

The Lake George Gem and Mineral Club -

Club News

January, 2018 Happy New Year!!



Program for the month: Saturday January 13, 2018

Our guest speaker will be LGGMC member and USGS scientist **Pete Modreski**, who will talk about “**New Ideas About Pegmatites**”. Here’s an abstract of Pete’s talk:

New Ideas about Pegmatites

Pete Modreski, U.S. Geological Survey

Pegmatites are exceptionally coarse-grained igneous rocks, typically occurring as dikes or pods within igneous or metamorphic host rocks. A common definition says that most grains are larger than 1 cm or 1 inch, but crystals can be huge, up to meters in size. Feldspar crystals up to 35 feet in length have been described. Granitic pegmatites are the most common, in which the typical minerals are quartz, microcline, albite, and micas. However, pegmatites can occur in syenite and other types of igneous rock.



1. (left) The Harding pegmatite, near Dixon, New Mexico. The pegmatite is the white, lower layer, with several mine tunnels visible in it; overlain by dark-colored metamorphic rock (amphibolite schist).
2. (right) The Lesser White Cloud pegmatite, South Platte district, Jefferson County, Colorado. A white quartz core, surrounded by feldspar-rich wall zones.

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The classic description of pegmatites states that they form from unusually water-rich magma, which promotes the growth of large to “giant” crystals, and that they represent the last, highly fractionated portion of a granite pluton to crystallize. Many “incompatible” chemical elements become concentrated in pegmatites, leading, in some cases to economic concentrations of lithium (in spodumene and/or lepidolite), beryllium (beryl), cesium (pollucite), tantalum and niobium (tantalite, microlite, columbite), tin, rare earths, uranium, and other metals. The concentration of light elements (lithium, beryllium, boron, fluorine, phosphorus) in pegmatites, plus the water-enriched environment, sometimes results in the growth of gem minerals, especially tourmaline, beryl, and topaz.



3. (left) The Brown Derby pegmatite, Gunnison County, Colorado. The pegmatite is the light-colored rock, overlain by dark-colored amphibolite.

4. (right) Close-up at the Mount Mica pegmatite, Oxford County, Maine. Elbaite tourmaline (dark green at base, grading into pink) with lepidolite, feldspar, muscovite, and black tourmaline (schorl).

Granitic pegmatites can be classified as *simple* (unzoned) pegmatites; *zoned* pegmatites, which typically have a quartz core surrounded by feldspar-rich shells; and *complex* pegmatites in which late-stage aqueous fluids have altered the primary minerals to produce metasomatic zones enriched in lithium or rare metals. Chemically, pegmatites can be classed as NYF (niobium-yttrium-fluorine) enriched, or LCT (lithium-cesium-tantalum) enriched. The former are most often found in anorogenic or extensional environments and are directly associated with granite plutons; the latter occur at deeper levels in orogenic belts and are emplaced within metamorphic host rocks. The Pikes Peak batholith, Colorado, is a classic host of NYF-type pegmatites; examples of the LCT type include the Harding pegmatite, New Mexico; the Brown Derby pegmatite, Colorado, and the White Picacho pegmatite district, Arizona. Other famous pegmatite districts worldwide include San Diego County, CA; the Black Hills, SD; the White Mountains, NH; Minas Gerais, Brazil; Madagascar; and Pakistan-Afghanistan.

Miarolitic pegmatites, the ones of most interest to mineral collectors in Colorado, are those that contain open cavities, originally believed to have been filled with hot, mineral-rich water into which free-growing gem crystals could form. Thus formed the amazonite-smoky quartz-topaz pockets in the Pikes Peak batholith, and the aquamarine-bearing pockets on Mount Antero.

Although it was always tempting to conceive of the large or perfect crystals in pegmatites as forming by very slow cooling, recent experimental studies, especially the work of David London (Univ. of Oklahoma) and his students, has inclined toward the view that pegmatites may crystallize quite rapidly—in years or weeks or even hours or days rather than in thousands or millions of years. In addition, crystal growth in pegmatites is

now being interpreted in terms of growth from a disequilibrium boundary layer enriched in incompatible elements, in which gem crystals grow rapidly from a thick, glassy, highly supercooled (cooled to a temperature far below its normal freezing point) melt, rather than from a highly fluid, water-rich liquid. There is also debate about which pegmatite magmas originate by partial melting of deeply buried, intensely metamorphosed rocks, rather than fractional crystallization of granite—that not all pegmatites have necessarily been derived from any “parent granite”, like the ones in the Pikes Peak batholith have.

