



Flatirons Facets

Flatirons Mineral Club of Boulder County, Colorado
Volume 64, Number 5
September-October, 2021



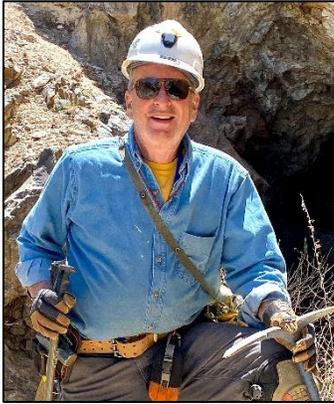
"Tiger iron" (folded jaspilite with chatoyancy quartz) from the Hamersley Range in Western Australia.

Banded Iron deposits, such as this "Tiger iron" from Australia, provide evidence of the rise of atmospheric oxygen levels on Precambrian Earth from some of the earliest life on our planet. Join us for our first in-person club meeting in over 18 months to learn more from Dana Hauschulz' presentation on "The Wreck of the Edmund Fitzgerald & Banded Iron Formation" on **Tuesday, October 12**, starting at 7:00 pm. See page 3 for more information about the meeting.

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President's Message

The Flatirons Mineral Club finished out July with a field trip to the Tyler Kentucky Lode claim where everyone found fluorite and silver. In August we had our annual club picnic, where we assembled grab bags for the Denver Gem & Mineral Show, awards were presented, and good camaraderie was shared by all.

Most importantly, the Club needs volunteers for our booth at the Denver Gem & Mineral Show, September 16–19. Please read below to find out more about these and future events.

Regards,
Brian Walko

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.



Volunteers Needed for Club Table at the Denver Gem & Mineral Show

We need volunteers for the club table at the Denver Gem and Mineral Show on September 16-19. Volunteers are required to work a minimum of 2 hours and will get free admission (admission will be \$10/day) to the Convention Center shows for that day and free parking in the parking garage (normally \$12 per day) adjacent to the Convention Center. An online volunteer sign up is located at the following link: <https://www.signupgenius.com/go/8050844ADA92BA2FF2-dgms>

The online volunteer signup is just to sign up for specific days and time assignments. If you can work only different hours on a certain day, you can add that to the notes when you sign up online.

If you have any questions, please contact Brian Walko, FMC President, at earthextractions@gmail.com or 303.931.4283.

The Denver Show is completely run by volunteers and also needs folks for other jobs at the show. Please see page 6 for a description of these volunteer jobs and how to sign up to help.

October Field Trips to Crawford, Nebraska - October 2-3



Hunting for Fairburn, prairie, picture, and blue agates, and petrified wood are the highlights of this trip. On Saturday evening, we will collect fluorescent agates and chalcedony using ultraviolet lamps. Log into the club webpage at <https://flatironsmineralclub.org/> to sign up for the trip.

Fluorescent agate and chalcedony from Crawford

In-Person Club Meetings Starting Tuesday, October 12 New Day - New Meeting Place



Magnetite-rich banded iron with quartz and serpentine from the Atlantic City Mine in Wyoming

Assuming the COVID infections do not escalate, we will be back with in-person club meetings starting Tuesday, October 12. For our first face-to-face meeting in over a year and a half, we will have Dana Hauschulz presenting “The Wreck of the Edmund Fitzgerald & Banded Iron Formation.” The Edmund Fitzgerald sank in 1975 carrying a load of iron ore made from a deposit of Banded Iron Formation (BIF) mined near Lake Superior. The talk diverges from the tragic sinking of an ore freighter to follow the geologic origins of BIF, only to find that an even greater tragedy resides buried in the rock record from over 2 billion years ago. Banded Iron Formation is found all around the world and is connected to the irreversible rise of oxygen in the atmosphere known as “The Great Oxidation Event.” The rise of oxygen led to an ice house “Snowball Earth” climate disaster. However, single cell carbon-based life survives, paving the way for the evolution of multicellular life, such as may be found listening to this story of double tragedy and genetic survival.

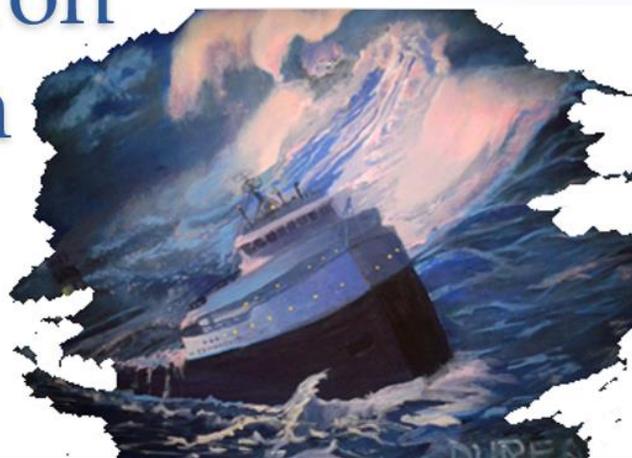
New Date: Club meetings will now be on the second Tuesday of each month, starting at 7:00 pm.

New Location: We will be meeting at Mountain View United Methodist Church, 355 Ponca Place in Boulder (right across the street from Frasier Meadows, our previous meeting place). Enter the building from the south side.

The Wreck of the Edmund Fitzgerald & Banded Iron Formation

- *Flatirons Mineral*
- *Club*

- October 12, 2020
- Damon Hauschulz
- Dana.Hauschulz@Colorado.edu



Where in Colorado?

