

THE BULLETIN OF THE COLORADO SPRINGS MINERALOGICAL SOCIETY Published Since 1960

CSMS General Meeting

Thursday, Nov. 17, 7:00 PM

CSMS will provide Cake & Ice Cream to celebrate the club's 80th anniversary

Guest Speaker: Steven Veatch

Topic: Update on Pebble Pups Program

November Program. Steven Veatch presented an update on the Pikes Peak Pebble Pups to an international audience on September 27, 2016 at the Geological Society of America. Veatch will present this to the CSMS members at the November meeting. His presentation will be a new, image -rich, updated version of his work with the pebble pups. CSMS members will not want to miss this latest update on their young members and what they are doing.

October's Meeting Presentation "All That Glitters"

Submitted by Frank Rosenberg

At the October club meeting, Larry Havens of The Littleton Gem and Mineral Club and The Friends Of Mineralogy and our own Jack Thompson gave an informative presentation on Pyrite. We understand Larry and Jack used this opportunity as a chance to practice as this same presentation will be given at this year's symposium in Socorro, NM





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Jan. '17	Feb. '17	Mar.'17	
Installation	Crystal	Faceting	
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Fossil	Jewelry	Lapidary	
Dec 2016 Christmas Party			

CSMS VOLUNTEERS NEEDED!!!

2017 OFFICER POSI-TIONS:

PRESIDENT

SECRETARY

CHAIRPERSONS:

SOCIAL CHAIR

FIELD TRIP COORDINA-TOR

FIELD TRIP LEADERS

COLORADO SPRINGS MINERALOGICAL SOCIETY PO BOX 2 COLORADO SPRINGS, COLORADO 80901-0002

CSMS Calendar

November & December 2016

Please note Crystal Group will not meet until January

Tue., Nov 1 & Dec 6—Fossil Group, 7 pm, Senior Center. Jerry Suchan 303 648-3410

Thu., Nov 3 & Dec 1—Board Meeting, 7 pm, Senior Center.

Tue., Nov 8 & Dec 13—Micromounts, 7 p.m., Senior Center. Dave Olsen, 719-495-8720

Thu., Nov 10 & Dec 8—Faceting Group, 7 pm, Senior Center. Doreen Schmidt, 719-577-4165

Thu., Nov 17 & Dec 15—Pebble Pups & Juniors, 5:30 pm Senior Center. Steven Veatch, 719 -748-5010

Thu., Nov 17 & Dec 15 — General Assembly, 7 p.m., Senior Center "August Picnic" Date & Time TBD

Thu., No Meetings until January—Crystal Group, 7 p.m., Senior Center. Kevin Witte, 719-638-7919 Appointment Only—Jewelry Group, Bill Arnson, 719 337-8070

Appointment Only—Lapidary Group, Sharon Holte, 719 217-5683

The Senior Center is located at 1514 North Hancock in Colorado Springs. For more information on any of the sub-groups, meetings, and other CSMS valuable information, go to our website, <u>csms-web.org</u>

Upcoming Events of Interest to CSMS Members

Submitted by Pete Modreski

Wed., Nov. 2, 4:00 p.m., CU Geology Colloquium, What does the deglacial carbon isotope minimum tell us about changes in atmospheric CO2 and climate?, by Jean Lynch-Stieglitz, Georgia Tech. Benson Earth Sciences Building, Auditorium (Room 180), CU Boulder campus. All are welcome; refreshments at 3:30 on the 3rd floor. See <u>http://www.colorado.edu/geolsci/colloquium.htm</u> for the full colloquium schedule.

Thurs., Nov. 3, 4:00-5:00 p.m., Hydrologic and structural controls on crystalline basement hosted, lowtemperature geothermal systems along the Rio Grande Rift in southern New Mexico, by Mark Person, New Mexico Tech. Van Tuyl Lecture Series, Colorado School of Mines, Berthoud Hall, Room 241. All are welcome.

Thurs., Nov. 3, The Friends of the Colorado School of Mines Geology Museum Annual General Meeting and "First Thursday" lecture series, Ben H. Parker Student Center, Ballroom E, Maple Street, Golden CO. Socializing and munchies begin at 6:00 p.m., Annual General Meeting at 6:45 and First Thursday lecture will at approximately 7:15. "The Potential for Transformation in the Geosciences & Engineering disciplines, in the Mining Industry, and even in Academia using the Principles of Applied Neuroscience", by Dr. M. Stephen Enders, Interim Department Head for Geology and Geological Engineering, Colorado School of Mines. Admission is free and all are welcome.

Fri., Nov. 4, 5:30 p.m., the Friends of Dinosaur Ridge holds its annual "Rock Out for the Ridge" dinner, lecture, and fundraiser at Pinehurst Country Club, W. Quincy Ave., Denver. The after-dinner speaker will be Dr. Ken Carpenter, on "Acrocanthosaurus, Inside and Out". For details see <u>http://www.dinoridge.org/fundraising.html</u>.

