

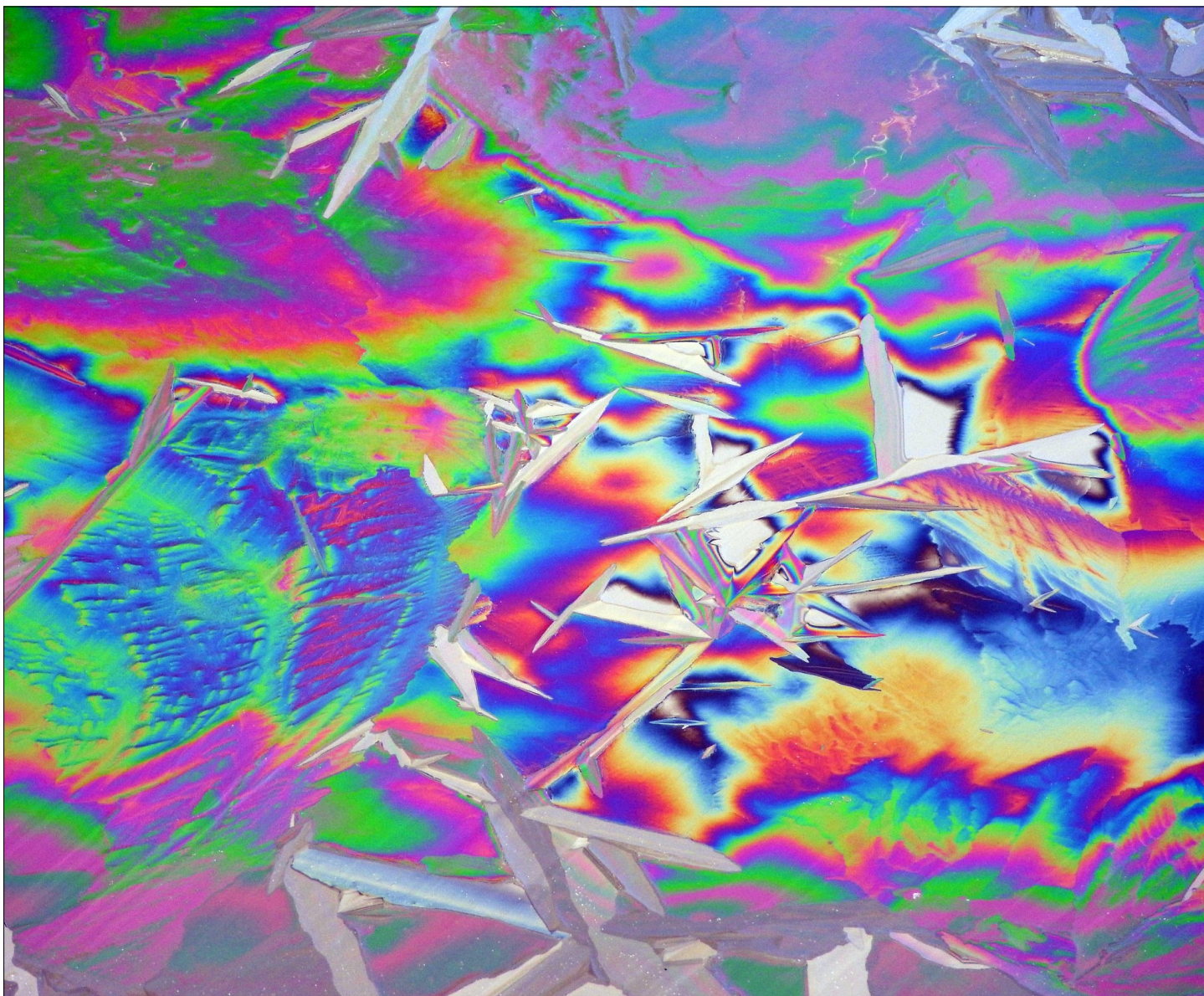
DAISY MOUNTAIN ROCKCHIPS

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 5, ISSUE 4

APRIL 2020

MEETINGS AND FIELD TRIPS CANCELLED UNTIL FURTHER NOTICE DUE TO COVID-19 CONCERNS



COVER PHOTO: This mosaic of ice crystals formed on the surface of a quiet stream near Ruby, Arizona. This is a view using a polarizing lens, which only lets in light vibrating in a single plane. Light reflects off the ice/water interface on the bottom of the ice crystals, gets polarized in the process, and bounces back through the ice crystals. When this newly polarized light passes back up through the ice crystals, portions of the returning light pass straight through the crystal, and others are refracted by the ice atomic structure, toward its optical axis -- and those refracted light rays take a longer route through the crystals. These two light waves headed for our eyes, are out of phase and interfere with each other. When these two polarized waves are forced through the polarizing filter of a camera or sunglasses, we see a rainbow of color, because of the interference. The more pastel colors are where the ice is thickest. The black areas are where the ice is super thin, in which case there is almost no difference in the paths the light rays take through the crystal. They are negligibly out of phase, so they are fully blocked out by the polarizing filter. So the next time you see thin ice on a pond or puddle, don your polarizing sunglasses!!

Photo by Susan Celestian

FOSSILS: PART VI

Kingdom: Animalia

Phylum: Bryozoa

By Susan Celestian

Bryozoa (or Ectoprocta) are commonly known as "moss animals", referring to the moss-like appearance of encrusting colonies, when feeding structures are extruded. The individuals are very small, and the colonies live a lifestyle like that of the Cnidaria (corals, discussed in the March 2020 DMRMC newsletter). In fact, they can look very similar to corals; however, the "holes" of a bryozoan colony are much smaller than those of corals.

Bryozoan characteristics are as follows:

- ▶ Their geologic record ranges from Early Ordovician to Recent -- the last of the major phyla to appear in the fossil record.
- ▶ There are 5000 extant species, and many, many more fossil ones.
- ▶ They are almost exclusively colonial (only one extant species is solitary).
- ▶ Individuals (*zooids*) are very, very small (about .5 mm or less long). There can be more than 2 million zooids in a colony that is a foot or so across!
- ▶ The body plan is rather complex, with epidermis, muscles, digestive system, and nervous system.
