



Bulletin of the Mineralogical Society of Southern California

Volume 94 Number 8- August, 2021

The 992nd meeting of the Mineralogical Society of Southern California

With Knowledge Comes Appreciation

A ZOOM Meeting **August 13th, 2021 at 7:30 P.M.**

Program : Discovering the Deep Earth Presented by: Dr. Krista Sawchuk

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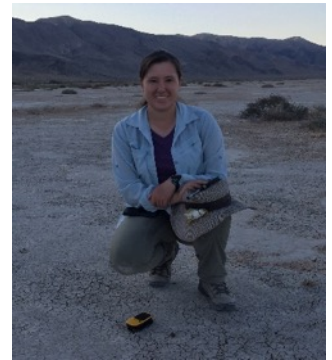
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Remember: If you change your email or street address, you must let the MSSC Editor and Membership Chair know or we cannot guarantee receipt of future Bulletins

About the Program: Discovering the Deep Earth Presented by: Dr. Krista Sawchuk:

Join Krista on a journey through the deep Earth. The deep Earth, which encompasses the mantle and core, makes up 99% of our planet. Because we can't physically go to the deep Earth, scientists employ a variety of techniques to learn more about it. Krista will share what we do know about the deep Earth and how her research on the behavior of minerals at high pressures and temperatures is helping us learn more about the chemistry of the mantle.

Dr. Krista Sawchuk recently graduated from UCLA with a PhD in geochemistry. Her dissertation research focused on the high-pressure behavior and chemical reactions of volatile-bearing minerals in Earth's mantle. Since graduating, Krista started a postdoctoral research position at Los Alamos National Lab in New Mexico where she continues her high-pressure research. In her spare time she enjoys mineral collecting and curating her personal mineral collection.



How to Join our ZOOM Meetings by Rudy Lopez

MSSC paid members will automatically be added to the invite list each month.

Non-Members must request to attend MSSC zoom meeting each month.

Please go to the MSSC website, <http://www.mineralsocal.org> to read our Bulletin for upcoming programs, then send Rudy Lopez an email, no later than the Tuesday before the meeting, to programs@mineralsocal.org and he will make sure you're contacted.

From the Editor: Linda Elsnau

As you can see, there are two emails from me this month. The first is this Bulletin and the second is the proposed changes to our ByLaws and Operating Rules. These changes will be voted on during the upcoming August meeting so it is very important that you look them over before the meeting to you can cast an informed vote. See the announcement on page 12 and watch for the second email from me.

FROM THE PRESIDENT: Interesting Minerals, A to Z. Round 2, A to Z., Installment 17, the Letter "Q": by George Rossman

Quartz

Quartz is a big topic. Let's narrow it down for now to just rose quartz. Let's immediately move beyond one thing. If you search for 'rose quartz' on Google, you will find lots of references to its 'healing properties'. DON'T get me started on that! Now that we have moved beyond this, let's look at the mineralogical aspects of rose quartz.

Rose Quartz

There is more than one type of quartz called rose quartz. The most common occurs in translucent masses made of intergrown, anhedral crystals. Some of these deposits can be very large. It is always massive and never has euhedral crystalline forms. It occurs in different hues of pink, sometimes violet approaching



Figure 1. Rose quartz from Tsaramanga, Antananarivo Province, Madagascar.
Photo Credit: Mark Garcia



Figure 2. Rose quartz from Olivera dos Brejinhos, Bahia, Brazil.
Photo Credit: grr

bluish, and sometimes more reddish. Some are very pale colored, and some are not. Rose quartz is always never completely transparent. It always has a hazy to translucent character. It occurs in numerous localities around the world. Large quantities occur in Madagascar (**Figure 1**) and Brazil (**Figure 2**). Nice quality material comes from many other localities, including Namibia (**Figure 3**) and South Dakota (**Figure 4**).

People have speculated for nearly a century about the origin of color of rose quartz. Herman in 1908 suggested that a manganese compound was the origin of the color, possibly in solid solution, or possibly as sub-microscopic particles. Many textbooks have repeated this suggestion. In 1917, Watson and Beard concluded that rose quartz was colored by an organic compound, an idea that goes back to at least 1816. In 1922 Hubbard simply stated that the color of rose quartz was from the absorption of colloidal titanium as the crystal grew.



Figure 3. Rose quartz from Rossing, Namibia.
Photo Credit: grr



Figure 4. Rose quartz from the Scott Mine, SD.
Photo Credit: grr

Herman W (1908) Über die Einwirkung oxydierender und reduzierender Gase auf die Färbung einiger Minerale. Z. anorg Chem 60, 369-404.

Hubbard GD (1922) Colloids in Geologic Problems. Amer Journal of Science 4, 95-110.

Watson TL, Beard RE (1917) The color of amethyst, rose, and blue varieties of quartz. Proceedings of the U.S. National Museum 53, 553-563.

