

Bulletin of the Mineralogical Society of Southern California

Volume 95 Number 12 – December, 2022

The 1,008th meeting of the Mineralogical Society of Southern California

With Knowledge Comes Appreciation

A ZOOM Meeting

December 9th, 2022 at 7:30 P.M.

Program: Diamonds, Their History, Synthesis, and Colors: Presented by George Rossman

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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: Diamonds, Their History, Synthesis, and Colors:

Presented by Dr. George Rossman

Dr Rossman will give us a colorful presentation recognizing that diamonds have long been mined in terrestrial deposits such as in Kimberley, South Africa. But now, synthetic diamonds are a significant player in both industrial and gem diamonds. The presentation will examine the early attempts to synthesize diamonds going back to the late-1700's. Better understanding of the thermodynamic factors of pressure and temperatures required to stabilize diamonds ultimately led to the modern technologies used in current diamond synthesis and led to a re-examination of the early claims to successful diamond synthesis. Modern methods of synthesis include high pressure methods, vacuum technology methods, and shock methods. We all know that diamonds come from kimberlites, but we will see that there are also other natural sources of diamonds, many of which are



microscopic. The size and quality and applications of synthetic diamonds now produced will be presented along with an introduction to our current understanding of the origin of common colors in diamonds helped, in part, by the synthetic materials.

MSSC President, George R. Rossman: Is an American mineralogist and a Professor of Mineralogy at the California Institute of Technology.

How to Join our ZOOM Meetings by Rudy Lopez

MSSC members are automatically included in the invite list each month.

For non MSSC Members who want to join this meeting. You must respond to our Programs chair, Rudy Lopez at programs@mineralsocal.org no later than Tuesday December 6, 2022. Please include "December ZOOM Meeting" in the subject line of your response. This response date will allow time for us to send you the information needed to participate in the ZOOM meeting.

From the Editor: Linda Elsnau.

Well, this Bulletin marks the end of my 10th year of editing the MSSC Bulletin. Sometimes I feel like it's only been a few years and other times it's been forever! I guess I will continue doing it as long as I keep enjoying it.

I want to extend my personal thanks to George Rossman for his excellent service to MSSC as our President for the past 4 years. I also want to thank Angie for her many years of wonderful minutes of our meetings. They were always thorough and entertaining. I will miss you both in these positions. George will be our "Past President starting in January 2023 while Angie is stepping up to replace him as our new President.

It is time to pay your MSSC membership dues for 2023. You can mail in your form and check (form attached to November, 2022 Bulletin) or go to the MSSC website to complete the form and use Paypal to send your payment.

Wishing everyone a great holiday season and let's look forward to an excellent 2023 for MSSC.

FROM THE PRESIDENT: Mineral Groups. Installment 7, "The Tourmalines" by George Rossman

For my final report, I will discuss my favorite group of minerals, namely, the tourmalines. Rather than focusing only on the most common ones, I will also present information about a few of the less common ones.

The general formula for members of the tourmaline group is $X Y_3 Z_6 (T_6O_{18}) (BO_3)_3 (V)_3 W$

Where most of these sites in the structure can have a variety of possible occupants:

 $X = Ca, Na, K, \Box = vacancy$ $Y = Li, Mg, Fe^{2+}, Mn^{2+}, Zn, Al, Cr^{3+}, V^{3+}, Fe^{3+}, Ti^{4+}, vacancy$ $Z = Mg, Al, Fe^{3+}, Cr^{3+}, V^{3+}$ T = Si, Al, B $\mathbf{B} = \mathbf{B}$ V = OH, OW = OH, F, O

This means that there are numerous combinations of elements in tournalines which means, in turn, that there are lot of species. Currently, we have 37 approved (by the International Mineralogical Association) species in the tourmaline group (and a couple more that are partially characterized and awaiting to be sent for IMA approval), If you want to see the names and chemical formulas of the ideal end-members of all of them, go to Wikipedia's tourmaline page:

https://en.wikipedia.org/wiki/Tourmaline

For now, I will not attempt to deal with all of them. Many are minute, microscopic samples found in extremely small quantities, and most of them are not exactly beautiful, gem-quality crystals.