- ▶ They are aquatic; most modern species live in shallow, tropical, marine environments; although they are known in polar, deep water, brackish, and freshwater environments.
- ▶ They are filter feeders (they extend a structure of ciliated tentacles, called a *lophophore*, into the water to extract food. They feed on plankton and bacteria.
- ▶ Within each colony, there are many zooids that perform specialized tasks: feeding, reproduction, defense, cleaning, colony strengthening/support.
- ▶ Bryozoans reproduce both sexually and asexually, the latter by budding within the confines of a colony. Sexual reproduction results in larvae, that may be dispersed by currents and waves.

Bryozoa continued on page 4....



ICE

By Susan Celestian

Ice might be an unusual material to be considered a mineral -- especially since it will melt if you put it on your knickknack shelf. However, it has all the necessary characteristics to be considered a mineral: definite chemical composition, crystalline structure, solid, naturally occurring.

Chemical Formula - H₂O (Hydrogen Oxide)

Crystal System - Hexagonal (3 of equal length, in one plane, and oriented 120° from each other; a fourth perpendicular to the plane of those 3).

Growth Forms/Habits - Massive, crystalline (snow, frost, firn, hail, glaciers ...)

Hardness - 1.5

Color - Clear, white, blue

Luster - Vitreous

Streak - White

Specific Gravity - 0.9167

Fracture - Conchoidal

Other - Liquid at temperatures above 32°F

Ice is solid water. Interestingly, ice (the solid) is LESS dense than water (the liquid). Freezing results in a molecular packing that is less dense than in liquid water -- and a resulting expansion of about 9%. That property makes ice a very effective agent of weathering. Water penetrates cracks in rock and inter-crystal spaces. Upon freezing and expanding, it exerts great force. This process of freeze-thaw causes rock to break-up into smaller blocks and to disintegrate, for rocks to be heaved up from below to the surface, for roads to deform, and for sidewalks to buckle and crack.

Ice is also responsible for some beautiful meteorological phenomena.

Ice continued on page 7....

INSIDE THIS ISSUE

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March 3, 2020
Board of Trustees Meeting Minutes
March 3, 2020
General Meeting Minutes

No meetings until further notice.

FIELD TRIP REPORT

No field trips until further notice.

In lieu of rocks, I'm posting photos of my some of my favorite wildflowers of the season.



