Bulletin of the Mineralogical Society of Southern California

Volume 92 Number 9 - September, 2019

The 972nd meeting of the Mineralogical Society of Southern California

With Knowledge Comes Appreciation

September 13th, 2019 at 7:30 P.M.

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

Program: **A Tale of Seven Elements Presented by Eric Scerri**

In this Issue:

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

About the Program: A Tale of Seven Elements, presented by Eric Scerri

In 1913, English physicist Henry Moseley established an elegant method for "counting" the elements based on atomic number, ranging them from hydrogen (#1) to uranium (#92). It soon became clear, however, that seven elements were mysteriously missing from the lineup--seven elements unknown to science.

In his well-researched and engaging narrative, Eric Scerri presents the intriguing stories of these seven elements--protactinium, hafnium, rhenium, technetium, francium, astatine and promethium. The book follows the historical order of discovery, roughly spanning the two world wars, beginning with the isolation of protactinium in 1917 and ending with that of promethium in 1945. For each element, Scerri traces the research that preceded the discovery, the pivotal experiments, the personalities of the chemists involved, the chemical nature of the new element, and its applications in science and technology. We learn for instance that alloys of hafnium--whose name derives from the Latin name for Copenhagen (hafnia)--have some of the highest boiling points on record and are used for the nozzles in rocket thrusters such as the Apollo Lunar Modules. Scerri also tells the personal tales of researchers overcoming great obstacles. We see how Lise Meitner and Otto Hahn--the pair who later proposed the theory of atomic fission--were struggling to isolate element 91 when World War I intervened, Hahn was drafted into the German army's poison gas unit, and Meitner was forced to press on alone against daunting odds. The book concludes by examining how and where the twenty-five new elements have taken their places in the periodic table in the last half century.

Eric Scerri is a leading philosopher of science specializing in the history and philosophy of the periodic table. He is also the founder and editor in chief of the international journal *Foundations of Chemistry* and has been a full-time lecturer at UCLA for the past twelve years where he regularly teaches classes of 350 chemistry students as well as classes in the history and philosophy of science. He is the author of *The Periodic Table: Its Story and Its Significance* and has given invited lectures all over the world.

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From the Editor:

Well, Fall is getting here faster and faster every year! It seems the older I get, the faster time flies. It is the same for you? Special thanks to Angie Guzman for her "memory tidbit. Any one else have any nifty memories of early mineral episodes? We'd love you to share them.

Looks like we have an interesting program this month. Don't forget that nominations for club positions is coming up soon. Be sure to let George Rossman know if you are interested in helping out in any position.
Linda Elsnau

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FROM THE PRESIDENT: Interesting Minerals, A to Z. Installment 20, the letter "T": by George Rossman

Titanite – not sphene!

Titanite is a moderately common accessory mineral often found in small amounts in granitic rocks and in pegmatites and some schists. It was first described by Klaproth in 1795 in a publication where the new mineral is referred to as 'fossils'. Its currently approved name comes from the fact that it contains a major amount of the element titanium.

Klaproth M H (1795) Untersuchung eines neuen Fossils aus dem Passauischen.
Beiträge zur Chemischen Kenntniss der Mineralkörper 1, 245-252

Petrologists often call it sphene from a Greek word '*sphenos*' meaning 'wedge', in allusion the wedge shape commonly seen in crystals. However, in 1982, the International Mineralogical Association adopted the official name as 'titanite' and discredited the name 'sphene'.

