



# 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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## “ESM EVENT: ARIZONA GIVES DAY”

By Harvey Jong



The Earth Science Museum (ESM) will be participating in Arizona Gives Day which is an online fundraising event, scheduled for Wednesday, April 9<sup>th</sup>. The fundraiser provides a special 24 hour period for Arizonans to come together and show their support for the state's nonprofit organizations. Donors will go online, connect with causes they care about, and make tax deductible donations. The event, which is being held for the second time, is organized by the Arizona Alliance of Nonprofits.

Although the ESM received limited contributions from last year's inaugural fundraiser, the museum decided to get involved with the event again given the increased publicity efforts by the Gives Day organizers. The ESM has also been in the news recently, so we're hoping that the two developments will lead to more donations.

Part of the added event publicity includes promotional materials that feature different causes, such as animals, arts, and after school education. The theme for the arts, which is shown below, was the closest match for the ESM:



Arizona Gives Day Postcard for the Arts

However, to better reflect the ESM's involvement with science education, a postcard was designed based on the basic layout of the Gives Day materials. It is shown below and can be downloaded from the ESM website:

[http://www.earthsciencemuseum.org/sites/default/files/az\\_gives\\_day\\_science\\_postcard.pdf](http://www.earthsciencemuseum.org/sites/default/files/az_gives_day_science_postcard.pdf)



ESM Version for an Arizona Gives Day Postcard

Note that as a nonprofit registered with Arizona Gives Day, the ESM is qualified to receive cash prizes in various fundraising categories such as Most Donors Overall, Most Dollars Overall, Small Nonprofit with Most Donors, or Most Donors in a given hour. While it would be wonderful to win such an award, the museum will be grateful for any contribution that it receives on April 9<sup>th</sup>! The minimum donation is \$10, and there is no maximum donation limit. (Just in case any readers happen to win the lottery before the event ☺). Contributions can be made at:

[www.razoo.com/story/Earth-Science-Museum](http://www.razoo.com/story/Earth-Science-Museum)

So please mark your calendar, help spread the word about Arizona Gives Day, and become part of the unique giving experience. Thank you!



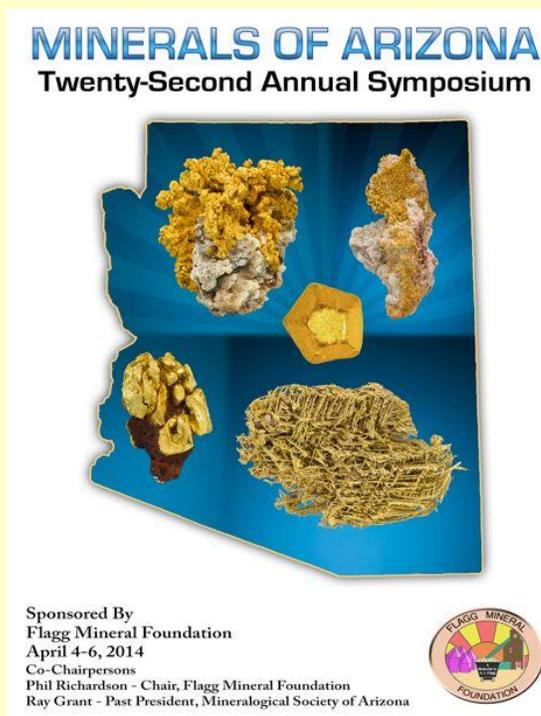
## Minerals of Arizona Symposium

You have until April 1 to register and can get all the information at:

[www.flaggmineralfoundation.org/home/minerals-of-az-symposium/](http://www.flaggmineralfoundation.org/home/minerals-of-az-symposium/)

Anyone can come visit the dealers on Friday evening from 5-10 p.m. in the poolside rooms at the Clarion Hotel at 5121 E. La Puente Ave. on the NW corner of Elliot Rd. and the I-10 in Phoenix and you do not need to register for the symposium.

A special feature at this year's event will be a collection of fluorescent minerals and will include Arthur L. Flagg's long lost "Coals of Fire" specimen from Ruby, Arizona, now owned by the Flagg Mineral Foundation.



Harvey Jong made another beautiful cover with Arizona gold for the symposium proceedings.

