Bulletin of the Mineralogical Society of Southern California

Volume 93 Number 7 - July, 2020

The 979th meeting of the Mineralogical Society of Southern California

With Knowledge Comes Appreciation

A ZOOM Meeting

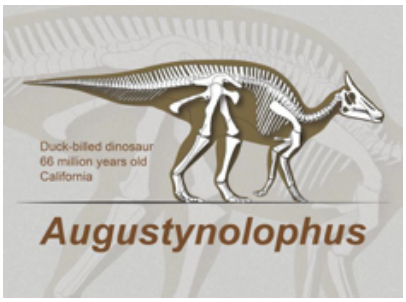
July 10th, 2020 at 7:30 P.M.

Program : **A Dinosaur for California** presented by **Karol McQueary**

In this Issue:

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

About the ZOOM Program: A Dinosaur for California presented by **Karol McQueary** , Past-President of the Southern California Paleontological Society



California, like all states, has many symbols – the state tree (redwood), state marine fish (Garibaldi), state fossil (*Smilodon fatalis*), and even a state insect (the dogface butterfly), just to name a few. But now, thanks to an enterprising law student's idea two years ago, it looks like California will also have an official state dinosaur. This dino, *Augustynolophus morrisi*, is a crested hadrosaur, an herbivore about 26 feet in length, and is only found in California. It dates to the late Maastrichtian Age, thus placing it as one of the last known dinosaurs before the K-T extinction. Only two specimens have been uncovered, both in the Moreno formation of the Panoche Hills of Fresno County, roughly in the geographical center of the state.

The two specimens, excavated from 1939 to 1940 by a team from the California Institute of Technology (Caltech), were thought to belong to the Saurolophus genus, but recent in-depth study of the fossils revealed that the cranial structure was quite unlike the other Saurolophus dinosaurs.

Editor's Note: Members who want to participate must respond to me, your Bulletin Editor, Linda Elsnau at bulletin@mineralsocal.org **no later than Saturday, July4th, 2020.** Please include "July 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 and also will allow time to get everything organized at Caltech. If enough people respond positively (minimum: 10 positives), we will go ahead with a ZOOM talk. If only a small number are interested, then, it probably is not worth the effort. If July is successful, we could host other speakers in the future via ZOOM. So, if you are interested in having "online" meetings in the future, you will need to participate in this July meeting to get the ball rolling.

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From the Editor: Linda Elsnau

Another busy MSSC Month! Be sure to let me kow if you want to participate in the July ZOOM meeting – it's a tight deadline! There will also be a vote on a proceedural update to the MSSC Rules and Regs during the next meeting. (see the Board Minutes for details). It looks like an interesting program for the July meeting as well.

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FROM THE PRESIDENT: Interesting Minerals, A to Z. Round 2, installment 4, the letter "D": by George Rossman

Dumortierite

The name, dumortierite, was in use long before the International Mineralogical Association set up a committee to approve mineral names. It was first described from a locality in Chaponost, in the French Rhône-Alps. It was named in honor of the French paleontologist Eugène Dumortier who was active in the mid 1800's. It is a product of high-temperature metamorphism from aluminum-rich rocks. It is also found in boron-rich pegmatites. Interestingly, the original article describing the mineral did not have any diagrams of the mineral or tables of its properties. Also, there were no maps locating the discovery locality.

> Gonnard F (1881) Note sur l´existance d´une espèce minérale nouvelle, la dumortiérite dans le gneiss de Beaunan, au-dessus des anciens aqueducs galloromains de la vallée de l´Izeron (Rhône), Bulletin de la Société Minéralogique de France 4, 2-5

Gonnard first observed small blue fibers in rocks that were used as a road fill. He was ultimately able to trace the source of the rocks to a local quarry. Larger masses of fibrous blue dumortierite are now found at many localities, world-wide **(Figures 1,2).** Nice crystals of blue dumortierite from Bahia, Brazil, can be seen on the Mindat.org Photo of the Day - 3rd Feb 2016. https://www.mindat.org/photo-720550.html

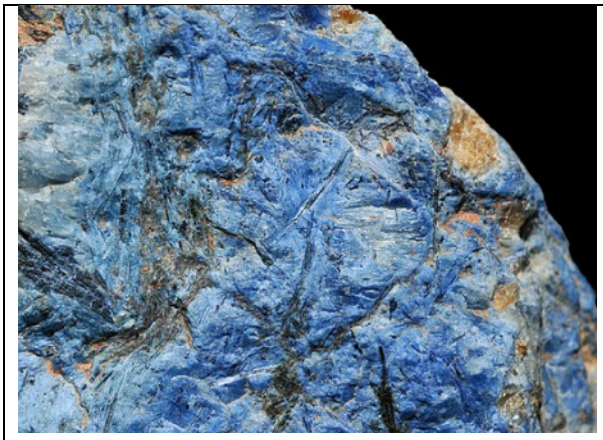

Figure 1. Blue dumortierite from Tuléar Province, Madagascar.
Photo Credit: Parent Géry – on Wikipedia Commons