The ideal chemical formula is $CaTiSiO_5$. If titanite had this ideal end-member formula, it would be colorless. Only rarely is it found as a colorless crystal. Mindat.org has a nice picture of a colorless titanite from the Rocca Predellara Quarry, Parma Province, Italy. Titanite can, and usually does, accept a wide range of substitutions of minor components in its structure. Minor amounts of a variety of elements are found including fluorine,

chromium, vanadium, yttrium, zirconium, niobium, tantalum, tin, iron, manganese, lanthanum, cerium, neodymium, ytterbium, plus thorium, and uranium. Thus its color can be quite variable depending on which minor components are present **(Figs. 1,2).**

Figure 1. Titanite from (left) Alchuri, Baltistan, Pakistan, and (right) Gamsberg, Namibia.
Photo credit. Rob Lavinsky and Irocks.com

Figure 2. Dark brown titanite from Eagenville, Renfrew County, Canada
Photo: G. Rossman

Titanite is commonly found in many of the rocks of southern California and northern Baja. A typical crystal shape is shown in **Figure 3**. There is a lot of titanite in the granodiorite rocks in the Santa Rosa Mountains, specifically, from northwest of Deep Canyon along the Palms-to-Pines Highway **(Fig. 4).** We even have it locally in Millard Canyon **(Fig, 5)**

Figure 3. A light brown titanite crystal in the granitic rocks of northern Baja California, Mexico.
Photo: G. Rossman

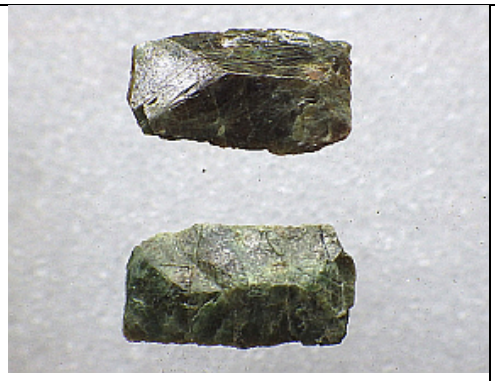

Figure 4. Darker greenish-brown titanite from Trail Canyon, Santa Rosa Mountains.
Photo: G. Rossman

Figure 5. A small crystal of titanite in a rock from Millard Canyon, Altadena
Photo: G. Rossman

Because titanite can incorporate minor amounts of radioactive elements such as uranium and thorium, it is subject to a process called metamictization. The radioactive elements undergo radioactive decay to emit alpha particles (ionized helium atoms) that have enough energy to cause structural damage by displacing atoms in the structure. This damages the structure, sometimes to such a great extent, that the crystal becomes almost like a disordered glass. Its X-ray diffraction pattern broadens and can nearly completely go away; the initially sharp infrared absorption pattern likewise degrades to a series of broad, featureless absorption bands. This destruction of the structure seems bad for the crystal, but it can be of use to us. Because if its uranium content, titanite can be used as a geochronometer. We determine the age of the titanite by measuring the amount of lead that formed from the radioactive decay of uranium in the crystal.

Interestingly, titanite crystals form deformation twins under hypervelocity-impact processes. A great example is the 300 km wide impact crater that formed when the asteroid impacted what is now Chicxulub, Mexico, about 65 million years ago. Drilling into the ocean floor has brought up rocks that contain such shocked titanite. By the way, that's the impact that is believed to have ended the reign of the dinosaurs.

Titanite is occasionally used as a gemstone, especially when it is a transparent, clear yellow-green color or a beautiful green color from minor amounts of either chromium or vanadium **(Fig. 5).** But other colors can also be used for gems. Some spectacularly large, comparatively clear crystals have come from Madagascar **(Fig. 6).** They, as well as titanites from other localities have found their way into the gemstone trade **(Fig. 7)**

Figure 5. Green titanite from Tormiq Valley, Baltistan, Pakistan.
Photo credit Rob Lavinsky, iRocks.com

