



Wickenburg Gem & Mineral Society, Inc.

P.O. Box 20375, Wickenburg, Arizona, 85358

E-Mail — wgmsociety@gmail.com

www.wickenburggms.org

The purpose of this organization shall be to educate and to provide fellowship for people interested in rocks and minerals; to foster love and appreciation of minerals, rocks, gems, and the Earth.

Membership shall be open to all interested people.



POTLUCK
 next meeting
November 13, 2015
6:30 pm
 Right after the workshop

ELECTIONS in DECEMBER

The club will be conducting elections for officers at the December meeting. Consider running for office. President, Vice President, Secretary & Treasurer.

If you'd like to nominate yourself or other member, contact an officer.



CLUB SHOW TIME HERE!

NOVEMBER 28 & 29, 2015

Sat 9-5; Sun 9-4

Hassayampa Elementary School

VOLUNTEER! VOLUNTEER!

An hour or two will help!

DONATE: rocks, slabs, or other items for Silent Auction

DONATE: items for door prizes

ENTER Best Rock Contest

Plan to attend and support the club and vendors!

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Meeting Minutes — October 3, 2015

The meeting was called to order by Debbie Keiser, and the pledge of allegiance was recited. The minutes of the October meeting was read and approved. The treasurer's report was read and approved.

Correspondence was discussed, including a flyer for the Sedona rock show on October 17 and 18, 2015, and a flier for a night desert telescope viewing trip on October 16, 2015. Also, from Jim Koning, he is planning demonstrations or classes over the winter months regarding rock cutting and polishing.

Field trips were discussed regarding the possibility of going on week day as well as week end field trips.

No one volunteered to work out any trips at this time. A possibility of a committee to be formed to work out trips was discussed, with nothing resolved. Members would like a trip in November, need to have something worked out. An email will be sent if an earlier trip is established.

The November WGMS Rock Show was discussed. Volunteer sign up sheets were sent around. Door prizes were discussed, there are some items have been donated at this time, but more door prizes are needed. There will be drawing for gold nuggets, also. No information is available at this time if a food vendor is set. Help is also needed for tear down, and during the show. A new show banner was made and donated by Jason.

New scholarship forms for 2016 will be sent out next week, to be returned mid April, 2016.

Dale stated the new web site is up and running. Look at the site for the "magic word." If any knows the word at the November meeting, a prize will be given to the first person to state it.

A flyer was made for anyone interested in joining the WGMS and will be available for the show.

Joyce Ramage will do a bracelet class on the evening of the next meeting, just prior to the meeting. Class is \$5.00, which will include a kit.

Continued.....

There was no show and tell.

Door prizes were won by Janice, Judy, and a guest, Joe Pleggenkukle.

Mel Canter gave a program on crested Saguaros, which was done in collaboration with Joe Pleggenkukle and the Crested Saguaro Society.

Respectfully submitted,
Judy Zimmerlee



Crested Saguaro near the Planet Mine, La Paz County, Arizona. This picture was taken in 2012. In late 2014, the crest was broken off and lying nearby. It looked like storm damage.

Photo by Susan Celestian

NOTES FROM THE EDITOR

Have a geological interest? Been somewhere interesting? Have pictures from a club trip? Collected some great material? Write a short story (pictures would be great). I'd like topic suggestions also.

Deadline for the newsletter is the end of the month.

Mail or Email submissions to:
Susan Celestian, editor
6415 N 183rd Av
Waddell, AZ 85355
azrocklady@gmail.com

<http://www.wickenburggms.org/>

If you ever have photos from a club field trip, send a couple to Dale, for posting on the website.

MAKE A GIFT OUT OF ARIZONA COPPER!

