



# Bulletin of the Mineralogical Society of Southern California

Volume 93 Number 6 - June, 2020

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*The meeting of the Mineralogical Society of Southern California*

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*With Knowledge Comes Appreciation*

***The June, 2020 meeting is CANCELLED!***

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

***Program : No Program this month***

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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: **SPECIAL NOTICE** by Linda Elsnau

**Yes, the June General Meeting at our normal PCC meeting location has been cancelled.**

**BUT...**

There is a possibility of an internet meeting via ZOOM.

Our President, George Rossman is offering a MSSC meeting via ZOOM as follows:

I would use Caltech's ZOOM license which allows meetings to last as long as the need. [Caltech says I am OK to do this] I could give a talk on **Diamonds, And Particularly The History Of Synthetic Diamonds And Color In Diamonds**. I could give the talk on **Jun 19** at our usual **7:30 P.M.** meeting time.

Members who want to do this must respond to our Bulletin Editor, Linda Elsnau at [bulletin@mineralsocal.org](mailto:bulletin@mineralsocal.org) **no later than Saturday, June 6<sup>th</sup>, 2020**. Please include **“June ZOOM Meeting”** in the subject line of your response.

This response date will allow time for Rudy Lopez or Linda to send you the information needed to participate in a ZOOM meeting and also will allow time to get everything organized at Caltech.

If enough people respond positively (minimum: 10 positives ), I will go ahead with a ZOOM talk. If only a small number are interested, then, it probably is not worth the effort.

If June is successful, I could host other speakers in the future via my Caltech license.

So, if you are interested in having “on line” meetings in the future, you will need to participate in this June meeting to get the ball rolling

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### From the Editor:

Wow, the above notice could make June a really interesting month for the members of MSSC! Be sure to respond if you wish to participate in a ZOOM meeting.

I also want to thank Ann Meister and Bob Housley for their articles in this Bulletin. Contributions are ALWAYS appreciated.

-- Linda Elsnau

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**FROM THE PRESIDENT: Interesting Minerals, , A to Z. Round 2, installment 3, the letter “C”:** by George Rossman

Cordierite,  $\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18}$

Cordierite is a mineral that typically occurs in metamorphic rocks. It is a minor gemstone and an important synthetic material. Cordierite was originally described from Großer Arber, Bayerisch Eisenstein, Bavaria, Germany. The description appeared in 1813 in an article by J.A.H. Lucas published in *Des Espèces Minérales*:

Lucas J A H (1813) XIII. Cordierite (Iolithe). in *Tableau Méthodique Espèces Minérales, Seconde Partie, D'Hautel* (Paris) 219-222