This newsletter kicks off a new column, testing your knowledge of geological features in Colorado.



This photo shows an historic structure installed along cliffs of Jurassic Wingate Sandstone above a river. Where in Colorado is this? See page 13 for the answer.

Jr. Geologists Activities

At last month's club picnic, the Jr. Geologists completed the requirements for the Maps Badge. They learned about different types of maps, including topographic and geologic maps, and what information we can learn from these maps. Using a topographic map of the picnic area, they participated in a scavenger hunt, where they collected rock and fossil specimens for their collections.



In September, the Jr. Geologists are heading for the dinosaur quarry in Wyoming to learn about the different dinosaurs found at the quarry and collect belemnites and other fossils for their collections. We plan to begin in-person meetings in October.

If your family would like to join us and you are not on the Jr. Geologists' email list, please contact Dennis at gertenbach1@gmail.com to have your name added.

Learning about topographic maps. Credit: Brian Walko

Denver Gem & Mineral Show - September 16-19

The 2021 Denver Gem & Mineral Show is right around the corner and it's shaping up to be quite the event.

The 2021 Denver Gem & Mineral Show (DGMS) in conjunction with the Hardrock Summit will be held at the Colorado Convention Center from **September 16-19, 2021**. The Hardrock Summit includes two downtown venues, the Convention Center and the Sheraton Downtown Denver Hotel. The new Evolution show (Sept 16-19) will be located at the Convention Center along with the DGMS and the shows will be **open to the public each day from 10:00am to 5:00pm**.

Visit hardrocksummit.com and denvershow.org for more details about this exciting new event and to purchase online tickets for \$10 per day (children under 12 years old have FREE admission).

Evolution will also have special exhibits including:

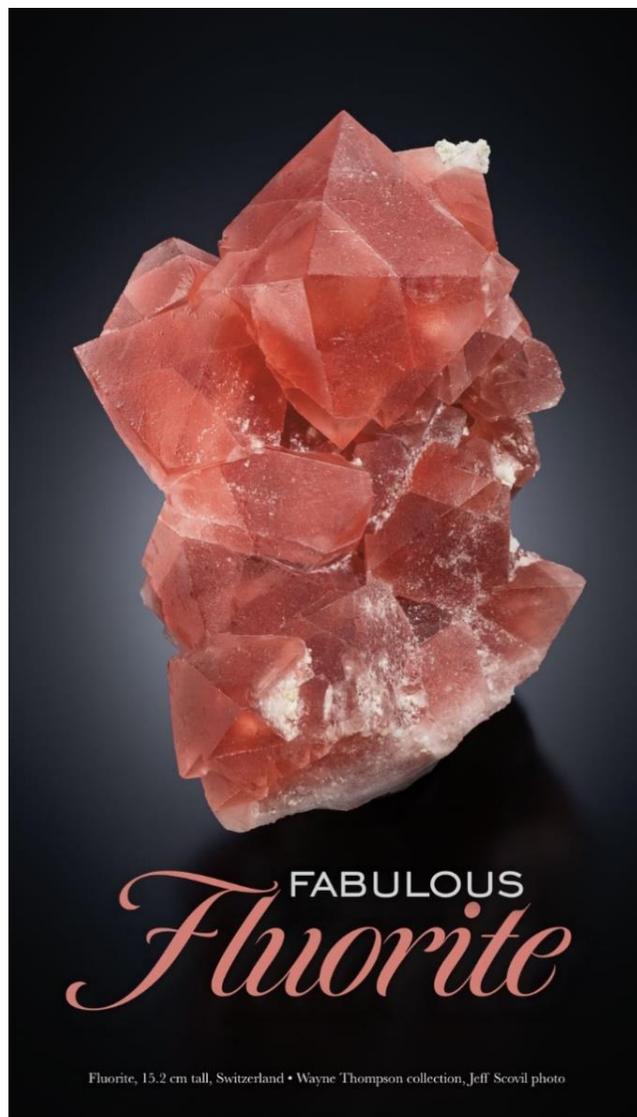
- Fabulous Fluorites (DGMS)
- Alma and its Treasures (the Rhodochrosite reunion)
- The incredible Trilliants of Gene Meieran
- The World's largest Martian meteorite
- The Meteorite Room
- <https://vimeo.com/525247321/5eaa896e11>
- The Hamlin Necklace

The Sparkle & Joy/AGTA/ICA Denver Show (Sept 18-21) will be at the Sheraton Hotel, and is a wholesale show, so you will not be unable to purchase anything from dealers if you do not have a business license, but you can still look at some fantastic jewelry. ***In addition, the world's largest topaz exhibit will be at the Sparkle and Joy Show.***

A free shuttle will go between the two venues. We are grateful for the opportunity to be part of the debut year of the Hardrock Summit, which is positioned to be Denver's premier gem, mineral, and fossil show.

The theme of the 2021 DGMS is ***Fabulous Fluorite***. The DGMS will occupy the space on the upper, entry level of the Convention Center. The DGMS 2021 show will include club tables, display exhibits, a kids' room, education exhibits, and 20+ dealers. Mr. Bones will be on hand for photo ops, and the new show will include perennial favorites like geode cracking by DeNatura (fee activity), as well as free gold panning, club demos, and our famous fluorescent room.

The convention center is just two blocks from the 16th street mall and is easily accessed by light rail (Theater District/Convention Center Station) and bus, and of course, you can walk, bike, or drive into our wonderful downtown. Make a day of it!