### 2014 Symposium Cover Photo Credits

Upper left:

Gold

Sunshine #8 claim, near Castle Hot Springs, Arizona  
Les and Paula Presmyk specimen

Jeff Scovil photo

Upper right:

Gold

Mystic mine, near Sun City, Arizona  
Les and Paula Presmyk specimen

Jeff Scovil photo

Middle:

Gold Pyritohedron crystal

Gold Eye mine, La Cholla Placers, Arizona  
Steve Hunt specimen

Erik Melchiorre photo

Lower left:

Gold on goethite

50 miles south of Quartzsite, Arizona  
Les and Paula Presmyk specimen

Jeff Scovil photo

Lower right:

Gold

Yuba mine, Greaterville, Arizona  
Les and Paula Presmyk specimen

Jeff Scovil photo



## Arizona Rocks 10

Text and photos by Ray Grant

We are almost done with igneous rocks. I hope you are getting the idea that igneous rocks are named based on two features. First the textures, is it fine-grained, coarse-grained or glassy, etcetera, and second the chemistry (minerals). Another common textural term used with igneous rocks is porphyry, which means the rock has two sizes of crystals. Mostly it is used for volcanic rocks where the magma started to cool underground and large crystals were forming and then it erupted out on the surface and the remaining magma cooled quickly forming small crystals. The volcanic rock name basalt, rhyolite, felsite, and andesite would be used with porphyry to name these rocks such as basalt porphyry.

Less commonly, a coarse-grained intrusive rock can have two sizes of crystals; the most common would be granite porphyry or porphyritic granite. This rock is important in Arizona as the major copper deposits are associated with porphyritic intrusive rocks and referred to as the “porphyry copper deposits”. The deposits at Ajo, Bagdad, Morenci, Ray, San Manuel, and others are classified as this type of deposit.

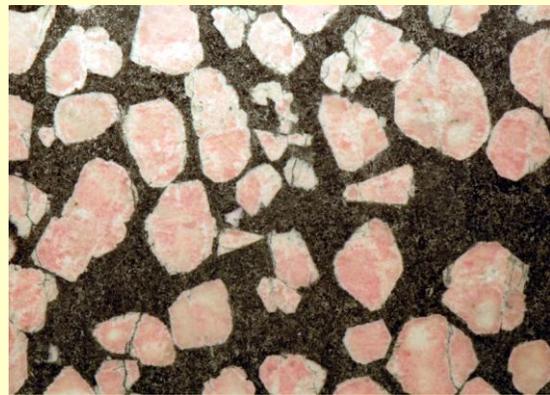
Next month we will do a summary of the igneous rock classification and names.



Pyroxene crystals in basalt from Red Mountain north of Flagstaff



Altered feldspar crystals in basalt from western New Mexico



Diorite porphyry from near Cue in Western Australia (Stan Celestian photo)



Red Mountain volcano is a spectacular and unusual cinder cone; unusual in that its internal structure is exposed. To reach Red Mountain from Flagstaff, drive northwest on Highway 180, this highway snakes through the central part of the San Francisco Volcanic Field on its way toward the Grand Canyon. About 25 miles from Flagstaff (at milepost 247), turn left at the Forest Service sign that announces the Red Mountain Geologic Area. Drive about a quarter mile on the dirt road to a parking space at the trailhead. The walk from there to the base of Red Mountain takes about 30 minutes. Carry plenty of drinking water (at least a liter of water per person). Trees in the natural amphitheater provide some shade. (Above photos and text by USGS)

## EXPLORE YOUR WORLD!

### Petrified Forest and Painted Desert National Park

Text & photos from NPS.gov and Wikipedia



During the Triassic Period (about 225 million years ago) what we now call Arizona was located along the equator and had a humid, tropical climate. The landscape was dominated by a large river system and massive stands of trees not unlike the Amazon River system in South America today.

This now high dry tableland was once a vast floodplain crossed by many streams. Tall, stately pine-like trees grew along the headwater. The tall trees fell and were washed by swollen streams into the floodplain. There they were covered by silt, mud, and volcanic ash and this blanket of deposits cut off oxygen and slowed the logs' decay. Gradually silica-bearing ground waters seeped through the logs, and bit by bit, encased the original wood tissues with silica deposits. Slowly the process continued, the silica crystallized into quartz, and the logs were preserved as petrified wood.



Petrified trees today lie strewn across clay hills and within cliff faces; each log broken

into large segments. The quartz within the petrified wood is hard and brittle, fracturing easily when subjected to stress. During the gradual uplifting of the Colorado Plateau, starting about 60 million years ago, the still buried petrified trees were under so much stress they broke like glass rods. The crystal nature of the quartz created clean fractures, evenly spaced along the tree trunk, giving the appearance today of logs cut with a chainsaw.



