

DAISY MOUNTAIN ROCKCHIPS

The purpose of Daisy Mountain Rock & Mineral Club is to promote and further an interest in geology, mineralogy, and lapidary arts, through education, field experiences, public service, and friendship.

VOLUME 4, ISSUE 11

DECEMBER 2019

MERRY CHRISTMAS AND
HAPPY NEW YEAR



Mixture of Cyanobacteria Found in a Microbial Mat Community Image courtesy of Rolf Schauder (University of Frankfurt), Mark Schneegurt (Wichita State University), and Cyanosite (www-cyanosite.bio.purdue.edu) - cropped from original

FOSSILS: PART II

Kingdom: Prokaryotae

By Susan Celestian

Humans have a penchant for classification. With regard to biological organisms, the various categories, from largest to more specific, are kingdom, phylum, class, order, family, genus, and species. (There are other sub-categories, but these are the primary ones.)

There are 5 kingdoms: Prokaryotae, Protocista, Fungi, Plantae, and Animalia. Most common fossils fall within the Kingdom Animalia. However, some interesting fossils fall within all of them.

In the newsletter of November 2019, fossils and fossil preservation were introduced. One further point of import is that the odds are fairly low, for any given organism becoming a fossil. Quick burial and hard parts greatly increase those odds. Thus it becomes obvious that the fossil record is skewed, but there is still a wealth of information for the paleontologically bent.

Prokaryotes are one-celled organisms without a compartmented nuclei or other discreet organelles. See Figures 1 & 5-6, on pages 9 & 11. Members of this kingdom are the bacteria and cyanobacteria -- probably representatives of the first living organisms on Earth. Some of the more interesting of these organisms are extremophiles (perfect for early Earth!) and methanogens¹.

BACTERIA

Actual, verifiable bacteria fossils are difficult to find. They are very small (1/8th-1/1000th the width of a strand of human hair), and difficult to preserve. However, evidence has been found -- filaments, short cell strands, biogenic minerals, rod-like structures, organic molecules Some evidence seems to be conclusively organic; some is controversial.

- ▶ Tiny hematite tubes tentatively thought to be bacterial (perhaps cyanobacterial) in origin have been found in 3.77+ billion- years-old rocks on the shores of

¹ **Extremophile** - an organism for whom ideal conditions would be extreme for humans, such as very hot, cold, salty, or oxygen-poor environments. Most are micro-organisms. **Methanogens** are largely anaerobic (and often extremophile) organisms for whom methane is a byproduct of metabolic activity.

Fossils continued on page 11....



FLUORAPATITE

By Susan Celestian

Fluorapatite was originally described in 1786 by Abraham Gottlob Werner, who named it just plain Apatite. The name is derived from the Greek ἀπατάω (apatao), "to deceive" because of the similarity of apatite to other minerals, such as beryl. In 1860, Carl F. Rammelsberg reclassified it as fluorapatite, when the apatite series was recognized. The Apatite Series includes fluorapatite, chlorapatite, hydroxyapatite, and carbonate-apatite. The minerals are usually a mineral mixture, as fluorine, chlorine, hydroxyl (OH), and carbonate (CO₃) substitute for each other -- fluorapatite the most common of the collectible species.

Chemical Formula - Ca₅(PO₄)₃F
(Calcium Phosphate Fluoride)

Crystal System - Hexagonal (3 axes of equal lengths, all perpendicular to a fourth) Minerals are generally long or short, with a 6-sided

cross-section. https://glossary.periodni.com/download_image.php?name=hexagonal_crystal_system.png&source=hexagonal+crystal+system

Growth Forms/Habits - Prismatic with flat, pyramidal, or dipyramidal terminations

Hardness - 3-3.5

Color - Clear, gray, yellowish, green, pink, blue, brown, purple

Luster - Vitreous, resinous, dull, greasy, waxy

Streak - White

Specific Gravity - 2.562

Cleavage - Good in 1 direction

Fracture - Irregular/uneven

Other - Fluorescent (pale yellow under LW UV light; Weakly pleochroic.

Fluorapatite continued on page 15....

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December 3, 2019
Board of Trustees Meeting Minutes

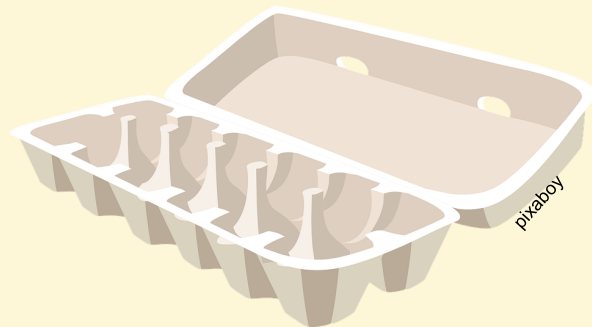
- In attendance: Clark L., Claudia M., Cynthia B., Deanne G., Ed W., Rebecca S., Stan C., Susan C., Tammy E., Tiffany P. and William F.
- November minutes approved
- Cynthia B. discussed our finances
 - Imbalance in the sheets right now of \$44.40
 - Will be fixed when category choice for expense can be made
- Thank you to Clark L. for securing our holiday party location
 - Board approved costs
 - \$400 for venue, \$150 for food and decorations
- Square reader will be setup soon
 - Approved because it will be the best price option
 - Also need for the show
- Ed W. discussed mining claims
 - There was a subcommittee created
 - Their first meeting was December 10th for lunch
- April club meeting will be at the Rare Earth Gallery in Cave Creek
 - Will not have board meeting that month
 - Wire wrapping will have to end early to get to location on time
 - There is no charge for event
 - The vendor has a meeting area setup in the back patio
 - There will be plenty of parking available
 - CAUTION: There are some very valuable specimens in this location
 - Please only touch items that are permitted to be held
 - Be cautious and diligent with children
 - ◆ You break it, you buy it
- The next show meeting was discussed
 - Stan C. has original sized photo to be used for PostNet
 - Will get them made for us for meeting
 - We want to start giving out flyers at vother clubs' shows
- Board member changes were announced
 - Tammy E. will be moving and cannot continue to be on the board
 - She, and all her beautiful jewelry that she donates, will be greatly missed!

Board Minutes continued on page 4....

December 3, 2019
General Club Meeting Minutes

- Cynthia B. discussed the financial report
 - Show expenses are starting to come in
 - Meeting rooms are paid up for 1/3rd of 2020
 - Show status was discussed
 - Next meeting was Dec. 17th at Civic Building
 - The show is a great money maker for the club
 - Jim R. is waiting on floor plan to continue with vendors
 - Most vendors from last year have responded for the show
 - ◆ Most wanted inside
 - Bill S. discussed the kid's corner
 - Thank you to Stan and Sue C. for their generous donation of rocks
 - **Please bring in any grey, cardboard egg cartons and plastic containers for storing specimens**
 - The next field trip was discussed by Stan C.
 - Was December 6th-7th to Red Cloud mine
 - William F. is taking over Stan C.'s position
 - Stan C. will still be a board member
 - Jonathan M. offered to become a board member
 - ◆ Will fill Tammy E.'s position
 - Raffle was led by Robin S.
 - She will have sign up for show raffle volunteers at the meetings
 - Claudia M. discussed the lapidary survey
 - Right now, our equipment is for use at the North Mountain Visitor's center
- ▶ Tammy E. will be sending out an email for her estate sale coming up

Respectfully submitted by Rebecca Slosarik



PLEASE DONATE THOSE EGG CARTONS!

