BRECCIA

Santa Clara Valley Gem and Mineral Society

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Events

April 28, 6:30 PM: Member Sale

If you have something to sell, please contact Jim Herbold.

April 28, 7:30 PM: The General Membership Meeting presentation is **OPEN**. The Bragging Rights theme is **"Opal"**.

May 26: The General Membership Meeting will feature a **Silent Auction**.

June 2, 7:30 PM: Board Meeting on Zoom. All Members are welcome to attend. If you do want to attend, please contact Jim Herbold.

Annual SCVGMS Picnic

Sunday June 14, 12–2: at the Belwood Cabana Club

Editor's Message

The 2026 Show was a great success! More than 50 people volunteered, and 2,250 attended. I worked as a cashier both afternoons; there were people coming in until just a few minutes from closing. I saw a lot of people leaving with great treasures.

There will be an "Old Rock Shop Sell-Out + New Stuff" on Saturday, April 25.

We have 7 new members and 2 new families!

I have included 3 more rocks from Jim Fox's Touch Table, and the last installment of Phil Kesten's Mélange.

Please contribute anything from a short "how-to" or "my favorite thing", up to 2 to 3 pages of whatever you think others would find interesting. Rock related photos are also appreciated. The deadline for submissions is the Sunday after each General Meeting.

Do you have anything that other members might enjoy?

Deb Runyan, Breccia Editor

editor@scvgms.org, 408-628-7789

Rockhound of the Month

Our rockhound of the month is **Sonia Dyer.** She spent hours identifying rocks for the show, and has given two presentations in the last year.

Sunshine

There is nothing for Sunshine this month.

If you know of anyone needing some sunshine in their lives, please email **Margo Mosher at** margomosher@yahoo.com.

Field Trips

Note: Driving times are from Campbell and are approximate.

May 1–3 (Friday–Sunday): Arizona Petrified National Forest and Adjacent DoBell Ranch, Holbrook AZ, 13.5-hours

Sponsors: Calaveras Gem and Mineral Society, Co-Op Field Trips

Park tour. Arizona petrified "picture wood". $60 fee dig at DoBell Ranch

Contact: Dan Coughlin, drcough@icloud.com, 530-957-2677

May 9 (Saturday): Clear Creek Management Area, Paicines CA, 3-hours

Materials: Jadeite, Plasma Agate, Petrified Wood, Serpentine, Druzy Quartz, Cinnabar, Spessartite Garnet

May 31 (Sunday): Pleiades Fluorite Mine, Austin NV, 8-hours

Pay to Play Fluorite mine. $200 per bucket of fluorite.

June 7 (Sunday): Rainbow Ridge, Virgin Valley NV, 10-hours

Pay to Play Opal, $900 for up to 3 adults.

For questions about field trips

Contact: Stephen May, Stephenmay0990@gmail.com

Phone: 669-248-3993 or 408-306-6782

Did You Know?

It is impossible to lick your elbow.

Over 75% of people who read this will try to lick their elbow.

Like fingerprints, everyone's tongue print is different.

A pregnant goldfish is called a twit.

Jim Fox's Touch Table

Airy Blue Chalcedony

Located in the Reese River Valley near Austin Nevada, this deposit was discovered in 1996 by Chris Rose and Larry Everitt. The chalcedony occurs in Thunder eggs that range in size from 7.5 to 90 cm in diameter (3" to 35"). Look for small blue chips on the ground in the area. Watch out for rattle snakes.

Chalcedony is a cryptocrystalline, or microcrystalline, variety of quartz; its crystals are too small to be distinguished without magnification. While chalcedony may be slightly softer than quartz (Mohs 6.5-7), the compact, dense arrangement of its crystal structure gives chalcedony greater strength. It is hard enough to be used for intricate carvings, takes a high polish, and exhibits good wearability, making it suitable for jewelry pieces.

The name chalcedony (pronounced kal' sed'nee) comes from the Latin word chalcedonius, which is derived from the Greek khalkedon. Chalcedony was found at the ancient Greek maritime town of Chalcedon (or Chalkedon), on the Bosporus strait in Asia Minor (modern-day Turkey). The contemporary town is named Kad'köy and belongs to the Istanbul district.

Chalcedony is one of the most ancient gemstones; it was carved into cylindrical seals in Mesopotamia as early as the 7th century BCE. Over the centuries, blue chalcedony has been used for cameo and intaglio carvings, as well as sculptural carvings.

