



Flatirons Facets

Flatirons Mineral Club of Boulder County, Colorado

Volume 64, Number 3

May-June, 2021

Field Trip Season is Here!

Warm weather is on the way, and everyone cannot wait to get outside to collect rocks, minerals, and fossils.

Pictured is Mary Maxwell, panning for gold in one of Boulder County's creeks. A field trip to Brian Walko's claim outside of Ward is just one of the club field trips planned for this year. Information about our field trips begins on page 4.

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President's Message



The future is looking brighter! In April, the FMC held our first field trip in over a year. The Denver Gem and Mineral Show is scheduled for September, and our own Rock and Rails show is scheduled for December. The Junior Geologists are starting to meet in person.

Additionally, we are releasing our tentative 2021 field trip schedule. More trips will be added as plans solidify. So, get ready for a fun, educational summer of geology.

Regards,
Brian Walko

Colorado's State Rock, Mineral, Gem, and Fossil Quiz

Our state is blessed with a great variety of minerals, gems, rocks, and fossils. But, do you know that Colorado has designated one of each of these to represent our state?

Take this quiz to test your knowledge of our state's geologic heritage.

1. What is Colorado's state mineral?
2. What is Colorado's state rock?
3. What is Colorado's state gemstone?
4. What is Colorado's state fossil?

Hint for the first three: think red, white, and blue.

The Junior Geologists provided the answers to this quiz on page 14.

Honor a Club Member as Our Rockhound of the Year

Each year, the club honors an active member or husband-and-wife team who have contributed to the success of the Flatirons Mineral Club. Our first Rockhound of the Year was honored in 2002, and each year since, a club member has been selected as our Rockhound of the Year by the club membership.

Recipients for this honor are first nominated by club members. Please consider nominating someone this year - perhaps someone who leads field trips, helps organize the club show, assists with club meetings, or helps with the Jr. Geologists. A nomination form can be found on page 20.

Please return your nomination to Gerry Naugle by July 10. It can be mailed to Flatirons Mineral Club, P.O. Box 3331 Boulder, CO 80307-3331, or emailed to Gerry at gnaugle@earthlink.net.

The Flatirons Mineral Club is a non-profit organization, which is dedicated to developing and maintaining interests in Earth science and associated hobbies. The purpose of this Club includes, but is not limited to, studying geology and Earth science, teaching others about our hobby, including young people, collecting gem, mineral and fossil specimens, and learning lapidary skills.

The Flatirons Mineral Club is affiliated with the Rocky Mountain Federation of Mineralogical Societies, the American Federation of Mineralogical Societies, and the Greater Denver Area Council of Gem and Mineral Societies.



May 13th Club Meeting: Why Are Minerals So Complicated?

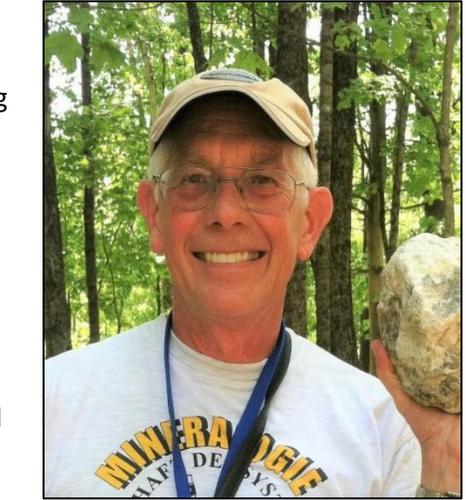
We are please to have Dr. Pete Modreski as our speaker at our next club meeting on **Thursday, May 13**. At this online meeting, Pete will talk about **Why Are Minerals So Complicated?**

If you've ever tried to look up information about minerals (such as in trying to write "correct" information about a mineral for a label), you've probably asked yourself, "What has happened to minerals?" Didn't they used to be more straightforward? Aren't they so very much more complicated now?

Perhaps some of these questions most apply to those of us who first studied and learned about minerals "a long time [decades] ago". If you're fairly new to minerals... well, maybe it all seems complicated to begin with. Is it overly complicated? Do mineralogists make up complicated names and classification schemes, just to be extra confusing and to plague students and beginners? Why are some minerals part of "families" or "groups" or (heaven help us) "supergroups"? Why do so many minerals have multiple names? And why are some commonly known minerals said "not to be real minerals at all"?

Pete will try, in a reasonably light-hearted and entertaining way, to take us through the story of why and how we go from such "simple" minerals as quartz, pyrite, calcite, fluorite, to "more complicated" ones like turquoise, mica, feldspar, tourmaline; to the "extraordinarily complicated" minerals like... well, how about hydroxylmanganopyrochlore, or ferro-fluoro-edenite? Is that green gemmy mineral, olivine or forsterite or peridot? And is that pink, fluorescent mineral, manganocalcite or manganooan calcite or manganiferous calcite or _____?