....Board Minutes continued from page 3

- William F. asked to become Vice President and subsequently will be the field trip chair leader
 - Approved
- Claudia M. has lapidary survey results
 - 39 surveys returned
 - Summary will be sent out to group
 - Looks like nighttime and weekend access to lapidary equipment is most wanted
 - Will have to wait to change location until a more feasible option presents itself

Respectfully submitted by Rebecca Slosarik

December 17, 2019 Show Meeting Minutes

- Open meeting, no attendance necessary
- Show March 20-22 at Anthem school on Freedom Way in Anthem
- Vendors: Jim R.
 - Still waiting on layout
- Will use an architectural program to maximize space
 - There is an excess of available vendors
- Financials
 - Some has been spent on marketing already
- Setup: Howard R.
 - Was on vacation – will finish once back
- Membership exhibit: Lori and Mike P.
 - In the works
 - Will be pertinent to helping get new members
 - Want to add lapidary and silversmithing aspect of club this year
- Marketing: Jessie R., Deb C., and Jessie C.
 - A subcommittee will be made to get everything done
 - We want to focus on marketing to fellow rock-hounders
 - TV and local magazines were unsuccessful
 - Will be going to as many other club shows in Arizona as possible
 - Will hand out flyers at them
 - Go to bead and rock stores
 - Leave posters at North Mountain Visitor's center
 - Will do Foothill's Focus ad again

- In & Out if very successful and helpful – will use again
- Posters: Stan C.
 - Posters look great!
 - They are all printed
- Fluorescent exhibit
 - All set, same as last year
- Food vendor: Clark L.
 - Will try to get same trucks as previous shows
- Kid's corner: Jeanne S.
 - All set
 - Will have microscope and Dr. Rocks this year
 - Will be a great addition
- Admissions: Jonathan M.
 - Still needs forms from previous years
- Raffle: Robin S.
 - All set
- ATM: Jennifer G.
 - All set
- Security: Ed W.
 - Have some overnight help already
 - Needs more volunteers for show and overnight
- Setup
 - Will need able bodied volunteers and as many friends as possible to help
- ▶ Next meeting will have no issues with civic building hours
 - Will be February 11th at 7pm (2020!)

Respectfully submitted by Rebecca Slosarik

6-LEGGED SNOWBIRDS

Winter is here, and this is the time of the year that Monarch and Queen butterflies are migrating into our area. If you have Desert Milkweed in your yard -- and you should -- keep an eye on it for caterpillars, butterflies, and other interesting creatures.

RIGHT - Blood-colored Milkweed Bug (*Oncopeltus sanguineolentus*);
BELOW - Oleander Aphid (*Aphis nerii*)
Photos by Susan Celestian



TOP - Monarch Butterfly (*Danaus plexippus*) chrysalis;



LOWER LEFT - Queen Butterfly (*Danaus gilippus thersippus*);
LOWER RIGHT Queen Butterfly chrysalis
Photos by Susan Celestian

Words of Wisdom

from our very own

Bob Evans



The older I get the earlier it gets late.

December Swap/Sell/Free

After the business meeting, show & tell, and raffle, the club members went shopping. Members brought in rocks, rock products, and handmade jewelry. It is great fun to see the talent in the club membership and to chat with fellow hobbyists! All photos by Stan Celestian.



For Show & Tell, Stan Celestian brought in some samples of material from Amethyst Hill, Hell's Gate, Burro Creek, Peridot Mesa, Saddle Mt., and the Gila River Bottom (he said Salt River, but he meant Gila) -- all good collecting sites.



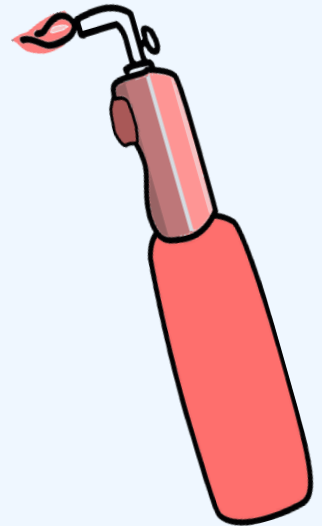
Bill Freese -- new field trip chair -- brought in samples from the recent club trip to Date Creek, for quartz; and the club-sponsored coalition trip to Sycamore Creek, for jasper.

....Swap & Sell continued from page 5



Mineral specimens, cabs, and jewelry galore!

Wire-wrapping maven, Jennifer, with some beautiful pendants.



Pretty rocks mounted on wood, and slabs -- including some very interesting breccia slabs, from Agate Mt. -- another possible field trip.



Deanne is becoming quite the lapidarists and silversmith! On the right are 3 Fordite cabs she made (Fordite aka Detroit Agate is composed of layers of car paint, and at least some on them should be dubbed Corvette-ite)



new juniors free raffle a hit!

For fun, at the November meeting, the Celestians conducted a free raffle of 12 nice thumbnail mineral specimens (pictured here), exclusively for juniors in attendance.

Each junior was given 12 tickets that they could apply to the thumbnails of their choice.

It seemed to be a lot of fun, so the Celestians will keep up supplying a free junior raffle. Maybe some of our juniors will display at the Tucson Show or major in geology some day.



Somebody's
Happy!



Each Junior received 12 tickets, that they could distribute between the 12 available minerals, in the raffle.



FIELD TRIP REPORT RED CLOUD MINE DECEMBER 6-7, 2019

Photos by Susan Celestian



WOW!
Stay on that road!



Roger and Ben (mine manager & fellow miner) have found some great wulfenite!! And it's all for sale!



CHRISTMAS PARTY 2019

Photos by Nancy Gallagher & Stan Celestian



Thank you Clark & Marie for all your hard work arranging for the party! And thanks to the owner of George's Famous Gyros & Pasta!



Tammy is moving, and we will miss her, her talent, her generosity, and her verve!

Hope you find rockhound buddies Back East, Tammy!!!

GREAT FELLOWSHIP

Christmas continued on page 10....

....Christmas continued from page 9

GREAT FOOD



GREAT FUN

Robin did another fabulous job of organizing and orchestrating the gift exchange!



PRETTY PACKAGES!