**Figure 1.** Cordierite from the Richmond Soapstone Quarry, Cheshire Co, NH. Photo credit: Rob Lavinsky & irocks.com

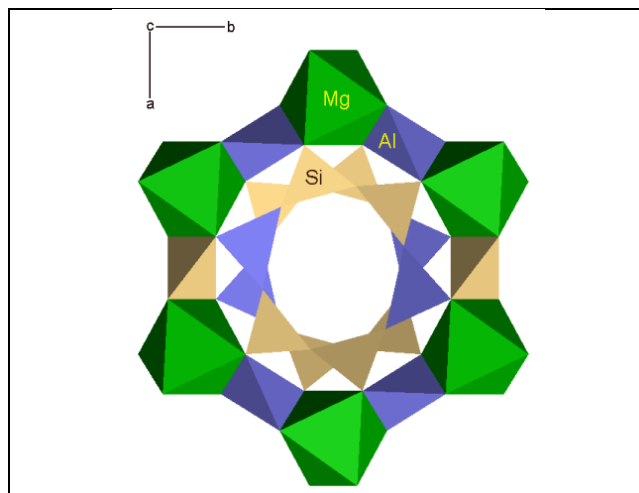


**Figure 2.** Cordierite from Anosy, Madagascar. Photo Credit: RRUFF project, U of AZ

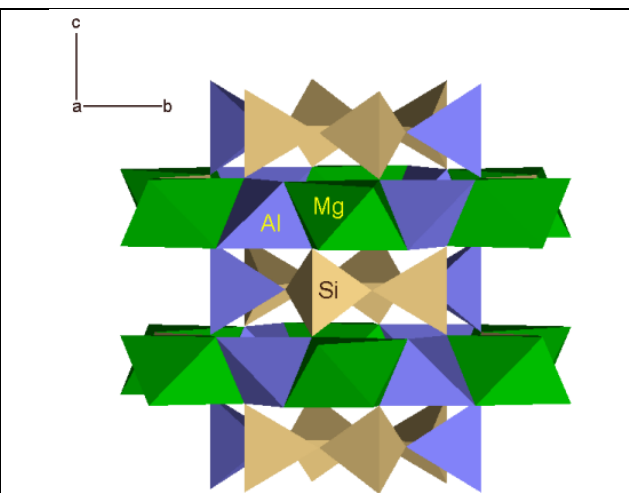
Cordierite was named after Pierre Louis Antoine Cordier. He was a French mining engineer and geologist, who first studied this species. He was head of the Museum d'histoire naturelle. He also was one of the early scientists who developed microscopic mineralogy.

Typically, cordierite is blue, often rather dark blue (**Figures 1,2**), due to its iron content. Iron can replace both the magnesium and aluminum in cordierite. It seldom forms nice crystals of the type collectors would desire.

If we look at the structure of cordierite, we see that cordierite, like beryl, has a structure that consists of rings of tetrahedrally coordinated ions. In beryl, those rings are composed of silicate ( $\text{SiO}_4$ ) groups; in cordierite, each ring is a mixture of silicate and  $\text{AlO}_4$  groups.



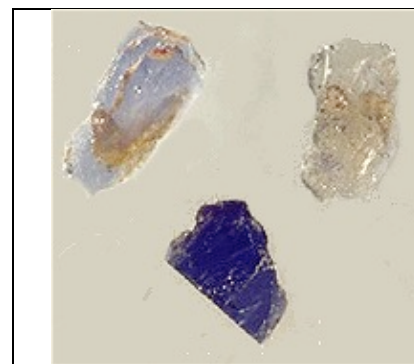
**Figure 3.** The structure of cordierite looking down the c-axis.



**Figure 4.** The structure of cordierite looking down the a-axis.

The structure (**Figures 3,4**) helps us to understand the blue color that cordierite typically has.  $\text{Fe}^{2+}$  can replace some of the Mg and  $\text{Fe}^{3+}$  can replace some of the Al. When both oxidation states of iron are present in adjacent crystal sites, an electron from the  $\text{Fe}^{2+}$  can be transferred to the  $\text{Fe}^{3+}$  under the provocation of the energy of incoming light of the appropriate wavelengths. This is the process called intervalence charge transfer that we have discussed before in other minerals. Furthermore, the Mg and Al are located adjacent to each other in the ab (001) plane. This means the intervalence interaction will happen when light is polarized in the (001) plane.

Cordierite is pleochroic. When examined in polarized light, it has a different color depending on the direction in which the light is polarized (**Figure 5**)



**Figure 5.** Cordierite in linearly polarized light along the a-, b-, and c-axes. Photo credit: grr



**Figure 6.** Colorless cordierite from Embilipitiya, Sri Lanka. Photo credit: Marc Garcia

If there were no iron in the cordierite, it would be colorless because Mg, Al and silicate are all incapable of absorbing light in the visible wavelengths. Examples do exist, but rarely (**Figure 6**).

Cordierite is found in Los Angeles County, but only in small crystals, primarily in the slates of the Hollywood hills.

Cordierite has a high temperature form that at first was called high-cordierite. Later, it was recognized to be a polymorph of cordierite and was given the name indialite (Miyashiro & Iiyama, 1954). Indialite has the same composition as cordierite, but has hexagonal symmetry, not the orthorhombic symmetry cordierite has. The species name come from the

locality of the sample used to obtain the first powder diffraction data, namely from the Bokaro coalfield, India.

Miyashiro A, Iiyama T (1954) A preliminary note on a new mineral, indialite, polymorphic with cordierite. *Proceedings of the Japan Academy* 30, 746-751

There are nice pictures of indialite crystals on Mindat.org. Indialite is hexagonal, unlike cordierite which is orthorhombic. The difference is the ordering of the Al and Si ions in the ring of tetrahedral ions. In cordierite, the aluminum ions are ordered so they all are in the portion of the ring of tetrahedra that points in the b-axis direction (Figure 1). In indialite, the Al and Si ions are completely scrambled with no preferential alignment. This occurs when the mineral forms at higher temperatures than the cordierite formation temperature region (for the technically inclined: entropy increases at higher temperatures giving rise to disorder).