Hedgehog Cactus (*Echinocereus engelmannii*), Burro Creek, Mohave County, Arizona Photo by Susan Celestian

Live Forever (*Dudleya saxosa* ssp. *colliomiae*), Seven Springs Road, Maricopa County, Arizona Photo by Susan Celestian



Desert Mariposa Lily (*Calochortus Kennedyi*), Seven Springs Road, Maricopa County, Arizona Photo by Susan Celestian



California Poppy (*Eschscholzia californica*), Burro Creek, Mohave County, Arizona Photo by Susan Celestian



#61 in the Burro Creek Beetle Battle on Mohave Woodyaster (*Xylorhiza tortifolia*) Photo by Stan Celestian

...Bryozoa continued from page 2

- ▶ Modern growth forms: bush-like, fan-shaped, branching, leaf-like sheets, encrusting (most common), gelatinous masses. While most have calcium carbonate exoskeletons, some are unmineralized or chitinous.

Fossil growth forms: encrusting, branching, fenestrate, domal, massive, and palmate. Of course, the fossil record is biased toward those species that secreted rigid exoskeletons of calcium carbonate -- and were therefore able to better withstand the rigors of becoming fossilized.

- ▶ The primary predators of modern bryozoans are nudibranchs (sea slugs), but include fish, star fish, sea urchins, mites, sea spiders, crustaceans, and snails.
- ▶ 125 modern species attach to ship bottoms, fouling speed and maneuverability; some freshwater species create jelly-like colonies, large enough to clog water intakes.
- ▶ Bryostatin, is a bryozoan-derived drug, currently being tested to combat cancer.

Images of bryozoans follow, in Figures 1-11.

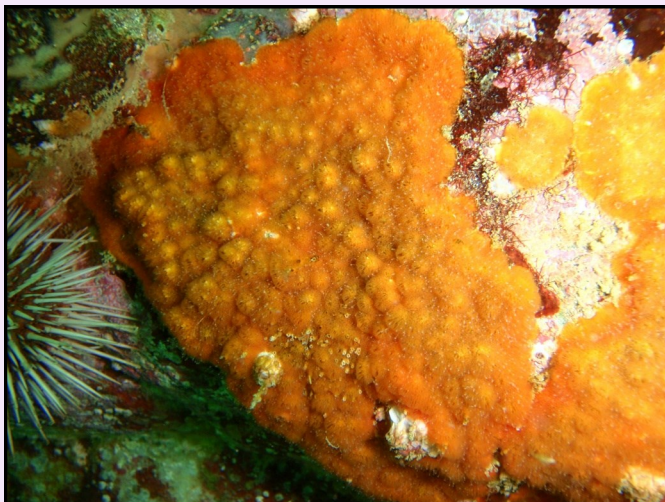


FIGURE 1 MODERN ENCRUSTING BRYOZOAN

This modern bryozoan occurs in Lorry Bay, south of Gordon's Bay and east of False Bay, Cape Town, South Africa. If you enlarge the page, you will see the "mossiness" as individuals have extruded their feeding structures. Photo courtesy of Peter Southwood, Creative Commons Attribution-Share Alike 3.0 Unported license. https://commons.wikimedia.org/wiki/File:Encrusting_bryozoan_at_Lorry_Bay_PB011924.JPG

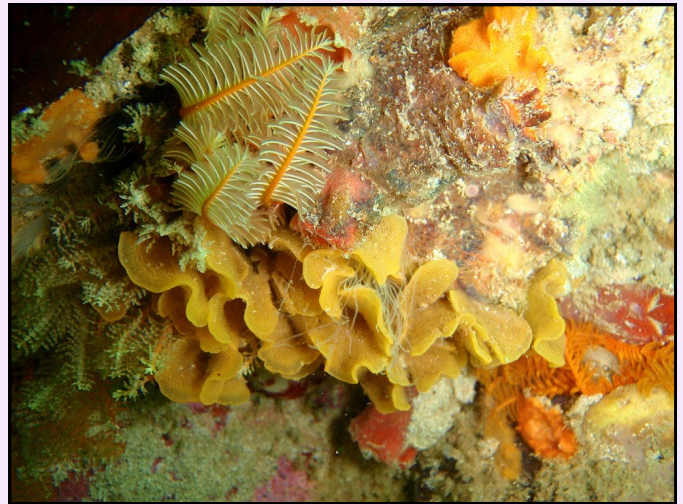


FIGURE 2 MODERN SHEET-LIKE BRYOZOANS

Another modern bryozoan from Lorry Bay, south of Gordon's Bay and east of False Bay, Cape Town, South Africa. Photo courtesy of Peter Southwood, Creative Commons Attribution-Share Alike 3.0 Unported license. https://upload.wikimedia.org/wikipedia/commons/9/95/Bryozoans_at_Lorry_Bay_PB012028.JPG



FIGURE 3 MODERN LACY BRYOZOAN

This is a deepwater lacy (aka fenestrate) bryozoan. The large openings are "windows" or fenestra in the fan-shaped colony. The zooids occupy the white areas. Photo courtesy of Islands in the Sea 2002, NOAA/OER.

