



# 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

January 2024  
Volume 13, Issue 1

## ESM OUTREACH UPDATE

Mardy Zimmermann, Outreach Coordinator

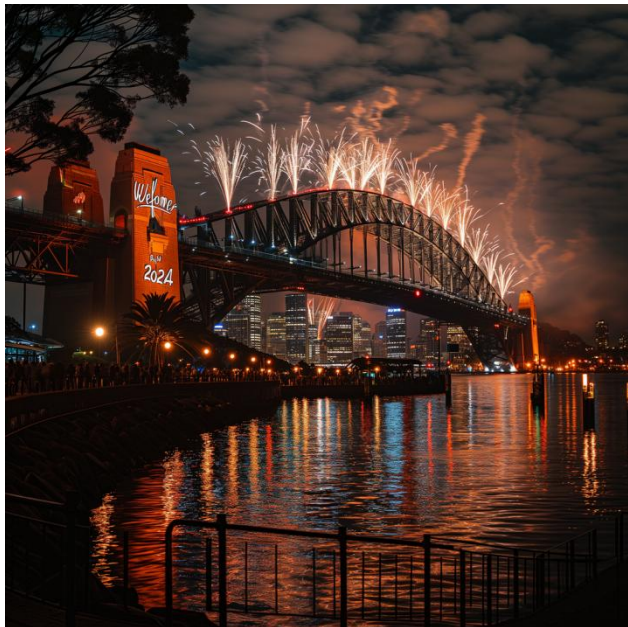
### January Outreach

There are no ESM outreach activities to report this month.

### New Year's Eve Solar Flare

By Harvey Jong

Across the globe, firework displays helped usher in 2024.



### New Year's Eve Fireworks Display in Sydney, Australia

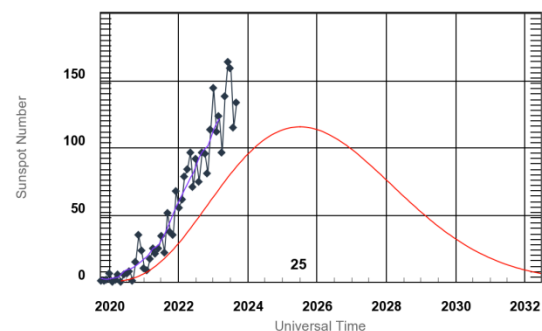
Ersu photo, - PD, via Wikimedia Commons

The Sun joined the celebration with its own spectacular firework - an X5 solar flare. This flare, which peaked at 4:55 p.m. Eastern Standard Time on December 31, 2023, represented the largest solar flare detected since 2017.

## Solar Flares and Their Classification

Solar flares are localized emissions of electromagnetic radiation in the Sun's atmosphere. The occurrences of these eruptions vary during the 11 year solar cycle. At the solar maximum several flares per day may happen, while less than one event per week may take place during the solar minimum. Currently, the Sun is progressing toward a maximum of Solar Cycle 25 which began in December 2019.

ISES Solar Cycle Sunspot Number Progression



### Observed and Predicted Solar Cycle 25 Activity Based on Sunspot Number Space Weather Prediction Center/NOAA chart, - PD, via Wikimedia Commons

Solar flares are classified with a logarithmic scheme involving X-ray brightness in the wavelength range of 1-8 Å (Angstroms). The different classes and their associated intensities are shown below:

Class	Intensity ( $\text{W}/\text{m}^2$ )
B	$< 10^{-6}$
C	$> 10^{-6}$ to $10^{-5}$
M	$> 10^{-5}$ to $10^{-4}$
X	$\geq 10^{-4}$

Each class has nine subdivisions ranging from 1 to 9 which are appended to a letter (e.g. M1 to M9). Some flares, however, may have intensities greater than 10 times the value of an X1, so these flares are designated with numbers higher than 9. The most powerful solar flare ever recorded occurred on November 04, 2003, and its strength was reported as X28+. [Note that X28+ indicates that the NOAA satellite X-ray detector was overloaded by this flare. Ground-based radio wave measurements produced an estimate of X45. (American Geophysical Union, 2004).]