Cordierite forms a solid-solution series with sekaninaite,  $\text{Fe}_2\text{Al}_3(\text{AlSi}_5\text{O}_{18})$ . Sekaninaite (**Figure 7**) was named after Professor Josef Sekanina, a Czech mineralogist who, in 1928, was the first to find the mineral in a [pegmatite at Dolní Bory, Křižanov, Czech Republic](#). It was submitted as a new mineral in 1967. It also has a blue color as a result of having both  $\text{Fe}^{2+}$  and  $\text{Fe}^{3+}$  in the structure

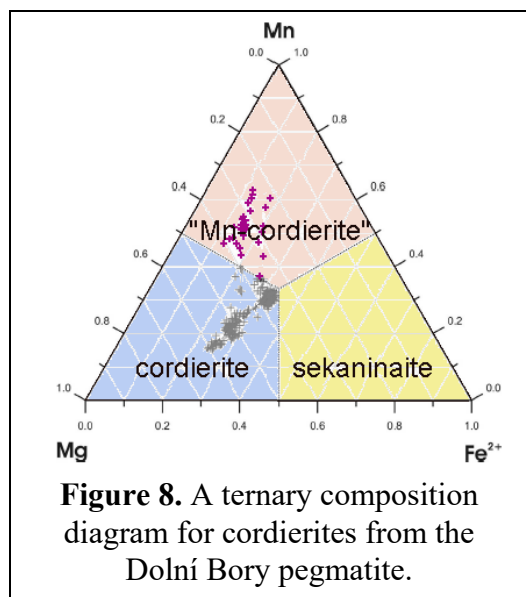
Stanek J, Miškovský J (1975) Sekaninaite, a new mineral of the cordierite series, from Dolní Bory, Czechoslovakia, *Scripta Facultati Scientiarum Naturalium Ujep Brunensis, Geologia* 1, 21-30

A manganese dominant member of the cordierite family has recently been discovered, also at the Dolní Bory pegmatite (Szuszkiewicz et al., 2019).

Szuszkiewicz A, Pieczka A, Gadas P, Vašinová-Galiová M, Szełęg E, Gołębiowska B, Galusková D (2019) First occurrence of Mn-dominant cordierite-group mineral: Electron microprobe and laser ablation ICP-MS study. *The Canadian Mineralogist* 57, 807-810



**Figure 7.** Sekaninaite from Dolní Bory, Czech Republic  
Photo credit: Rob Lavinsky & irocks.com



**Figure 8.** A ternary composition diagram for cordierites from the Dolní Bory pegmatite.

But it was not fully characterized and submitted to the International Mineralogical Association for consideration as a new mineral species. The compositions of analyzed phases from that pegmatite are shown in **Figure 8** in what we call a ternary diagram. That is a diagram with three chemical components: in this case, magnesium (Mg), iron (Fe) and manganese (Mn). Anything that plots at the top of the diagram is pure, end-member “Mn-cordierite” with 100% Mn in the site. Anything that plots in the pink region will still have more than 50% of the site filled with Mn and will be considered “Mn-cordierite”.

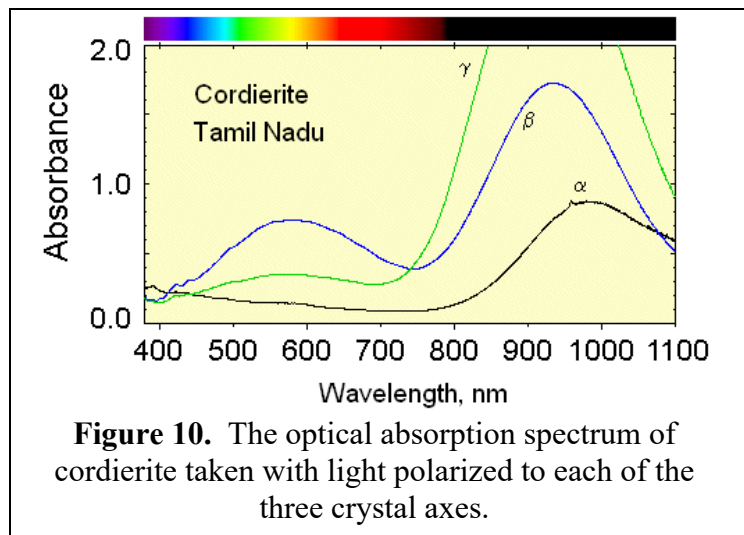
Beautiful violet colored gems are cut from transparent cordierite (**Figure 9**). In



**Figure 9.** Gem cordierite  
Photo credit: Indiamart.com

the gem world, cordierite gems are sold and characterized under the name ‘iolite’. This name comes from a Greek work, *ios*, which means violet, in allusion to its color. Many cordierite gems now come from southern India, although, they may also come from Madagascar, Sri Lanka, or Canada.

