



The Apache Junction Rock & Gem Club, Inc.

# SMOKE SIGNALS

Apr 2013

## Officers of the Apache Junction Rock & Gem Club, Inc.

President:	Katy Tunnichiff	918-440-9152 katydidnt2007@gmail.com
Vice-President:	Jerry Gervais	480-252-2456
Secretary:	Barbara Bayer	480-832-3561 babrillhart@msn.com
Treasurer:	Martha Montague	480-982-1790 coolwater2k@yahoo.com
Trustee:	Jack Pawlowski	480-288-2642 j6ac5k@calcon.net
Trustee:	Ken Perkins	480-343-5617 lperkins18@cox.net
Trustee:	Ted Montague	480-982-1790 coolwater2k@yahoo.com

The Club meets on the second Thursday of every month October thru April at 7:00 pm at the Carefree Manor RV Park, at the corner of Tepee & Delaware, Apache Junction, AZ

Club Dues - \$24 a year per member prorated to first of month of joining. This may be paid at the general meeting or by mail to Ron Ginn, 691 N. Velero St., Chandler, AZ 85225.

### In This Issue

General meeting minutes – page 1  
 Article of the Month – page 2  
 Field trips Planned – page 4  
 Rock Shows in Apr & May – page 5

Next Meeting – Oct 10, 2013

### Field Trips

There will be a field trip to Table Mesa for stripped jasper on Wednesday the 17th of April. We will meet just off of exit 236 on I-17 North at 8:30 AM and leave at 9:00 am. This is past the City of Anthem.

### National Forest Rock

### Hounding Rules

### RECREATIONAL & HOBBY COLLECTING

#### Hobby Collecting of Fossils/Petrified Wood

#### Recreational Mineral Collecting

Limited collection\* of rocks and minerals for personal use is allowed on most National Forest System lands. These materials may be collected without a permit provided the collecting is for personal, hobby, and noncommercial use. For commercial\*\* or other uses of rock material, contact the local Forest Service Office.

#### What types of recreational rock and mineral collecting are allowed on the National Forests?

Collection of small amounts\* of wide-spread, low-value, relatively common minerals and stones (common quartz crystals, agate, obsidian) for non-commercial use.

■

Hobby mining activities; such as recreational gold panning or use of metal detectors to prospect for gold nuggets and other naturally occurring metals.

■

#### Are there any National Forest areas that are closed to recreational collecting?

Certain lands within the National Forest are not open to collecting due to wilderness designation or other sensitive areas. Contact the Forest Service for local information.

■

It is a good idea to check with the Bureau of Land Management for specific locations to find out whether or not there are mining ■ claims in the area.

#### Would I need a permit or other permission?

**No permit or notification is required for collecting if the following applies:**

- Collecting of samples is on the surface (no digging with hand tools or mechanized equipment).
- Collection is for personal use and esthetic values (cannot be sold or bartered).

**For the following activities, please contact the Forest Service to discuss permitting or authorization:**

■ Activity that *does* involve digging with hand tools or mechanized earth-moving equipment, including bobcats, suction dredges, 'high banking' or dry washing equipment.

■ Commercial activities including collecting mineral or fossil specimens for re-sale.

■ Removal of more than insignificant amounts\* of landscape rock.

**However, the following items may *not* be collected or removed by casual collectors:**

■ Vertebrate fossils (dinosaurs bones, fish, - anything with a backbone), and shark teeth.

**Archeological resources** including any material remains of prehistoric or historic human life or activities, which are at least 50 years old, and includes the physical site, location, or context in which they are found. (36 CFR 261.2)

■ The collection of **projectile points, pottery**, or any other archeological resource or artifact is not allowed (36 CFR 261.9 (h)) without a permit. Projectile points include 'arrowheads' and any prehistoric human-modified stone.

\* You may collect reasonable amounts of specimens. Generally, a reasonable amount is up to 10 pounds.

\*\* Commercial use is any trading, bartering, or selling of rocks and minerals from National Forest System Lands.