Dr. Pete Modreski is a longtime mineral collector, since college days at least. He has a B.A. in Chemistry (Rutgers, 1968) and an M.S. and Ph.D. in Geochemistry from Penn State (1971, 1972). After some years in the USAF and at Sandia National Laboratory, he worked for the U.S. Geological Survey from 1979 onward, ultimately retiring at the beginning of October, 2020, after 41 years. Pete has conducted many classes and presentations about minerals for science educators, school groups, rockhounds, and professional societies. He is the "Mineralogical Technical" and "Fluorescence Technical" chair for the RMFMS. Pete was a coauthor of "Minerals of Colorado" (1997). For many years, he has given an annual presentation at the Denver Gem and Mineral Show on "Starting a Mineral Collection". Pete thinks that almost any kind of rock or mineral is "cool", but especially, pegmatites, volcanic rocks, kimberlites,



Dr. Pete Modreski, speaker at our May 13th club meeting

carbonatites, conglomerates, and orbicular and rapakivi granites, and he thinks that there is nothing more fun in the world than understanding the chemistry of minerals. If asked to name his favorite mineral, he might choose tourmaline.

The meeting will be on Zoom, beginning at 7:00 pm on May 13. The Zoom link will be sent to members the day before the meeting. If this is your first-time using Zoom, see page 13 for tips and suggestions.

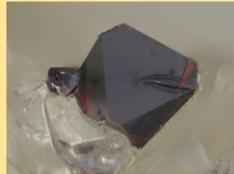
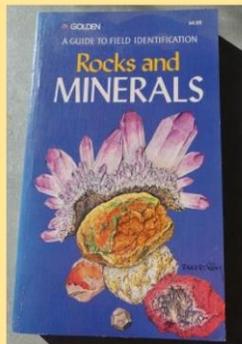
Why are minerals so complicated?

(have they gotten worse withtime??)

Dr. Pete Modreski, Flatirons Mineral Club, May 13, 2021



*Pyrite FeS₂
isometric*



*Hydroxylmanganopyrochlore
(Mn²⁺, Th, Na, Ca, REE)₂(Nb, Ti)₂O₆(OH)
isometric
Laacher See, Germany ~1 mm
Mindat© StephanWolfsried*

Field Trips!

With warm weather on the way and COVID restrictions relaxing, all of us cannot wait to get out on field trips. Here is information about club field trips already planned. Signups for these trips will be posted on the club's website (<https://flatironsmineralclub.org/>) in the next few weeks. And, there will be more on the way. Also, be sure to read our Field Trip Code of Ethics (page 6) and the article on field trip safety (page 7), guidelines for collecting etiquette and safety for all of your field trips this summer.

Club Field Trips 2021

Book Cliffs (Grand Junction, Colorado) and Yellow Cat Flats (Utah) June 5-6

Barite, calcite, jasper, fossil wood, and agate

The trip begins at the Book Cliffs site late Saturday morning and spend a few hours searching for barite and calcite. That afternoon, we will proceed to Yellow Cat, where we will find fossil wood, jasper pseudomorphs after barite, agate. We will be camping in an area on Saturday night and continue to collect on Sunday before leaving for home.



Calcite from the Book Cliffs



Yellow Cat jasper, fossil wood, and other minerals



A nice specimen of petrified wood found at Yellow Cat

Kremmling, Colorado

June 12

Fossils

During the late Cretaceous when much of Colorado was covered by the Western Interior Seaway, the Pierre Shale outcrops found northwest of Kremmling were deposited. The fossils now found in this area show that a teeming

community of marine animals once thrived in this part of Colorado. In the morning, we will visit the protected (no collecting) Kremmling Cretaceous Ammonite Locality to see the molds of giant ammonites up to 3 feet in diameter. After lunch, we will travel outside the protected area to collect fossil clams, ammonites, snails and other marine animals.



Large ammonite molds at Kremmling



Several large *Inoceramus* clam fossils collected at Kremmling

Hartsel, Colorado

July 17

Blue Barite

Hartsel in South Park is known for its blue barite. Join us as we collect these beautiful crystals.

Jamestown

July - date to be announced soon

Fluorite, gold and silver ore

We will visit one of several claims to collect fluorite, plus gold and silver ore.



Area near Hartsel where blue barite is found.



Silver ore (left) and fluorite (right) from Jamestown



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Gold Panning near Ward

August - date will be announced soon

Learn how to placer mine for gold on a claim in Boulder County. Perhaps, you find a nice gold nugget.



Happy club gold panners

Crawford, Nebraska

October 2-3

Agates, petrified wood, and fluorescent agate and chalcedony

Hunting for Fairburn, prairie, picture, and blue agates, and petrified wood. Saturday evening collecting fluorescent agates and chalcedony using ultraviolet lamps.



© Earth Extractions, LLC



© Earth Extractions, LLC

Fluorescent agate and calcedony from Crawford

Field Trip Code of Ethics

A large measure of the enjoyment of our hobby is collecting in the field. For this reason, the American Federation of Mineralogical Societies of which our club is a member is proud to endorse the following Code of Ethics. This Code of Ethics helps guide our members as they participate on both club field trips and their own personal collecting activities. By following these guidelines, both private and public lands can remain open to collecting.



- I will respect both private and public property and will do no collecting on privately owned land without permission from the owner.
- I will keep informed on all laws, regulations or rules governing collecting on public lands and will observe them.
- I will, to the best of my ability, ascertain the boundary lines of property on which I plan to collect.
- I will use no firearms or blasting material in collecting areas.
- I will cause no willful damage to property of any kind such as fences, signs, buildings, etc.
- I will leave all gates as found.
- I will build fires only in designated or safe places and will be certain they are completely extinguished before leaving the area.
- I will discard no burning material - matches, cigarettes, etc.
- I will fill all excavation holes which may be dangerous to livestock.
- I will not contaminate wells, creeks, or other water supplies.
- I will cause no willful damage to collecting material and will take home only what I can reasonably use.