*Copper mined, smelted, and manufactured by our own members
Joyce Ramage and Gary Huetra, Reserve Bank Mine*

WHAT: *Bracelet-making Workshop*

By Joyce Ramage

WHEN: *November 13, 2015 (regular meeting night)*

5:00 pm NOTE EARLY TIME

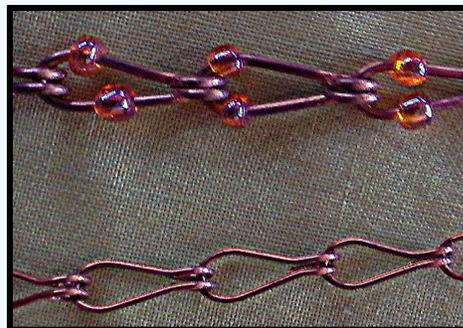
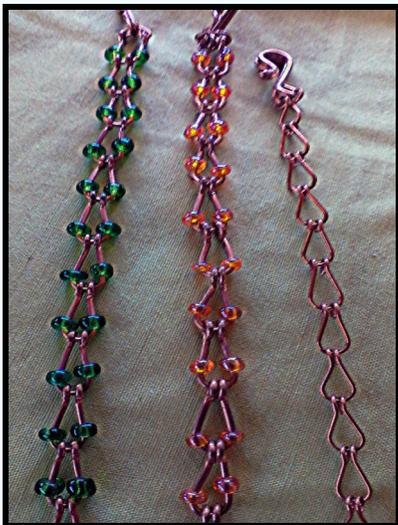
WHERE: *Coffinger Park banquet room (regular meeting room)*

COST: *\$5 for each bracelet*

All supplies included

Bring your own tools (wire cutters, round-nose pliers, needle-nose pliers (preferably with no teeth), tape measure.

*To assure adequate materials: **RSVP to www.wickenburggms.org**
— let us know you are coming
and how many bracelets you want to make.*



Socialize with your fellow club members.

Make gifts for friends and family!

POTLUCK at 6:30

INTRUSIVE IGNEOUS ROCKS GRANITE IN ARIZONA

Intrusive (or Plutonic) - form at depth, beneath Earth's surface

As mentioned in August's newsletter, intrusive igneous rocks cool very slowly, giving ions enough time to link up, and build visible crystals. These rocks will be coarse-grained — comprised of interlocking crystals of various minerals. This month we will look at granite.

Granite is the compositional equivalent of rhyolite. See Figure 1. However, it is coarse-grained, with visible crystals of quartz, potassium feldspar (K-feldspar or K-spar), plus muscovite, and possible associates — plagioclase, biotite and/or hornblende. (As the percentage of plagioclase feldspar increases, granite grades into a more intermediate composition — grano-diorite — however, this is not a distinction one can make visually. In fact, many rocks we refer to granite, may in fact be grano-diorites. But at this point, let's not split hairs.)

	Light color	Intermediate	Dark color
Fine-grained; extrusive	RHYOLITE *white, lt gray, pinks * very viscous lava * stratovolcanoes; domes	ANDESITE *med-dk gray * very viscous lava * stratovolcanoes	BASALT *black, dk gray, rust red * very fluid lava * shield volcanoes
Coarse-grained; intrusive	GRANITE *grays, pinks, (red) * visible quartz *K-feldspar, muscovite, biotite, hornblende	DIORITE *salt and pepper * no visible quartz *plagioclase, K-feldspar, hornblende, biotite	GABBRO *black * no visible, often visible olivine *plagioclase, pyroxene
	OBSIDIAN → *glassy, black, rust-red, greenish,		
	PUMICE → *glassy froth: white, yellow, brown, black		
	Decreasing % Silica →		
	Increasing % Iron and Magnesium →		

FIGURE 1 *Igneous Rock Chart*, showing the relative compositions and relationships of the igneous rocks.
Table by Susan Celestian

Granite is common within continental crust, and is the most abundant rocks comprising the *basement rocks* — those rocks forming the foundations of the continents, and over which sedimentary rocks have been laid.

Most granite probably forms in convergent zones, where two tectonic plates collide. (For example, when an oceanic plate (underlain by basalt), collides with a continental plate (granitic composition), the heavier oceanic plate will dive down (subduct) under the more buoyant continental plate, dragging with it oceanic sediments and water. The metamorphic core complexes are prominent exceptions to this 'rule'. In Arizona, that includes the granites of the White Tank Mts, Santa Catalina Mts, among others). See Figure 2.