\*\*\* Searching for artifacts (man made objects) with metal detectors is discouraged, as **any** ancient or historical artifacts found may **not** be removed from federal lands, such as old coins, metal implements, or utensils.

## Bureau of Land Management Rock Hounding Rules

### Collection Limits - Free Rock, Mineral & Semi-Precious Gemstones

Rocks, minerals and semiprecious gemstones may be collected on public lands managed by the BLM without charge or permit as long as:

1. The specimens are for personal use and are not collected for commercial purposes or bartered to commercial dealers.
2. You may collect reasonable amounts of specimens. In Arizona, BLM sets the "reasonable" limits for personal use as up to 25 pounds per day,

plus one piece, with a total limit of 250 pounds per year. These limits are for mineral specimens, common invertebrate fossils, semiprecious gemstones, other rock, and petrified wood.

3. A group of people does not pool their yearly allotment to collect a piece larger than 250 pounds of either rock hounding specimens or petrified wood.

4. Collection does not occur in developed recreation sites or areas, unless designated as a rock hounding area by BLM.

5. Collection is not prohibited or restricted and posted.

6. Collection, excavation or removal are not aided with motorized or mechanical devices, including heavy equipment or explosives. Metal detectors are acceptable, with the exception of the San Pedro National Conservation Area.

7. No undue or unnecessary degradation of the public lands occurs during the removal of rock, minerals, or gemstones.

8. For pieces of petrified wood heavier than 250 pounds or situation not covered here, please contact your **local BLM office**.

9. If you wish to obtain more than 250 lbs. of rock in a year, please visit the local BLM office to arrange to purchase it.

## Minutes of Apr. Mtg.

Apache Junction Rock & Gem Club-General  
Meeting Minutes April 11, 2013

Submitted by Barbara Bayer

The President called the meeting to order at 7:00 pm. She led the Pledge of Allegiance.

- The President, Katy Tunnickliff, introduced visitors at the meeting. She announced there would be a Rock Show at the Dreams and Legends of the Superstitions Gallery this Saturday, April 13, 2013. There are coupons available for Natural Expressions in Apache Junction.
- The Secretary's minutes from March 2013 were accepted as circulated. Barbara Bayer reported that she has received communication from the supervisors of Tonto, Prescott, and Coconino National Forests. Their rules for rock hounding are the same and will be printed in the newsletter. She also just heard from the BLM regarding Barry Goldwater Air Force Range for field trips. Two get well cards were sent to members this month.

- The Treasurer, Martha Montague presented the following: \$200 was spent on two items for silver smith activities and the payment of \$3300 was made to Mr. Sundling for the lapidary shop building. A \$400 deposit was made to SRP for the electricity. An insurance payment of \$850 is due this month. The funds of \$10,000 will be invested in a CD. The President and Treasurer are investigating the best Bank interest rates for the CD. The following account funds were reported: Lapidary Checking account \$4,668.50, Lapidary Savings \$955.74, Show Checking \$9,604.86, Show Savings \$2,533.79, General Checking \$4,068.29, and General Savings \$121.36.
- Trustee, Ted Montague is calling for a work group to clean up the yard of the Lapidary Shop. He announced the new Trustee- Mr. Ken Perkins. The 24" saw can be reserved for \$5.00 deposit.
- The Membership Chairman, Ron Ginn, reported that we have 125 members renewing membership, 81 new members, and 14 life members. This totals 220 members in the club.
- Membership Analysis by Month Joined and Renewed

Month	Total	Joined	Renewed
Attendance			
October	5	2	3
31			
November	17	5	12
29			
December	35	4	31
42			
January	56	22	34
74			
February	77	34	43
71			
March	11	9	2
52	Average 50		
Life members do not renew	14		
Total	215		

- Wally Frlich thanked the many volunteers at the Flagg Mineral Show and our Rock Show. He encouraged us to use the many businesses that supported our Rock Show.
- Natalie Kirmiel thanked those contributing to the snacks and wishes those traveling home a safe journey.
- Lapidary Shop Chairman announced the new hours for the Summer. There will be

reduced hours as many of our monitors have returned home for the season.

