



EARTHQUAKE

e-Newsletter about what's movin' and shakin' at the Earth Science Museum

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ESM OUTREACH UPDATE

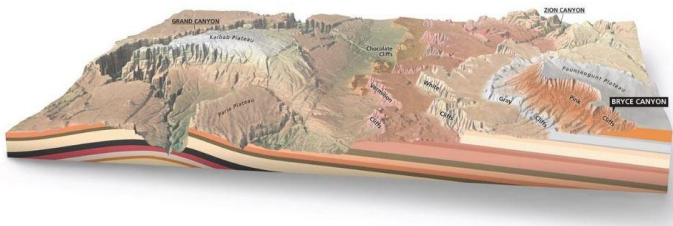
Mardy Zimmermann, Outreach Coordinator

Teachers and school children have returned from their summer hiatus and are now getting settled in to the school routine again, consequently, there are no new ESM-related outreach activities to report.



Grand Staircase

<https://www.nps.gov/brca/learn/nature/grandstaircase.htm>



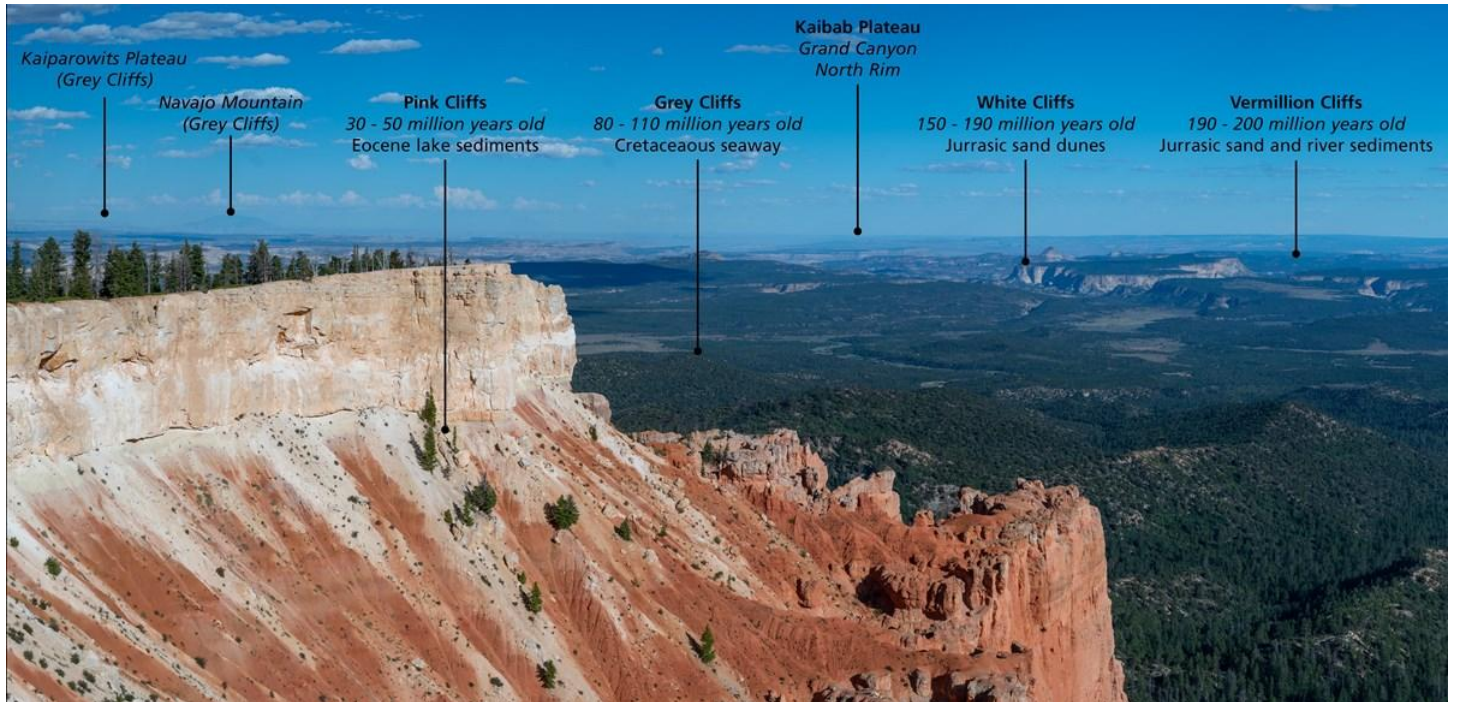
The Grand Staircase is a series of colorful sedimentary rock layers that extends 100 miles from Bryce Canyon to the Grand Canyon

The Grand Staircase is an immense sequence of sedimentary rock layers that stretch south for 100 miles (161 km) from Bryce Canyon National Park through Zion National Park and into the Grand Canyon. In the 1870s, geologist Clarence Dutton first conceptualized this region as a huge stairway ascending out of the bottom of the Grand Canyon northward with the cliff edge of each layer forming giant steps. Dutton divided this layer cake of Earth history into

five steps that he colorfully named Pink Cliffs, Grey Cliffs, White Cliffs, Vermilion Cliffs, and Chocolate Cliffs. Since then, modern geologists have further divided Dutton's steps into individual rock formations.

What makes the Grand Staircase worldly unique is that it preserves more Earth history than any other place on Earth! Geologists often liken the study of sedimentary rock layers to reading a history book--layer by layer, detailed chapter by detailed chapter. Unlike igneous and metamorphic rocks, only sedimentary rocks are capable of preserving fossils. The problem is that in most places in the world, the book has been severely damaged by the rise and fall of mountains, the scouring of glaciers, etc. Usually these chapters are completely disarticulated from each other and often whole pages are just missing. Yet the Grand Staircase and the lower cliffs that comprise the Grand Canyon remain largely intact speaking to over 600 million years of continuous Earth history--from Permian - Tertiary (275- 50 mya)--with only a few paragraphs missing here and there.