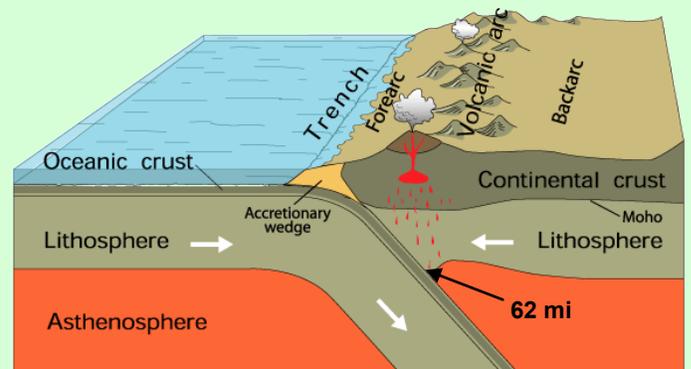


FIGURE 2 *Oceanic-Continental Convergence* Where an oceanic plate collides with a continental plate, the oceanic plate with subduct. *Graphic courtesy of the USGS*

At a depth of about 62 miles (100 kilometers), the oceanic plate and sediments begin to melt. Recall, from Bowen's Reaction Series, that the minerals that form at the lowest temperatures, are the first to melt (See Figure 3, page 5). So, the first minerals to melt are those lowest in ferromagnesian minerals (potassium & sodium feldspars, micas, quartz). As these minerals melt, they begin to rise (molten rock being less dense than solid rock), through the continental crust. Magma moves upward by forcing its way into weak areas/cracks (stopping) and melting (assimilating) rocks it encounters. Rocks melted on the way upward, are assimilated into the rising

Granite continued on page 5.....

..... Granite continued from page 4

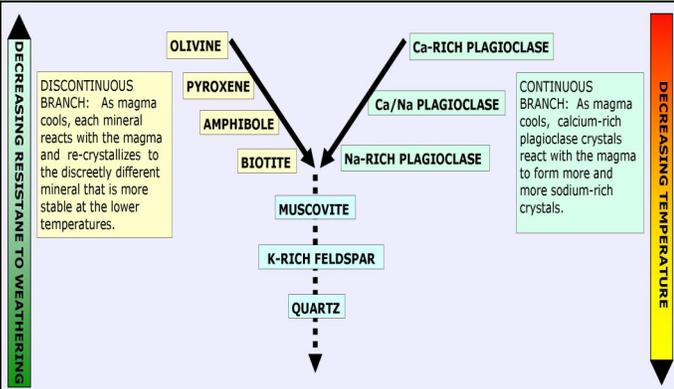


FIGURE 3 Bowen's Reaction Series This diagram depicts the order in which minerals crystallize in a cooling magma. (Enlarge for better view.)
Diagram by Susan Celestian

magma, contributing further to the creation of a magma of granitic composition (See Figure 4).

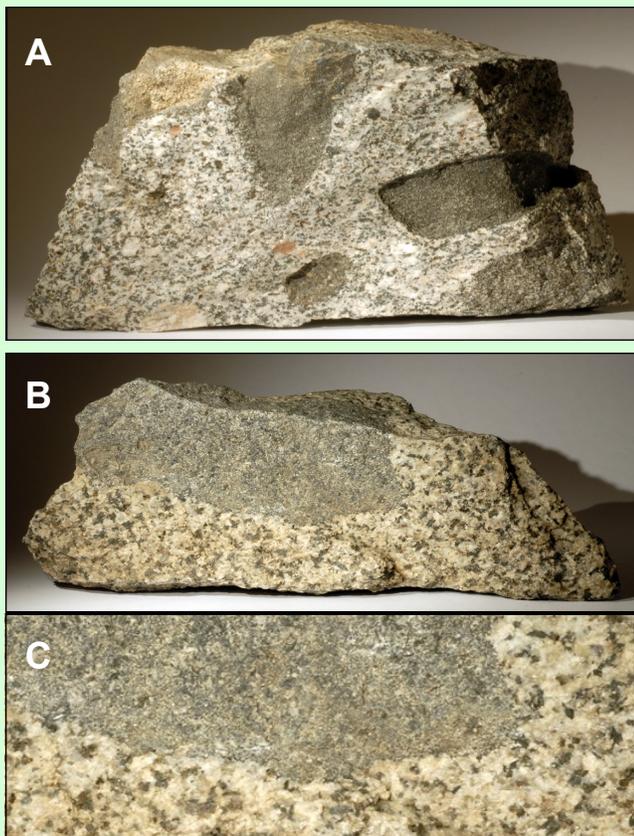


FIGURE 4 Xenoliths in Granite Xenoliths are bits of rock through which a granite has moved. These bits have not melted, although you can see in 'C' that the granite/xenolith boundary is indistinct.
Photos by Stan Celestian

At some point (but still miles below Earth's surface), the magma will cool, to form bodies (*plutons*) of granite, often constituting the cores of mountain belts.