- Show Chairman, Kelly Iverson, present the finances of the show as follows: Income Dealers \$6,800.00, Wheel \$202.86, Silent Auction \$2,406.85, Raffle \$742.00, Ming Trees \$339.00, Gate \$3,855.40, Brochure \$900.00 to total \$15,246.11. The expenses of the show were: dealers \$106.35, Ming Trees \$76.55, Brochures \$610.67, Advertising \$1,040.62, Scholarships \$3,000.00,
- Security \$810.00, School Facility Rentals \$686.00, Table Rentals \$1,117.05, Donuts \$16.97, UV Flashlights \$40.00 to total \$7,504.21. The net profit from the show was \$7,741.90. Two problems occurred during the show- electricity failures and people smoking on the high school campus. The permitted lighting fixtures will be included in next year's contract.
- De Wright announced a field trip to be held Wednesday, April 17, 2013 to Table Mesa. Those participating should meet at Exit 236 off Hwy 17 at 8:30 am. Any vehicle can make this trip.

The 50:50 drawing was won by Tom Sundling for \$32.50. The silent auction was held.

Mr. Gene Johnson, Past President, presented the history of the Apache Junction Rock and Gem Club.

There was a presentation of slides focusing on huge crystals found in a submerged cave in Mexico.

The meeting was adjourned.

## Article of the Month

### Mineralogy of Eruptions *by Andrew A. Sicree*

#### Sticky or runny lava

Mauna Loa, on Hawaii, erupts and a river of crimson lava wells up and out of the caldera on the summit of the volcano. Flowing briskly and smoothly, the incandescent river pours down the side of the mountain and stretches toward the sea. The landscape is covered with acres of black *basalt*; some is smooth and ropey, some is rough with jagged edges.

Two thousand miles east of Hawaii, in the Cascade Mountain Range, Mt. St. Helens erupts

violently. Ash and dust are blown out of the volcano with terrific force. The side of the volcano, built of the volcanic rock known as *dacite*, is blasted open. A cubic mile of rock is blasted into the air and traces of the dust rain down a thousand miles away. As the eruption ceases, dacitic lava piles up on the steep side of the volcano once again. The volcano sleeps, fitfully. Another major explosion will occur, perhaps even bigger than the last, but we do not know when.

Two volcanoes. Two very different styles of eruptions. The differences arise from the different mineralogies of each volcano's lava.

## Magma and lava

Molten rock beneath the surface of the Earth is called magma. Magma varies with factors such as the source material (i.e., the rocks that were melted to form the magma), the depth of melting, and how the magma changes as it moves toward the surface (e.g., olivine crystals might form and settle out of the magma). Also, magmas are not always fully melted – they may entrain unmelted rock fragments or mineral crystals. These unmelted fragments are called *xenoliths* (“strange stones”).

When magma flows out onto the surface, it is known as lava. Lava applies to the pools, rivers, and fountains of molten rock that flow from volcanic vents. In addition, when the melt “freezes” solid, the resulting rock may be commonly called “lava” or “lava rock.” Lava from Mauna Loa produces basalt, a dense black volcanic rock, while Mt. St. Helens produces a volcanic rock called dacite.

## Lava on Mauna Loa

A wide variety of volcanic rocks make up the Hawaiian Islands. This is not meant to be an exhaustive discussion of their types. Rather, our purpose is to compare how mineralogy affects the drastically different styles of eruptions that we observe between Mauna Loa and Mt. St. Helens.

Much of Hawaiian “lava rock” is basalt while lava from Mt. St. Helens solidifies to produce mostly dacite. Technically, basalt is an extrusive (i.e., volcanic) igneous rock that is “silica-poor” compared to dacite. Note that silica-poor means relatively low in silica, not that silica is absent. Hawaiian basalts are typically about 48.4% SiO<sub>2</sub> compared to about 63.5% SiO<sub>2</sub> for dacite from Mt. St. Helens.

