



EARTHQUAKE

e-Newsletter about what's movin' and shakin' at the Earth Science Museum

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Solar-Powered Fluorescent Mineral Display

By Harvey Jong

The Earth Science Museum (ESM) debuted its solar-powered fluorescent mineral display at the 42nd Annual Flagg Gem and Mineral Show. The outdoor display was well received and represented what may be Arizona's first application of solar power for exhibiting fluorescent minerals. Over 671 visitors enjoyed the collection of colorful, glowing minerals.



ESM booth at the 2014 Flagg Gem & Mineral Show
Doug Duffy and Dave Fanger staffed the ESM booth that featured the new solar-powered fluorescent mineral display. H. Jong photo.

The exhibit was using a combination of old and new elements. The Arizona Leaverite Rock and Gem Society provided the bright ultraviolet (UV) lamp that included two 25-watt short wave (254 nm) tubes. This lamp was one of the two UV lights that were on loan to the old Arizona Mining and Mineral Museum's fluorescent room. Mardy Zimmermann refurbished a display case, donated by the Maricopa Lapidary Society, and supplied specimens from her extensive fluorescent collection. The case and minerals were housed in a black canopy that ESM recently purchased with funds from the Friends of the Arizona Mining and Mineral Museum (FAMM) grant.

The ESM also acquired a high capacity 1200 amp-hour battery-inverter system with the help of a new grant from the Staples Foundation's *2 Million and Change Program*.



High Capacity Battery and Built-in Inverter

The battery provided more than enough power to run the ultraviolet light for an entire day at the show. H. Jong photo.

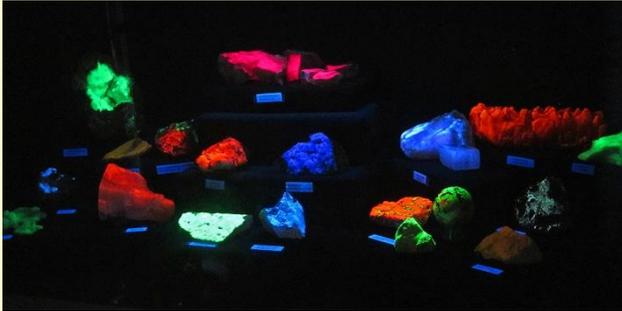
Dick Zimmermann furnished an old hand-cranked lift to move the heavy battery that weighed 103 pounds. The lift also served as a stable platform for mounting a pair of 30-watt solar panels that charged the battery.



High Tech Meets Low Tech - Hand-cranked lift and solar panels. H. Jong photo.

The main case of fluorescent minerals was illuminated with the short wave UV light and featured specimens from Arizona and other states.

A hand-held UV light with both short-wave and long-wave sources was also available to check the fluorescence of their minerals.



Case of Fluorescent Minerals

The glowing comments about the fluorescent minerals included many “oohs” and “aahs”. H. Jong photo



Close-up of Fluorescent Minerals

The display included eucryptite (top) specimens from the Midnight Owl mine, and the distinctive reddish-pink glow seemed especially bright. H. Jong photo.

The solar-powered fluorescent mineral display encompasses two key themes of the Earth Science Museum:

1. To provide exciting , engaging, and exceptional visitor experiences
2. To demonstrate sustainability

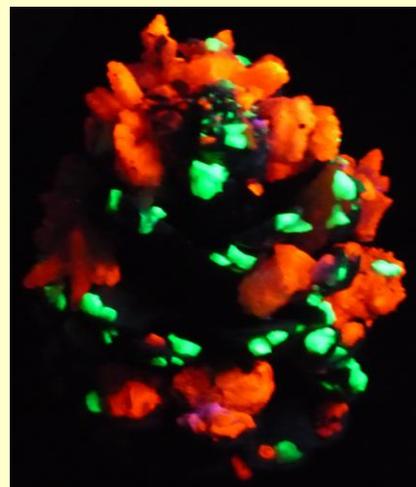
The ESM plans to feature the exhibit at other events, such as Earth Science Day (October 18, 2014) and various science fairs/festivals.



Entrance to the Fluorescent Mineral Display. H Jong photo.



