



## Wickenburg Gem & Mineral Society, Inc.

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

E-Mail — wgmssociety@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.*

## Leland Blue

By Dave Perkad

Leland is a small town along the eastern shore of Lake Michigan, Lower Michigan's western border. It's beginning history dates back to the early to middle 1800's. The era of its industrial site as a smelting operation was from the 1860's to 1890. In the early to middle 1900's it was a small picturesque commercial fishing port. It is currently an attractive and very popular tourist area, just north, (up the coast line), of Sleeping Bear Dunes National Lakeshore. Sleeping Bear, with its gigantic sand dunes and the adjacent Manitou Islands have been designated as one of the most beautiful parks in the US. Figure 1 is of a portion of Lake Michigan showing Leland, Michigan and the Sleeping Bear area.

Leland, located at a river mouth on the western shore of Lake Michigan, where it had a good harbor and the vicinity had an abundance of high quality wooded areas. In the later half of the 1800's, many steamers plied Lake Michigan carrying goods up and down the lake, particularly wood and other materials to feed the building of the Chicago and Milwaukee areas. Rich iron ore deposits were discovered in the upper peninsula of Michigan. Leland was a source of quality maple, birch and other hardwoods, woods that made high quality charcoal. Thus, iron ore from the upper Michigan mines was transported by rail to the lake shore, loaded onto steamers (at Escanaba, an upper Michigan port just north of Wisconsin and at the northern end of Green Bay), and transported across the lake to Leland. Smelters were built at this site where the iron ore met the charcoal. This smelting industry thrived in Leland from 1865 to 1885, after which the operation was no longer economically viable and it was closed.

The iron ore had a high content of quartz in it. The ore was put into cauldrons (smelters / hot ovens) to separate out the iron. Limestone was also added as a flux in the smelting process. The smelters were brought to an intense heat by the charcoal. When the mixture was melted, the quartz and other impurities and additives, i.e. slag, would float to the top and this mixture was skimmed off and simply disposed of. It was dumped in low areas and in the lake and anywhere convenient.

*Blue continued.....*

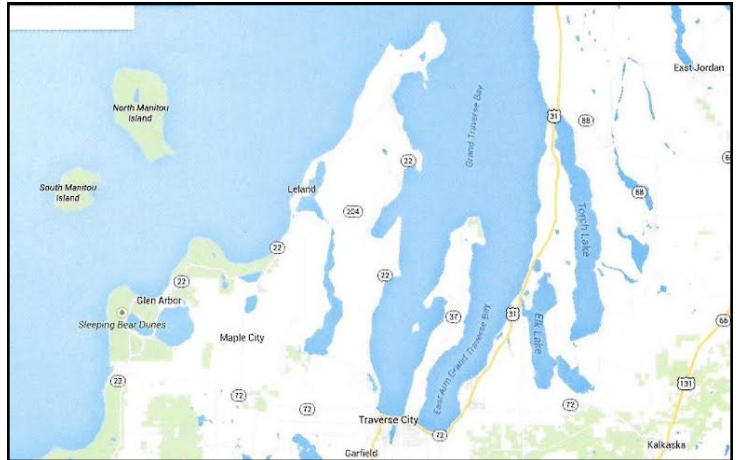


Figure 1 Map showing location of Leland, Michigan

*.....Blue continued*

The molten mixture byproduct was really a glass mixed with other rock debris. The color of the glass mixture was dependent on the mineral content of the basic ore and the chemical additives of the smelting process. The slag by-product of the Leland operation was apparently shades of blue with many impurities mixed-in. This glass by-product can also be in many shades of purple, grey and green from a light to a deep color. A local jeweler states that there are over 30 colors.

Although there were a number of similar smelting operations on Lake Michigan, Leland is the only place known to have produced the shades of blue and turquoise that we know today as Leland Blue. The slag can also be purple, multiple shades of grey and green, up to a dark olive green.

