Bulletin of the Mineralogical Society of Southern California

Volume 93 Number 3 - March, 2020

The 978th meeting of the Mineralogical Society of Southern California

With Knowledge Comes Appreciation

March 13th, 2020 at 7:30 P.M.

Pasadena City College
Geology Department, E-Building, Room 220
1570 E Colorado Blvd., Pasadena

Program : **"It All Started With…" Presented by Karol McQueary**

In this Issue:

Remember: If you change your email or street address, you must let the MSSC Editor and Membership Chair know or we cannot guarantee receipt of future Bulletins

About the Program: "It All Started With…" Presented by Karol McQueary

Karol McQueary is a retired teacher, principal, volunteer dinosaur bone preparator, and past president of the Southern California Paleontological Society. Although she has collected minerals for most of her life, her interest in fossils began when she retired from Los Angeles Unified School District. She joined a fossil club and started volunteering at the Natural History Museum in their Dino Lab, as well as in their Dino Hall. Karol still loves teaching, though, and looks for opportunities to share her love of science whenever she can.

When the opportunity came up to help California get its own state dinosaur, Karol enlisted the help of the kids in the Paleo Society as well as the students at her former school. Their efforts on behalf of our new state dinosaur, *Augustynolophus morrisi*, are the topic of her talk, "It All Started with...."

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From the Editor:

Happy March to everyone! The deadline for the Roster has passed so IF you have NOT paid your dues, your info will not appear in the Roster. Also, This will be the LAST MSSC Bulletin you will receive! Get your dues to Cheryl Lopez (membership chair) so you don't miss any future bulletins. (Only 9 members have NOT yet sent in their dues!) We don't want to lose you! Linda Elsnau

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FROM THE PRESIDENT: Interesting Minerals, A to Z. Installment 26, the letter "Z": by George Rossman

Zoisite

Zoisite, $Ca_2Al_3(Si_2O_7)(SiO_4)O(OH)$, is a mineral commonly found in metamorphic environments. The name, zoisite, goes back to 1805 when A Werner introduced the name to honor Sigmund Zois, a scholar in Austria who funded mineral collecting expeditions. Werner got the holotype sample from Zois. The holotype specimen is a single specimen (the "type specimen") which was used to describe and name the new mineral species. Of historical interest, before 1805, zoisite was known as saualpite in recognition of an occurrence in Saualpe, Austria.

Normally, zoisite is a pale colored, not particularly attractive mineral. When a small amount of iron replaces some of the aluminum, it can be brown in color **(Figures 1,2).**

Figure 1. Zoisite from the Shigar District, Pakistan Photo: Rob Lavinsky

Figure 2. Zoisite from Mitchell County, NC Photo: Mark Garcia

Zoisite is orthorhombic. There is a monoclinic polymorph of zoisite known as clinozoisite **(Figure 3)**. The chemical composition is the same, but the atoms are arranged in a somewhat different pattern in the crystal. A modest amount of iron (Fe^{3+}) typically substitutes for some of the aluminum, giving clinozoisite a yellow-brown to brown color.

Photo: Rob Lavinsky

Photo: GRR

Photo: Rob Lavinsky

Figure 3. Three clinozoisite crystals from Pakistan.

When one of the three aluminum atoms in clinozoisite is replaced by iron, the name changes to epidote, $Ca_2Al_2Fe^{3+}(Si_2O_7)(SiO_4)O(OH)$, a fairly common mineral in metamorphic environments although nice crystals are uncommon **(Figure 4).** Epidote is commonly found as a green stain on weathering calcic feldspar-containing rocks **(figure 5)**

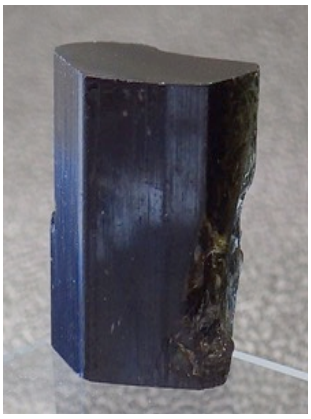

Figure 4, Epidote crystal from Kenya
Photo: GRR

Figure 5, rock stained green with fine-grained epidote from near Victorville, CA.
Photo: GRR

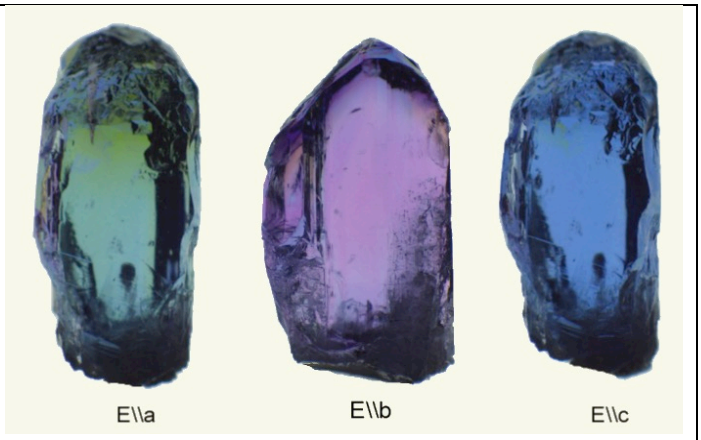

Figure 6. Zoisite, variety tanzanite, from Merelani, Tanzania. Showing pleochroism in linearly polarized light with the polarization direction parallel to each of the crystal axes. Photo: GRR