Schorl (Figure 1) is by far the most common member of the tourmaline group that we encounter.

It is the sodium ferrous iron tourmaline with the ideal chemical formula:

NaFe²⁺₃Al₆Si₆O₁₈(BO₃)₃(OH)₃OH

There is lots of it in Southern California and south into Baja, Mexico. The nomenclature for schorl goes back to the year 1505 (Ertl, 2006).

Ertl, A. (2006): Über die Etymologie und die Typlokalitäten des Minerals Schörl [About the etymology and the typelocalities of schorl] Mitteilungen der Österreichischen Mineralogischen Gesellschaft, 152, 7–16 (in German with English abstract).

Figure 1 shows a mounted slice of a sample from the type locality, a small village in Germany known today as 'Zschorlau' but which was called Schorl hundreds of years ago.



Germany. Cahuilla Mountain, CA. Photo Credit: GRR Photo Credit: GRR

rossmanite and elbaite from Mount Mica. Maine. Photo Credit: GRR

Surprise; several of the tourmalines commonly called schorl that we have analyzed from Southern California have actually been the species foitite. Foitite has the chemical formula: $(Fe^{2+}_2AI)AI_6Si_6O_{18}(BO_3)_3(OH)_3OH$ which means, in the end-member formula, sodium is missing (where \square means a vacant site) and one of the Fe²⁺ ions is replaced by $A1^{3+}$ to get the additional positive charge needed for charge balance. In **Figures 2 and 3** we see a black foitite crystal from Little Cahuilla Mountain and a black cap of foitite on tourmaline from Mount Mica, Maine.

Foitite is in a continuous solid solution with magnesio-foitite. In magnesio-foitite, rather than Fe^{2+} occupying the (Fe²⁺₂Al) site, there is (Mg²⁺₂Al). Magnesium replaces iron. The chemical formula for this species is

 $Mg_2Al)Al_6(Si_6O_{18})(BO_3)_3(OH)_3(OH)$. This is a rare mineral, but it has been found in Japan (Figure 4). It is not much to look at if you expect beautiful, long, gemmy, transparent crystals.

Next, we will consider fluor-buergerite (Figure 5). It was originally given the name 'buergerite' in 1966, but when more detailed examination was conducted, it was observed that fluoride dominates in the site normally occupied by hydroxide. So, in 2011, the name was changed to fluor-buergerite. (Henry et al, 2011).



Henry, D., Novák, M., Hawthorne, F.C., Ertl, A., Dutrow, B.L., Uher, P., Pezzotta, F. (2011) Nomenclature of the tourmaline supergroup minerals. American Mineralogist: 96: 895-913.

Here is a tourmaline which may be a new species, but which has not been approved (yet) by the IMA. The proposed name is luinaite-(F). It has the chemical formula:

In **Figure 6**, you can see a sample of the proposed species from Ehrenfriedersdorf, Germany. This material was actually originally studied back in 1890, but only recently has it been re-examined.

It is related to another proposed tourmaline species luinaite-(OH) with the formula

 $Na(Fe^{2+})_{3}Al_{6}(Si_{6}O_{18})(BO_{3})_{3}(OH)_{3}OH$. Actually, this name was approved in 2009 by the IMA but upon further investigation was discredited in 2022 as it was shown to be a slightly distorted version of schorl. Ahh, confusion sometimes reigns.

We all should be familiar with elbaite, the common tourmaline species used for gems (Figure 7).

Elbaite has the chemical formula: $Na(Li_{1.5}Al_{1.5})Al_6(Si_6O_{18})(BO_3)_3(OH)_3(OH)$. It has been mined extensively for both specimens and gems in the Pala and Mesa Grande regions of San Diego County, California (Figure 8), as well as in the pegmatites of Maine. Even now, it is coming out of the Tourmaline King Mine near Pala.