Unfortunately, the Grand Staircase is such a vast region of rock that no matter where you stand on its expanse, most of it will be hidden behind the curvature of Earth. Places such as [Yovimpa Point](#) and the north slope of the Kaibab Plateau are the exception where even a non-geologist can discern the individual chapters of this colossal history book--these immense steps of Dutton's Grand Staircase.



From Yovimpa Point much of the Grand Staircase can be seen. *NPS Photo / Peter Densmore*

The Grand Staircase can also (and perhaps best) be viewed from below at LeFevre Overlook along Hwy. 89A north of Jacob's Lake, Arizona.



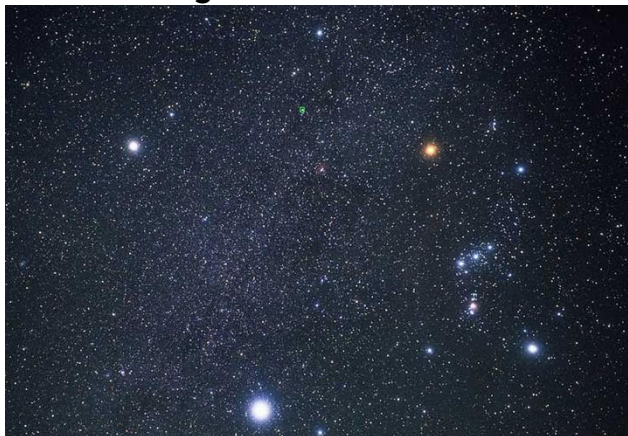
Looking from the bottom of the Grand Staircase back toward Yovimpa Point at LeFevre Overlook provides an exceptional view of the feature.

Dog Days of Summer, Mines, and Minerals

By Harvey Jong

Heat waves in Arizona and across the globe are a definite sign that we're in the dog days of summer. Historically, this hot, uncomfortable part of summer has been associated with the rising of the star Sirius at dawn. Sirius is also known as the "Dog Star" since it follows the constellation Orion. These canine-related facts provide the motivation for this article which follows an Earth science theme involving dogs.

Sirius the Dog Star



Hubble Space Telescope Image of Sirius and the Orion Constellation

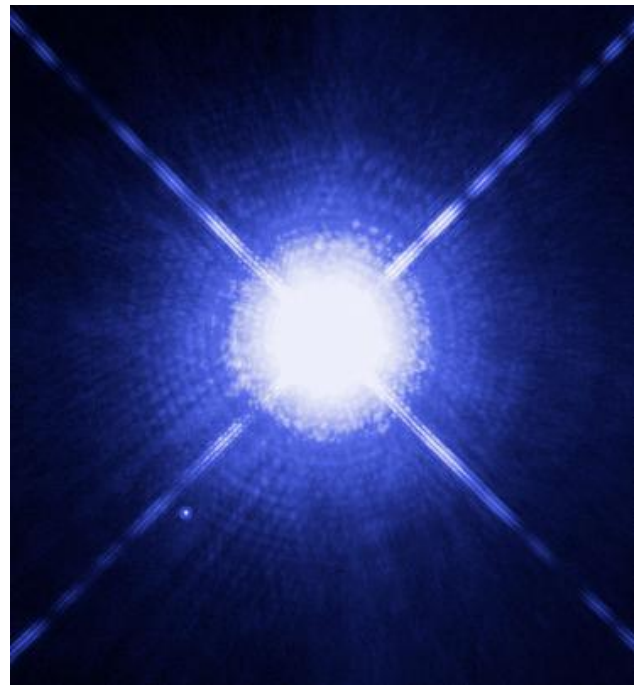
Image credit: Akira Fujii (Japanese astrophotographer), created by NASA and ESA - PD, via Wikimedia Commons

Sirius is the bright star near the bottom center of this image, while Orion is on the right. The line of three stars of Orion's "Belt" points towards Sirius.

Sirius is the brightest star in night sky with a visual apparent magnitude of -1.46 (logarithmic scale of brightness). The name is derived from the Greek word, *Seirios*, for glowing or scorching. References to being the "Dog Star" and associated with hot summer temperatures appear in ancient Greek literature, such as Homer's 8th century epic poem the *Iliad*:

*"Sirius rises late in the dark, liquid sky
On summer nights; star of stars,
Orion's Dog they call it, brightest
Of all, but an evil portent, bringing heat
And fevers to suffering humanity."*¹

Sirius is actually a binary star system comprised of a bluish-white main sequence star, Sirius A, and a white dwarf star, Sirius B. Sirius A is about twice as massive as the Sun and 25 times more luminous.



Close-up of Sirius A and B

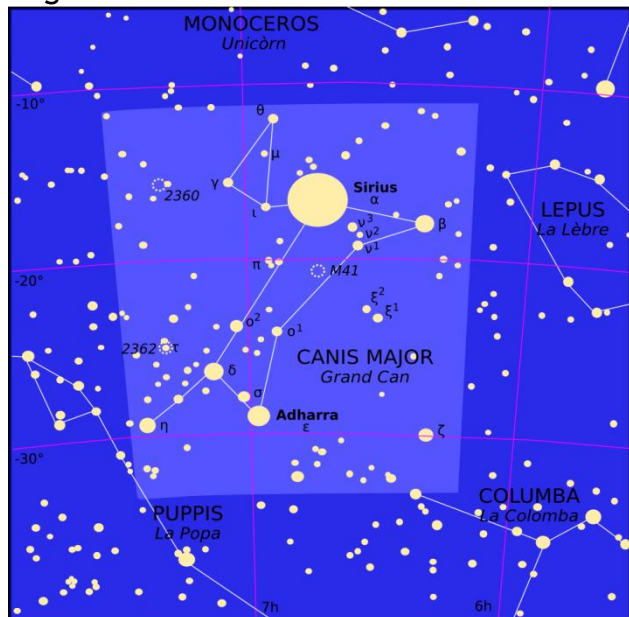
Image credit: M. Barslow (University of Leicester), created by NASA and ESA - PD, via Wikimedia Commons

This Hubble Space Telescope image shows the Sirius star system with the main star, Sirius A, and its faint white dwarf companion, Sirius B. Note that the cross pattern and rings around the stars are due to diffraction of the telescope's imaging system.