*Blue continued page 3.....*

### INSIDE THIS ISSUE

Leland Blue—article by Dave Perkad	1,3
Meeting Minutes, New Members	2
Anderson Mine trip	4-6
Save the Museum	7-8
Coupon for Anthem Show	8
Show List, Upcoming Field Trips; Club Info	9
Mineral Symposium agenda	10
Minerals in Our Everyday Lives — Uses of Fluorescence	11

### Meeting Minutes — February 6 , 2014

Craig Jones called the meeting to order at 7:00 pm. Total attendance: 43 with 7 visitors. Craig thanked everyone for participating in the outings. It has been a lot of fun.

The January minutes were read and the Treasurer's report given. Both were approved as read. Debbie reported that \$50.00 was spent for rental of the meeting room for a memorial (in lieu of flowers) for Lucille Burroughs. She also read thank you letters from Lucille's family members.

Old Business: Beth thanked everyone who helped with the Gem and Mineral show in November and gave out the remaining few door prizes to volunteers. The tables used for the show will not be available this year for the Gem and Mineral show. Beth, Dale, and Craig will meet with the school to see what arrangements can be made. They will approach the school with a "swap": the school's use of the tables we plan to buy, for a reduction in the amount of rent we pay for the show. This was voted on and approved.

Craig thanked Tom and Gloria Luther, and Terry Warren, for their instructional help with the polisher/grinder at Stanton.

Marty talked about the membership pamphlet revision and encouraged people to work on submitting examples.

*Minutes continued.....*

*.....Minutes continued*

Steve Hill reported on the Gem and Mineral Society scholarship. It seems that the kids are apprehensive about applying, because they don't think they can win. Teachers and kids need to get on the web site to learn more about it.

Field Trips: February 10 was the Anderson Mine trip. Dale gave a presentation on what we can find and where to meet: 9:30 am at Alamo Road and Highway 93; February 21<sup>st</sup> at Al and Erma Roe's place in Congress; and March 7<sup>th</sup> at The Gem Shop in Morristown for a polishing demonstration by Jim Jacobs. Bring your camp chairs and water.

New Business: Debbie needs a co-signer for checks, etc., and suggested that Craig Jones be the one. A motion was made, seconded, and passed.

Dave Perry did a presentation on copper mines in Keweenaw, Michigan,

Show & Tell: Al Roe was the winner.

Door Prizes: Janet Bell, Greg Butler, Sue Jones, Harriet Wills, Allyson Arnold, and Mel Canter.

The meeting adjourned at 8:45 pm.

Respectfully submitted,  
Sue Jones, Secretary

### 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.



Azurite Sun  
Malbunka Copper Mine, Areyonga, Northern  
Territory, Australia  
From the Celestian Collection, Photo by Stan Celestian

.....Blue continued from page 1

The slag that was dumped into the lake has been broken and tumbled by the lake to produce rounded rocks and stones of many sizes that blend-in with the multi colored lake stones. **Figure 2** is of typical Leland Blue "stones" as found along the lake shore in the Leland area. In land-fill dump areas and other land sites, the slag is as it solidified after being skimmed from the furnaces. It has a usually very fractured glass-like consistency.



Figure 2 Water-worn Leland Blue 'stones'  
Photo by Dave Perkad

**Figure 3** shows chunks of slag as found and slabs of the slag as cut. Although always attractive, the material has become very popular in jewelry making and the rough can range up to \$20.00 an oz. for good colorful and textured material. The mixed colors and imperfections can enhance the uniqueness and beauty of a "one of a kind" piece of jewelry.

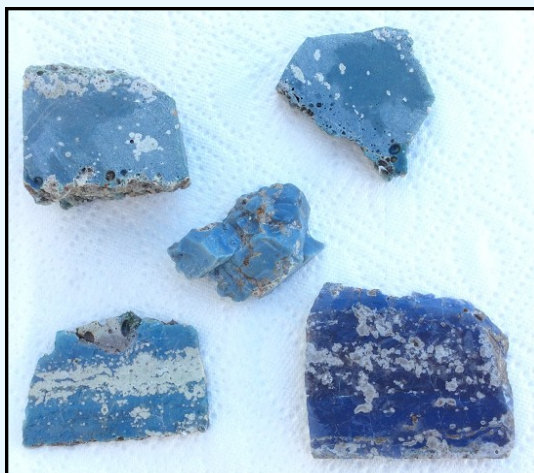


Figure 3 Rough and slabbed Leland Blue  
Photo by Dave Perkad

.....Blue continued

**Figure 4** shows jewelry and cabochon samples. Note that one of the cabochons has a residual iron deposit from the smelting process. Also note the swirls of color, predominantly a blue turquoise and blue-green tint and the impurity deposits within the material. The products are usually in the form of beads or pendants and is exquisite in combination with other formed materials.