Basalts are richer in iron and magnesium than dacite. Chemical analyses show Hawaiian basalts to be about 11.2% FeO and 9.7% MgO, compared to about 4.2% FeO and 2.0% MgO for Mt. St. Helens dacite. Hawaiian basalts are also lower in alumina than are Mt. St. Helens dacites (13.2% vs. 17.6% Al<sub>2</sub>O<sub>3</sub>). Due in part to higher iron content, basalt tends to be black in color while dacite is more often light gray or tan. Color, however, is not very useful in differentiating the two rocks because dacite can also be dark gray, red, or even black. Basalts are also denser than dacites, but the apparent density of a volcanic rock can be deceptive because many eruptive rocks contain open space – vugs and vesicles formed from gas bubbles during cooling.

Basaltic lavas erupt with substantially higher temperatures than dacitic lavas. The normal temperature range for basaltic lavas is about 1100-1250°C (2012-2282°F), versus that of dacitic lavas at about 800-950°C (1472-1742°F).

## Mineralogy of a lava

If we look into the crystal structures of the above silicate minerals, we can see why basaltic lavas behave so differently from dacitic lavas.

Mineralogically, basalt is composed mostly of calcium-plagioclase and pyroxene minerals with additional minor amounts of olivine. The principal minerals in dacite are quartz, feldspar, pyroxenes, and hornblende. The pyroxenes are a group of related minerals that include augite, diopside, and enstatite. Hornblende (more properly ferro-hornblende or magnesium-hornblende) is an amphibole mineral. Note that both dacite and basalt have pyroxenes, but only dacite has quartz.

Silicate minerals are built of silica tetrahedrons – each silicon atom is surrounded by four oxygen atoms. In framework silicates (also called tectosilicates) like quartz, each silica tetrahedron attaches to four other silicon atoms, which are themselves surrounded tetrahedrally by four oxygen atoms. Thus, quartz's structure is much like a tetrahedral jungle-gym. Inter-connectedness of the silica tetrahedrons gives the quartz structure great strength and rigidity.

In olivine, each silica tetrahedron is by itself, unattached to any other silicon atoms. The silica tetrahedra are surrounded by a sea of magnesium or iron ions. This is why olivine belongs to the class of nesosilicates, or “island silicates.”

Pyroxenes and amphiboles are composed of chains of silica tetrahedra (chain silicates are called inosilicates). In these minerals, the tetrahedra are linked at their corners to build long chains of tetrahedra. The principal structural difference between pyroxenes and amphiboles are that the former is built of single chains, while the latter has double chains (two chains linked side-by-side).

The behavior of a lava is related to the mineralogy of the rocks that it will eventually form. A molten lava is not simply a soup of unattached atoms. Rather, within the molten lava, silicon and oxygen atoms are already bonded together, and to a certain extent the silica tetrahedrons are also beginning to connect (or “polymerize”). A lava with a higher content of silica will have a higher degree of interconnectedness.

When silica tetrahedra are linked together, they make the lava “sticky” and less fluid. Molten lavas in which the silica tetrahedra are not well connected tend to flow readily. Basaltic lavas, which will form chain silicate crystals (pyroxenes and olivine), are less “sticky” than lavas such as dacitic lavas, from which framework silicates like quartz will form. Dacitic lavas, with substantially higher silica contents, are less fluid than basaltic lavas, which have lower silica contents.

## Characteristics of eruptions

In silica-rich magmas such as those that produce the dacitic lavas of Mt. St. Helens, the “stickiness” of the lava prevents gases from escaping easily. As dacitic magma rises upward within the volcano, the confining pressure (from the weight of the overlying lava and rock) decreases. Dissolved gases begin separating from the magma as bubbles, but the “stickiness” of the magma prevents the resulting gases from escaping easily. When the confining pressure decreases sufficiently, the pressure exerted by the confined gases grows greater than the confining pressure, the gases expand rapidly, and the overlying lava and rock is blown upward. This, in turn, decreases the confining pressure of deeper magma, and it too releases gas, which expands and is also blown upward. Thus, the eruption takes off violently.