Zoisite is not a particularly common mineral, but is it is a highly valued gemstone when it is transparent blue and comes from Tanzania. The blue, vanadium-containing variety is then known as tanzanite. A particularly spectacular property of tanzanite is it's pleochroism. That means, when we look down the a-, b-, and c-axes of the crystal, we see different colors. Even more spectacular is the appearance of tanzanite crystals when they are viewed in linearly polarized light with the direction of polarization rotated to vibrate alone each of the three axes **(Figure 6).**

Much of the tanzanite, when mined, is brown color **(Figure 7)** It is subjected to a heat-treatment process to turn it blue for the gemstones **(Figure 8).**

Most tanzanite in the gemstone market has been heat-treated to the blue color **(Figure 9).**

Figure 9. Gem zoisite, variety tanzanite.
Photo: Pala Gems.

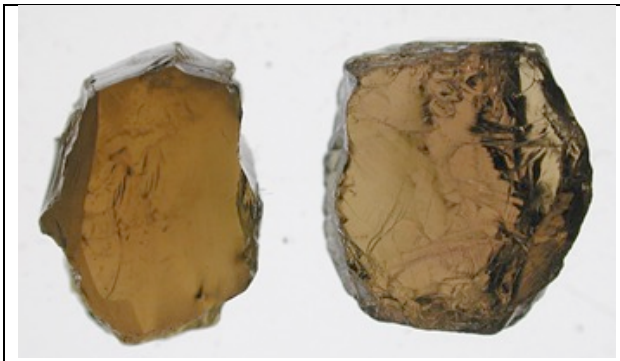

Figure 7. Naturally brown crystals looking down the c-axis. (grr)

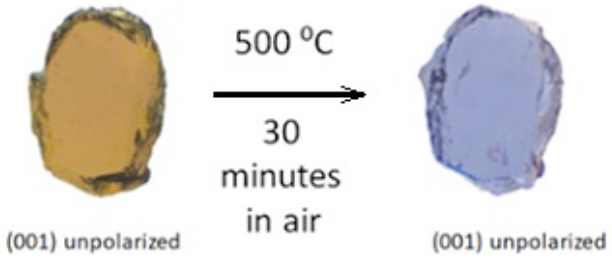

Figure 8. Tanzanite is heat-treated to turn it blue. (grr)

Zoisite can also be pink if it contains a little manganese in the 3+ oxidation state **(Figures. 10 & 11)**

Figure 10. The thulite variety of zoisite with 0.3% manganese.
photo: Mark Garcia

Figure 11. A light red zoisite crystal from the Merelani Hills, Tanzania (GRR)

If a greater amount of the aluminum atoms in zoisite is replaced by manganese, it becomes the mineral piemontite, $Ca_2(Al_2Mn^{3+})(Si_2O_7)(SiO_4)O(OH)$. Manganese in the 3+ oxidation state is commonly some shade of red, so we should not be surprised to find that piemontite is red in color **(Figure 12).**

Zoisite can also have other colors when it contains iron but only a little vanadium. Such crystals are found in Pakistan **(Figure 13).**

The final word on the letter Z. Tanzanite crystals can be rather large. How would you like to have the 3-inch crystal in **Figure 14** in your collection?

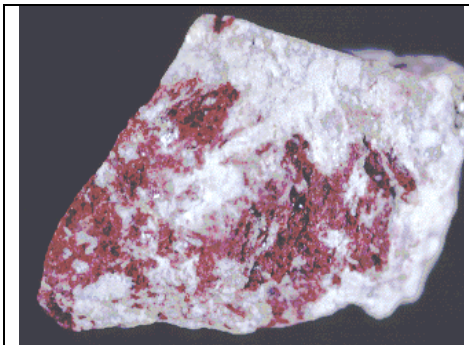

Figure 12. Piemontite from the Whitewater River west of Palm Springs, CA. (grr)

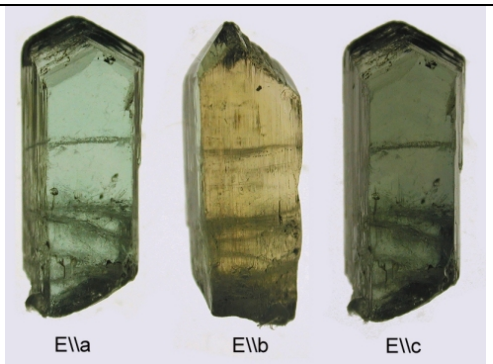

Figure 13. Zoisite from Alchuri, Shigar Valley, Pakistan, contains 1.5 to 2% iron also a trace (0.05%) of vanadium. (grr)

Figure 14. A 3-inch-tall tanzanite crystal from Tanzania.
Photo: Mark Garcia

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MINUTES of the February 21, 2019 Meeting

At 7:30p.m., the **977th Membership Meeting** of the Mineralogical Society of Southern California (MSSC) was called to order by President Dr. Rossman, Ph.D.