Volunteers Needed at the Denver Gem & Mineral Show

Volunteers are still needed for both the DGMS and Evolution Shows, especially the club tables (see page 2 to help at the Flatirons Mineral Club table). Here are the volunteer positions and descriptions for the Denver Gem & Mineral Show and Evolution Show.

- **Display Case Set-up and Tear Down** - 30 to 40 wooden display cases to put together and take down – Tuesday 10am-2pm and Sunday 5pm-9pm
- **Information Booth** – Sitting position to answer questions and direct people to shows. Thursday, Friday, Saturday, and Sunday 10am-5pm
- **Volunteer Sign-in Table** – Sitting position to sign in volunteers and hand out badges and work assignments. Thursday, Friday, Saturday, and Sunday 9am-5pm
- **Greeters/Provide Directions to Attendees** – Standing position to direct the public to the shows and provide information. Thursday, Friday, Saturday, and Sunday 10am-5pm
- **Dealer Unloading Drop-Off Area** – Direct dealers/exhibitors to drop-off and unloading area, direct and help dealers as needed, coordinate with union staff who will push carts and pallet jacks for dealers. Tuesday 10am-10pm, Wednesday 7am-10pm, Sunday 6pm-10pm, and Monday 10am- 5pm
- **Grab Bags/Pins/Posters** – Sell to attendees. Thursday, Friday, Saturday, and Sunday 10am-5pm
- **Fluorescent Room** - Answer questions. Thursday, Friday, Saturday, and Sunday 10am-5pm



Fluorite on orthoclase with quartz, 8.8 cm tall, from the Erongo Mountains, Namibia, John Lucking collection.
Credit: Jeff Scovil

An online volunteer signup is located at the following link: <https://www.signupgenius.com/go/4090D45A5AD2EA2F94-denver>. You can also contact Amber Brenzikofer at amberbrenzikofer@gmail.com to sign up. **Please sign up by September 9**, so we can get your badges printed. The online volunteer signup is just to sign up for specific days and assignments. Hours will be determined each day for each position next week. If there are only specific hours you can work on a certain day, you can add that to the notes when you sign up online.

If you have any questions, please contact Amber Brenzikofer, 2021 DGMS Chairperson, at amberbrenzikofer@gmail.com or 720-480-5234.

Member Name Tags

Would you like a Flatirons Mineral Club name tag to wear at club events and field trips? The club places orders for name tags several times a year for members.

If you would like a name tag, please log onto our website and choose the “Request a Name Tag” link in the Members Area. Add your name to the list as you want it to appear on your name tag, and it will be ordered for you. Your first name tag is free!



Example of a club name tag

Jamestown Field Trip Review

It was a beautiful Saturday for a field trip on July 17. Under the leadership of Brian Walko, club members went to the Jamestown area to collect fluorite, silver ore, lead ore, and quartz. Charlotte Small, one of our Jr. Geologists, provides this report of the trip. Following her report are photos from Brian Walko of the trip.

Fluorite

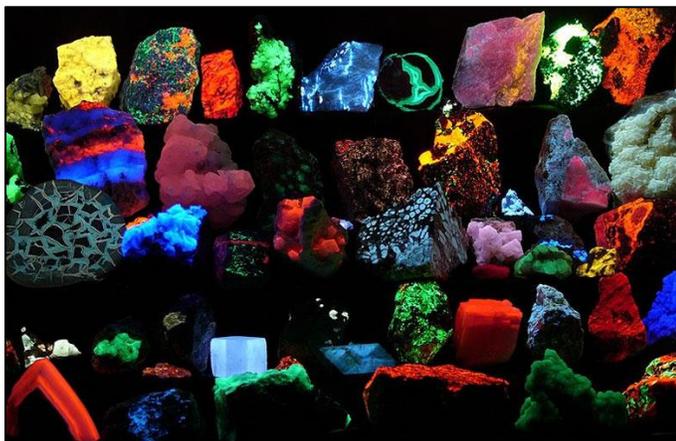
Charlotte Small, age 13

On July 17, we went to a place near Jamestown to collect purple and clear fluorite. We parked near the road, and Brian talked about what we will be collecting and safety hazards. Then we drove up a nearby dirt road. The 2-wheel drive and the low clearance vehicles headed off to park below. The high clearance and 4-wheel drive vehicles parked on top of a little hill. Immediately when I got out, I saw little purple rocks littering the ground. Those were the fluorite that Brian was talking about. We scattered around and started collecting. Near the middle of the trip, Brian offered to walk up to a silver vein (not valuable); it took quite a while to get there. The silver were big black heavy rocks, nothing like what I envisioned silver to look like. After that, we left for home. I got quite a lot of pieces of purple fluorite, some silver ore, and some tiny shards of clear, fluorescent fluorite.

Fluorite comes in many different colors. The most common are purple, blue, green, or yellow. The hardness is 4 and the cleavage is isometric, which has 4 points of cleavage. It also absorbs negative energy and reacts to ultraviolet light (see below), the streak is white, and it is used to make lenses. The lenses are used in microscopes and telescopes.

