help sea grass. One article I looked up was “Our pee could help bring back sea grass”. The dried urine forms the mineral struvite, which contains phosphorus and nitrogen and these are key ingredients in fertilizers. Experiments found that putting the slow dissolving struvite on sea grass was one of the best methods for restoration.

What does this have to do with Arizona Rocks? In 2016 a new mineral was described from Arizona. It was named rowleyite for the Rowley Mine where it was found. The Rowley Mine north of Gila Bend is a well-known Arizona locality with collectors for its wulfenite specimens. A photograph of Rowley wulfenite is on the cover of the new edition of the Mineralogy of Arizona. Struvite is one of the minerals found with the rowleyite so struvite has been added to the Arizona mineral list and that is why the article caught my attention.

It is thought that the struvite and rowleyite probably formed from decaying bat guano, which was the source of the organic material. Finally, I am putting the chemical formulas for struvite and rowleyite here, especially rowleyite, so you don't have to ask me what the formulas are, because they are complex. Struvite is  $(\text{NH}_4)\text{Mg}(\text{PO}_4)\cdot 6\text{H}_2\text{O}$  and rowleyite is  $[\text{Na}(\text{NH}_4, \text{K})_9\text{Cl}_4][\text{V}_2^{5+,4+}(\text{P}, \text{As})\text{O}_8]_6 \cdot n[\text{H}_2\text{O}, \text{Na}, \text{NH}_4, \text{K}, \text{Cl}]$ . If you need more information, go to [mindat.org](http://mindat.org).



Rowleyite (green) with murdochite (black), Rowley Mine, Maricopa County, Arizona, FOV 0.56 mm, photo by Tony Kampf, Natural History Museum of Los Angeles County specimen.



Wulfenite in the Rowley Mine, Ray Grant photo



## Pinal Geology & Mineral Museum

### Pinal Museum and Society News

351 N. Arizona Blvd., Coolidge, AZ

**Pinal Geology and Mineral Society meeting**

**December 21, 2022**

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

Ray Grant [raycyn@cox.net](mailto:raycyn@cox.net).

**The Museum is open from 11 to 4,  
Wednesday through Saturday**

Masks are now optional at the Museum. Please bring your own mask if you wish to wear one. We will have some masks on hand at the Museum, but cannot guarantee to provide them.

December 10 - International Mountain Day Celebration - special activities and crafts about mountains and volcanoes

December 21 - Meeting, Presentation by Robert McCord, Curator of Paleontology, AZ Museum of Natural History

December 25 - Christmas, Museum closed

December 31 - New Years Eve, Museum closed

January 1 - New Years Day, Museum closed

December 21 Meeting/Presentation "The Late Cretaceous of Arizona" with Dr Robert McCord 7:00-8:30 pm, IN PERSON at the Museum

Doors open at 6:30 pm

Join us at for a presentation by Dr Robert McCord, Curator of Paleontology, Arizona Museum of Natural History.

We'll have a silent auction, door prizes, and refreshments. We need a refreshments volunteer! Contact [info@pinalgeologymuseum.org](mailto:info@pinalgeologymuseum.org) Please!





# 50<sup>TH</sup> ANNUAL **FLAGG GEM & MINERAL SHOW**



**GOLD** - QUARTZSITE, LA PAZ COUNTY, ARIZONA  
U OF A MINERAL MUSEUM COLLECTION  
PHOTO CREDIT: JEFF SOOVL  
2.2CM HIGH

**JAN** 6 to 8  
2023



MESA COMMUNITY COLLEGE  
NE CORNER OF US 60 AND  
DOBSON ROAD | 9AM - 5PM



The Tailgate Show  
Tradition Continues!