We will also continue a **silent auction for some cool specimens** and other items donated by Club members. The specimens will be displayed at the back/side of the room with “bid sheets”. Each item will have a minimum starting bid. You write your bid and initials in a blank space on the sheet and then watch to see if others outbid you. You can keep on bidding until the President says bidding is closed. So, bring some CASH and be prepared for the fun!

✓ ✓ Here’s a message from incoming President, **Robert Baker**:

Interest in gems and minerals began the same way for all of us when we first bent over, picked up a rock, and said “That’s pretty, I wonder what it is?”. That sense of wonderment has led us to the Lake George Gem and Mineral Club where we can learn “What it is”. Our club has many experts, professionals, and experienced members who can answer your query; but the process of learning is much more than just asking another for the answer. Learning means looking in your Rock Identification Guide, attending a mineral identification class, going on field trips to see the different formations and rock types that the specimens come from, and doing online research through sites like Mindat.

Our club is committed to continuing education through the Pebble Pups program for our youngsters and the several classes that Bob Carnein holds each year. This year will not be an exception with a focus on fun learning opportunities like talks by experts after Club Meetings, the possibility of trips to local mines or to the dinosaur trackway in the Picketwire Canyon.

This is your club. Let the Club Officers know what your interests are (see the last page of this newsletter for their contact information). Have a safe, prosperous, and enjoyable 2018. HAPPY HUNTING!

Coming Events

✓ ✓ Several mineral, fossil, and geology clubs meet relatively nearby and encourage visitors. These include:

>**Cañon City Geology Club**, meets on the 2nd Monday of the month at 6PM in the United Methodist Church, Cañon City;

>**Colorado Springs Mineralogical Society**, meets on the 3rd Thursday of each month at 7PM in the Mt. Carmel Veteran’s Service Center, 530 Communication Circle, Colorado Springs;

>**Columbine Gem & Mineral Society**, meets on the 2nd Thursday of each month, 6:30PM in the meeting room, Mt. Shavano Manor, 525 W. 16th (at J St.), Salida;

>**Pueblo Rockhounds**, meets on the 3rd Thursday of each month at 6:30PM in the Westminster Presbyterian Church, 10 University Circle, Pueblo.

✓ ✓ **Watch for the following upcoming events:**

January-February (3 weeks) Tucson gem and mineral shows; 45 venues/shows. Check the internet for particulars (e.g. <https://spopress.com>).

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Feb. 23-25: Denver Gem & Mineral Guild Jewelry, Gem, and Mineral Show, Jeffco Fairgrounds, 15200 W. 6th Ave., Golden (corner W. 6th and Indiana)

April 6-8: Ft. Collins Rockhounds Gem & Mineral Show, Larimer Co. Fairgrounds, 5280 Arena Circle, Loveland.

April 6: North Jeffco Gem & Mineral Club Silent Auction, Arvada Community Center, 6842 Wadsworth Blvd., Arvada.