The brightness of Sirius can also be attributed to its proximity to the Earth. The

¹ From *The Essential Iliad* 1997 translation by Stanley Lombardo, p. 423.

star system is 2.64 parsecs (8.7 light-years, 5.11×10^{23} mi.) away and represents one of our closest stellar neighbors. It is part of the constellation Canis Major, the “greater dog”.



Constellation Canis Major

Diagram by Nicolas Eynaud - CC_BY_SA-4.0, via Wikimedia Commons

Arizona Mine Names Involving Dogs

For something a bit closer to home, we'll explore some Arizona mines that include “dog” as part of their names. Note that Arizona mining properties may have several different names due to ownership changes or purposeful obfuscation. The following list of 16 mines has been compiled from searches for “dog” at mindat.org, the Arizona Geological Survey's ADMMR mining collection, and in the site names listed in the Mineral Resources Data System (MRDS) database

(<https://mrdata.usgs.gov/mrds/find-mrds-graded.php>). Current and some previous names, mine ids or files, locations, discovery year, and ore commodities are provided. The current name (according to MRDS or ADMMR) along with the primary ore commodities appears in a bold typeface.

Mine 10046291	Bulldog Mine (Bulldog and Enterprise Mine)
Location	Bulldog Canyon, Goldfield, Pinal County
Discovery year	1892
Ore commodities	gold, silver, copper

Mine 10046171	Copper Dog Mine (Peterson Mine)
Location	Sunnyside, Cochise County
Discovery year	1916 (year of first production)
Ore commodities	copper, silver, gold

Mine 10024020	Dog Bone Hill Cinder deposit
Location	Apache County
Discovery year	n/a
Ore commodities	volcanic materials

Mine 10108965	Dogtown Mine (Arizona No. 3 Mine, Argenta Mine)
Location	San Xavier, Pima County
Discovery year	1948 (year of first production)
Ore commodities	lead, silver, zinc, copper, gold

Mine 10103742	Dogwater Mine (Silver Cable Mine)
Location	Klondyke, Laurel Canyon, Graham County
Discovery year	1915 (year of first production)
Ore commodities	lead, copper, molybdenum, silver

Mine 10283620	Fritsimmons Dogpatch (Wright property, Rambling Rose prospect)
Location	Yavapai County
Discovery year	1980 (year of ownership)
Ore commodities	iron

Mine ADMMR file	Hot Dog Placers
Location	Mayer, Yavapai County
Discovery year	n/a
Ore commodities	gold

Mine 10102472	Lost Dog prospect (Melinda Mine, Lorian Mine)
Location	Workman Creek, Gila County
Discovery year	1954 (year of claim lease)
Ore commodities	uranium, lead, copper

Mine 10161969	Lucky Dog prospect
Location	Organ Pipe Cactus National Monument, Pima County
Discovery year	1960 (year of ownership)
Ore commodities	gold

Mine 10259032	Mad Dog claims (Copper Camp Creek claims, Copper Cliff claims)
Location	Saddle Mountain, Maricopa County
Discovery year	1890's (initial filing) 1973 (year of ownership)
Ore commodities	copper

Mine 10186606	Red Dog pat. claim #3470 (Gold Star pat. claim)
Location	Phoenix Mountains, Maricopa County
Discovery year	1921 (year of ownership)
Ore commodities	sand, gravel

Mine 10259108	Red Dog claim
Location	Campo Bonito, Pinal County
Discovery year	1940 (year of ownership)
Ore commodities	gold, silver

Mine ADMMR file	Rude Dog claims
Location	Yavapai County
Discovery year	1999
Ore commodities	Gemstone (banded schist)

Mine 10259199	Sammy Dog Mine (God's claim, Hillside Mine, Ironwood Mine)
Location	Silver Bell Mountains, Pima County
Discovery year	1957? (year of ownership)
Ore commodities	copper, lead, silver, zinc

Mine 10259501	South Dog hole (Never Get Left Mine , Golden Butterfly)
Location	White Hills, Mohave County
Discovery year	1979 (year of ownership)
Ore commodities	gold, copper, silver

Mine mindat page	Yellow Dog Mine
Location	Cunningham Mountain, La Paz County
Discovery year	1995
Ore commodities	gold

Some notable mineral specimens have been collected at two mines, the Dogwater Mine and Sammy Dog Mine, so we will take a closer look at these localities.

Dogwater Mine

The Dogwater Mine is a former underground lead-copper-molybdenum-silver mine located near Klondyke in Laurel Canyon in Graham County. The property is 4/5 of a mile south of the Grand Reef Mine and worked a vein deposit that varied from three to eight feet wide. Mine workings included an adit 190 feet long and a stope to the surface.

Information about mining activity is limited with no dates on when operations started or ended. Production data only indicate that about 230 tons of ore were shipped since 1920. In 1920, 160 tons of concentrate were produced along with an unknown portion of a 117 tons of mixed ore from the Grand Reef, Aravaipa, and Dogwater Mines (Minor, 1921).

The ore from the Dogwater Mine contained cerussite, galena, argentite, and wulfenite and was associated with considerable amounts of purple to white fluorite. Relatively high silver values were noted, while wulfenite was described as widespread and locally abundant in veins up to an inch thick (Simons, 1964).

According to mindat.org, the list of minerals found at the Dogwater Mine includes 11 valid species.