Bodies of granite (*plutons*) occur as batholiths, stocks, laccoliths, dikes, and sills.

- ◆ *Batholiths* are very large bodies, with a surface exposure exceeding 40 miles².
- ◆ *Stocks* are smaller, with a surface exposure less than 40 miles².
- ◆ *Laccoliths* are formed when large bodies of magma intrude between sedimentary layers to form a flat-bottomed, domed bodies.
- ◆ *Dikes* are sheet intrusions that cut across sedimentary layers or into a rock mass.
- ◆ *Sills* are sheet intrusions that conform to sedimentary layers or metamorphic foliation.

Heat radiating from granitic magma bodies (or any magma body, for that matter) will metamorphose surrounding rocks. As a result, it is very common for large granite bodies to be surrounded by "rings" of metamorphic rock, with the highest-grade metamorphic rocks occurring closest to the granite, and the degree of metamorphism decreasing outward to un-metamorphosed country rock. See Figure 5.

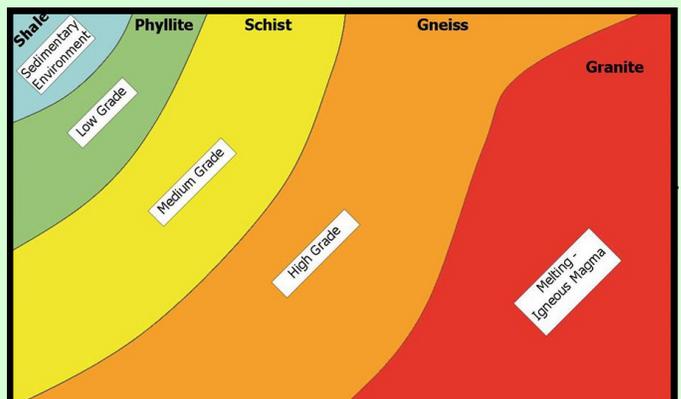


FIGURE 5 Metamorphism Around a Granitic Body As heat radiates outward from a hot magma body, the country rock is metamorphosed, with the grade of metamorphism decreasing with distance from the magma.
Diagram by Stan Celestian

Granite

continued on page 5.....

..... Granite continued from page 5

As previously mentioned, granite forms at great depth. For example, indications are that the rocks forming Piestewa Peak crystallized at a depth of over 6 miles (10 km). That means that for us to see them at the Earth's surface, over 6 miles of rocks have been removed by erosion!!!

Some of the oldest rocks on Earth are granites. In Arizona, granite is seen in the mountains and features of central and southern parts of the state and the Grand Canyon, including the following topographic features:

- White Tank Mts. - 2+ by & 35 my
- South Mt. - 25-35 my
- Camelback Mt (the hump) - 1.5 by
- Granite Dells (Prescott) - 1.4 by
- Santa Catalina Mts. - 1.44 by & 72-45 my
- Texas Canyon (east of Benson) - technically the rocks are quartz monzonite - 50 my
- Inner gorge of Grand Canyon - 1.4-1.7 by
- Bagdad Mine (& others) - 1.6 by

Physical and chemical weathering of granite produces some distinctive topographic features.

- ◆ As the erosion removes the weight of overlying rocks, granite tends to crack along curved planes, roughly parallel to the surface. These are called exfoliation joints. This produces rounded topography, such as the exfoliation dome, of which Half Dome in Yosemite is a classic example. See Figures 6 & 7.



FIGURE 6 Exfoliation joints Exfoliation joints in granite, resulting from unloading, are exposed along a road in Yosemite National Park.