GPS:

39 26.536' N,

117 21.397' W

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Graveyard Point Plume Agate

This seam form of agate comes from the Owyhee Mountains of Oregon only seven miles from Homedale, Idaho. Plume agate gets its name from its beautiful plume-like shapes. The colors range from a creamy white to yellow, pinks, reds, and different shades of blue. Iron pyrite can add a nice touch of sparkle. Inclusions of browns and blacks come from other minerals. The colors create fascinating scenes for the imagination to play with.

Graveyard Point Plume Agate forms in cracks in the local basalt. The veins can be from one inch to about 18 inches thick and extend from a few feet to 30 feet in length. They can go in any direction, but most veins are vertical. During the formation of the agate, many of the cracks in the basalt did not completely fill in. This results in small cave-like structures filled with angel wing chalcedony. Angel wing chalcedony refers to feathery stalactitical growths that cover the inside of the agate seam. This is the plume formation in the agate without the complete agate covering.

The Graveyard Point area is well known for angel wing chalcedony. Mohs hardness: 7.

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Basanite

Basanite is a fine-grained, hard rock that forms when bits of lava shoot out of volcanoes (extrusive-igneous rock). Mineral Content: Augite; Feldspar; Ilmenite; Olivine; Plagioclases; and either Nephelite or Leucite.

It was formerly used as a touchstone. Since the early 16th century, touchstone has referred to a particular kind of siliceous stone (stone containing silica) used to do a particular job: determine the purity of precious metals. The process involves comparing marks made by rubbing a sample of a metal of known purity to marks made by a metal of unknown purity. The method is accurate enough in the case of determining the purity of gold, that it is still in use today.

Mohs hardness: 7. Colors: Black; Brown; Green; Grey; Red; White.

Uses: Arrowheads; Construction Aggregate; Cutting Tool; Spear Points.

Old Rock Shop Sell-Out + New Stuff

Saturday 4-25 - 9:30 to 3:30 ish

Rocks & lapidary equipment/tools: cabers; Genie $900; diamond saws; sledges; picks; flex shaft; torches; heater buddy $30; Lortone ST 10 saw $500; + etc.

Tons of opalite; obsidian; howlite; pet wood; quartz; jade; fossils; spider-rhodonite; thunder eggs; jasper; graveyard point; moss agate; plasma; yard rock; + etc. Everything is $1.00/lb., cash only, bring buckets.

Willow Glen area (San Jose) address will be sent later.

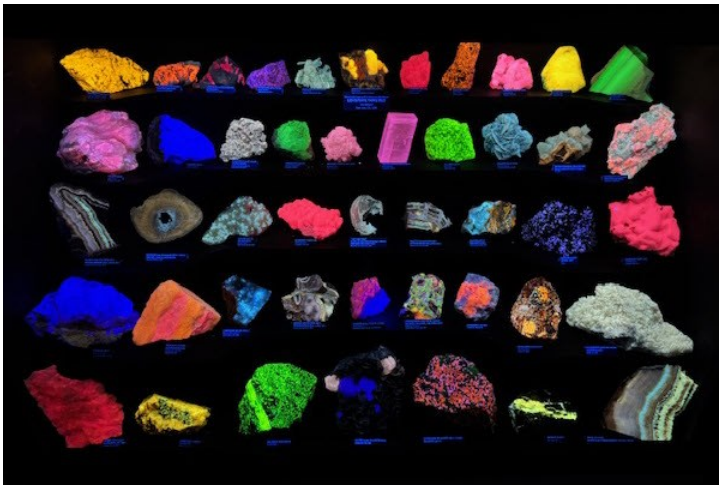
For more info, leave a message or text John at 408-757-8201.

President's Message

Hello, rockhounds! Spring has sprung and the temperatures are up, which means more outside time for you! I hope that you are able to take advantage of this with lots of exercise, rockhounding, and enjoying your mineral hobby and friends.

We have all had our deep exhale after the annual show from a couple weeks ago. I've not seen any actual numbers yet, but I've heard that attendance and revenue were strong. I've made a point over the years of talking to all of the vendors and I do usually ask them how sales are going, especially compared to the prior year. Overall our vendors were happy. A few indicated that sales were higher than last year and a lot of them said it seemed that sales were close enough to last year for them to be satisfied. That's good, because it's hard to get attendees to our show without the vendors! Margo did a tremendous job as show coordinator, and many thanks to all the volunteers who made the show another great success!