Iolite gems are usually pleochroic. They transmit light differently when viewed from different directions due to the intervalence charge transfer. But, due to the



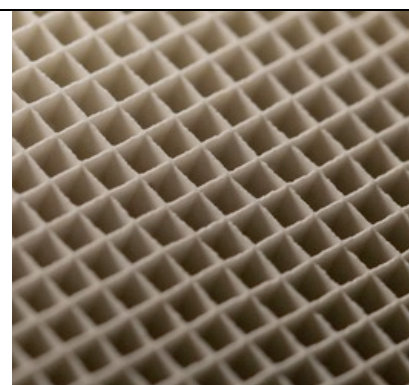
transparency of the gems, pleochroism is particularly obvious. If we look at the absorption spectrum of a gem cordierite taken in polarized light, we can see how the absorption of light in the visible region of the spectrum varies with the direction in which the light is polarized (**Figure 10**). When the trace goes up, more light is absorbed. Absorption in the visible region is particularly strong with light polarized in the beta direction (the b-axis direction).

You can see a video of the pleochroism at <https://www.youtube.com/watch?v=17UJzVYbJG8>

Because of its very low thermal expansion characteristics, synthetic cordierite ceramics are used to support the catalysts in tailpipe automotive emission control catalysts (**Figures 11, 12**). They are made from a paste that contains talc, kaolinite, quartz, and alumina and an alkali hydroxide flux. The paste is extruded, cut to shape, and heated at a temperature greater than 1400 °C to react the components to form cordierite. The cordierite does not react with the gasses in the exhaust stream of your car.



**Figure 11.** Cordierite automotive emissions control catalyst support for vehicle catalytic converters.  
Picture Credit: Corning



**Figure 12.** Close up of the cordierite emission control catalyst support for vehicles showing the openings through which the exhaust gasses flow.  
Picture Credit: Corning

For this purpose, the openings are coated with palladium, rhodium, or platinum metal which act as the catalyst to decompose the unwanted gasses that flow through the cylinder.

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## MINUTES of the May, 2020 Meeting

Since the May meeting was cancelled, there are no minutes to be reported.

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## List of Upcoming MSSC Events : Mark your Calender!

Event	Date	Comments / Scheduled Program (if known)
<b>Meeting Dates:</b>	July 10, 2020	Peter Goetz: - Beautiful Opal, Identification, and Internet Opal
	September 11, 2020	Vali Memeti: Super Volcanoes
	October 9, 2020	Karin Rice: Collecting Fossils
	November 13, 2020	Professor Abby Kauner UCLA: Minerals Under Pressure
<b>Annual Picnic</b>	August, 2020	<i>Date &amp; Location to be Announced</i>
<b>Board Meeting</b>	June 14, 2020	<i>To Be Announced</i>