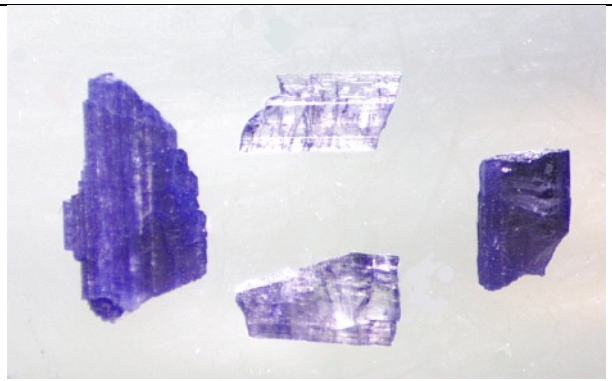

Figure 2, Dumortierite from Sahirina, Madagascar, in different orientations of polarized light.
Photo credit: GRR

Dumortierite not only blue but also can be pink to pinkish-lavender or a color derived from a mixture of these two colors **(Figures 3-5).**

Figure 3. Dumortierite in quartz from near Dehesa, San Diego County, California
Photo Credit: Mark Garcia

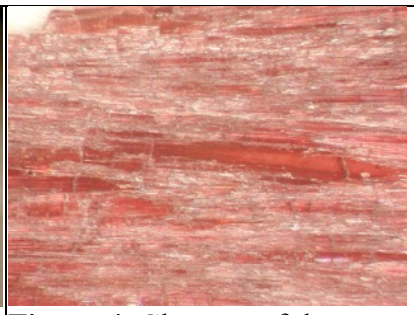

Figure 4. Close up of the Dehasa dumortierite.
GRR photo

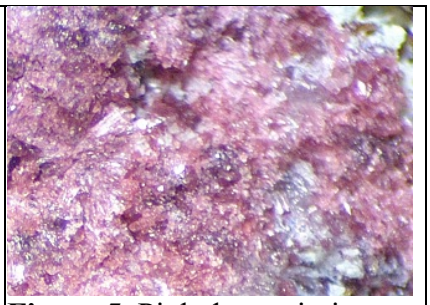

Figure 5. Pink dumortierite from Margarite Peak, near Fallbrook, California.
GRR photo

Dumortierite is an alumino-borosilicate meaning it contains aluminum, boron and silicon ions along with oxygen ions. Ideally, its chemical formula would be $AlAl_6BO_3Si_3O_{15}$. There are seven aluminums in the formula, so why don't I write the formula as $Al_7BO_3Si_3O_{15}$? If we look at a picture of the crystal structure of dumortierite (Figure 6), we can see why. Not all aluminum atoms are in the same environment. In Figure 6, you can see the one I colored red in the center of the ring of tetrahedral (colored blue) is in a different environment compared to all the other aluminum atoms that are colored green. Therefore, we give it its own separate place in the chemical formula.

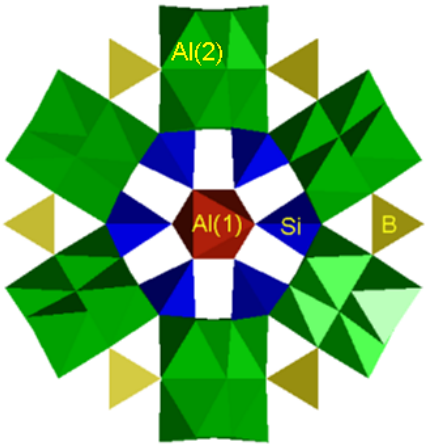

Figure 6. The structure of dumortierite looking down the c-axis

The first chemical analysis of dumortierite appeared in 1881:

> Damour A (1881) Analyse de la dumortiérite. Bulletin de la Société Minéralogique de France 4, 6-8.

Damour's formula was $Al_8Si_3O_{18}$. He did find a trace of iron and magnesium, but totally missed the borate component.

The color of dumortierite is usually due to its iron and titanium content. The colors are due to a process we have previously discussed named intervalence charge transfer. In this process, an electron is excited by incoming light and transfers from one atom to a neighboring atom, briefly changing the oxidation states (valence) of both atoms in the process. It appears that intervalence charge transfer between Fe^{2+} and Ti^{4+} causes the red color and

intervalence charge transfer between Fe^{2+} and Fe^{3+} causes the blue color. Some crystals are mixtures of the two mechanisms and have intermediate colors. A typical 'real' formula of dumortierite might be:

$$Al(Al_{5.75}[]_{0.15}Ti_{0.05}Fe_{0.05})BO_3Si_3O_{14.25}(OH)_{0.75}$$

Where [] represents a vacant position (missing atoms) and where minor amounts of iron, titanium, and hydroxide are also present.