Message from the Chair: Dr. Rossman reported that there are still 5,534 IMA approved minerals. No new minerals have been *published* by IMA for the past two months, but some have been approved (not published).

Regular Business

a) Minutes: Dr. Rossman said he would entertain a motion to approve the January 2020 Banquet Minutes as published in the February 2020 Bulletin. The Motion was made by Ahni Dodge and seconded by Laura Davis. There was no discussion and no corrections or additions. The voice vote was called. **The motion to approve the January 4, 2020 Minutes passed unanimously**.

Announcements and Reports:

(a) Field Trip Report: The next field trip will be to Lonely Butte, aka "Brown Butte" in Mojave Desert. Geoff Caplette says the area is a bog that was petrified where there are palm and cattails, as well as, lots of brown agate. He says the site has easy access; it is 10 miles east of Mojave. The trip is scheduled for Saturday, March 7th; meet up 9 a.m. at 55th St exit of Hwy 58. Contact Marek at marek.chorazewicz@keysight.com for more details. Rudy mentioned that the previous field trip was to Lead Mountain (after PMC) and the collection was barite mineral crystals.

(b) Tucson Gem & Mineral Show ended Sunday, February 16, 2020. Brief report was given by Angie Guzman and Renee Kraus, who each had a wonderful experience. Check the MSSC website for a few photos of their Tucson excursion including Renee's awesome geode pix.

(c) Pacific Micromineral Conference report by Rudy Lopez: Rudy prepared a short PowerPoint presentation with highlights of the Conference at Fallbrook. The event featured speakers, oral and silent auctions, $1 micro mineral table (we sold 774), old and new friends, homemade cookies (thanks Mrs. Bricker and Mrs. Halstrom) and hot coffee. There were a few who signed up as new MSSC members, including Eric who came in from Japan. Welcome new members! The conference was well attended; in fact, Rudy displayed a photo of those who attended 2020 PMC *each of whom has a mineral named for them. WOW*! Thanks to all who helped set-up and tear-down and to the Fallbrook Gem and Mineral Society for the use of the hall.

(d) MSSC Board Meeting: The next MSSC Board meeting will be held March 8th starting at 1 p.m. at PCC Geology Building. This is the same place where we hold our regular Membership Meetings. Everyone is welcome to attend. The Board is looking for a member to volunteer and serve as a Director for the 2020-2021 term. If you're interested, please contact one of the officers for more information.

(e) Other Announcements by Rudy Lopez: **(1)** The 6th Annual Nature Fest (flyer) will be held March 14-15 at the Natural History Museum of Los Angeles County. MSSC will again have a table with exhibits and specimens for the kids. If you can volunteer, please contact Rudy Lopez. **(2)** Cabochons for sale! The cabs have been crafted by Rudy and he will donate sale proceeds, less his costs, to MSSC. As agreed by the Board, the cabs will be available at membership meetings; **(3)** The Fallbrook "Rough N' Cut" (flyer) will be March 21st. "Dive into the world of rough-cut rock….everyone is welcome to shop for rough stone, yard rock, lapidary material specimens, slabs, minerals, crystals, gemstones and more!" Rough N' Cut sale is from 1-4 p.m. and there are Silent Auctions at 1:30, 2:30 and 3:30 p.m. Fallbrook Gem & Mineral Society is located at 123 W Alvarado St., Fallbrook, CA. Contact info@fgms.org for additional details.

Program: Program Chair Rudy Lopez introduced the night's illustrious guest speaker, MSSC's own, Dr. George Rossman, Ph.D. [Overlay music from "Rocky" – you had to be there!]. Dr. Rossman is Professor of Mineralogy at California Institute of Technology where he has been affiliated for over 48 years. He earned his Bachelor of Science degree in Chemistry and Mathematics from University of Wisconsin (Eau Claire) and his Ph.D. in Chemistry from Caltech where his studies involving molybdenum cyanides and polymerized iron compounds had little to do with minerals or geology. Dr. Rossman studies mineral spectroscopy, the study of

interaction between matter and electromagnetic radiation. He is: "…an expert in the origin of color, effects of natural and artificial radiation damage and the concentration and crystal chemistry of hydrogen in minerals…" (Paul Asimow)*. He has authored or co-authored over 360 papers in mineralogy, chemistry, and materials science. The tourmaline species, *rossmanite*, published in 1998, was named in recognition of his studies of the color and spectroscopy of tourmalines. Dr. Rossman is President of the Mineralogical Society of Southern California (MSSC). His program is: "Do Rocks Start Fires?"

Dr. Rossman starts his story by telling us of the day he had a visit by a lawyer from Southern California Edison (SCE) who said they were working on a problem. The man brought two rocks and when he smacked them together, in a dark room, a flash of light came out that he thought were sparks. [Rossman showed a photo from the Internet displaying similar result – a light flash.] Rossman explained to the lawyer that what he was looking at was triboluminescence. Triboluminescence is thermal emission of light resulted when chemical bonds are broken and mix with the nitrogen in the air to form chemically energetic compounds that quickly give off light (i.e., break a LifeSaver). Dr Rossman was able to convince the SCE lawyer that what he was looking at was energetic light, not fire. The lawyer was satisfied, and he left.