In 1924, Holden examined 21 different specimens of rose quartz from a variety of localities. Ideas examined were 1) that radioactive minerals act on white quartz to cause the rose color; 2) that an inorganic impurity causes the color; and 3) that the color was due to some organic impurity. His experiments with radiation from radium salts only made smoky quartz, never rose quartz. Never did he find organic material in the rose quartz. His final conclusion was that manganese in the rose quartz was responsible for the color. After all, rhodochrosite, a manganese mineral, is red, isn't it?

Holden EF (1924) The cause of color in rose quartz. American Mineralogist 9, 75-88.

Later, other speculations emerged. In his doctoral thesis from Hamburg University, W Hechler proposed in 1962 that the color may be due to a possible Al-O-Ti radiation color center. Wright et al in 1963 made artificial titanium 3+ color centers in rose quartz, but found that none of them was sufficiently stable to survive in nature. However, [Wright et al. \(1963\)](#), [Lehmann \(1969\)](#) and [Cohen and Makar \(1982, 1985\)](#) all linked the color to titanium in the 3+ oxidation state. Cohen and Makar attributed the Ti³⁺ to irradiation.

Wright PM, Weil JA, Buch T, Anderson JH (1963) Titanium colour centres in rose quartz. Nature: 197: 246-248.

Lehmann G (1969) Zur Farbe von Rosen quartz. Mineral. Monatsch 222-2245.

Cohen AJ, Makar LN (1984) Differing Effects Of Ionizing-Radiation In Massive and Single-Crystal Rose Quartz. Neues Jahrbuch für Mineralogie-Monatshefte 513-521 ,11.

Cohen, AJ; Makar, LN (1985) Dynamic Biaxial Absorption-Spectra of Ti-3+ and Fe-2+ In a Natural Rose Quartz Crystal. Mineralogical Magazine 709-715, 49 .

In 1978, Smith et al. published a variant of a mechanism involving titanium. They proposed that an intervalence interaction between Fe²⁺ and Ti⁴⁺ was the cause of the color of rose quartz. In this process light moves an electron from Fe²⁺ over to Ti⁴⁺.

Smith G, Vance ER, Hasan Z, Edgar E, Runciman WA (1978) A charge-transfer mechanism for the colour of rose quartz. Physics Status Solidi A46, K134-K140.

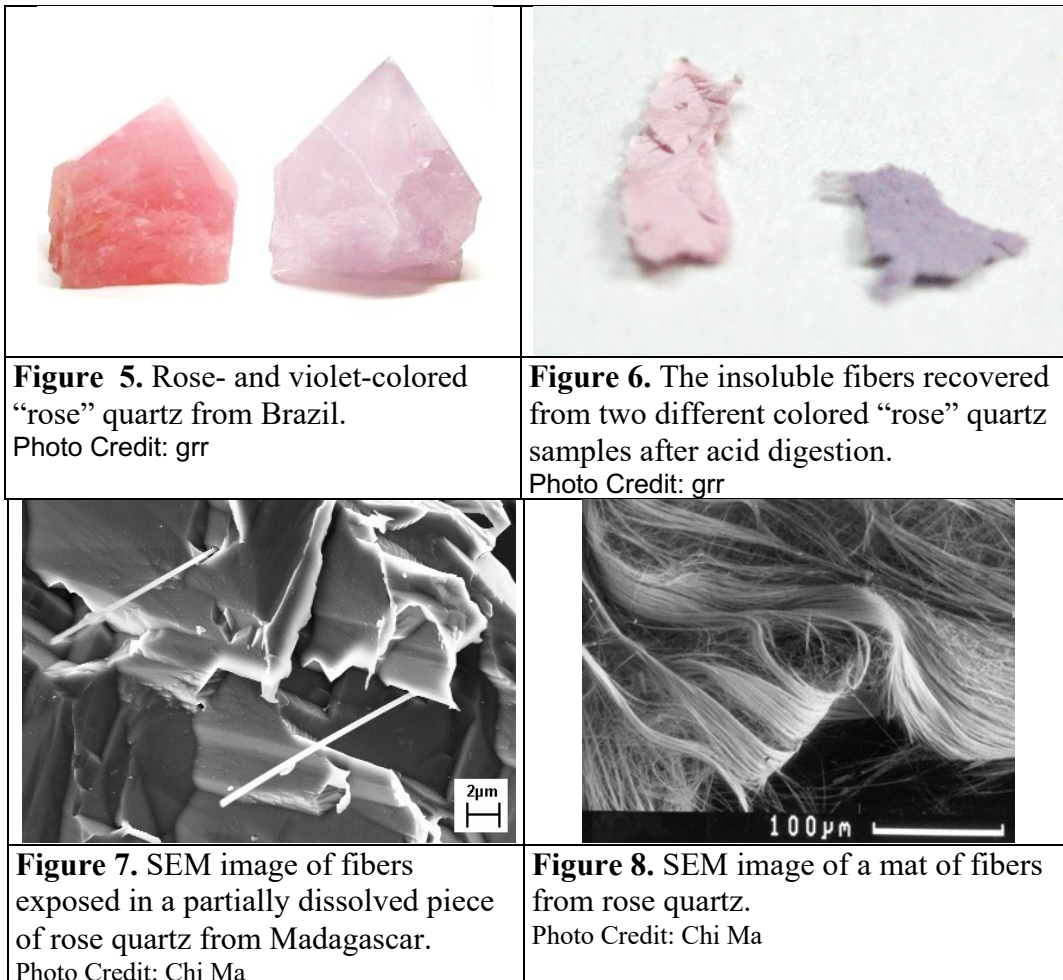
So, which of these proposals for the origin of the color is correct? Or, are any of them correct? The first clue to the answer came from a paper published by Applin and Hicks in 1987 where they describe and experiment in which they dissolved a piece of rose quartz in hydrofluoric acid and found fibers of what they called dumortierite in the acid-insoluble residue. This observation led Goreva et al. (2001) and Ma et al. (2002) to conduct a systematic examination of rose quartz samples from numerous localities to see what sort of fibrous material was contained within.