### NASA's Solar Dynamics Observatory

NASA's Solar Dynamics Observatory (SDO) captured images of the New Year's Eve solar flare.



### Launch of NASA's Solar Dynamics Observatory

NASA photo, - PD, via Wikimedia Commons  
This spacecraft was launched on February 11, 2010 and includes three scientific experiments:

- Atmospheric Imaging Assembly (AIA) - observes the solar atmosphere at multiple wavelengths
- EUV Variability Experiment (EVE) - measures extreme ultraviolet irradiance that covers the wavelengths 100-1200 Å
- Helioseismic and Magnetic Imager (HMI) - studies photosphere oscillations and magnetic field

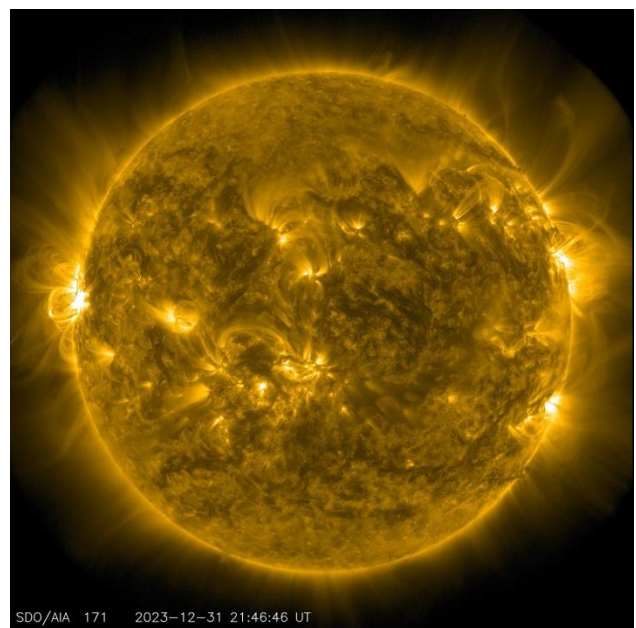


### NASA's Solar Dynamics Observatory

NASA CI Lab/Chris Meany artist's concept, - PD, via Wikimedia Commons

The AIA's multi-wavelength sensors are located on the top of the spacecraft, while the EVE and HMI instruments (not shown) are on the bottom.

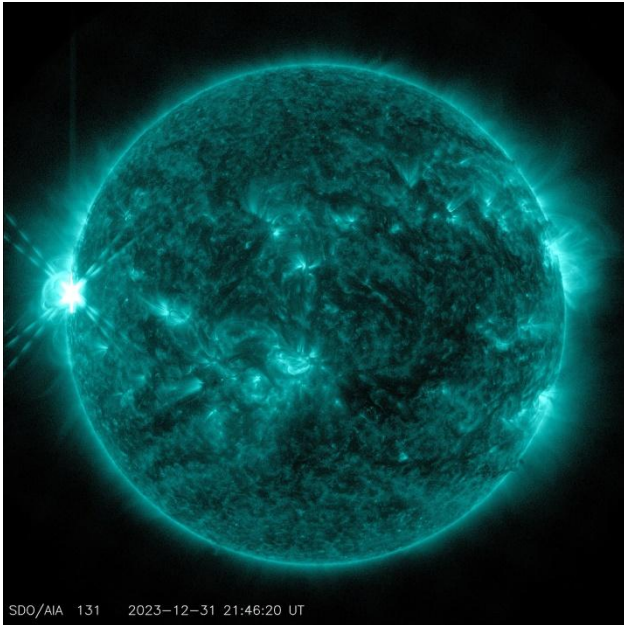
Images of the solar flare were recorded by the AIA instrument at two different wavelengths, 171 Å and 131 Å.