A couple years later, the lawyer comes to Rossman's office again and says he was involved with a case where rocks collided and were believed to have sparked and started fire. The question from Rossman was why was SCE so concerned about this? The lawyer stated there were some legal issues surrounding this concept and he wanted to know if rocks could start fire. Dr Rossman suggested testing using infrared camera technology, which can detect heat signature(s). And, by the way, SCE flies infrared cameras on their helicopters along their power line routes to detect damage or other public safety issues.

Rossman shows a map of Rosemead, Cabazon and Palm Springs areas. SCE headquarters is in Rosemead and they have a heliport there. Dr Rossman and a SCE crew boarded one of their helicopters and flew to Banning airport. Did I mention, Dr. Rossman loves helicopters and likes to fly in helicopters? The trip continued to a flank of the mountains above Cabazon where SCE power lines are located. On the side of the mountain a ways down from the powerlines, the group located a huge boulder, marked by a flag, which the Forest Service concluded "sparked" the fire that ultimately destroyed a huge swath from above Cabazon across the San Jacintos to and including the Palm Springs Aerial Tramway! Dr Rossman noticed there was the invasive cheat grass in the hills, but, back to that in a minute. The Forest Service said the fire started at the location of the huge boulder, as evidenced by noticeable shearing off of the rock. The desert varnish "coating" was not visible, and it was evident something large sheared it off. It was determined that a large boulder tumbled down the hill, hit the huge boulder and that sparked the fire. The fire grew, backfires were lit to prevent spreading, but it soon got out of hand/control and the fires carried on to the tramway area. Dr. Rossman notes that the helicopter has projections above and below the cabin which serve as knives that sever power lines should the helicopter fly into those lines. In that way, the helicopter will not go down, but the lines would be cut. It's a built-in safety feature.

In answer to George's question, why was the SCE so concerned about do rocks start fires, he learned that the SCE was being sued by the U S government and SCE needed to get to the "rock starts fire" resolution. There were some individuals of Cabazon who noticed SCE workers above and to the west of them around the time of the fire outbreak. These folks concluded that SCE started the fire by rolling rocks down the hill. So, for our professor, the task was at hand.

The Forest Service had studied the cheat grass extensively and their research found that the grass will ignite if held at 600°F for 1 minute. Is the "spark" flying off the collided rock at a temperature equal to the ignition criteria of the cheat grass enough to start a fire in the grass? The rock is tonalite, a feldspar rich igneous rock which makes up most of the San Jacinto area. So, the team helicoptered in to measure rock "behavior" by infrared camera technology. Several methods of rock collision were used, in an entire day of testing on the hilltop, the team was never able to exceed 350°F in their measurements.

Then, at Caltech a study was done of the rocks, the mineralogy of the rocks at the top of the hill and from the lower area was conducted. The study also included weathering, coatings (desert varnish as opposed to sheared off surfaces) and fractures in the rock, thereby chemical characteristics of the rocks are derived. In addition,

back to the hilltop (via helicopter, again George was happy to fly up) and using SCE's big crane, a group of huge boulders were brought back to a SCE test site in Palm Springs for additional infrared camera testing. These tests measured the impact, luminescence and temperature under different methods. The infrared cameraman positioned himself and the test commenced. First was sledge hammering one of the rocks manually, second was the swinging (pendulum) the boulders one against another to measure the impact and collision results and third was the drop test - one on top of another, all the while being filmed and monitored with the infrared camera in place. None of the tests exhibited a temperature rise above 365°F and barely at 300°F for less than split second. All of the infrared camera testing and measurements were conclusive; there was never attainment of the 600°F threshold to ignite the grass by colliding rock(s).

Again, George is happy, mostly because he gets another helicopter ride back to SCE headquarters. Lawyers, lawyers… Dr. Rossman goes to downtown Los Angeles and is deposed, "Are you a fire investigator?", "How many fires have you investigated?" etc., all day long. Next trip to Riverside County courthouse for first day of trial in USA vs Southern California Edison to recoup monies spent fighting the fire. After a day's worth of sitting in the court hall waiting to testify in court (judge and lawyers, no jury) where there were arguments against his opportunity to provide testimony and then finally allowing his testimony, he was questioned about everything and anything he said. By 4:30 p.m. the judge demanded proof that infrared camera technology was valid in California law and, he demanded the proof by 5:00 p.m. that very day!! Rossman called the Librarian at Caltech and asked them to fax him anything they could find on articles involving infrared cameras in law. By 4:55 p.m. that day, just 25 minutes later, he had 125 abstracts faxed to the courtroom plus, SCE lawyers were able to produce some 50 documents regarding infrared cameras being used in California law.