FREE Parking  
FREE Admission  
FREE Samples for Kids  
[www.Flaggshow.info](http://www.Flaggshow.info)





2023  
65<sup>th</sup> ANNUAL  
GILA COUNTY  
GEM & MINERAL SHOW

**JANUARY 13th, 14th & 15th 2023**  
**FRI & SAT. 9 AM - 5 PM & SUN 10 AM - 4 PM**

**DEALERS \* DISPLAYS**  
**DEMONSTRATORS \* ACTIVITIES**

**LOTS OF CHILDREN'S ACTIVITIES \*\* DEMONSTRATORS AND VENDORS**  
**LAPIDARY EQUIPMENT/TOOLS \*\*40+ SPECIMEN DISPLAYS**  
**HOURLY DOOR PRIZES \*\* AND MUCH, MUCH MORE!!**

**OPENING CEREMONY PRESENTATION OF COLORS PROVIDED BY THE GLOBE JRPTC**

**SNACK BAR PROVIDED BY THE GLOBE/MIAMI ELKS LODGE # 489**

**WITH HANDS ON LEARNING**

**PRESENTATION FOR ALL AGES**

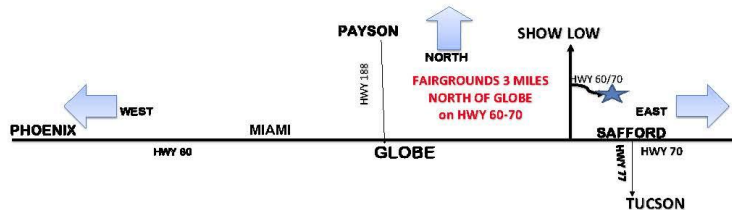
*JOHN O'BRIEN - WHAT IS A FOSSIL @ 1PM FRIDAY, SATURDAY & SUNDAY*

**DEMONSTRATION FOR ALL AGES**

*GILA COUNTY COLLEGE - LAPIDARY - ALL DAY FRI, SAT & SUN*  
*WIRE WRAPPING JEWELRY WITH POLYMER CLAY- CINDY KOONTZ - ALL DAY FRI, SAT & SUN*  
*WIRE WRAPPING ART - HALEY WILLIAMS - ALL DAY FRI, SAT & SUN*  
*NATHAN SCHOLTEND - STONE CARVING WITH JADE - ALL DAY SATURDAY*

**JOIN US @ GILA COUNTY FAIRGROUNDS**  
**GLOBE, ARIZONA**  
**3 MILES NORTHEAST OF JUNCTION U.S. 60-70**

**VISIT US ON THE WEB [WWW.GILAGEM.ORG](http://WWW.GILAGEM.ORG)**



**DONATIONS**

**\$3 SINGLE**  
**OR**  
**\$5 COUPLE**  
**STUDENTS AND KIDS FREE**

**CONTACT**

**JODI BREWSTER**  
*President*  
**(623) 810-9780**

**JERRY KASTNER**  
*Vendor Chair*  
**(520) 401-6715**



## PRESS RELEASE

A DAY AT THE ALFIE: ALFIE NORVILLE GEM AND MINERAL MUSEUM  
LAUNCHES EVENT DURING TUCSON GEM SHOW SEASON

### **A Day at the Alfie**

**Saturday February 4th 9:30am-10pm**

Spend the day listening to expert guest speaker presentations, networking with industry professionals, and enjoying the newest exhibit installations in our galleries!

Food and beverage will be included at each portion of the day.

Purchase tickets for each separate event or an all-day pass!

#### **9:30am-2:45pm Brunch Presentations**

10am Wim Vertriest, Gemological Institute of America  
Mozambique Field Exposition  
Mozambican Rubies: News from the Field

11am Bruce Bridges, Bridges Tavorite  
The Discovery and Faceting  
of The Lion of Merelani Tavorite

12pm David Smith, Faceters Paradise  
The United States Faceters Guild

1pm Les Presmyk, Chairman, Flagg Mineral Foundation  
Underground Collecting:  
Adventures in Arizona and Mexico

2pm Aaron Palke, Gemological Institute of America  
Sapphires from Montana:  
Gemology, Geology, and History

#### **3-6:45pm Afternoon Presentations**

3pm Jeff Morrison, Havey Quarry  
Mining the Havey Tourmaline Quarry

4pm Robert Weldon, Gemological Institute  
of America  
Peter Rainier and the Chivor Mine  
Colombian Emeralds in 1920s

5pm Jesse Fisher  
Fluorite from the Weardale Region,  
Northern England

6pm Justin Prim, Faceting Apprentice  
Early History of American Gem Cutting &  
Early History of Mixed Drinks

QR Code to book tickets  
or Search "A Day at the  
Alfie" on Eventbrite for  
Tickets