- I will practice conservation and undertake to utilize fully and well the materials I have collected and will recycle my surplus for the pleasure and benefit of others.
- I will support the rockhound project H.E.L.P. (Help Eliminate Litter Please) and will leave all collecting areas devoid of litter, regardless of how found.
- I will cooperate with field-trip leaders and those in designated authority in all collecting areas.
- I will report to my club or federation officers, Bureau of Land Management or other authorities, any deposit of petrified wood or other materials on public lands which should be protected for the enjoyment of future generations for public educational and scientific purposes.
- I will appreciate and protect our heritage of natural resources.
- I will observe the "Golden Rule", will use Good Outdoor Manners and will at all times conduct myself in a manner which will add to the stature and Public Image of Rockhounds everywhere.

Field Trip Safety

As field trip season gets underway, we need to be mindful of safety in the field. Most of us really enjoy collecting in the field, but we all want to come back safely to enjoy our finds.

Bill Klose, Safety Chairman of the Eastern Federation of Mineralogical Societies, published these safety tips in the June 2001 *EFMLS News*.

- Never go on a Field Trip alone. Have someone along who can help, or summon help if necessary. Make sure someone knows where you went and when to expect you back. Carry a cell phone to expedite communications.
- Should there be children, have the child within seeing and talking distance. A child not only could get lost, but could encounter a snake, scorpion, etc., or have an accident of some sort.
- Do not collect directly above or underneath people where there might be danger of falling rock.
- Park so that all cars can get out. Do not block the roadway.
- Should you leave the field trip early, notify the person in charge.
- Make sure all fires are out and wet down with water or smothered with dirt completely.
- Break all matches in fingers before discarding, and be careful where they are thrown.
- Break any cigarette before discarding and then crush it on the bare ground.
- Do not throw rocks, and do not allow children to do so.
- Avoid old mine tunnels. Never go into a mine alone. Carry a flashlight and a candle. Carbon dioxide or other gases may be present. There may even be a lack of oxygen. Mines are also havens for snakes, scorpions, spiders, rodents and their feces, etc. Mines also may have uncovered deep shafts and pits.
- Respect property rights and signs. Obtain permission to enter property if owned by private persons or company owned. Attend Company safety briefings and sign releases if required. Pay attention to and practice Company safety policies.
- Inquire if there are vicious animals in the fields.
- Never walk or drive RVs like 4 wheelers on newly planted or cultivated fields without special permission.
- Be extremely cautious when hunting near abandoned buildings. You may stumble into a deep well or cesspool not properly covered.
- Refill any deep hole you dig, so people or animals might not fall in. Do not dump dirt and other debris into streams.



Be safe in the field - Follow all safety signs

- Respect another's diggings. If a person has left for lunch or for any reason with the intention of returning, and has left a pick, coat, or definite marker, find another place.
- Leave any place in good condition. Don't leave papers, cans, etc. lying around to mar the beauty of the place, and to tell others you have been there.
- Close all gates you may have opened.
- Never eat wild berries or anything else unless you are absolutely sure they are safe. Carry bottled water and do not drink from streams or wells that have not been recently tested.
- Be able to recognize poison ivy, poison oak, etc. Should there be any doubt, don't touch!
- Always be alert for snakes, scorpions, ticks, spiders, rodent infestations, etc. Be very cautious where you put your feet and hands.
- Do not over exert or stay in the direct sunlight or heat too long. Take a rest in the shade from time to time and drink plenty of fluids.
- Properly wear appropriate safety equipment, sunscreen, and clothing.
- Bring and use the appropriate well maintained and inspected tools. Don't expect others to provide tools for you.
- Have your vehicle in proper working order with appropriate emergency supplies and equipment.
- Use proper lifting and carrying techniques to bring home your finds. Do not overload your vehicle.

Junior Geologists Activities

Collecting Badge

Jr. Geologists, along with most of the rest of us, love to collect rocks, minerals, and fossils. At our online April meeting, the juniors showcased some of the best in their collections. In addition, they set up displays of their specimens with labels, as they earned the Collecting Badge.



Connel's *Spinosaurus* tooth



Fossils in Connel's collection



Some of Charlotte's fossils and

Gold Panning and Prospecting Badge

The Jr. Geologists enjoyed last month's field trip to the Hidee Mine outside of Central City. As they toured the mine, learned about Colorado's mining history, and tried their hand at gold panning, they earned the Gold Panning and Prospecting Badge. See page 10 for more about this field trip.



Fossils at the May Meeting

At last, we were able to hold our first in-person meeting since last summer learning more about fossils. We put together a geologic timeline to get a better idea about what ancient animals and plants lived when. We learned about the different types of fossils and how fossils form. The highlight was identifying different types of fossils that we got to take home.

Aubrianna earns the Rockhound Award

When a Jr. Geologist earns six badges, she or he earns the Rockhound Award. Since the badge program started over 16 years ago, fewer than 30 juniors in Colorado have earned this badge. Aubrianna becomes the latest Jr. Geologist to receive this award after she earned the Gold Panning and Prospecting Badge at the Hidee Mine field trip. Congratulations to Aubrianna for her efforts.