Photo by Stan Celestian

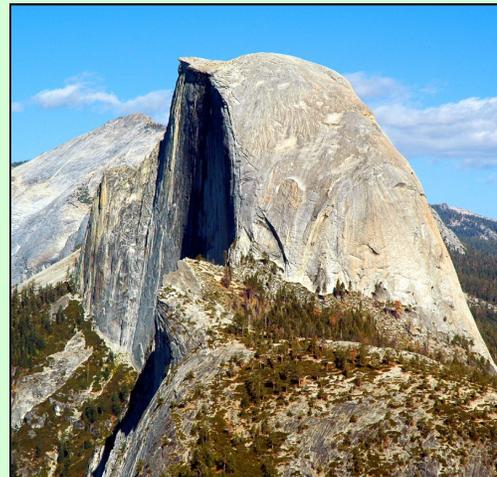


FIGURE 7 Exfoliation Dome Half-Dome, in Yosemite National Park, is what remains of an exfoliation dome (the other half was removed by glaciers).

Photo by Stan Celestian

Granite continued on page 7.....

.....Granite continued from page 6

- ◆ Exposure to weak acids at the Earth's surface, cause the chemical breakdown of the feldspars, micas, and ferromagnesian minerals in granite. This may result in fields of rounded boulders (spheroidal weathering (Figure 8) — a topic for another day) and ultimately the rock disintegrates to form *grus* — coarse-grained, angular sediment composed of fragments of granite. Grus is the stuff many of us have purchased and spread on our yards.



FIGURE 8 Spheroidal Weathering of Granite This scene in Texas Canyon, east of Benson, Arizona, is a result of the weathering of granite to produce rounded boulders. *Photo by Stan Celestian*

Granite textures, composition, and colors can vary quite a bit. What all granites have in common are:

- ◆ Basic components of quartz and K-feldspar
- ◆ Coarse-grained
- ◆ Typically light-colored

Figures 9-14 illustrate the variability possible under the umbrella of Granite.

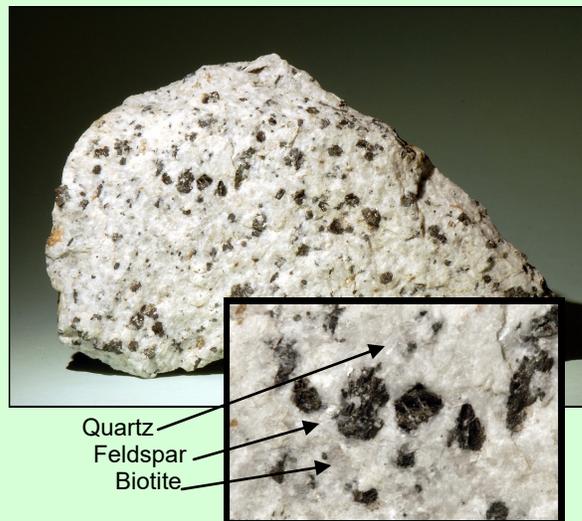


FIGURE 9 Granite from Southern California
Photo by Stan Celestian

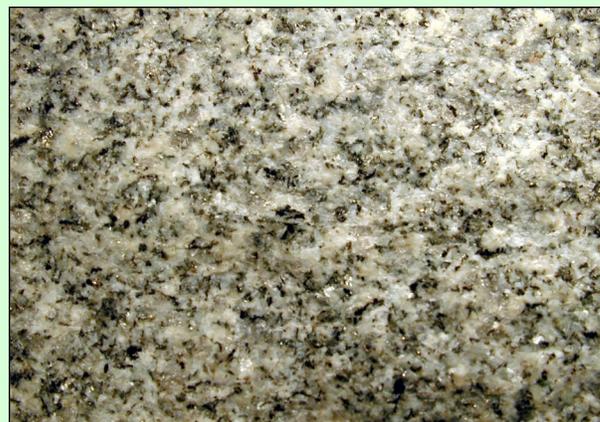


FIGURE 10 Fine-grained Granite This granite is of similar color(s), but much finer-grained than that in Figure 7. Minerals visible are muscovite, biotite, K-feldspar, and quartz.
Photo by Stan Celestian

Granite continued on page 8.....

