

Cedar Valley Gems

Cedar Valley Rocks & Minerals Society

Cedar Rapids, Iowa

cedarvalleyrockclub.org

CEDAR VALLEY GEMS

MARCH 2019

VOL. 45, ISSUE 3

Ray Anderson, Editor: rockdoc.anderson@gmail.com

Welcome AFMS and MWS Delegates!

As the President of the Cedar Valley Rocks and Minerals Society, the host club for the American Federation of Mineralogical Societies (AFMS) and the Midwest Federation of Mineralogical and Geological Societies (MWF), I would like to personally welcome everyone to our 55th Annual Show. While Iowa in the later part of March may not have the warmest weather, especially desired for field collecting, we hope to make your visit to Cedar Rapids and our show a very welcome and warm experience. We understand that a 2-day show may be shorter than what you are used to, but we feel that between the Saturday and Sunday show and the extra day on Friday for meetings, you will be kept busy.



We are very proud of our club and the many things we have done over the years, but we feel especially honored and proud to host the AMFS and MWF groups. We hope that your attendance at our show will allow you to see and experience the enthusiasm of the general public in this area for the hobby that brings us all together. We try to heavily promote the show and really focus a lot of attention on young people, since they are the future for the survival of our hobby. As you interact with the public please feel free to ask members of the club, or even the vendors, any questions you may have. As noted previously, we have been a very active club for many years with many highlights and accomplishments. We have included in your registration packet a sheet that explains some of these accomplishments. We hope this will help you understand our enthusiasm.

Again, welcome to our show and we hope you have a great experience and a safe travel home.

Sincerely,
Marvin Houg, President

CVRMS Feb. 19 Meeting

Hiawatha Community Center

Order called by President Marv Houg at 7:15 pm

Introduction of new members or guests-Ginger Schlicht.

Minutes of last meeting reviewed. Motion to accept as published by Julie, 2nd by Bill. Minutes approved.

Treasurer's report by Dale. Checking account balance \$16,176.15. Motion to approve by Kim, 2nd by AJ. Report approved.

Door Prize won by Sharon.

Program presented by Ray Anderson.

National Geographic Movie "Life After Dinosaurs"

Old business

MSHA training will be held Monday after the show on March 25 at the Ladd Library. Times are 2:p.m and 5:30 p.m. Anyone desiring more information can call Marv.

New Business

Sign up sheets passed around to volunteer for various jobs.

Discussion regarding the display cases and the need for more. Motion made by Tom that \$600 be allocated to the building of new cases. Discussion about how many we could make for that amount. Maybe 4?? Motion approved.

Ray reported that speakers are all lined up for the educational programs.

Sharon reported that 48 people have registered for the banquet on Saturday night. Shirts for this show must be ordered ahead of time. Cost is \$18 and there will be none available for purchase at the show. Order forms are available through Sharon.

Tom made a suggestion that different signs should be made. Motion made to allocate \$300 for new signs, 2nd by AJ. Motion approved.

Miscellaneous

Dale reminded us of the March 16 Science Fair to be held at the Lindale Mall. Dale made motion that the club donate \$200 to science fair for awards, 2nd by Tom. This is the usual amount that the club has donated in the past. Motion approved.

Ray and Bill represented the club at the Freeze Fest. They were filmed and interviewed. They will be online and will let us know

8:50 p.m. Motion to adjourn by AJ, 2nd by Tom. Meeting adjourned.

Respectfully submitted,
Dell James, Secretary.



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CVRMS Board Minutes Feb 26

Called at 7:10 at the home of Marv Houg

Present: President Marv Houg, Dale Stout, Ray Anderson, Bill Desmarais, Dell James, Jay Vavra, Sharon Sonnleitner, Rick Austin, Kim Kleckner

Show Report: AFMS Registrants will receive a welcome bag containing articles such as our latest newsletter, coupons, maps, pens or anything else we can come up with.

Marv will write a welcome letter for inclusion in newsletter.

Jay will write an informational brag letter about our club to be included with AFMS delegates bag.

Ray will present talk on "Iowa's State Rock; the Mysterious Geode" after pot luck on Friday night.

Joy has volunteered to be CVRMS liaison at the AFMS/MWF meetings at the Ramada Inn and provide information and directions as needed. We need another person for Friday and Saturday afternoon.

62 people registered for Saturday AFMS banquet. Motion made by Sharon, second by Jay that club will pay the AFMS meal costs for the following people. Marv, Ray banquet. Kim for delegate lunch. Joy for editors breakfast & AFMS lunch. Motion passed.

Show displays will include fossils from Johnson County, Iowa minerals, fossils, agates, and other geologic materials from Iowa. Consensus was that we borrow cases from other clubs instead of building our own new ones at this time.

Show security will be handled by Bill Desmarais and Jay Vavra for Friday and Saturday nights. Sheriffs security fee \$49 hour.