Tues., Nov. 8, 3:00 p.m., Earth Sciences Colloquium at the Denver Museum of Nature & Science, Exploring the Eocene Forests of Colorado, by Steve Manchester, Florida Museum of Natural History. In the VIP Room. All are welcome, museum admission is not required.

Thurs., Nov. 10, 4:00-5:00 p.m., Van Tuyl Lecture, by Pete Rose, AAPG Distinguished Lecture; topic TBA. Colorado School of Mines, Berthoud Hall, Room 241. All are welcome. See <u>http://inside.mines.edu/GE_Lecture-Series</u> for this and other series topics.

Sat.-Sun., Nov. 12-13, 37th annual New Mexico Mineral Symposium, at New Mexico Institute of Mining & Technology, Socorro, NM; Always a very interesting and worthwhile weekend program and rendezvous for mineral collectors, mineralogists, geologists, and rockhounds; it includes a day and a half of lectures, a Sat. eve. banquet a Sunday afternoon silent auction, mineral dealers, and some optional field trips on Thursday and Friday. See <u>https://geoinfo.nmt.edu/museum/minsymp/home.cfml</u> for full program and registration information.

Thurs., Nov. 17, 7:00 p.m. Colorado Scientific Society November meeting- Terrestrial Ecosystems during the Mesozoic: the Dinosaurs of Madagascar by Joe Sertich, DMNS. Shepherd of the Hills Presbyterian Church, 11500

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GEM CHRYSOBERYL, PRISMS, AND PEANUTS: LESSONS FROM GROWING UP IN A SMALL TOWN

Mike Nelson csrockguy@yahoo.com

Science is fun. Science is curiosity. We all have natural curiosity. Science is a process of investigating. It's posing questions and coming up with a method. It's delving in. Sally Ride

I was thinking, actually daydreaming, the other day about curiosity and my experiences as a 1-12 student. Today I suppose it would read K-12 but my small community certainly did not have the kindergarten in the system. In fact, my friends and I heard rumors that kindergarteners mostly took naps and drank milk with little learning. At any rate, our science classes seemed to thrive with experiments and my curiosity increased each year. Some of these experiments were repeated at home, along with several invented projects. One project that I distinctly remember early in grade school (two grades in each room) was the teacher bringing out a prism and showing us white light was actually composed of several colors (**Fig. 1**). We examined these different colors and then brought out our box of crayons (mine was 16 colors and I was jealous of those students with 32 or 64) and duplicated the prism colors. The class then learned about rainbows and waited for a Kansas rain! That Christmas I asked Santa for a prism.

In composing this post I was reminded of the prism as readers will notice below. I also thought about *curiosity* and how I still have that inner -gut feeling today. This started out as a little post to satisfy my curiosity about chrysoberyl, a gemstone I knew little about. But it was like painting one wall of a room. You soon decide that the entire room needs the paint, and then the ceiling, and then...! Well, the same for this post---I described the gemstone, then found the sample from South Dakota, and then tried to explore how chrysoberyl formed in so many environments. And so, this submission goes on and on and may begin to bore readers as I try to understand some complex (at least for me) geochemistry.

The oxides are a group of minerals where oxygen (the negatively charged anion) combines with one, or more, cations (positively charged metals or semi-metals or things elements that act like metals). We often think of *simple oxides* where the oxygen combines with a single cation—something like cuprite with copper and oxygen, Cu₂O, or maybe quartz with silicon and oxygen, SiO₂. However, I suppose many/most mineralogists would argue that quartz is really a silicate rather than an oxide (another story for later)! The *compound oxides* have two cations combined with an oxygen such as one of my favorite gemstones, spinel-MgAl₂O₄ with aluminum and magnesium plus oxygen. Most classification schemes also include the hydroxides into the oxides. Here a very tiny positive hydrogen (+) combines with a much larger negative oxygen (- -) and the resulting negative radical (OH-) is about the same size as the oxygen and can fit into spaces previously occupied by just oxygen. One of the better hydroxide examples is goethite [FeO(OH)], a hydrated iron oxide prized by Mr. Rockhounding the Rockies, the well-known amazonite hunter



Fig.1. Thanks to <u>http://</u> <u>www.theozonehole.com/</u> for allowing use of this prism diagram.

here in the Pikes Peak region. Many of the oxides are quite hard (corundum), important ores (chromite; chrome, cassiterite; tin) and gemstones (ruby, sapphire, spinel). Most oxides are accessory minerals in igneous and metamorphic rocks; however, hardness and durability allows many oxides to last through the weathering cycle and become detrital minerals in unconsolidated sediments (ruby is a good example) or in consolidated sedimentary rocks (such as magnetite, rutile and ilmenite).