Applin K, Hicks B (1987) Fibers of dumortierite in quartz. *American Mineralogist* 72, 170-172.

Goreva JS, Ma C, Rossman GR (2001) Fibrous nano-inclusions in massive rose quartz: The origin of rose coloration. *American Mineralogist* 86: 466-471.

Ma C, Goreva JS, Rossman GR (2002) Fibrous nano-inclusions in massive rose quartz: HRTEM and AEM investigations. *American Mineralogist* 87: 269-276.

What they found was that the color rose quartz, world-wide, was due to the color of sub-microscopic fibrous inclusions of a borosilicate mineral related to dumortierite. ‘Related’ because two directions of the unit cell were twice as large as those in dumortierite – namely, a superstructure. Rose-colored quartz gave rose-colored fibers and violet colored quartz gave violet-colored fibers (**Figures 5 and 6**). **Figure 7** is an SEM image of a partially dissolved rose quartz fragment showing the insoluble fibers sticking out of the remaining quartz and **Figure 8** is an SEM image of a mat of the fibers that looks like fine hair.



These fibers are oriented along the 3 *a*-axes of the quartz and can cause asterism that produces a spectacular 6-rayed appearance (**Figure 9**)



Figure 9. Asterism in rose quartz.
Photo Credit: Rock Currier

Pink Quartz

A second variety of pink-colored quartz occurs in well-formed crystals. There are substantial differences between massive rose quartz and the pink crystals in both the physical properties and causes of color. Therefore, it has been suggested to give the variety of pink-colored quartz that forms crystals the name "**pink quartz**"(Hori, 2001) or "**Rosaquarz**" (German for pink quartz, Rykart, 1995). To date, neither of these names has found widespread use, although some authors do make the distinction.

Fraser HJ (1930) Paragenesis of the Newry Pegmatite, Maine. *American Mineralogist* 15, 349-364.

Hori H (2001) Nomenclature of Quartz Color Variation: Pink and Rose. *Mineralogical Record* 32.

These crystals are typically found as a late-stage formation in pegmatite pockets. Frequently, they are found growing on top of smoky quartz crystals in crystallographic alignment with the smoky quartz. They occur in several deposits near the city of Galiléia in Minas Gerais, Brazil (**Figures 10,11**) and other localities in Minas Gerais(**Figure 12**). It is found in the US at Mount Mica, Maine (**Figure 13**), and a variety of other localities around the world. The color was studied by Maschmeyer and Lehmann (1983) who concluded that the color is caused by irradiation-induced color centers involving aluminum, Al, and phosphorous, P, that replace Si in the crystal structure. Specifically, an electron is believed to be removed from the oxygen between an Al and a P forming transforming an Al-O²⁻-P unit into an Al-O¹⁻-P unit.

Maschmeyer D, Lehmann G (1983) A trapped-hole center causing rose coloration of natural quartz. *Zeitschrift für Kristallographie* 163, 181-196.



Figure 10. Pink quartz from the Berilo Branco claim, Galiléia, Minas Gerais, Brazil.
Photo Credit: Rob Lavinsky, irocks.com



Figure 11. Pink quartz from the Pitorra claim, Laranjeiras, Galiléia, Minas Gerais, Brazil.
Photo Credit: Rob Lavinsky, irocks.com

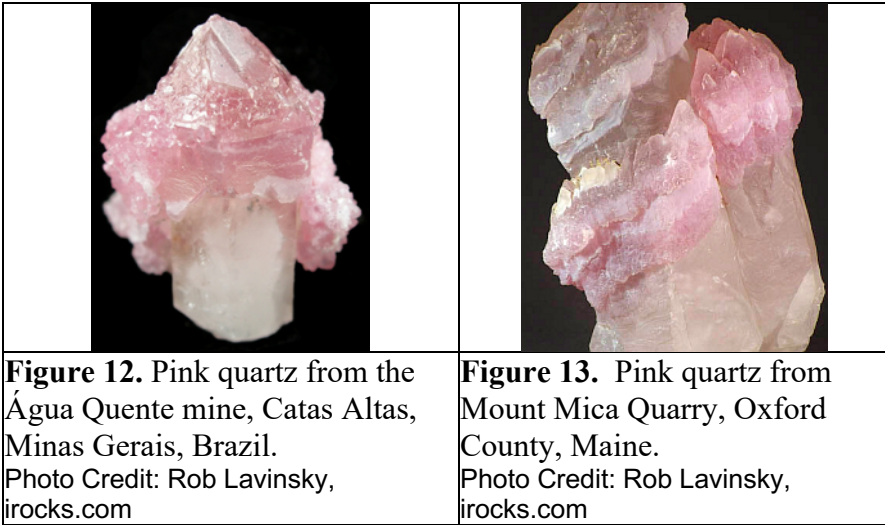


Figure 12. Pink quartz from the Água Quente mine, Catas Altas, Minas Gerais, Brazil.
Photo Credit: Rob Lavinsky, irocks.com