As you probably know, I help out with the fluorescent room. I'm lucky to have a group of collector friends that are motivated to bring their fluorescent mineral cases to the show for the weekend. This year we had seven cases, and I really feel that the overall room was one of our best ever. I hope that you got to see it in person. There's a lot of deep science to mineral luminescence, but the general visitor to the room is almost always wowed by the bright and varied colors. I'll brag a little bit with an assertion that our show has the best group of fluorescent displays of any show in the western US, including Denver. I've certainly never seen any postings on social media from any other show that would contend with what we put together each year in San Jose!



My longwave fluorescent case. I'm not sure I can do anything else to make it better :-)

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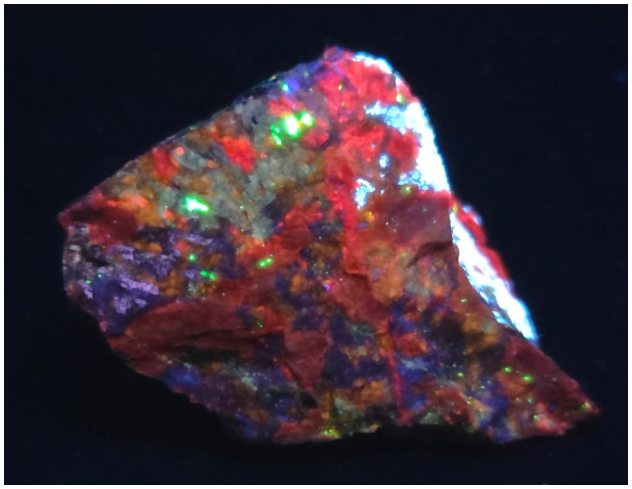
In other club news, **Paul Kidman** and **Frank Mullaney** finished up our annual financial statement, and that is available to members for review. Let me know directly if you would like to see it. Our overall financial position remains strong.



This is a small piece of "Parker Shaft soup" purchased at the show by a friend of mine. This is an extremely rare and valuable specimen that includes an amazing 7 minerals. It has margarosanite, axinite, prehnite, pectolite (or maybe clinohedrite), nasonite, xonotlite, and willemite. There may be some small occurrences of roeblingite as well (other known specimens often have them) but an expert in New Jersey fluorescence would need to examine the piece in person to confirm this. Congrats to my pal for finding this—it instantly became the best piece in his collection!

That's it for now, and I hope to see you all at the next general meeting!

Enjoy!

Jim Herbold

SCVGMS President

Getting Older

The older I get, the more I understand why roosters just scream to start their day.

It's weird being the same age as old people.

We celebrated last night with a couple of adult beverages, Metamucil and Ensure.

Bragging Rights

March's Bragging Rights Theme was **"Quartz"**.

1. Quartz Crystal Cluster - **Jim Fox**

2. Large Enhydro Quartz - **Cynthia Porter** - Winner!

3. Sugar Quartz Geodes - **Simon**

4. Pretty Quartz - **Sandra**

5. Quartz Cathedral, horizontal slice, Paraguay via Tucson - **Stephen May**

6. Large Himalayan Quartz - **John Hawk**

The winner is **Cynthia Porter.**

April's Bragging Rights theme is **"Opal"**.

Member Displays

Megalodon Tooth - **Simon**

? - ?

Show off what you love, so that we can enjoy it with you.

Membership Dues for 2026 Are Due

SCVGMS membership dues are due for the year 2026. Your dues are essential to the operation of SCVGMS.

Dues are $5.00 for Junior, $20.00 for an individual, and $30.00 for the household.

You can now easily pay online, at https://www.scvgms.org/product/membership-dues/

Or

Pay Frank at a meeting

Or

Send your check to Treasurer, Santa Clara Valley Gem and Mineral Society, Box 54, San Jose, CA 95103-0054, or to: Frank Mullaney, 5705 Begonia Drive, San Jose, CA 95124

Thank you.

Website Links

Your Window to the World of Important Websites

SCVGMS Website: https://www.scvgms.org/

SCVGMS Facebook Page: https://www.facebook.com/santaclaravalleygemandmineralsociety

American Federation of Mineralogical Societies (AFMS): https://www.amfed.org

American Lands Access Association (ALAA): www.amlands.org

BLM Rockhounding: https://www.blm.gov/programs/recreation/rockhounding

California Federation of Mineralogical Societies (CFMS): https://www.cfmsinc.org/

"CO-OP"—The Cooperative Field Trip Chairmen Association's Website: https://www.co-opfieldtrips.com/field-trips

GemKids: https://gemkids.gia.edu/

Mindat.org (world's largest open database of minerals, rocks, meteorites): https://www.mindat.org/

Smithsonian Science How Webcast Archives: https://naturalhistory.si.edu/education/school-programs/grades-3-5/smithsonian-science-how/smithsonian-science-how-webcast-archives

Smithsonian National Museum of Natural History: https://www.youtube.com/@nationalmuseumofnaturalhistory

Punishment

Why do Rockhounds love earthquakes?