Minerals Found at the Dogwater Mine		
Acanthite	Fluorite	Plumbojarosite
Anglesite	Galena	Quartz
Cerussite	Malachite	Wulfenite
Chrysocolla	Massicot	

Some noteworthy wulfenite specimens have been collected from the Dogwater Mine, but they tend to be relatively small. Samples may consist of micromount size (< 13mm) groups of crystals on quartz breccia, while intergrown crystal aggregates may be miniature size (< 64mm). Individual crystals may lustrous and translucent with sizes around 1-3 mm. The shapes include rectangular or rounded tabular crystals with beveled edges or elongated blocky prisms. Colors may vary from pale orange to bright yellow.



Wulfenite

Jerry Cone photo - PD, via mindat.org
Dogwater Mine, Klondyke, Laurel Canyon,
Graham County, Arizona
Field of view: 4.8 mm

Sammy Dog Mine

The Sammy Dog Mine is situated in Pima County's Silver Bell mining district; however, there is some ambiguity about its exact location. The MRDS record for the current name, Ironwood Mine, attributes ownership to Hartley in 1957. No claim matching this description was found, but a search did return filings for 'IRONWOOD #1-4' which were owned by ASARCO in 1959. These claims specified a location of Sec. 29 & 32, T. 11S, R. 8E. A 1980 claim for 'GODS CLAIM #1' and a subsequent 1997 filing for 'SAMMY

DOG MINE' indicated a location of Sec. 16, T. 11S, R. 8E. In 1999, another claim was filed for 'SAMMY DOG MINE', but the location changed to Sec. 21, T. 11S, R. 8E. Adding to the uncertainty, the site may potentially lie within the Ironwood Forest National Monument that was created in 2000.

Specific reports on mineral deposits and mining activity are not available since the locality was a small past producer and a lesser-known specimen collecting site. Mindat.org currently indicates that 23 valid minerals occur at the Sammy Dog Mine. This list appears to be based on photo submissions.

Minerals Found at the Sammy Dog Mine		
Allophane	Cuprite	Malachite
Anglesite	Descloizite	Mimetite
Azurite	Diopase	Quartz
Baryte	Fluorite	Talc
Bayldonite	Galena	Vanadinite
Calcite	Goethite	Willemite
Cerussite	Hematite	Wulfenite
Chrysocolla	Magnetite	

The Sammy Dog Mine is known for bright, colorful mimetite crystals with unusual habits. Colors may be colorless, yellow, yellow orange, or red. Crystals may be up to 1.5 cm in size and associated with bayldonite, descloizite, malachite, or vanadinite.

Clusters of acicular crystals are typically found in vugs.



Mimetite

Rob Lavinsky photo, iRocks.com - CC_BY_SA-3.0, via Wikimedia Commons
Sammy Dog Mine, Silver Bell Mountains, Pima County, Arizona
4.2 x 3.6 x 1.6 cm

<https://www.mindat.org/photo-964495.html>

Close-up of Acicular Mimetite Crystals with Malachite

Bohuslave Bures photo - Copyright ©BB, via mindat.org
Sammy Dog Mine, Silver Bell Mountains, Pima County, Arizona
Field of view: 10mm, largest crystal 5 mm

The crystals of some specimens may be elongated.

<https://www.mindat.org/photo-1163279.html>

Group of Elongated Mimetite Crystals

Dan Polhemus specimen and photo - Copyright ©Dan Polhemus, via mindat.org
Sammy Dog Mine/"Scott Claim", Silver Bell Mountains, Pima County, Arizona
Field of view: 5 mm

<https://www.mindat.org/photo-409930.html>

Elongated "Match-Stick" Mimetite Crystals

Rolf Luetcke specimen and photo - Copyright ©Rolf Luetcke, via mindat.org
Sammy Dog Mine, Silver Bell Mountains, Pima County, Arizona
Field of view: 4 mm

A few samples may feature bright, bi-colored crystals.

<https://www.mindat.org/photo-134861.html>

Bi-colored Mimetite Crystals

Phil McCollum photo - Copyright ©Phil McCollum, via mindat.org
Sammy Dog Mine, Silver Bell Mountains, Pima County, Arizona
Field of view: 4.6mm
Mindat.org Photo of the Day - 9th Apr. 2008

Crystals are generally well terminated and exhibit different termination forms. This is an example of a flat termination.

<https://www.mindat.org/photo-1107855.html>

Mimetite Crystals with Flat Terminations

Phil Partington specimen, Rolf Luetcke photo - Copyright ©Rolf Luetcke, via mindat.org
Sammy Dog Mine, Silver Bell Mountains, Pima County, Arizona
Field of view: 4 mm

In other samples, the crystals may be pointed.

<https://www.mindat.org/photo-953022.html>

Mimetite Crystals with Pointed Terminations

Chris DeGrave photo - Copyright ©Chris DeGrave, via mindat.org
Sammy Dog Mine, Silver Bell Mountains, Pima County, Arizona
15 x 13 x 7 mm
Field of view: 4 mm, largest crystal 3 mm

An unusual flower-like or “wheat-sheaf” termination may occur with specimens that experienced secondary growth.



Mimetite Crystals with “Wheat-sheaf” Terminations

Harvey Jong specimen and photo
Sammy Dog Mine, Silver Bell Mountains, Pima County, Arizona
Field of view: 10 mm

<https://www.mindat.org/photo-879458.html>

Mimetite Crystal with “Wheat-sheaf” Termination

John Meek specimen, Bruce Kelley photo - Copyright ©John Meek, via mindat.org
Sammy Dog Mine, Silver Bell Mountains, Pima County, Arizona
Field of view: 3.29 mm

<https://www.mindat.org/photo-667536.html>

Close-up of a “Wheat-sheaf” Termination

Bruce Kelley specimen and photo - Copyright ©2015 Bruce Kelley, via mindat.org
Sammy Dog Mine, Silver Bell Mountains, Pima County, Arizona
Field of view: 1.2 mm

Some specimens may involve interesting shapes, such as bow ties or “bouquets”.