Figure 4 Cabochons and jewelry using Leland Blue  
Photo by Dave Perkad

Several years ago, there was a "feeding frenzy" of locals gathering Leland Blue. The town had decided to modernize a large parking area near the waterfront and the fishing port, a large, very popular, tourist area. The heavy equipment uncovered a large cache of "dumped" slag. As word spread, locals descended on the area with buckets to gather what they could. Any remains of that site are now under a large blacktopped municipal parking lot. Needless to say, there is only a finite quantity of Leland Blue in existence. There may be some more yet to be washed up on the lakeshore in the near vicinity (people continually walk the local beach areas, particularly in the spring when the ice recedes and also after major lake storms that gin up huge waves which reshape the beach. There may be some dump sites yet to be discovered. One never knows if a new excavation site may have been an old dump site in the 1860's era.

Note that there are many unique and colorful lake stones that one discovers while walking the beaches of Lake Michigan.





Panoramic view of the Anderson Mine

## ANDERSON MINE TRIP FEBRUARY 10, 2015



On a lovely Tuesday, a caravan of about 10 vehicles, led by Dale Keiser travelled to the Anderson Mine, an abandoned uranium mine, in the beautiful and rugged transition zone of Arizona. This has, for decades, been a favorite spot for Arizona rockhounds. Agate, petrified palm rootlets, palm wood, and uranium minerals (carnotite, weeksite) can all be found in the mine and surrounding area. *Photos by Susan Celestian, unless otherwise noted.*

The Anderson Mine was an active mine in the 1950's, with ore being shipped to Tuba City for milling. Production came to a halt in 1959, when the Atomic Energy Commission quit buying purchasing ore. A number of feasibility have been conducted by several mining companies, in the intervening years, resulting in over 1400 drill holes. In May 2011, Uranium Energy Corp merged with Concentric, acquired 459

unpatented lode mining and placer claims, staked an additional 89 claims (total of 9.852 acres);. A technical report was released in June 2012. After spending nearly \$1,000,000, the bottom line of the report was that reactivating mining at the mine is feasible, with an annual production over 1,000,000 pounds over a mine life of 14 years. The ore would be heap leached, and "loaded resin" shipped to White Mesa Mill (Blanding, Utah). More study was proposed before jumping in with both feet. SO, one of these days, the mine may be inaccessible to rockhounds. In the meantime, all that assessment has greatly improved the roads to and in the mine property.



Bulldozer at work on the Anderson mine.  
Source: 2011-03-0869, ADMMR Photo Archive,  
Arizona Geological Survey.

Mineralization occurs in 197-328-foot thick Miocene-age Chapin Wash Formation — lake sediments (interfingering siltstones, mudstones, silty limestones, and calcareous tuffaceous rocks), associated with organic debris (plant material). Carbon-rich materials are associated with the precipitation of uranium minerals. Sediments and volcanic rocks were deposited in a series of basins that developed in the area, 17-19 million years ago.

*Continued on page 5.....*

.....continued from page 5



Dale Keiser gathers the group for orientation at the Anderson Mine.