When it erupts, Mt. St. Helens kicks out a great amount of ash and dust. Lavas that escape being blasted sky-high tend to pile up in sticky masses near the lava vents. Dacitic lava does not flow well. This is why stratovolcanoes (volcanoes made of alternating layers of lava and ash) like Mt. St.

Helens have steep sides compared to those of Mauna Loa.

Contrariwise, fluidity of Hawaiian basaltic magmas allows dissolved gases to escape from the molten magma before an eruption occurs. The resulting lava flows quite readily and smoothly. Hawaiian basaltic lavas have been clocked at flow speeds up to 6 mph (9.6 kph). Fluidity allows basaltic lavas to flow great distances and the resulting pile of volcanic rock can be quite broad – more than one hundred miles across at its base. These large broad volcanoes are called shield volcanoes because they resemble a giant round shield lying on the ground.

The fluidity of Hawaiian basalts allows the volcanoes to create lava caves. The lava caves found in Hawaii are actually the tubes through which molten lava flowed during an eruption. Rock is a good insulator. During an eruption, the exterior (exposed to air or water) of a lava flow will cool and solidify forming a rock crust. This crust then insulates the remaining molten lava, which continues to flow. Lava flows can create their own “pipes” or tubes. The walls of these tubes form from solidified lava, and molten lava flows downhill through the tubes for considerable distances (many miles). Some tubes extend into the sea. When the eruption ceases, the tubes may drain completely, leaving a lava tube cave behind. The last bits of lava in an otherwise empty tube solidify as dagger-like “icicles” of basalt hanging downward from the ceiling.

©2009, Andrew A. Sicree, Ph.D.

## **GREISENS, GRANITES, AND TIN**

Greisen is an altered granitic rock of interest to mineral collectors and prospectors alike. A greisen is composed principally of quartz, mica, and topaz. The mica is usually either muscovite or lepidolite (lithium-bearing mica).

Associated minerals formed in greisens during the alteration process include tourmaline, wolframite, rutile, and fluorite. The presence of cassiterite (SnO<sub>2</sub>, tetragonal tin oxide) is characteristic of greisen, to the extent that greisen has been defined by some as a tin-bearing rock.

## **SOLID-SOLUTION SERIES**

Mineral formulas represent an effort to write down, in “chemical shorthand,” the composition of a mineral. You may see more than one mineral formula for a mineral because it is sometimes difficult to pin down the exact composition of a mineral. Olivine is an example of mineral that

occurs as a solid solution series. Mineral species lists usually report that olivine is not an accepted mineral species and they will refer you to forsterite and fayalite.

Olivine does exist, however. It is a mineral with the formula  $(\text{Mg,Fe})_2\text{SiO}_4$ . The difficulty arises from the fact that magnesium (Mg) and iron (Fe) substitute completely for each other. This means that the (Mg,Fe) portion of the olivine formula could represent 80% Fe and 20% Mg, or 100% Fe and 0% Mg, or 0% Fe and 100% Mg, or any other possible ratio of the two elements. We call the magnesium-rich (>50 mole% Mg) side of the solid solution series *forsterite*, while the iron-rich olivines (>50 mole% Fe) are called *fayalite*. The "end-member" composition for forsterite is represented by  $\text{Mg}_2\text{SiO}_4$ , while the formula for the magnesium-free end-member fayalite is  $\text{Fe}_2\text{SiO}_4$ .