Coming Next Month: Geodes

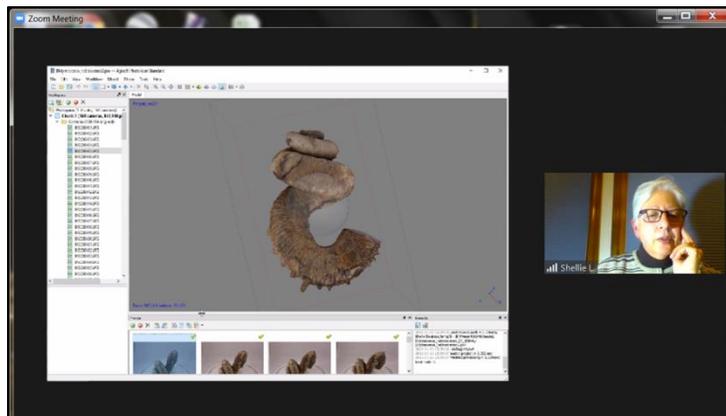
Saturday, June 5, will be our next in-person Jr. Geologists meeting, starting at 2 pm. Howard Gordon will teach us about geodes - the different types, how they are formed, and where they can be found. Plus, everyone will get to take home a geode for their collections.

Geodes, the theme for June's Jr. Geologists meeting
 Credit: James Petts, licensed under the [Creative Commons Attribution-Share Alike 2.0 Generic](#)

March and April Club Meetings

Although we cannot meet in person, we still are able to get together on Zoom once a month. Jean Orr continues to schedule outstanding speakers for our meeting. In case you missed them, here are brief summaries of our programs for March and April.

Our speaker for March was Shellie Luallin, who explained how 3D images of fossils and minerals are created and how these are used by both scientists and collectors. These images viewers to rotate specimens on their computer screens to see it from any angle. You can also zoom in on the specimen to see more detail. To see some of the beautiful fossil images that Shellie has created, see <https://sketchfab.com/Paleogirl>.



Shellie Luallin explains how she creates 3D images like this *Didymoceras nebrascense* ammonite

April's meeting featured Gerry Naugle, discussing meteorites and what they tell us about our solar system. Gerry explained the differences between the three categories of meteorites - stony, iron, and stony iron - and showed examples of each. In addition, his talk included some of the most interesting meteorites found in Colorado, the United States, and around the world.



Gerry Naugle shows a meteorite from Meteor Crater, Arizona

Our First Field Trip of the Year: the Hidee Gold Mine

Brian Walko

It takes a lot of effort to plan a club field trip. First, one needs to find an interesting place to visit. Next there is the coordination with the mine/claim owner to pick a date. Then the club members must be notified in the hope we get enough people to attend. This all came together and FMC's first field trip of the season on April 10 was quite a success. The owners of the Hidee Gold Mine were excellent in hosting our group. We had 17 adults and 13 Junior Geologists. The Hidee Gold Mine, originally call the Pittsburg Mine was founded in 1896 and was worked until 1947. The mine produced 55,000 ounces of gold, 109,000 ounces of silver and 2.2 million pounds of copper. In 1981 the Hidee Gold Mine became a tour mine.

Our field trip participants were split into two groups. We were given hardhats and gathered for a safety briefing before heading underground.





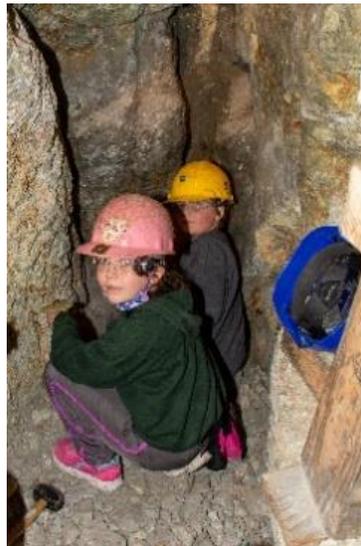
The first stop was gold panning. The other group went farther into the mine to the gold vein.



After gold panning, our tour guide explained the local geology and mining methods.



The highlight of the tour was hammering and chiseling at a pyritic gold vein for a sample of gold ore.



It was a great trip and the group gained an appreciation for underground mining. And each Junior Geologists earned the Gold Panning and Prospecting Badges at this trip.

In Memoriam

Nadia Maxwell

FMC member Nadia D. Maxwell, 90, passed away recently and she will be missed by the club. Nadia was a fixture at nearly all of the club Silent Auctions in recent years as a seller and as a buyer mainly of lapidary and jewelry items, which were her main interests. She helped at our annual shows, working in the kids' area. We will miss not seeing her at our monthly club meetings.

A native of North Dakota, Nadia moved to the Boulder area from California about 10 years ago. In earlier years with equipment, she had created a lot of lapidary and jewelry at the expert-level of skill. She is survived by active FMC member Mary Maxwell.



Nadia (right) wearing a pendant she made, with Mary (left) and another family member at the club holiday party in 2019



Connie Hauser

Consuelo (Connie) Hauser died December 29, 2020 in Louisville, Colorado at the age of 91. She was very active in the club during the 1990s, serving on the board and leading field trips. Minerals were her passion and she assembled an extensive collection over the years. Many of these specimens have been donated to the club to support the Jr. Geologists and other programs.