FIGURE 4 MODERN LACY BRYOZOAN

A full colony of lacy bryozoan (*Triphyllozoon moniliferum*) from Shark Point, Ciovelly Bay, Sydney, New South Wales, Australia. Photo courtesy of John Turnbull, Creative Commons Attribution-Share Alike 2.0 Generic license. https://commons.wikimedia.org/wiki/File:Lace_bryozoan.jpg



...Bryozoans continued from page 4



FIGURE 5 LACY BRYOZOAN This specimen is from the Naco Formation, a Pennsylvanian-aged limestone in Arizona.
Photo by Stan Celestian

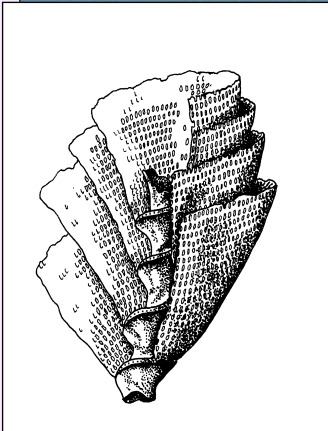
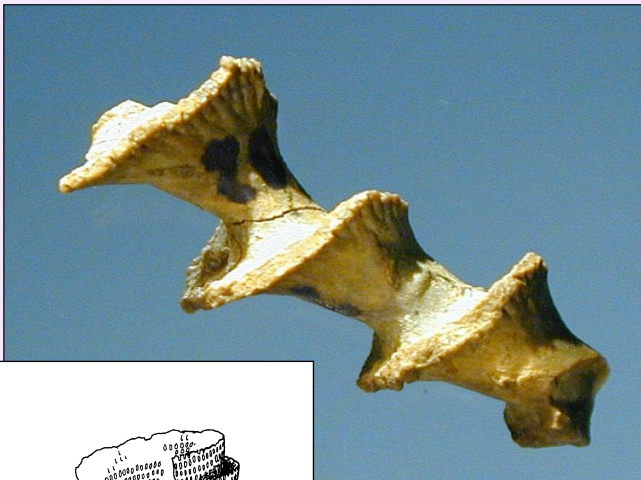


FIGURE 6 LACY BRYOZOAN
Archimedes was a lacy bryozoan, with a central supporting column. The column is solid and therefore most easily preserved as a fossil. This a Mississippian-age fossil from southern Indiana. *Photo by Stan Celestian and illustration by Susan Celestian*



FIGURE 7 BRANCHING BRYOZOAN Enlarge your page view, and see how tiny the openings are -- like pinpricks. Bryozoan individuals are very tiny. This branching form is great for keeping the colony above the substrate, where possible burial is possible. The upper fossil is from Indiana, the lower from Arizona's Naco Formation.
Photos by Stan Celestian



FIGURE 8 MASSIVE BRYOZOAN These bryozoan colonies exhibit the massive form. Notice the bumps on the top photo. These are called *monticules*. It is thought that they are specialized zooids, charged with generating currents to carry waste away from the colony and feeding zooids.
Photos by Stan Celestian

...Brachiopods continued from page 5

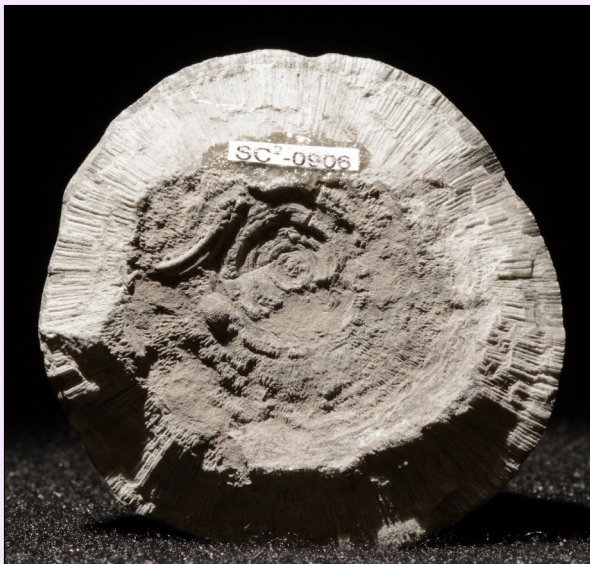
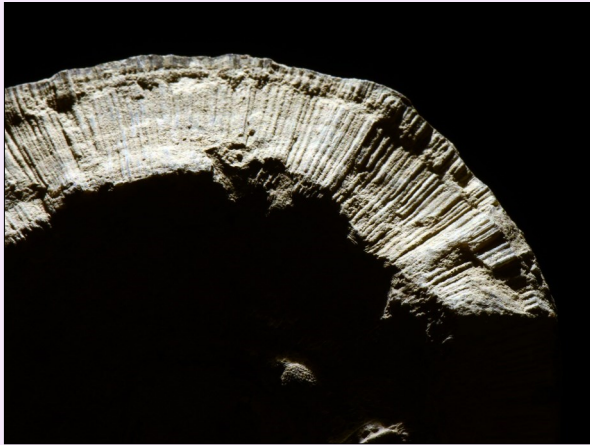