## Rock Shows

### May 2013

**25-26—PINETOP, ARIZONA:** Show and sale; White Mountain Gem & Mineral Club; Hon-Dah Resort/Conference Center; junction of Hwy. 260 and Hwy. 73, enter off Hwy. 73; Sat. 9-6, Sun. 10-4; adults \$2, children (16 and under) free; demonstrations, speakers, kids' activities, silent auction, raffles, fluorescents, jewelry, minerals, fossils; contact Rick Olson, 8276 Tahoe Pl., Show Low, AZ 85901, (928) 251-0949; e-mail: [walkaround@earthlink.net](mailto:walkaround@earthlink.net); Web site: [whitemtngmc@gmail.com](mailto:whitemtngmc@gmail.com)

### Jun 2013

5-9-Open Air Gem & Mineral Show in Flagstaff, AZ presented by the Coconino Lapidary Club and Silver Saddle Outdoor Market Contact Becky Cox email: [bcox@fused1.org](mailto:bcox@fused1.org) 6666 North Snowflake Drive Flagstaff, AZ 86004

### Jul 2013

**12-13—FLAGSTAFF, ARIZONA:** Annual show; Val Latham, Sharon Szymanski; Radisson Hotel Ballroom; 1175 W. Hwy. 66; Fri. 9-5, Sat. 9-4; adults \$3, children free with adult; gems, beads, rocks, jewelry, fossils, lapidary tools and supplies, gold and silver jewelry, rocks, agates, rock slabs, cabochons, rough rock, costume jewelry, wire wrapping on the premises; contact Val Latham, 840

W. Charleston Ave., Phoenix, AZ 85023, (602) 466-3060; e-mail: [Val65@cox.net](mailto:Val65@cox.net)

## Bench Tips CUTOFF WHEELS

Cutoff wheels are inexpensive and do a great job cutting or shaping steel. You can use them to sharpen tool points, cut piano wire to length, make slots, and sharpen worn drills. Other uses include modifying pliers and making your own design stamps. My preference is the one inch diameter size. Be sure to hold the wheel firmly so nothing moves to break the disk, and definitely wear your safety glasses. Those are little flakes of hot steel coming off the disk. BTW - Cutoff wheels are poor at soft metals like copper, silver and gold. Soft metals clog up the cutting edges.

## DEBURRING JUMP RINGS

When cutting jump rings from large gauge wire for chain making, you'll notice the saw leaves a small burr. An easy way to remove these is to tumble the rings with some fine-cut pyramids. Only a minute or so is needed, and in fact you don't even need a tumbler. I just put a handful of pyramids in a wide mouth plastic jar and shake for a bit. You can find these pyramids in the tumble finishing section of most jewelry supply catalogs.

More Bench Tips by Brad Smith are at [facebook.com/BenchTips/](https://www.facebook.com/BenchTips/) or see the book "Bench Tips for Jewelry Making" on Amazon

Nearly 40 local artists and artisans - each  
with a unique vision and creative personality -  
are offering fresh, fun & affordable  
art and fine crafts for sale!

2013 **ORACLE**  
**ARTIST**  
studio tour  
MAY 4&5

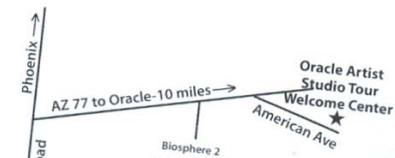
**SATURDAY & SUNDAY**  
from 10AM-5PM both days

YOUR FIRST STOP IS OUR  
**Gallery Welcome Center,**  
1880 American Ave.

PREVIEW artworks, PICK UP YOUR SELF-  
GUIDING TOUR MAP, and FOLLOW THE  
LAVENDER SIGNS around our community to  
studios, historic ranches, & group venues.

FULL ARTIST info  
& TOUR MAP to download:

[www.OracleStudioTour.com](http://www.OracleStudioTour.com)



Oracle is located in the cool Catalina foothills just  
35 MILES NORTHEAST OF TUCSON on Hwy. 77 (mile  
marker 100). FROM THE PHOENIX AREA, take Hwy. 60  
east to Florence Junction, then Hwy. 79 south toward  
Tucson. At Oracle Junction, follow Hwy. 77 to Oracle.