Oxygen readily combines with hydrogen (H₂O) and the result is water, a solution that helps in weathering and decomposition of minerals and rocks. Water commonly takes on additional dissolved oxygen and it is this oxygen (not the water oxygen) that helps create the oxide minerals. In metallic ore deposits geologists hunt for the oxidized zone since minerals in this zone are easier to mine and refine than the sulfides in the underlying primary zones. This oxide zone, as compared to the primary sulfides, is situated closer to the surface since more oxygen is available.

But certainly not all oxide minerals are formed in the oxidized zones near the earth's surface. Corundum (Al₂O₃), for example (ruby and sapphire are gem varieties), is formed in high temperature igneous and metamorphic rocks where the magma (igneous) or parent rock (metamorphic) is deficient in, or under-saturated with, silica but is rich in aluminum. Seyenite (similar to granite but with a low quartz content, <5%) and nephaline seyenite (devoid of quartz with nephaline and feldspar) are igneous rocks that under-saturated with silica and sometimes produce corundum. If the sedimentary rock limestone is subjected to high heat and high pressure (metamorphism) corundum

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may be formed. For example, I have seen (in museums) gorgeous red rubies perched on white marble (metamorphosed limestone).



Fig. 2. A gemmy chrysoberyl specimen acquired from Espirito Santo, Brazil. The crystal shows several twins. Length of specimen ~1.6 cm.

One oxide mineral that is of interest to me is chrysoberyl, a beryllium, aluminum oxide [BeAl₂O₄] that is a relatively unknown mineral to most readers "but is a surprisingly widespread mineral, particularly in a historical context" (Cook, 2010). If readers are familiar with the mineral it is likely due to the gem varieties known as alexandrite and cat's-eye. I have a nice "normal" specimen of chrysoberyl collected from Espirito Santo, one of Brazil's famous localities (Fig. 2). It is a typical yellow-green in color and transparent to translucent. However, other crystals of chrysoberyl are different shades of green or yellow or brown or white and even blue, and some non-gem varieties are more opaque than translucent. The yellow color probably comes from iron while the green may be due to chromium and or even vanadium (Schmetzer and others, 2016). Crystals are Orthorhombic; however, many/most specimens are twinned (sometimes multiple twinning) and those crystals seem blocky and/or distorted. Other crystals are platy. Collectors like to focus on "trillings" where there are three twins each taking 120 degrees of space and producing a pseudohexagonal crystal (Fig. 3). Chrysoberyl has a vitreous luster, especially the gemmy varieties whereas less-gemmy forms may be subvitreous (or at least "duller"). The mineral has a fairly high refractive index or brilliance (more light is bent and reflected back up through the crown of a faceted stone rather than passing through) ranking slightly below ruby and emerald. However, one of the major distinguishing properties of chrysoberyl is its hardness, coming in at ~8.5 (Mohs) and third in hardness among gemstones be-

hind diamond and tourmaline. Therefore, gemmy specimens are valued for use as gemstones, especially rings. This hardness and durability also allows chrysoberyl to weather out of the host rock and show up in sands and gravels---Sri Lanka produces a number of gems gathered as rounded pebbles from local streams and then worked into jewelry stones.

The rarest and most expensive chrysoberyl gems are a variety known as alexandrite. When this stone is viewed under normal daylight it appears green while under incandescent tungsten light the gem appears red. Why? Here is what I understand about the situation, and remember I am not a physicist! The easiest way to understand this property is to think of light bulbs as their ratings are color correlated! There is a major difference between color temperatures of light emitted from bulbs and these colors are measured on the Kelvin Scale. Natural sunlight is composed of most or all colors of the spectrum and is measured at ~5250+ Kelvin and is rated as a cool light on the bulbs. For a confusing lesson on lights go to the hardware store, check out the multitude of light bulbs, and read the labels. The higher the Kelvin rating, the brighter the emitted light seems. I use a variety of sunlight-rated bulbs (high Kelvin) in my basement office (devoid of natural sunlight). Some people prefer a warm light that generally is low on the Kelvin scale. For example, halogen bulbs are ~ 3200K (mid-range) while incandescent bulbs (the ones being phased out) are ~ 2600K. These incandescent bulbs are closer to the low end of the scale and tend to turn out a yellow light hue, the cozy and inviting warm lights preferred by many vs. the "harsh" 5250K "sunlight" bulbs. As a kid I always wondered why my Kodak slides and photos had a yellow tint when taken in a home under "normal" (incandescent) light. Flash bulbs (in the old days) or electronic strobe lights emitted a much brighter white light; hence, the yellow tint was gone.



Fig. 3. A twinned chrysoberyl crystal known as a trilling (7.33 mm). Collected from Minas Gerais, Brazil. The file is posted on Wikimedia Commons and has been approved for free distribution and use by the author, Matteo Chinellato. Originally published at: http://www.mindat.org/photo-282796.html

What all this means is that different light sources have different contributions of light wavelengths. If you want to see the visible colors get out a prism and stick it in the sun! Light is measured in wavelengths defined by nanometers (one billionth of meter) and visible light ranges from ~380 nanometers (nm) to 740 nm (Fig. 4).