If more than half of the OH⁻ in the last position is replaced by O^{2-} , you might think that the name should change to oxy-elbaite. But no, the naming commission decided to name this species darrelhenryite (Figure 9). Darrelhenryite has the formula: Na(LiAl₂)Al₆(Si₆O₁₈)(BO₃)₃(OH)₃O. Its formula is the close to the formula for elbaite except that one of the OH⁻ in elbaite is replaced by O^{2-} in darrelhenryite and then more Al is incorporated for proper charge compensation.

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If we replace all the lithium in elbaite with aluminum, we then have the tourmaline species olenite with the chemical formula: NaAl₃Al₆Si₆O₁₈(BO₃)₃O₃OH (**Figure 10**). Although rather uncommon, it is a major component of the so-called "mushroom" tourmaline from Momeik, Myanmar (**Figure 11**).



If we consider the six different calcium tourmalines, we should discuss liddicoatite. Richard Liddicoat, for many years, was the Chairman of the Board of Governors of the Gemological Institute of America. He lived in Santa Monica. At first the mineral with spectacular color zoning from Madagascar was called liddicoatite (Figures 12,13), but when detailed chemical analyses were performed, it was found that there was more fluoride that hydroxide in the W-site, so the name was officially changed to fluor-liddicoatite with the chemical formula, $Ca(Li_2AI)AI_6Si_6O_{18}(BO_3)_3(OH)_3F$.



Finally, I present the tournaline species with the highest aluminum concentration discovered to date (Figures 14,15). It was found in a quarry in Eibenstein an der Thaya, Austria. To date, it hasn't been found in

exactly gem quality, but it is still dear to my heart. It is the tourmaline species with the rather long name: aluminooxy-rossmanite and with the chemical formula:

Al₃Al₆(Si₅AlO₁₈)(BO₃)₃(OH)₃O.

For a recently described new mineral (Ertl et al, 2022) it is a rather remarkable find in that crystals up to more than 2 cm in size have been found. Most current new mineral crystals are microscopic in size.



Ertl A, Hughes JM, Prowatke S, Ludwig T, Lengauer CL, Meyer HP, Giester G, Kolitsch U, Prayer A (2022): Alumino-oxy-rossmanite from pegmatites in Variscan metamorphic rocks from Eibenstein an der Thaya, Lower Austria, Austria: a new tournaline that represents the most Al-rich end-member composition. American Mineralogist 107. 157-166.

There are undoubtly new species of tourmalines waiting to be discovered. Go out and find one.

Dues are Due!

It is time to pay your 2023 MSSC dues. You may use the Membership Form that was attached to your November, 2022 Bulletin and mail your completed form with your payment to the address on the bottom of the form; or you can go the MSSC Website to complete the form and use PayPal. The last date to pay your dues and be listed in the 2023 MSSC Roster is Feb. 17th, 2023. For any questions, please contact either Cheryl at membership@mineralsocal.org or

Carolyn at treasurer@mineralsocal.org.

MINUTES of the November 11, 2022 ZOOM Meeting

Call to Order (Dr. Rossman, President):

President Dr. George Rossman, Ph.D. called the meeting to order at 7:33 p.m. It was MSSC's **1,007th** Membership Meeting and the 30th via ZOOM conferencing.

Message from the Chair (Rossman)

Dr. Rossman said the IMA has now approved 5,863 mineral species. George announced that the MSSC elections will be held after Aaron's presentation and requests members to stay on board.

Regular Business

MINUTES of the October 2022 Membership Meeting as published in the November 2022 Bulletin were up for approval. Dr. Rossman asked for corrections, additions or deletions to the minutes. Leslie said there was a discrepancy: the header on page 1 said the 1006th meeting and the Minutes showed 1006th meeting had taken

place in October2022. The header was in error, should have been 1007th. The first item was noted as correction. Motion to approve as corrected was made by Cheryl Lopez and seconded by Carolyn Seitz. The vote was called and the motion passed. [Secy Note: After the fact, a second error on page 12 in "A Message from the Secretary", 2nd paragraph listed the date as November 11, 2023, should be 2022.]