<https://www.mindat.org/photo-280847.html>

Mimetite “Bow Tie”

Michael D. Cline photo - Copyright ©Michael D. Cline, via mindat.org

Sammy Dog Mine, Silver Bell Mountains, Pima County, Arizona

Field of view: 4 mm

A mimetite bow tie is speared on a single elongated crystal.

<https://www.mindat.org/photo-718363.html>

Mimetite “Bouquet”

Rolf Luetcke photo - Copyright ©Rolf Luetcke, via mindat.org

Sammy Dog Mine, Silver Bell Mountains, Pima County, Arizona

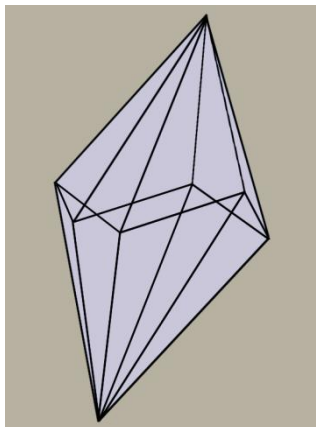
Field of view: 6 mm

A red cluster of mimetite crystals.

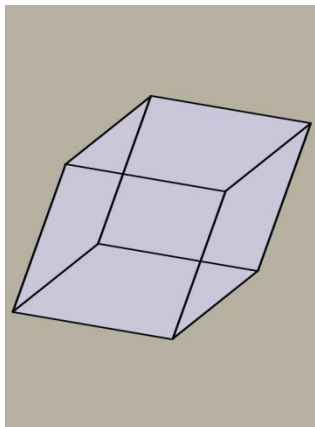
“Dog-tooth Spar”

We will conclude with a final, familiar canine mineral reference - “dog-tooth spar” which is a variety of calcite. “Spar” is an old mining term that refers to light-colored, crystalline minerals with good cleavage. For example, in his 1556 treatise on mining and minerals, *De re metallica*, Georgius Agricola called baryte “heavy spar”, calcite “calcspar”, and fluorite “fluorspar”.

Calcite belongs to the trigonal crystal system and has over 1000 different crystal forms. These forms may be grouped into two basic crystal structures: scalenohedrons and rhombohedrons. A scalenohedron consists of 12 faces in which each face is a scalene triangle. A rhombohedron has six faces, and each face is a parallelogram. Dog-tooth spar or calcite refers to scalenohedral crystals where the pointed terminations resemble a dog’s canine tooth.



Scalenohedral Crystal Diagram



Rhombohedral Crystal Diagram

The occurrence of calcite, which is a polymorph of calcium carbonate (CaCO_3), is determined by environmental conditions, such as temperature, pH, and composition of mineral solutions. At high temperature, aragonite is the dominant, but metastable, mineral species. Lower temperatures will result in transitions to vaterite (another metastable polymorph) and eventually to calcite (stable polymorph). If a high concentration of Ca^{2+} ions is present, scalenohedral crystals will form. As the Ca^{2+} ions are fully incorporated, the pH may drop with an increase in CO_3 concentration. This leads to the dissolution of the scalenohedral crystals. The calcite may, then, re-precipitate as rhombohedrons if the pH approaches a neutral value (Cizer et al., 2012).

According to mindat.org, calcite has been found at 1,031 locations in Arizona. The number of occurrences of scalenohedral crystals is not specified, but below are a few noteworthy localities.

Bisbee's Southwest Mine is a former underground mine that hosted many spectacular, but mostly forgotten, cave formations (See [Forgotten Caves](#)). The mine has produced a wide variety of calcite specimens. Samples include stalactitic cave

calcites and large integrown aggregates of scalenohedral crystals. The lustrous calcite clusters are often colored by inclusions of hematite or malachite.



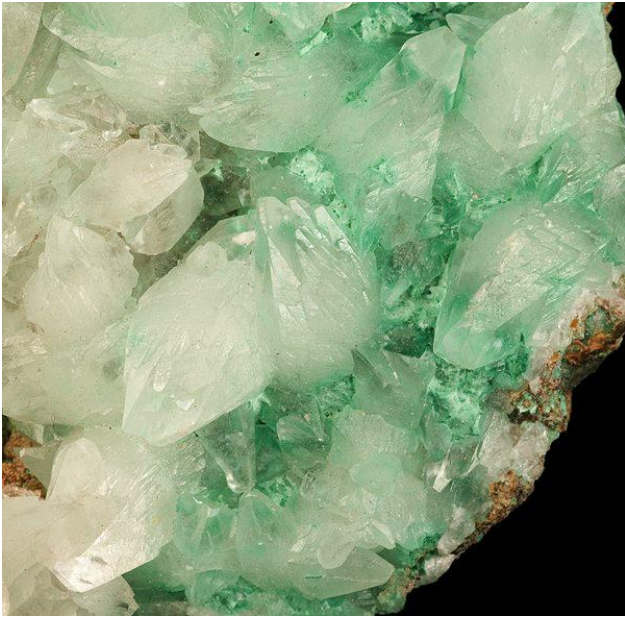
Arborescent Cluster of Calcite Scalenohedrons

Photo by Rob Lavinsky, iRocks.com - CC_BY_SA=3.0, via Wikimedia Commons
Southwest Mine, Bisbee, Cochise County, Arizona
9.7 x 8.0 x 7.5 cm



Calcite with Hematite

Rob Lavinsky photo, iRocks.com - CC_BY_SA=3.0, via Wikimedia Commons
Southwest Mine, Bisbee, Cochise County, Arizona
6.8 x 3.4 x 2.9 cm



Calcite with Malachite

Rob Lavinsky photo, iRocks.com - CC_BY_SA-3.0, via Wikimedia Commons

Southwest Mine, Bisbee, Cochise County, Arizona

12.5 x 10.0 x 8.5 cm

The Holland Mine is located in the Washington Camp-Duquesne mining district in Santa Cruz County. The site is probably best known for large, well-formed Japan-law twin quartz crystals, but some calcite specimens have also been collected from the former zinc-lead-copper-silver-gold mine.