### Sun Emits X5 Flare on December 31, 2023

NASA's Scientific Visualization Studio - Scott Wiessinger, Denise Hill/NASA/GSFC/SDO image, - PD, via Wikimedia Commons

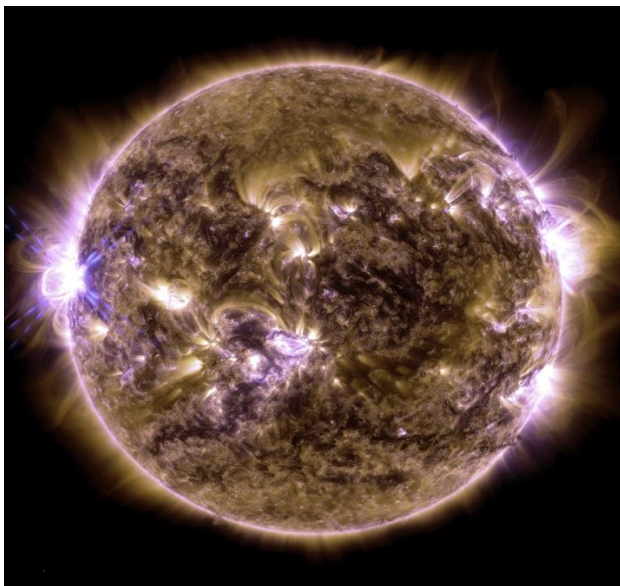
This extreme ultraviolet image was captured at a wavelength of 171 Å. The solar flare is seen as the bright flash on the left.



### Sun Emits X5 Flare on December 31, 2023

NASA's Scientific Visualization Studio - Scott Wiessinger, Denise Hill/NASA/GSFC/SDO image, - PD, via Wikimedia Commons

This image shows the flare at a wavelength of 131 Å.



### Sun Emits X5 Flare on December 31, 2023

NASA's Scientific Visualization Studio - Scott Wiessinger, Denise Hill/NASA/GSFC/SDO image, - PD, via Wikimedia Commons

This blended photo combines the 171 and 131 Å images. The colorized rendering in blue and gold highlights the extremely hot material emitted by the flare.

### Coronal Mass Ejection (CME)

The New Year's Eve solar flare was accompanied by a Coronal Mass Ejection (CME) which is a large emission of plasma and magnetic flux from the Sun's corona. Several billions of tons of coronal material may be ejected and travel at speeds ranging from 250 km/sec to 3000 km/sec. Several days to as little as 15-18 hours may be needed for a CME to reach the Earth. The solar material interacts with the Earth's magnetic field which produces the Aurora Borealis (Aurora Australis in the Southern Hemisphere) and may disrupt radio communications.



### Aurora Borealis Seen in Northern Saskatchewan, Canada

Dre Erwin photo, - CC0-1.0 UPD Dedication, via Wikimedia Commons

This stunning aurora photo was captured on December 11, 2023 at Pinehouse Lake, Saskatchewan, Canada.

The CME of the New Year's Eve solar flare made a glancing impact on the Earth on January 2<sup>nd</sup>. It had only a minor impact on high frequency radio transmissions.

**References:**

American Geophysical Union (2004). Biggest Ever Solar Flare Was Even Bigger Than Thought. *ScienceDaily*, 16 March 2004. [www.sciencedaily.com/releases/2004/03/040316072425.htm](http://www.sciencedaily.com/releases/2004/03/040316072425.htm). (accessed January 6, 2024).

◇ ◇ ◇

**Late Breaking News**

A CME was observed lifting off the Sun on January 20, 2024. The National Oceanic and Atmospheric Administration (NOAA) Space Weather Prediction Center issued a G2 (moderate) geomagnetic storm watch for January 22-23. It also mentioned that the aurora may be visible over some northern and upper Midwest states (New York to Idaho).

**[NASA model of January 20<sup>th</sup> CME](#)**

NASA animation, - PD, via [spaceweatherlive.com](http://spaceweatherlive.com)

This animation depicts how the CME may impact the Earth and some satellites.

◇ ◇ ◇

**An Early Arizona Mineral Collector**

By Raymond Grant

[ray@pinalgeologymuseum.org](mailto:ray@pinalgeologymuseum.org)

(Written for *Mineral News* January 2024)



James Goodwin, photo from the Arizona Mining and Mineral Museum

James C. Goodwin's story is about a very adventurous man who seemed to succeed at everything he tried. He was very important to the early history of mineral museums in Arizona, but he has never been properly recognized for his contributions.