Announcements and Reports

Rudy Lopez – Programs/Education: Next month's scheduled speaker is from Jurupa Valley Discovery Center; January will be Denise Nelson ("Diamonds from the Forbidden Zone"); Paolo Sanchez (TBD) in February and Jurupa Valley's "Dinosaur Trek", a virtual treat in March. Rudy reported speaker slots open toward the end of 2023. Rudy said he was invited to a presentation (Kentucky) that will be on Arizona wulfenite. Carolyn Seitz mentioned she will be in New Mexico for their symposium next week and will be in touch with several potential speakers.

Marek Chorazewicz – Field Trips: The Tecopa Opal trip was successful. Everybody found nice opal with great colors, and they found trilobite heads. He said a young couple from Orange County joined the field trip, Shawnee and Ryan, and there was a re-discovery of the old location for opal, from the fifties and sixties when clubs went on their field trips. It was about a mile away from the location this group went to originally.

There will be another field trip on December 3rd, weather permitting. It will be off I-15 east of Hodge Road, near Barstow. This is an iron and phosphate locality, there are hematite blades and dark blue grains of lazulite in a milky white quartz vein. Please look for email notice and check the website for information, as well.

Bob Housley – Pacific Micromount Conference (PMC): The PMC is slated to be held at the Fallbrook Gem & Mineral Museum from January 27, 2023 to January 29, 2023. The set up will be Friday the 27th earlier in the day then the PMC will commence with first speaker Housley. On Saturday the speakers will be Paul Adams and, Dan Evanich. Sunday will be a field trip, TBD. Bob will be sending out notices soon. Please check the website for information.

Other Announcements: Dr. Tony Kampf informed us Peter Keller passed away a couple of days ago. Peter was the president of the Bowers Museum for the last 30 years and was with Natural History Museum of Los Angeles County for 15 years prior to that. He and Tony started at NHMLAC around the same time. Tony said Keller was probably a member of MSSC around that time.

Program - Rudy Lopez, Program Chair, introduced our esteemed speaker, Dr. Aaron Celestian, Ph.D. Dr. Celestian is curator of Mineral Sciences at the Natural History Museum of Los Angeles County (NHM) and holds adjunct teaching and research faculty positions at University of Southern California and is an Affiliate Research Scientist at NASA's Jet Propulsion Laboratory. In addition to research, he oversees the Gem & Mineral Hall at the NHM and develops mineral science exhibits. His presentation is titled: "Prospering Backyards: Lead Sequestration Using Zeolites in Los Angeles". Basically, the current clean approach by government to remove lead contaminated soil.

Dr. Celestian starts by telling us he's been working on this for the last couple of years. It's called Prospering Backyards. Its funded primarily by the Getty for the PST, Pacific Standard Time's 2024 Art Symposium – happening in a couple of years. The EPA is also involved, as is Self Help Graphics, an art institute just outside downtown Los Angeles. The title of the project is "Sinks: Places We Call Home", based on a paper by Laura Pulido. Sinks are land, air or water that are radically devalued bodies. The research Pb Project Coordinator is Maru Garcia, an LA based artist and researcher, Pb Lead Scientist is Dr. Aaron Celestian, Curator Mineral Sciences, NHM Los Angeles and the Pb Researcher is Maura Palacios, Asst. Professor of Biology, Mt San Antonio College. Palacios does DNA sequencing of the soils.

About 10% of all discovered minerals have lead component but very few pose a toxic problem to humans. One of those is cerussite (PbCO₃). It's barely soluble under slightly acidic conditions, you can handle it, mount as a micro, put it on display. But, if you get bits on your hands and accidently ingest it, problems can happen. The lead can get into your body and it's toxic even at "ppm" level - parts per 1 million. It doesn't take much.