Fig. 4. I appreciate Georgia State University (www.hyperphysics.phy-astr.gsu.edu/hbase/ vision/specol.html) allowing the use of this color spectrum.

Alexandrite seems to have chromium (according to most authors) as the chromophore (less than 1% replacing part of the aluminum) and in sunlight, or high Kelvin light, atoms of that element absorb the blue (~400 nm) and yellow portions (~600 nm) of the light leaving behind the

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blue-green and green (470-520 nm) and red (650 nm and above) portions of the spectrum (**Fig. 5**). However, natural sunlight produces a higher concentration of green light than red so the gem appears green when viewed in such light. Incandescent bulbs produce more red light of the color spectrum and so chrysoberyl appears red under many house-hold lights. But, with all of the new LED, halogen and CFL bulbs, often intermixed in a building, it is hard telling what color might the gem might show. With the price of color-change alexandrite gems, I suppose this question will not be answered by my sleuthing! That is about all I can do to explain color change in alexandrite, something that is way above my pay grade!





Fig. 5. Step Cut Alexandrite Cushion, 26.75 cts. Bluish-green in daylight, red in incandescent light. Thanks to photographer David Weinberg for posting on Alexandrite.net and releasing to the public domain.

and most stones today come from Brazil with minor sources in Zimbabwe, Tanzania, Sri Lanka and perhaps a few other localities. However, the major source of alexandrite is Russia, not from the mines but from laboratories. Most alexandrite gems on the market today are synthetic, especially stones seen on jewelry television and internet sites. If you are looking to purchase a natural stone, "know your dealer."

Another, completely different, gemstone cut from chrysoberyl is cat's-eye (**Fig. 6**). In the gemstone trade there are a number of different minerals that exhibit the cat's-eye effect such as tiger eye, moonstone, corundum, spinel, scapolite, apatite, aquamarine, sillimanite and quartz. However, only the stones cut from chrysoberyl are technically termed cat's-eye while all others I listed must have mineral or varietal names as modifiers, such as scapolite cat's-eye. Whatever the mineral, the gems must be cut as cabochons for the cat's-eye to appear. Evidently the minerals contain a very dense network of parallel fibers such as rutile, maybe titanium, or very thin tubes running parallel to the C-Axis. Light entering the stone then reflects from the dome of the cabochon at right angles to the parallel fibers or tubes. If cut correctly the milky white line of the cat's-eye will be at the center of the cabochon dome appearing to pass through the entire crystal as a single ray of light. The best cat's-eyes also are chatoyant having a haziness derived from the scattering of inner light rays. The "old" name for this type of gem is cymophane. Most cat's-eye rough stones seem to come from Brazil or Sri Lanka; the latter stones are usually found as rounded pebbles screened from alluvial gravels.

As I understand the situation, chrysoberyl is found in pegmatites (Brazil) or high grade



Fig. 6. Chrysoberyl cut en cabochon showing the "cat's--eye line as well as chatoyancy. Thanks to photographer David Weinberg for posting on Alexandrite.net and releasing to the public domain.

metamorphic rocks (Sri Lanka) or perhaps volcanic rocks (Australia). In pegmatites chrysoberyl forms directly from the magma, or in a zone where the magma is penetrating aluminum-rich rocks. At any rate, the magma or the metamorphic host rocks must be enriched with beryllium and to a lesser degree, aluminum. It also is interesting that magma rich in beryllium could produce either beryl [Be₃Al₂(Si₆O₁₈) or chrysoberyl. In some localities either beryl or chrysoberyl is dominant; however, in other cases both are common constituents. Why? That is one of those persistent questions of life! I do know that beryl has a high ratio of beryllium to aluminum whereas chrysoberyl has a low ratio. For the quite rare variety alexandrite to form, the magma must intrude surrounding rocks with available chromium. Franz and



Fig. 7. Specimen of chrysoberyl, in a quartz matrix along with accessory muscovite, collected from Scott's Rose Quartz Mine in the Black Hills of South Dakota. Width of specimen 5.4. cm.

Morteani (1982) studied metamorphosed pegmatites in Sweden and the Czech Republic and concluded that "chrysoberyl is always accompanied by quartz, and is a breakdown product of primary pegmatitic beryl... and that the formation of Al-rich minerals like chrysoberyl and sillimanite in pegmatites is due to a post-pegmatitic event at high *P*—*T* conditions." Is this the case for all metamorphic, chrysoberyl? I don't know but I would like to find the answer.