For Friday pm potluck AFMS and MWF visitors have paid \$3.00 to participate. Anticipated attendance about 100 total. The club will provide extra meat such as a ham. Members are encouraged to bring extra portions or more dishes for the extra people.

Miscellaneous Raffle permit obtained, tickets printed.

Materials still needed for door prizes, silent auction, and pebble pit material.

Sharon will get posters printed but not laminated.

Fluorescent lights and case lights need upgrading.

Difficulty getting to the snowed in trailer.

Auction: Nothing new to report.

Other Business: Motion made by Bill to allocate up to \$600 for purchase of a club computer. Second by Sharon. Motion approved. More to follow on this.

Motion to adjourn by Jay, 2nd by Bill 9:45 p.m. meeting adjourned.

Respectfully Submitted

Dell James, Secretary .

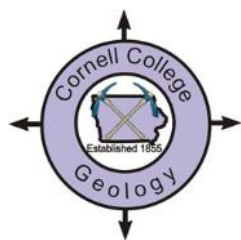
Next CVRMS Meeting Tues. Mar. 19

Hiawatha Community Center
101 Emmons St., Hiawatha - 7:15 pm

featured speakers

Cornell College Geology Students Discussing Their New Zealand Field Class Partially Funded by CVRMS

This month, Cornell College geology students Kira Fish and Cali Pflieger will show photos and talk about the New Zealand field class that they participated in earlier

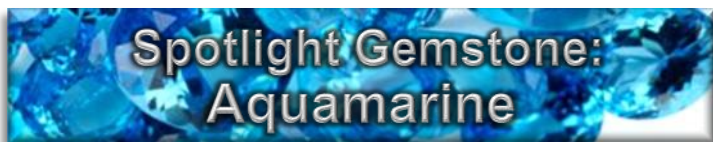


this year. New Zealand is the perfect natural laboratory to learn about all aspects of geology. Students hike over mountains, glaciers, fault lines, and beaches in order to explore one of the most beautiful and geologically inter-

esting areas on the planet. Course highlights include traversing the boundary between tectonic plates along a stream, tracing the Alpine fault at the base of the Southern Alps, five days of hiking and mapping the geology of Cape Farewell, and exploring the hot springs and glaciers at Franz Josef. Yearly scholarships are awarded to the Cornell Geology Department to assist in supporting this field work. Funding for these scholarships is from profits from our annual Rock, Mineral, and Fossil show.



View across seracs (pinnacles and ridges) of the Main Icefall on the Franz Josef Glacier looking toward the Tasman Sea in Westland National Park, West Coast, New Zealand



Aquamarine, the blue variety of the mineral Beryl and birthstone of March, is a rich, medium to dark blue colored stone produced in Brazil, Madagascar, Russia, and the USA, and it has long been a symbol of youth, health and hope. Recently, aquamarine from China and Columbia has come on the market, but they are generally a little bit more yellow. Aquamarine is a highly sought-after semi-precious gem, which for centuries has been used in the creation and encrustation of jewelry and everyday items. Sailors of legend believed that mermaids' tails were made of Aquamarine. The lucky stone was thought to protect the sailors from drowning and ensure their safe return. The gem was believed to aid in digestion, and Roman physicians would employ Aquamarine to treat overeating and reduction of body fluid retention. Aquamarine was thought to possess the ability to reawaken the love in married couples. Roman legend also tells that it absorbs the atmosphere of young love; *"When blessed and worn, it joins in love, and does great things."* It is also considered an appropriate gift for a groom to give to his bride following the consummation of their marriage. To the Sumerians, Egyptians, and Hebrews, Aquamarine was the symbol of happiness and everlasting youth. Legend says that you should place your Aquamarine under a full moon, to help restore its look and renew its energy. Aquamarine colors range from very light blue all the way through to a deeply saturated Ocean blue. The best color is often called Santa Maria Blue and recently there has been a new find in Madagascar called Double Blue. The name Aquamarine comes from the Latin words "aqua" (Water) and "marina" (Sea). The largest stone ever found is from Minas Gerais, Brazil; it weighed 242 pounds and measured 19 inches x 17 inches. The largest cut Aquamarine is the **Dom Pedro** which now sits in the Smithsonian Institute. It finished weighing in at 10,363 cts and measured 14 x 4 inches.

<https://www.gemrockauctions.com/learn/a-z-of-gemstones/aquamarine-information-the-blue-beryl>

What in the World?



What in the World is this feathery-looking green material and what is its story???



February's Photo



Last month's "What in the World" photo showed a view down the Natural Entrance Trail into the Carlsbad Caverns in New Mexico. The 1.25 mile trail is extremely steep and descends down about 750 feet (the equivalent to the height of a 75-story building). The hike takes about one hour to complete.