It gives them something to fault.

What did the Rockhound say when his wife asked him to bring home some rocks?

"Of Quartz, dear."

Information on Shows 2026

April 8-19 – Thousand Oaks, CA
Conejo Gem and Mineral Club
Borchard Community Center
190 N. Reino Road
Hours: Sat 10–5, Sun 10–4
Web: www.CGAMC.org

April 11–12 – Mariposa, CA
Mariposa Gem and Mineral Club
Mariposa County Fairgrounds
5007 Fairgrounds Rd.
Hours: Sat 10–5, Sun 10–4
Contact: mgmc@sti.net
Web: mariposagemclub.org/

April 11-12 – Placerville, CA
El Dorado County Mineral and Gem Society
Placerville Fairgrounds
100 Placerville Dr.
Contact: 530-676-2472, office@edcmgs.org
Web: https://edcmgs.org

April 18 - Lodi, CA
Lodi Gem & Mineral Society
Tailgate and Rock Swap
Grape Festival Fairgrounds
Hours: 8:30–3:30
Contact: ambersmithlmft@proton.me, 209-329-6217

April 18-19, 2026 – Thousand Oaks, CA
Canejo Gem and Mineral Club
Borchard Community Center
190 N. Reino Rd
Hours: Sat 10–5, Sun 10–4
Web: www.cgamc.org

April 24-26 – Butte Valley, CA
Paradise Gem & Mineral Club
Mechoopda Event Center
149 Openshaw Rd.
Hours: Fri & Sat 9–5, Sun 9–4
Contact: paradisegemmineral@gmail.com
Web: www.paradisegemmineral.com

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April 25-26 – Anaheim, CA

Searchers Gem and Mineral Society

Brookhurst Community Center

2271 W. Crescent Ave.

Hours: Sat 10–5, Sun 10–4:30

Contact: anaheimsearchers@gmail.com

Web: https://www.searchersrocks.org/

April 25-26, 2026 – Atascadero, CA

Santa Lucia Rockhounds

Atascadero Colony Park Community Center

5599 Traffic Way

Hours: Sat 10–5, Sun 10–4

Contact: (805) 610-0603, slrockhounds@gmail.com

Web: https://slrockhounds.org/

May 1-2, 2026 – Yucaipa, CA

Yucaipa Valley Gem & Mineral Society

Located on Yucaipa Blvd

Hours: Fri Noon–9, Sat 6pm–10pm

Contact: djvintage57@gmail.com

Web: https://www.yvgms.org/

May 1-3, 2026 – Vista, CA

Vista Gem and Mineral Society

Antique Gas and Steam Engine Museum

2040 North Santa Fe

Hours: Fri & Sat 10–5, Sun 10–4

Contact: info@vistarock.org

Web: https://vistarocks.org/

June 27-28, 2026 – Culver City, CA

Culver City Rock & Mineral Society

Veterans Memorial Auditorium

4117 Overland Ave.

Hours: Sat 10–6, Sun 10–5

Contact: culvercityrocks35@gmail.com

Web: culvercityrocks.org/.fiesta/

July 31-August 2, 2026 – Nipomo, CA

Orcutt Mineral Society

Nipomo High School

525 N. Thompson Rd.

Hours: Fri & Sat 10–5, Sun 10–4

Contact: nipomocowgirl55@yahoo.com, (805) 929-2783

Web: https://oms-inc.org

Mélange—Part 3

By Prof. Philip R. Kesten, Ph.D.

And finally, let us spend just a moment considering the applications of some rocks and minerals. Yes, you likely find beauty in the shapes and colors of rocks and minerals. So you can, certainly, put a specimen of almost any rock in your display cabinet. And for the same reason, many rocks and crystals find their way into pieces of art or into jewelry. But some rocks have value that goes beyond their beauty.

For starters, a number of rocks, typically those at the upper end of the Mohs hardness scale, are used as abrasives. As has been mentioned in other essays, the standards of the Mohs hardness scale are, from one to ten (that is, from soft to hard): talc, gypsum, calcite, fluorite, apatite, orthoclase feldspar, quartz, topaz, corundum, and diamond. The hardness values of these stones follow the handy mnemonic, based on the first letter of each: "The girls can flirt and other queer things can do."