Figure 13. Pink quartz from Mount Mica Quarry, Oxford County, Maine.
Photo Credit: Rob Lavinsky, irocks.com

The proof of origin of color in crystalline pink quartz comes from the synthetic work of Vladimir Balitsky in Chernogolovka, Russia. There, he made a synthetic counterpart by hydrothermal synthesis (Balitsky et al. 1996, 1998). Phosphorous was added to the growth formula of the synthetic quartz and X-ray Fluorescence analysis showed that the phosphorous was incorporated into the synthetic quartz.

After the crystals were irradiated with gamma rays, the P-bearing color centers developed and were responsible for its

pink color. The synthetic crystals are also slightly dichroic. The color is more intense when the polarization plane is perpendicular to the c-axis.

Balitsky VS, Makhina IB, Emel'chenko AG, Mar'in AA (1996) Conditions of formation of phosphorus-containing rose quartz crystals. Doklady Akademii Nauk 349, 358-360.

Balitsky VS, Makhina IB, Prygov VI, Mar'in AA, Emel'chenko AG, Fritsch E, McClure SF, Tajing L, DeGhionno D, Koivula JI, and Shigley JE (1998) Russian Synthetic Pink Quartz. Gems & Gemology 34, 34-43.

Nickel-containing quartz.

There is a third type of pink quartz (actually a bit on the violet side) made synthetically to incorporate a small amount of nickel ions. It was produced experimentally by VS Balitsky, but, to my knowledge, the details of its synthesis have not been published and it has not been produced in large crystals for commercial distribution. **Figure 14** shows what it looks like.

So, now you know the story of rose quartz. Hopefully, you have at least one of these in your collection.

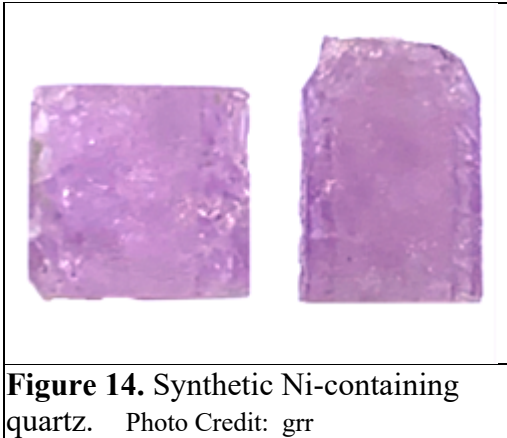


Figure 14. Synthetic Ni-containing quartz. Photo Credit: grr

MINUTES of the July 9, 2021 ZOOM Meeting

At 7:31 p.m., the **991st Membership Meeting** of the Mineralogical Society of Southern California (MSSC) was called to order by President Dr. Rossman, Ph.D. It was MSSC's 14th ZOOM conference meeting.

Message from the Chair (Dr. Rossman):

Dr. Rossman welcomed everyone. He reports that the International Mineralogical Association's (IMA) has approved 5,721 as compared to 5,327, the number approved when he became MSSC's President almost 4 years ago! And, since that time, the average approved mineral species has been 100 per year. One currently approved mineral specimen is Liguowite, a tungsten oxide, WO₃. It was submitted late last year as a new mineral. Liguowite is housed in the Geological Museum of China in Beijing, China.

Dr Rossman reminded us of the upcoming MSSC Board Meeting on July 13, 2021 at 1pm, via ZOOM. If any member has an item to be discussed or considered at the Board meeting, please notify one of the Board members.

Regular Business (Dr. Rossman)

Minutes: Dr. Rossman called for a motion to approve the June 11, 2021 Membership Meeting Minutes as published in the July 2021 *Bulletin*. Dr. George asked if there were any corrections or additions and hearing none, called for a motion to approve. A motion to approve the stated minutes was made by Carolyn Seitz with a

second by Rudy Lopez. The vote was called and **the motion to approve the minutes passed unanimously**. Dr. Rossman declared the Minutes approved.

Announcements and Reports

1. Program/Education Chair Rudy Lopez announced that the next 3 meetings coming up will feature: (a) UCLA's Krista Sawchuk presents "Discovering the Deep Earth; (b) UCLA Meteorite Museum's Dr. Alan Rubin presents "The Origin of Chondrules" and (c) NASA JPL lead Science Operations for the Mars 2020 Rover, Dr. Sarah Milkovich ("Mars"). November will have a CalTech student presentation, and December will feature MSSC member residing in Indonesia, Miko Sujatmiko
2. Rudy reports that **MSSC's 1,000th Membership Meeting** is fast approaching in April 2022. We would like to celebrate MSSC with a past to present presentation containing old and new photos, stories about your collecting and perhaps member presentations. E-mail Rudy with your comments, pictures and stories: programs@mineralsocal.org.
3. Dr. Rossman gave a brief report of field trips. Check the Bulletin and/or website for updates.