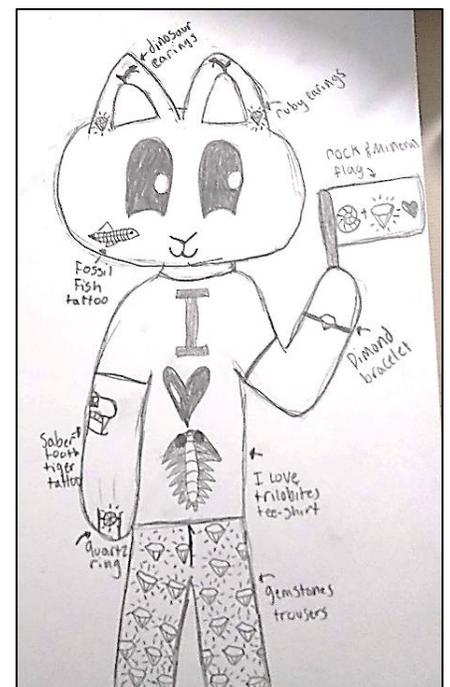


Purple fluorite and silver ore I collected on the trip.



Fluorescent minerals, including several fluorite specimens.
Credit: Hannes Grobe/AWI licensed under the [Creative Commons Attribution-Share Alike 2.5 Generic](https://creativecommons.org/licenses/by-sa/2.5/)

Editor's Note:
Charlotte is in 8th grade and a "Bunny Luvver" (right). She has been a Jr. Geologist for nearly 6 years.



Photos from the Jamestown Field Trip

Brian Walko



Searching for silver and fluorite specimens



Don and Henry Poe picking specimens on the ground (left)

Teddy and Justin work a vein of fluorite (right)



Teddy and Bernie show off their finds. (left)

Another nice pocket is found by Aubrey Wingo. (right)



Baculites

Adler Casson, age 11

Baculites are cephalopods, related to the modern-day squid, octopus, and nautilus. They lived in the mid to late Cretaceous period, but went extinct 66 million years ago.

What They Ate

Baculites ate mostly plankton, which were small enough for baculites to crush in their jaws. They would sometimes eat snails and crustaceans. They also had jaws adapted for eating small prey in the water.

Where You Can Find Them

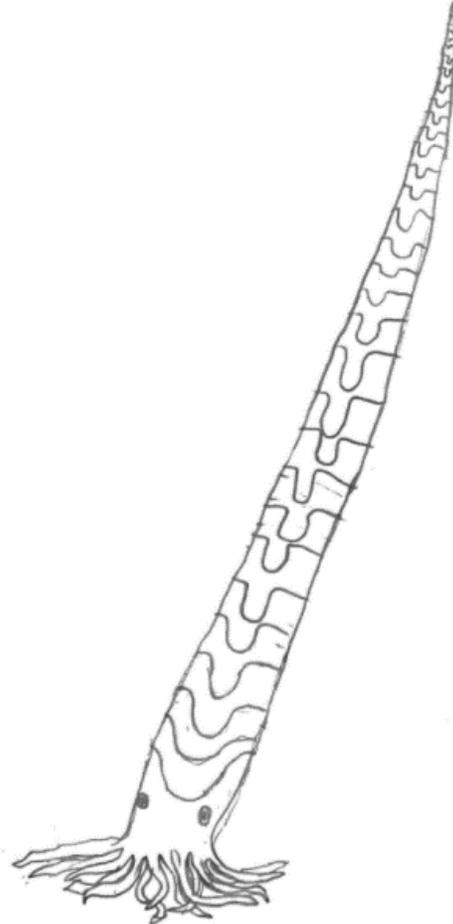
Baculites are commonly found in the Pierre Shale. A good site that I have gone to is Baculite Mesa. Baculite Mesa is in the Pierre Shale of Colorado on private land. (I went there on an organized field trip through WIPS). Another place I go is Kremmling.

When And Why Baculites Went Extinct

When the meteor named Chicxulub struck the earth and wiped out the dinosaurs, it created harsh conditions, such as cold temperatures, dust clouds, natural disasters such as volcanoes, tsunamis, fires, and huge earthquakes. Baculites were one of many species that went extinct. They went extinct 66 million years ago at the end of the Cretaceous period.

Predators

Baculites dined on mostly snails and plankton, but what ate them? Well, to answer that question, a huge reptilian creature called a mosasaur ate



Living baculite reconstruction by Adler Casson



Large baculite from the North American Museum of Ancient Life. Credit: Ninjatacoshell, licensed under the [Creative Commons Attribution-Share Alike 3.0 Unported](https://creativecommons.org/licenses/by-sa/3.0/)

them. Also, fossil evidence shows that some have been attacked by the beaks of other cephalopods.

Why I Find Them Interesting

I find baculites interesting because they are less known than ammonites, and it is more common to find fossils of baculites than ammonites. They are also my favorite fossil.

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Baculite fossils. Credit: DanielCD, [GNU Free Documentation License](#)

Editor's Note: Adler attends Casey Middle School. Baculites are his favorite fossils.

Kid Safety on Field Trips

Ellery Borow



Editor's Note: This article first appeared in the A.F.M. .S. Newsletter, Volume 70, Number 9, October, 2017. Ellery Borow was the AFMS Safety Chair that year.

Kid safety? Isn't kid safety the same as adult safety? Well, yes it is, more or less. And that is the crux of the matter — the "less" part that is. Kids are generally less — less experienced in matters of safety, less tall, less heavy, have smaller hands and overall, have smaller proportions than adults.

There are thus, some safety considerations when it comes to kid safety. Namely:

1. Some safety goggles are made of hard plastic or rubber. They do not easily conform to the smaller faces on kids. Solution: try using softer vinyl framed goggles which are flexible

Examples of different styles of safety glasses. Credit: DJSparky, licensed under the [Creative Commons Attribution-Share Alike 4.0 International](#).

enough to properly fit kid faces or smaller glasses especially made for kids. Goggles with elastic head bands can easily be adjusted to fit kids. If one is using safety glasses with side shields make sure the temples are sized to fit kids. One would find it uncomfortable to have safety glasses keep sliding down the nose every time one looked downward - and let's face it, looking downward is a large part of rock, mineral and fossil collecting.