Diamond tops the hardness list; diamond paste, and small bits of diamond epoxied to the business end of a drill bit, or to a polishing pad, are commonly used to cut into, or to polish, metal and stone. Diamonds are costly, of course… but you can get nearly as much polishing power for far less money by using corundum. Corundum has a Mohs hardness of nine, so it is nearly as hard as diamond, but corundum is far less costly. And at a value of nine on the hardness scale, corundum will polish metal, and (of course) wood and plastic. So glue some small bits of corundum to a piece of cloth or thick paper, and you have a fine sanding and polishing device. You know its name, too: you will have made "sandpaper"! (See Fig. 10.)

Fig. 10. A piece of sandpaper is made by affixing small bits of corundum to a thick strip of paper or cloth.

https://laz-img-sg.alicdn.com/p/a9e742b766e80fa5307d7211cc31ca43.jpg

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To be strictly correct, it is important to note that not all sandpaper is made with corundum. A lot of sandpaper is made by gluing small bits of garnet to a thick paper or cloth backing. Garnet has a Mohs harness of seven or so, and small bits of garnet often have sharp points and edges. So garnet does an excellent job of polishing and sanding. Another kind of sandpaper is made using silicon carbide. Although silicon carbide is both expensive and difficult to manufacture, it is also relatively hard, coming in at nine and a half on the Mohs hardness scale.

How about this common application of rocks? Because many rocks are hard and durable, and because many rocks are not easily compressed, rocks are often used as construction materials. Granite, for example—which is both durable and also not easily compressed—can often be found at the base of the piers of many bridges, in retaining walls, in building foundations, and in dams. (A retaining wall built using granite blocks, is shown in Fig. 11Aa.) Basalt is another rock that finds its way into piers, foundations, and dams. Basalt has properties similar to those of granite, and it has the added advantage of being impervious to moisture. So basalt, like granite, is an ideal stone for use in building retaining walls as well as large structures. (A retaining wall built using granite blocks, is shown in Fig. 11Ab.)

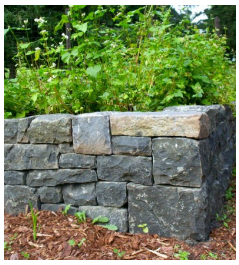

Fig. 11Aa. A retaining wall constructed from blocks of granite.
https://wholegardensnw.com/wp-content/uploads/2016/03/Rock-Walls-3.jpg

Fig. 11Ab. A retaining wall constructed from blocks of basalt.
http://all-geo.org/highlyallochthonous/wp-content/uploads/2013/07/Basalt-Drywall-600x326.jpeg

Slate is another stone that finds its way into many construction projects. No, not in the foundations of buildings—slate is not particularly strong, so it is easily broken. But because slate can be pulled apart into relatively thin sheets, and because its gray-black color is considered attractive, slate is often used as tiles on

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the roofs of houses (see Fig. 11Ba.), as flooring (see Fig. 11Bb.), as well as for creating pathways and walkways (see Fig. 11Bc.).

Fig. 11Ba. The tiles on the roof of this house are made from pieces of slate.

https://www.vrroofing.com/wp-content/uploads/2017/08/slateroof.png

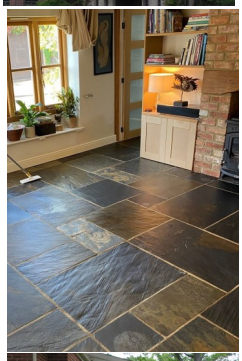

Fig. 11Bb. These floor tiles are made from slate tiles.

https://athenastonecare.co.uk/wp-content/uploads/2021/11/Nicki-Burgess-Banbury-Slate-restoration-sealing.jpg

Fig. 11Bc. Slate tiles were used to create this walkway.

https://www.younghouselove.com/wp-content/uploads//2008/09/pathdugin.jpg

And then there is marble, another favorite rock of those who build. Marble is relatively strong, it is not porous, and it is easily polished. And best of all, marble—especially polished marble—is considered rather attractive. This stone, then, makes an excellent choice for kitchen and bathroom countertops. (An example of a marble countertop, in a modern kitchen, is shown in Fig. 12A.)