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

## **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](mailto: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

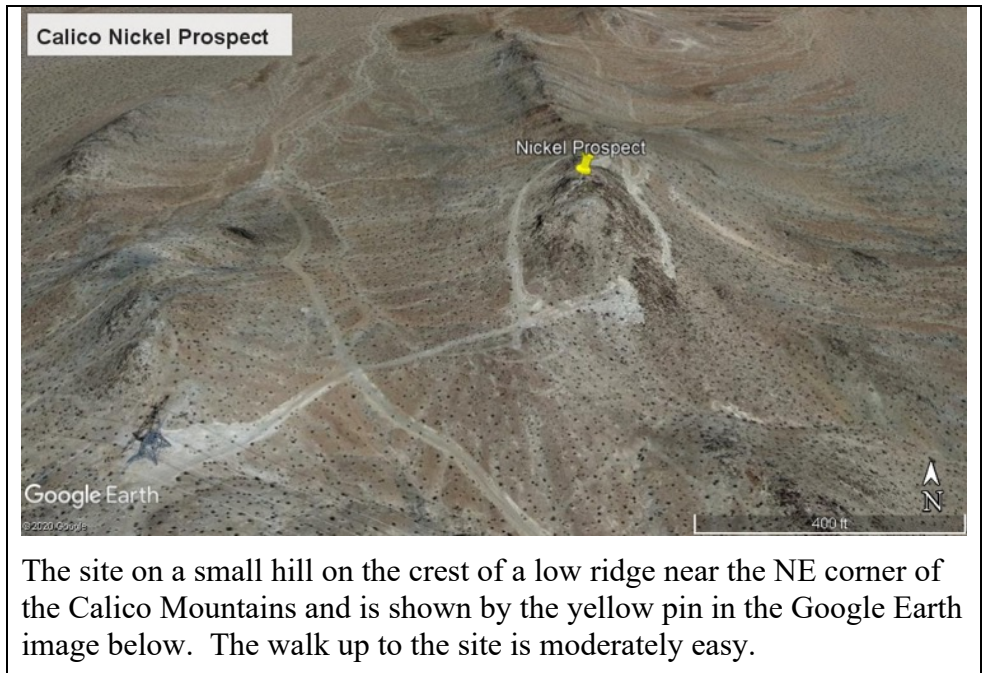
Looking for	Who	Where	Contact at
A Ride home after meetings	Ed Kiessling		<i>See emailed bulletin</i>
A ride	Richard Stamberg		<i>See emailed bulletin</i>

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## **An Unusual Occurrence of Nickel and Chromium Minerals in the Calico Mountains** By Robert Housley

I first read many years ago about Ni mineralization having been reported to occur in the Calico Mountains, and although certainly curious, had nonetheless never made any attempt to track down the location myself. I was therefore happily surprised when I learned that Howard Brown knew the location and planned to lead our Spring 2017 Southern California Friends of Mineralogy (SCFM) field trip there on 3/26/17. As hoped, that turned out to be a beautiful Spring day with the wildflowers in full bloom.

Howard Brown has recently mapped the North Calico and Lane Mountain areas in detail. The ridge on which the site is situated is as a whole composed of Paleozoic age (250-500 my) metasediments. According to Howard "The hill in which the deposit occurs is composed dominantly of north striking moderately to steeply dipping interbedded diopside, quartz, wollastonite rock with occasional garnet and other calc-silicates. Other nearby metasediments include calc-silicates, schist, impure carbonates and laminated calc-silicate quartzite, all of which are highly folded and have been intruded by dated Late Jurassic (148 my) and Mid-Late Cretaceous (~85 my) plutonic rocks."



The site on a small hill on the crest of a low ridge near the NE corner of the Calico Mountains and is shown by the yellow pin in the Google Earth image below. The walk up to the site is moderately easy.

Farther north along the ridge there is a large body of wollastonite. Farther south the rocks are dominantly schists. A schorl bearing pegmatite dike about 6 inches wide is exposed near the road intersection in the lower left, and can be traced for over 100 feet.

The prospect itself consists largely of a pit about 6 feet deep by 12 feet long. This is shown in the photo below taken by Gregor Losson. A shear zone exposed in the bottom and the ends does not seem to exceed about 1 foot in width.



This next picture of our group on the pit dump with the cars parked in the background was also taken by Gregor Losson.

Again according to Howard “The nickel mineralization zone strikes roughly EW perpendicular to the strike of the metasediments and seems to be filling a vertical dipping fracture zone as a dike like feature but with no persistence on strike or depth.” The mineralized material in the zone seems to consist mostly of widely disseminated irregular blobs of green garnet to about 1 cm, along with similarly disseminated metallic grains and their altered remnants to a few millimeters, in a diopside rich matrix.

I collected a few representative pieces and then spent the rest of my time trying to trace the fracture zone in the surrounding rock. I could not! I was not able to find any indication of green garnet in any of the surrounding rock. A short adit a little lower down on the east side of the ridge peak also does not expose much if any. Marek collected a small bag of samples with the goal of getting some with unaltered metallic grains that could be used to identify the primary “ore” minerals, and later gave the bag to me for study. He called attention to the fact that many of the altered primary grains had thin concentric rings of first green, and then yellow or tan alteration products around them.



A sample of the rock with an unusually dense array of large green garnet inclusions, photographed by Howard Brown, is shown below. The green garnets are always highly fractured, rarely show smooth faces, and will not separate from the matrix.