James Goodwin was born in Ralls County, Missouri in March, 1864. After finishing school at the age of 18, he traveled to California and visited "nearly all the prominent coastal points". He returned to Missouri, but from his travels, he had developed a great interest in Arizona to where he moved in 1884. First, he went to Tombstone, then Bisbee and finally to Tempe where he had a residence for the rest of his life.

In Tempe, Goodwin and his brothers, who had joined him there, started extensive farming south of town. They constructed the Goodwin branch to the Tempe canal to get water to their farmland. He was active in founding a railroad in the Phoenix area and was known for his Tempe streetcar. It was mule-drawn and described as "the only such road in America that never charges a fare". He was also involved in planning an electric powered line. He served in the Arizona Territorial Legislature in 1897 and again in the Arizona State Legislature from 1915 to 1918. In 1898 he joined Teddy Roosevelt's Rough Riders, went to Florida, but did not make it to Cuba. He was very active in early years of the Tempe Normal School (now Arizona State University).

Sometime in the early 1900's Goodwin became interested in mining and minerals. Minerals have been an important part of the Arizona State Fair since its beginning in 1884. The first fair was more of an industrial exhibition and the mines in the state sponsored a mineral exhibit. In 1905, it was named the Arizona Territorial Fair, and after statehood in 1912, it became the Arizona State Fair. A 1913 newspaper article

describes Goodwin's extensive travels in Arizona to visit mines and obtain specimens for the fair exhibit. Another article describes how Goodwin made annual trips to add new specimens to the collection.

In 1915 the Arizona Legislature appropriated funds for a Mineral Building at the State Fairgrounds. The state funds were insufficient, and Goodwin helped to finance the completion of the building. This was the home of the Arizona Mineral Museum from 1919 until 1991. Goodwin was assistant and then superintendent of the State Fair's Mineral Department from 1919 to 1922. It is said that he "did most of the work assembling the Museum's early collections". The Museum was only open during the fair until 1953 when it opened year-round to the public.

Goodwin and his brothers established the Magmatic Copper Company and had a mine about 2 miles south of Superior, Arizona. They issued stock and started to sell shares in 1916. There are several shafts and a tunnel on the property, but there is no report of any ore ever being mined, and the mine was never developed after their initial activity.

James Goodwin died in October 1922 when he had an accident driving home from one of his prospecting trips. He was thrown from his car and returned home but died a week later. He had a small mineral collection that was donated by his family to the Tempe Historical Society in 1972, and the Historical Society gave it to the Arizona Mining and Mineral Museum in 1991. The catalog of his collection from 1972 has 193 specimens and the Museum received 237 specimens from his collection. He mounted most of his specimens in a plaster base and wrote the name and locality on the plaster.

His collection is currently in storage at Arizona Mining Mineral and Natural

Resources Education Museum, 1502 W. Washington Street, Phoenix. The Museum is in the strategic planning stages of development after receiving a 12 million dollar state appropriation for capital improvements. It will be closed for the next two years for renovation. There are a few Goodwin specimens on display at the Arizona State Capitol Museum in a mineral exhibit. The Goodwin specimens can be recognized by the plaster bases.

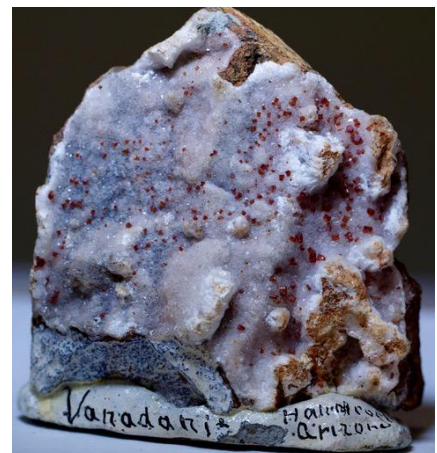
### Acknowledgment

Thanks to Catie Carter Sandoval, Curator of the Arizona Mining, Mineral and Natural Resources Education Museum and Jared Smith, Curator of History at the Tempe Historical Museum for information about James Goodwin.