The second half of this story concerns a small rock picked up decades ago (in the late 1960s) from a mine in the Black Hills of South Dakota—the Scott Rose Quartz Mine near Custer (Fig. 7). It has been stuck away all these years in my South Dakota collection labeled "unknown, maybe quartz but too hard." Recently I was sorting through my Black Hills collection and shelving and shuffling specimens around. At the same time, I was writing this little post on chrysoberyl and was examining mineral photos on MinDat when *whoa, that photo looks like my specimen labeled unknown.* So, I pulled it out and was able to identify the specimen as chrysoberyl.

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The reason, well maybe my excuse, as to why it was never identified in the past decades is that the South Dakota specimen does not appear as expected. The only chrysoberyl that I have seen is the more typical cat's-eye and the faceted green or yellow-green variety. And, I never expected chrysoberyl to appear in the South Dakota pegmatites. In retrospect, I missed reading about the mineral in Roberts and Rapp (1965) although I have perused the volume many times. My mind simply had established a picture of typical chrysoberyl: cat's-eye, green or yellow-green faceted stones or twinned crystals.



Fig. 8. Photomicrograph of vitreous, and hard, mass of chrysoberyl crystals from South Dakota. I presume twinning is present but the jumbled mass sort of defies that identification. Width of photo ~ 8 mm.



Fig. 9. Chrysoberyl crystals of a very light yellow-green color, the upper center crystals are more white due to light reflection from a crystal face. Q is the quartz matrix while M are tiny flakes of muscovite. Width of photo ~ 2.2 cm.



Fig. 10. 180-degree rotation of above photo. Width ~ 2.9 cm.

Roberts and Rapp (1965) described the Scott's Quarry chrysoberyl as "intergrown crystal masses weighing several hundred pound, associated with beryl, muscovite and quartz...greenish gray twinned crystals...and fine striated yellowish to yellow-green crystals have been collected..." (**Figs. 8-10**). MinDat described their single photographed specimen as "radiating clusters of elongate chrysoberyl crystals... partially hidden in the iron-stained quartz matrix..." My specimen is a mixture of sort-of-yellow massive chrysoberyl crystals, white to clear muscovite, and quartz. Again, the most distinguishing property is the extreme hardness of the chrysoberyl.

In conclusion, the more I delved into chrysoberyl, the more questions popped up in my mind about its formation. I believe/think that: 1) chrysoberyl is a fairly uncommon mineral, especially the gem varieties; 2) primary chrysoberyl is formed in pegmatites crystalizing from the magmatic melt and "is usually restricted to high-T[emperature] pegmatites with low to moderate degree of fractionation" (Cerny, 2002); 3) other chrysoberyl crystallizes in some sort of a reaction zone when the magma invades host rocks rich in aluminum; 4) some chrysoberyl is formed during very high grade metamorphism; 5) in metamorphosed pegmatites chrysoberyl may be "a breakdown product of primary pegmatitic beryl... and that the formation of AI-rich minerals like chrysoberyl and sillimanite in pegmatites is due to a post-pegmatitic event at high *P[ressure]—T[emperature]* conditions" (Franz and Morteani, 1982); 6) some chrysoberyl may form in volcanic rocks (Schmetzer and others, 2016); 7) beryl *occasionally* is associated with chrysoberyl in beryllium-rich pegmatites (Sardi and others, 2016), somethings that seems in contrast with the South Dakota chrysoberyl; 8) in trying to answer my question about crystallization of beryl or chrysoberyl, Sardi and others (2016) noted that "calculated crystallization temperatures for the beryl-bearing sample are somewhat higher than those obtained for some other beryl-bearing granitoids that contain more complex mineral assemblages, including chrysoberyl"; and 9) Merino and others, (2013) found that "the interplay between the silica and alumina activities likely controls the stabilization and the preferential crystallization of gahnite [zinc oxide] + chrysoberyl or beryl + chrysoberyl assemblages..."

As for science and curiosity, as a kid I was always fascinated by the work of George Washington Carver and was curious about how he succeeded. Why? Well remember that I grew up in the 1950s in a very small "white" community where the nearest large town (~50,000) had a segregated swimming pool. But, one week we had a grade school history and science lesson about the famous African American plant scientist George Washington Carver (born into slavery) who spent part of his teen years after the War in Minneapolis, Kansas (our county seat). As a science experiment we then grew some peanuts. As a history lesson we learned how cotton had destroyed much of the fertile land in many Southern states and how Carver had suggested farmers rotate crops and plant peanuts. He also developed many useful products from peanuts. I thought something like "well, if a person from the small town county seat (Pop. ~2000) could be a scientist so could a small town (Pop. 400 or less) kid and suggested to my parents that we plant some peanuts in the garden this summer so I could do some experiments. My father thought the better idea was squash, tomatoes, beans, peas, etc., the standard fare for gardens in central Kansas.

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Later as an adult I did plant peanuts but was fairly unsuccessful in roasting them. However, I did maintain my curiosity about science.

REFERENCES CITED

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W. 20th Ave., Lakewood CO. All welcome.