A civil engineer, she held the distinction of being the first woman to receive an engineering degree from Yale University. Connie married her college sweetheart, Ray Hauser, in Norristown, Pennsylvania in 1951. They moved to Colorado in 1954 to pursue their graduate degrees in engineering at the University of Colorado. She had a long career as an engineer in Colorado and retired in 1989. Interested in ghost towns and outhouses, Connie enjoyed the outdoors and was an avid camper and backpacker. She took her kids and grandchildren on multiple rock expeditions and visited many National Parks. Her sense of humor is reflected in the name she gave her Jeep, "Outhauser".

FMC Scholarship Recipient

In 1991, FMC member Paul Ralston had a dream to give an annual scholarship to support earth science college students attending a Colorado university or college with tuition and other expenses. He fulfilled this dream by setting up a special fund for these scholarships, supported by the sale of grab bags and donations from club members. This is the 30th year of the FMC Scholarships.

This year's recipient is junior Jack Henry, who will receive \$1,000 this next school year as he continues his undergraduate work at the Colorado School of Mines. His area of concentration is in Extraterrestrial Fluvial Fans, in collaboration with other research geologists. Most recently, this project has been studying the future NASA rover landing site on the Jezero Crater Fan on Mars.

In the spring of 2020, Jack was awarded 1st place as an undergraduate presenter for this research at the Student Research Fair at Mines. Jack is a current member of the CSM Dean's List and Honor Roll societies. Jack is also an active member of the American Geophysical Union (AGU), and the American Association of Petroleum Geologists, (AAPG). As you can see, Jack Henry is a busy young man and the club wishes him the best regards in the completion of his undergraduate work at CSM.

Club Member Bruce Skelton Mineral Sale, May 7 and 8

Bruce will be selling minerals and other specimens at the Town of Superior's garage sale on May 7th and 8th, 8 am-2 pm. He is trying to reduce his tonnage of mineral specimens dramatically. Colorado, US, and world material and specimens, cabbing and faceting rough, micromounts, Rock & Gem magazines, a couple of small display cases, and even some cut gemstones will be on sale. There will be free rocks for kids, too.

FMC Virtual Meetings on Zoom: How to Participate.

The 7:00 PM meeting on May 14, will be a virtual meeting presented over **Zoom**. Try to join by 6:55 PM using a URL link to be emailed to you before the meeting. Seasoned Zoom veterans will know what to do.

If you are a Zoom novice, this summary with video links gets you started. Zoom allows a Host presenter who controls the roles of other **Participants**. As a novice, allow yourself a *minimum* of 15 minutes to set up before the time of the presentation. (It could take less, but be pessimistic.) These short videos describe what you will do - the same basic information presented three different ways. *Watch them well before the meeting:*

<https://support.zoom.us/hc/en-us/articles/201362193> 'Joining a Zoom meeting.' 1.09 min.

<https://www.youtube.com/watch?v=6fIYWnfTc5o> 'Joining a Zoom meeting for the first time – A cozy step-by-step guide.' 6.08 min.

<https://www.youtube.com/watch?v=NIYudDeULLw> 'How to join a Zoom meeting for the first time.' 2.26 min.

These videos are for laptops versions (Windows or Mac) and explain a Zoom download and install if required. The link you will receive also works for your iPad or Smartphone, but with some screen variations. Download & install the Zoom App ahead of time

The many on-line guides and videos mainly address the Host function rather than the Participant function. Participants can reset various options including their background image, but this is beyond the scope of this introduction. Controls/options may be frustratingly hidden by default until you hover the mouse over the bottom edge of the screen. At top right of the default screen, as a participant you can toggle between **Speaker** and a **Gallery** of the participants - see this link: <https://support.zoom.us/hc/en-us/articles/201362323-How-Do-I-Change-The-Video-Layout->

Enjoy, and smile for the camera!

Theft from the Last Chance Mine in Creede

Jack Morris, owner of the Last Chance Mine, has asked for assistance in returning material stolen from the mine this past year. If anyone has approached you attempting to sell pieces, please contact Jack immediately at 719-238-7959. Jack is also offering a \$1,000 reward for the return or for information leading to recovery of amethyst stolen June, 2020.

Quiz Answers: Colorado's State Rock, Mineral, Gem, and Fossil

Charlotte, one of our Jr. Geologists, provided these answers to the quiz questions.

1. *What is Colorado's state mineral?* Rhodochrosite is Colorado's state mineral. It was made the state mineral when Colorado announced they produced the best quality rhodochrosite.
2. *What is Colorado's state rock?* Colorado's state rock is Yule marble. It was made the state rock in 2004 after a Girl Scout troop in Lakewood signed a petition.
3. *What is Colorado's state gemstone?* The Colorado state gem is aquamarine. It was made the state mineral in 1971. It is mined on Mt. Antero. Here is a video about mining aquamarine on Mt. Antero:
<https://youtu.be/h9su-BssTo8>.



Colorado's State Mineral, Rock, and Gemstone

Rhodochrosite (left), from the Sweet Home Mine, Colorado. Credit: Eric Hunt, licensed under the [Creative Commons Attribution-Share Alike 2.5 Generic](#)

Yule marble from Colorado (middle) was used for the exterior of the Lincoln Memorial. Credit: Carol M. Highsmith, public domain

Aquamarine (right) found in a pocket on Mt. Antero. This cut stone weighs 6.90 ct. Credit: Steve Green, licensed under the [Creative Commons Attribution-Share Alike 4.0 International](#)

Adler, another Jr. Geologist, provided the answer to the fourth quiz question.