Fig. 12A. A marble countertop in a modern kitchen.

https://i.pinimg.com/originals/6f/f7/8e/6ff78e6194a955fcf60df5826c674373.jpg

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We humans have been using marble long before the kitchen in your house was built… we have been using it for thousands of years, really. The ancient Greeks and ancient Romans, for example, were using marble to create statues, monuments, and buildings. And marble was used in ancient Mesopotamia, some five thousand years ago, to create statues of animals and people. One of these, a carving of a vessel supported by two rams, is shown in Fig. 12B. This sculpture is on display in the Metropolitan Museum of Art in New York City.

Fig. 12B. A statue of a vessel supported by two rams, carved from a block of marble.

https://www.themorgan.org/exhibitions/noahs-beasts

Finally, I cannot overlook the benefits we derive from rocks that contain iron. These are iron ores… rocks such as magnetite and hematite. The molecules in magnetite consist of three iron (Fe) atoms bonded to four oxygen (O) atoms, or Fe_3O_4., and each molecule in a specimen of hematite consists of two iron atoms bonded to three oxygen atoms, or Fe_2O_3. The arrangements of the atoms in these molecules are shown in Fig. 13A. and Fig. 13B.; in these figures, a single red line connecting two atoms represents an atomic bond resulting from one electron shared between the two atoms, and a double red line represents a bond that results from two elections connected to the nuclei of the two atoms. And certainly, iron atoms are at the heart of both of these ores.

Fig. 13A. A molecule of magnetite consists of three iron atoms (Fe) bonded to four oxygen atoms (O), or Fe_3O_4.

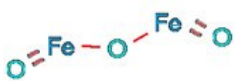

Fig. 13B. A molecule of hematite consists of two iron atoms bonded to three oxygen atoms, or Fe_2O_3.

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Oh my(!), we use iron—we rely on iron—in so many ways. In building construction, yes, but also in other applications. Here is just one example: steel, used to create the backbone of nearly all large buildings, is an alloy of iron in which iron atoms are combined with a bit of carbon and often small amounts of chromium, manganese, and nickel. Carbon is added to steel to increase the strength of the final product compared to the strength of pure iron. And those various trace elements are used to create different grades of steel. Stainless steel, for example, is an alloy of iron, chromium, and nickel; the chromium makes stainless steel resistant to corrosion, and nickel improves the ability to form the stainless steel into shapes. The nickel is also added to iron to make it easier to weld pieces of this alloy together, as well as to make it easier to draw it out into thin wires.

So yes, there is plenty of iron around you. But there is also plenty of iron in you, too! Iron is essential for good health, for us humans, for other mammals, and in general, for most vertebrates.

We humans need lots of iron, and more than two thirds of the iron in our bodies is found in hemoglobin. Hemoglobin is a protein found in red blood cells, and it is the iron in hemoglobin that helps to carry oxygen out to our cells and organs… and, more generally, to carry oxygen all around within our bodies. And you most certainly want that iron in your red blood cells: oxygen, after all, is critically important for our bodies to function properly.

There are rocks, then, in the foundation of buildings, and rocks in the steel beams used to make skyscrapers. And there are rocks, in the form of iron, in your blood. But wait! You might also have some rocks, or at least some products made from rocks, on you! Minerals are a common ingredient in a wide range of cosmetics.

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Skin care products make use of a variety of minerals. Silica, for example, is commonly added to lotions and skin creams to absorb oils. Silica helps keep our skin moist, and it can give to our skin what many people consider to be a healthy texture. Mica, in powdered form, is also sometimes added to these lotions—mica lends a shiny, shimmery appearance to your skin. And a variety of other minerals are used to create the colors found in makeup; chromium, for example, is used to create a range of vibrant green colors, and titanium—which is extracted from rutile, ilmenite, and other minerals—is used to create white makeup.

You are probably reading these essays because you are interested in rocks and minerals… you probably did not need me to convince you that rocks and minerals can be interesting. But just in case: Rocks and crystals exhibit fascinating shapes and also a wide range of colors, and rocks and crystals also have many and varied applications. All of which makes rocks and crystals interesting… and exciting!

Prof. Philip R. Kesten, Ph.D., Department of Physics, Santa Clara University

New Members

We welcome new members to SCVG&MS!