Dr. Celestian shows photos of beautiful cerussite specimens. He says that cerussite was used as a base pigment for all kinds of applications and just recently got phased out in the 1980's. There are automotive paint factories, where there is lead all over the place; so, it's not just lead acid battery recycling facilities full of lead. There are other minerals containing lead that are not dangerous but safe: vanadinite wulfenite, mimetite, to name a few. Additionally, other recent discoveries containing lead, as described by Tony Kampf, are safe as well: redmondite, pohlite, hagstromite and nitroplumbite, for example. Actually, less than 10% of known mineral species have Pb as a component.

When we get to Los Angeles and dealing with lead that's in the soil, there's one main problem, and there are lots of them, but this is the one we're working on. It's the Exide case. Exide, the company itself, has been around since the late 1800's. The Exide lead battery recycling facility on the east side of downtown Los Angeles was in operation from 1981 until March of 2015. During that time, Exide recycled 11 million auto batteries every year releasing 3,500 tons of lead through March 2015. Exide made batteries and lead oxide is one of their products. They made lead batteries for NASA, so it is a big company. The company battery recycling operation is located on a 15-acre site in Vernon, CA.

A lot of the smelted lead was brought into other forms so it could be recycled. Much of it ended up being mixed with carbon dioxide forming lead carbonates that eventually just rained down on soils in neighboring neighborhoods. The concentration of lead at Exide is about 4,000 ppm. That translates to .4 weight percent of the soil is lead. The surrounding neighborhoods measure 300-400 ppm. According the EPA, their limit is 100 ppm, so these are 3 to 4 times over EPA standards. Several homes were thousands of ppm lead in their backyard soils!

This is a serious problem. It doesn't take much to induce problems. Lead mostly attacks the brain causing neurological disorders, learning disabilities and kids are particularly susceptible because their brains and neural systems are developing. Adults are susceptible, as well. It can cause kidney problems, liver failure and other blood diseases. Pregnant women can pass these on to their infants.

The lead contamination in areas of East and South Los Angeles caused by Exide is evident as shown on a map displayed by Aaron. The land area is quite large, the map shows Santa Monica Fwy to the north, Huntington Park to the south, Santa Fe St to the west and East LA/Commerce to the east. It's sizeable!

Current clean up by the government consists of going to someone's house, testing the soil, make sure it has Pb, digging it up and transporting it somewhere else! There is no real clean up, the contaminated soil is just moved to another place. The agencies are running out of money from the State, the soil is not cleaned and the projected completion date is March 31, 2025 – and that's just for the land immediately adjacent (within 2 miles) of the Exide recycling facility. Keep in mind, the carbonates have moved well beyond. The projection is 10,000 homes have been affected by the Exide event but only 5,000 are going to be cleaned.

The danger here is for the children who play in the soil, track dirt into their homes on the bottoms of their shoes...dirt and dust that can cause cancer, respiratory illnesses. People are afraid to let their children play outside. This 40, or so, year problem has virtually been ignored.

The project Aaron is working on is going to try to help the people not be afraid of their soil. The team wants to show how the testing is done, how the soil can be treated and how to test fruits and vegetables they grow in the neighborhoods. It will also instill a sense of cooperation between the scientists and the community.

Now, there are thousands of publications about cleaning soil but very little has actually been done. This project is taking action. First is to identify homes that have high levels of lead, run tests and get an average lead value of the property. There may be hot spots and may be lesser hot spots for lead. The approach is a molecular biological perspective and, neurological as well. It is totally transparent, holistic, in fact. The government is not off the hook, by the way, they still need to do their part. Though their approach is community oriented, active participation by all residents not required.

Environmental DNA work is a sequencing of bacteria and viruses and everything that's in the soil. That process will help the community build garden beds with treated soil and to maintain backyards with cleaned soil. How is this accomplished? Zeolites! Zeolites only need water. But why not immobilize the lead using

apatite like phosphates where lead can easily go into a phosphate structure? Because it takes more energy in order to crystallize out apatite with lead in them.