The story of dumortierite continues, but now we have to switch our attention to rose quartz. Rose quartz is a mineral that occurs in massive veins, usually in pegmatites. We have some in Southern California including in the Lakeview Mountains, in the Cahuilla Mountain region, and in the Pala and Mesa Grande districts of San Diego County. Rose quartz is always translucent to distinctly turbid **(Figure 7)**. Sometimes, rose quartz can show asterism. That means it will show an enhanced reflection from the surface of a stone that is in the shape of a "star". A beautiful example is shown in **Figure 8.** You may have seen this rose quartz sphere when the Mike Scott collection was on display at the Bower's Museum in Santa Ana, California, a few years ago. The star pattern comes from fibers that are oriented along the three *a*-axes of a hexagonal or trigonal crystal and the general turbidity is also due to numerous fibrous inclusions within the quartz.

Figure 7. Rose quartz from the Scott Mine in South Dakota *GRR photo*

Figure 8. Rose quartz with a six-fold star due to inclusions of a dumortierite-related phase.
Photo Credit: Harold and Erica van Pelt

So, what are these fibers? We can find out by dissolving the quartz in hydrofluoric acid and obtaining an insoluble residue which, in fact, is these very **fibers (Figures 9,10)**. The fibers track exactly the color of the rose quartz. [Yes, not all rose quartz is precisely rose. Some grades into more of a lavender color. So, why do we still call it "rose" quartz ????].

Figure 9. Purple- and rose-colored "rose" quartz. *GRR photo*

Figure 10. The fibers extracted from them after dissolving the quartz.
GRR photo

These microscopic fibrous inclusions in rose quartz are a borosilicate mineral related to dumortierite. When Applin and Hicks reported them in 1987, they called them dumortierite. But later, Goreva et al, 2001 and Ma et al, 2002 showed that while the fibers **(Figure 11)** are related to dumortierite, their electron diffraction pattern **(Figure 12)** shows that the have a slightly different structure called a superstructure caused by atomic ordering in the fibers.

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

Goreva, J.S., Ma, C., Rossman, G.R. (2001) Fibrous nanoinclusions in massive rose quartz: The origin of rose coloration. American Mineralogist: 86: 466-471.

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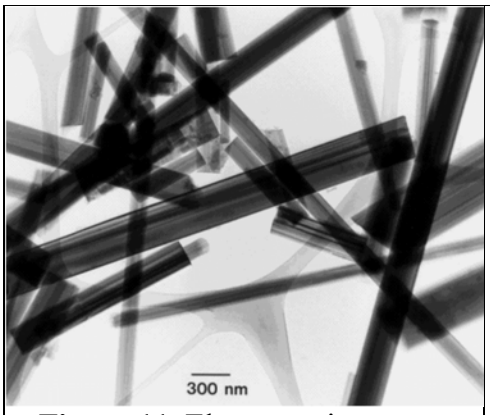

Figure 11. Electron microscope photograph of dumortierite-related fibers in rose quartz. 1 mm = 1,000,000 nm (nanometers). *Photo credit: Chi Ma*

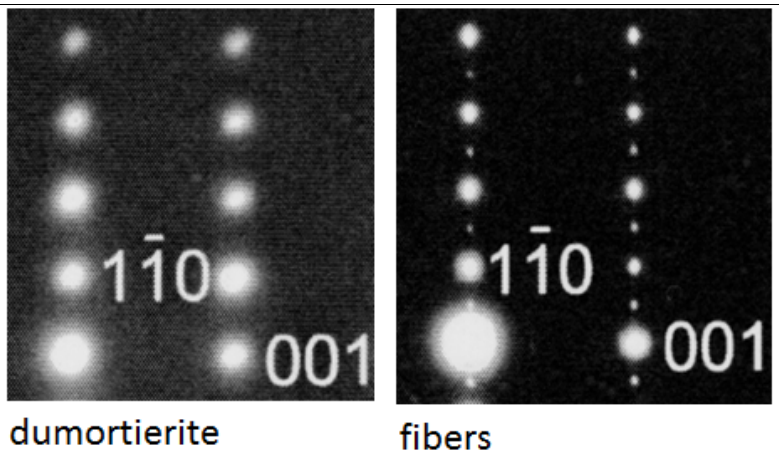

Figure 12. Electron diffraction patterns of dumortierite crystals on the left and of the fibers in rose quartz on the right. The pattern for the fibers shows an additional series of diffraction dots in the fiber pattern. *Photo credit: Chi Ma*

To date, the phase related to dumortierite has not been given a mineral species name. But, in samples of dumortierite from Oreana, Nevada **(Figure 13)**, both dumortierite, itself, and the superstructure phase exist side-by-side in the hand specimens.

Figure 13. Dumortierite from Oreana, Nevada *GRR photo*

Commercially, dumortierite has been used in the manufacture of porcelains. I like the way Albert Peck of the University of Michigan stated it in his 1926 American Mineralogist article "*Dumortierite as a Commercial Mineral*":

"However, as a result of the fact that modern research is continually striving for the better, we are able at this time to add another hitherto rare and practically useless mineral to the list of those of real value. The mineral referred to is dumortierite."