Program

Dr. Rossman turned the meeting over to Secretary Angie Guzman. Angie introduced the night's speaker, Rudy Lopez. Rudy has been a member of MSSC for approximately 10 years and he has presented cabbings exhibits at the Natural History Museum of Los Angeles County (Nature Fest) for the past 5 years, as well as, giving demonstrations at other events to promote interest in MSSC. Rudy's forte is education and he has spearheaded mineral exposure, particularly to children so they see, know about, touch and receive a sample mineral to take home. Rudy is experienced in lapidary, jewelry setting and stone cutting/slabs, among other skills. He is currently Program and Education Chair. Rudy enjoys and is an avid fisherman. He brings us to Guadalupe Island, the waters, minor land masses around the island, the people of the island and he tells us about the shield volcano that is Guadalupe Island.

Rudy takes us on his "field" trip south of the border to Guadalupe Island. The volcanic island is 250 miles southwest of Ensenada and 150 miles off the west coast of the Baja California Peninsula. Heading down on a fishing vessel out of San Diego is as fun and exciting as the first trip he'd taken about 20 years ago. The boat has stateroom accommodations, two per, a TV, bathroom; the boat has a galley and other amenities. Loading the boat takes time and there is always a stop at the bait mart before the trip. "Once past Coronado Island, we're in international waters", says Rudy. A stop at Ensenada Harbor, where armed guards are very present, taxes for fishing permits are collected and protocols are given for fishing in Mexican waters.

On our way, playful dolphins swim alongside our fishing boat for miles. Nearing Guadalupe Island, it becomes evident the island has developed its own eco-system. The island is approximately 22 miles long and 6 miles across and from far away, looks to have no shrubs or trees.

So far from the mainland, no Native Americans ever visited the island, but pirates, naturalists, adventurers and goats played some role in its history. In 1602, a Spaniard, Sebastian Vizcaino, lead an expedition of the California coast searching for ports but the project was soon abandoned because settling California would "be more trouble than it would be worth". In the 18th century, John Clipperton, an English privateer, was involved in buccaneering expeditions. He is said to have passed the island; others claimed he used it as a base for his raids on shipping. Rumor has it he buried treasure on the island, none has been found.

Russian and American fur hunters seeking the Guadalupe fur seal in the 18th and 19th centuries nearly caused the elephant seal's extinction by 1844. In 1922 the Mexican government stepped in to protect the elephant seals. When the Russian fur hunters came in the early 19th century, they brought goats. Vegetation was eventually eliminated and the number of goats decreased by a few thousand. In 1901, the goat population, it was determined, was responsible for extinction of "...many interesting species of plants formerly abundant...and also one or more of the bird peculiar to the island..." according to naturalist A. W. Anthony. Not only goats were introduced. Pirates, hunters and naturalists also brought rats and cats. The cats hunted the rats, the birds were eaten by the cats and cats ate birds. The cats did not survive. Many bird species went

extinct. As for the goats, they thrived and their numbers have again increased. They eat low grasses and tree seeds. The palm tree was especially affected. The goats ate seeds that fell from the palm trees limiting new palm growth; the goats are feral and rule the island.

The island was designated a nature conservancy area in 1928, one of the oldest in Mexico. And, as of June 2005, the Mexican government had almost completed a round-up and evacuation of the remaining goat population. In 2000, an ecology group from Cal Berkeley came in to help with control of the goats. They built fences to protect certain areas where tree growth, shrub, low grasses could survive. The delineation shows the stark difference. One side of the fence shows no growth while the other shows tree saplings, low grass growth and even some shrubs. Guadalupe Island has been designated a biosphere reserve.

Guadalupe has two major climate zones: one is very arid, semi-hot and the other is very arid, temperate. Most rain occurs in the winter months with strong influences of northwestern winds and cyclones. Prime tuna fishing time is in November. The Mexican Navy has a base on the island and there is even an airstrip. The island population in 2010 was 213 people but is probably closer to 300 today. They live in the coastal village, West Camp. The village has a school, water towers, desalination system that was installed in 2010, street lights, solar panels, and is a marine reserve. Residents are fishermen who fish for lobster and dive for abalone. Rudy's photos show the terrain is practically barren. The tree line on the crest of the island high point close to West Camp is very sparse.