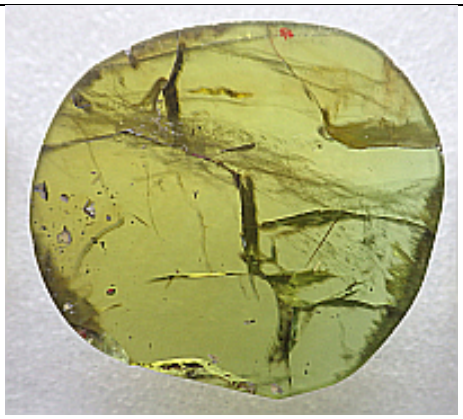

Figure 6. A 6 cm wide slab of titanite from Madagascar
Photo: G. Rossman

Figure 7. a) 40 carat golden brown faceted titanite (sold as sphene). b) 4.5 carat greenish-gold faceted titanite from Afghanistan, and c) 14 carat yellow green stones from Zimbabwe.
Photo Credits: a) Jason Stephenson, PalaGems; b) Rob Lavinsky, Irocks.com, c) Mia Dixon, PalaGems

It is comparatively soft – hardness 5.5, so it does not wear well when exposed to sand and other harder materials. But it can be spectacular as a gemstone. It is known for is exceptionally high dispersion of colors (rainbow effect), to an extent that exceeds the dispersion of diamond.

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Minutes of the August 11, 2019 Picnic/Meeting

On Sunday, August 11, 2019 the 971st Membership Meeting of the Mineralogical Society of Southern California was called to order by President Dr. George Rossman. This meeting was the society's Annual Picnic. The Picnic and Silent Auction were held at the Carter residence with much appreciation. Most of the regular business was suspended until the next regular Membership Meeting, September 13th.

President Dr. George Rossman, who announced that there are now 5,479 approved mineral species recognized by the International Mineralogical Association, IMA. He mentioned two new minerals, one named after a Chinese environmental geologist and one named after the North Star mine (Utah). The paper where this information was derived was authored by Dr. Tony Kampf and Dr. Bob Housley, each MSSC members.

Among the usual suspects, the welcomed guests included Mary Fong/Walker, president of Fallbrook Gem and Mineral Society, her husband, Bill Walker (both former MSSC members) and Alfredo Petrov. This year's theme, "Stories of Disappointment" will commenced after we enjoyed the wonderful food.

Business and Announcements: (1) A **motion to approval of Minutes** published in the August 2019 *Bulletin* was made by Ann Meister and seconded by Laura Davis. The voice vote was called and **passed unanimously**. (2) Announcement of upcoming Field Trip was reported by Marek Chorazewicz. The trip will be in Nevada, near to Reno. Check the *Bulletin* for more information. (3) Show and Tell: Marek brought samples. (4) Mary Walker/Fong announced the Fallbrook Gem and Mineral Show will be coming up October 13th. Watch the *Bulletin* for more information. (5) Trona is cancelled this year due to damage sustained during the recent earthquakes in the region. The Silent Auction is up and running. Dr. George extended a big THANK YOU to Dr. Bruce Carter and his wife, Kathy, for their hospitality. Bruce is not able to participate fully due to recent illness.

Rudy tells us we have tri-tip and brisket, smoked to perfection, salads, fruit, desserts, beverages and other goodies. Chef Rudy says "Come and Get It!" Silent Auction is on.

Picnic Theme Stories: Dr. George, tells about the time he was in Bolivia collecting high quality material and storing in one backpack and low-quality material in another. Have you heard about someone's luggage ending up in Cleveland? Well, not exactly but Dr. George ended up with the low-quality backpack! [Someone lucked out getting the high-quality material backpack.] Next up Alfredo telling us that in a canyon there is an old abandoned mine into which he took his brand new $400 ultraviolet light. There was no moon that evening, he was looking for scheelite. Using his ultraviolet light, he found a blue rock with a white spot on it. He thought he had a find. When he got home, he looked and discovered the white was actually bird poop! Moral of the story go out on a full moon night! Then Cheryl Lopez tells about this huge geode that was too big to dig out and each time she and Rudy went out to Wiley's Well, there it was, again and again. She claimed it as her own only to find that the next time, someone with bigger equipment came dug it out and hauled it off. "They got my rock" says Cheryl. Next, Geoff Caplette told the story of collecting petrified wood and one time up in Oregon, there were a lot of trees buried in pillow basalt. He and a friend worked on digging out a 22" diameter by 7' long log, weighing about 2 ton. It was too much for one trip, so they took about half and decided to come back for the rest later, after the rain stopped and they could rest up. They travelled back after 2 weeks to find some other guys trying to haul their petrified wood up to the road from the side of the hill where Geoff and his friend had worked so hard to get the log. After some friendly discussion, they decided to work together to get the remaining half log out. It wasn't a disappointing story, but they did lose about 3 or 4 slices of petrified wood as payment to the other guys who helped them bring the log up.