Hmm. How many other useless minerals do you have in your collection?

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MINUTES of the June 19, 2020 ZOOM Meeting

At 7:33p.m., the 978th Membership Meeting of the Mineralogical Society of Southern California (MSSC) was called to order by President Dr. Rossman, Ph.D. The historic meeting was broadcast via ZOOM, an internet conference medium, compliments of Caltech. It was reported that 22 logged on to the meeting with a few having at least 2 people in front of their monitors.

Message from the Chair: Dr. Rossman reported that there are now 5,575 International Mineralogical Association, IMA, published and approved mineral species. There are other new minerals that are pending approval and have yet to be published by IMA. Dr. Rossman mentioned one of the more recent ones, *Uvite*, a calcium magnesium iron aluminum boro-silicate of the tourmaline group whose chemical formula is $CaMg_3(Al_5Mg)(Si_6O_{18})(BO_3)_3(OH)_3(OH)$. This oxy-tourmaline species is from Elba, Italy.

Regular Business

a) Minutes: Dr. Rossman called for approval of the May 2020 Membership Minutes, the cancelled meeting, as published in the June 2020 *Bulletin*. He asked if anyone was opposed or if there were any corrections, seeing none, declared the minutes approved.

Announcements and Reports:

a) Updates Picnic and Annual Banquet: Rudy Lopez, Program Chair, announced that due to the uncertain conditions brought about by the COVID-19 flu pandemic, both the Picnic and Annual Banquet are on hold for 2020/21

b) Field Trip Report: Marek Chorazewicz reports that there are no field trips scheduled through the summer due to the novel coronavirus (COVID-19) pandemic. However, there is a trip planned for October 24, 2020 to Red Cloud Mine. The field trip offers trolling through the dumps ($35) and/or exploring down the nearby vertical shaft mine for underground mining ($45). Each option has a cost payable at the time of the visit. Red Cloud, among other minerals, has quality wulfenite, mimetite, fluorescent willemite and other interesting minerals. This trip requires high clearance vehicles; it is dependent upon pandemic status to ensure safety of those who may attend (AZ is spiking now). Check the MSSC website for details at www.mineralsocal.org ;

c) Dr. Rossman announced that, out of our shared interests for minerals, several parties had been invited to participate in this Zoom meeting. Dr. Rossman also thanked Caltech for allowing this meeting to take place under their Zoom account to promote outreach;

d) Dr. Rossman asked if anyone had other business to discuss. There was none. He then turned over to Program Chair Rudy Lopez to introduce our speaker.

Program: Rudy Lopez introduced MSSC's President, Dr. George Rossman, Ph.D. Dr. Rossman adds that, for those who don't know him, he is Professor of Mineralogy at California Institute of Technology (Caltech) where his work has been concerned with how minerals interact with the electromagnetic spectrum. Of particular interest is the origin of color in minerals, he has been involved with that for many years and he helped develop techniques for characterizing minerals. Dr. Rossman mentioned his good working relationships with some MSSC members in attendance: Dr. Anthony R. Kampf (Curator Emeritus NHM, Los Angeles County), Dr. Robert Housley (Caltech) and others. Dr. Rossman said it's been a great ride working at Caltech and he again thanked them for allowing the use of this format for the MSSC meeting this evening. Rossman is the current President of the Mineralogical Society of Southern California (MSSC). His presentation is "Diamonds, a**nd Particularly the History of Synthetic Diamonds and Color in Diamonds via ZOOM."**

Dr. Rossman begins his PowerPoint, telling us that diamonds have fascinated people for centuries. He shows us the Kimberly Diamond Mine in South Africa. This mine has been operating since around 1871. They will celebrate 150 years of operation in 2021. The first diamond at Kimberly was found in the ground some two years before the mine was opened. Previous to this find, diamonds were found in alluvial rock. This find, however, was source rock and it opened new interest and methods in diamond exploration; holes were dug in the ground – deep holes. The Karowe Diamond Mine in Botswana is an example of how large quantities of earth have to be moved in order to obtain the diamonds - think of the spiral tracks created by those huge earth mover trucks heading down, creating a huge hole. This is a hard rock, open pit mine.

Diamonds have a special place in human society. They are valued and expensive – you can almost rest assured that someone would want to synthesize them. Can diamonds be synthesized? Well, in 1797 Smithson Tennant, who discovered the elements osmium and iridium, was the first in the world to show that diamonds are made out of carbon. How? He made carbon dioxide gas. In experiments, using graphite (a carbon) and squeezing it tightly, he thought it would make a diamond. The structures of diamond vs. graphite are different, however. Dr. Rossman displayed the diamond tetrahedron structure, repeating pattern of 8 atoms, 3 dimensional with strong bonds while the graphite structure has flat layered sheets (looks like chicken wire) but both are allotropes of carbon.