FIGURE 9 MASSIVE BRYOZOAN This is nearly complete bryozoan colony from Henderson Harbor, New York. The top image is a view of the upper surface, and the bottom image is a view of the bottom surface -- about 2" across. Notice the obvious zooecia ("houses") in the side view.

Photos by Stan Celestian

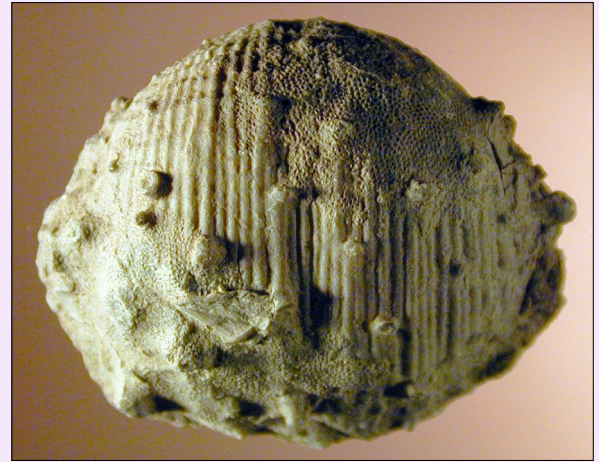


FIGURE 10 ENCRUSTING BRYOZOAN

Patches of bryozoan are visible on this brachiopod, from the Pennsylvanian-age Naco Formation of Arizona. Encrustation is a good survival strategy -- it puts the colony above the substrate, and adds physical support against the ravages of currents and waves. It might even make it more difficult for predators to partake.

Photo by Stan Celestian



FIGURE 11 ENCRUSTING BRYOZOAN

on a conularid (we'll discuss these in a later issue), from the Pennsylvanian-age Naco Formation of near Kohls Ranch, Gila County, Arizona. *Photo by Stan Celestian*

GENERAL RESOURCES FOR BRYOZOA

- <https://en.wikipedia.org/wiki/Bryozoa>
- <https://ucmp.berkeley.edu/bryozoa/bryozoamm.html>
- <https://ucmp.berkeley.edu/bryozoa/bryozoa.html>
- <https://www.whoi.science/B/people/kamaral/bryozoans.html>
- <https://spo.nmfs.noaa.gov/sites/default/files/tr99opt.pdf>

...Ice continued from page 2

Images of ice (and its power) follow in Figures A-K.

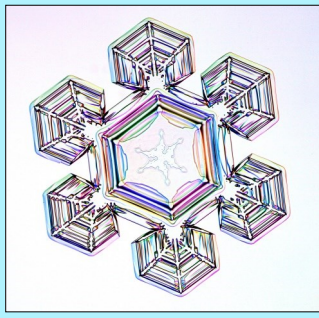
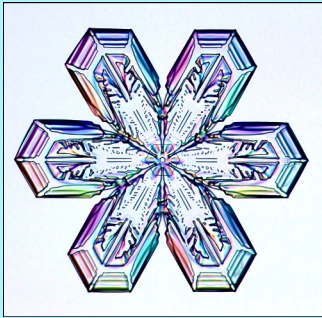


FIGURE A SNOWFLAKES

Single snowflakes starkly exhibit the hexagonal symmetry. Many, many forms reflect the atomic structure!

Images used with permission by Dr. Kenneth Libbrecht; www.snowcrystals.com

Any reproduction of this article that includes these images will require separate permission from Dr. Libbrecht.