Sabrina Pham
Rick Porter & Family
Ming Qi
Maddie Quaranta
Joseph Langdon
Chad Eckert & Family
Carl & Austin Wong
Anselm Matthews

EARTHQUAKE LIGHTS

By Sigrid Stewart

Mysterious lights in the night sky—harbingers of earthquakes? This claim is not as far-fetched as it might sound, because such lights have been reported for millennia. The ancient Greeks, living in a very earthquake-prone land, were familiar with the phenomenon. Most recently video was captured in Morocco before a 6.8 magnitude earthquake, which was centered in the High Atlas Mountains, and which resulted in damage to Marrakesh and many small towns and villages.

"Streams of light" were seen running along the ground north-west of San Francisco before the infamous 1906 earthquake, which destroyed 80% of the city. A bright pink-purple globe of light flew above Quebec's St Lawrence River prior to the 1988 Saguenay earthquake. In Italy's 2009 L'Aquila earthquake, a resident of the area led his family to safety after seeing flashes of light inside his home a few hours before the earthquake hit.

These bright colored lights that seem to dance about are easier to see in darkness but probably occur in daylight as well. Many videos have captured due to the modern use of security cameras and cellphones. Sometimes they look like ordinary lightning or bands like the aurora borealis, or glowing spheres. They can also look like flames coming out of the ground. These Earthquake Lights (EQL) seem to be correlated with earthquakes of greater than 5.0 magnitude. Past theories have included piezoelectric activity and gas releases.

John Derr, a former USGS geophysicist who has coauthored several scientific papers on EQL, and several colleagues studied some 65 American and European earthquakes with reports of earthquake lights. In their 2014 paper published in Seismological Research Letters, they note that although most earthquakes occur where tectonic plates meet, EQL appears to be more common within tectonic plates and rift.

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Tagish Lake Earthquake Lights

Earthquake lights over Tagish Lake on the Yukon-Alaska border region. The photograph was probably taken in July 1972 or 1973 (exact date unknown). The estimated diameter of the balls is about 1 meter (Courtesy: Jim Conacher)

Romanian Earthquake Lights

Streaks of light in Romania, one of five photographs taken around March 1977 near Brasov, Romania. This is about 100 km north-west from the epicenter of a 7.2 magnitude earthquake and its aftershocks. (Courtesy: Seismological Society of America)

One collaborator, Friedemann Freund, an adjunct professor at San Jose University and former researcher at NASA's Ames Research Center, has a new theory. When rocks containing some types of crystals with particular impurities or crystal lattice defects are put under stress, they may break and generate electricity.

According to Freund, in his paper "Rocks that Crackle and Sparkle and Glow—Strange Pre-Earthquake Phenomena", igneous and metamorphic rocks, which make up a major portion of the Earth's crust, contain electric charge carriers, which have been overlooked in the past. These charge carriers are defect electrons in the valence band, i.e., "positive holes". Normally, they are dormant, but under stress, the rocks begin to sparkle and glow.

His paper describes the physical and chemical nature of these positive holes, how they are introduced into minerals and rocks, and how they become activated. Evidence indicates that once the positive holes are generated, currents can propagate through the rocks leading to electromagnetic emission, to positive surface potentials, to corona discharges, to positive ion emission, and to mid-

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infrared radiation. These phenomena are expressions of the same fundamental process: the awakening of dormant positive hole charge carriers, that turn rocks momentarily into p-type semiconductors.

In another study, Robert Thériault of Quebec's Ministry of Natural Resources and colleagues studied well-documented observations of the phenomena going back to the 1600s. The team found that 97% of earthquake lights were associated with subvertical faults, which only cause about 5% of the Earth's total seismic activity. Subvertical faults exist where a region of a tectonic plate is stretched, pulling it apart and causing faults in the form of vertical cracks—or rifts—to form in the crust. These "intraplate" regions are unlike the subduction zones that are associated with most earthquakes, where one plate is slipping below the other.

Some records of earthquake lights (and the magnitudes):

869 Sanriku, Japan, earthquake, 8.4 to 9.0

1888 North Canterbury, New Zealand, earthquake. 7.0

2008 Sichuan, China, earthquake, 8.0

2003 Colima, Mexico, earthquake, 7.6

2007 Peru earthquake, 8.0

2010 Chile earthquakes, 8.8

2014 Sonoma County, CA, 6.0

2016 Wellington, New Zealand, 7.8

2021 Acapulco, Mexico, 7.1

2022 Fukushima, Japan, 9.1

2022 Qinghai Province, China, 6.6

2023 Turkey–Syria earthquake, 7.8

Other strange things occur before, during and after earthquakes. Non-seismic earthquake phenomena have been reported world-wide from tectonically active

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areas for centuries. Some have been well documented by decades of painstakingly detailed field work. Reports include (from a paper by Tributsch 1983):