The first real attempt, in 1880, to make a synthetic diamond actually turned into the creation of a pipe bomb! Lithium metal, bone oil and paraffin oil, all heated (by coal) in a lead tube was just not the right combination. The thought was the heat plus the pressure would make a diamond. A second try was in 1890 by Henri Moissan a French chemist, he attempted to melt iron in a crucible then let the metal cool. He use pressure to try to make a diamond. The third try was by Burton in 1905. He used carbon in a calcium lead alloy. That did not work either. In 1917, a fellow named Parsons basically repeated the 1890 Henri Moissan experiments. Parsons

claimed to have founds diamond crystals in the cooled crucible, but it appeared after trying so many times, he fudged by putting actual diamond crystal particles in the crucible. Dr. Rossman points out these experiments could today be carried out in your garage.

This brings us to thermodynamics. The academics said that if you want to make diamonds, you have to bring it to 20,000 atmospheres of pressure even at the temperature of 1,000 degrees or so. Dr. Rossman goes on to explain that past attempts were actually fraud experiments and showed that (diamond) synthesis could not have been done during any of those early experiments, not the 1880, the 1890 or even the 1917 – all frauds.

Harry Drickamer (1918-2002), a University of Illinois chemical engineer, did not synthesize diamonds either, but he used 425k bars pressure at room temperature. At 70kbars of pressure at 500degrees C for prolonged times still did not produce lab diamonds.

Finally, in 1955 at General Electric, using a catalyst of nickel metal, chromium, manganese metal powders mixed with graphite at 45kbar of pressure at 1500 degrees C found they could produce synthetic diamonds! GE made the pressure chamber. Today, diamonds can be made in 20 seconds at those pressures. It is possible to produce gem quality synthetics; they're grown in a lab! Dr. Rossman had the opportunity to meet Tracy Hall at GE and discuss how he came about his discovery of the catalyst. Turns out there were other experiments including the use of peanuts to make diamonds. Overall, the ability to create synthetic diamonds was probably the biggest achievement at GE.

Now, China is a huge producer of synthetic diamonds. They have many high pressure, high temperature chambers used to make diamonds. In the industry, there are strict guidelines for growing synthetics including identification measures for the diamonds.

On the other hand, natural diamonds can be found in meteorite chunks. For instance, in the late 1800's two chunks were found in Siberia. One is in a museum and the other was actually eaten by some of the natives! In Arizona at Meteor Crater, there are micro diamonds all around and in the crater. They are result of the shock waves caused when a huge meteor hit the Earth there. And, Popigai Crater (62 miles across) in Siberia has 400,000 ton of industrial diamonds equal to trillions of carats. Then there are interstellar diamonds, some as absorption bands from super nova blasts. Kazakhstan, Norway and Germany all have micro diamonds, as well.

CVD, chemical vapor deposition, is a vacuum chamber used for synthetic diamonds. George mentions the Diamond Dome of DeBeers and China's huge factory of CVD diamond chamber machines.

Rossman speaks to the color of diamonds: The "Blue Moon" diamond is boron atom substituted for carbon and, it can conduct electricity. [*Secy. Note: The 12 carat "Blue Moon" diamond was on exhibition at the Natural History Museum of Los Angeles County*]. The Hope Diamond *[Secy. Note: 45.52 carat]*, housed at the Smithsonian, is simply exquisite. One of Dr. Rossman's graduates went to work at the Smithsonian and was allowed to move the Hope Diamond. Wow, not a bad gig! If a diamond is yellow it's because of the nitrogen: canary, cape and pale-yellow diamonds are all a form of nitrogen placement in the atom structure. Other diamonds of note are the Kazanjian Red diamond *[Secy. Note: 5.05 carat]*, formerly known as the Red Diamond and the Dresden Green *[Secy. Note: 41 carat]* (radiation, interstitial complex) diamond. Spectroscope tests are performed on diamonds. Synthetic diamonds are entering the gem market.

Q&A followed with questions including "Blood" diamonds – human blood, and Argyle red diamond in Australia.

Dr. Rossman thanked everyone and again expressed his appreciation to Caltech for their contribution of ZOOM for the evening's meeting of the Mineralogical Society of Southern California. Thanks to all who participated and special thanks to Dr. Rossman for an interesting look at synthetic diamonds.

The meeting adjourned at 8:39 p.m.

Respectfully submitted by Angie Guzman, MSSC Secretary

Please check the *Bulletin* for the next MSSC meeting.

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List of Upcoming MSSC Events : Mark your Calender!

Event	Date	Comments / Scheduled Program (if known)
Meeting Dates:	August 14, 2020	*TBA*
	September 11, 2020	*TBA*
	October 9, 2020	*TBA*
	November 13, 2020	*TBA*
Annual Picnic	Due to current world conditions, the 2020 Picnic has been cancelled There will be a ZOOM meeting for August as noted above	
Board Meeting	October 4, 2020	Via ZOOM
Field Trip	October 24, 2020	Red Cloud Mine in Arizona (See Field Trip Report in Minutes)

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

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MSSC Board of Directors Meeting Minutes JUNE 14, 2020 – Via ZOOM

Call to Order and Roll Call

The MSSC Board meeting was on June 14, 2020 via ZOOM as hosted by Caltech through President George Rossman. The meeting was called to order at 1:03 p.m. The following Officers, Directors and Committee Chairs were logged on and present: George Rossman, Ahni Dodge, Jim Kusely, Angela Guzman, Ann Meister, Bob Housley, Leslie Ogg, Rudy Lopez, Pat Caplette, Cheryl Lopez, Linda Elsnau, Al Wilkins and Marek Chorazewicz. Excused was Laura Davis.