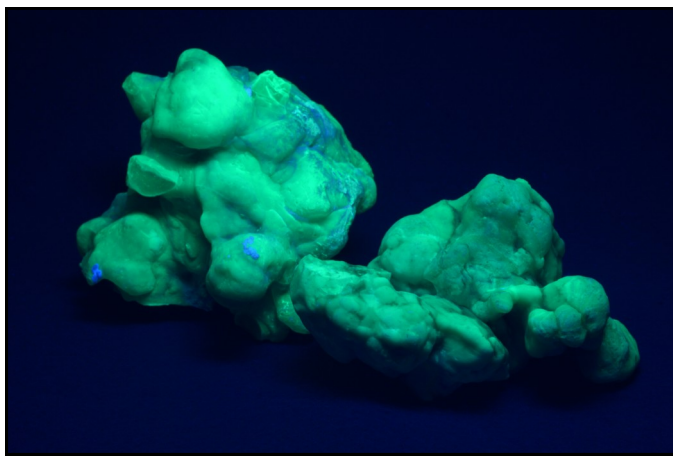
A complimentary "air show" over the Anderson Mine.



The ground around the Anderson Mine is littered with agate.



Lumpy white agate occurs in beds throughout the Anderson Mine property.



ABOVE: The photo on the left is of a couple funky lumps of agate in plain light; on the right, the same funky lumps in UV light *Photos by Stan Celestian*

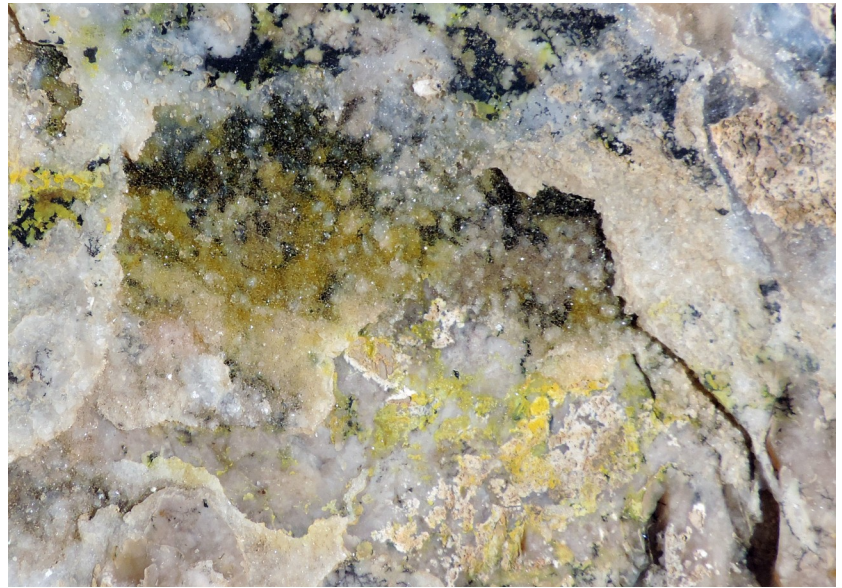
RIGHT: A look across the pit at the Anderson Mine and off toward the west.



Continued on page 6.....

Sparkly yellow crystals of Weeksite (probably) cover the surfaces of many rocks within the Anderson Mine pit.

A Uranium ore mineral, Weeksite is a Hydrus Potassium Uranate Silicate  
 $K_2(UO_2)_2(Si_5O_{13}) \cdot 4H_2O$



Spring has sprung near the Anderson Mine.....



On the drive to the Anderson, we went through the heart of Joshua Tree Forest, Yavapai County. This tree-like yucca is endemic to the southwestern United States.



Blue Dicks (aka Purplehead or Brodiaea) - *Dichelostemma capitatum* - at the mine.



California Poppy  
*Eschscholzia californica*



Volcanic craters???? No — just some cool anthills in a wash.

## HELP! Restore the Mineral Museum

A letter from Kathy Connell, local gold club member and former museum volunteer

Update from Richard Zimmerman

Dear Friends,

We have a chance to restore the mineral museum back to its former state with some small changes and upgraded exhibits. This will only occur if the public informs their present legislators they want **Bill SB1200** passed.

You have 3 ways to let your representatives know your desire for the bill to pass through our state legislator. You can call, e-mail or write a snail mail letter. They pay most attention to actual letters sent to them, but the other two methods will work.

Each of us has **One Senator** and **Two House Representatives**. This is different from the federal government.