4. *What is Colorado's state fossil?* *Stegosaurus* means "roofed lizard" or "covered lizard". It was a large herbivorous dinosaur that lived in the area now called Colorado about 150 million years ago (mid-Jurassic to the late Cretaceous period). It is the Colorado state fossil because the first *Stegosaurus* was found about 15 miles from Denver in the town of Morrison, Colorado, in 1876 by M.P. Felch. It was officially named *Stegosaurus* in 1877, by Othniel C. Marsh. *Stegosaurus* was designated the state fossil by several leading paleontologists and geologists in 1982.



Skeleton of *Stegosaurus unguatus* in the Carnegie Museum of Natural History, Pittsburgh, Pennsylvania.

Credit: Perry Quan, licensed under the [Creative Commons Attribution-Share Alike 2.0 Generic](#)

Fossils in the News - *T. rex* Edition

Dennis Gertenbach

Several new *Tyrannosaurus rex* discoveries have been announced over the past few months. In recognition of these new additions to science, this month's Fossils in the News is dedicated to *T. rex*, among the favorites of most dinosaur lovers.

Boulder 8th Grader Discovers *T. Rex* Tooth

Eighth grader Jonathan Charpentier was hiking in southeast Boulder County, when a shiny rock caught his eye. He picked it up and took it home. When he washed it off, he recognized that it was not just an ordinary rock. So, he sent an email to the Denver Museum of Nature and Science about his find. DMNS dinosaur curator Joe Sertich realized that the student's discovery was a *T. rex* tooth, which Jonathan turned over to the museum. The find will most likely kick off a new research dig to try and discover more dinosaur bones in the area. As Charpentier told CBS4 News, "Be on the lookout for these things, because you can really find them anywhere."



A *Tyrannosaurus rex* tooth from the Late Cretaceous Hell Creek Formation.

Dinosaurs replaced worn teeth by shedding them continuously, so a single *T. rex* may have shed hundreds or even thousands of teeth during its lifetime. Credit: Rhonda Fore, licensed under the [Creative Commons Attribution 2.0 Generic](#)

Information from <https://denver.cbslocal.com/2021/03/31/jonathan-charpentier-trex-tooth-boulder-county/>

Did *T. rex* Hunt in Packs?

Although there has been some indication - mostly from footprints - that groups of tyrannosaurs hunted together, most paleontologists believe that they were solitary hunters. However, a recent discovery from a site at Grand



Staircase-Escalante National Monument in southern Utah is changing that thinking. Fossils from a family of drowned tyrannosaurs suggest these giants formed groups that hunted in packs. Five tyrannosaur skeletons of the genus *Teratophoneus* were unearthed. Based on their sizes, the group was composed of one adult, one subadult, and three juveniles. Stable isotope analysis showed that these five dinosaurs died and were fossilized at the same time, suggesting that they were caught in a flood while hunting together.

Did *T. rex* hunt in packs like these two, or were they hunt along? Credit: 1Ado123 licensed under the [Creative Commons Attribution-Share Alike 4.0 International](#)

Staircase-Escalante National Monument

in southern Utah is changing that thinking. Fossils from a family of drowned tyrannosaurs suggest these giants formed groups that hunted in packs. Five tyrannosaur skeletons of the genus *Teratophoneus* were unearthed. Based on their sizes, the group was composed of one adult, one subadult, and three juveniles. Stable isotope analysis showed that these five dinosaurs died and were fossilized at the same time, suggesting that they were caught in a flood while hunting together.

Although some large predators such as wolves, orcas, and lions, hunt in groups, they are mostly solitary hunters. Among the dinosaurs' closest living relatives, such as birds and crocodiles, collaborative hunting is quite rare. Further fossil evidence is needed to confirm that tyrannosaurs actually hunted in groups, rather than just being caught in the same catastrophic event.

Information from <https://www.newscientist.com/article/2275060-tyrannosaurs-may-have-hunted-together-in-packs-like-wolves/#ixzz6sjAnYOoz>

How Fast Did *T. Rex* Walk?

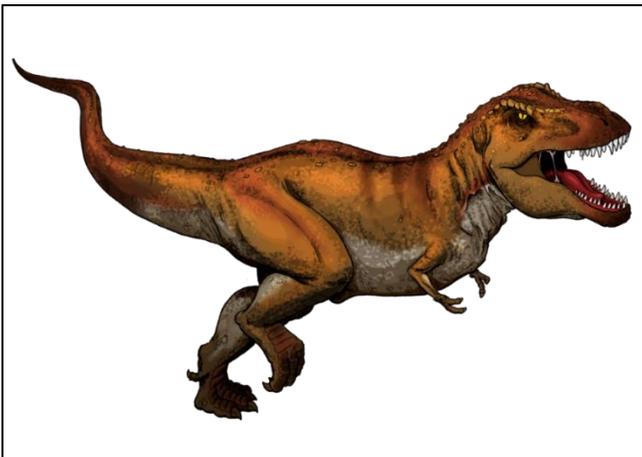
Those who have watched the Jurassic Park/World movies have seen *T. rex* chasing a speeding vehicle through the jungle. Based on the spacing of *T. rex* tracks and the size of their legs, paleontologists previously calculated that this dinosaur had a walking speed of 4½ to almost 7 miles an hour, and could reach speeds of up to 30 miles an hour.