2. Heavy-duty work gloves in either large, or sometimes medium size are easily found in most stores. Heavy-duty kid work gloves are not so easily found. Solution: try looking for ladies small-size heavy-duty gloves. Sometimes the more well stocked suppliers will have smaller, heavy-duty gloves.

3. Hard hats for kids? Sometimes I have seen the play hard hats, but never have I seen small-scale hard hats that meet all the various ANSI or OSHA specifications. Solution: check out the adjustability of the head band and suspension system. Some are more adjustable than others. Seek one that can be adjusted to fit smaller heads. The benefit is that a good hard hat can be adjusted to fit as the child grows.

4. Steel toe work shoes in smaller sizes? There again, in some specialty work clothes establishments one can find safety-toe work boots that fit smaller lady-size feet. The problem there is often finding the correct width, but with a little luck one might be successful in finding a safety shoe that fits. As fast as kids grow, it will be quite a trick to keep kids in proper safety footwear. The best one can mostly hope for is just providing good sturdy work boots. Oh, there are steel and safety-toe sneakers, so there may be some suitable offerings there as well.

4. Kid appropriate tools? Sure, kids love to hammer on things. Can one find kid appropriate rock collecting tools? Solution: I have found none specifically made for kids, but what I have seen are what I call "travel tools", tools that are smaller -- less heavy rock picks, crack hammers, and chisels. Why does a kid need smaller tools? Well, smaller tools are more easily controlled in kid's smaller, less strong, and less coordinated hands. Mind that any use of tools should be suitably adult supervised. Along with tool use safety, first-aid kits should have kid-sized bandages packed in with all the adult-size bandages.

We like protecting our kids from harm. Large, dangerous working mines, quarries, pits and other hazardous commercial operations often limit kid entry. Insurance and liability requirements in operating facilities often dictate that no one under 18 is permitted on site. Thus, kid-specific safety gear is often not needed because kids are often not permitted inside. Common sense should reign in other collecting sites.

In general, safety requirements are similar for kids and adults – keeping hydrated, minding site specific rules and regulations, wearing eye protection, and so on. **The trick with kid safety is this one simple guideline: kids use adults as role models.** If kids see their parents wearing eye protection, they will want to as well, because it's the adult thing to do. If kids see their parents using gloves, kids will want to as well. Kids learn from us, so if we adults set a good example, our work in keeping kids safe is made much easier. The bonus with this approach is that we stay safe too (for our kids' sake).

Please be safe out there, whether you are a kid, an adult, or a kid-like adult!



Smaller rock hammers are ideal for kids. Credit: Dr. H. Sulzer wikipedia:herbye, licensed under the [Creative Commons Attribution-Share Alike 3.0 Unported](#)

Annual Picnic in August

We could not have asked for a nicer day for our picnic on August 21st. It was nice to visit with club members in-person once again. Everyone had a great time filling grab bags for the upcoming Denver Gem & Mineral Show and our own Rocks & Rails show later this fall. The Jr. Geologists completed the requirements for the Maps Badge. Plus, the food was delicious.

One of the highlights each year at the annual picnic is to recognize club members for their contribution to the Flatirons Mineral Club and to earth science. Here are this year's honoree's

Rockhound of the Year – Susanne Peach

The Flatirons Mineral Club of Boulder, Colorado, is pleased to honor Susanne Peach as their 2021 Rockhound of the Year. Susanne is one of the leaders of our Jr. Geologists program. She helps with the monthly meeting with activities and hands-on learning experiences. She has also led field trips for the Jr. Geologists to collect smoky quartz and other minerals, plus provides specimens for the juniors to add to their collections. The Flatirons Mineral Club appreciates the time Susanne spends with our juniors.

Susanne's name has been added to the club's Rockhound of the Year plaque, plus she will be recognized in the Rocky Mountain Federation of Mineralogical Societies' and the American Federation of Mineralogical Societies' newsletters.



The Flatirons Mineral Club Rockhound of the Year plaque.

Junior Rockhound of the Year – Charlotte Small

Charlotte Small is the first Junior Rockhound of the Year for the Flatirons Mineral Club. She was selected because of her active involvement in the club's Jr. Geologists program. Charlotte has earned 8 of the AFMS's badges and has the goal of earning all 20 badges. She has written articles for the club's newsletter and made a presentation about trilobites at a Jr. Geologists meeting. We appreciate Charlotte's enthusiasm at meetings and on field trips.

Charlotte received a Rockhound of the Year plaque, plus Howard Gordon presented her a trilobite from Morocco. In addition, she will be recognized in the Rocky Mountain Federation of Mineralogical Societies' and the American Federation of Mineralogical Societies' newsletters.



Markus Raschke, our FMC Lifetime Achievement Award recipient.

FMC Lifetime Achievement Award

Markus Raschke of the University of Colorado was awarded the club's Lifetime Achievement Award engraved on our Hall of Fame Plaque under the category of "**Minerals Research**". Markus, with students and colleagues has made numerous contributions through his studies of Rare Earth Element (REE) minerals in Colorado, specifically near Jamestown and in pegmatites of the South Platte mining district.