The colorful mudstones and clays of the area are composed of bentonite, a product of altered volcanic ash. The clay minerals in the bentonite can absorb water to as much as seven times their dry volume. The expansion and contraction properties of the bentonite cause rapid erosion by preventing much vegetation from growing on the slopes of the hills.



The much quicker weathering and erosion of the mudstones and clays of the Chinle Formation sometimes leaves segments of petrified wood balancing precariously atop short rounded mounds.

Did you know that a cubic foot of Arizona petrified wood weighs approximately 168 pounds?



## ESM Membership Program

By Harvey Jong

You may have noticed that the membership form (featured on the last page of the newsletter) is different than the original founding version. This change reflects two important issues. First, establishing a physical facility for the Earth Science Museum has proven to be a lot of more challenging than anticipated. The various founding membership benefits, however, rely on having a building that hosts a variety of exciting, engaging, and exceptional exhibits. Since the museum development timeframes have moved out, it didn't seem right to continue to promote these benefits.

The second issue involves the need to expand the museum's membership.

Members represent the key ingredient for the success of the museum. The Board of Directors felt that a simpler, more affordable membership program would attract more people to join our efforts. Subsequently, the ESM Earth Science Investigation (ESI) Team was created. As indicated by the above graphic, the concept is loosely based on the popular television series, *CSI: Crime Scene Investigation*.

Museum members become part of a dedicated, multidisciplinary team of Earth Science Investigators (ESI's) who help inspire teaching and learning about the earth sciences for all generations!

If you joined the museum as a founding member, please note that you will remain a member in good standing per the original membership terms. This will extend to the year that the museum opens. In the interim, you may optionally become an ESI Team member.

Whether you are a founding member, an ESI Team member, or both, we want to thank you for your continuing support!!

## ESM's Upcoming Meeting

The Earth Science Museum's next scheduled meeting is April 9<sup>th</sup>, 2014, at the Burton Barr Library, located near Central Ave. and McDowel in Phoenix at 6:30 p.m. in Rm. B. Everyone is welcome to attend.

## Rock & Gem Shows in Arizona

### April 2014

**12-13 - Anthem, Arizona:** Annual show; Daisy Mountain Rock & Mineral Club; Anthem School; 41020 N. Freedom Way; Sat. 10-5, Sun. 10-4; adults \$3, seniors and students \$2, children free; gems, minerals, fossils, fluorescence, jewelry, beads, wire wrapping, geodes, raffles, kids' events; contact Ed Winbourne, 978-460-1528; e-mail: [ewinbourne@gmail.com](mailto:ewinbourne@gmail.com)

### June 2014

**6-8 - Flagstaff, Arizona:** Annual show; Coconino Lapidary Club; Silver Saddle Outdoor Market; corner of Rte. 89N and Silver Saddle Rd.; daily 9-4; free admission; rough, finished, jewelry, fossils, raffles; contact Becky Cox, 928-380-6657; e-mail [bcox@fUSD1.org](mailto:bcox@fUSD1.org)

## MANY THANKS TO OUR MAJOR DONORS!

AZ Leaverite Rock & Gem Society  
[www.azleaverite.org](http://www.azleaverite.org)

Flagg Mineral Foundation  
[www.flaggmineralfoundation.org](http://www.flaggmineralfoundation.org)

Friends of the AZ Mining & Mineral Museum

Maricopa Lapidary Society

Mineralogical Society of AZ  
[www.mineralogicalsocietyarizona.org](http://www.mineralogicalsocietyarizona.org)

White Mountain Gem & Mineral Club  
[www.whitemountain-azrockclub.org](http://www.whitemountain-azrockclub.org)

Wickenburg Gem & Mineral Society  
[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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### ESM Earth Science Investigation Team Membership Form

\_\_\_\_\_ New Member      \_\_\_\_\_ Renewal

Membership levels:

\_\_\_\_\_ ESI Family \$20

\_\_\_\_\_ ESI Individual \$10

\_\_\_\_\_ ESI Student (16 & under) \$5

Membership benefits:

- ◆ Monthly e-newsletter *Earthquake*
- ◆ Official team membership card
- ◆ Knowledge that your contribution is making a difference in earth science education.

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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: \_\_\_\_\_

Expires: \_\_\_\_\_ Card ID # \_\_\_\_\_

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3215 W. Bethany Home Rd.  
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**Editor E-Mail:**  
scote@earthsciencemuseum.org

**Mission**

Establish an innovative, world-class destination museum in the Phoenix area dedicated to inspiring all generations about earth sciences.

**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).

Please join us at the next ESM board meeting Wednesday, April 9, 2014, at the Burton Barr Library in Phoenix at 6:30 p.m. Rm. B.

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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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