Calcite

Rob Lavinsky photo, iRocks.com - CC_BY_SA-3.0, via Wikimedia Commons

Holland Mine, Patagonia Mountains, Santa Cruz County, Arizona

7.0 x 4.0 x 3.8 cm

The Magma Mine is a former underground lead-manganese-silver-zinc mine located near Superior in Pinal County. Scalenohedral calcites from this site may have a distinctive, craggy appearance which has been described as resembling a “flame” or “wheat-sheaf”.



Calcite

Rob Lavinsky photo, iRocks.com - CC_BY_SA-3.0, via Wikimedia Commons

Magma Mine, Superior, Pinal County, Arizona
3.6 x 3.0 x 1.6 cm

References

Cizer, O., C. Rodriguez-Navarro, E. Ruiz-Agudo, J. Elsen, D. Van Gemert, and K. Van Balen (2012) Phase and morphology evolution of calcium carbonate precipitated by carbonation of hydrated lime. *Journal of Materials Science* 47: 6151-6165.

Minor, C.E. (1921) Report on the properties of the Aravaipa Leasing Company: 55p. in Grand Reef 2011-01-1616, ADMMR mining collection, Arizona Geological Survey.

Simons, F.S. (1964) Geology of the Klondyke quadrangle Graham and Pinal Counties Arizona. *U.S. Geological Survey Professional Paper* 461: 173 p.



AZ Mining, Mineral & Natural Resources Education Museum Update August 2022

<https://ammnre.arizona.edu/>

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Help support the museum at:

<http://tinyurl.com/SupportMM-NREMuseum>

The 'Feast of Rocks' at the Cave Creek Museum has been updated for their 2022-2023 season, which begins on October 1st. For the past year, the CCM has displayed the Thanksgiving Dinner exhibit, which included a variety of meats, sides, and desserts. This year, we swapped the Thanksgiving items with a breakfast display that includes pancakes, eggs, and other treats. We are also integrating some objects from the Cave Creek Museum's collection with the help of their curator Stephanie Bradley. The museum will be open Wednesday through Sunday, October through May.

The idea to collaborate with the Cave Creek Museum was originally proposed by Charlie Connell in 2021. We are happy to continue this loan for another year and honor Charlie's memory.



Catie working on the new display at the Cave Creek Museum



Charlie Connell with the Cave Creek Museum's Golden Reef 10-stamp mill and tramway dedication marker
(Credit: Cave Creek Museum YouTube channel)



Breakfast treats: hot cross bun (rhyolite), cinnamon roll (chert) and donuts (sandstone, agate).



Vitamins (apache tears), milk (tin oxide), and coffee cake (quartz) with objects from the Cave Creek Museum's collection, including a tabletop waffle maker (with chert waffle) and antique tea set



Arizona Rocks 111

Text by Ray Grant
Photos by Bill Yedowitz

Fossilized lightning is the name sometimes given to fulgurites. This time of year, we see lots of lightning and when a strike hits the ground, and it is hot enough a fulgurite can form. The shape and appearance of fulgurites can be very varied depending on the size of the lightning bolt, and the composition and moisture content of the struck ground. The lightning strikes can form hollow branching tubes, crusts, clumps, or masses. Most fulgurites are mainly a silica glass. But can contain other amorphous material and can have a range of color from colorless to black. Iron is the main coloring agent in the glass.

You can go search sandy or loose soil areas where lightning is common to find your own fulgurite, you can buy them for very reasonable prices online, or maybe you can make your own by putting a metal rod in sand where lightning can hit it. The Mohave Museum in Kingman has a number of fulgurites from Mohave County for sale for \$.10 a gram on their website.

Please be careful when there is lightning, so you don't become a fulgurite. Photographs by Bill Yedowitz of specimens in his collection



Fulgurite from near Colossal Cave, Pima County, Arizona - Note the green glassy areas.



Branching fulgurite, Humboldt County, Nevada



Fulgurite, Lake Havasu, Mohave County, Arizona



Fulgurite attached to a pebble, Queen Creek area, Pinal County, Arizona



Pinal Museum and Society News

351 N. Arizona Blvd., Coolidge, AZ

Pinal Geology and Mineral Society meeting

September 21, 2022

www.pinalgeologymuseum.org

Ray Grant raycyn@cox.net.

**Starting on September 1, the Museum will be open from 11 to 4,
Wednesday through Saturday**

Masks are now optional at the Museum. Please bring your own mask if you wish to wear one. We will have some masks on hand at the Museum, but cannot guarantee to provide them.

September 1 - start of winter hours, Wednesday - Saturday, 11am-4pm

September 14-17 - Collects Rocks Week! Kids can visit the Museum and collect a rock or two

September 17 - Start a Rock Collection class with Tony O, 10-11am, kids 8-12

We will be holding in person meetings again starting on Wednesday, September 21 with refreshments, door prizes and a silent auction. Don't miss it, more information in the next newsletter.