**Hmmm.....
Should we keep
this one, or steal
someone
else's?????**



...Prokaryotes continued from page 2

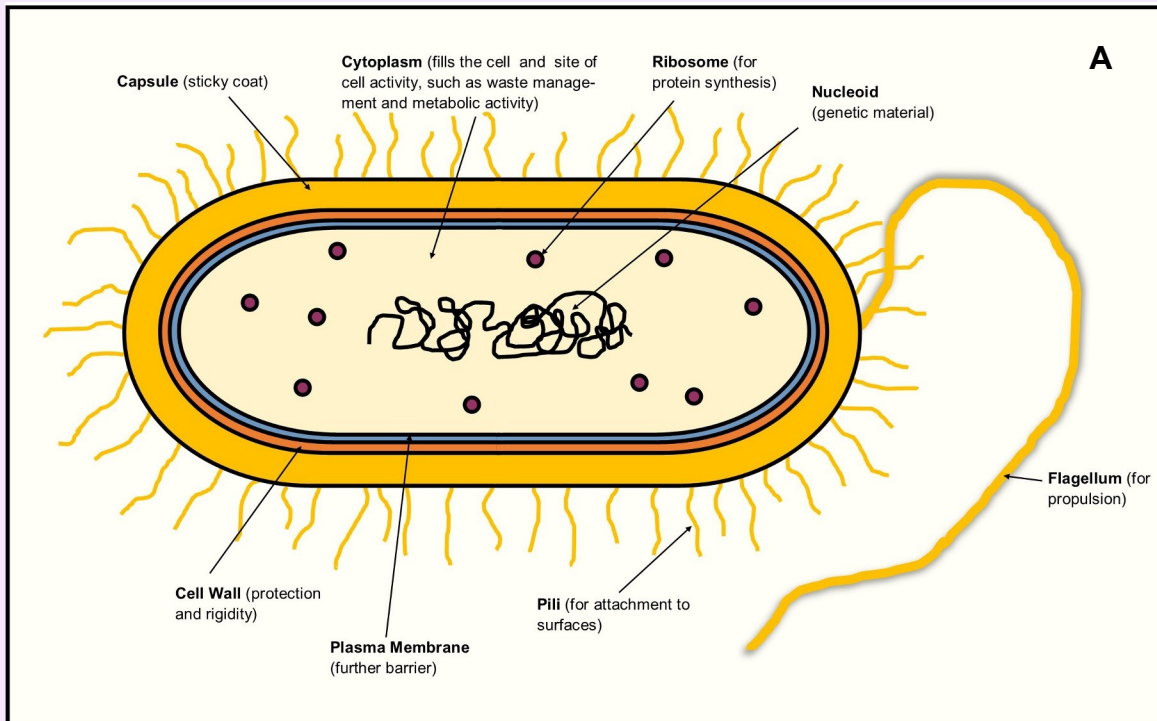


FIGURE 1 PROKARYOTIC ORGANISMS Bacteria (A) are very simple, fairly undifferentiated single-celled organisms, within the Kingdom Prokaryotae. Their tiny size makes them hard to find in ancient rocks. However, sometimes they leave behind chemical traces.

Graphics by Susan Celestian

Hudson Bay in Quebec, Canada. These structures are similar to structures produced by iron-oxidizing bacteria found at modern hydrothermal vents on the deep sea floor.

- ▶ Structures in two Martian meteorites (ALH 84001 and PIA00285) appear to possibly be due to activity of bacteria. See Figure 2, page 12.
- ▶ Ancient, yet still living, bacteria have survived within a fluid inclusion in the salt body below the salt flat in Searles Lake, at Trona, California. See Figure 3-4, page 12.
 - ▶ Bacteria can be also be preserved as pseudomorphs, being replaced by pyrite or siderite.
 - ▶ Boring bacteria leave micro-canals within shells.
 - ▶ Bacteria have been discovered in amber and in mummies.
 - ▶ Magnetobacteria create tiny (nanometer scale) magnetite crystals within their tissues. The discovery of these crystals has extended to 2 bya, and reside in rocks as evidence of the ancient presence of tiny bacteria.

...Prokaryotes continued from page 11

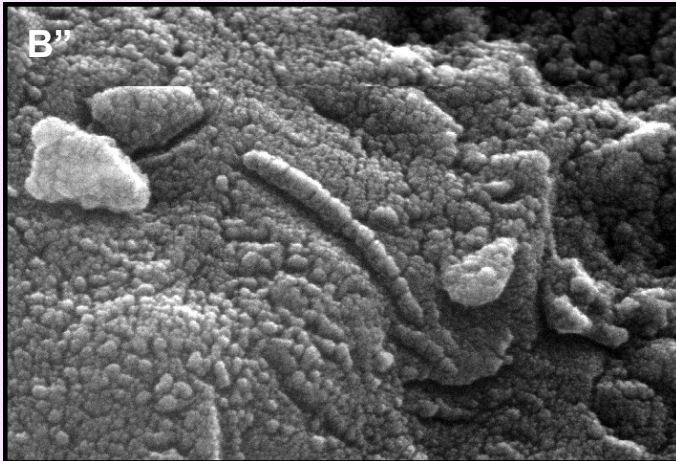
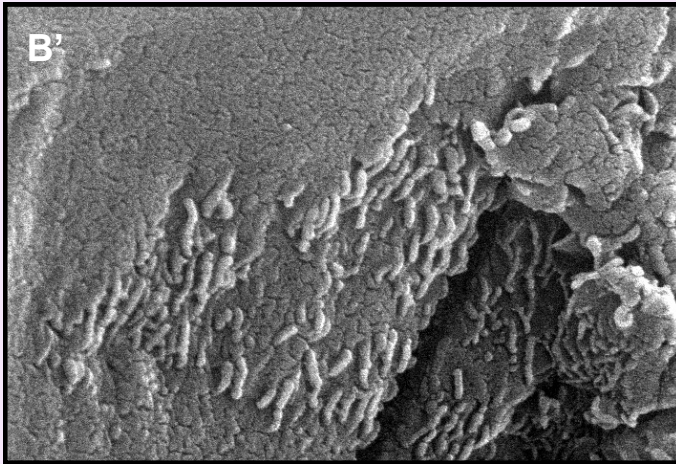
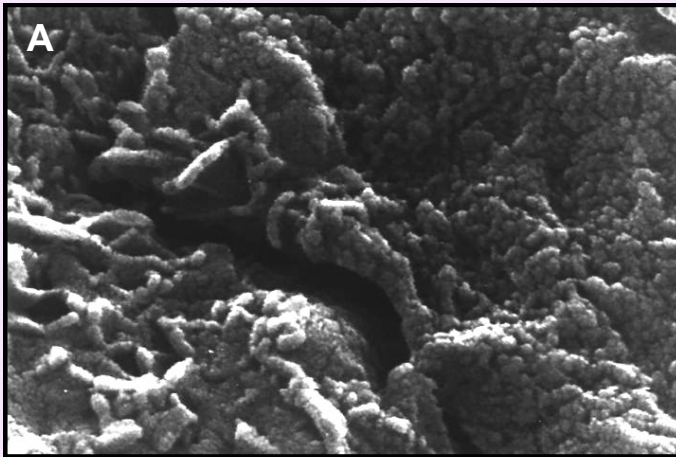


FIGURE 2 MARTIAN BACTERIA - MAYBE Photo A, is from Martian meteorite PIA00285, 3.6 billion years old. The largest structures are 1/100th-1/1000th the width of a human hair, and in association with organic molecules/carbonate mineral grains, could be bacteria fossils. *Image credit to NASA/JSC/Stanford University* Similarly, photos B' and B'' are from ALH 84001. The rod-like structures, organic molecules, and carbonate mineral grains point to a possible biologic origin. *Photos credited to D. McKay (NASA / JSC), K. Thomas-Keprta (Lockheed-Martin), R. Zare (Stanford), NASA.*

One great example of an extremophile bacteria, is the halophilic (*thriving in hypersaline environments*) bacteria inhabiting the brine pools at Trona, California. This bacterium is protected from UV radiation by the beta-carotene-like material that gives them their scarlet-red color. See Figures 3 and 4.