Items for Action: a) Approval of March 2020 Board Meeting Minutes as published in the April 2020 *Bulletin*: A **MOTION** was made by Angie Guzman and seconded by Ahni Dodge. Rossman asked for corrections or additions and seeing none, called for the vote. The motion **passed by unanimous approval**.

1. Comments and questions from the President [Rossman]**:** Dr. Rossman first thanked Caltech for letting him use ZOOM for our meeting. He explained that the potential outreach could be literally thousands of people.

a) Is it too early to know status of PCC for future meetings? Ahni Dodge, VP and a PCC Professor reports that no one is allowed on campus, when found, campus police will escort the person(s) away. PCC classes for summer and fall semesters will be held only on-line.

It's still too early to tell when the campus will be opened. George comments that Caltech has very limited participation and only by essential persons on campus; he is unsure when it will open fully;

b) Next MSSC meeting, Friday June 19th, will be via ZOOM; 18 attending, so far. Speaker will be Dr. Rossman; topic is Diamonds (synthetic). Ahni asked George if he felt comfortable giving presentations on ZOOM. George reports he has been teaching his classes using ZOOM for the past 2 months. He demonstrated how he can bring up PowerPoint presentations and other things to share;

c) Asked previously: Should we consider ZOOM (paid service) for Board meetings to improve attendance? I am using Caltech's license now. We may want to think of this situation as long term, and we may wish to consider ZOOM. No concrete decision, yet;

d) We still need a Director to cover vacancy created by Pat Stevens. George stated that he attempted to contact JoAnna Ritchey for that purpose, but did not receive any responses. Discussion followed including suggestions of Renee Kraus (by Angie) and Cheryl Lopez (by Rudy). Ann Meister said we've had husband and wife directors in the past. George called for vote to **appoint Cheryl Lopez as Director** which was approved unanimously. Angie reports that this decision needs to be published in the *Bulletin* before Cheryl officially begins her duties. Leslie wanted to update website with Rudy's name and Angie indicated she could, but to wait for approval of these Minutes for Cheryl's appointment;

e) MSSC Picnic, will there be one? Angie said that given circumstances of the country due to Pandemic, we probably will not be able to have it this year. Ahni wanted to know if anyone has heard from Kathy Carter, Rudy addressed this, and no one has heard or received a response from her. Also, Rudy said (before the

Pandemic) he had contacted parks for costs (i.e. Eisenhower Park at $225 for the day) for our Picnic. Al Wilkins says that until there is a vaccine, he would not agree to our August Picnic. Cheryl wanted to know if there would be a regular meeting instead of the Picnic and shouldn't it be published as such in the *Bulletin.* It was decided that there will be a ZOOM Membership Meeting on 8-14-20 in place of the Picnic;

f) Banquet status… Board discussion including Angie says that given what Al just said about a vaccine, it would be prudent not to have the banquet, Al says it's too early to say no because the banquet is January 2021 . It was decided that the January 2021 meeting will be a ZOOM meeting in place of the Banquet

g) Verified: The MSSC is an approved Federal 501(c) (3) organization for tax deductible donations) George comments that the NY Mineralogical Club displays (on their website) that they are NOT a 501(c) (3). He asked Jim to look into our status and Jim says we ARE a 501(c) (3) and donations ARE tax deductible. Jim says we have been 501(c) (3) since 1941 and that travel expenses to meetings, picnic, etc. are deductible. George says items donated to the auctions are deductible, too.

Dr. Rossman concluded his portion and asked if anyone wanted to add any comments or questions.

Dr. Bob Housley wanted to know if the mineral collection for micromounts was picked up. Rudy contacted the parties to arrange for the pick-up, but nothing ever came of it because the pandemic hit. Bob said they have so much that it'll still be around for a long time. Rudy said the guy said you could fill up a truck five times; he said he didn't have a problem picking it up but would like an answer.

Rudy wanted to revisit the Banquet: George said his feeling was that we probably would not have the Banquet in January. Al agreed. George said we should just not have it but plan for January 2022. Jim Kusely says the holiday season will not be the same, confusing for some. We will plan for a ZOOM meeting in January (George).