Goodwin specimen of azurite and malachite, Morenci, Arizona; the specimen is 10 cm across.

Goodwin specimen of vanadinite on calcite from the Hancock Arizona Mine (also called Black Prince and Olsen Mines), Superior, Arizona; the specimen is 19 cm across.





## AZ Mining, Mineral & Natural Resources Education Museum Update January 2024

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

Catie Carter Sandoval

cscarter@email.arizona.edu

703.577.6449

Help support the museum at:

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

Happy New Year from the museum! There are many new things on the horizon for the AMMNRE Museum this year, including a new Executive Director (update soon), continued design-build progress, new exhibit collaborations, and more. We look forward to sharing these updates with you all as they happen.

In the meantime, we plan to participate in the 2024 Tucson Gem and Mineral Show at the Tucson Convention Center this February with a special exhibit case showcasing pegmatites from our collection - from Arizona, the United States, and beyond. We recently received an incredible donation from mineral collector Bob Weaver, who passed away in December. Bob's United States collection includes some exceptional pegmatite minerals, so our display will also include some specimens from Bob's collection as a tribute to him. We are very thankful for his generosity and thanks as well to Les Presmyk for facilitating the donation.

More to come next month! Thank you all for your continued support in this New Year. We appreciate our stakeholders, volunteers, and all friends of the museum and know how important you all are to the success of our project. Thank you!



Three specimens from Bob Weaver's US collection donation including topaz on smoky quartz from Idaho, amazonite from Colorado, and tourmaline from Delaware



Blue beryl from Maricopa Co., Arizona; this single crystal is around 11 cm in diameter.



Biotite from Silver Crater Mine, Faraday Township, Hastings Co., Ontario, Canada



## Arizona Rocks 128

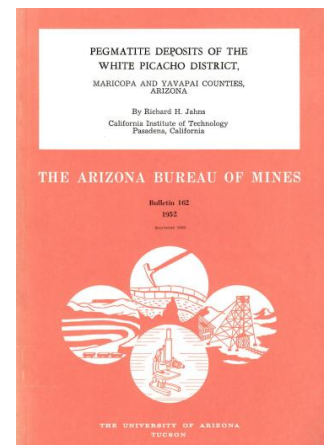
Text & photos by Ray Grant

The theme this year at the Tucson Gem and Mineral Show (February 8 to 11) is Pegmatites - Crystals Big and Beautiful. There will be many exhibits of pegmatite minerals and there are a lot of talks about pegmatites. Check the Tucson Gem and Mineral Society website for the times of the talks. Arizona Rocks in the September 2013 Earthquake (available on the ESM website) has a description of pegmatites.

Arizona is not well known for its pegmatites because there are so many other famous mineral deposits, but there are hundreds of pegmatite localities in Arizona. They formed at a number of different times. The oldest in the Grand Canyon area formed 1,750 Ma (million years ago) and the youngest about 50 Ma in southern Arizona. Many of the pegmatites have not been dated so their age is unknown.

Pegmatites in Arizona have been worked commercially for feldspar, quartz, muscovite, beryllium, bismuth, lithium, tantalum, and rare earth minerals. Most of this production has been limited with the exception of the feldspar for the ceramic industry. Over 120 different minerals have been found in Arizona pegmatites. The best pegmatite specimens found in Arizona are the beryl crystals. They occur in all the different age pegmatites and some are gem quality.

Part of Kingman feldspar mine, dark rock is diabase dike cutting pegmatite.