The geology of Guadalupe is rugged. The island consists of two overlapping shield volcano. Shield volcano lava travels further and thins out the further it goes. Repeated eruptions result in layer upon layer of lava built up giving it its distinctive shield shape. On Guadalupe Island, the northern shield is higher and youngest [*Secy Note: formed during Holocene epoch*]. The island lies atop a fossil oceanic ridge crest, and features high volcanic mountain ridges with the highest northern elevation at 4,259 ft (Mt. Augusta) and an elevation of 3,199 ft. (Mt. Picacho) at the southern end, which is an almost barren landscape. The coast has rocky bluffs with detached rocks in front of them, very rugged. There are two high but smaller islets off the southwestern end of the island: Islote Adentro is the inner one closest to Guadalupe and Islote Afuera (steep, almost vertical walls) is the outer islet. These Islotes are separated by a gap called Tuna Alley. Included in the geography are smaller islets, about 6 of them, that are close to the main island, Guadalupe. There is erosion on the island, mostly due to lack of vegetation. There are cinder cones on the island, as well.

In 1960's, vugs of epidote were discovered but little to no effort has been made to prospect or mine the area. According to Mindat.org, the mineral may have really come from a different island, Isla Cedros. However, most exposed rock on Guadalupe consists of volcanic rock, olivine basalt, trachyte or their alteration products.

Rudy talked about the 5-year ban on fishing in the area. It was imposed to protect the island's marine reserve. Recently, the fishing has been reopened for responsible fishing. Rudy also showed photos of bait barter between fishermen and West Camp residents and the charter fishermen's humanitarian Christmas gift-giving for the kids and other community members living on Guadalupe Island. Oh, then there are the Great White Shark Cage Divers.

The tuna fishing brings a huge number of great white sharks to Tuna Alley. Adventurers and thrill seekers are attracted to the area for the sheer thrill of being in the water with uncontrolled, ferocious and violent creatures. The cage divers come from many areas; they don diving gear, including their cameras for that lasting photo of their experience.

Rudy showed a video of the huge, record breaker great white shark, "Big Blue", a pregnant, 22-foot-long shark that cruises around Tuna Alley. The next video was of cage divers who were behaving a little too reckless for my taste. There were close calls but no one was injured during that videotaping.

All in all, Rudy has great photos, especially of lava flows, island terrain, those darn goats and seagulls over the ocean next to Guadalupe Island. Thanks Rudy for the wonderful photos and the informative commentary! Rudy tells us that since COVID-19 outbreak, the island is off limits.

If you missed Rudy’s presentation, you missed other parts of his presentation. We ask that you join us next time for “Discovering the Deep Earth”, another great ZOOM presentation. MSSC’s next meeting is August 13, 2021 via ZOOM. Contact our Program Chair, Rudy Lopez, if you would like to be put on the invite list.
programs@mineralsocal.org

There was no other society business. Dr. Rossman thanked Caltech for sharing their ZOOM license with us. Thanks to all who attended. Be well and stay safe.

Adjournment was at 8:32 p.m.

Respectfully submitted, Angie Guzman, MSSC Secretary

List of Upcoming MSSC Events : Mark your Calender!

Event	Date	Comments / Scheduled Program (if known)
Meeting Dates:	ZOOM September 10, 2021	Alan Rubin: The Origin of Chondrules
	ZOOM October 8, 2021	DR. Sarah Milkovich - MARS
	ZOOM November 12, 2021	Paolo Sanchez, UC Berkeley, Geology & Geophysics ’22 -Important Minerals You Probably Never Heard Of
	ZOOM December 10, 2021	Dr. Rebecca Greenberger CALTEC TBA
Board Meeting	ZOOM October 24, 2021	ZOOM
Field Trip	September 4-6, 2021	Topaz Mountain, Thomas Range, Utah
	October 16 & 17, 2021	Cady Mountains

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

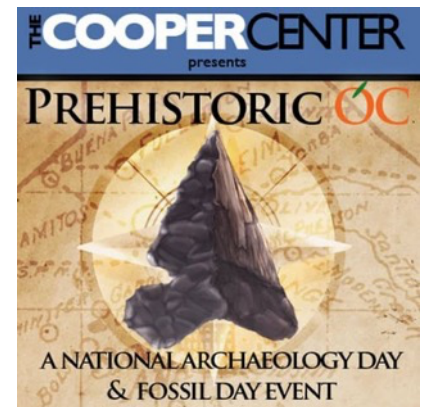
WE HAVE BEEN INVITED BACK TO PREHISTORIC OC

OC Park’s special events are back! We are excited to announce this year’s Prehistoric OC at Clark Regional Park in Buena Park will take place on Saturday October 9th from 10am-2pm.

Prehistoric OC is a free annual family festival celebrating local archaeology, paleontology, history, and science. A celebration of National Fossil Day and International Archaeology Day in one location.

Ralph B. Clark Regional Park is nestled at the foot of the Coyote Hills.

Any MSSC Members wishing to volunteer to help at the MSSC Booth should contact Rudy Lopez at programs@mineralsocal.org



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
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A ride	Richard Stamberg	<i>Meetings cancelled due to COVID</i>
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OTHER FREE THINGS TO DO...by Ann Meister

The **Watson Lecture Series at Caltech is on hiatus until the Fall semester.** Stay tuned until October!