2. Treasurer's Report [Kusely]**:**

Discussion and report included bank reconcilement, finally closing Merrill Lynch account and the following: [Secy Note: Agenda items taken out of order;]

f) Operating Rules change *to be published in Bulletin, then to vote on it at the next General Meeting*:

Operating Rules and Regulations of the

Mineralogical Society of Southern California, Inc

ARTICLE IV – DUTIES OF CORPORATE OFFICERS

Section 4. Treasurer

k) Ensure that all required Federal and State filings are accomplished

ADD THE FOLLOWING:

e. To the California Attorney General: Form CT-TR-1 including any required supplements

1. Explanation of "Other Expenses";

2. "Balance Sheet" including assets, liabilities and net worth.

Proposal for Dues fee change: Jim states the procedure to change the By-Laws and/or Operating Rules also applies to fee changes. Jim wants to submit his proposal for dues, have it published then voted on by the general membership. Inasmuch as the last dues change was 2014, and there are already 2 proposals before the Board, he suggests a 3rd possibility; further discussion followed, after which there was no decision reached. Jim also reports that the CFMS newsletter states that 14 clubs did not renew. Money is tight and we need to watch ours.

a) *Speaker fees*:

1. Jim says in light of ZOOM conferencing/meetings, there is a need to find out costs – what are speaker's fees for those using ZOOM? Our current payout for in-person speakers is, in some cases, more than the speaker normally charges/expects. After lengthy discussion by the Board, it was suggested that: i) we see how our first ZOOM meeting is attended and received on June 19th, ii) speakers may co-host their Zoom presentations, iii) in-person speakers are booked into 2021 and are willing to reschedule given COVID-19 and iv) we need to revisit this once we can be assured of at least attendance of 25 or more;

2. PayPal as a payment option for dues. Jim wants Leslie to configure something similar to San Diego's fee collection using PayPal. PayPal's cost is another issue, but we are eligible for Non-Profit discount. Fees could be per transaction; however PayPal also accepts credit cards, which may present higher transaction fees. Jim will look into this option a little further. Leslie will check deeper at San Diego's on-line pay option.

b) *Office expenses* – none at this time; *[Secy Note:* ***c)*** *and* ***d)*** *were originally omitted]*

e) *Jim's retirement*: Jim has changed his mind; he will stay on for another year Thank you Jim!

3) Pacific Micromineral Conference Report [Al Wilkins]: PMC depends on the vaccine. Announce in *Bulletin* that there will be one, but we just don't know exactly when. Discussion regarding other shows specifically Tucson, a worldwide event. Dallas Conference may be cancelled, as well. Thought international airfare has increased, as well as the prices! Regarding the Tucson show, some people did come down with the virus. Bob Housley says we'd love to have it, but we want everyone to be safe. Marek commented on the past conference field trip to Lead Mountain.

The 2021 Pacific Micromineral Conference is dependent on conditions due to COVID-19 pandemic. Check the website and *Bulletin* for updates.

4) Membership Chair's Report [Cheryl Lopez]: No change since last Board Meeting. Cheryl wanted to know when we change over to PayPal – Jim says it looks like the beginning of December this year.

5) Field Trip [Marek]:

a) PMC field trip was fun and before lockdown;
b) Palos Verdes trip cancelled (July-August);
c) Red Cloud Mine and Geronimo Mine (late October 24) still viable – social distancing, masks, etc. However, if 2nd wave or spike, plans may change. – Publish in *Bulletin* and website (done). Linda, send out invite (done)– Marek will supply info for Linda to send.

6) Federation Director Report [Angie]: Short report – everything cancelled due to Pandemic. The annual late year (Visalia) meeting is still on but may be cancelled, as well.

7) Program Chair's Report [Rudy]:

a) Speakers – Rudy wants to wait to see the outcome of our first ZOOM meeting on June 19th before we move forward with in-person Vs ZOOM presentations. He has speakers lined up;

b) Howard Heitner, chemist, has ZOOM talks. His speaker fee is $75;

c) George brought up ZOOM presentations via Harvard Museum, Blue Cap Productions and Eloise Gaillou. He recently viewed Rob Lavinsky's presentation which included diamonds, mineralogy moving to China and other tidbits. The Harvard ZOOMs by weekly. If interested, register at http://go.mineraltalkslive.com/register . There is no fee.

Discussion about speakers and ZOOM.

8) Webmaster Report [Leslie]: Website activity report shows traffic is downward by 1/3 but 85% are coming in, possibly new. The field trip in Nevada showed 192 hits and general field trips at 185. 40% are mobile while the rest are on laptop. The membership page needs an aesthetic adjustment and Leslie says she will work on formatting for PayPal.

9) Bulletin Report [Linda]: The *Bulletin* is going out monthly despite internet problems. As always, Linda asks for more articles, especially during this time. Linda has expenses for postage and printing (November – June) for the snail mail *Bulletins*. She will send the receipts to Jim for reimbursement. She reports that we have 7 snail mail Bulletins. 3 of the 7 people have e-mail but prefer paper copies. Special mailings are NHM (1) and PCC (2). If there is anyone else, she needs e-mail addresses and full names. Board members thanked Linda for a great job. George offered a suggestion: to ask members to write a short note about their favorite mineral. Linda reports that was tried before without much, if any, member response.