The same minerals as those shown in the upper left photo, only without the UV lights on, don't solicit the same glowing comments. S. Coté photo



Fluorescent mineral decorated pine cone. S. Coté photo



Arizona Rocks 8

Text and photos by Ray Grant

Ultramafic (high in iron and magnesium) igneous rocks are relatively rare. The common name that we will use is peridotite, but again there are many specific names based on the minerals present or the chemistry of the rock. Ultramafic rocks originate in the Earth's mantle and are pushed up to the surface in mountain building events or they are carried to the Earth's surface as nodules (xenoliths or inclusions) with basalt magma. Peridotite contains mainly olivine and pyroxene with small amounts of other minerals such as garnet and spinel.

The Arizona occurrences of peridotite are found as nodules in basalt. The most famous Arizona peridotite locality is Peridot Mesa on the San Carlos Reservation. At Peridot Mesa, there is an amazing amount of peridotite where it is mined for the Peridot, the gem name for olivine. The volcanic eruptions of basalt that contain the olivine happened between one and four million years ago. It is estimated that these nodules came from the mantle at a depth of 50 to 100 miles beneath the earth's surface.

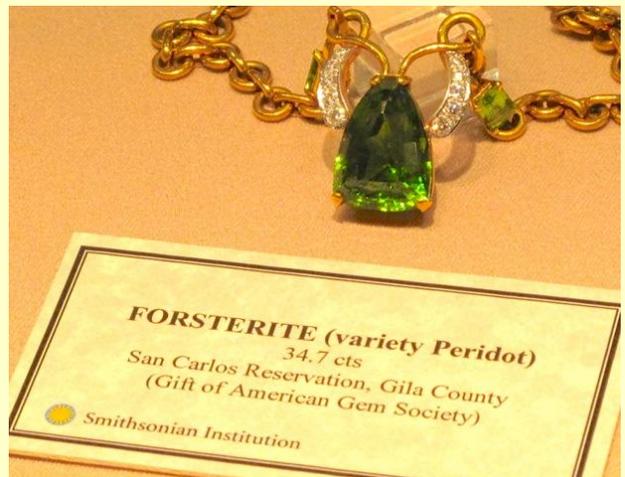
Peridotite nodules are also found in the Uinkaret volcanic field on the north side of the Grand Canyon, the San Bernardino volcanic field in the southwest corner of the state and at the Sullivan Buttes in the Chino Valley. At the Sullivan Buttes, the nodules are composed of garnet, pyroxene, and amphibole. There is no olivine present.



Outcrop of basalt with peridotite nodules at Peridot Mesa



Peridotite nodules mainly olivine at Peridot Mesa (Quarter for scale)



Faceted peridot (olivine) from Peridot Mesa

EXPLORE YOUR WORLD!

Kitt Peak National Observatory

Text & photos from NOAO.edu/kpno and Wikipedia

Kitt Peak is 56 miles southwest of Tucson, AZ, via State Route 86, and an additional 12 miles to the summit via 386; the observatory sits at an elevation of 6,875 feet where it is 15 to 20 degrees cooler than Tucson.

Kitt Peak National Observatory is open daily (except New Year's, Thanksgiving and Christmas) from 9 a.m. - 4 p.m. and offers a free Visitor Center and self-guided walking tours. There are three guided tours daily (fees apply) and each tour visits one of three separate telescopes. A tour of the McMath-Pierce Solar telescope will most likely provide a view of a sunspot, a temporary cool region in the sun's photosphere or sign up to view the sunset through the largest solar telescope in the world! (Separate fees apply.)

A visit to the Mayall 4-meter telescope's indoor observation deck provides a 360 degree view of the surrounding Arizona-Sonoran Desert.



Mayall 4-meter telescope, photo Wikimedia Commons

Stargaze through their Nightly Observing Programs or even spend a night at a telescope with their Advanced Observing Programs (separate fees apply).

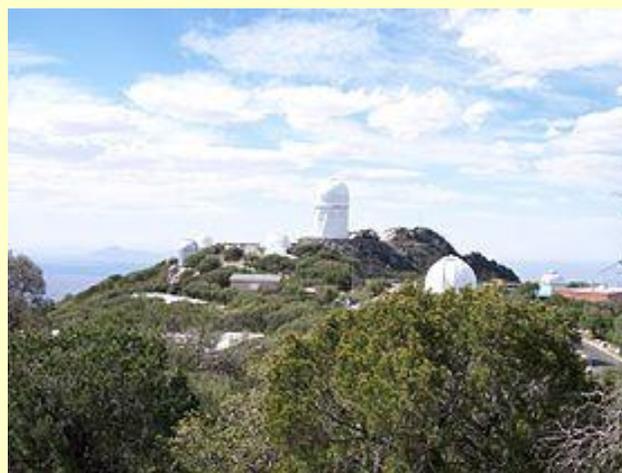
A private 5-hour VIP Tour for groups up to 20 people can be arranged (separate fees apply). VIP tours provide a more in-depth knowledge of the historic and scientifically important

observatories on Kitt Peak than the regular daytime tours can offer.