Thurs., Nov. 17, 7:30 p.m., Friends of Mineralogy, Colorado Chapter bimonthly meeting, Denver Museum of Nature and Science, VIP Room, Barite-Bearing Concretions near the Book Cliffs Area of Grand Junction, Mesa County, Colorado: Genesis, Mineralogy and Collecting, by Daniel Kile. See <u>http://</u> friendsofmineralogycolorado.org/ for an abstract (with photographs) of the presentation. All are welcome.

Fri., Nov. 18, Colorado Science Teachers Conference (full title, Colorado Science Conference for Professional Development), at the Denver Mart, sponsored by the Colorado Association of Science Teachers and other science education organizations. For full program and registration information see http://www.coloradoscienceconference.org/

Fri.-Sat.-Sun., Nov. 18-20, Gem and Mineral Show at the Jefferson County Fairgrounds, Exhibit Building, sponsored by Denver Area Gem and Mineral Dealers. 10-5 Fri., 10-6 Sat., 11-4 Sun. Free admission.

Sat., Nov. 19, 11 a.m. – 4 p.m., Silent Auction, held by the Littleton Gem and Mineral Club. All are welcome. Columbine Hills Church, 9700 Old Coal Mine Avenue, Littleton, CO. "Setup 11 a.m., silent auction starts at noon, verbal auction starts at 1 pm, checkout starts at 3:30 pm."

Mon., Dec. 5, 7:00 p.m. (social hour at 6:00), DREGS 2016 Distinguished Lecture, Dr. Murray W. Hitzman, "Mud, Ma-Iaria and Mining: 18 Years of Geological Research in the Central African Copperbelt". At Colorado School of Mines, Berthoud Hall room 241. All are welcome.

Tues., Dec. 6, 3:00 p.m., Earth Sciences Colloquium at the Denver Museum of Nature & Science, Pterosaur paleobiology: Insights from photogrammetric Ichnology, by Brent Breithaupt and Neffra Matthews, BLM.. In the VIP Room. All are welcome, museum admission is not required.

Wed., Dec. 7, 4:00 p.m., CU Geology Colloquium, Colorado's geothermal resources and thermal springs: a simple groundwater flow model, by Paul Morgan, Colorado Geological Survey. Benson Earth Sciences Building, Auditorium (Room 180), CU Boulder campus. All are welcome; refreshments at 3:30 on the 3rd floor. See <u>http://www.colorado.edu/geolsci/colloquium.htm</u> for the full colloquium schedule.

Fri-Sun., Dec. 9-11, Gem and Mineral Show/"Rocks and Rails", sponsored by the Flatirons Gem and Mineral Club; together with the Boulder Model Railroad Club; at the Boulder County Fairgrounds, Main Exhibit Building, 9595 Nelson Rd., Longmont, CO. 10 a.m. – 5 p.m. daily.



Fig. 11. Stamp issued by USPS honoring George Washington Carver.

PEBBLE PUPS KICK OFF SATURDAY STUDY SESSIONS

By Steven Wade Veatch

Steven Veatch and Pebble Pup Jamie Weise kicked off the first Pebble Pup study session at the Old Colorado City Library on Saturday, October 23. These monthly sessions, designed for individual pebble pups to come and work on their projects outside of their regular Pebble Pup meetings, take place at the library. During the morning session, Veatch helped Jamie on his science fair project.

The afternoon was devoted to a pack of cub scouts. Veatch and Jamie covered everything necessary for the scouts to earn a geology merit badge. Each scout took home a rock, mineral, and fossil specimen to start their collection. Each scout also received a magnifying glass.

The meeting room in the library has a projection screen, tables and chairs, and a sink. It is an excellent place for the Pebble Pups to meet for their study sessions once each month. These supplemental meetings will continue each month at the library and will be in conjunction with their regular meeting. Similar meetings will take place in Teller County for the Pebble Pups who live in Teller county.



Pictured Left: Jamie Weise and Steven Veatch are helping a group of local scouts earn a geology merit badge during a meeting at the Old Colorado City Library.

PEBBLE PUPS CORNER



CSMS Pebble Pups & Junior Group

The Junior Group & Pebble Pups meet at the Senior Center every third Thursday at 5:30 PM until 6:15 PM or so. We only meet during the academic year, and we include January. So, it is Sept through May. Special announcements and field trips are noted on our blog and through the CSMS website.

Ready to have some fun? Here's a place where announcements are made and lessons can be worked on independently...

http://pebblepups.blogspot.com

Pictured Right: Jamie Weise is a Pebble Pup in the 5th grade. Steven Veatch, Pebble Pup Leader, is helping with his science fair project.