Dale Harwood spun his tale about the Golden Door Café, still there. In the window was a 1½" rhombohedral crystal for sale, about $20. He begged his parents to buy it for him for Christmas. Guess what he didn't get. That crystal today would be worth quite a lot more than that $20 of all those years ago; Bob Housley told about finding arrowheads and a special trip with his grandparents when he was about 13 or 14 years old. He went out early looking for arrowheads, found some and found an Indian knife about 3" long. He took his treasures home, kept them safe and looked at them every so often. One day, he decided to clean up the knife, went to the kitchen, dropped it in the sink and boom, the obsidian knife shattered. Oh my!

The Walkers told their story and Marek talks about mushroom collecting (yikes!). Then Bruce tells us about his first mineralogy class collecting in mud clusters. Digging about 2' down, were fist-size completely clear transparent crystals, displaying multiple crystallographic forms. WOW! He pulled them out, put them in his ice chest and, by the time he got them home, they were already cloudy on the surface – it was the sodium sulfate plus the water. But Bruce said he will always remember the beautiful mirabilite crystals he pulled out of that 2' hole. Lastly, Dr. George finishes with his story from 30 or so years ago when he visited a pegmatite mine that had a 25' tall milky quartz vein. George was using a small sledge to chisel into the quartz to get at a beautiful morganite crystal. Oops, one swing too many and that morganite shattered. ☹

These were fun and wonderful stories that may spark your own; another wonderful picnic with good memories, great company and yummy food.

The Silent Auction is closed. Settle up with Cheryl. Leftovers and containers are available to any that want to take food home.

"Thank You": Bruce and Kathy Carter for allowing the Society to hold the event in your lovely backyard. Thanks to Rudy Lopez for cooking; to Bruce, Rudy, Cheryl and Angie for setting up. Thanks to all who helped with the clean-up and tear down. Thanks to all who attended the picnic, brought food and those who donated items for the silent auction fund raiser. Till next year…

Reminders: The next MSSC regular **Membership Meeting** will be held at PCC Geology Building E on **Friday, September 13** starting at 7:30pm. Our scheduled speaker is Eric Scerri, "A Tale of Seven Elements". Refreshments will be available after the meeting. The next **Board Meeting will be held on Sunday, September 15th** at the Carter residence. Everyone is welcome to attend either/both meeting. Check the *Bulletin* or the MSSC website for any changes or updates!

Submitted by Angie Guzman, Secretary. (Apologies in advance for any errors or omissions.)

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List of Upcoming MSSC Events : Mark your Calender!

Event	Date	Comments / Scheduled Program (if known)
Meeting Dates:	October, 11, 2019:	Karin Rice: Geology of Rancho La Brea/ LA Brea Tar Pits
	November 8, 2019	Renee Newman: "The Allure of Diamonds"
	December 13, 2019	Steve Hardinger: 'Minerals Containing Carbon"
	January 11, 2020	**Banquet:** Paul Adams: *To Be Announced*
	February 21, 2020	Justin Seastrand: Forest Service – Land Rights
Board Meeting	September 15, 2019	Board Meeting at Bruce Carter's house
Field Trip	September 28, 2019	(Exact date to be announced) Nevada's Goodsprings District

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

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OTHER FREE THINGS TO DO...by Ann Meister

The **Von Kármán Lecture** on *Thursday/Friday* **September 19 and 20** at 7 PM. The speaker is Dr. Marc Rayman, Mission Director/Chief Engineer/Project Manager for Deep Space 1. The title of the presentation is **"It Broke! A Story of How we Fixed It."** A story of how we repaired and saved a spacecraft that was millions of miles away. ** Thursday is at the Von Kármán Auditorium at JPL and Friday is at Ramo Auditorium at Caltech.