The publications on Colorado, and others on related subjects about minerals from the North Cascades and Sichuan Mountains are widely recognized internationally. Ongoing research is focusing again on a REE occurrence near Jamestown and other collaborations on pegmatites in the Pikes Peak batholith.

Photos from the Picnic



A beautiful Colorado day for a picnic.
Credit: Trick Runions



Enjoying the food. Credit: Susanne Peach



Filling grab bags. Credit: Brian Walko (above)
and Trick Runions (right)



Charlotte recognized by Howard Gordon as our
Junior Rockhound of the Year. Credit: Brian Walko

Where in Colorado? (from page 4)

Dennis Gertenbach

The photograph on page 4 (also seen to the right) shows the historic Hanging Flume, which ran along the San Miguel and Delores Rivers in Western Colorado.

In the late 1880s, there was a major gold strike along Mesa Creek Flats below the confluence of the San Miguel and Delores Rivers. In 1888, the Montrose Placer Mining Company, composed of wealthy investors from St. Louis, purchased mining claims along 6½ miles of the rivers. Their plan was to use hydraulic mining techniques to recover the gold from the sands and gravels on their claims.

Hydraulic mining requires a continuous supply of lots of water at high pressure, much more water than was available from side creeks along their claims. Their solution was to use technology developed in California, where water was diverted upstream and channeled through ditches and flumes to the gold-bearing gravel. This would provide a reliable source of water at high pressure. However, the large scale of the flume - 7 miles with sections suspended hundreds of feet above the river - had never been attempted before.



Hanging Flume along the San Miguel River. Credit: Dennis Gertenbach



The Hanging Flume ca. 1890s, W.J. Carpenter, public domain

The flume was designed and constructed by Nathaniel P. Turner, who had experience constructing flumes in California. The flume consisted of both earthen and square wooden sections. The suspended wooden chute was six feet wide and four foot tall, anchored to the cliffs with metal brackets and supported by wooden braces. Laborers were suspended from to the top of the cliffs to drill 18-inch-deep holes for the bracket bolts. Lumber came from the La Sal Mountains to the west and was either lowered down to the brackets or transported along the completed sections. In all, 24 workers completed the flume in two years.

The Hanging Flume delivered 80 million gallons of water a day at sufficient pressure for the hydraulic mining equipment. However, the fine gold in the gravels could not be profitably recovered and the operation was shut down after 3 years.

The Hanging Flume can be viewed at a kiosk along Highway 141 at mile marker 81.5, west of Naturita. A dirt road, passable in good weather by a passenger car, follows the Hanging Flume for several miles to the confluence of the San Miguel and Delores Rivers. You can download a self-guided tour at:

http://montrosecounty.granicus.com/DocumentViewer.php?file=montrosecounty_18d5f8148e95dd873cf892d29444b15c.pdf.

Worth Visiting in the Area

The Hanging Flume is along the Unaweep-Tabeguache Scenic and Historic Byway, south of Grand Junction. This paved byway travels 133 miles along Highways 141 and 145, and features spectacular scenery along Delores and Unaweep Canyons. It extends from Whitewater to Placerville, passing through the communities of Gateway, Naturita, Nucla, Redvale and Norwood. For more information, see <https://www.codot.gov/travel/colorado-byways/southwest/unaweep-tabeguache> and <https://www.myscenicdrives.com/drives/colorado/unaweep-tabeguache-scenic-byway>.



Delores River Canyon along the Unaweep-Tabeguache Scenic and Historic Byway. Credit: Dennis Gertenbach

Ray and Dorothy Horton's Rock, Mineral, and Lapidary Equipment Sale

A big thank you to Paul Boni and Andrew MacGregor for helping the family of long-time FMC members Ray and Dorothy Horton sell their lifetime collection of rocks, minerals, and lapidary equipment in August. Here are several pictures from the sale.



2021-22 Paul Ralston Scholarship Recipient

In 1991, FMC member Paul Ralston had a dream of giving 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 Jack Henry, who will receive \$1,000 this school year. Jack is a senior at the Colorado School of Mines, majoring in geophysics. His class research paper involved "Fluvial Fan in the Jezero Crater on Mars." Jack is a member of the American Geophysics Union at the school.

We wish Jack the best as he pursues his education in the earth sciences.

Fossils in the News

Dennis Gertenbach



Artist's impression of the fearsome *Thapunngaka shawi*. Credit: University of Queensland press release

An Ancient Flying "Dragon" in Australia

Australia's largest flying reptile has been uncovered, a pterosaur with an estimated 23-foot (7-meter) wingspan that soared over a vast inland sea that covered much of today's Queensland. The jaw of this creature was analyzed by a research team from the University of Queensland. The new pterosaur, which is named *Thapunngaka shawi*, would have been a fearsome beast, with a spear-like skull measuring over 3 feet (1 meter) and containing over 40 teeth. Just seeing this beast flying overhead would have sent a chill up the spine of any small dinosaur below.

Information from <https://www.eurekalert.org/news-releases/924692>

Bird-like Fossil is a Bizarre Lizard

When first described in 2020, *Oculudentavis khaungrae* was thought to be the smallest avian (bird-like) dinosaur ever found. The 99-million-years-old tiny skull was discovered in a piece of amber from Myanmar. The creature had long teeth, large eyes, and a short, vaulted braincase, which led researchers to think it was a tiny bird, similar in size to today's smallest hummingbirds.