FIGURE 3 SALT-LOVING BACTERIA

The brine pools at Trona, CA are often blood-red due to colonies of halophilic bacteria that thrive there. In the photo

below, you can see wispy scarlet strands and globules that are the bacteria.

Photos by Susan Celestian

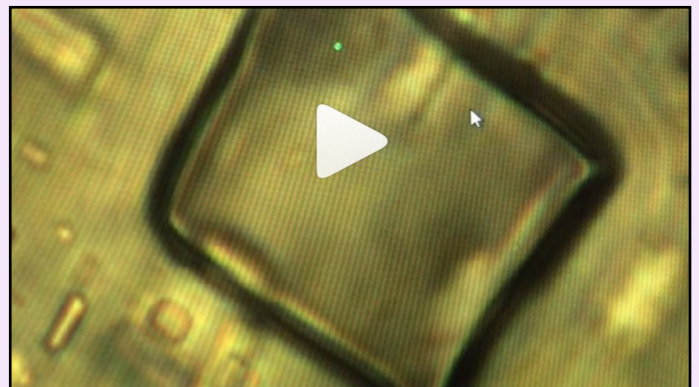


FIGURE 4 REALLY OLD LIVING HALOPHILES

Ctrl/Click on the photo and go to an Instagram post by Dr. Aaron Celestian, Natural History Museum of Los Angeles County (NMHLA). It is a short video of seemingly living bacteria bounding around (follow the arrow) in a fluid inclusion within halite retrieved from a core drilled out of the salt beds below the playa at Trona, California. This bacteria may have survived in this "crystal aquarium" for tens of years; however in other deposits: Bottom of Searles Lake = 2mya, Boulby Mine, England = 200+mya; in Gypsum at Naica, Mexico - 50-60,000 years. Now that's an extremophile! *Image and video by Aaron Celestian and used by permission of NMHLA.*

Fossils continued on page 13....

...Prokaryotes continued from page 12

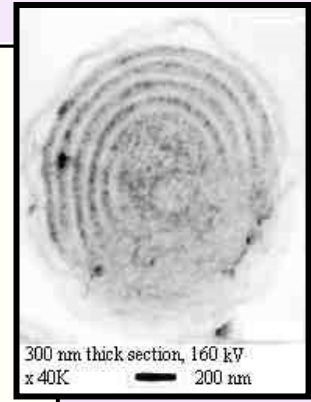
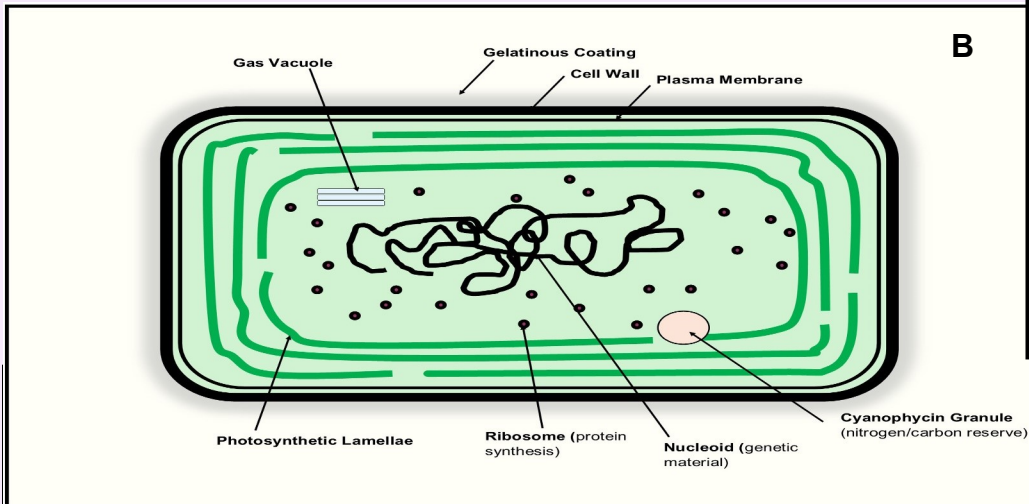


FIGURE 5
PROKARYOTIC ORGANISMS
Cyanobacteria (B) are very simple,

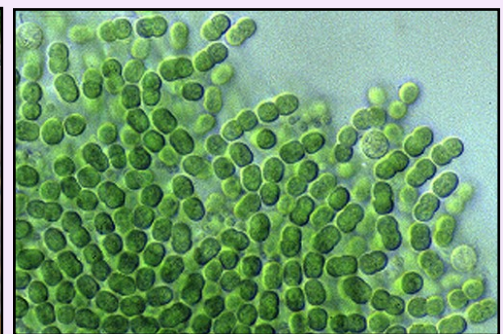
fairly undifferentiated single-celled organisms, within the Kingdom Prokaryotae. They are distinguished from other bacteria, by their ability to photosynthesize. The inset is a Transmission Electron Microscope (TEM) image of a single cell, of *Anacystis nidulans*, magnified 40,000 times. The black line in the image bottom is for scale -- at 200 nanometers, it is equal to .000007874 inches. Graphic by Susan Celestian; TEM courtesy of Eric Inyo (Death Valley National Park), Mark Schneegurt (Wichita State University), and Cyanosite www.cyanosite.bio.purdue.edu



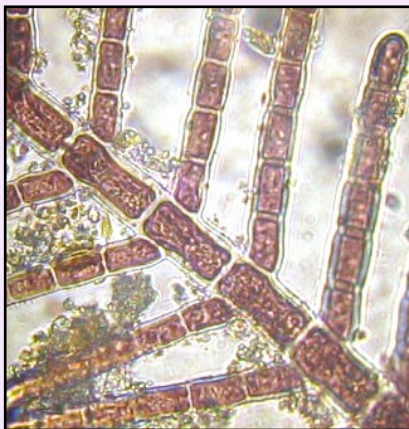
Spirulina sp. Credit: Isao Inouye (University of Tsukuba), Mark Schneegurt (Wichita State University), and Cyanosite