September 21 - Meeting, Presentation by Susan Leib, Alfie Norville Museum Collection

October 8 - Rock Art Day, Stop by the Museum and create some rock art

October 12-15 - National Fossil Week, come visit our fossils

October 15 - National Fossil Day Celebration - crafts and more

October 19 - Meeting, Presentations by David T., on Tucson Mountain Geology; Bob Hole, on Arizona Geology Places

November 12 - Full STEAM Ahead! A celebration of Science, Technology, Engineering, and Math

November 16 - Meeting, Presentation by Mesa Community College Speaker TBA

November 24 - Thanksgiving, Museum Closed

December 10 - International Mountain Day Celebration - special activities and crafts about mountains and volcanoes

December 21 - Meeting, Presentation by Robert McCord, Curator of Paleontology, AZ Museum of Natural History

December 25 - Christmas, Museum closed

December 31 - New Years Eve, Museum closed

January 1 - New Years Day, Museum closed

THE UNIVERSITY OF ARIZONA



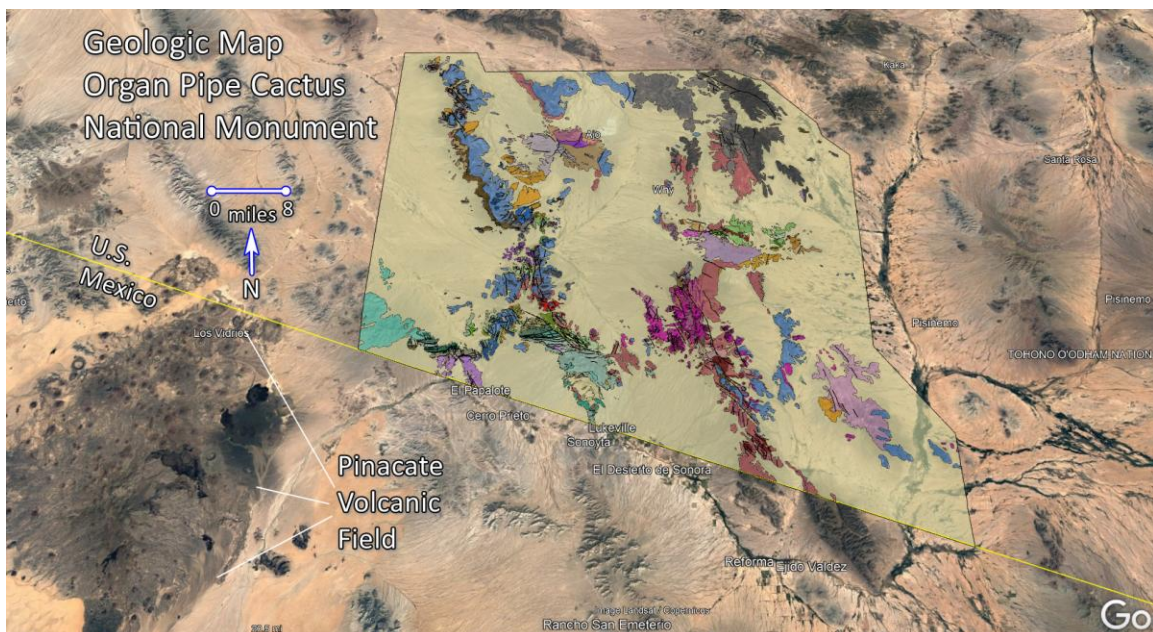
Arizona Geology Blog

Organ Pipe Cactus National Monument: Geologic Resource Report

The U.S. National Park Service just released a comprehensive 'Geologic Resources Inventory Report' for Organ Pipe Cactus National Monument, Arizona, USA. Today's Arizona Geology Blog includes a brief description and link(s) to the 104-page report by Katie KellerLynn (Colorado State University) includes 32 figures and 3 tables, and GIS database(s) of geologic mapping of the monument. <https://blog.azgs.arizona.edu/blog/2022-08/organ-pipe-cactus-national-monument-geologic-resource-report>

Arizona Geological Survey
15 August 2022

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Parent/Teacher Resource Page

[HTTPS://WWW.EARTHSCIWEEK.ORG/NEWSLETTER](https://www.earthsciweek.org/newsletter)

EARTH SCIENCE WEEK UPDATE

August 2022

ORDER YOUR EARTH SCIENCE WEEK 2022 TOOLKIT

You can order an Earth Science Week 2022 Toolkit today. The toolkit contains everything you need to prepare for Earth Science Week 2022 (October 9-15), which celebrates the theme "Earth Science for a Sustainable World." This year's toolkit includes:

- 12-month school-year activity calendar, suitable for hanging
- New Earth Science Week poster, including a learning activity
- NASA materials on climate change and agriculture science
- Geoscientists Without Borders® activity sheets from SEG
- National Park Service resource on fossils and paleontology
- Flyer on resources from the Soil Science Society of America
- Geologic Map Day poster on the geoscience of sustainable soil
- NOAA community resilience education activity booklet
- Mineral Education Coalition material on metals and sustainability
- IRIS flyer dealing with seismology and earthquakes
- American Geophysical Union material on science in the news
- CLEAN material on climate, energy, and citizen science
- AmericaView-NASA-USGS Landsat Sustainability poster
- CUAHSI poster on the critical zone and a Secchi disk activity
- Association for Women Geoscientists geoscience flyer
- Forest Service material on groundwater-dependent ecosystems
- Flyer on curricula and more from Nutrients for Life Foundation
- Earth science material for educators from NESTA and NAGT
- Bureau of Land Management dinosaur coloring page
- Caves and karst education material from NCKRI
- National Science Foundation soil science activity sheet
- GemKids poster from Gemological Institute of America
- Water Footprint Calculator information on water science
- AIPG, UNAVCO, AMS, CMB-S4, Forest Service items and more

Order your [Earth Science Week 2022 Toolkit](#) now. The toolkit is free and available for the cost of shipping and handling. Pay just \$9.50 for the first toolkit and \$2.50 for each additional toolkit in the United States.

See the AGI Store for special pricing on a multi-pack of toolkits addressing different topics. For ordering, special shipping, bulk orders, and more information, email AGI Publications at pubs@americangeosciences.org.