- changing well water levels
- ground-hugging fog
- earthquake lights from ridges and mountain tops
- low frequency electromagnetic emission
- local magnetic field anomalies up to 0.5% of the Earth's dipole field
- temperature anomalies by several degrees over wide areas as seen in satellite images
- changes in the elevation of the Earth's surface
- changes in the plasma density of the ionosphere
- strange animal behavior
- possible human premonition of impending earthquakes

The phenomenon of ball lightning, which was referred to as an unsolved problem in atmospheric physics by Stenhoff in a 1999 paper, may be related. Ball lightnings are free-floating volumes of ionized air that detach themselves from the ground. According to eyewitness reports, small ball lightnings have entered rooms through windows, often without leaving a trace or any cracks in the glass or through telephone jacks and electric sockets. The balls drift through the air with a faint hissing sound, and explode with a bang after a few seconds, leaving behind a smell of ozone (Grigor'ev et al. 1992).

Such balls of ionized air seem to appear before or during large thunderstorms and before or during seismic activity. In the case of earthquakes, these plasma balls may detach themselves from the ground when clouds of positive hole charge carriers arrive at the Earth's surface, leading to high electric fields, like those of thunderstorms and lightning (Derr and Persinger 1986).

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The Earth can be a strange place! Many phenomena are not well understood. It occurs to me that some UFOs may be similar ionic charge artifacts.

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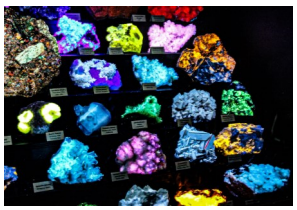
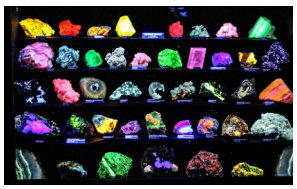
https://hgms.org/backbenders-gazette-october-2023/

Photos from the 2026 Show

Some of the displays from the fluorescent room

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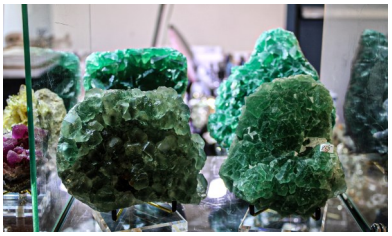
Displays and Rocks for Sale



Rick Kennedy

Michael Paone

A Vendor

The Student Grant Winners: Michae Musick, Travis Fischer, Margo Mosher, Angelika Jones, Alex Crouse, and Jim Herbold

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Volunteers

Bob Phelps & grandsons **Andrew** & **Noah Coffaro**

Travis Fisher & **Steve May**

Kiam Choo

Howard Young, **Bonnie LeMat**, & **Jim Sugiyama**

Kyle Van Woerkom, **Petr Svec**, **Steve May**, & **Cathy May**

Michelle Powers

Gemologist **Dennis Freiberger** & Mineral Identifier **Peter Adams**

Sonia Dyer & **John Vinton**

Murphy Alexander

Lisa LaRoca & **Deb Runyan**

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Founder's Day Raffle: TBD

Hospitality: Margo Mosher

Installation Dinner: TBD

Member Displays: TBD

Refreshments: TBD

Show Chair: Margo Mosher

Silent Auction: TBD

Sunshine: Margo Mosher

Trophies: Frank Mullaney

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An Invitation

This society is pleased to invite guests to attend general meetings, study groups, and field trips. **General meetings are held the fourth Tuesday of every month with meet and greet time beginning at 7:00 followed by the meeting at 7:30 PM at 100 Belwood Gateway (the Cabana Club), Los Gatos, CA 95032.** Belwood Gateway is just south of Blossom Hill Road between Leigh Avenue and Harwood Road.

Our Society's Purpose: The inculcation of a love of rocks and minerals by the furtherance of members' interests in the earth sciences and by education in all facets of related educational activities with the promotion of good fellowship, proper ethics, and conduct.

Our Membership Requirements: Attendance at two general meetings within twelve months.

This society is a member of the California Federation of Mineralogical Societies (CFMS) and is affiliated with the American Federation of Mineralogical Societies (AFMS).

Our Newsletter, the Breccia, is published 11 times annually. The deadline for all articles is the Sunday after each general meeting. The Breccia editor is **Deb Runyan** who may be contacted by email at editor@scvgms.org and by phone at 408-628-7789. The Breccia is proofread by **Pat Speece** and **Sonia Dyer**.

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