The **Von Kármán Lecture** on Thursday, **August 19** at 7:00 PM. Available live on at [Live & Upcoming - YouTube](#) NASA JPL Live [NASA JPL Live \(ustream.tv\)](#). The speaker is Dr. Lindy Elkins-Tanton, Principal Investigator, NASA Psyche Mission, Arizona State. The title of the presentation is **“Psyche: Mission to a Metal World.”** Deep within the terrestrial planets, including Earth, scientists infer the presence of metallic cores, but these lie unreachably far below the planets’ rocky mantles and crusts. The asteroid Psyche offers a unique window into these building blocks of planet formation and the opportunity to investigate a previously unexplored type of world.

The **UCLA Meteorite Gallery** is temporarily closed until further notice; however, the monthly lecture will be presented on Sunday, **August 15** at 12:00 PM. No registration is necessary as this will not be a live lecture. This is a pre-recorded lecture that will be available on our YouTube at noon. The speaker is Dr. Nick Gessler, Duke University. The title of the presentation is **“Meteorites: A Cultural and Curatorial Perspective.”**

“LOOKE Up and see VVonders!” That admonition resonates more resoundingly today than it did on April 9, 1628, when, “this miraculous, prodigious, and fearful handy-worke of God was presented to the aftonifhable amazement of all beholders... In an instant was heard, first a hideous rumbling in the Ayre... and strange and fearful peale of Thunder... this thunder caried akind of Maiefticall fteate with it, for it maintaiyned the fashion of a fought Battaile... First, for an on-set, went on one great Cannon as it were of thunder alone...then a little whileafter, was heard a secund, and so by degrees a third, until the number of 20... In some little distance of time after this, was audibly heard the sound of a Drum beating a Retreate... this begat a wonderful admiration, that at the end of the report of every cracke, or Cannon-thundering, a hizzing Noyse made way through the Ayre, not vnlike the flying of Bullets from the mouthes of great Ordnance... They were Thunderbolts... one of them was seene by many people... (which) Miftris Greene, caused to be digged out of the ground.”

Whether witnessed in Chelyabinsk, Russia, on February 15, 2013, discovered on the Antarctic Ice or California deserts, the experience and awe of discovery and exploration is familiar to those investigating meteorites with reactors, mass spectrometers, microprobes, microscopes or loupes, to curators of museums and their visitors, conference organizers, speakers and their audiences, to bolide chasers, hunters, collectors, dealers and all those with the curiosity to ask, “what does this mean?” Thousands are looking now. This is the cultural and curatorial perspective I hope to briefly survey. It is an homage to those who pursue the unexpected and are surprised. Visit the website and check on events and videos and other neat things about meteorites, go to

<https://meteorites.ucla.edu>. See the **2021 Poetry Contest Winners** at [The UCLA Meteorite Collection - Gallery Events](#)

MSSC Advertisement Policy:			
Mineral-related ads are allowable in the MSSC bulletin. Below is the price per month			
	Business Card	\$5.00	
	1/3 page	\$10.00	
	1/2 page	\$20.00	
	Full Page	\$35.00	
In addition, any advertiser who purchases 12 months of space in advance will receive a discount of 12 months for the price of 10 months. The copy for the ads should be mailed to the editor at bulletin@mineralsocal.org and the payment should be sent to the MSSC Treasurer 13781 Alderwood Lane, #22-J, Seal Beach, CA 90740			

Calendar of Events:

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

Due to COVID-19 many clubs have cancelled or changed their show dates. CFMS updates this list if clubs notify them. If you have any questions, please reach out to the contact listed to make sure the show is still taking place.

July 10, 2021 – Bellflower, CA

Delver's Gem and Mineral Society
Holy Redeemer Lutheran Church, 14515 Blaine Ave., Bellflower, CA 90706
Parking lot sale! 10AM to 4PM
Website: delversgemclub.wordpress.com

August 21-22, 2021 – Tehachapi, CA

Tehachapi Valley Gem and Mineral Society
TVGMS Annual Gem, Mineral and Jewelry Show
500 East "F" Street, Tehachapi, CA 93561
Saturday and Sunday 9 AM to 5 PM
Website: <http://tvgms.org>

September 4-5, 2021 – Reno, NV

The Reno Gem & Mineral Society, Inc.
Jackpot of Gems
Reno Convention Center, 4390 S. Virginia St., Reno
Saturday 10 AM-5 PM, Sunday 10 AM – 4 PM
www.renogms.org

September 18-19, 2021 – Chico, CA

Feather River Lapidary and Mineral Society
Silver Dollar Fairgrounds, 2357 Fair St., Chico, CA 95928
Saturday 9 AM – 5 PM, Sunday 9 AM – 4 PM
Website: <http://featherriverrocks.org>

September 24, 25, 26, 2021 – Stoddard Wells, CA

Victor Valley Gem and Mineral Club
Location: Dale Evans Parkway and Stoddard Wells Road, Apple Valley, CA. Go straight on Stoddard Wells Road, will turn to dirt. Follow 7 miles to "Tailgate". Signs will mark the road. Cars & RV's can make it with ease, go slow. See our website for additional details and directions.