Zeolites are used in several common applications such as detergents, absorbents, fertilizers, as catalysts in turning crude oil into gasoline and other uses. At this point, Aaron shows several photos of lab-made zeolite crystals viewed under powerful microscope. We can see nano sized pores where water and metals can move in and out. Zeolites are very good at separating things at a molecular level. Their crystals are always ready to absorb atoms and molecules in such a way to lower the energy of the system. When the zeolites are in solution, they want to absorb larger cations, it's spontaneous although not really well understood. The process is very fast, within seconds. This is a really low energy system and is not harmful because they're benign to people.

The project measures the lead by X-ray fluorescence. Taking samples and pressing them into pellets, they are analyzed under microscope and checked for fluorescence levels. On a graph display, there is a huge spike indicating presence of lead. If there was a flat line, that would mean no lead is present. Testing incudes X-ray diffraction to determine soil mineral content and Raman spectroscopy to determine Pb uptake properties in crystal. Other determinations are made with the help of SEM imaging to ensure the team looks at every single aspect of the soil and its content. There is no stone left unturned.

After all is said and done, it is evident thousands of pounds of zeolite are needed to treat the targeted area. Finding a source is the next step. Commercial zeolites purchased at a market or pet store is not the high quality needed – it has a lot of iron and some calcium in it and those items get stuck in the nano pores and channels of the zeolite. Enter ZeoSource facility in Victorville. It has what is needed. After discussion with Aaron and his team, ZeoSource understood the need to eradicate lead from the soil. So, they will supply all the zeolite needed - for free! The zeolite the team will use on the project is the most abundant zeolite, clinoptilolite. It is a hydrated alkali aluminosilicate.

Closing in on the lead eradication in soil, the process is clear, the supply of zeolites is in hand, now comes community education. Many neighbors were invited to the lab to see the process, look through microscopes to experience how the zeolites work on the soil and finally about 40 homes were selected. The top 15 of those homes that had the highest concentrations were invited to the museum for training on how to collect samples and how to add zeolite to their soil. These people will be involved with the project over the next year and a half. Aside from the important work with zeolites, the group will also look at bacteria, viruses, fungi and changes in the soil over time. When the soil is healthy, they will be able to plant.

The project participants report back. The training was 2-4 hours, Aaron says they did not want to overwhelm the people because they have jobs, too. However, they have to constantly water; they were given water rain gauges – water is the critical element for the zeolites to function. The neighbors will go to follow up meetings and the whole project will probably get published, but that is not the top priority. It's all about the soil! COVID threw a monkey wrench in the works and threw the project off schedule by 3-4 months but projected close of the project is now July 2023.

Thank you, Aaron, this is such a fascinating presentation and project. Dr. Celestian was kind enough to take several questions regarding other areas, depth of soil for sampling, and many related topics. Again, thank you Dr. Celestian.

MSSC Nominations and Elections (Angela Guzman)

Angie Guzman thanked Cheryl Lopez and Carolyn Seitz for their participation and contributions regarding the nomination process for the 2023 MSSC elections. Angie listed officers and directors eligible for nomination and named those self-nominations for Director previously accepted: Pat Stevens, Simona Cianciulli and David Lesperance. She opened the floor for nominations and reminded the membership of the importance to fill the President seat. According to our By Laws and the State of California, if we do not have a President, we have no society; MSSC would have to dissolve. This is mentioned because, thus far, there are no nominations for that seat.

Angie called for nominations from the floor for Vice President. Cheryl Lopez said she was undecided and there were no other nominations from the floor;

Angie called for nominations for Treasurer. Carolyn Seitz self-nominated for the seat;

Angie called for nominations for Secretary and CFMS Director. Angie self-nominated for Secretary and CFMS Director;

Angie consulted with Past President Ann Meister regarding the lack of nominations for President. Ann commented that we could have an election in December, if need be. Also, she mentioned that So Cal Micro-mineralogists folded in with MSSC because they could not find a President. We do need to have a President. We have an ongoing 501 C(3). Discussion followed with comments from various members – and thanks to all who commented.

Angie said she would consider President position if there was someone who would step in as Secretary [Secy Note: President cannot be Secretary or vice versa]. Leslie Ogg said she would be Secretary. Angie nominated Leslie Ogg for Secretary. Leslie accepted.