Visit Pebble Pups on Facebook: http://www.facebook.com/ PikesPeakPebblePups.com

For more information, email:

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November 2016

2016 CSMS Officers Present at Meeting	SECRETARY'S SPOT GENERAL ASSEMBLY MEETING MINUTES 10/20/2016 by Ronald "Yam" Yamiolkoski	
Jean Luce, President		
Lisa Kinder, Vice President	Special Guests: Jack Thompson and Larry Havens The meeting was officially called to order by Ronald "Yam" Yamiolkoski, Secretary, at 7:04 PM, Five of the nine officers were present. The Pledge	
Ronald "Yam" Yamiolkoski, Secretary X	of Allegiance was recited.	
Ann Proctor, Treasurer	Yam announced upcoming events. November is CSMS 80 th Anniver-	
Norma Rhodes, Editor X	So, we'll be providing Cake and Ice Cream to celebrate. Next month the	
Sharon Holte, Membership Secretary X	will include the Election of officers, Potluck, Silent Auction, and Gift Ex- change. Finally, January's meeting will be the Installation Dinner at Golden Corral near Palmer Park and Powers.	
Doreen Schmidt, Member-at-Large X		
Ariel Dickens, Member-at-Large X	Phil Spry brought some very nice specimens of blue barite from Hartsel. He wanted members (who've been to Dave and Lark's mining claim but only found small chips) to know, there is still plenty of nice, big speci- mens to be found there. Also, if members go to the Bayou Salado and	
Mark Lemesany, Past President		
2016 CSMS Chairpersons	pay \$5 they will allow you to dig at the claim most of the time.	
Kim & Bodie Packham, Show Chairs	Yam announced the passing of long time member Paul Berry, who had	
Sharon Holte, Field Trip Director	been the faceting group's leader for many years. A moment of silence commenced in his honor.	
Ronald "Yam" Yamiolkoske-Club Claim Agent	New members and Guests were asked to introduce themselves. There	
Frank Rosenberg– Club Claim Agent	were 3.	
Frank & Ellie Rosenberg, Librarians	Yam introduced our various subgroups and their chairs or representa- tives: Dave Olsen (Micro-mounts Group), Kevin Witte (Crystal Study	
TBD, Social Committee Chair	Group) will not have a meeting November and December, Sharon Holte (Lapidary Group), Doreen Schmidt (Faceting Group), and Jerry Suchen	
Ann Proctor, Store Keeper	(Fossil Group). Doreen has been the interim leader for faceting but can- not continue in 2017. SEE PICK & PACK FOR MORE INFORMATION ON CSMS GROUPS.	
Jackson Peirce, Webmaster		

Club claim status. Yam and Frank will be filing the appeal to the Mining Board. Yam explained that the poor turnout (only 8 members and 1 non-member) for the stewardship to the claim, makes it hard to justify keeping the claim if the appeal isn't successful. More discussion (and a vote) will certainly follow.

A motion was made and seconded to approve September 2016 Meeting Minutes (published in the Pick and Pack). Vote approved

Larry Havens and Jack Thompson gave a wonderful presentation about pyrite titled "All That Glitters". This was a "test run" for their Socorro presentation and was both informative and interesting.

After a break for refreshments the following items were discussed.

The first volunteer position that needs filling is the position of Social Chair. We need a volunteer now and through 2017. The second important volunteer position is that of Field Trip Chair. Yam then discussed the nomination of officers for 2017. This is where we currently stand. President: - VACANT Vice President: Lisa Kinder- Would prefer a replacement so she can focus on the 2017 Annual Show but will remain if needed. Treasurer: Ann Proctor will remain if needed. Secretary: VACANT. Membership Chair: Robin Hill has volunteered to fill this position!! Member-at-Large: Doreen Schmidt will remain if needed. Member-at-Large: Ariel Dickens will remain if needed Editor of the Pick & Pack: Norma Rhodes will remain unless someone else would like to learn the position. She'd be happy to fill them in. Past President: Jean Luce

Mike Nelson announced that RMFMS (Rocky Mountain Federation) needs an editor for 2017

The meeting was adjourned at 8:50 PM.



In Memoriam : Paul Berry passed away on September 27, 2016. He was a long time member of CSMS, leader of the faceting group for many years. Paul also taught faceting at the Senior Center. He will be missed by all...

Brad's Bench Tips for November

TEMPLATES

Whenever I have to make more than 2-3 exact copies of anything, I think of making a template. A template lets me easily draw the shape of an item. Art stores sell templates for common shapes like circles, ovals, hearts, etc. Other sources would include cooltools.us/ and kingsleynorth.com/



For nonstandard shapes, it's easy to make your own template. Simply cut the shape out of sheet plastic or thin sheet metal. My preference is brass. I carefully lay out the shape using a steel ruler, a set of dividers, a scribe, and a fine center punch.

One example is the brass template in the pic below that let's me quickly trace the design of ginko leaf earrings onto silver sheet. Another is the nickel template which makes it easy to drill a pattern of holes for pin inlay into wooden handles.

DENTAL TOOLS

A ready source of free tools is your local dentist. Dental picks can be reworked into wax tools or straightened and sharpened to make a stylus for marking and layout. The steel in these tools is high quality, and the handles are designed for comfort.