Researchers from Spain and the United States found a similar looking fossil in Myanmar amber. This new fossil contained neck vertebra along with the skull, which proved that it was a lizard, not an avian dinosaur. When compared to the original *Oculudentavis khaungrae*, they found that



Reconstruction of life-appearance of *Oculudentavis naga*, prior to being trapped in tree-resin. Credit: Stephanie Abramowicz / Peretti Museum Foundation, Institut Català de Paleontologia press release

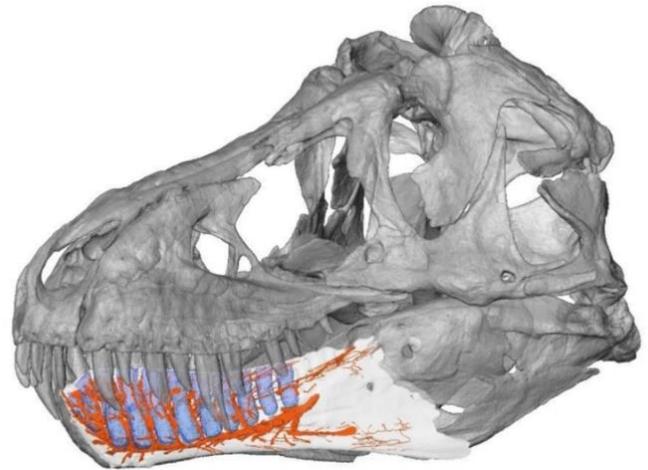
both fossils were lizards from the same genus, but different species. They named the new fossil *Oculudentavis naga*.

Information from <https://www.icp.cat/index.php/en/press-room/noticies-icp/item/3156-bizarre-lizard-bird-arnau-bolet-icp>

New Study of *T. rex*'s jaw Finds It Was Even More Fearsome

Tyrannosaurus rex was not just a huge beast with a big bite. Researchers have discovered that it had nerve sensors in the very tips of its jaw, enabling it to better detect – and eat – its prey. This made *T. rex* sensitive to slight differences in material and movement, helping it recognize different parts of its prey and eat it differently depending on the situation. This ability would make *T. rex* an even more fearsome predator than previously thought.

By using digital analysis of *T. rex* jaws, the scientists found that nerves in the jaw were distributed more complexly than those of any other dinosaurs studied to date, comparable to those of modern-day crocodiles and tactile-foraging birds. The sensitivity of the snout of *T. rex* was considerably greater than that of the ornithischian dinosaurs compared in this study.



Hypothesized distribution of nerves in the mandible of *Tyrannosaurus Rex* (orange). Credit: Taylor & Francis Group press release

Information from <https://newsroom.taylorandfrancisgroup.com/t-rexs-jaw-had-sensors-to-make-it-an-even-more-fearsome-predator-new-digital-study-finds/>



Left to right, *Conacodon hettingeri*, *Miniconus jeanninae*, *Beornus honeyi*. Credit: Banana Art Studio, Taylor & Francis Group press release

Rapid Mammal Evolution after the Dinosaurs Went Extinct

This summer, Madelaine Atteberry and Jaelyn Eberle from the University of Colorado described the discovery of three new species of ancient mammals from Wyoming that lived just after the extinction of the dinosaurs. These mammals are among the earliest from the Paleocene Epoch, within a few hundred thousand years of the dinosaur's demise. Their discovery suggests that mammals diversified more rapidly after the mass extinction than previously thought.

Researchers believe that they may have been omnivores because they evolved teeth that would have allowed them to grind up plants as well as meat. However, this does not rule out their being exclusively herbivores.

Information from <https://newsroom.taylorandfrancisgroup.com/new-prehistoric-hobbit-creature-is-among-three-discoveries-suggesting-rapid-evolution-of-mammals-after-dinosaur-extinction/>

Dinosaur of the Month Club

New this year. Dinosaur Ridge is launching a [Dinosaur of the Month Club](#). Join the 12-month Club and each month you can swing by the Main Visitor Center (currently only available for in-person pick-up) and collect your Dinosaur of the Month dinosaur figure. It will be a surprise every time. Each dinosaur comes with a kid-friendly information card filled with details about the dinosaur. You'll want to collect them all. Great for dinosaur lovers of all ages, but perfect for those under 12 years old.



Other Rockhounding Events and Activities in the Area

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

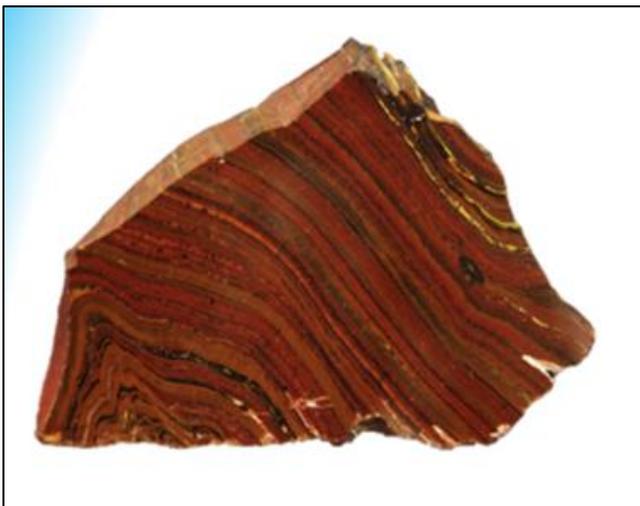
September Shows. For more information about all these (below, plus others, some of which—not listed here—are wholesale/trade shows only) September mineral and gem shows in Denver, see <https://xpopress.com/showcase/shows/2/denver-gem-mineral-fall-showcase>.