The most nearly complete, well-formed green garnet crystal I have seen from there, collected and photographed by Gregor Losson,



The day after returning from the trip I looked at one of the green garnet samples by Raman spectroscopy and concluded that the green was uvarovite. I also looked at the surrounding matrix and found that it contained diopside as expected and grossular. George Rossman using infrared spectroscopy also confirmed the identification of the uvarovite. Based on that information SCFM president Don Buchanan notified our entire group that we had collected uvarovite. Later George had second thoughts and checked the composition of a green garnet using X-ray fluorescence. It turned out that Al is still more abundant than Cr so the more accurate identification should have been Cr-rich grossular.

About a week after the trip I did 20 SEM-EDS analyses on 6 sub-millimeter black or metallic grains I had broken out of my samples. Five analyses are of oxygen free primary minerals. One is nickeline, NiAs, 3 are gersdorffite, NiAsS, and 1 is a Ni arsenide/sulfide with element ratios different from gersdorffite. Of the remaining oxide analyses 2 appear to be annabergite  $\text{Ni}_3(\text{AsO}_4)_2 \cdot 8\text{H}_2\text{O}$ , 6 are of a bright green Ni silicate, 1 is a Ni, Mg silicate, 5 are a Ni arsenate/silicate, and 1 is grossular. Nickeline, gersdorffite, and annabergite are listed for the site on Mindat.

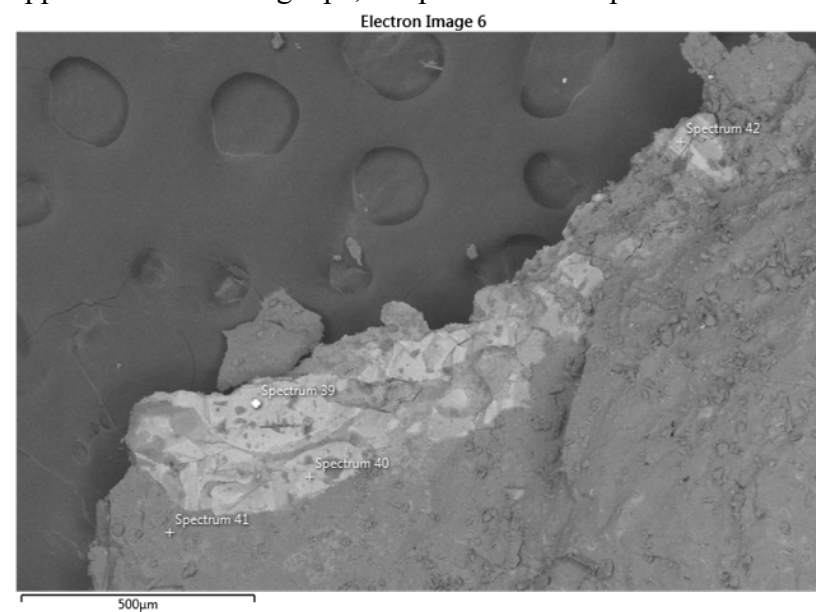
The bright green Ni silicate, and yellow and tan grains of alteration rim material of undetermined chemistry, all yield fairly sharp Raman spectra suggesting that they are well crystallized. However none of these spectra are in the available database of Raman spectra, and pure samples of any of them would be difficult to separate from the matrix. A single pinkish sample provided by Marek yielded a sharp Raman spectrum of talmessite  $\text{Ca}_2\text{Mg}(\text{AsO}_4)_2 \cdot 2\text{H}_2\text{O}$ .

There are probably at least 2 currently undescribed minerals in these samples. One is the unusual Ni arsenide/sulfide that is not gersdorffite and the other is the frequently occurring Ni arsenate/silicate. We have not pursued these up until now largely because other samples, easier to work with, from other localities have taken priority.

In terms of the bigger picture this whole deposit is very mysterious to me. Nickel and chromium mineralization are usually associated with ultramafic rocks, and none of these are known anywhere near the Calico Mountains. Even more puzzling is trying to figure out what sort of chemical and physical processes could have dispersed these minerals into their diopside rich matrix rocks and then concentrated these in the small area in which they are found.

I am grateful to Howard Brown for sharing his mapping results and for clarifying the geologic context of the deposit, to Gregor Losson for use of his photographs, and to Marek Chorazewicz for sharing samples and insight. Unless otherwise noted, all other images are provided by me, Robert Housley.