24th Annual Payson Gem and Mineral Show
September 16-18, 2022
 Fri 2-7 Sat 9-5 Sun 10-4



Vendors
 Rocks and Slabs
 Polished Rocks
 Fossils
 Jewelry & Art

Fun and Education
 Kids Area
 Fluorescents
 Auctions, Raffles
 Demonstrations

Admission
 \$5 Adults
 \$3 Friday
 Kids under 13
FREE all days

AT THE Mazatzal Hotel and Casino
 Sponsored by the Payson Rimstones Rock Club

Clarkdale Rocks Gem & Mineral Show
48th Show

Show & Sale



SEPTEMBER 23-25, 2022

Clark Memorial Clubhouse Auditorium
 19th N. Ninth Street, Clarkdale, AZ 86324
 FRI & SAT 9am-5pm, SUN 9am-4pm
Free Admission
 Mingus Gem & Mineral Club
 www.mingusgem.club

Crystals Minerals Gems Jewelry
 Fossils Cabachons Findings
 Rock Slabs Geode Splitting
 Daily Raffles and much more!

Rock, Gem & Jewelry Show



October 15 & 16
 Sat 10-5 / Sun 10-4

Sedona Red Rock High School - 89A at
 Upper Red Rock Loop Rd, W. Sedona

Hourly Raffles
Grand Prize
 Admission - \$4
 Children under 12 - Free




 For more information go to:
www.sedonagemandmineral.org



48th ANNUAL HUACHUCA MINERAL, GEM, AND JEWELRY SHOW



8th AND 9th OCTOBER 2022
 2200 EL MERCADO LOOP,
 SIERRA VISTA, AZ
 For Information;
 Contact Maudie Bailey, gmbailey@msn.com,
 520 249-1541





Apache Junction Rock & Gem Club

Meetings are on the 2nd Thursday
 Next Meeting: September 8, 2022, 6:30 pm
www.ajrockclub.com
 @ Club Lapidary Shop
 2151 W. Superstition Blvd., Apache Jct.



Daisy Mountain Rock & Mineral Club

Meetings are on the 1st Tuesday
 (unless a Holiday then 2nd Tuesday)
 Next Meeting: September 6, 2022, 6:30 p.m.
Please go to their website for more info
www.dmrmc.com
 @ Anthem Civic Building
 3701 W. Anthem Way, Anthem, AZ



Maricopa Lapidary Society, Inc

Meetings are on the 1st Monday
 (unless a Holiday then 2nd Monday)
 Next Meeting: September 12, 2022, 7:00 pm
www.maricopalapidarysociety.com
 @ North Mountain Visitor Center
 12950 N. 7th St., Phoenix



Mineralogical Society of Arizona

Meetings are on the 3rd Thursday
 Next Meeting: September 15, 2022, 7:30 pm
Please go to their website for more information
www.msaz.org
 @ Franciscan Renewal Center
 Room: Padre Serra
 5802 E. Lincoln Dr., Scottsdale



Pinal Geology & Mineral Society

Meetings are on the 3rd Wednesday
 Next Meeting: September 21, 2022, 7:00 pm
In person meeting
www.pinalgeologymuseum.org
 @ Artisan Village
 351 N. Arizona Blvd., Coolidge



West Valley Rock & Mineral Club

Meetings are on the 2nd Tuesday
 Next Meeting: September 13, 2022, 6:30 pm
www.westvalleyrockandmineralclub.com
 @ Buckeye Community Veterans Service Center
 402 E. Narramore Avenue, Buckeye, AZ



Gila County Gem & Mineral Society

Meetings are on the 1st Thursday
 (unless a Holiday then the next Thursday)
 Next Meeting: September 1, 2022, 6:30 pm
www.gilagem.org
 Club Building
 413 Live Oak St, Miami, AZ



Wickenburg Gem & Mineral Society

Meetings are on the 2nd Friday
 (February & December on the 1st Friday)
 Next Meeting: October 14, 2022, 7:00 pm
www.wickenburggms.org
 @ Coffinger Park Banquet Room
 175 E. Swilling St., Wickenburg

ESM's Meeting Notice

ESM's next meeting will be at North Mountain Visitor Center, 12950 N. 7th St., Phoenix, on Tuesday, TBA 2022, at 6:30 p.m.

BECOME A MEMBER!
Join the Earth Science Museum's



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**ESM Earth Science Investigation
 Team Membership Form**
 _____ New Member _____ Renewal

Membership levels:

_____ ESI Family \$20

_____ ESI Individual \$10

Membership benefits:

- ◆ Monthly e-newsletter *Earthquake*
- ◆ Official team membership card
- ◆ Knowledge that your contribution is making a difference in earth science education.

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- Flagg Mineral Foundation
www.flaggmineralfoundation.org
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- Maricopa Lapidary Society
<http://maricopalapidarysociety.com/>
- Mineralogical Society of AZ
www.msaz.org
- Payson Rimstones Rock Club
- Sossaman Middle School
- White Mountain Gem & Mineral Club
www.whitemountain-azrockclub.org
- Wickenburg Gem & Mineral Society
<http://www.wickenburggms.org>
www.facebook.com/pages/Wickenburg-Gem-and-Mineral-Society/111216602326438
- West Valley Rock and Mineral Club
<http://www.westvalleyrockandmineralclub.com/>
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www.staplesfoundation.org
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Visit us at:

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Mission

Our Mission is to excite and inspire all generations about earth sciences through educational outreach.

Vision

We envision a community where students and the general public have curiosity about, passion for, and understanding of the underlying principles of earth sciences.

For more information about the ESM, how to become a member or how to arrange for a school visit or Community function, go to:
www.earthsciencemuseum.org.

NOTICE:

ESM's next meeting will be at North Mountain Visitor Center, 12950 N 7th St, Phoenix, on Tuesday, TBA 2022, at 6:30 p.m.

THANK YOU FOR YOUR CONTINUING INTEREST & SUPPORT!!!

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