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

The **UCLA Meteorite Gallery** lecture is on Sunday, **September 29**. The speaker is Professor Ed Young of UCLA. The title of his talk is **"Polluted White Dwarfs."** When a star the size of the Sun has burned all its H and He, it starts to cool by radiation. It eventually becomes very dense; white dwarfs typically contain the mass of the Sun in an Earth-size star. The gravitational field is so strong that elements other than H and He settle out of the atmosphere on a short time scale (months to 106 years). Thus it was a surprise when detailed surveys showed 25% of white dwarfs to be polluted with asteroidal or cometary debris. Recent studies of WD atmospheres thus allow comparison of these pollutants with the smaller materials orbiting our Sun. The UCLA Meteorite Gallery in Geology room 3697 is open with a docent present every Sunday from 1 till 4. The lecture, which is always on a Sunday afternoon at 2:30 pm, is in room 3656 near the Meteorite Gallery.

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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	Linda Vista Ave. Pasadena, CA	*See emailed bulletin*
A ride	Richard Stamberg	North Orange County, near Cal State Fullerton	*See emailed bulletin*

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September 28th Field Trip Information

The next fieldtrip will be on Sat, September 28, 2019 in the Yerington, NV area. In the morning we will collect copper phosphates at Blue Jay Mine, in the afternoon we will go to Boulder Hill Mine for cubic fluorite and barite.

For more details and maps please go to our website:

http://www.mineralsocal.org/fieldtrip-information-reports/yerington-area-nv-sept-28-2019/

It is a long way from SoCal so plan your trip accordingly. I've also added suggestions for self-guided trips in the immediate area for Sunday, if anybody wants to collect there for one more day.

Hope to see you all there, Marek C.

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Revamp of the La Brea Tar Pits

LANHM is in the process of redesigning the La Brea Tar Pits park and Museum. According to the article in the LA Times on 8/26, three firms are submitting options for consideration. (https://www.latimes.com/entertainment-arts/story/2019-08-26/la-brea-tar-pits-redesign-proposal-mammoth-los-angeles-architecture)

If you have concerns or feelings about what the Museum looks like in the future, you have until Sept 15, 2019 to offer your feedback.

Renderings of each firms plans will be on display in the museum at the La Brea Tar Pits through Sept. 15 and digital versions of the materials are available at TarPits.org. The public is asked to provide feedback on each of the proposals at the museum or online.

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A Memory Tidbit from Angie Guzman

Here's my tidbit "disappointing story": Years before the San Gabriels became a monument, a person could collect and keep what they found. During that time, my brother Manny asked me if I wanted to go panning for gold up there. I had never been and was anxious to give it a try. If the '49ers could do it, I could, too. I immediately got gold fever; nuggets were swimming around in my head. I asked what I needed to bring, he said he had everything. So, up we go, passing people in the river with equipment helping in their endeavors, sluice machines, hoses, etc. I was in awe (nuggets, nuggets, nuggets). We get to our spot in the riverbed next to a nice little flow. The water was ice cold, but I didn't care…nuggets, nuggets, nuggets. Manny shows me how to pan, slosh the material around, dip, slosh, separate, dip, slosh, separate, dip… Then he hands me tweezers! Argh! "What's this?" I ask. He said it's to get the gold out of the pan. My vision of nuggets turned out to be nothing but flakes, and a few, at that. Ah, gold fever!!!