An SEM backscattered electron image of gersdorffite (spectra 39, 40, and 42) in grossular (spectrum 41) is shown below. The upper left is mounting tape, not part of the sample.



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## OTHER FREE THINGS TO DO...by Ann Meister

The **Von Kármán Lecture** on Thursday **June 18**, on-line at 7:00 PM. This webcast show will be conducted via video conference, with speakers joining remotely from home. Watch live via YouTube and Facebook and submit your questions via the chat. **View online here:** <https://www.youtube.com/nasajpl/>

The speakers are Dr. Briony Horgan, scientist, Mars 2020 mission and professor, Purdue University and Armen Toorian, system testbed lead for the Mars 2020 mission, NASA-JPL. The title of the presentation is **“Making a**

**Mars Rover.**” We're preparing to launch the Perseverance rover to Mars, but what's involved in getting the Mars 2020 rover mission ready to head to Mars, and how do we prepare for operations once we're there? In this month's show, we'll talk with one of the researchers working on Mars 2020 to get a scientist's perspective on what it's like to develop a Mars rover mission. We'll then transition to hear about how NASA-JPL uses unique testing facilities on Earth for developing Mars rovers — testbeds for mechanical components, software, and even full-size test rovers that roll about our Mars Yard to try out new systems and approaches for landing and operating on Mars.

The **Watson Lectures** at Caltech's Beckman Auditorium have been **cancelled**.

The **UCLA Meteorite Gallery** will be closed until further notice, however the monthly lecture will be presented on Zoom on Sunday, June 14 at 2:30 PM.

**Zoom Invitation:** <https://ucla.zoom.us/meeting/register/tJ0ud-yppzkh9zTgL43K75yP73wYub-w6ET>. If you need detailed instructions on [how to join a meeting](#) via Zoom please contact our Meteorite Manager, Natalia Campos, at [ncampos@ucla.edu](mailto:ncampos@ucla.edu).

The speaker is Dr. Frank Kyte, UCLA Cosmochemist. The title of the presentation is, “**Spherules in Sediment Deposits from Asteroid Impact Ejecta.**” This talk will discuss formation of impact spherules and their occurrence in impact deposits ranging in age from 0.8 Ma (million years before present) to 3400 Ma. When asteroids impact the Earth with cosmic velocities (about 20 km/sec) they release enormous amounts of kinetic energy. A large portion of this energy is transferred to the Earth's surface that results in seismic waves and excavation of a crater many times the asteroid's volume. Materials ejected from this crater are deposited mostly near the crater, but in large impacts the ejecta with the highest velocity can travel above the atmosphere and return as a global deposit. The famous dinosaur-killing impact at the K/Pg (a.k.a. KT) boundary produced a global deposit that was probably only a few mm thick. It is well known that this K/Pg layer has lots of iridium from the asteroid but its most distinctive characteristic on a macro level is that it is composed mainly of small spherical particles known as impact spherules. Impact spherules are a common feature of distal impact deposits (those deposited far from the impact site). Large impacts can melt significant amounts of crustal rocks in the impact crater, producing spherules around the crater. The highest velocity ejecta likely comes from a supercritical\* “ejecta plume” composed of a mixture of crustal and asteroidal materials. As this ejecta plume expands, melt droplets will form, some condensing from a vapor, and these will solidify to form the silicate spherules common in impact deposits.

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## **HISTORICAL HIGHLIGHTS** by Ann Meister

Sixty-two years ago, on June 7, 1958, MSSC held its annual meeting and “show” at the Odd Fellows Hall, 175 N. Los Robles, Pasadena. If you look for the Hall now, you will find the Westin hotel, however the building was moved to El Molino Avenue and became an adult day care center. That year – 1958 – was the last year that the annual meeting included exhibits of members' mineral collections which could be entered into competition. By the next year, this morphed into a one-day show that was open to the public.

The schedule for the day started at 10 AM when the hall was open for the placement of exhibits. At 3 PM all competitive exhibits had to be in place for the start of the judging. Some exhibits were simply laid out on the tables without using display cases. How trusting! The judges included Mrs. Jessie Chittenden, Mr. H.W. Scott, and Mrs. Veryl Carnahan. During setup and judging, there was a snack bar for coffee and sandwiches and home-made pie! Nettie Modesti called this the “Interior Decoration Department” – food, that is.