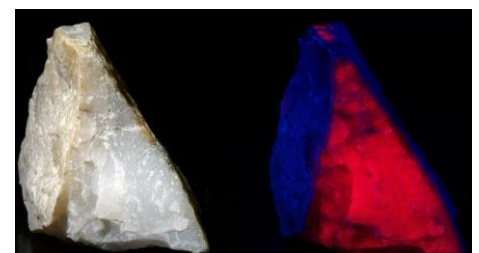
Book by Richard Jahns on the White Picacho pegmatites near Wickenburg, available to view on Arizona Geological Survey website



Beryl crystal from the Sierrita Mountains south of Tucson, collected by Barbara Muntyan and photographs by Jeff Scovil



Fluorescent eucryptite, Midnight Owl Mine, White Picacho District, Yavapai County (Stan Celestian photograph)



Mill in Kingman that processed feldspar ore for ceramic industry from 1939 into the 1980s





## **Pinal Museum and Society News**

351 N. Arizona Blvd., Coolidge, AZ

### **Pinal Geology and Mineral Society next meeting**

**February 21, 2024**

Meetings are the third Wednesday at 7pm, doors open at 6:30

Everyone is welcome!

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

**Ray Grant** [ray@pinalgeologymuseum.org](mailto:ray@pinalgeologymuseum.org)

Through next May, we will have our hours of 10 to 4 Wednesday through Saturday, admission is free.

Pinal Geology and Mineral Society next meeting's speaker will be David Morris

### **Rock Art of the Southwest**

The production of "rock art" is found in cultures around the world. It was a means to record stories, information and events in an early world. This program will examine some of the petroglyphs and pictographs found in the southwest. What were their possible meanings and purpose? What can be learned from some of these ancient images? A short demonstration of the production of the rock carvings will be given.



David Morris has been a resident of southern Arizona for over fifty years. Originally from the Kansas - Oklahoma area, a member of the Choctaw Nation of Oklahoma, he received a degree in Plant Sciences from Northern Arizona University. During a ten year teaching career in the Indian communities he was introduced to many of the traditions and stories related to the rock art and native plant uses. A retired museum aide with the Pueblo Grande Museum in Phoenix, Dave volunteers with groups such as Boyce Thompson Arboretum and the Arizona Site Stewards.



**SUN CITY ROCKHOUND MINERAL MUSEUM**  
**SUNDIAL RECREATION CENTER**  
**14801 N. 103<sup>RD</sup> AVE.**  
**SUN CITY, AZ 85351**  
**scrockmuseum@gmail.com**  
**623-428-6442**

Sun City Rockhounds participated in the 51<sup>st</sup> Flagg Gem and Mineral Show  
 By Carol Ann Hewett

On the weekend of January 6-7, the Sun City Rockhounds traveled to Mesa Community College to take part in the Flagg Gem and Mineral show which has been running since 1970. The Flagg Mineral Foundation sponsors the show. Parking and admission are free.

The Sun City Rockhounds decided to continue a tradition started by Mardy and Dick Zimmerman called the “Egg Carton” exhibit. The exhibit consisted of two stations of twelve trays containing small size mineral specimens like Apache tears, selenite, amethyst, and chalcedony. For one-dollar children and adults could pick out one of



each specimen to put into a section of their egg cartons. Each egg carton had a numbered list with the name of the corresponding specimen. This hopefully prevented anyone from getting home and hearing the question “Now what was the



C. Sandoval photo

**WINTER HOURS**  
**OCTOBER – APRIL**  
**10 AM TO 1 PM**  
**CLOSED THURS., & SUNDAY**  
**SUMMER HOURS**  
**MAY–SEPTEMBER 10AM–1PM**  
**SATURDAYS ONLY**

name of this rock?” We engaged so many enthusiastic children and adults over the two-day event and heard adults’ comment “My parents brought me here every year for the egg cartons, and now here I am with my kids.” *Seeing the joy and excitement in the children’s faces as they carefully chose that special rock made us rock hounds feel like we might be witnessing future geologists!*

A retail booth was also set up by the Rockhounds which was doing brisk business. We had the opportunity to hand out museum brochures



encouraging people to come for a visit. The Sun City Mineral Museum is open Monday-Saturday from 10:00 to 1PM, closed Thursday and Sunday, and was recently listed on a local blog as one of the top ten fascinating yet free things to do in Arizona! The Egg Cartons will be available again at the club’s annual rock sale on Saturday March 9 at Mountain View parking lot at 9749 N 107th Ave. Sun City AZ.