A new study by Dutch researchers, using computer 3D reconstructions of a *T. rex* tail, came up with a very different estimate of the walking speed of this dinosaur. Their research indicates that this predator walked at just under 3 miles an hour. As the animal walked, its tail bounced up and down as it was suspended in the air, providing much of the force that moved *T. rex* forward. This motion, combined with track measurements, indicated that *T. rex* was moving at 2.86 miles per hour. The researchers plan to use this technique to calculate how fast *T. rex* could have run.

Information from https://www.smithsonianmag.com/smart-news/new-study-finds-that-t-rex-walked-at-slow-pace-of-3-miles-per-hour-180977572/?utm_source=smithsoniandaily&utm_medium=email&utm_campaign=20210423-daily-responsive&spMailingID=44858469&spUserID=NzEwMTQ4NzQ2NTg1S0&spJobID=1983845947&spReportId=MTk4Mzg0NTk0NwS2



To calculate how the tail propelled the *T. rex*, the researchers scanned and modeled an adult *T. rex* specimen at the Naturalis Biodiversity Center in Leiden known as "Trix," pictured here. Credit: Rique, licensed under the [Creative Commons Attribution-Share Alike 4.0 International](https://creativecommons.org/licenses/by-sa/4.0/)



Tyrannosaurus rex lived throughout what is now western North America, at the time an island continent termed Laramidia. Credit:

myfavoritedinosaur.com and LadyofHats, licensed under the [Creative Commons Attribution 3.0 Unported](https://creativecommons.org/licenses/by-sa/4.0/)

[180977529/#:~:text=By%20using%20approximations%20of%20the,Charles%20R.](https://www.smithsonianmag.com/smart-news/scientists-estimate-25-billion-total-tyrannosaurus-rex-roamed-earth-180977529/#:~:text=By%20using%20approximations%20of%20the,Charles%20R.)

How Many *T. rex* Roamed on Earth?

With the relative scarcity of *T. rex* fossil skeletons discovered to date (about 100 are known), one would expect that these dinosaurs were fairly rare. A new study reviewed all of the *T. rex* research over the past two decades and determined that if one landed in ancient Montana about 67 million years ago, on average the closest *T. rex* would be 15 miles away. *T. rex* fossils have been found from Alaska to Mexico, which equates to about 20,000 *T. rex*s alive on Earth at any one time.

T. rex was on Earth for 2.4 million years, implying that 2.5 billion *T. rex*s lived on our planet. Although only a tiny fraction of animals is preserved as fossils (nearly all are eaten by predators and/or decompose), there should be lots more *T. rex* fossils for future paleontologists to find.

Information from [https://www.smithsonianmag.com/smart-news/scientists-estimate-25-billion-total-tyrannosaurus-rex-roamed-earth-](https://www.smithsonianmag.com/smart-news/scientists-estimate-25-billion-total-tyrannosaurus-rex-roamed-earth-180977529/#:~:text=By%20using%20approximations%20of%20the,Charles%20R.)

Come to the Combined RMFMS and AFMS Meeting

The Sublette County Rock Hounds are hosting the combined American Federation of Mineralogical Societies (AFMS) and Rocky Mountain Federation of Mineralogical Societies (RMFMS) Conventions on June 17-20, 2021, in Big Piney, Wyoming. That's practically right in our backyard! The show features some of the best exhibits in the country, plus field trips before and after the show. It is a great place to meet with other rockhounds from across the nation.

The convention is at the Sublette County Fairgrounds, conveniently located near other towns, tourist destinations, rock hunting, fishing, museums, Fossil Butte National Monument, Grand Teton and Yellowstone National Parks, and major airports. Wyoming is a great place to explore and find some wonderful rocks!

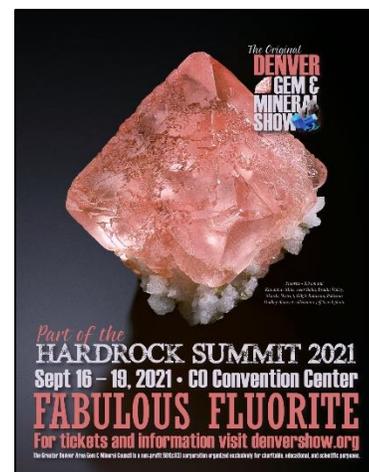


For more information about the show, including lodging options, please download a convention packet at <https://rmfms.org/uploads/conferences/2021/2021%20RMFMS%20Convention%20Packet.pdf>.

Denver Show Update

We are pleased to announce that the Denver Gem & Mineral Show has an agreement to be part of the exciting new Hardrock Summit 2021. The 4-day show will be held at the Colorado Convention Center September 16-19, 2021.

Everything will be scaled back for this year, but the Summit organizers have generously made room for us to have exhibits, dealers, speakers, and demos. The American Gem Trade Association (AGTA) will also host an overlapping 4-day show under the same umbrella.



Fabulous Fluorite, the Original Denver Gem & Mineral Show, AGTA, and the Hardrock Summit are going to blow your mind!