.....Granite continued from page 7



FIGURE 11 Porphyritic Granite This granite is composed of large crystals of quartz, white K-feldspar, biotite — and extra large orange-ish crystals of K-feldspar. The two grain sizes in this rock make it a *porphyry*. There were two stages of cooling — one period of very slow cooling, during which the extra large crystals of K-feldspar formed, followed by a period of slow, but faster, period of cooling, during which the rest of the crystals formed.
Photo by Stan Celestian



FIGURE 12 Porphyritic Granite This granite, from near Bagdad, Arizona, is composed primarily of quartz and K-feldspar. There two sizes of feldspar crystals, with some very obvious very large K-feldspar crystals. These crystals are easily freed from the host rock, making them very collectable. *Photo by Stan Celestian*

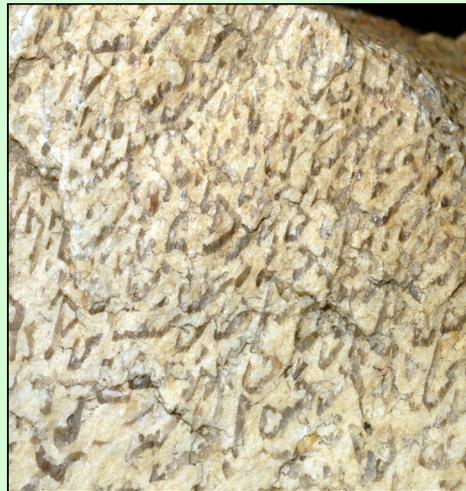


FIGURE 13 Graphic Granite This intergrowth of quartz (gray) and Na-feldspar (milky white) resembles ancient writing - hence the name. Locality - Buckeye Hills near Buckeye, Arizona. *Photo by Stan Celestian*



FIGURE 14 Coarse Granite This polished fragment of granite countertop clearly reveals fairly large crystals of gray granite, pink feldspar, and black biotite.
Photo by Stan Celestian

UPCOMING AZ MINERAL SHOWS

November 21-22 - Payson, AZ Longhorn Gymnasium, Payson High School; Corner of W Longhorn Rd & S McLane Rd; Sat 9-5, Sun 10-4, Admission \$2, children under 12 free.

November 21-22 - Apache Junction, AZ Apache Junction High School cafeteria; 2525 S Ironwood Dr; Sat 9-5, Sun 10-4, Admission: Adults/Seniors \$3, Students \$1, children free.

January 8-10 - Mesa, AZ Flagg Gem and Mineral Show, Mesa Community College, Dobson Rd, just north of Rte 60; Fri-Sun 9-5; Admission/Parking free. See flyer on page 10.

January 8 - February 28 - Quartzsite, AZ Desert Gardens Rock, Gem and Mineral Show; Desert Gardens Show Grounds, Admission/Parking: free. <http://www.xpress.com/quartzsite-shows-swapmeets-schedule.html>

January 20-24 - Quartzsite, AZ QIA PowWow Gem & Mineral Show, Admission/Parking: free. <http://www.xpress.com/quartzsite-shows-swapmeets-schedule.html>

January 1-10 - Quartzsite, AZ Tyson Wells Rock & Gem Show, Tyson Wells Show Grounds, Admission/Parking: free <http://www.xpress.com/quartzsite-shows-swapmeets-schedule.html>

January 29 - February 14 - Tucson, AZ Tucson Gem & Mineral Showcase; 43 different gem, mineral, fossil, bead & jewelry shows - nearly 4000 vendors. <http://www.xpress.com/tucson-gem-mineral-fossil-jewelry-shows-schedule.html>

February 11-14 - Tucson, AZ Tucson Gem & Mineral Show, Tucson Convention Center, 260 S Church Ave; Thur-Sat 10-6, Sun 10-5; Admission fee.

If you are travelling, a good source for out-of-state (or in-state) gem and mineral shows AND clubs is

<http://www.the-vug.com/vug/vugshows.html> or <http://www.rockngem.com/ShowDatesFiles/ShowDatesDisplayAll.php?ShowState=AZ>

For out-of-the-country shows: <http://www.mindat.org/eventlist.php>

A good source for a list of Arizona Mineral Clubs and contact information is http://whitemountain-azrockclub.org/Public_AZ_Clubs_Links.html

UPCOMING WGMS FIELD TRIPS

NO FIELD TRIPS ARE SCHEDULED, DUE TO SUMMER BREAK

DATES SUBJECT TO CHANGE

CONSIDER VOLUNTEERING TO PLAN OR HELP PLAN TRIPS. YOU WOULD NOT NEED TO LEAD EVERY TRIP, BUT KEEP THINGS ON TRACK.