Go to that website for some great views of growing snowflakes, more images, and more science of snowflake growth.

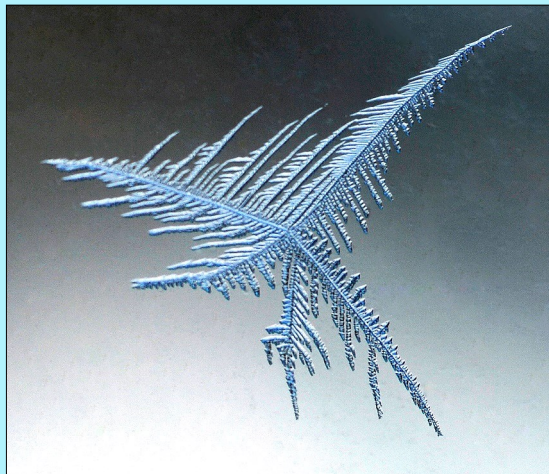


FIGURE B FROST

We don't see this much (or ever) in the Phoenix area, but these ice crystals, aka frost, formed out of water vapor, and onto a window in Indiana were quite decorative. Photos by Stan Celestian



FIGURE C HOAR FROST Hoar frost, named for an Old English word meaning aged, makes vegetation look 'hairy' (like an old man :-). This occurrence was near Ruby, Arizona. Photo by Stan Celestian

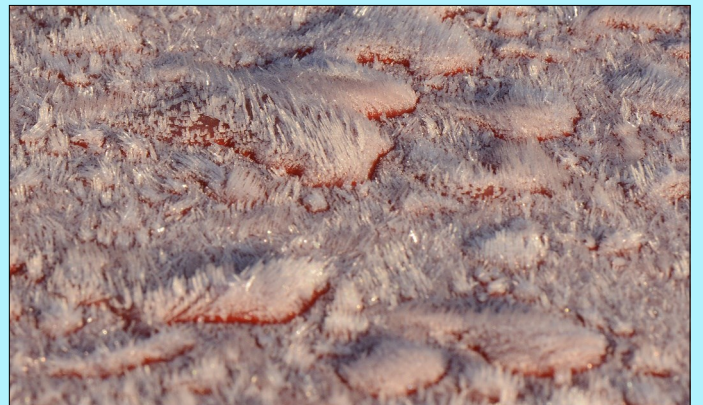


FIGURE D HOAR FROST These clumps of hoar frost began as water droplets on the hood of our car. Then they froze, and water vapor in the air caused the hoar to grow, making fuzzy 'puddles'. Photo by Stan Celestian



FIGURE E ICY CLOUDS This anvil head cloud just looks icy. Rapidly rising wet air freezes, and the streaky ice trails form. Photo by Stan Celestian

...Ice continued from page 7



FIGURE F HALOS & SUN DOGS As the Sun shines through ice crystals of cirrostratus clouds in the air, the flat, plate-like ice crystals (<20.5 micrometers) refract light, forming these halos and spotty rainbows, at about 22° from the Sun. **See Figure G.** Light is bent (refracted) twice as it passes through the ice crystals, and the resulting angle is 22°, thus the 22° halo. Other halos form in different positions, as the shape and orientation of the ice crystals change.

Photos by Stan and Susan Celestian

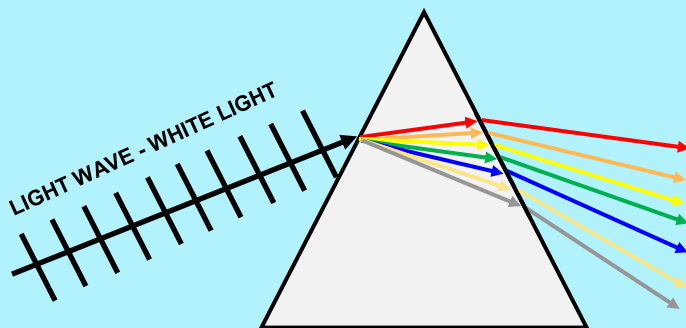


FIGURE G Refraction and Dispersion of Light in a Prism As light waves slow upon entering a denser or less dense medium, the light wave bends or refracts. Each component wavelength (color) refracts at a different angle, thereby splitting out into a rainbow of colors. This is the same process taking place in icy clouds. *Diagram by Susan Celestian*



FIGURE H SUN PILLAR As the Sun shines through ice crystals of cirrostratus clouds in the air, a pillar of light may form. The ice crystals are flat, hexagonal plates oriented horizontally, so that they act like tiny mirrors. *Photo by Stan Celestian*



FIGURE H FALLING ICE CRYSTALS form columns under the clouds out of which they are forming. Once they descend far enough, warming causes ice to melt into water.