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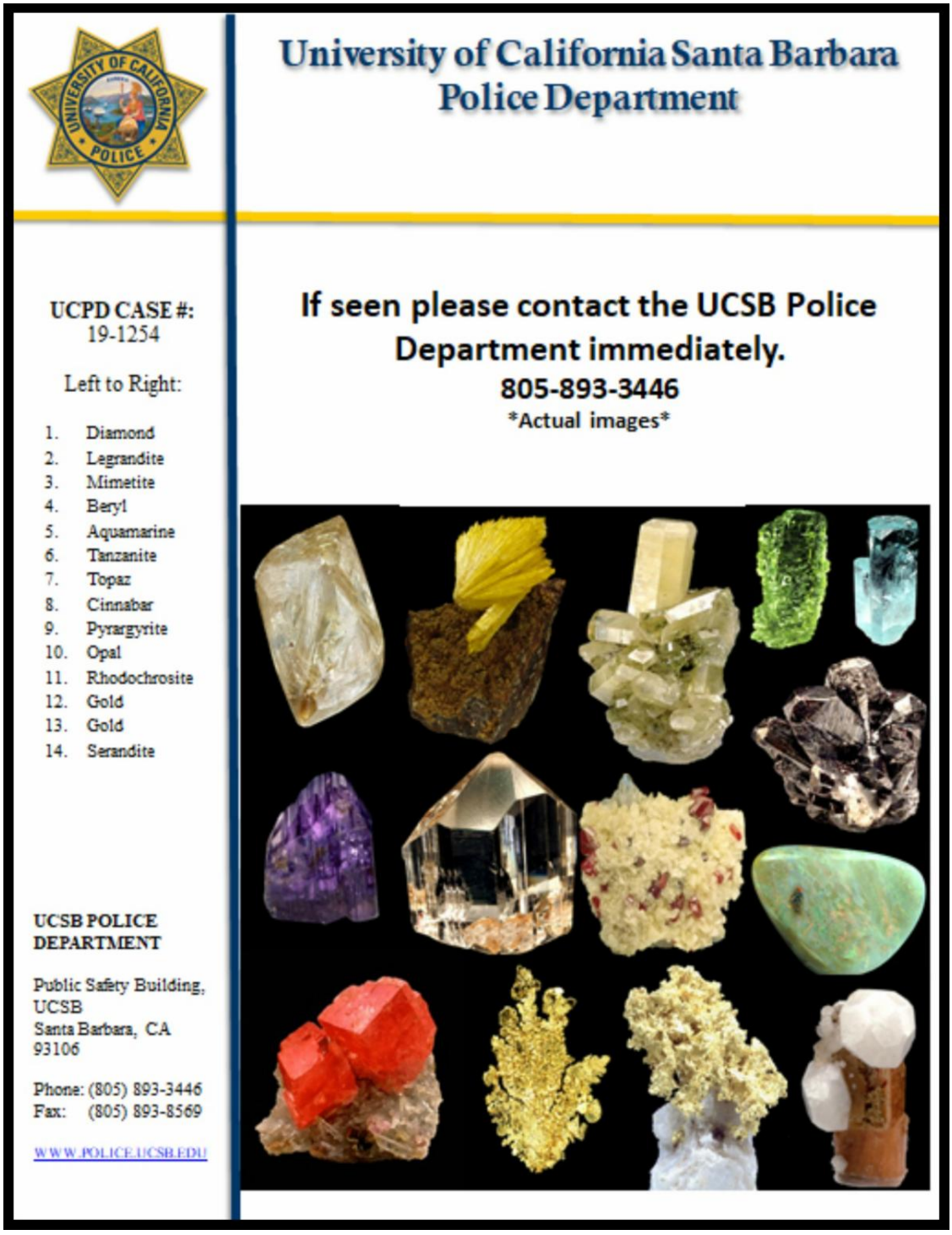
If you see any of these specimen, please use the contact information on the poster.