- **Sept. 10-13, “2021 Just Minerals and Crystals Event-Denver”**. Friday 2–9 p.m.; Saturday and Sunday, 10 a.m.–6 p.m.; Monday, 10 a.m.–5 p.m. Not fossils, jewelry, or supplies - just natural crystal and mineral specimens and gems. Moving location this year to the ballrooms of the Marriott Denver Airport at Gateway Park, 16455 E 40th Circle, Aurora. This event is open to the public with wholesale pricing to all. Some dealers will also have some of their regular retail items.
- **September 10-18 (all week), Colorado Mineral and Fossil Fall Show** at the Crowne Plaza Denver Airport Convention Center, 15540 E. 40th Ave., Denver. No admission charge; see www.coloradomineralandfossilshows.com.
- **September 10-18 (all week), JG&M Expo Denver Show**, at the Clarion Hotel, 200 W 48th St., Denver; open to the public, free admission. Jewelry, gems, minerals, crystals, fossils, beads.
- **September 10-19 (all week), National Western Complex Denver Mineral, Fossil, Gem & Jewelry Show**. 10 am - 6 pm daily; no admission charge; on the north side of I-70 at Exit 275-B, Brighton Blvd.
- **September 10-12, MinCollect Show**, Hilton Double Tree “Denver”, 3203 Quebec St. Denver, CO 80207, at M.L.K. Jr. Blvd. & Quebec St. [not to be confused with another Hilton Double Tree “Denver Central Park”, which is also on Quebec St.] 10-6 Friday and Saturday, 10-5 Sunday, free parking & admission.
- **September 16-19, Denver Gem & Mineral Show**; 10 a.m. – 5 p.m. daily Thurs.-Sun. at the Colorado Convention Center, held as part of the “Hardrock Summit - Evolution” mineral and gemstone show. See www.denvermineralshow.com. This is the show hosted by the Denver Council of Gem and Mineral Societies, and formerly held at the Denver Merchandise Mart; it is “The original” Denver Gem and Mineral Show, with special exhibits by clubs and museums. The featured mineral this year will be **Fluorite**.

- **September 16-21, "Hardrock Summit 2021"** gem and mineral show, Denver. This will consist of two separate shows; "Evolution", September 16-19, a gem and mineral show open to the public at the Colorado Convention Center (admission and parking fees [consider using public transportation!]), and "Sparkle and Joy", September 18-21, a gem trade show held at the Sheraton Denver Downtown Hotel, Plaza Ballroom. For more information see www.hardrocksummit.com.

Other Rockhounding events

- **Thursday, September 16**, 4:00 p.m., the Western Museum of Mining and Industry in Colorado Springs will feature a talk by Dr. Karin Larkin, Assistant Professor and Curator of Anthropology at UCCS on "**Killing for Coal: The Archaeology of the Ludlow Massacre.**" The massacre of striking miners and their families at Ludlow, Colorado, on April 20, 1914, made newspaper headlines worldwide. Gunfire between strikers and state militia troops took place on April 20 and resulted in more than twenty deaths. The camp was overrun and burned by the troops. This talk kicks off a new exhibit at the Museum about Ludlow. Sign up for the lecture (\$5) at <https://fareharbor.com/embeds/book/wmmi/items/213075/calendar/2021/09/?flow=41147&full-items=yes>.
- **October 1-3, Pikes Peak Gem, Mineral, & Jewelry Show**, at the Norris Penrose Event Center, 1045 Lower Gold Camp Road, Colorado Springs. Sponsored by the Colorado Springs Mineralogical Society; see <https://pikespeakgemshow.com>. This year's show features turquoise.
- **October 2-3, Reynolds Ranch House Harvest Festival & Miners' Pumpkin Patch** at the Western Museum of Mining and Industry in Colorado Springs featuring live music, petting zoo, gold panning with Gold Prospectors of Colorado, machinery demonstrations of the Osgood Steam Shovel, Air Trammer and the famous Yellow Jacket II Stamp Mill, operational blacksmith shop, performances from the Gold Canyon Gunfighters Show, Model A car Display, tours of the newly rehabilitated Reynolds Ranch House, and kids' fun activities at the Miners' pumpkin patch. Cost is \$10 each (pre-purchase) or \$12 at the door, plus \$5 per pumpkin. <https://minerspumpkinpatch.com/news-events/miners-pumpkin-patch.html>.
- **Saturday, October 16, is the Littleton Gem and Mineral Club Silent and Verbal Auction** at Heritage United Methodist Church, 7077 S. Simms Street in Littleton. Silent Auction for individual bidding on minerals, gems, jewelry, fossils, books, equipment, and more, gets underway at 12:00. Verbal Auctioneer Auction with bidding on a variety of unique and beautiful specimens starting around 1:30. Payments by cash or check only.



Come to the in-person club meeting on Tuesday, October 12, to learn more about banded iron (like the specimen to the left) and what it tells geologists about Earth's history 2 billion years ago. See page 3 for more details.

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Denver Show Club Table

open

Be Safe
Stay Healthy!



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First Class Mail

Upcoming Events

Date	Event	Location
September 16-19	Denver Gem & Mineral Show. See pages 2 and 5	Convention Center, Denver
October 2-3	Field trip to collect agates, petrified wood, fluorescent agates and chalcedony. See page 2	Crawford, Nebraska
October 12, 7:00 pm	In-person club meeting featuring Dana Hauschulz' presentation on "The Wreck of the Edmund Fitzgerald & Banded Iron Formation." See page 3	Mountain View United Methodist Church, Boulder

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.