And then there's the sales table. The announcement in the Bulletin states: “Save your ‘GREEN STUFF,’ – break your piggy banks, -- secure bank loans – anything to take advantage of the finest and most spectacular sales table we have ever had at an annual meeting!!!! Through the generous arrangement on the part of George Burnham of Burminco we will have, on consignment, a great variety of minerals on the sales table. Also some members have kindly donated specimens. Of course, we will be glad to accept more. Sales table will be open early in the day – there will be lots of goodies – plan on doing some easy mining.”

Next on the schedule was DINNER from 7:00 to 7:45. The banquet ticket cost was all of \$2.50 and was catered by Mrs. Bowman with an “entirely new menu.” After dinner was a business meeting which included nominations and elections of officers and the presentation of trophies and ribbons. The Nominating Committee consisting of John Powell, Jack Streeter and Louis Vance recommended that the present slate of officers be re-elected. Officers elected in 1958 were President H.M. Flick, Vice-President Eugene A. Singer, Secretary Connie Flick, Treasurer Ray Bittman, and Federation Director, Gus Meister.

From 8:30 on, there was an auction with Willard Perkin as auctioneer, sales table, time to admire the exhibits, visit, enjoy yourself. Note, if you cannot come to the dinner, please do come to the after-dinner activities, for which, of course, there is no admission charge.

President Deac Flick offered these comments in his monthly column The President’s Corner. “Perhaps a few words on our Annual Meeting, June 7<sup>th</sup>, will be in order. OUR show is YOUR show; its success depends on UNITED participation, and all signs indicate we are all going to enjoy it wholeheartedly.

For our newer members who may not have attended previously, this traditional annual affair is a combination banquet, business meeting and earth science display. Business is conducted, officers and Board of Directors are elected, the year’s accomplishments noted, and the awards are presented with all possible dispatch so there is no delay in getting the auction started where most of us enjoy bidding for and buying new material. There will also be a sales table where you may purchase mineral specimens and other items.

Here is a chance to demonstrate what we have discussed in the past, namely, what incentives have we to display? We like to display our collections for others to enjoy and because we are proud of them. The values are relative only, so they need not be superb specimens to be interesting.

Come to the Annual Meeting and you may find just that specimen you have been wanting to add to your collection – and remember – this is the only money raising activity our Society has during the year.”

The 1958 Annual Meeting income included Ticket sales, \$370.00; Auction sales, \$103.35; Food sales, \$37.00; Sales table, \$51.26 for a total of \$561.61. Expenses totaled \$393.02 (including \$50 for Hall rental). The net profit for the evening totaled \$168.59 which with the addition of dues was the operating budget for the Society for the coming year.

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<b>MSSC Advertisement Policy:</b>			
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 <a href="mailto:bulletin@mineralsocal.org">bulletin@mineralsocal.org</a> and the payment should be sent to the <b>MSSC Treasurer 1855 Idlewood Road, Glendale, CA 91202</b>			

### **Calendar of Events:**

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

**Until further notice, All CFMS Club Shows have been cancelled.**

*With Knowledge Comes Appreciation !*

## 2020 MSSC Officers:

<b>OFFICERS</b>		
President	George Rossman	<a href="mailto:president@mineralsocal.org">president@mineralsocal.org</a>
Vice President	Ahni Dodge	<a href="mailto:vicepresident@mineralsocal.org">vicepresident@mineralsocal.org</a>
Secretary	Angie Guzman	<a href="mailto:secretary@mineralsocal.org">secretary@mineralsocal.org</a>
Treasurer	Jim Kusely	<a href="mailto:treasurer@mineralsocal.org">treasurer@mineralsocal.org</a>
CFMS Director	Angie Guzman	
Past President	Ann Meister	
<b>DIRECTORS</b>		
2019--2020	Currently vacant	
2019--2020	Bob Housley	
2019--2020	Leslie Ogg	
2020-2021	Pat Caplette	
2020-2021	Currently vacant	
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Hospitality	Laura Davis	
Membership	Cheryl Lopez	<a href="mailto:membership@mineralsocal.org">membership@mineralsocal.org</a>
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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:

**Mineralogical Society of Southern California**

**1855 Idlewood Rd.,**

**Glendale, CA 91202-1053**

**E-mail:** [treasurer@mineralsocal.org](mailto:treasurer@mineralsocal.org)

**Website:** [www.mineralsocal.org](http://www.mineralsocal.org) **The Mineralogical Society of California, Inc.**

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

To:



**With Knowledge Comes  
Appreciation**

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