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October Featured Mineral: **Prehnite**
Formula: $Ca_2Al_2Si_3O_{10}(OH)_2$
Crystal System: Orthorhombic
Name: Named in 1788 by Abraham Gottlieb Werner in honor of the Dutch Colonel, Hendrik von/van Prehn [July 31/August 2, 1733 Cape of Good Hope Colony - August 1785 Heilbronn, Wurttemberg {Germany}], who is credited with discovering the mineral in 1774 at the Cape of Good Hope in South Africa.

© irocks.com photo

Prehnite
$Ca_2Al_2Si_3O_{10}(OH)_2$
Locality: Jeffrey Mine, Asbestos, Les Sources RCM, Estrie, Québec, Canada
4.3 cm x 4 cm x 1.5 cm

© irocks.com photo

Prehnite **$Ca_2Al_2Si_3O_{10}(OH)_2$**
Locality: Jeffrey Mine, Asbestos, Les Sources RCM, Estrie, Québec, Canada
2.1 cm x 1.9 cm x 1.8 cm

© irocks.com photo

Prehnite
$Ca_2Al_2Si_3O_{10}(OH)_2$
Locality: Arrondissement Diakon, Commune Diakon, Cercle de Bafoulabé, Kayes Region, Mali
6.4 cm x 2.2 cm x 1.9 cm

© irocks.com photo

Prehnite **$Ca_2Al_2Si_3O_{10}(OH)_2$**
Locality: Djebel Melh, Bou Arfa, Figuig Province, Oriental, Morocco
5.4 cm x 4.2 cm x 2.7 cm

© irocks.com photo

Prehnite
$Ca_2Al_2Si_3O_{10}(OH)_2$
Locality: Muotta Naira, Piz Lai Blau, Nalps Valley, Tujetsch, Vorderrhein Valley, Grisons, Switzerland
5.7 cm x 3.4 cm x 2.3 cm

© irocks.com photo

Prehnite $Ca_2Al_2Si_3O_{10}(OH)_2$
Locality: Merelani Hills, Lelatema Mts, Simanjiro District, Manyara Region, Tanzania
1.6 cm x 1.5 cm x 1.4 cm

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Calendar of Events:

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

AUGUST

August 2, 3 & 4: NIPOMO, CA
Orcutt Mineral Society
Nipomo High School
525 Thompson Avenue
Hours: Fri-Sat 10 - 5, Sun 10 -4
Website: omsinc.org

SEPTEMBER

September 21: LONG BEACH, CA
Long Beach Mineral & Gem Society
Expo Arts Center
4321 Atlantic Avenue
Hours: 10:00 - 5:00
Email: lbmineralgemsociety@gmail.com

OCTOBER

October 12 - 13: TRONA, CA
This show has been cancelled because of the July, 2019 Earthquake. Watch for next year's show!
Website: iwvisp.com/tronagemclub

October 19: WEST HILLS, CA
Woodland Hills Rock Chippers
First United Methodist Church
22700 Sherman Way
Hours: 10 - 5
Website: rockchippers.org Show Page

NOVEMBER

November 2 - 3: ANAHEIM, CA
American Opal Society
Business Expo Center
1960 S. Anaheim Way
Hours: Sat 10 - 6; Sun 10 - 5
Website: opalsociety.org/ Show Page

DECEMBER

No CFMS Shows listed for December

JANUARY, 2020

No S. Calif. CFMS Shows listed for January

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**

2019 MSSC Officers:

OFFICERS		
President	George Rossman	*president@mineralsocal.org*
Vice President	Renee Kraus	*vicepresident@mineralsocal.org*
Secretary	Angie Guzman	*secretary@mineralsocal.org*
Treasurer	Jim Kusely	*treasurer@mineralsocal.org*
CFMS Director	Jo Anna Ritchey	
Past President	Ann Meister	
DIRECTORS		
2019--2020	Bruce Carter	
2019--2020	Bob Housley	
2019--2020	Leslie Ogg	
2018-2019	Pat Caplette	
2018-2019	Pat Stevens	
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 San Bernardino County Natural History 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!