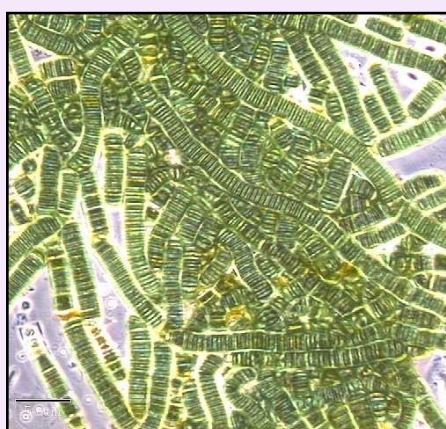
Scytonema cf. **Crustaceum** Credit: Dan Kramer (Cyano Biotech GmbH), Mark Schneegurt (Wichita State University), and Cyanosite



Cyanobacterium notatum Credit: Jeff Johansen (John Carroll University), Mark Schneegurt (Wichita State University), and Cyanosite



Nostocopsis sp. Credit: Jonathan Henwood (University of Malta), Mark Schneegurt (Wichita State University), and Cyanosite



Lyngbya sp Credit: Rolf Schauder (University of Frankfurt), Mark Schneegurt (Wichita State University), and Cyanosite



Anabaena sp. from a freshwater lake in Oregon X100. Credit: Cliff Ambers (University of Oregon), Mark Schneegurt (Wichita State University), and Cyanosite

FIGURE 6 CYANOBACTERIA Cyanobacteria defines a very broad group of species of photosynthetic bacteria. These images of modern cyanobacteria give us a close glimpse at some of the species. Images courtesy of Cyanosite www.cyanosite.bio.purdue.edu

...Prokaryotes continued from page 13

CYANOBACTERIA

Also called blue-green algae, cyanobacteria are bacteria capable of photosynthesis. As a group, they are very diverse; and today inhabit the thermal pools of Yellowstone, the hypersaline water of Shark Bay, in Western Australia, icy pools of Antarctica, high metal environments, highly alkaline soda lakes (pH 10-11!), the surface of rocks in arid desert areas, and more.

- ▶ Cyanobacteria cells are housed within a slimy coating. Communities of various species of cyanobacteria, plus other bacteria and microbes can create slimy mats, spheres, domes, knobs and similar structures. The slime traps particulate debris, and the metabolic activity of the organisms results in the precipitation of calcium carbonate. In this way layer upon layer is deposited to form **stromatolites and oncolites** (the latter being spherical structures), and these layered mats/domes are fairly common in the ancient rock record. See Figures 7-9.



FIGURE 7 STROMATOLITES This is a view of Hamelin Pool in Shark Bay, in Western Australia, at low tide. At that time, the mounds created by cyanobacteria are exposed. Not only is the salinity of the bay 70ppt (about twice normal marine salinity), but at low tide the communities are subject to high temperatures and dehydration. Definitely extremophiles! Photos by Stan & Sue Celestian

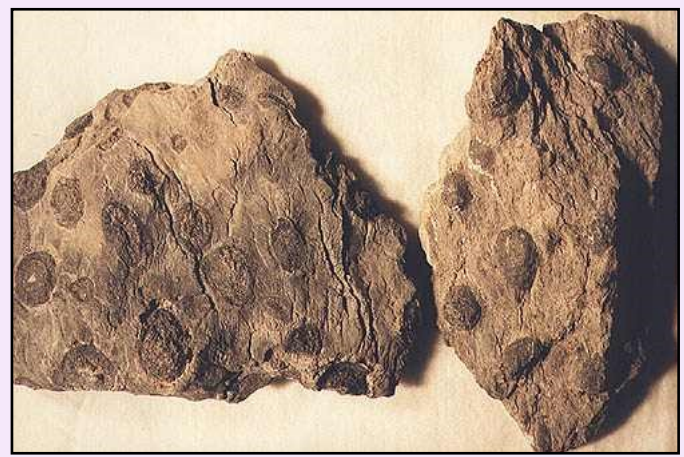
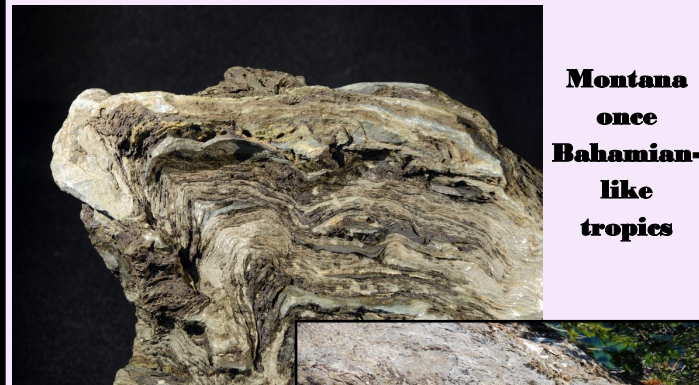


FIGURE 8 ONCOLITES This is a view of limestone from the Mule Spring Limestone (Lower Cambrian age), at Waucoba Spring in Death Valley National Park. The spherical structures visible, are oncolites, composed of *Girvanella* sp. cyanobacteria and algae. Photo courtesy of Eric Inyo (Death Valley National Park), Mark Schneegurt (Wichita State University), and Cyanosite www-cyanosite.bio.purdue.edu



Montana once Bahamian-like tropics

FIGURE 9 STROMATOLITES in GLACIER NP

The lower photo is bedrock at Logan Pass, and the upper is a specimen from that area -- both out of the PreCambrian Belt Series. Note the thin layers that resulted from regrowth over layers of calcite and silt. Photos by Sue & Stan Celestian

Go to <https://www.instagram.com/p/BqsDTH2AU16/> Use the arrows, flanking the photo, to see the photos of a thin section of the stromatolite in the first photo. The thin section reveals air bubbles preserved in the rock. These were bubbles of oxygen created by the cyanobacteria. The oxygen immediately reacted with iron to produce goethite (a hydrous iron oxide) that crystallized along the margins of the bubbles.

Go to <https://www.nps.gov/articles/park-paleo-fall-2018-stromatolites.htm> for great pix within Glacier NP

...Prokaryotes continued from page 14

- ▶ The earliest atmosphere was rich in carbon dioxide, carbon monoxide, methane, ammonia, and other compounds not conducive to life. Reef-forming cyanobacteria were largely responsible for the introduction of oxygen into the Archean (4-2.5 bya) and Proterozoic (2.5 bya - 543 mya) atmospheres. This made it possible for the evolution of life, as we know it.
- ▶ Proterozoic oil deposits have been credited to cyanobacteria activity.