BUT, (wait for it…) in California law, and it is well documented, infrared cameras are primarily used to search out drug houses, the cameras are attached to law enforcement helicopters to pinpoint areas of concern. This **implies** a *moving camera* over a *stationary target (house)*. All of the SCE tests were performed using a *stationary camera* over *moving target (rocks/boulders)*. The judge said because of the moving and stationary cameras, Dr Rossman could not mention anything about infrared cameras or the work (tests) done with infrared cameras. Really???? Rossman points out that whether the camera is moving, and the target is stationary, or the target is moving, and the camera is stationary, the result is the same! However, according to the judge, the (infrared camera) rock tests was not a valid use of infrared cameras as applied to California legal consideration and, such testimony is, therefore, disallowed. *[Sheesh!]*

The next trial day, the jury trial portion commences. So, Dr. Rossman mentions the desert varnish on some rocks and the sheared off top of the boulder that was collided by another large rock. In some areas, ancient Native Americans carved through the varnish to create petroglyphs, a well known and proven geologic and archeological fact. He goes on to explain, in detail, the chemistry, weathering and other factors that affect rocks. The USA attorneys argued Rossman's testimony stating rock coatings were irrelevant because there were chemical sprays over the fire area and that changed the coatings and color of the rocks. *[Secy note: the exchange was probably much more detailed and intense than what I present here, but you get the idea!]* The judge instructed the jury to accept the USA attorney's argument.

Dr Rossman mentions the US government documented that, in Fynbos, South Africa, where there is dense vegetation, fires can ignite by rocks falling down onto accumulated sediment, organic debris, compressed and compacted material, like hot compost. He gives another example, a bulldozer driver who claimed he did not start a fire when his machine pushed a rock over a ravine (so the rock started the fire) that landed 6 feet away from his position. But, a fire ignited, probably by the tip of his lowered bucket scraping something on the ground…a rock?

At the end of the jury deliberation, the US government won, SCE was found guilty of starting the fire. The jury concluded that SCE was responsible for the rocks rolling down the hill, colliding with other rocks and that's what started the fire. The Federal prosecutors tell Rossman they had to go after him in their prosecution of SCE, but they thought he was a very formidable witness. The judge complimented Rossman by telling the attorneys that he was the most intelligent witness in a courtroom. After trial, the jury was polled and told about the infrared testing. It was explained what Dr. Rossman would have testified had the judge allowed the infrared

testing. Each juror independently stated that had they known; each would have voted Not Guilty. SCE attempted a re-trial, but the courts would not allow it. Back at the SCE headquarters, Rossman handed the SCE lawyer his bill for the 3 months work and the lawyer said, out loud, "God, you professors don't know how to charge!"(apparently, a lowball figure). **The California legal precedent now says rolling rocks that collide DO start fires!** So, maybe on our field trips, we need to be aware of that and make certain to be extra careful. Finally, on that hilltop, George found a lot of bullet casings on the ground (room for further speculation about how the fire started) and, the Cabazon people only saw SCE people at the top of the hillside, they did not see the fire actually start. Q&A followed.

* Per Wikipedia

That was very clever and interesting. Thank you, Dr. Rossman.

Door Prize: The drawing was won by Jeff Dongrove. Congratulations!

Adjourn: The meeting was adjourned at 8:28 p.m.

Refreshments and interesting conversation followed the meeting. Thanks to Laura Davis, Rudy Lopez and Cheryl Lopez for bringing and setting up the refreshments.

Reminders:

-Submissions for the *Bulletin* are due to Editor Linda Elsnau by the 22nd of each month.

-**Field Trip** on Saturday, March 7th (see above for details).

-**MSSC Board meeting** will be Sunday, March 8th at PCC starting at 1:00 p.m.

-**MSSC's 978th Membership Meeting** Friday March 13, 2020 at PCC starting at 7:30.p.m. The scheduled speaker is Karol McQueary presenting "A Dinosaur for California". Put it on your calendar now! You don't want to miss another great presentation.

Respectfully submitted by Angie Guzman, MSSC Secretary

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List of Upcoming MSSC Events : Mark your Calender!

Event	Date	Comments / Scheduled Program (if known)
Meeting Dates:	April 10, 2020	Krista Sawchuk: Discovering the Deep Earth
	May 8, 2020:	Webers- Rainforest Jasper of Queensland Australia
	June 12, 2020	Eric Scerri: The Periodic Table: It's Story & In Significance
	July 10, 2020	Peter Goetz: - Beautiful Opal, Identification and Internet Opal
Field Trip	March 7, 2020	Lonely Butte, a.k.a. Brown Butte *See Page 10*
Annual Picnic	August, 2020	*Date & Location to be Announced*
Board Meeting	March 8, 2020	*PCC Meeting Room*

Note: Dates and programs shown above are subject to change. Check your bulletins to confirm final information each month.

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L.A. Nature Fest is a two-day festival that celebrates L.A.'s wild side ! By: Rudy Lopez

Saturday, March 14, 9:30 am - 5 pm & Sunday, March 15, 9:30am – 5pm
Los Angeles Natural History Museum
900 Exposition Blvd., Los Angeles, CA 90007
213.763.DINO (3466)

There's a surprising amount of nature in Los Angeles, and the more you know how to look for it, the more you'll see. You'll be blown away by the plants, animals, and the people devoted to protecting and studying them.