The Sun City Rockhounds would like to give a special thanks to Mardy and Dick Zimmerman, Shirley Cote and Doug Duffy from the Earth Science Museum organization for their input and rock donations for this project.

We hope to see you soon!

**Find us on: Facebook: Sun City Rockhounds**

## Arizona Rock and Gem Shows

**Tucson Gem and Mineral Society  
proudly presents the 69th  
Tucson Gem and Mineral Show®  
February 8-11, 2024  
Thurs., Fri., Sat. 10 - 6  
Sun. - 10 - 4**

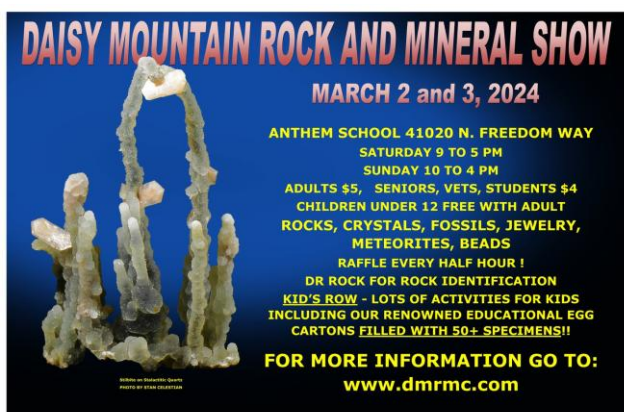
Tickets \$12.00 with a \$1.00 TCC ticket tax  
Children 14 and under are free  
with a paying adult  
Tucson Convention Center  
260 S. Church Avenue

**Mingus Gem & Mineral Club  
Annual show  
February 23-25, 2024**

**Fri. 9-5, Sat. 9-5, Sun. 9-4  
Free Admission  
Clark Memorial Clubhouse Auditorium  
19 N. Ninth Street  
Clarkdale, AZ**

**Daisy Mountain Rock and Mineral Club  
Daisy Mountain Rock and Mineral Show  
March 2-3, 2024**

**Sat. 9-5, Sun. 10-4  
Adults, \$5,  
Seniors, Vets, students \$4  
Children under 12 free with adult  
Anthem School  
41020 N. Freedom Way  
Anthem, AZ**



**DAISY MOUNTAIN ROCK AND MINERAL SHOW**  
**MARCH 2 and 3, 2024**

**ANTHEM SCHOOL 41020 N. FREEDOM WAY**  
SATURDAY 9 TO 5 PM  
SUNDAY 10 TO 4 PM

ADULTS \$5, SENIORS, VETS, STUDENTS \$4  
CHILDREN UNDER 12 FREE WITH ADULT  
ROCKS, CRYSTALS, FOSSILS, JEWELRY,  
METEORITES, BEADS  
RAFFLE EVERY HALF HOUR!

DR ROCK FOR ROCK IDENTIFICATION  
KID'S ROW - LOTS OF ACTIVITIES FOR KIDS  
INCLUDING OUR RENOWNED EDUCATIONAL EGG  
CARTONS FILLED WITH 50+ SPECIMENS!!

**FOR MORE INFORMATION GO TO:  
www.dmrmc.com**

## 31st Annual Arizona Mineral Symposium

**When:** April 13, 2024  
8am to 5:30pm  
**Where:** Southeast Regional Library  
775 N. Greenfield Rd.  
Gilbert, AZ 85234

A series of speakers, highlighting field collecting, includes the following:

**Karen Wenrich, Ph.D.** - *The Sweet Home mine, Alma, Colorado*  
**Mark Hay** - *Fluorite from the Oatman District, Mohave Co., AZ*  
**Mark Pecha** - *Where did that turquoise come from?*  
*A case study of the turquoise deposit from Bisbee, Arizona*  
**Anna Domitrovic** - *Field Collecting & Collectors at the Desert Museum*  
**Jeff Smith** - *The Peculiar Geodes of the Trancas Station, Chihuahua, Mexico*  
**Erin Delventhal** - *A rediscovery of epidote pseudomorphs after orthoclase from the Orogrande district, Otero County, New Mexico*  
**Phil Richardson** - *Collecting Contemporary Utah*  
**Mike Sanders** - *Three decades of Collecting Adventures in the Hansonburg Mining District, Socorro County, New Mexico*

There will be several dealers including the premiere by Shannon Family Minerals of a 10,000 piece collection of micromounts and thumbnail specimens.