The major change this bill makes is that it hands the running of the mineral museum over to the Arizona Geological Survey. At the present time the Arizona Historical Society is running the show and they dismantled the museum.

If you write or call you need to express your feeling from your heart. You can talk about the beauty of the minerals that are no longer on display in one general area, the children's educational program that has stopped, enjoyment of bringing visitors to the museum, the family days that no longer exist, volunteering and giving back to the community. Everyone of us has a different story. Do not repeat everything that I just wrote down. It will sound staged.

Some of us know our legislators and some do not. Copy off this e-mail and follow the directions on how to find out **who and how** our present legislators are and how to contact them:

1. Go to [www.azleg.gov](http://www.azleg.gov)
  2. This will bring you to a bunch of web pages so find the web page with the same link [www.azleg.gov](http://www.azleg.gov) and hit it.
  3. When the page comes up it will have a picture of the state capitol and on the LEFT hand side there is a column and among the subjects is how do I find my legislator....**hit it**
  4. Now click where it says you do not know who your legislator is
  5. At the top of the page that appears type in your present address in the yellow box and hit FIND.
  6. You want the number for the LEGISLATIVE DISTRICT not the Congressional District (this is for federal elections)
- You are almost there....it is not that hard.....
7. Now **go back to the previous page** by hitting the BACK ARROW at the top left hand corner of the page you are presently on.
  8. At the top of the page it says Senate and put your cursor on that and scroll down to members and hit members!
  9. The page brought up will list alphabetically all the senators in the state and scroll down until you see your district number which you found a few minutes ago. This will tell you who your senator is.
  10. Next to your senators name is their e-mail, telephone number and room number (which you will use if you send him a real letter)

Hopefully, you will take the time to call or e-mail your senator and request that he support **SB1200**. If you are more ambitious a letter can be sent.

Continued on page 8.....

.....continued from page 7

Then you can do the same for your **2 state representatives**. Go to the top of the page and hit house, then members, and scroll down the list and find your 2 representatives. If the senate passes SB1200 it goes over to the house to committee and hopefully makes the floor for a vote. You can call them now and tell them you are supporting SB1200 and hope that they will too.

If you write a real letter, below is **an example** of the address on the envelope:

Senator Martin Quezada  
Arizona State Senate Capitol Complex  
Rm. 313  
1700 West Washington  
Phoenix, AZ  
85007-2890

**UPDATE** Richard Zimmerman: I just received the message below from Senator Gail Griffin. We need to have everyone possible support SB1200 with a message to the Governors office now. Snail mail or a fax will get more attention than an email, but please do send an email if that is all that fits in you schedule. A phone message can help too. To review the bill go to: [http://www.azleg.gov/DocumentsForBill.asp?Bill\\_Number=SB1200&Session\\_ID=114](http://www.azleg.gov/DocumentsForBill.asp?Bill_Number=SB1200&Session_ID=114)

Governor Doug Ducey  
STATE CAPITOL  
1700 West Washington Street  
Phoenix, AZ 85007

[Directions](#)

EMAIL [Send your questions and comments to Governor Ducey](#)

TELEPHONE NUMBERS: Phoenix: [602.542.4331](tel:602.542.4331); Tucson: [520.628.6580](tel:520.628.6580)

SUBSCRIBE, FOLLOW, AND INTERACT

[facebook.com/dougducey](https://www.facebook.com/dougducey)

[twitter.com/dougducey](https://twitter.com/dougducey)

[Governor's YouTube Channel](#)

[instagram.com/dougducey](https://www.instagram.com/dougducey)

**SAVE \$1.00  
with this email coupon**

**2015 ANTHEM  
GEM & MINERAL SHOW**

**March 28th Saturday 9am-5pm  
March 29th Sunday 9am-4pm**

**Diamond Canyon School  
40004 N Liberty Bell Way  
Anthem, AZ 85086**

Gems, minerals, fossils, jewelry, beads,  
geodes, raffles, kids events.