Rock Calendar CVRMS EVENTS OF INTEREST

2019

Mar. 19 - CVRMS Monthly Meeting
Feature Program
"CVRMS & Field Work at Cornell College"
by Cornell Geology Students
Hiawatha Community Center 7:15 pm

Mar. 21-24—AFMS/MWF Annual Meeting
Ramada Inn
Cedar Rapids
see p. 10 for details

**Mar. 23-24—CVRMS Rock, Fossil,
and Mineral Show**
Hawkeye Downs
Cedar Rapids
see p. 10 for details

**April 6-April 8—MAPS National
Fossil Expo 41**
"Trilobites"
Sharpless Auctions Facility, Iowa City
see p. 11 for more information

Apr. 16 - CVRMS Monthly Meeting
Feature Program
"to be announced"
Hiawatha Community Center 7:15 pm

Sept. 21-22—CVRMS Rock Auction
Amana RV Park and Event Center
Amana, Iowa
<http://www.cedarvalleyrockclub.org/auction.htm>

Ask a Geologist by Ray Anderson aka "Rock Doc", CVRMS Vice President

Ask a Geologist is a monthly column that gives CVRMS members an opportunity to learn more about a geologic topic. If you have a question that you would like addressed, please send it to rockdoc.anderson@gmail.com, and every month I will answer one in this column. Please let me know if you would like me to identify you with the question. I will also try to respond to all email requests with answers to your questions.

I have been asked many times "What is the deepest well that has ever been drilled?" I recently read an interesting article on Smithsonian.com entitled [What's the world record for deepest vertical dig](#). So I copied that article below (and add a bit of additional information when necessary.) Ray

How low can we go? That's the challenge that has been taken up by scientists around the world over the last five decades, with each seeking to drill a hole that will go deeper than before. The goal: the **Earth's mantle**. The mantle makes up 40 percent or more of the planet, which has a radius of 4,000 miles. The 1,800-mile-thick mantle sits—or more accurately, heaves up and down—just below the Earth's crust and above the Earth's core. **The crust** is just a tiny portion of the planet—averaging three to 25 miles thick. The mantle is the major engine driving the planet's constant evolution and contains a geological record of much of the Earth's history. "If we have a better knowledge of what the mantle is and how the mantle behaves, we have better knowledge of volcanoes and earthquakes, and better knowledge of how the planet as a whole works," said Benjamin Andrews, a research geologist and a curator for the National Rock and Ore Collection at the Smithsonian's National Museum of Natural History. Scientists took their first crack at the mantle in 1958 with **Project Mohole**. American engineers drilled through the Pacific Ocean floor off Guadalupe, Mexico. But Congress discontinued funding in 1966, at a depth of 11,700 feet (2.2 mi), before the drillers ever reached the mantle. The quest to drill deeper created a global scientific contest akin to the Space Race. In 1970, Soviet geologists took on the challenge, setting their drills over the Kola Peninsula, which juts eastward out of the Scandinavian landmass. The **Kola Super-deep Borehole** was just 9 inches in diameter, but at 40,230 feet (7.6 mi) reigns as the world's deepest hole. It took almost 20 years to reach that 7.5-mile depth (only about half the distance to the mantle). Among the more interesting discoveries: **microscopic plankton fossils** found at four miles down. The Kola hole was abandoned in 1992 when drillers encountered higher-than-expected



Japanese Research Drilling vessel Chikyu will try to drill the world's deepest well.

temperatures of 356 degrees Fahrenheit (not the 212 degrees that had been anticipated). The heat wreaks havoc on equipment. And, the higher the heat, the more liquid the environment, and the harder to maintain the bore, said Andrews. It's like trying to keep a pit in the center of a pot of hot soup. In 1990, German scientists began the **German Continental Deep Drilling Program** in Bavaria. The researchers passed through seismic plates and encountered temperatures as high as 600 degrees F. They managed to get down 29,860 ft. (5.7 mi) before they ran out of funds. But they gleaned new knowledge about seismic activity and the crust's composition. Not surprisingly (because the crust is thinner) some deep holes have been bored through the ocean floor. The specialized Japanese drillship *Chikyu* claims the record for the deepest offshore hole drilled for scientific purposes, about 10,000 feet (almost 2 miles) below the sea floor, according to James F. Allan, program director for the Ocean Drilling Program at the National Science Foundation. The oil and gas industry also claims some deep holes, on land and offshore. BP's **Deep-water Horizon** holds the offshore record. The drilling rig (lost in an explosion in 2010) managed to get some 30,000 feet (5.7 mi) below the sea. Now, the

international team that sponsors the *Chikyu* is endeavoring to top all previous records. The Integrated Ocean Drilling Program has been in operation since 2003 and is mainly funded by the **Japan Ministry of Education, Culture, Sports, Science and Technology** and the **U.S. National Science Foundation**. Also lending support are the **European Consortium of Ocean Research Drilling**, the **People's Republic of China**, the **Republic of Korea**, **India**, **Australia** and **New Zealand**, and the **Federal Republic of Brazil**. The effort is expected to take many, if not dozens, of years, and **may require \$1 billion**. *Chikyu* is capable of carrying up to 32,000 feet (6 miles) of drill pipes. But, the drill bits have a limited lifespan. High temperatures can deform bits and pipes, not to mention creating a mess out of the bore hole. Temperatures can hit 1,600 F where the crust meets the mantle, and as high as 4,000 degrees at the bottom of the mantle. Drilling to such massive depths requires mapping and seismology studies, but even with those guides, "occasionally we hit a surprise," said Andrews. Ultimately, it's a **journey of discovery**. "Part of why you're drilling is because you want to find out what's down there," he said.