A final agenda will be posted on the Flagg Mineral Foundation website, [flaggmineralfoundation.org](http://flaggmineralfoundation.org), by mid-January.

Payment may be made by cash, check or Zelle.  
Cost is as follows:

\$80 for members  
\$90 for non-members

Symposium program,  
lunch and refreshments  
will be included.



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

The Tucson Gem and Mineral Society Proudly Presents:  
THE 69TH ANNUAL  
TUCSON GEM & MINERAL SHOW®

# PEGMATITES

## Crystals BIG & Beautiful



Albite and quartz - Maria Gemis, Brazil. Photo: Przemyslaw Cielinski. Jeff's coin photo



**February 8 - 11, 2024**  
**Tucson Convention Center**

for more information, visit: [www.tgms.org](http://www.tgms.org)

Scan code for  
information on  
our Tucson Gem &  
Mineral Show®



# DAISY MOUNTAIN ROCK AND MINERAL SHOW MARCH 2 and 3, 2024



Blue Quartz from Maricopa

**ANTHEM SCHOOL 41020 N. FREEDOM WAY**

**SATURDAY 9 TO 5 PM**

**SUNDAY 10 TO 4 PM**

**ADULTS \$5, SENIORS, VETS, STUDENTS \$4**

**CHILDREN UNDER 12 FREE WITH ADULT**

**ROCKS, CRYSTALS, FOSSILS, JEWELRY, METEORITES, BEADS**

**RAFFLE EVERY HALF HOUR !**

**DR ROCK FOR ROCK IDENTIFICATION**

**KID'S ROW - LOTS OF ACTIVITIES FOR KIDS INCLUDING OUR RENOWNED EDUCATIONAL  
EGG CARTONS FILLED WITH 50+ SPECIMENS!!**

**FOR MORE INFORMATION GO TO: [www.dmrmc.com](http://www.dmrmc.com)**



### Apache Junction Rock & Gem Club

Meetings are on the 2<sup>nd</sup> Thursday  
 Next Meeting: February 8, 2024, 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: February 6, 2024, 6:30 p.m.  
**Please go to their website for more info**  
[www.dmrmc.com](http://www.dmrmc.com)  
 @ Anthem Civic Building  
 3701 W. Anthem Way, Anthem, AZ



### Maricopa Lapidary Society, Inc

**Note: New meeting day**  
 Meetings are on the 3<sup>rd</sup> Tuesday  
 Next Meeting: February 20, 2024, 7:00 pm  
[www.maricopalapidarysociety.com](http://www.maricopalapidarysociety.com)  
 @ North Mountain Visitor Center  
 12950 N. 7<sup>th</sup> St., Phoenix, AZ



### Mineralogical Society of Arizona

Meetings are on the 3<sup>rd</sup> Thursday  
 (Except December & June)  
 February 15, 2024, 7:30 pm  
 Franciscan Renewal Center, (Piper Hall)  
 5802 E. Lincoln Drive, Scottsdale  
[www.msaz.org](http://www.msaz.org)



### Pinal Geology & Mineral Society

Meetings are on the 3<sup>rd</sup> Wednesday  
 Next Meeting: February 21, 2024, 7:00 pm  
**In person meeting**  
[www.pinalgeologymuseum.org](http://www.pinalgeologymuseum.org)  
 351 N. Arizona Blvd., Coolidge



### West Valley Rock & Mineral Club

Meetings are on the 2<sup>nd</sup> Tuesday  
 Next Meeting: February 13, 2024, 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: February 1, 2024, 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: February 9, 2024, 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 2024, 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

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

---

*We're on the Web!*

*Visit us at:*

[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 2024, 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/ Treasurer

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

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