L.A. Nature Fest unfolds in our very own Nature Gardens, the outdoor space where museum scientists do real research and educators share nature's coolest stories.

Each day will be filled with performances, hands-on activities, and presentations.

PAST FESTIVAL HIGHLIGHTS INCLUDE

- Meet live animals such as falcons, owls, opossums, and reptiles
- Build your own bird houses! Limited availability, first come, first served
- Raptor flight demonstrations
- Over 35 exhibitor booths with local organizations
- Talk face to face with scientists and nature experts who are excited to answer your questions
- Free giveaways from the Tree People and seed packets from Big Green
- Hands on nature crafts and activities

Any Questions or to volunteer to help, contact Rudy Lopez *programs@mineralsocal.org*

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55th Pacific Micromineral Conference By: Rudy Lopez

The 55th Pacific Micromineral Conference was held on Friday, January 31st & Saturday, February 1st, at the Fallbrook Mineral Museum. There were 35 in attendance and plenty of microscopes filling the tables. There were 4 great presentations, tables full of micromounts for sale, and tables full of free minerals to look at. There were also two tables of great silent auction items and great minerals for the verbal auction. The event was a great success for MSSC and all that attended.

Al Wilkins as always did a fantastic job setting up the Conference.

The giveaway tables were filled every hour and by the end of the event there were plenty of empty boxes.

The sales table started with 1,958 micromounts, and we sold 774. We only have 1,184 left for next year. We need more for next year.

Everyone having fun and hard at work

We had guests from Japan that I invited, they were staying with a fishing buddy of mine from San Diego. They have been collecting rocks and tumbling them with a couple of tumblers I gave them. We made sure they took home some great minerals.

We enjoyed four excellent presentations on Saturday. The silent Auction was a success as there were excellent pieces contributed by the conference attendees. We had all the cookies and treats we needed. I want to thank Janice Bricker and Anna Hagstrom for baking such great treats. Angie Guzman made sure there was fresh coffee each day.

I want to thank the Fallbrook staff that came and made sure the floors were clean, wiped down all the tables, and made sure we had everything we needed. Also I want to thank, Angie Guzman and myself for getting there early and arranging tables and chairs for the event.

Hope to see more micro-mounters next year.

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Ride Share Listing

Can You Provide A Ride?
Would You Like Company On The Drive To Meetings?

We have heard from several of our members that they would like to ride-share with someone to the meetings. We will list the names, general location and either a phone number or an email address of anyone who would like to connect for a ride-share. If you would like to catch a ride or would like company for the trip, let me know at msscbulletin@earthlink.net and I'll put the information in this section of the bulletin. After that, any final arrangements made are up to you. Also, If you make a connection that works for you, let me know so that I can remove your information from the bulletin. The Editor

Looking for	Who	Where	Contact at
A Ride home after meetings	Ed Kiessling	*See emailed bulletin*	*See emailed bulletin*
A Ride home after meetings	Isabel King	*See emailed bulletin*	*See emailed bulletin*
A ride	Richard Stamberg	*See emailed bulletin*	*See emailed bulletin*

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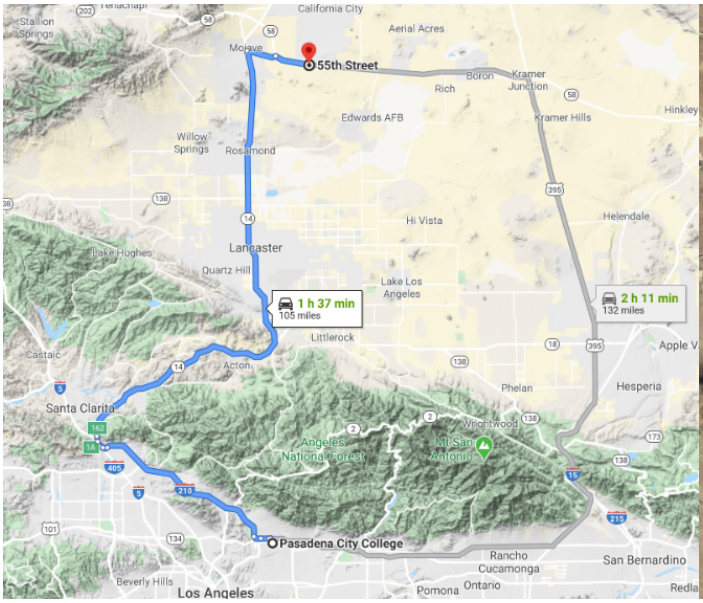
Next MSSC fieldtrip, Lonely Butte area, March 7th, 2020: Marek.Chorazewicz@keysight.com

Hi, fieldtrip friends,

PMMC and Tucson 2020 are now history, so let's focus on the field collecting again. And just a reminder of the new rule in 2020 -- the fieldtrip participants need to be current MSSC members.

The next fieldtrip will go to one of the old-school rockhounding areas in the Mojave desert -- Lonely Butte, a.k.a. Brown Butte. The material is petrified reed, petrified palm root, and agate in all shades of brown, from latte to espresso for the coffee lovers. The hillside is littered with chunks of material and there are veins of agate all over the area. The area is on BLM land, just outside of the Edwards AFB boundary. Be mindful of the BLM rock collecting limits, up to 25 pounds a day and the material collected cannot be sold. The agate is good for cutting and tumbling.