modified from <https://www.smithsonianmag.com/smithsonian-institution/ask-smithsonian-whats-deepest-hole-ever-dug-180954349/>

Ice Cream Cone Shaped Creature Finally Has a Home on the Tree of Life

Hyaloliths are abundant and globally distributed “shelly” fossils that appeared early in the Cambrian period and



fossil hyolith (above)
artist's reconstruction (below)

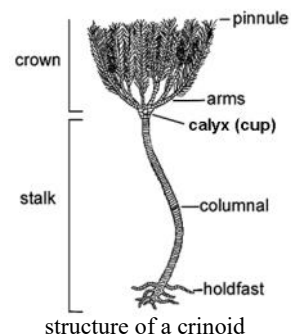


can be found throughout the 280 million year span of Palaeozoic strata. These long-extinct invertebrates sported a distinct conical shell, giving them the appearance of an inverted ice cream cone. They were among the first creatures known to form mineralized external skeletons. Hyoliths were

very common during the Cambrian period, about 540 million years ago, when they first appear in the fossil record. Long thought to be related to squids and snails, it was hard for paleontologists to figure out where, exactly, these small sea-creatures fit on the tree of life, because there's nothing like them alive today. A new classification was recently published in *Nature* by a 20-year-old Toronto undergrad paleontology student and his co-authors. They examined over 1,500 specimens of the mid-Cambrian hyolith *Haplophrentis* from the Burgess Shale and Spence Shale Lagerstätten. The exceptionally preserved soft tissues in their samples include an extendable, gullwing-shaped, tentacle-bearing organ surrounding a central mouth, which they interpreted as a lophophore, and a U-shaped digestive tract ending in a dorsolateral anus. Together with opposing bilateral sclerites (armored, segmented appendages) and a deep ventral visceral cavity, these features suggest an association with the lophophorates (brachiopods, phoronids and tomotiids), substantially increasing the morphological disparity of this prominent group. They reconstructed *Haplophrentis* as a semi-sessile, epibenthic suspension feeder that could elevate its tubular body above the sea floor https://motherboard.vice.com/en_us/article/mg4j88/oldest-life-quebec-canada-arctic

Crinoid for Iowa's State Fossil

Iowa is one of 10 states that does not have a State Fossil. Last year the CVRMS initiated a project to convince the Iowa Legislature to designate the crinoid as Iowa's State Fossil. That bill did not clear the Legislative funnel but did receive some good publicity. This year we are back to try again. The 2019 “Crinoid for State Fossil” bill, **Senate Joint Resolution 12**, is sponsored in the Iowa Senate by Senator Joe Bolkcom and others and in the House by Representative Mary Mascher and others. The bill was introduced on Feb. 6, so now it's



time for all you “friends of the crinoid” to contact your legislators and encourage them to support the bill. Fossil crinoids from Iowa, especially from Le Grand, Burlington, and Gilmore City are among the finest ever collected, and are displayed in museums all over the world. Still alive on Earth today and sometimes called “sea lilies,” crinoids are actually animals and many can actually swim or crawl. The animals were especially abundant in the Paleozoic Era (250 to 530 million years ago) in the warm, shallow seas that covered Iowa at that time. Consequently, crinoid fossils are preserved in the rocks that underlie much of Iowa, and they can be easily found, even by novice

FLOYD THE 'NOID



Project mascot “Floyd the ‘Noid” says “**please contact your legislators, and talk to others about contacting their legislators to support the crinoid bill.**”

collectors. In fact, they are a major constituent of many Iowa limestone units. A page on the CVRMS web site provides information about crinoids (both living and as fossils from Iowa) as well as information on the bill and how to identify and contact your legislator.

<http://cedarvalleyrockclub.org/crinoids.html>

Researchers Discover Oldest-Ever Evidence of Animals on Earth

According to a new study, ancient sea sponges called *Demospongiae* emerged 635 to 660 million years ago, during the mid-Neoproterozoic era. That time was especially stressful for life on Earth, because nearly the entire planet was covered in ice. This was the **Marinoan glaciation**, the last of a series of "Snowball Earths," times when glacial ice enveloped the entire planet. These conditions were triggered by the massing of the continents near the equator, leading to



Modern Demosponges evolved from the Earth's earliest animals.