GENERAL RESOURCES

Cyanosite <http://www-cyanosite.bio.purdue.edu/images/images.html>

JPL/NASA Photojournal <https://photojournal.jpl.nasa.gov/catalog/PIA00285>

JPL/Universities Space Research Association <https://www.lpi.usra.edu/lpi/meteorites/life.html>

National Center for Biotechnology Information/JPL <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4187170/>

nhmla_gems on Instagram <https://www.instagram.com/p/BTFYHt9ICqm/> and <https://www.instagram.com/p/BqsDTH2AU16/>

Reuters, Mar 1, 2017 Canadian bacteria-like fossils called evidence of oldest life <https://ca.reuters.com/article/topNews/idCAKBN16858B?sp=true>

Sciencemag.org, Mar 1, 2017 <https://science.sciencemag.org/content/273/5277/924>

University of California Museum of Paleontology <https://ucmp.berkeley.edu/bacteria/bacteriafr.html>

Wikipedia <https://en.wikipedia.org/wiki/Cyanobacteria>

...Fluorapatite continued from page 2

Fluorapatite is common as an accessory mineral in various igneous rocks; and in many metamorphic rocks. It can also be included as sand grains in a sedimentary rock, and is the predominant mineral in phosphorous ore deposits (phosphorites), such as the Phosphoria Formation of the Western United States. This deposit formed within a basin oceanward of the Early Permian continental margin, where the cold, nutrient-rich water upwelling from the continental slope resulted in increased growth of organisms, which (upon death) accumulated on the ocean floor. In the absence of significant carbonate or detrital sedimentation, to mask the phosphates (and related hydrocarbons), these accumulations have created important phosphorite deposits.

USES:

- ▶ Fluorapatite, and other phosphates in the apatite series, is an important component of the bones and teeth of vertebrates (including YOU), and inarticulate brachiopods. In the case of human teeth, fluoridated water and toothpaste cause hydroxylapatite to alter to the more resistant fluorapatite. Additionally, fluorapatite bacteriostatically decreases the bacteria that causes dental cavities.
- ▶ Fluorapatite is treated to produce phosphoric acid, and in the process it also released hydrogen fluoride, which is used to create hydrofluoric acid. The latter is an important industrial reagent.
- ▶ Synthetic fluorapatite was the basis for second generation halophosphors, used in fluorescent tubes. Doped with manganese-II and antimony-V, the emitted light can be made to offset the blue spectrum, with more pink.
- ▶ The thermal history of rock involved in mountain-building and sedimentary basins, the source of sediments, dating strata, and even dating paleo-wildfire can be determined by the observations of *fission tracks*¹ within fluorapatite crystals.
- ▶ It is a gemstone, although it is pretty soft.
- ▶ From it, white phosphorous can be produced, for use in weapons.

Fluorapatite is not a rockhound target in Arizona, but you might purchase a specimen or two at a rock show, especially since fabulous specimens come out of Mexico and South Dakota. It is collectible from Mt. Apatite in Maine and the pegmatites of South Dakota, where it is commonly blue or violet-colored (I've collected blue apatite in South Dakota). See Figures 1-8.

¹ Fission tracks are damage trails left by high-energy particles emitted when Uranium-238 (²³⁸U) decays. ²³⁸U is unstable, and decays through a number of steps -- at a known rate of decay -- ending as stable ²³⁵U. Uranium is common in both igneous and some sedimentary rocks, fission tracks are produced at a given rate, and both the number of tracks and the ratio of ²³⁵U to ²³⁸U can be used to date the rocks.

...Fluorapatite continued from page 15



FIGURE 1 FLUORAPATITE and calcite from the Cerro de Mercado Mine, Victoria de Durango, Cerro de los Remedios, Municipio de Durango, Mexico
Photo by Stan Celestian



FIGURE 2 FLUORAPATITE from the Yates Mine, Otter Lake, Pontiac RCM, Outaouais, Quebec, Canada. This apatite came out of an orange calcite, and is 3.4" tall x 2.2" wide.
Photo by Stan Celestian



FIGURE 3 FLUORAPATITE with galena & pyrite, from Panasqueira, Castelo Branco Dist., Beira Baixa, Portugal. These crystals are fairly pure, as

they are basically colorless. *Photo by Stan Celestian and courtesy of Natural History Museum of Los Angeles Co.*



FIGURE 4 FLUORAPATITE from the Sapo Mine, Feruginha, Conselheiro Pena, Doce Valley, Minas Gerais, Brazil.
Photo by Stan Celestian



FIGURE 5 FLUORAPATITE This celestial blue crystal is from Ipira, Bahia, Brazil.
Photo by Stan Celestian



FIGURE 6 FLUORAPATITE from Staffel, Nassau, Rhineland-Palatinate, Germany. *Photo by Stan Celestian and Courtesy of the Natural History Museum of Los Angeles County (NHMLA), NHMLA-8867*



FIGURE 7 DICHROIC FLUORAPATITE viewed through a photographic polarizing filter. This 1"-tall crystal changes color, depending on the directions of the polarized light upon it. It is caused by the selective absorption of different wavelengths of light.
Photo by Stan Celestian



FIGURE 6 FLUORAPATITE from Rio Grande do Norte, Brazil. *Photo by Stan Celestian and Courtesy of the Natural History Museum of Los Angeles County (NHMLA), NHMLA-62543*

Fluorapatite continued on page 18....

UPCOMING FIELD TRIPS & MEETINGS

WHEN: Tuesday, December 10, 2019

WHERE: TBD

WHAT: Claims Committee Meeting

MEET: 6:30

LEADER: Ed Winbourne

WHEN: Tuesday, December 17, 2019

WHERE: TBD

WHAT: Show Committee Meeting

MEET: 7:00

LEADER: Ed Winbourne

WHEN: Saturday, January 11, 2020

WHERE: Sheep's Bridge Area

WHAT: Agate - For pictures of what is possible, go to <http://www.sailorenergy.net/Agates/AgatesArizonaSheepBridge01PurpleSagenite.html>

MEET: TBA

LEADER: Howard Roose

WHEN: Saturday, January 18, 2020

WHERE: Quartzsite

WHAT: Pow Wow/Desert Gardens Shows

MEET: TBA

LEADER: Ed Winbourne

WHEN: 2020

WHERE: Little Horn Peak

WHAT: Geodes, Desert Roses, Apache Tears

MEET: TBA

LEADER: Ed Winbourne

WHEN: Sunday, February 2, 2020

WHERE: Burro Creek

WHAT: Jaspers & Agates

MEET: TBA

LEADER: Stan Celestian

WHEN: Saturday, February 15, 2020

WHERE: Contact Mine

WHAT: Amethyst

MEET: TBA

LEADER: Ed Winbourne

WHEN: Saturday, March 7, 2020

WHERE: Bullard Mine

WHAT: Copper Minerals

MEET: TBA

LEADER: Ed Winbourne

WHEN: Saturday, March 28, 2020

WHERE: Prism & Blue Cube Mines

WHAT: Fluorite

MEET: TBA

LEADER: Dave Haneline?