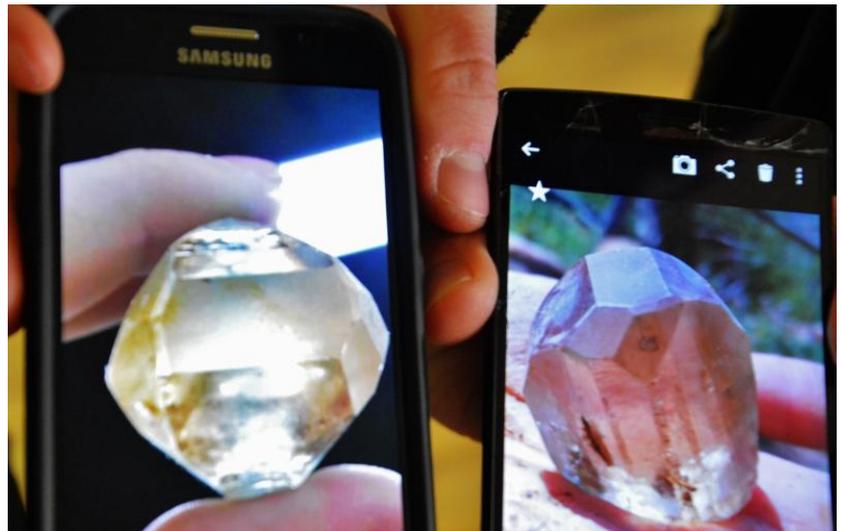
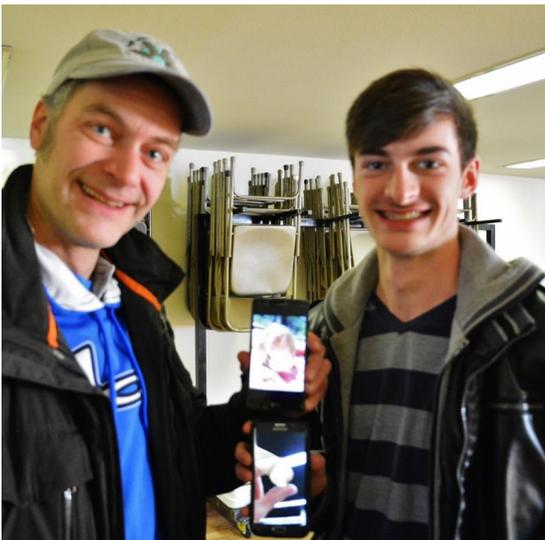
April 13-15: Colorado Mineral and Fossil Spring Show, Crown Plaza Hotel/Convention Center, 15500 E. 40th, Denver.

June 1-3: Pikes Peak Gem & Mineral Show, Norris Penrose Event Center, 1045 Lower Gold Camp Rd., Colorado Springs.

June 15-17: Victor Gem and Mineral Show, downtown Victor, CO.

✓ ✓ Many thanks to **Joey Korzekwa**, who is working on testing a new application that will make it much easier for members to pay their dues and sign up for field trips online. Watch for an announcement soon.

✓ ✓ More thanks to head photographer Frank Rosenberg, who took some great shots at the Christmas party:



Todd and Taylor look pretty happy about something.....



John Sprouse passes the gavel to new President Bob Baker



Jerrolynn Kawamoto explains wire wrapping



Lots of good food and interesting things to look at.....



Smokies with topaz, fluorite, and phenakite; some really BIG amazonites; those agates look good enough to eat!



A really nice Hartsel baryte by the Babbitz's; John Sprouse gets a cheering up from Loren Lowe.

✓ ✓ Steve Veatch sent this short article by a Lake George Pebble Pup:

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The Mysterious Blue Orbs of K2 Granite