10) Next Meeting Date was selected as October 4, 2020. (Rudy will be out of town.) If anyone has a conflict, e-mail George for possible change; Oct 4th will be via ZOOM.

Finally, discussion regarding notification to the membership about the June 19th general meeting to be held via ZOOM – Linda will blast out an e-mail notification on June 16th. and George will send the ZOOM link on the 19th or possibly on the 18th. Cheryl wanted to know if George's presentation could be recorded and posted to our webpage. No, not possible due to liability and violation of copyright issues. It happened to Caltech and was very costly.

Everyone thanked George for arranging the ZOOM conference for our Board Meeting. George acknowledged Caltech for sharing their outreach tool with MSSC.

The meeting adjourned 2:37p.m.

Submitted by Angie Guzman, MSSC Secretary

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Ride Share Listing

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

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

Looking for	Who	Where	Contact at
A Ride home after meetings	Ed Kiessling	Pasadena, CA	*Contact info. in emailed bulletin*
A ride	Richard Stamberg	North Orange County, near Cal State Fullerton	*Contact info. in emailed bulletin*

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OTHER FREE THINGS TO DO...by Ann Meister

The **Von Kármán Lecture** on *Thursday/Friday* **July 9** and **July 10** at 7:00 PM. The Thursday event is live on Upstream. http://www.ustream.tv/nasajpl2 ** Supposedly, Thursday will be at the Von Kármán Auditorium at JPL and Friday will be at Ramo Auditorium at Caltech. But check online for changes and other viewing options. https://www.jpl.nasa.gov/events/lectures_archive.php?year=2020&month=7

The speakers are to be determined. The title of the presentation is **"A Day in the Life of the Deep Space Network."** Following a day in the life of the Deep Space Network; the coder to the scientist to the ACE to the spacecraft and back again. We'll explore the different aspects of what actually goes into the difficult Tetris game that is Deep Space Communications and what's coming next.

The **Watson Lectures** at Caltech's Beckman Auditorium are on hiatus for the summer. Hopefully, they will return in the Fall.

The **UCLA Meteorite Gallery** is temporarily closed until further notice; however the monthly lecture will be presented on Zoom on Sunday, **July 12** at 2:30 PM.

Zoom Registration: https://ucla.zoom.us/meeting/register/tJwrde2vrz4tHtOUYDnw4xEBFtQrG6634bmy
If you need detailed instructions on how to join a meeting via Zoom please contact our Meteorite Manager, Natalia Campos, at ncampos@ucla.edu.

The speaker is Dr. Cristina Thomas, Northern Arizona University. The title of the presentation is, **"DART (Double Asteroid Redirection Test): A Telescope Observer's Perspective."** DART is NASA's first planetary defense mission, which will test asteroid deflection by kinetic impactor. The spacecraft will impact the satellite of the binary near-Earth asteroid (65803) Didymos in fall 2022. I lead the DART team responsible for observing and understanding the orbit of the moon prior to and after impact. The observed orbit change will be how the team determines the effectiveness of the experiment.

We understand the orbit of the binary asteroid system using light curves, a measure of how the brightness of an object changes over time. When Didymos is close to Earth, the moon and the primary eclipse each other from the vantage point of our telescopes on the ground. Each eclipsing event causes a subtle dimming of the light curve known as a "mutual event". Observing these events enables us to observe the path of the satellite around the primary and predict the next mutual events. We observed the Didymos system in 2019 and have additional pre-impact observations planned for later in 2020 and early 2021. These observations will establish the state of the system before impact. We will perform similar observations in the period following the fall 2022 impact to determine the change in the satellite orbit. I will discuss how we understand the orbit of the satellite, results from our recent observations, and our future plans for observing the Didymos system.

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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 1855 Idlewood Road, Glendale, CA 91202

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:

OFFICERS		
President	George Rossman	*president@mineralsocal.org*
Vice President	Ahni Dodge	*vicepresident@mineralsocal.org*
Secretary	Angie Guzman	*secretary@mineralsocal.org*
Treasurer	Jim Kusely	*treasurer@mineralsocal.org*
CFMS Director	Angie Guzman	
Past President	Ann Meister	
DIRECTORS		
2019--2020	Rudy Lopez	
2019--2020	Bob Housley	
2019--2020	Leslie Ogg	
2020-2021	Pat Caplette	
2020-2021	Cheryl Lopez	
COMMITTEE CHAIRS		
Bulletin Editor	Linda Elsnau	*bulletin@mineralsocal.org*
Hospitality	Laura Davis	
Membership	Cheryl Lopez	*membership@mineralsocal.org*
Micro Mount Conf. Chairman	Al Wilkins	
Program and Education	Rudy Lopez	*programs@mineralsocal.org*
Publicity	Linda Elsnau	*bulletin@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
1855 Idlewood Rd.,
Glendale, CA 91202-1053
E-mail: *treasurer@mineralsocal.org*

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

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

To:

With Knowledge Comes Appreciation

Your MSSC Bulletin Is Here!

Happy 4th of July!