WHEN: Saturday, April 4?, 2020

WHERE: Planet Mine

WHAT: Specular Hematite, Copper Minerals

MEET: TBA

LEADER: Stan Celestian

WHEN: Saturday-Sunday, April 18-19, 2020

WHERE: Nuevo Corrales/Devil's Gate & Ruby

WHAT: Geodes & Ghost Town

MEET: TBA

LEADER: TBA

OTHER: Possible overnight trip

WHEN: Saturday-Sunday, May 2-3, 2020

WHERE: Topaz Mountain, Utah

WHAT: Topaz

MEET: TBA

LEADER: Stan Celestian

DATES SUBJECT TO CHANGE

Stan and the field trip committee will be actively looking for productive spots for field trips. If you have any suggestions, you are encouraged to contact him at stancelastian@gmail.com

...Fluorapatite continued from page 16

RESOURCES:

<https://timescavengers.blog/introductory-material/generalscience/common-minerals/>

Encyclopedia Britannica <https://www.britannica.com/science/apatite#ref61704>

Mindat <https://www.mindat.org/min-1572.html>

Natural History Museum of Los Angeles County (NHMLA)

Stan Celestian <https://www.flickr.com/photos/usageology/albums> Search for fluorapatite

Webmineral [http://www.webmineral.com/data/Apatite-\(CaF\).shtml#.Xf60C2RKq2w](http://www.webmineral.com/data/Apatite-(CaF).shtml#.Xf60C2RKq2w)

Wikipedia <https://en.wikipedia.org/wiki/fluorapatite>
https://en.wikipedia.org/wiki/Phosphoria_Formation

NEEDED: QUALITY MINERAL (or OTHER) DONATIONS WITH LABELS -- for monthly raffle prizes; and for raffle, door prizes, and sales tables at the annual show. If you have specimens to donate, please see Robin Shannon. The Daisy Mountain Rock and Mineral Club is a 501(c)(3) non-profit organization, and will gratefully acknowledge your donation with a Tax Deduction Letter. Thank You!

NOTE FROM THE EDITORS

Have a geological interest? Been somewhere interesting? Have pictures from a club trip? Collected some great material? Send us pictures -- or write a short story (pictures would be great).

Deadline for the newsletter is the 22nd of the month.

Mail or Email submissions to:
Susan Celestian
6415 N 183rd Av
Waddell, AZ 85355
azrocklady@gmail.com

ROCKY MOUNTAIN FEDERATION SUMMER MULTI-FEDERATION FIELD TRIPS JUNE 13-16, 2020

The RMF Show & Convention is being held in Big Piney, Wyoming June 19-21. Prior to the event, there will be collecting trips available. Planned already is Blue Forest for petrified wood (<http://blueforestpetrifiedwood.com/about-us/>) and Green River Formation for fish fossils (\$fee).

Others are in the works.

Interested in the field trips? Contact Doug True
dtruefossils12@yahoo.com

Interested in the Show? Contact Jim Gray
jimgray@wyoming.com

I'm sure more information will be forthcoming. But if you think you'd like to attend, you might want to start making campground or motel reservations.

The closest facilities will fill up fast -- and there probably aren't any motels closer than 20-25 miles away, and you'll want to get a spot as close as you can.

WIRE-WRAPPING CLASS

4:30-6:30 pm

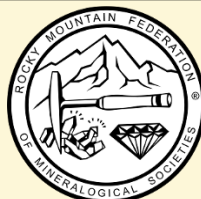
Prior to the meeting

Bring: cab or stone, about quarter-sized or larger; 26 and 18 gauge copper-based wire; round nose pliers and flush wire cutter, beads (optional), little clamps, masking tape, E6000 jewelry glue.

Free, but donations are appreciated.

Questions? Contact Jennifer at
Jennifer@eliteshuttersandblinds.com

This is the project Jennifer has planned for January!



Visit <http://rmfms.org/> for news about conventions, events, and associated clubs. If you are travelling, you might want to contact a club local to your destination. Maybe they have a field trip you could join, while in town.

UPCOMING AZ MINERAL SHOWS

January-February - Quartzsite, AZ For a complete list of shows, go to <https://www.desertusa.com/cities/az/quartzsite.html#anchor832166>

Desert Garden January 1-February 28
 Pow Wow January 15-17
 Tyson Wells January 3-12

January 3-5 - Mesa, AZ Flagg Mineral Foundation; Mesa Community College, 1833 W Southern Av; Fri-Sun 9-5; Admission: free. *See poster on page 20.*

January 10-12 - Globe, AZ Gila County Gem & Mineral Society; Gila County Fairgrounds, 900 Fairgrounds Rd.; Fri-Sat 9-5, Sun 10-4; Admission: Adults, single \$3; Adults, couples \$5; children & students free.

January 20-February 17 Go to <http://www.tucsongemshows.net/coming.html> for a complete list of Tucson gem, mineral & fossils shows.

January 29-February 16 - Marana, AZ Smokey's Miner's Co-op Rock Show, Mike Jacobs Sports Park, 6901 N Casa Grande Hwy; 9-sunset daily.

February 13-16 - Tucson, AZ Tucson Gem & Mineral Society; Tucson Convention Center, 26 S Church Av; Thurs-Sat 10-6, Sun 10-5; Admission: Adult \$13, 14 and under free w/paying adult. *See poster on page 21 -- discount coupon.*

March 21-22 - Anthem, AZ Daisy Mountain Rock & Mineral Club; Anthem School, 40100 N Freedom Way; Sat 9-5, Sun 9:30-4; Admission: adults \$3, seniors & youths \$2, children under 12 free. *See poster on page 22*

May 2-3 - Kingman, AZ Mohave County Gemstoners; Kingman Academy of Learning HS, 3420 N Burbank; Sat 9-5; Admission: free.

July 11-12 - Lakeside, AZ White Mountain Gem & Mineral Club; NEW VENUE Country Court Event Hall, 3369 W White Mountain Blvd.; Sat 9-6, Sun 10-4;

July 31-August 2 - Prescott Valley, AZ Prescott Gem & Mineral Club; Findley Toyota Center, 3201 N Main St; Fri-Sat 9-5, Sun 9-4; Admission: adults \$5, seniors, vets, students \$4, children under 12 free.

If you are travelling, a good source of shows AND clubs is <http://the-vug.com/educate-and-inform/mineral-shows/> or <http://www.rockngem.com/ShowDatesFiles/ShowDatesDisplayAll.php?ShowState=AZ> For out-of-the-country shows: <http://>

FACEBOOK

Visit and join the club page periodically. See what is happening, and boost our visibility on the web. Go to: [The Daisy Mountain Rock and Mineral Club](#). It is set up so you can post photos of outings or related items.

AWARD-WINNING WEBSITE

<http://www.dmrmc.com/>

If you have comments, contact Nancy Gallagher.

GROUPWORKS

As a DMRMC club member, your name should be available at <https://app.groupworks.com/#/login>, and you should receive an email linking you to registration. Create an account and receive reminders about club events, meetings, and important club information. You may post pictures and information -- all seen only by club members.