## SHOW HOURS

**Thursday, February 9 - 10:00 am to 6:00 pm**

**Friday, February 10 - 10:00 am to 6:00 pm**

**Saturday, February 11 - 10:00 am to 6:00 pm**

**Sunday, February 12- - 10:00 am to 4:00 pm**

**Tickets are \$12.00 with a \$1.00 TCC ticket tax**

**Children 14 and under are free with a paying adult**

***OPEN TO THE PUBLIC!! COME JOIN THE FUN!!***

**At the Tucson Convention Center - 260 S. Church Avenue**



### Apache Junction Rock & Gem Club

Meetings are on the 2<sup>nd</sup> Thursday  
 Next Meeting: December 8, 2022, 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  
 (unless a Holiday then 2<sup>nd</sup> Tuesday)  
 Next Meeting: December 6, 2022, 6:30 p.m.  
**Please go to their website for more info**  
[www.dmrnc.com](http://www.dmrnc.com)  
 @ Anthem Civic Building  
 3701 W. Anthem Way, Anthem, AZ



### Maricopa Lapidary Society, Inc

Meetings are on the 1<sup>st</sup> Monday  
 (unless a Holiday then 2<sup>nd</sup> Monday)  
 Next Meeting: December 5, 2022, 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 3<sup>rd</sup> Thursday  
 (Except December)  
 Next Meeting: Saturday, December 10, 2022,  
 5:00 pm  
**Please go to their website for more  
 information**  
[www.msaz.org](http://www.msaz.org)  
 Member Christmas Party at an  
 outdoor Scottsdale location



### Pinal Geology & Mineral Society

Meetings are on the 3<sup>rd</sup> Wednesday  
 Next Meeting: December 21, 2022, 7:00 pm  
**In person meeting**  
[www.pinalgeologymuseum.org](http://www.pinalgeologymuseum.org)  
 @ Artisan Village  
 351 N. Arizona Blvd., Coolidge



### West Valley Rock & Mineral Club

Meetings are on the 2<sup>nd</sup> Tuesday  
 Next Meeting: December 13, 2022, 6:30 pm  
[www.westvalleyrockandmineralclub.com](http://www.westvalleyrockandmineralclub.com)  
 @ Buckeye Community Veterans Service  
 Center  
 402 E. Narramore Avenue, Buckeye, AZ



### Gila County Gem & Mineral Society

Meetings are on the 1<sup>st</sup> Thursday  
 (unless a Holiday then the next Thursday)  
 Next Meeting: December 1, 2022, 6:30 pm  
[www.gilagem.org](http://www.gilagem.org)  
 Club Building  
 413 Live Oak St, Miami, AZ



### Wickenburg Gem & Mineral Society

Meetings are on the 2<sup>nd</sup> Friday  
 (February & December on the 1<sup>st</sup> Friday)  
 Next Meeting: December 2, 2022, 7:00 pm  
[www.wickenburggms.org](http://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. 7<sup>th</sup> St., Phoenix, on Tuesday, TBA 2022, at 6:30 p.m.

**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](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)
- West Valley Rock and Mineral Club  
<http://www.westvalleyrockandmineralclub.com/>
- Staples Foundation  
[www.staplesfoundation.org](http://www.staplesfoundation.org)
- Anita Aiston
- Peter & Judy Ambelang
- Stan & Susan Celestian
- Russ Hart
- Will & Carol McDonald
- Debbie Michalowski
- Janet Stoeppelmann
- Dennis & Georgia Zeutenhorst

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

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**Earth Science Museum**

3215 W. Bethany Home Rd.  
Phoenix, AZ 85017

**Phone:**

602-973-4291

**Editor E-Mail:**

scote@earthsciencemuseum.org

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*We're on the Web!*

*Visit us at:*

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

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**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).

**NOTICE:**

ESM's next meeting will be at North Mountain Visitor Center, 12950 N 7<sup>th</sup> St, Phoenix, on Tuesday, TBA 2022, at 6:30 p.m.

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

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

|                  |                         |
|------------------|-------------------------|
| Harvey Jong      | President               |
| Mardy Zimmermann | VP Outreach             |
| Shirley Coté     | Secretary/<br>Treasurer |

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

**Earth Science Museum**

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Phoenix, AZ 85017