Other Rockhounding Events and Activities in the Area

If you plan to attend any of these, please check their websites for the latest updates before you go.

- **Friday-Sunday, May 21-23**, is the **Colorado Mineral and Fossil Denver Spring Show** at the Crowne Plaza Denver Airport Convention Center, 15500 E 40th Ave in Denver. 86,000 square feet of indoor and outdoor shopping. <https://www.rmgmpromotions.com/>



Crowne Plaza Hotel and Convention Center
15500 E. 40th Avenue
Denver, Colorado, 80236

**86000 SQUARE FEET
OF INDOOR AND
OUTDOOR SHOPPING
SPACE!**

To ensure a safe and enjoyable show,
face masks are required by all
attending.

Join us for a great show!



- **Western Museum of Mining and Industry** in Colorado Springs. See <https://wmmi.org/> for more information about these activities.
 - **Regular Hours have returned!** Museum Hours are MONDAY - SATURDAY from 9 am to 4 pm. Tickets may be purchased online or at the door.
 - **Tuesday, May 11** at 4:00 pm is the next monthly lecture. Kaitlyn McCann is the speaker with a fascinating discussion of **Egyptian Mining: its history, techniques and impact**. Call to reserve your space. \$5.00 general admission and FREE for Museum Members. 719-488-0880
- **Saturday, May 15** from 9:30 am to noon is a **Walk with a Geologist at Dinosaur Ridge**. Take a 2.5-hour walking tour of Dinosaur Ridge and discuss the Denver area's changing geology. \$15 per person; registration is required. More information is available at <https://dinoridge.org/walk-with-a-scientist-guided-walking-tours/>.



**WESTERN MUSEUM OF
MINING & INDUSTRY**

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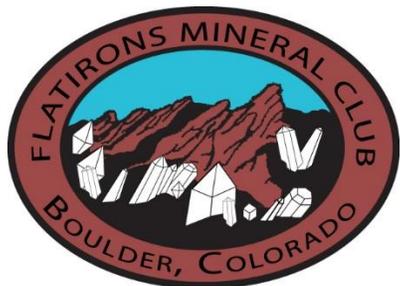
Other Show Committee Members

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accatino@colorado.edu

Denver Show Club Table

open

Practice social distancing
Wear a mask in public
Be Safe
Stay Healthy!



Flatirons Mineral Club

P.O. Box 3331
Boulder, CO 80307

2021 Ballot for FMC / RMFMS / AFMS 'Rockhound of the Year'

The club membership each year honors an active member or a husband-and-wife team who have dedicated substantial time during the past year promoting and furthering Flatirons Mineral Club activities, goals, and the club's Mission Statement.

Since inception of this program in 2002, the annual FMC recipients have been: Charlotte Morrison (2002), Paul & Martha Ralston (2003), Ray & Dorothy Horton (2004), John & Jeanne Hurst (2005), Ray & Joyce Gilbert (2006), Chuck & Jan Buda (2007), Cory Olin co-tie with Hallie & Dot Cook (2008), Shaula Lee (2009), Anita Colin co-tie with Gabi Accatino (2010), Mel & Charlotte Bourg (2011), Deborah Knox (2012), Ed Raines & Silvia Pettem (2013), Mike Smith (2014), Tally O'Donnell (2015), Dennis Gertenbach (2016), Trick Runions (2017), Jean Orr (2018), Craig Hazelton (2019), and Brian Walko in 2020.

Please list your 2021 nominee below. You can also vote by electronic means. All voting information is confidential and is tallied and is then erased or shredded by Gerry Naugle. The FMC annual winners' names are sent to the RMFMS and AFMS offices for publication in their respective newsletters. Note: The annual FMC winner(s) are also inducted into the "FMC Hall of Fame" and their name(s) are engraved onto the club's HOF Plaque.

Your 2021 nomination is: _____

The person (or) persons should be honored because (brief summary):

Submitted by, please print _____

Please return this paper ballot to Gerry Naugle (use the letterhead address above) by July 10th or (easier), you can vote by leaving a message or text to: 303-591-2830 or by (easiest) sending an e-mail to: gnaugle@earthlink.net

Voting results will be announced at the 2021 annual club picnic at the Pavilion at Harlow Platts Park, 1496 Gillespie Drive in Boulder in August. The picnic starts at 11:00 am with grab bags, then lunch and the award. More information about the picnic will be available in the next newsletter.

Thanks for participating!



Flatirons Facets
P.O. Box 3331
Boulder, CO 80307-3331

First Class Mail

Upcoming Events

Date	Event	Location
Thursday, May 13, at 7:00 pm	Monthly club meeting featuring Pete Modreski with his program Why Are Minerals So Complicated? See page 3	Zoom
Saturday, June 5, at 2:00 pm	Jr. Geologists meeting on Geodes . See page 9	TBD
Saturday, June 5-6	Field trip to collect calcite, barite, agate, jasper, and petrified wood, page 4	Book Cliffs, Colorado, and Yellow Cat, Utah
Saturday, June 12	Field trip to see the giant ammonite casts and to collect fossils nearby, page 4	Kremmling, Colorado

Please check the club's website at <https://flatironsmineralclub.org/> for the status of these activities, as they may be canceled because of safe COVID-19 guidelines.