Upcoming Meeting Programs

Thanks to Ed Winbourne for scheduling the following speakers:

- January - Jay Yett (club member)
- March - Patti Polk (Agate)
- April - Wayne Helfand AT the Rare Earth Gallery in Cave Creek

Officers, Chairpersons, & Trustees

- President:** Ed Winbourne.....ewinbourne@gmail.com
- Vice President:** Bill Freese..... bfreese77@cox.net
- Secretary:** Rebecca Slosarik .. rslosarik1@gmail.com
- Treasurer:** Cynthia Buckner....Cbuckrun1@q.com
- Publicity:** Jessie Redmond...
- Membership:** Tiffany Poetsch tnpoetsch@gmail.com
- Editors:** Susan & Stan Celestian.....azrocklady@gmail.com
- Field Trip:** Bill Freese ... bfreese77@cox.net
- Show Chair:** Ed Winbourne

- Trustees:**
- | | |
|-------------|-----------|
| Cynthia V | Claudia M |
| Susan C | Tiffany P |
| Bob E | Jim R |
| Jennifer G | Witt R |
| Don R | Howard R |
| Jessica C. | Rebecca S |
| Johnaton M. | |

Meetings are held the **1st Tuesday of the month** at the **Anthem Civic Building**, 3701 W Anthem Way, Anthem, AZ 85086. Business meeting at 6:30 pm. We **do not meet in July or August.**

DMRMCLUB@GMAIL.COM

Membership Dues:
First year \$30, then \$20.00 Adults per Person
First year \$45, then \$25.00 Family (2 people)

Meeting Dates for 2020

Jan 7, Feb 4, Mar 3, Apr 7, May 5, June 2, Sept 1, Oct 6, Nov 3, Dec 1

48TH ANNUAL FLAGG GEM & MINERAL SHOW



Forsterite var. Peridot - Peridot Mesa, San Carlos, San Carlos Indian Reservation, Gila Co., Arizona, USA
CUT GEM: Don Boushelle - PHOTO: Don Boushelle | ROUGH: Bill Yedowitz - PHOTO: Bill Yedowitz



Obsidian var. Apache Tears - Picketpost Mountain area, Superior, Superior Mining District, Pinal Co., Arizona, USA | Don Boushelle - PHOTO: Don Boushelle



Volcanic Bomb - San Franciscoan volcanic field, Coconino Co., Arizona, USA
Bill Yedowitz - PHOTO: Bill Yedowitz



Natrolite - Horseshoe Dam area, Maricopa Co., Arizona, USA
Bill Yedowitz - PHOTO: Bill Yedowitz

ARIZONA VOLCANICS

THE TAILGATE SHOW TRADITION CONTINUES!
WWW.FLAGGSHOW.INFO

JANUARY 3RD / 4TH / 5TH, 2020
MESA COMMUNITY COLLEGE | 9AM - 5PM
NE CORNER OF US 60 & DOBSON ROAD



FREE ADMISSION FREE PARKING FREE SAMPLES FOR KIDS

Sunset Crater, San Franciscoan volcanic field, Coconino Co., Arizona, USA | PHOTO: Dawn Boushelle

THE 66TH ANNUAL TUCSON GEM AND MINERAL SHOW[®]

FEBRUARY 13-16, 2020

Tucson Convention Center
260 South Church Avenue • Tucson, Arizona 85701

Thursday: 10:00 a.m. - 6:00 p.m.

Friday: 10:00 a.m. - 6:00 p.m.

Saturday: 10:00 a.m. - 6:00 p.m.

Sunday: 10:00 a.m. - 5:00 p.m.

Tickets go on sale Thursday, January 17, 2020 at all TCC Ticket outlets or call the TCC Box Office at 520-791-4101, option 1 for more information.

Don't forget, you can buy your ticket at the door!

Admission is \$13.00

(\$12.00 plus \$1.00 facility tax) per adult.

Children 14 and under FREE with a paying adult

Friday, February 14, 2020 is Military (active & retired) and Senior Citizens Day (62 and older), receive \$2.00 off the regularly priced ticket (cannot be used with any other discount).

2-day tickets will be available for a cost of \$22.00 (cannot be used with any other discount).

Clip the coupon for \$2.00 OFF on one adult General Admission ticket (cannot be used with any other discount).

FEATURING:

- Honoring 50 years of Mineralogical Record
- Retail Dealers | Exhibits
- Junior Education Area
- FREE Lectures | Symposiums
- "Micro- Mineral" Room
- Hourly Drawings at the Giveaway Booth
- Saturday Night Banquet & Awards
- Silent/Live Auctions

For more information: visit: www.tgms.org



**TUCSON
GEM & MINERAL
SOCIETY**

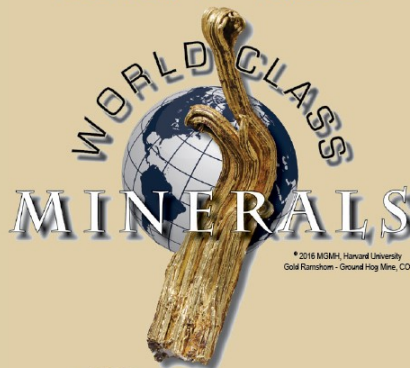


Scan code for information on our Tucson Gem and Mineral Show[®]



TUCSON GEM AND MINERAL SHOW[®]

Tucson Convention Center
February 13 - 16, 2020



\$200 OFF
ONE ADULT GENERAL ADMISSION

www.tgms.org

CHILDREN 14 AND UNDER FREE WITH A PAYING ADULT

This coupon cannot be used with any other discount

2020 ANTHEM GEM AND MINERAL SHOW

SATURDAY MARCH 21 9 AM - 5 pm
SUNDAY MARCH 22 10 PM - 4 PM

ANTHEM SCHOOL
41020 N. FREEDOM WAY, ANTHEM

BRING THE KIDS !

KIDS CORNER: LOTS TO DO
EGG CARTONS, GAMES, PRIZES, HANDS-ON

VENDORS

JEWELRY, GEMS, MINERALS, FOSSILS, BEADS, WIRE WRAPPING, GEODES AND MORE

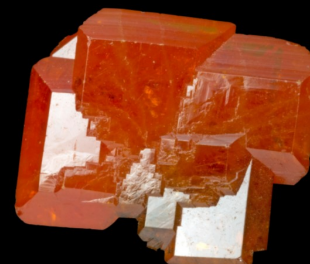
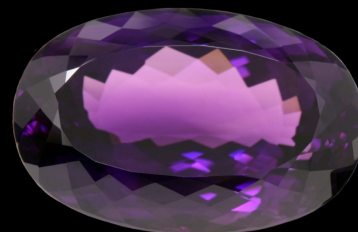
RAFFLES & DOOR PRIZES

SPECIAL ULTRA VIOLET DISPLAY
EXPERTS WILL IDENTIFY YOUR ROCKS

ADULTS \$3, SENIORS AND STUDENTS \$2
KIDS 12 AND UNDER ARE FREE

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FOR MORE INFORMATION CONTACT:
ED WINBOURNE (978-460-1528)
EMAIL: ewinbourne@gmail.com



PHOTOS BY STAN CELESTIAN