deep weathering of the crustal rocks, and an associated catastrophic reduction of atmospheric CO₂ to produce a **reverse greenhouse world**. As this global ice cap melted, the Earth warmed creating just the right conditions for early multicellular organisms to emerge. A recent study of the rocks that formed at that time has yielded "**the earliest robust biomarker evidence for Neoproterozoic animals.**" In 2009 these same UC Riverside researchers reported evidence that *Demospongiae*

may have emerged during this period, however, these interpretations weren't universally accepted. It turned out that the biological marker molecule that the researchers identified, a steroid named *24-isopropylcholestane*, wasn't exclusive to ancient sponges, but was also found in *pelagophyte* (a type of ancient marine algae). In the recent research study they examined evidence from the steroid *26-methylstigmastane* (believed to be unique to *Demospongiae*). In other words, the new research provides the most solid proof yet that animals emerged extremely early in Earth's history, thriving within frigid ancient glacial meltwater. According to the research paper, published in *Nature Ecology & Evolution*, it's possible that even older evidence of multicellular animals may exist in samples from the Chuar Group, a group of ancient rocks in the Grand Canyon, and the Visingsö Group in southern Sweden. However, that evidence has not yet been confirmed. These new findings strongly suggest that demosponges floated in Neoproterozoic marine environments and even existed as far back as the Cryogenian period, which spanned 720 to 635 million years ago. They have left a continuous chemical fossil record in rocks to the present. The emergence of the demosponges set the stage for an incredible period of animal evolution, the Cambrian explosion about 541 million years ago, when animal life rapidly diversified and most major animal phyla appeared within a 25-million-year period. The demosponges may not have had eyes or teeth, but they were animals that were adaptable enough to have descendants thriving today. Modern *Demospongia* make up 76.2% of all species of sponges on the planet, living in seas world-wide and even in fresh water environments. Most of the nearly 8,000 species of demosponges are brightly colored invertebrates that reproduce both sexually and asexually. They exhibit a great variety of body shapes and sizes ranging up to 1 meter in diameter. https://motherboard.vice.com/en_us/article/vbkn8m/635-million-year-old-sponges-reveal-clues-about-origin-of-animals

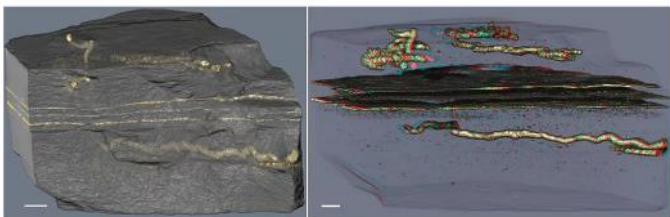
Two Billion-Year Old Fossils Reveal Earliest Evidence of Living Locomotion

For most of the Earth's 4.6 billion year history it has been inhabited by single-celled organisms that just sat there in lumps, or floated around on water currents. But now fossils found in the African country of Gabon have disclosed the earliest evidence of life moving around of its own accord. It now seems that life was mobile some 1.5 billion years earlier than previously thought. The earliest forms of life had no hard parts so



The earliest known evidence of locomotion in complex lifeforms has been found in Gabon in Africa in 2.1 billion-year old fossils

didn't fossilize well. So the primary evidence we have of their existence is what are known as trace fossils, tracks, burrows, etc. The oldest of these is roughly half a billion years old. The newly-discovered fossils also fall into this category, but are much older. Using geometrical and chemical dating techniques, researchers say they're about 2.1 billion years old. That makes them the oldest known examples of locomotion in multicellular organisms, by quite a wide margin. These trace fossils are made up of a series of tiny tubes in the rock, measuring just a few millimeters wide. From this and analyses of the surrounding material, the researchers inferred that the organism may have been slug-like and lived in oxygenated waters, suggesting it depended



3D images show the tubes in clear detail

on oxygen (a key development in the history of life on Earth). Fossilized microbial mats found nearby, may have been a food source for the organism. But the most interesting finding is that this more complex organism might have been "**multicellular.**" It may have been an important step in the evolution of multicellular lifeforms. It is plausible that the organisms behind these trace fossils moved in search of nutrients and oxygen that were produced by bacteria mats at the seafloor-water interface. Was this a primitive biological innovation, a prelude to more perfected forms of locomotion seen around us today, or was this simply an experiment that was cut short?

https://newatlas.com/earliest-evidence-life-mobility/58435/?utm_source=quora&utm_medium=referral#gallery