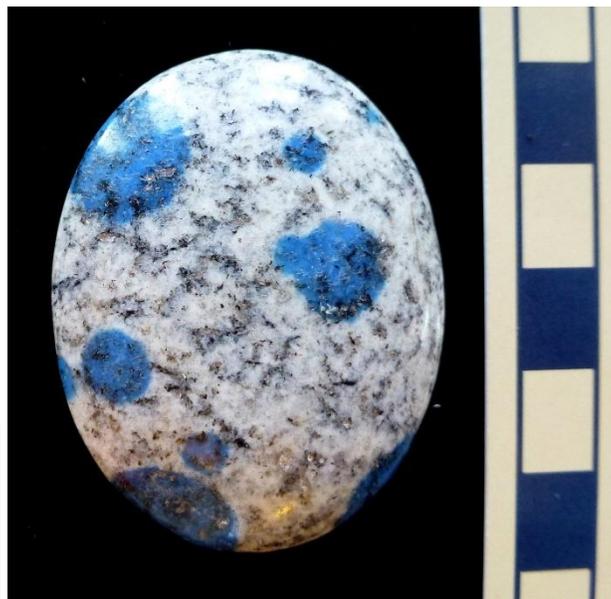
By
William Wray

K2 granite, with impressive splashes of blue circles or orbs on its surface, is a rock from a rarely visited site in the Himalayas. The blue circles are azurite inside of white K2 granite rock. The white granite is fine-grained and composed of these minerals: quartz, feldspar, muscovite, and biotite. The azurite stained parts of the granite, make blue dots, which range from a couple of millimeters to about two centimeters across. Azurite has a relative hardness of 3.5-4 on the Mohs hardness scale, but this is the hardness of the white granite because the azurite is only a stain. The azurite formed after all the other minerals in the granite had cooled and hardened. With a hand lens or microscope, azurite spheres reveal that the azurite appears along the edges of mineral grains, in tiny fractures in the granite, and in feldspar grains

Since azurite and white granite are rarely found together, some people don't think the blue orbs are azurite, and commonly think of it as simply a blue dye added to make the rock a novelty. Scientific tests have not been made, so the jury is still out on the blue orbs in this interesting rock. There is lively debate on mineral forums, including Mindat.org, about the nature of the blue orbs.

K2 granite is found near the base of K2, the mountain it is named after, in the Himalayas. K2, also called "Mount Goodwin Austen" is the second highest mountain in the world, rising up at 8,611 meters (28,253 feet). K2 was named by the British surveyor T.G. Montgomerie. The "K" comes from the Karakoram mountain range and the "2" means that it is the second tallest peak recorded.

K2 granite is an excellent lapidary material. It cuts and tumbles well because of its high feldspar content, and it can be easily shaped on a diamond wheel. K2 is durable in jewelry because the feldspar has a hardness of 6. K2 granite will scratch over time and is not suitable for bracelets or rings. K2 granite is not very pricey, and excellent specimens can be bought for about \$30 to \$40 at gem shows and other venues. K2 granite is a colorful rock, and its bright blue azurite orbs will make it a nice addition to your collection of curiosities.



An oval cabochon made from K2 Granite found on K2, a mountain between Pakistan and China, revealing several bright blue azurite stains. The blue azurite stains formed after the granite cooled and hardened. Photo © by the author. Specimen from the William Wray collection.



A view of K2, summer 2006. At 8,611 meters (28,253 ft) this mountain is ranked second largest in the world. Note the large valley glacier flowing out of the mountain. Photo by Svy123. This image is licensed under the Creative Commons Attribution 3.0 license.

Meet the author: William Wray is a fifth grader at Lake George Community Charter School. He is a prolific reader with a love of all things nature related—from rocks and fossils to animals and plants. He attends the Pikes Peak Pebble Pups in Lake George, Colorado and participates there as an Earth Science Scholar.

For Further Reading

K2 Granite: A white granite with azurite - AKA K2 Jasper. (n.d.). Retrieved from <http://geology.com/gemstones/k2/>

Nicholas Varnay and K2 — The Practical Gemologist. (n.d.). Retrieved from <http://www.thepracticalgemologist.com/gemstones-2/2015/5/22/pick-of-the-week-nicholas-varnay-and-k2>



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✓ ✓ Thanks to **Wayne Orlowski**, who sent in some interesting links:

****FREE E-BOOK LAUNCHED:**

NEW ZEALAND GEOLOGY - AN ILLUSTRATED GUIDE

by the late Peter Ballance, 397 pages. This was his 10 year retirement project. The book provides a ***magnificently illustrated guide for the layperson and student*** and is published and sponsored by the Geoscience Society of NZ. It has been illustrated with colour maps and diagrams by Geoclubber Louise Cotterall and readied for e-publication by Geoclubbers Jill Kenny and Bruce Hayward. Download it for a great holiday read and use the various regional chapters as you travel around the country.

Download at <http://www.gsnz.org.nz/zealand-geology-p-632.html>

****Macrostrat's [interactive geologic map](#)** covers the world with geologic map data aggregated from diverse sources; clicking on a location brings up more detailed information about said location. [[Maps Mania](#)] Zoom in close to see the satellite image under the geologic map and find your specific location in question. Click on the screen and a information box will pop up. Not much detail but better than nothing.