Photo by Stan Celestian

...Ice continued from page 8

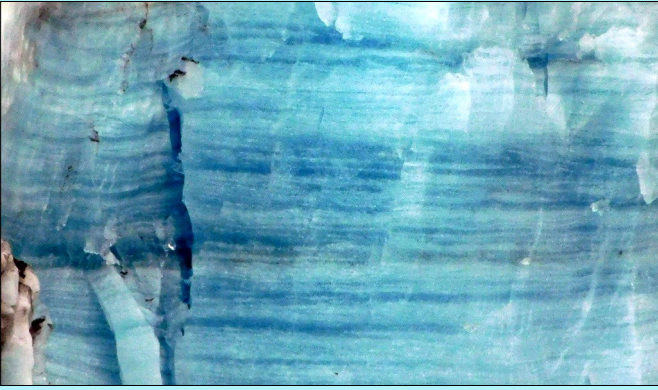


FIGURE I GLACIAL ICE Glacial ice is very dense and bubble-free. Extreme compression squeezes out air bubbles (which make regular ice appear white) and causes ice crystal size to increase. The ice appears blue because it absorbs most other wavelengths, and only blue escapes to our eyes. The thicker/denser the ice, the bluer the color. Photo by Susan Celestian at Lapaugh Glacier in Glacier Bay National Park in Alaska.

FIGURE J FROST/ICE HEAVING In wet ground, freezing water expands and pushes soil and rock particles up. When the ice melts, small particles fall/flow into the void. In this case, the soil looks disturbed, as a result of the heaving during a night freezing, followed by a morning thaw.

Photo by Stan Celestian



FIGURE K PATTERNED GROUND In glacial and peri-glacial areas (in this case Rocky Mountain NP), the process of ice heaving can produce ground with a stony polygonal pattern. Rocks are moved toward the surface, while finer material falls downward. The rocky surface does not hold water as well as the finer material below. Repeated freeze/thaw of that wet ground produces lateral forces that push the rocks into stripes and polygons. The power of ice! Photo by Susan Celestian

UPCOMING FIELD TRIPS & MEETINGS

WHEN: Friday-Sunday, May 8-11, 2020

WHERE: Topaz Mountain, Utah

WHAT: Topaz Mountain, Bixbyite

TBA

LEADER: Stan Celestian

DATES SUBJECT TO CHANGE

Bill 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 bfreese77@cox.net

CANCELLED



Western Diamondback Rattlesnake (*Crotalus atrox*), on Burro Creek Crossing Road.

Keep an eye out and stay safe! Photos by Susan Celestian



Words of Wisdom

from our very own

Bob Evans



I can remember waking up without making sound effects. Good days!

FACEBOOK



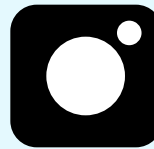
Visit and join the club page periodically. See what is happening, and boost our visibility on the web. Go to: [The Daisy Mountain Rock and Mineral Club](https://www.facebook.com/TheDaisyMountainRockandMineralClub/). It is set up so you can post photos of outings or related items. Share with friends!

AWARD-WINNING WEBSITE

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

If you have comments, contact Nancy Gallagher.

INSTAGRAM



Follow the club on Instagram. Go to <https://www.instagram.com/daisymountainrockclub/> and follow today. Share with friends!

Officers, Chairpersons, & Trustees

President: Ed Winbourne.....ewinbourne@gmail.com

Vice President: Bill Freese..... bfreese77@cox.net

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Membership: Tiffany Poetsch tnpoetsch@gmail.com

Editors: Susan & Stan Celestian.....
azrocklady@gmail.com

Field Trip: Bill Freese ... bfreese77@cox.net

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

DMRMCLUB@GMAIL.COM

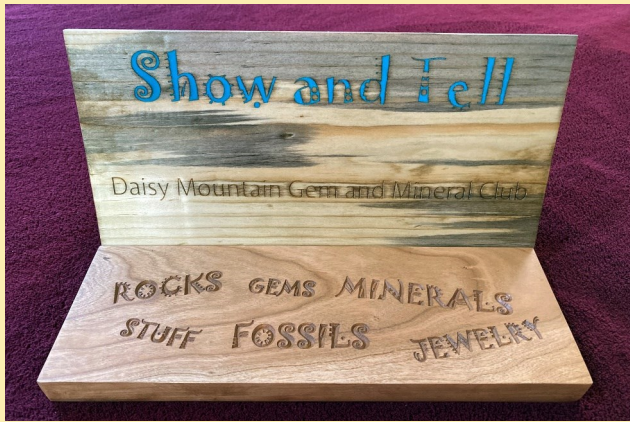
Membership Dues:

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

MEETINGS CANCELLED UNTIL FURTHER NOTICE DUE TO COVID-19 RESTRICTIONS



Share!