We will meet on Saturday, **March 7th** at 9:00 AM at the 55th St exit off Hwy 58, approx. 8.2 miles east from Hwy 14 and Mojave Barstow Rd intersection in Mojave. The meeting spot is located 105 miles from Pasadena, a one-and-a-half-hour drive. The coordinates of the meeting place are 35°01'13.8"N 118°02'01.1"W (35.020511, -118.033631), the Google Maps pin is https://goo.gl/maps/uPtAULiEpKtyVRgMA. From there we will drive 3.2 miles south on good quality dirt roads to the second butte turnoff and park at the foothill, plenty of space for many cars. I think even dedicated sedans will make it to at least that turnoff, no need for high-clearance or 4x4 vehicles this time.



The last turnoff coordinates (in case you're late): 34°58'41.1"N 118°02'05.3"W (34.978083, -118.034818), Google pin: https://goo.gl/maps/ggqpB96KYLMAcWLf9, but don't use this pin for directions or Google will take you around on various unrelated roads for 30 miles. Use the first pin instead, then head south on the main dirt road. After crossing the railroad tracks bear slightly right to continue on the main dirt road.

Hope to see you all there, Marek C

****

OTHER (FREE) THINGS TO DO...Ann Meister

The **Von Kármán Lecture** is on *Thursday/Friday* **March 5 and 6** at 7 PM. The speaker is Dr. Morgan Cable, Astrobiology and Ocean Worlds, JPL. The title of the presentation is **"The Search for Life: Exploring Ocean Worlds."** The search for life is "civilization level science." What happens if or when we find it? Using the upcoming block of "Ocean Access" missions, Dr. Morgan Cable shows us why ocean worlds are important and what the discovery of life could mean to us as a civilization. ** Thursday is at the Von Kármán Auditorium at JPL and Friday is at Beckman Auditorium at Caltech.

The **Watson Lecture** at Caltech's Beckman Auditorium is on Wednesday, **March 18** at 8 PM. The speaker is Julia A. Kornfield, Professor of Chemical Engineering, Caltech. The title of her talk is, **" Megasupramolecules: When Disaster Leads to Discovery."** The events of 9/11 spurred Kornfield's research team to begin research on polymers that, when added to fuels like gasoline, minimize the risk of explosion when ignited. These polymers, known as megasupramolecules, change the way liquid fuels flow and could help reduce fatalities and injuries from plane crashes, auto accidents, and IED attacks on the battlefield.

The **UCLA Meteorite Gallery** lecture is on Sunday, **March 8** at 2:30 pm*. The speaker is Dr. Alan Rubin; UCLA Cosmochemist. The title of his talk is **"Meteorites and Minerals."** About 460 minerals have been identified in meteorites, about 8 to 9% of the total number of well-characterized mineral phases. Meteorite mineral species include native elements, metals and metallic alloys, carbides, nitrides and oxynitrides, phosphides, silicides, sulfides and hydroxysulfides, tellurides, arsenides and sulfarsenides, halides, oxides, hydroxides, carbonates, sulfates, molybdates, tungstates, phosphates and silico phosphates, oxalates, and silicates from all six structural groups. The minerals in meteorites formed by numerous processes including (1) condensation (e.g., in gaseous envelopes around evolved stars, in the solar nebula, within impact plumes on asteroids, and from late-stage vapors in differentiated bodies), (2) crystallization (e.g., from CAI, AOI and chondrule melts, as well as in differentiated bodies), (3) exsolution (e.g., in minerals in CAIs, chondrules, and opaque assemblages), (4) annealing of amorphous material (in the solar nebula and on parent bodies), (5) thermal metamorphism, (6) aqueous alteration, (7) precipitation from asteroidal brines, (8) shock metamorphism, (9) space weathering, (10) solar heating near perihelion, (11) atmospheric passage and (12) terrestrial weathering. **The UCLA Meteorite Gallery in Geology room 3697 is open with a docent present every Sunday from 1 till 4. The lecture, which is always on a Sunday afternoon at 2:30 pm, is in room 3656 near the Meteorite Gallery.

Calendar of Events:

Only S. California area shows are listed here. Other CFMS Club shows can be found at: http://www.cfmsinc.org/

MARCH 2020

March 7 – 8: VENTURA, CA
Ventura Gem & Mineral Society
Ventura County Fairgrounds
10 West Harbor Blvd.
Hours: Sat 10 – 5; Sun 10 – 4
Website: vgms.org

March 13, 14 & 15: VICTORVILLE, CA
Victorville Valley Gem & Mineral Club
44th Annual Rockhound Tailgate
Stoddard Wells Road/Dale Evans Pkwy
Hours: 9 – 5 daily
Website: vvgmc.org Show Page

March 21st: FALLBROOK, CA
Fallbrook Gem and Mineral Society
123 W. Alvarado Street, Fallbrook, CA 92028
1 pm – 4 pm
Web site: http://fgms.org

March 21 – 22: Lemoore CA
Lemoore Gem & Mineral Club
Trinity Hall
470 Champion St., Lemoore
Hours: Sat 10 am – 6 pm, Sun 10 am – 4 pm
Facebook: http://www.Facebook.com/AndLemoore
Gems, minerals, rocks, fossils, geode cutting

March 28 – 29, TORRANCE, CA
South Bay Lapidary & Mineral Society
Ken Miller Recreational Center
3341 Torrance Blvd, Torrance, CA 90503
Hours: Saturday, March 28, 10 am – 5 pm, Sunday,

March 29, 10 am – 4 pm.