Kitt Peak is now offering a VIP Tour on the fourth Saturday of each month that anyone can sign up for! Individual members of the general public, couples, and small groups are encouraged to sign up.

For a full list of special public programs and advanced public programs, go to <http://www.noao.edu/outreach/kpvc/classes.html>.

Teacher resources including "Teaching With Telescopes" and "Hands-On Optics", please go to <http://www.noao.edu/education/>.



Telescopes atop Kitt Peak, Wikipedia photo

Interested in Astronomy? Here a few of the many astronomy clubs in Arizona:

East Valley Astronomy Club
<http://www.eastvalleyastronomy.org/>

Phoenix Astronomical Society
<http://www.pasaz.org/>

Saguaro Astronomy Club
<http://www.saguaroastro.org/>

Tucson Amateur Astronomy Association
Email: taaa@seds.org

University of Arizona Astronomy Club
<http://uaastroclub.org/>

ESM's Upcoming Meeting

The Earth Science Museum's next scheduled meeting is February 5th 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

January 2014 - February 2014 - March 2014

Jan. 1 - Feb. 28-QUARTZSITE, AZ
<http://xpopress.com/QZ-show-schedule.html>

Feb. 1-15-TUCSON, AZ
www.tucsongemshows.net/coming.html

Feb. 13-16-TUCSON, AZ
 Tucson Gem and Mineral Show, Tucson Convention Center; 260 S. Church Ave.; Thurs. - Sat. 10-6, Sun. 10-5; www.tgms.org.

Feb. 22-23-MESA, AZ
 48th Annual Jewelry, Gem and Rock Show Skyline High School, 845 S. Crismon, Rd. Sat. 9-5, Sun. 10-4; www.ajrockclub.com

March 15-16-COTTONWOOD, AZ
 Show and Sale; Mingus High School, 1801 E. Fir Sat. 9-5, Sun. 9-4



Morris Jackson with his display of model stamp mills at the recent Flagg Gem & Mineral Show; photo by S. Coté.

MANY THANKS TO OUR MAJOR DONORS!

AZ Leaverite Rock & Gem Society
www.azleaverite.org

Flagg Mineral Foundation
www.flaggmineralfoundation.org

Friends of the AZ Mining & Mineral Museum

Maricopa Lapidary Society

Mineralogical Society of AZ
www.mineralogicalsocietyarizona.org

White Mountain Gem & Mineral Club
www.whitemountain-azrockclub.org

Wickenburg Gem & Mineral Society
www.facebook.com/pages/Wickenburg-Gem-and-Mineral-Society/111216602326438

Staples Foundation
www.staplesfoundation.org

Stan & Susan Celestian
 Russ Hart
 Will & Carol McDonald
 Debbie Michalowski
 Dennis & Georgia Zeutenhorst

Morris Jackson, master model maker, was a volunteer at the former AZ Mining and Mineral Museum where he helped reassemble the 5-stamp stamp mill that is still located at 1502 W. Washington, where, sadly, it sits idle since May 2011.



Stamp mill at the former AZ Mining and Mineral Museum

Morris's expertise in model building doesn't stop at stamp mills. He has made models of whole mining towns that have been displayed at the former AZMMM during their extremely popular "Family Day" events.

Morris currently volunteers at the Cave Creek Museum located at 6140 E. Skyline Dr., Cave Creek, AZ.



Superstition Mountain Museum booth at the Flag Gem & Mineral Show in early January.



Chuck Messersmith, Roger Camplin and Charlie Connell, volunteers for the Superstition Mountain Museum with their model stamp mill.



Flag Show visitors deciding which rocks, minerals and fossils to choose, from the hundreds of samples, for their very own egg carton collection at the AZ Leaverite Rock & Gem Society booth.



So popular were the egg carton collections at the AZ Leaverite Rock & Gem Society booth that even some animals showed up to make one!

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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**

----- 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: _____
 Expires: _____ Card ID # _____

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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We're on the Web!

Visit us on  and at:
www.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.

Please join us at the next ESM board meeting Wednesday, February 5, 2013, at the Burton Barr Library in Phoenix at 6:30 p.m. Rm. B.

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