Unraveling Secrets of Diamond Formation

Understanding the global carbon cycle provides scientists with vital clues about the planet's habitability. It's the reason why the Earth has a clement stable climate and a low carbon dioxide atmosphere. Compare this to the atmosphere of Venus, for instance, which has a thick carbon dioxide atmosphere, a runaway greenhouse state, and high surface temperature. One major difference between Earth and Venus is the existence of active plate tectonics on Earth, which make our environment unique within our solar system. But the atmosphere, oceans, and Earth's crust are only part of the story. The mantle, which represents 75% of Earth's volume, potentially holds more carbon than all other reservoirs combined. Carbon, one of the essential building blocks of organic life, is taken into Earth's interior by subduction, where it drastically lowers the melting point of the solid mantle, forming carbon-rich molten rocks in the shallow mantle that fuel surface volcanoes. Carbonate minerals may also be transported much deeper into the Earth, reaching the lower mantle, but what happens next is uncertain. Answering that question has many challenges; conditions deep within the Earth are extreme and samples from the mantle are rare. The solution may be to recreate those conditions in the lab using sophisticated technology. Now a team of experimental geoscientists from the University of Bristol have done just that. Their results, published open access in *Earth and Planetary Science Letters*, reveal new clues about what happens to carbonate minerals when they are transported into the mantle via subduction of the oceanic crust. They have uncovered a barrier to subduction of carbonate beyond depths of around 620 mi, where it reacts with silica in the oceanic crust to form diamonds that are stored in the deep Earth over geological timescales. Researchers subjected synthetic carbonate rocks to very high pressures and temperatures, comparable to deep Earth conditions of up to 90 GPa (about 900,000 atmospheres) and 2,000 degrees C using a laser-heated diamond anvil cell. They found that carbonate remains stable up to depths of 620-800 mi, almost halfway to the core. Under these conditions carbonate then reacts with surrounding silica to form a mineral known as **bridgmanite**, which constitutes most of the Earth's mantle. The carbon released by this reaction is in the form of solid carbon dioxide. As the hot surrounding mantle eventually heats the subducted slab, this solid carbon dioxide breaks down to form superdeep diamonds. Eventually the superdeep diamonds could be returned to the surface in upwelling mantle plumes. This process could represent one of the sources of superdeep diamonds that we find at the surface (the only direct evidence we have of the composition of the deep earth). The researchers now plan to apply these high pressure and high-temperature experiments along with advanced computer simulation techniques to other minerals and materials. They speculate that as well as carbon, there is the potential for several ocean's worth of water having been transported deep into the mantle, and when released this will induce melting of Earth's upper and lower mantle.

<http://www.geologyin.com/2019/02/unraveling-secrets-of-diamond-formation.html>

WULFENITE IS LOVED

“Wulfenite is Loved” is the theme of the 2019 Tucson Gem and Mineral Show. Each year, the show committee determines a special theme, and this year’s show represents an important mineral for Arizona.



Rowley Mine, near Theba, Arizona

Many collectors instantly associate Wulfenite with Arizona. In fact, in 2017, Wulfenite was officially recognized by the Arizona state legislature as their official State Mineral.

In recognition of this status, and reflecting the fact that Wulfenite is a highly aesthetic mineral with fine examples in many collections, the Tucson Gem and Mineral Show committee selected Wulfenite as the theme for this year’s show. **Wulfenite** is a lead molybdate mineral with the formula $PbMoO_4$. It is most often found as thin tabular crystals with a bright orange-red to yellow-orange color or sometimes brown, although the color can be highly variable. It occurs as a secondary mineral in oxidized hydrothermal lead deposits with cerussite, anglesite, smithsonite, hemimorphite, anadsiite, yromorphite, mimetite, descloizite, plattnerite and various iron and manganese oxides. A noted locality for wulfenite is the Red Cloud Mine in Arizona. Crystals are deep red in color and usually very well-formed. The Los Lamentos locality in Mexico produces very thick tabular orange crystals. Another locality is Mount Peca in Slovenia. The crystals there are yellow, often with well-developed pyramids and bipyramids. In 1997, the crystal was depicted on a stamp by the Post of Slovenia. Small crystals also occur in Bulwell and Kirkby-in-Ashfield, England. These crystals occur in a galena-wulfenite-uraniferous asphaltite horizon in a dolomitic limestone. The wulfenite found in this area is similar in properties to the wulfenites of the Alps and may be similar in origin