Part of the fun of being in a rock club is sharing with members. Have you found a cool rock -- recently or in the past? Have you made something out of a rock or mineral?

Bring an item in to the monthly and tell its story.

Everyone who brings in something for Show & Tell will get an extra ticket for the attendance/nametag raffle.

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

For more information/registration go to:

https://mcusercontent.com/a2ce2966ec6188e041bd58c21/files/ab24fc42-f110-4286-b2c5-b5af797e2fca/2020_RMFM_S_Convention_in_Wyoming_Packet_REV_1.pdf. 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 -- 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.

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

WIRE-WRAPPING CLASS

4:30-6:30 pm

Prior to the meeting

Bring: cab or stone, about quarter-sized or larger; 26 and 18 or 20 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

FOR APRIL

**SEE YOU WHEN MEETINGS RESUME!
STAY WELL!!!!**

BRING PAPER & A PEN TOO!



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

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

May 29-31 - Flagstaff, AZ Coconino Lapidary Club; Fort Tuthill County Park Fairgrounds - Commercial Building, 2446 Fort Tuthill Loop; Fri-Sat 9-5, Sun 9-4; Admission: free.

June 19-21 - Big Piney, WY Wyoming State Mineral & Gem Society PLUS Rocky Mt Federation Convention; Sublette County Fairgrounds, 10937 Hwy 189; Fri-Sat 9-5, Sun 9-4; Admission: adults \$2, children free. *See poster on page 26.*

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; Admission: adults \$2, children under 16 free.

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://www.mindat.org/shows.php?current=1>

THE CORONAVIRUS (COVID-19), THAT HAS SPREAD GLOBALLY, IS PROMPTING WARNINGS TO SOCIALLY DISTANCE OURSELVES FROM EACH OTHER.

AS A RESULT, IN THE FORESEEABLE FUTURE, CLUB MEETINGS, SHOWS, AND OUTINGS ARE CANCELLED. WATCH YOUR EMAIL FOR CLUB ANNOUNCEMENTS -- AND READ THEM!

STAY WELL AND HOPE WE CAN ALL GET TOGETHER SOON!

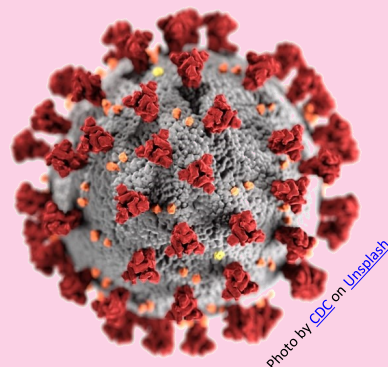


Photo by [GDP](#) on [Unsplash](#)

Zoisite variety Tanzanite, Merelani, Arusha District, Tanzania



Photo by Stan Celestian

Fluorapatite, Cerro de Mercado Mine, Mun. de Durango, Mexico



Photo by Stan Celestian

Brucite, Khuzdar District, Baluchistan, Pakistan



Photo by Stan Celestian

Rocky Mountain Federation of Mineralogical Societies convention
 &
Wyoming State Mineral & Gem Society show

Gem & Mineral Show

2020



***ROCK & ROLL WITH
 WYOMING ROCKS***

Hosted by the Sublette County Rock Hounds

June 19th, 20th, & 21st

at the Sublette County Fairgrounds
 10937 Hwy 189, Big Piney, Wyoming

Friday & Saturday 9-5, Sunday 9-4

*Dealers, lectures, demonstrators, exhibits, field trips, Mr. Bones, Fossil
 Butte National Monument walking fish fossil, fluorescent mineral
 display, kids' activities, food concession & more!*

Admission: \$2.00 adults, kids free



and a funding contribution made by Pinedale Travel & Tourism Commission www.VisitPinedale.org

Contact: jimgray@wyoming.com