A special note however - If you want to modify the shape of the tool, don't try to just bend it with pliers. Working this alloy of steel while it's cold will cause it to snap. Changing its shape can only be done when it's hot. I work it like a blacksmith. Prop your torch up on the bench so that you can use both hands for the work. Have a hammer and bench block ready. Heat the tip red hot, and hammer it straight or bend it with pliers.

And don't forget to ask your dentist for some of the cutting burs they throw out. These are useful for a variety of things. It's best to call a week or two before your visit and ask the dentist or hygienist to put some of these tools aside for you. It's good practice also to ask that they run them through the sterilizer for you. If that's not possible, pop them in an oven at around 250 F.

See all Brad's jewelry books at Amazon.com/author/BradfordSmith



Our Staff... Norma Rhodes—Editor

We encourage everyone to submit articles, photos, illustrations or observations.

Share your experiences, your new finds, or simply your experience at our last field trip.

Handwrite it, type it, or email it. Format does not matter. All submissions are welcomed. The DEADLINE for items to be included in the next Pick & Pack, is the **21st of the month**

To submit an item:

For hardcopy photos or articles, mail to the address below or bring them to the General Meeting. All hardcopy photos remain the property of the submitter and will be returned. Electronic photos should be submitted at resolutions above 200 dpi in TIF, BMP, JPG, or PIC format. Articles are preferred in word. Editors will correct font.

E-Mail to: csmseditor@hotmail.com

Mail to: Pick & Pack Editor PO Box 2 Colorado Springs, CO 80901

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CSMS

T-Shirts, Badges, and Pins are available for sale.

If you celebrated a CSMS anniversary in 2014 or 2015, you are eligible for your one year pin award Please see Storekeeper

Please see Storekeeper, Ann Proctor



Brian Paterson was contacted by School Districts 11 and 20 regarding the minerals and crystals that have been donated to them over the past 10 years. With the retirement of the teacher that had handled getting the materials to the science teachers, SD11 and SD20 asked Brian to continue helping out teachers with assorted minerals. The crystals do not need to be whole, cleaned or have multiple types on one sample (e.g. smokies and Amazonite). The kids range in age from Grade 3 through Grade 11. Yes you can include just about anything. Have extra fossils? Micro-mounts? Gypsum? Tumbled? Kindly label the bag/box/whatever with what it contains. You can contact Brian by phone, email or at the regular meetings. (719) 359-6238, patersonbrian22@yahoo.com

GEM & MINERAL SHOW NOVEMBER 18-20, 2016

Jefferson County Fairgrounds

Public Welcome

Free Admission

> Free Parking

Sponsored by Denver Area Mineral Dealers

Jefferson County Fairgrounds, 6th Ave. Frontage Rd. and Indiana St., Golden, CO. Fri. 10:00 - 5:00, Sat. 10:00 - 6:00, Sun. 11:00 - 4:00. Open to the public. 24 dealers featuring minerals, fossils, gemstones, jewelry, cabochons, beads, books, carvings and findings. Free admission and plenty of free parking.

November 2016

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CSMS is an incorporated nonprofit organization with these goals:

To promote and disseminate knowledge of the earth sciences, especially as they relate to mineralogy, lapidary, and fossils.

To encourage study, collection, and fashioning of minerals.

To accomplish the same through social meetings, lectures, programs, displays, shows, and field trips.

The Pick & Pack is published 10 times each year to assist and promote the above.

Joining the Colorado Springs Mineralogical Society (CSMS):

Meetings are held the **third (3rd) Thursday of each month**, except January & August, **7:00 p.m.** at the Colorado Springs Senior Center, 1514 North Hancock Ave., Colorado Springs, CO. <u>Visitors are always welcome</u>. CSMS also offers Satellite Group meetings that allow more focused attention in specific areas of our members' interests. Our current Satellite Groups consist of the following: Crystal Study Group, Faceting Group, Fossil Group, Jewelry Group, Lapidary Group, Micromounts Group, and Pebble Pups/Juniors. For details on Satellite Group meetings, check out the calendars on page 2 and the web site.

Yearly dues include 10 issues of the *PICK&PACK*, all field trips (additional fees may be required on some field trips, and members are responsible for all transportation to and from), participation in all Satellite Groups (some groups may request additional fees to help cover resource costs), free admission to the *Western Museum of Mining & Industry*, a year of learning and enjoyment, plus a lifetime of memories.

Individuals—\$30, Family—\$40, Juniors—\$15, Corporate—\$100, *****Application is on the web site. If you are interested in joining CSMS or would like more information, we encourage you to attend our next General Meeting or visit our web site: www.csms.us.

CSMS is a Member of the following organizations:

American Federation of Mineralogical Societies (AFMS)www.amfed.orgRocky Mountain Federation of Mineralogical Societies (RMFMS)www.rmfms.org

Time Value Do Not Delay