Adults \$3; Seniors and students \$2; Children are free

Hosted by  
**Daisy Mountain Rock & Mineral Club**



## UPCOMING AZ MINERAL SHOWS

**March 12-15, 2015 - Deming, NM** 50th Annual Rockhound Roundup; Deming Gem & Mineral Society; Southwest New Mexico Fairground; 9-5 daily; Free admission, free parking. Field trips Thurs-Sat. Flyer: <http://www.thedgms.com/wp-content/uploads/2014/09/2015-Flyer.pdf>

**March 27-29 - Phoenix, AZ** Minerals of Arizona Symposium; Clarion Hotel at the Phoenix Tech Center; northwest corner of Elliot Rd & I-10. Symposium registration fee; but the Mineral Sale is FREE — there will be dealers in several of the hotel rooms: Friday 5-10, Sat 4:30-6 and after dinner. **SEE AGENDA ON PAGE 10.**

**March 14-15 - Cottonwood, AZ** CKM Productions, LLC; Mingus Union High School; 1801 East Fir Street; Sat 10-5, Sun 10-4; Admission \$3.00 adults.

**March 28-29 - Anthem, AZ** Daisy Mountain Rock & Mineral Club; Diamond Canyon School; 40004 N Liberty Bell Way; Sat 9-5, Sun 9-4; Admission \$3, seniors & students \$2, children free; parking free. **COUPON ON PAGE 8**

**May 16-17 - Pinetop, AZ** White Mountain Gem & Mineral Club; Hon-Dah Conference Center; 777 Highway 260; Sat 9-6, Sun 10-4; Admission \$2.00, seniors 70+ Free, students and children 18 and under free. Dinosaur Exhibit.

**June 5-7 - Flagstaff, AZ** Coconino Lapidary Club, Outdoor Market At Silver Saddle; 9001 N Hwy 89 (Hwy 89 and Silver Saddle Rd, 3.5 miles north of Flagstaff Mall); Fri-Sun 9-4; Admission is Free.

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](http://whitemountain-azrockclub.org/Public_AZ_Clubs_Links.html)

## UPCOMING WGMS FIELD TRIPS

**March 7, 2015 ROCK POLISHING DEMO** by Jim Jacobs; Gem Shop in Morristown

*DATES SUBJECT TO CHANGE*

**If you all have some place that you would like to go. Let Bob Bartlett 623-388-0749, Marty Hagan 602-469-7770, Craig Jones 208-681-4770. We have some dates to fill in. This is your club lets 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 Jones .....208-523-9355  
**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 don't 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 2014/15

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

**Minerals of Arizona**  
**Twenty-third Annual Symposium**  
**Friday March 27, Saturday March 28, and Sunday March 29, 2015**  
**Clarion Hotel at Phoenix Tech Center, 5121 E. La Puente Avenue\***

**Friday Program:** Micromineral Symposium

2:00 Welcome by Ron Gibbs

Trade / give-away session - Microscopes available or bring your own. Please bring minerals to share, trade, and/or brag about.

4:00 Presentation: to be announced

5:00 Dealers selling in rooms

**Saturday Program:** Continental Breakfast 8 AM, talks from 9 AM to 4:40 PM followed by a Dinner at 6 PM with a speaker and an auction of donated items

8:00 - 8:45 - Coffee Hour

8:45 - 9:00 - Welcoming Remarks and Introductions

9:00 - 9:40 - Crystallized Gypsum Deposits of the San Pedro River Basin - Barbara Muntyan

9:40 - 10:20 - Red Cloud Mine - the world's greatest wulfenite locality - Les Presmyk

10:20 - 10:50 - Break

10:50 - 11:30 - Notable Native Silver Specimen Producing Localities in Arizona and New Mexico - Tony Potucek

11:30 - 12:10 - The Apex Mine, Utah -- A Colorado Plateau-type Solution-Collapse Breccia Pipe and a Tsumeb, Namibia Analogue - Karen Wenrich

12:10 - 1:30 - Lunch

1:30 - 2:10 - Mine Reclamation and Mineral Specimen Recovery Operation at the Blanchard Mine, Socorro County, New Mexico - Mike Sanders