Angie said Vice President is not a mandatory position. However, Cheryl Lopez said she would self-nominate as Vice President.

Angie presented the slate:

President	Angie Guzman	CFMS Director	Angie Guzman
Vice President	Cheryl Lopez	Director	Simona Cianciulli
Treasurer	Carolyn Seitz	Director	David Lesperance
Secretary	Leslie Ogg	Director	Pat Stevens

Angie asked if those nominated accepted their nominations and they all did. Note: the 3 directors had already been accepted. Ann Meister made a **motion** to accept the slate of nominations for office by acclamation. The motion was seconded by Carolyn Seitz and the vote was called and the **motion passed** unanimously by the membership.

Dr Rossman was thanked for his 4 years as President and acknowledged as new Past President. Dr. Bob Housley thanked all for volunteering because it is important for the future of the society. Dr. Rossman said he would lend a hand. Angie thanked Leslie for stepping up to be Secretary and she congratulated all the officers and directors just elected. Installation will be in January and Ann Meister was asked to do the honors to which she accepted. Dr. Rossman closed by thanking all who volunteered saying, "It is very important we have a variety of people participating in the society. Thank you."

Meeting was adjourned at 8:55 p.m.

Respectfully submitted ; Angie Guzman, MSSC Secretary

<u>*The Ride Share Listing*</u> is being temporarily discontinued until such time as MSSC starts holding in-person meetings again.

Event	Date	Comments / Scheduled Program (if known)	
Meeting Dates:	ZOOM Jan 13, 2023	Denise Nelson: Diamonds of the Forbidden Zone	
	ZOOM Feb 17, 2023	Paolo Sanchez TBA	
	ZOOM Mar 10, 2023	Wes Andree: "JMDC's Dinosaur Trek" our augmented	
		reality (AR) dinosaur hunt.	
	ZOOM Apr 14, 2023	Michael "Mike" Kaas: Zinc Mining in the Friedensville	
		Mining District and The Birth of the U.S. Zinc Industry	
Board Meeting	ZOOM Jan 15, 2023	ZOOM at 1:00 PM	
Field Trip	December 3, 2022	Hodge Rd Iron & Phosphates, near Barstow, CA	

List of Upcoming MSSC Events : Mark your Calender!

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

Field Trip: Sat., December 3, 2022: Hodge Rd Iron & Phosphates near Barstow, CA

We will continue the fall season with a quick trip to an interesting iron location in the Barstow area. On Sat, Dec 3rd, we will visit the iron & phosphate prospects near the Hodge Rd exit off I-15 south of Barstow. The area has been known for decades for lustrous black blades of **hematite**, an iron oxide, and dark blue grains of **lazulite**, an Mg-Al phosphate in a milky-white **quartz** vein. There were some historical reports of **wernerite** crystals, but we could not locate any so far. However, yellow-olive layers of another rare mineral, **mitridatite**, a Ca-Fe phosphate, have been found recently during scouting. It was originally found 100 years ago on the Crimean Peninsula. On the micro side, we also found **tale**, brown-red **rutile**, clear **apatite**, and a surprise — purple **corundum** grains.

We will meet on Saturday at 8:30 AM at a camping area next to the quarry, 2.4 miles east of the Hodge Rd exit, at these coordinates: 34°44'10.6"N 117°08'09.0"W (34.736288, -117.135831). The meet place is 92.6 miles, an approx. 1.5-hour drive from Pasadena, several miles south of Lenwood, Barstow. The dirt road to the meeting place is in good condition thanks to the operating quarry, sedans should make it with no problems. The collecting place is 1+ mile from there, and due to a rough road, high clearance 4WD is a must. We will arrange carpooling to the location area if needed. Here are the Google directions: https://goo.gl/maps/MACaiXUBZ3yoWJor5

Questions: contact Marek Chorazewicz at marek@ixiacom.com

OTHER FREE THINGS TO DO ... by Ann Meister

MERRY CHRISTMAS and HAPPY NEW YEAR from Caltech and NASA/JPL.