Hours: 9 AM – 5 PM daily

Website: <http://www.vvgmc.org>

October 1-3, 2021 – Vista, CA

Vista Gem and Mineral Society
Vista Gem and Mineral Open Air Market
Antique Gas and Steam Engine Museum, 2040 N. Santa Fe Ave., Vista CA 92083
Friday and Saturday 10 AM – 5 PM, Sunday 10 AM – 4 PM
Website: <http://www.vistarocks.org>

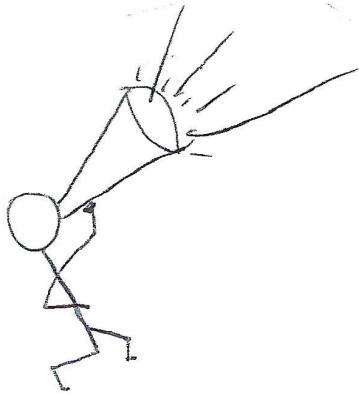
October 8, 9, 10 & 11, 2021, Clovis CA

Fresno Gem & Mineral Society
Clovis Rodeo Grounds, 445 Clovis, CA 93613
Time: Friday-Sunday Oct. 8th-10th – 10 AM – 5 PM, Monday Oct. 11th – 10 AM – 4 PM
Website: <http://www.fgms.us/>

October 10, 2021 – Fallbrook, CA

Fallbrook Gem and Mineral Society
Fall Festival of Gems
Location: Across the street from the Fallbrook Gem and Mineral Museum, 123 W. Alvarado St., Fallbrook, CA in the parking lot.
October 10th, 9 AM – 4 PM
Email: info@fgms.org

With Knowledge Comes Appreciation



ATTENTION : ALL MSSC MEMBERS

Stick Figure by A.Guzman

According to the MSSC Bylaws and Operating Rules and Regulations, please draw your attention to the following:

Article 1, Section 7, c), i. and ii: "Amendments of these Operating Rules shall require:

- i. Notice published in the Bulletin of the MSSC prior to the meeting at which a vote of the membership is taken, and
- ii. Majority affirmative vote of regular members present at any regular meeting."

Notice was published in the July 2021 Bulletin under Minutes of the June 11, 2021 Membership Meeting, Announcements and Reports, Item 4 and was approved July 9, 2021 by the membership. The notice is as follows:

"4. Angie Guzman reports that the Bylaws review is almost finished and will be voted on by the Board at their upcoming July 11, 2021 meeting and, by the Membership at the August 13th ZOOM meeting..."

Upcoming Member Vote: As per past practices, the proposed Bylaws and Operating Rules and Regulations will be distributed to members with the August 2021 Bulletin as a separate file. The snail mail Bulletin will include printed copies of the documents.

Once approved, appropriate changes, as noted, will be applied. Note: **Strike-throughs are highlighted in yellow** and will be deleted; **changes and additions, highlighted in blue**, will not be highlighted and, thereby, made a part of the document. An explanation of the major changes is listed below.

Notable changes of general interest include, but are not limited to:

1. Membership dues increase, change in Pro-Rated Dues and inclusion of an alternate dues payment method;
2. Bulletin: printed copies charge to cover printing and postage has increased;
3. Duties of Corporate Officers include update of several Board approved changes;
4. Committees show clarification for Chairs plus, there are additional likely committees listed with some description(s).

The Society membership will vote on the proposed Bylaws and Operating Rules and Regulations at the August 13, 2021 meeting.

Submitted by
Angie Guzman, Secretary

Full copies of these documents are being sent to you as a separate email.

2021 MSSC Officers:

OFFICERS		
President	George Rossman	president@mineralsocal.org
Vice President	Ahni Dodge	vicepresident@mineralsocal.org
Secretary	Angie Guzman	secretary@mineralsocal.org
Treasurer	Carolyn Seitz	treasurer@mineralsocal.org
CFMS Director	Angie Guzman	
Past President	Ann Meister	
DIRECTORS		
2020-2021	Pat Caplette	
2020-2021	Cheryl Lopez	
2021--2022	Rudy Lopez	
2021--2022	Pat Stevens	
2021--2022	Leslie Ogg	
COMMITTEE CHAIRS		
Bulletin Editor	Linda Elsna	bulletin@mineralsocal.org
Field Trip	Marek Chorazewicz	
Historian	Ann Meister	
Hospitality	Laura Davis	
Membership	Cheryl Lopez	membership@mineralsocal.org
Micro Mount Conf. Chairman	Al Wilkins	
Program and Education	Rudy Lopez	programs@mineralsocal.org
Webmaster	Leslie Ogg	webmaster@mineralsocal.org

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:

Mineralogical Society of Southern California
13781 Alderwood Lane, #22-J, Seal Beach, CA 90740

E-mail: treasurer@mineralsocal.org

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

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DISCLAIMER: The Mineralogical Society of Southern California, Inc. is not responsible, cannot be held responsible or liable for any person's injuries, damages or loss of property at or traveling to or from any general meeting, board meeting, open house, field trip, annual show or any other MSSC event.

MSSC Bulletin Editor
3630 Encinal Ave.
Glendale, CA 91214-2415

To:



**With Knowledge Comes
Appreciation**

***Your MSSC
Bulletin Is
Here !***