If you all have some place that you would like to go, let Bob Bartlett [623-388-0749](tel:623-388-0749), Marty Hagan [602-469-7770](tel:602-469-7770), or Craig Jones [208-681-4770](tel:208-681-4770) know. We have some dates to fill in. This is your club. Let's go out and have some fun.

Check the website for field trip announcements, especially if you don't have email!

Officers and Chairpersons

- President:** Craig Jones208-523-9355
- Vice President:** Martin Hagan 602-469-7770
- Secretary:** Sue Jones 208-523-9355
- Treasurer:** Debra Keiser 928-684-1013
- Program Director:** Dale Keiser 928-684-1013
- Publicity:** currently open position
- Membership:** Roma Hagan 602-469-7662
- Editor:** Susan Celestian 602-361-0739
- Field Trip:** Craig Jones, Bob Bartlett, Marty Hagan
- Show Chair:** Beth Myerson 480-540-2318
- Scholarship Chair:** Steve Hill 928-533-3825
- Historian:** Jeanine Brown 928-684-0489

Meetings are held the **2nd Friday** most months at **Coffinger Park banquet room**. Potluck dessert at 6:30 pm. Business meeting at 7:00 pm. **Exceptions: February and December** meetings are held on the **first Friday of the month**. We do not meet in the summer — **no meetings in June, July or August**.

Membership Dues: \$15.00 Adults per Person
\$ 5.00 Juniors and Students

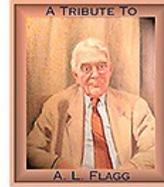
Meeting Dates for 2015/2016

Wickenburg: Jan 9, Feb 6, Mar 13, Apr 10, May 8, Sept 11, Oct 9, Nov 13, Dec 4, Jan 8, Feb 5, Mar 11, Apr 8, May 13

Stanton meets Thursday after the Wickenburg meetings. Apr 16, May 14, Sept 17, Oct 15, Nov 19, Dec 10, Jan 14, Feb 11, Mar 17, Apr 14, May 19 (subject to change)

The tailgate show tradition continues!

44TH ANNUAL FLAGG GEM & MINERAL SHOW



Arizona Silver

JANUARY 8-10, 2016 9AM TO 5PM
MESA COMMUNITY COLLEGE
NE CORNER OF US 60 & DOBSON ROAD



SPONSORED BY
FLAGG MINERAL
FOUNDATION

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

Free Admission ✕ *Free Parking* ✕ *Free Samples For Kids*

2016 Flagg Show Poster Photo Credits: Top left—Silver, Mineral Park, Cerbat Mts., Mohave Co, AZ, GIA Museum specimen, Tony Kampf photo; Top right—Silver, Silver King Mine, Pinal Co., AZ, Wendell Wilson photo; Center—Silver, Silver King Mine, Pinal Co., AZ, Barbara Muntyan specimen, Jeff Scovill photo; Bottom left—Silver, Mohave Co., AZ, Evan Jones specimen, Evan Jones photo; Bottom right—Silver, Lucky Cuss Mine, Tombstone Hills, Cochise Co., AZ, Flagg Mineral Foundation specimen, Jeff Scovill photo.

MINERALS IN OUR EVERYDAY LIVES

USES OF GRANITE

Granite has been a popular stone for thousands of years. It is common, attractive, hard, durable, and relatively inflexible.

- ◆ Building stone (from the time of Egyptian pyramids to today)
 - ◆ Building facing stone
 - ◆ Architectural trim
 - ◆ Sculpture
 - ◆ Tombstones & Memorials
 - ◆ Flooring tiles
- ◆ Rails for the Haytor Granite Tramway in Devon, England (1820)
 - ◆ Surface Plates - plane of reference for engineers
- ◆ Base for optical instruments (it is rigid, stable, and dampens vibrations)
 - ◆ Curling stones
 - ◆ Paving and Curb stone
 - ◆ Countertops
 - ◆ Floor tiles
 - ◆ Fireplace mantels
 - ◆ Mailbox posts
- ◆ Landscape rock - grus or crushed granite