The Watson Lecture will resume in January.

The Von Kármán Lecture will resume in January.

The UCLA Meteorite Gallery has reopened. Check the website for hours. The monthly lecture will be presented on Zoom on Sunday, December 18 at 2:30 PM. Speaker and topic are not yet available. Zoom Registration: <u>https://ucla.zoom.us/meeting/register/tJEqduyupj0vGd3S0_52FsbHTbPjYr0sZQUj</u> If you need detailed instructions on <u>how to join a meeting</u> via Zoom please contact our Curatorial Assistant, Juliet Hook, at <u>jahook@ucla.edu</u>. Note: Registration is only needed once as this is a recurring meeting in Zoom. The speaker and topic will be announced on the website. Visit the website and check on events and videos and other neat things about meteorites, go to <u>https://meteorites.ucla.edu</u>

Calendar of Events:

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

March 4-5, 2023 – Ventura, CA

Ventura Gem & Mineral Society Ventura County Fairgrounds, 10 W. Harbor Blvd., Ventura, CA 93001 Hours: Sat 10 AM-5 PM, Sun 10 AM – 4 PM Website: <u>http://www.vgms.org</u>

March 10-12, 2023 – Stoddard Wells Victor Valley Gem and Mineral Club 47th Annual Stoddard Wells Rockhound Tailgate Time: Friday, Saturday & Sunday – 9 AM – 5 PM Website: http://vvgmc.org March 18-19, 2023 – Lemoore, CA Lemoore Gem & Mineral Club Trinity Hall, 470 Champion St., Lemoore, CA Hours: Sat 10 AM – 6 PM, Sun 10 AM – 4 PM Website: <u>https://facebook.com/AndLemoore</u>

March 24-26, 2023 – Clovis, CA Fresno Gem and Mineral Society The Clovis Rodeo Grounds, 748 Rodeo Dr., Clovis, CA 93612 Hours: Fri & Sat 10 AM – 5 PM, Sun 10 AM – 4 PM Parking and Free Admission Website: <u>https://www.fgms.online</u>

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Featured Mineral: Ludlockite

Formula: $PbFe^{3+}_{4}As^{3+}_{10}O_{22}$

Crystal System: Triclinic

Name: Named for mineral dealers Frederick Ludlow Smith III and Charles Locke Key, who discovered the mineral.



Ludlockite $PbFe^{3+}_{4}As^{3+}_{10}O_{22}$ Locality: Tsumeb Mine (Tsumcorp Mine), Tsumeb, Otjikoto Region (Oshikoto), Namibia 1 cm x 0.8 cm x 0.8 cm



irocks.com photo **Ludlockite** PbFe³⁺₄As³⁺₁₀O₂₂ **Locality:** Tsumeb Mine (Tsumcorp Mine), Tsumeb, Otjikoto Region (Oshikoto), Namibia 1.1 cm x 0.6 cm x 0.6 cm



Ludlockite $PbFe^{3+}_{4}As^{3+}_{10}O_{22}$ Leiteite $Zn(As_2O_4)$ Locality: Tsumeb Mine (Tsumcorp Mine), Tsumeb, Otjikoto Region (Oshikoto), Namibia 2.8 cm x 1.8 cm x 1.2 cm

This specimen is clearly Leiteite in form, and yet it has a bright umberred color to it! The cause is due to minute dispersed inclusions of Ludlockite.

Just in Case you are curious.....

The Triclinic crystal system is defined as never having 90° angles and all axes are of different lengths



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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. We are a scientific non-profit organization that actively supports those endeavors through public outreach, field study and related programs. 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. However, due to current health considerations, MSSC meetings are held via ZOOM conferencing until further notice. 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 \$30.00 for an individual membership, \$40.00 for a family membership. Bulletins are delivered by email, there is an additional annual fee if you prefer paper bulletins mailed to your address. The Society's contact information:

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To:



With Knowledge Comes Appreciation