2:10 - 2:50 - Origins of Azurite and Malachite - Erik Melchiorre

2:50 - 3:20 - Break

3:20 - 4:00 - History of the Freeport-McMoRan Minerals Mineral Collection - Will Wilkinson

4:00 - 4:40 - Emus, 'Roos and Minerals and Mines at Broken Hill, NSW, Australia - Anna Domitrovic

4:40 - 6:00 - Happy hour, visit dealers

6:00 **Dinner and evening speaker** - There will also be an auction of donated items and an evening speaker to be announced. Cost is \$20 per person.**Sunday Program****9:00 to 11:00** - Portable XRF demonstration of analyzing gold and other minerals for their chemistry. Participant can bring one unknown sample to be analyzed.

\*The Clarion Hotel is located on the NW corner of Elliot Road and I-10 in Phoenix (Take Interstate 10 N or S to Elliot Road exit. Go west on Elliot Road to the first light (a short block), turn north on 51st Street to La Puente Ave. Turn right into the Clarion). The Clarion has a special rate for rooms during the symposium. They are \$99.00 per night plus tax and include breakfast and a light evening meal (salad bar and one hot item). If you want a selling room you need to request a first floor, courtyard (poolside) room, these **rooms** are also \$99 plus tax this year. We have asked that those rooms be saved for dealers. If you do not want a selling room, just specify that you are with the mineral symposium to get the quoted rate. The Clarion telephone number is 480-893-3900.

## MINERALS IN OUR EVERYDAY LIVES

In honor of the funky lumps on page 5

### USES OF FLUORESCENCE

#### MINING

- ◆ Prospect for Scheelite, a tungsten ore — both along the surface, and in mine walls and drill cores (subsurface prospecting)
- ◆ Sort ore rock, to separate out Scheelite and other fluorescent ore minerals
- ◆ Spot small gemstones in gravel or crushed ore — useful for ruby, kunzite, diamond, and opal
- ◆ Identify origin of gemstone (for example: South Africa's Jagerfontein Mine produces colorless diamonds with strong blue fluorescence)

#### FOOD INDUSTRY

- ◆ Aromatic amino acids, nucleic acids, tryptophan residues of proteins, riboflavin, and vitamin A are fluorescent molecules in dairy products. Monitor fluorescence at various wavelengths can help to track desired changes occurring as cheese ages.
- ◆ Identify geographic origin of cheese.
- ◆ Aid in monitoring the oxidative stability and quality of yogurt
- ◆ Establish egg freshness
- ◆ Identify the freshness of meat, chicken and fresh/frozen-thawed fish
- ◆ Identify food-borne pathogens
- ◆ Identify bones/cartilage/fat, for removal from meats on conveyor belt,
- ◆ Establish purity of olive oils
- ◆ Discriminate type of edible oils
- ◆ Fingerprint wines
- ◆ Determine botanical origin of honey

*Continued .....*

#### HEALTH

When fluorescent chemicals are bound to cells, body fluids, or cleaning supplies:

- ◆ Monitor cell proliferation
- ◆ Detect damage to cornea, other body parts
- ◆ Detect foreign bodies in the eye
- ◆ Monitor thoroughness of hospital cleaning procedures
- ◆ Track fluids through body (these may be injected or ingested (one example is to determine whether a person has ingested antifreeze)
- ◆ Fluorescence image-guided surgery
- ◆ Diagnosis of fungal and bacterial infections
- ◆ Detection of melanoma

#### OTHER

- ◆ Fluorescent chemicals added to fluids can be used to detect leaks in pipes (ex: underwater oil and gas pipes)
- ◆ Fluorescent chemicals released into water can be used to track and locate lifeboats or other stranded-at-sea individuals
- ◆ Fluorescent lighting
- ◆ LED lighting
- ◆ Visualize fingerprints, in forensics.
- ◆ Detect blood, in forensic investigations
- ◆ Road signs
- ◆ Detection of counterfeit money
- ◆ Authenticate oil paintings
- ◆ During WWII — UV interior lighting to read instrument panel (safer than radium paint and less visible to enemy); fluorescent ink for charts; UV visible pencils and slide rules

**AND MANY MORE**