APRIL 2020

April 3 – 5; VISTA, CA
Vista Gem & Mineral Society
2040 N. Santa Fe Ave., Vista, CA 92083
Hours: 9 am-5 pm each day
Website: www.vistarocks.org

April 18 -19; PASO ROBLES, CA
Santa Lucia Rockhounds
Paso Robles Event Center
2198 Riverside Ave., Paso Robles CA
Hours: 10 am – 5 pm
Amazing Agates!
Web site: http://www.slrockhounds.org/show.html

April 18 – 19, Thousand Oaks, CA
Canejo Gem & Mineral Club
Borchard Community Park, 190 N. Reino Rd.,

Thousand Oaks 91320
Hours: Sat 10 am – 5 pm, Sun 10 am – 4 pm
Website: https://cgamc.org/

April 25-26; ARCADIA, CA
Pasadena Lapidary Society
Arcadia Masonic Center
50 W. Duarte Rd., Arcadia CA 91007
Hours: Sat 10 am – 6 pm, Sun 10 am – 5 pm
Web site: http://pasadenalapidary.org

April 25 – 26: LANCASTER, CA
Antelope Valley Gem & Mineral Club
Antelope Valley Fairgrounds
2551 West Avenue H
Hours: Sat 9 – 5; Sun 9 – 4
Website: www.avgem.weebly.com

MAY 2020

May 1-3; YUCAIPA, CA
Yucaipa Valley Gem and Mineral Society
Yucaipa Blvd and Adams Street, Yucaipa, CA
Hours: Fri 6 pm – 9 pm; Sat 12 noon – 9 pm; Sun 12 noon – 6 pm
Web Site: http://www.yvgms.org

May 2 – 3; ANAHEIM, CA
Searchers Gem and Mineral Society
Brookhurst Community Center
2271 W. Crescent Ave., Anaheim
Hours: Sat 10 am – 5 pm, Sun 10 am – 4:30 pm
Website: http://www.searchersrocks.org

JUNE 2020

June 1-2: CAMBRIA, CA
San Luis Obispo Gem & Mineral Club
Cambria Veterans Hall
1000 Main Street, Cambria
Hours: 10 – 5 daily

June 27 – 28, CULVER CITY, CA
Culver City Rock and Mineral Club
Veterans Memorial Auditorium
4117 Overland Ave, Culver City CA 90230
Website: http://culvercityrocks.org/fiesta.htm

2020 MSSC Officers:

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About the Mineralogical Society of Southern California

Organized in 1931, the Mineralogical Society of Southern California, Inc. is the oldest mineralogical society in the western United States. The MSSC is a member of the California Federation of Mineralogical Societies, and is dedicated to the dissemination of general knowledge of the mineralogical and related earth sciences through the study of mineral specimens. The MSSC is a scientific non-profit organization that actively supports the geology department at Pasadena City College, Pasadena, California. Support is also given to the Los Angeles and San Bernardino County Museums of Natural History. The Bulletin of the Mineralogical Society of Southern California is the official publication of the Mineralogical Society of Southern California, Inc.

The MSSC meetings are usually held the second Friday of each month, January, February and August excepted, at 7:30 p.m. in Building E, Room 220, Pasadena City College, 1570 E Colorado Boulevard, Pasadena, California. The annual Installation Banquet is held in January, and the annual Picnic and Swap Meeting is held in August Due to PCC holidays, meetings may vary. Check the Society website for details.

The Society also sponsors the annual Pacific Micro mount Symposium held at the Fallbrook Mineral Museum during the last weekend of January.

Annual Membership dues for the MSSC are $20.00 for an individual membership, $30.00 for a family membership. Bulletins are delivered by email, there is an additional annual $20.00 fee if you prefer paper bulletins mailed to your address. The Society's contact information:

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Website: ***www.mineralsocal.org*** **The Mineralogical Society of California, Inc.**

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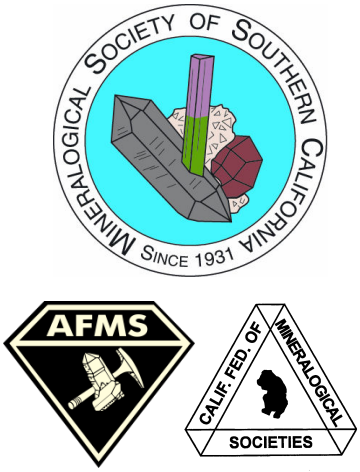
To:



With Knowledge Comes Appreciation

Your MSSC Bulletin Is Here!