<http://www.maproomblog.com/2017/12/an-interactive-geologic-map-of-the-world/>

****By monitoring every grumble, shiver and burp our planet makes, researchers hope to be more prepared to take action when things go awry;**

https://www.smithsonianmag.com/innovation/could-fiber-optics-detect-earthquakes-180967585/?utm_source=smithsoniandaily&utm_medium=email&utm_campaign=20171219-daily-responsive&spMailingID=32318823&spUserID=NzQwNDU1NTY4NzMS1&spJobID=1182445244&spReportId=MTE4MjQ0NTIONAS2

****Very good article that is the foundation for both the understanding and misunderstanding of 'science' issues of the day. If only the public could intellectually understand this misuse of science process. Instead, the thought process is driven by pleasure at the individual level and greed at the corporate level. The marketing ploy by the tobacco industry to use science investigation tactics against science is a brilliant corporate marketing strategy that has killed millions of people. The later part of the article comparing the use of science in Europe and the USA is telling of the corporate backed mess we are in for.**

From the article - "The sound science tactic exploits a fundamental feature of the scientific process: Science does not produce absolute certainty. Contrary to how it's sometimes represented to the public, science is not a magic wand that turns everything it touches to truth. Instead, it's a **process of uncertainty reduction**, much like a game of 20 Questions. Any given study can rarely answer more than one question at a time, and each study usually raises a bunch of new questions in the process of answering old ones. "Science is a process rather than an answer," said psychologist [Alison Ledgerwood](#) of the University of California, Davis. Every answer is provisional and subject to change in the face of new evidence. It's not entirely correct to say that "this study proves this fact," Ledgerwood said. "We should be talking instead about how science increases or decreases our confidence in something."

https://fivethirtyeight.com/features/the-easiest-way-to-dismiss-good-science-demand-sound-science/?ex_cid=SigDig

✓ ✓ And here is the latest installment of "Bench Tips" by Brad Smith (www.BradSmithJewelry.com):

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Sorry; no Bench Tips received for January

[See all Brad's jewelry books at Amazon.com/author/bradfordsmith](http://Amazon.com/author/bradfordsmith)

Notes from the Editor

Bob Carnein, Editor

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Thanks to **Paul Combs**, who thought you might be interested in some winter-time collecting in Arizona!

GOING TO TUCSON IN FEBRUARY? DON'T MISS THIS STOP ALONG THE HIGHWAY! By Paul Combs

As I'm sitting here, my wife, Denise, is packing for our Christmas trip to visit in-laws—and I should be helping. But I want to give a quick heads-up for those of you who intend to travel to the Tucson show after Christmas. **Glauberite!** Or, specifically, gypsum pseudomorphs after glaucoberite. Glauberite is an uncommon mineral that usually forms when a large body of water evaporates to the point where water-soluble minerals become super-saturated and form crystals.



Glauberite crystal, 2 cm. wide, from Salton Sea, Imperial Co., California. Note simple monoclinic habit. (Carnein specimen and photo)

That is exactly what happened in Arizona's Verde River valley toward the end of the last ice age. Arizona's climate was drying up, and the huge lake that used to exist in the Verde Valley slowly evaporated. At the deepest point in the lake, soluble minerals, such as halite, gypsum, calcite and glauberite, formed crystals—lots of crystals. As a matter of fact, that area was a salt mine for a few years. You can find nice chunks of rock salt (halite) there, too.



Gypsum pseudomorph after glauberite, Camp Verde, Arizona. Simple crystal on left is 2.6 cm. across; cluster on right is 3.5 cm. across. (Specimens provided by Paul Combs; photos by C.R. Carnein)

Glauberite * $\text{Na}_2\text{Ca}(\text{SO}_4)_2$ * occurs as very nice crystals between 0.5 and 5 inches long, and most of them are “twinned” or form very attractive clusters. But glauberite is highly soluble and, over the years, rainwater removed the sodium and the glauberite became gypsum, * $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ *. If you have had chemistry, you can see how closely related the two minerals are. But the good part is that the crystals retained their original shape and there are millions of them lying around. You can also find good gypsum crystals up to 4 inches long. And the halite, of course. (Some web sites tell you that the glauberite was replaced by calcite, but a simple vinegar test has always shown me that the replacing mineral was gypsum.)