photos from <https://www.mindat.org/photo-806667.html>



Red Cloud Mine, La Paz Co., Arizona



Hillsboro, New Mexico

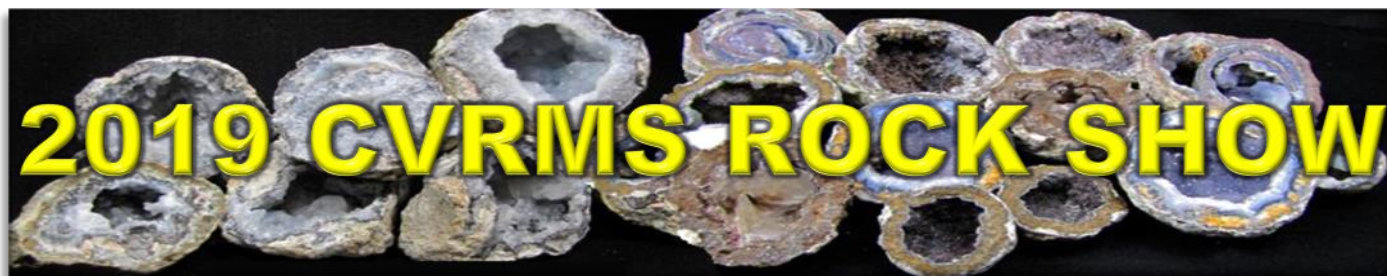


Perovskite: the Mineral that could Make Internet Faster

Perovskite is a calcium titanium oxide mineral ($CaTiO_3$). Perovskites have sub-metallic to metallic luster, colorless streak, cube like structure along with imperfect cleavage and brittle tenacity. Colors include black, brown, gray, orange to yellow. Crystals of perovskite appear as cubes, but are *pseudocubic* and crystallize in the orthorhombic system. Perovskite crystals have been mistaken for galena; however, galena has a better metallic luster, greater density, perfect cleavage and true cubic symmetry.

Perovskite lends its name to the class of compounds which have the same type of crystal structure as $CaTiO_3$ ($X^{II}A^{2+VI}B^{4+}X^{2-}_3$), known as the perovskite structure. Many different cations can be embedded in this structure, allowing the development of diverse engineered materials. Scientists have discovered the mineral’s ability to use the terahertz spectrum in transferring data. The specific type of perovskite used is both inorganic and organic and can be thinly layered on a silicon wafer. The system’s unique ability is that it uses light instead of electricity to transfer data, allowing transfer speeds 1,000 times faster than current technology. The terahertz band lies in between infrared light and radio frequency (100 to 10,000 gigahertz). This compares to the 2.4 gigahertz range most cellphones use today. The layered perovskite mineral can transfer data through light waves in the terahertz band using a simple halogen lamp. This allows the encoding of data in the waves and transfer of this data 1,000 times faster than traditional electronic data transfers. In addition, it is possible to specify the color of the light to modulate data simultaneously on different frequencies. So not only can data be transfer 1,000 times faster using terahertz waves, multiple data sets can be transferred simultaneously using different colored lamps. This technological breakthrough opens the door to using terahertz data transfer in future generation computing and communication. At a thousand times faster, this inexpensive and simple way to transfer data presents a multitude of opportunities to transform our digital lives. Unfortunately, we’ll have to wait at least 10 years until it becomes commercially available. When that time comes, this could present a step change in computing and communication.

<https://newspunch.com/mineral-internet-faster>



Cedar Valley Rocks & Minerals Society's 55th Annual Rocks, Fossils, and Minerals Show

"GEODES: IOWA'S MYSTERIOUS STATE ROCK"

The 2019 Show will be held March 23rd-24th, 2019
at Hawkeye Downs, Cedar Rapids.

Hours are 8:30am to 6:00pm on Saturday March 23, 2019
9:30am to 4:00pm on Sunday March 24, 2019

<p>PROGRAMS Programs on Theme-Related Topics Call ahead or check our website for Speakers & Times</p>		<p>DISPLAYS Geodes Minerals Crystals Fossils Amethyst Crinoids, Artifacts Petrified Wood Polished Stones Spheres, Agates</p>																				
<p>DEMONSTRATIONS Tumbling Glass Bead Making Cabbing, Beading Silversmithing Flint Knapping Geode Cracking</p>		<p>SILENT AUCTION Geodes, Minerals, Crystals, etc.</p>																				
<p>PEBBLE PIT FOR KIDS 1¢, 5¢, 10¢, 25¢, & 50¢ Items \$1 Rock & Mineral Kits</p>	<p>SLUICE FOR MINERALS (Kids & Adults) MANY ITEMS FOR SALE, INCLUDING:</p>	<p>DONATIONS REQUESTED Adults..... \$3.00 Students..... \$1.00 (12-18) Children..... Free (Under 12) Youth Groups..... Free (w/adult)</p>																				
<p>HOT FOOD Hawkeye Downs Concessions</p>	<table border="0"> <tr> <td>Books</td> <td>Fossils</td> <td>Jewelry</td> <td>Minerals</td> <td>Book Ends</td> </tr> <tr> <td>Opal</td> <td>Agates</td> <td>Carvings</td> <td>Seashells</td> <td>Petrified Wood</td> </tr> <tr> <td>Slabs</td> <td>Geodes</td> <td>Crystals</td> <td>Tumblers</td> <td>Lapidary Equip.</td> </tr> <tr> <td>Gems</td> <td>Beads</td> <td>Spheres</td> <td>Meteorites</td> <td>Jewelry Findings</td> </tr> </table>	Books	Fossils	Jewelry	Minerals	Book Ends	Opal	Agates	Carvings	Seashells	Petrified Wood	Slabs	Geodes	Crystals	Tumblers	Lapidary Equip.	Gems	Beads	Spheres	Meteorites	Jewelry Findings	<p>CHILDREN MUST BE ACCOMPANIED BY AN ADULT ONLY SERVICE DOGS ALLOWED</p>
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<p>PROFITS GO TO SCHOLARSHIPS NOT RESPONSIBLE FOR ACCIDENTS</p>																						

associated with the Rock Show this Year, CVRMS is Hosting the:


AMERICAN ASSOCIATION OF MINERAL SOCIETIES NATIONAL SHOW

and the

MIDWEST FEDERATION OF MINERALOGICAL AND GEOLOGICAL SOCIETIES ANNUAL MEETING

March 21-24, 2019 Ramada, Cedar Rapids


see <https://www.cedarvalleyrockclub.org/AFMSHome.html> for details and registration



MAPS
Mid-America Paleontology Society

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National Fossil Expo 41

Sharpless Auctions Facility, IOWA CITY, IA
Dates & Topic for EXPO 2019

The theme for Expo 2019 will be the
TRILOBITES
and the show will run from
Friday, March 29th to Sunday, March 31st, 2019.

The keynote speaker will be Dr. Jonathon Adrain of the University of Iowa. The keynote talk will be at 6:00PM on Friday, March 31, 2019.

The MAPS EXPO Show will be held March 29-31, 2019, at the Sharpless Auction facility just north of I-80 at Exit 249. The Hotel Pre-Show is scheduled to occupy the Clarion Hotel north of I-80 at Exit 246 on North Dodge Street about 3 mi from Sharpless Auctions. Both venues are located in Iowa City, Iowa.

NATIONAL
FOSSIL
EXPOSITION

Sharpless Auctions
Iowa City, IA

March 29-31, 2019

41

The MAPS Fossil Expo. is the largest show in the world that exhibits fossils exclusively. [Learn More >](#)

MAPS is one of the few strictly fossil clubs in the country.

MAPS is for the novice who wants to know more about

THESE TREASURES FROM THE PAST

for the old-timers who have

SO MUCH EXPERTISE AND KNOWLEDGE

to share with the rest of us

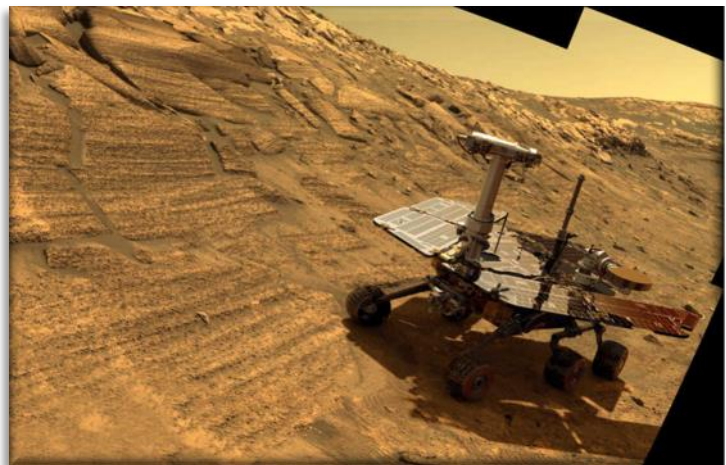
and for all those who fall in-between who

SHARE OUR LOVE OF FOSSILS

MORE ABOUT MAPS >

NASA's Opportunity Rover Dies on Mars

Freshly arrived from Earth, the NASA Rover Opportunity bounced to a stop on the Martian surface in 2004 and went on to roam from crater to crater for 14 years. NASA officially declared the mission over on Feb. 12 of this year. A huge dust storm that wrapped around the planet last June covered the rover's solar panels and left engineers struggling for months to regain contact. Opportunity had weathered many storms over its 14 years, but its age and the storm brought its demise. Opportunity survived 5,111 Martian days and drove over 28 miles — a distance record for wheeled vehicles beyond Earth. But, five months after Opportunity went silent, NASA landed another spacecraft on Mars, the lander InSight.



An artist's impression of Opportunity overlaid on a real image of Endurance Crater

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Hospitality	Karen Desmarais (desmarais_3@msn.com)	365-0612
Webmaster.....	Sharon Sonnleitner (sonnb@aol.com)	396-4016

Club meetings are held the 3rd Tuesday of each month from September through November and from January through May at 7:15 p.m., at the Hiawatha Community Center in the Hiawatha City Hall, [101 Emmons St., Hiawatha IA](#). The December meeting is a potluck dinner held the 2nd Tuesday at 6:30. June, July, and August meetings are potlucks held at 6:30 p.m. at area parks on the 3rd Tuesday of each month

CEDAR VALLEY ROCKS & MINERAL SOCIETY

CVRMS was organized for the purpose of studying the sciences of mineralogy, geology, and paleontology and the arts of lapidary and gemology. We are members of the Midwest (MWF) and American (AFMS) Federations. Membership is open to anyone who professes an interest in rocks and minerals.

Annual dues are \$15.00 per family per calendar year. Dues can be sent to:

**Dale Stout
2237 Meadowbrook Dr. SE
Cedar Rapids, IA 52403**

CVRMS website:
cedarvalleyrockclub.org



Ray Anderson, Editor
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