I don't have a great deal of time, so I will refer you to Googling images of glauberite on the internet to see what you'll be looking for. Those people have better photos than I could take, anyway. You will see that glauberite crystals have a distinct, nearly rhombic shape. But don't let that fool you—they actually belong to the monoclinic crystal system.

Don't worry about cleaning your crystals: some water and a soft plastic brush are all you need. You can even wash the halite chunks, but just dip them briefly. Once the salt has dried, immediately place it in a zip-loc bag or it will begin to form a whitish powdery coating.

HOW TO GET THERE: You will probably take Interstate 40 to Flagstaff, then head south on US 17 toward Tucson. *Great!* The glauberite is only about 2 miles off the highway. If you are going south on US 17, your first turn is at Camp Verde: Take South Access Road (AKA General Crook Trail), which only goes east from US 17. Turn right at the “T” junction (HWY 260) for about 200 yards. Turn right on Oasis Road and right again on Salt Mine Road. About ½ mile later, you will pass Gamble Road on your left. About 50 yards later, you will notice an unused dirt road to your right. **Park there** and proceed through the livestock gate to your west. The salt, gypsum crystals and glauberite pseudomorphs are on and in the high soil bank that you can see about 200 yards to your west. Remember that people are lazy, including rock hounds, so the easiest area has been picked over. If you climb around on the high bank, you’ll find better specimens. I go all the way around and up the back side for the best stuff.

NOTES: No need to dig. Just bring something for carrying the fragile crystals and maybe a soft plastic brush so you can get a better look at what you are finding.

It is pretty bleak out there and the whitish soil makes the Arizona Sun extremely bright: Bring polarizing sunglasses, long sleeves, long pants and a hat with a brim—not a baseball cap.

Bring lots of water and remember to drink it.

There are no bathrooms, but the good news is that there are no people, either.

* * * I highly recommend reconnoitering the area with Google Maps beforehand, just to familiarize yourself with the roads, the terrain, etc.

If you decide to go, bring some of your finds to LGGMC club meeting!

DINING: There are several restaurants in Camp Verde, including great Mexican. If you have the time, Fort Verde—a former Army frontier fort—is located in town, as an extremely well-preserved outdoor museum. You can explore the buildings, which are furnished.

NEAREST ROCK SHOP: I recommend planning a visit to Jim & Ellen’s Rock Shop (1019 N. Main Street, Cottonwood, AZ). The owners are very friendly and they offer (A) a lot from Mexico, (B) unique specimens from the nearby copper-mining boom town of Jerome and (C) cool stuff from obscure local sites. You can find the shop on the internet. More restaurants there, too.

Lake George Gem & Mineral Club
PO Bo 171
Lake George, CO 80827



The Lake George Gem and Mineral Club is a group of people interested in rocks and minerals, fossils, geography and history of the Pikes Peak/South Park area, Indian artifacts, and the great outdoors. The Club's informational programs and field trips provide opportunities to learn about Earth science, rocks and minerals, lapidary work and jewelry making, and to share information and experiences with other members. Guests are welcome to attend, to see what we are about!

The Club is geared primarily to amateur collectors and artisans, with programs of interest both to beginners and serious amateurs. The Club meets on the second Saturday of each month at the Lake George Community Center, located on the north side of US Highway 24 on the east edge of town, sharing a building with the county highway shops. **In the winter, we meet at 10:00AM. From April through October, we meet at 9:00AM, to allow more time for our field trips.**

Our organization is incorporated under Colorado law as a nonprofit educational organization, and is a member of the Colorado, Rocky Mountain, and American Federations of Mineralogical Societies. We also sponsor an annual Gem and Mineral Show at Lake George, where collectors and others may purchase or sell rocks, minerals, fossils, gems, or jewelry. Annual membership dues (Jan. 1 through Dec. 31) are \$15.00 for an individual (18 and over), and \$25.00 for a family (parents plus dependents under age 18).

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