



# Flatirons Facets

Flatirons Mineral Club of Boulder County, Colorado  
Volume 60, Number 1  
January-February, 2017

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.



## The Leadville Limestone, a Rock of Consequence at Aspen

That is the topic for January's club meeting on Thursday, January 12. Club member Ed Raines will present another of his talk about Colorado geology and Colorado's mining history. Learn how Aspen owes its existence to the riches found in the Leadville Limestone.



Mollie Gibson mine complex and the town of Aspen between 1890 and 1910. From the Denver Public Library collection



Ed Raines, our January speaker

Club meetings are on the second Thursday of each month in the Sky Lounge at Frasier Meadows, 350 Ponca Place, Boulder, CO 80303, starting at 7:00 pm. As you enter Frasier Meadows, just ask the receptionist for directions to the elevator that will take you to the Sky Lounge.

Our **February 9** meeting will feature **Damon Hauschulz** with his presentation **Colorado Basement and Large Scale Lapidary**. The talk will be a geological and lapidary story woven around a floor made using a 9-ton boulder from Fairplay.

## After-Show Appreciation Party

As an appreciation to all of the club members who volunteered to make the Rocks & Rails show such a success, all club members who worked at least one 2-hour shift are invited to the after-show party on **Thursday, January 19<sup>th</sup>**. It will take place at the Frasier Meadows Sky Lounge starting at 7:00 pm. In appreciation for your time, there will be door prizes drawn for nice mineral specimens. Refreshments will be provided. The club show would not happen without our club members who volunteer to plan and run the show. Thanks to all who helped!

## President's Message



Happy New Year Everyone!

Welcome to the Flatirons Mineral Club's 60<sup>th</sup> year! Rockhounds since 1957!

I hope 2017 brings us a great year of interesting programs, wonderful field trips, educational juniors events, and another great rock and mineral show.

Speaking of shows: Our December 2016 Rocks & Rails show was a resounding success! The weather cooperated and we had a tremendous turnout of both visitors and volunteers. Many thanks to all who helped out at the show. We are now even better

poised to pursue items on our club's wish list and to continue to fund a scholarship to a worthy Colorado college student.

Speaking of interesting programs: Look on page 1 for the upcoming speakers schedule for our general meetings.

Speaking of educational junior events: The Juniors Program gets going in full swing with their January meeting. Find a PDF of a Juniors flyer if you would like to print it and spread the word to introduce the program to other families.

And those field trips: Let's go places! Please contact me with suggestions or offers to lead a trip.

Best wishes to all of you, wonderful members, Gabi

### Club General Meetings Schedule for 2017

Here are the dates and activities for the club meetings for this year. Be sure to add them to your calendar. All meetings will be held at Frasier Meadows with some exceptions due to building construction issues and other scheduling issues.

January 12	Speaker	Ed Raines
February 9	Speaker	Damon Hauschulz
March 9	Speaker	TBA
April 13	Silent Auction **	
May 11	Summer Field Trip Signup	
June 8	Speaker	TBA
July 13	Mineral Specimen Prep Night **	
August 19	Annual Picnic *	
September 21	Speaker ***	TBA
October 12	Speaker	TBA
November 9	Towel Show **	
December 14	Holiday Gift Exchange Party **	

\* The annual FMC picnic is always scheduled on the 3<sup>rd</sup> Saturday on August and will be held at Harlow Platts Park.

\*\* These 4 meetings currently do not have meeting places due to the construction at Frasier Meadows.

\*\*\* This meeting is scheduled for the 3<sup>rd</sup> Thursday of the month due to our participation in the Denver Gem and Mineral Show which will occur on September 15-17.

**Directions to Frasier Meadows:** Exit Foothills Parkway at Baseline and go west. Turn left (south) onto Mohawk Drive and then turn left onto Pawnee Drive, traveling to the east of Burke Park. Take Ponca Place to your left and the Frasier Meadows parking lot will be on the left. When you enter the building, tell the receptionist that you are here for a Flatirons Mineral Club meeting and ask for directions to the elevator to get to the Sky Lounge for January and February meetings and the 4<sup>th</sup> Floor North Community Room for the meeting during the rest of the year.

**For a Google map of the location, see:**

<https://www.google.com/maps/place/350+Ponca+Pl,+Boulder,+CO+80303/@39.9932747,-105.2356879,15.75z/data=!4m2!3m1!1s0x876bed9bb0459cf3:0x9bfaa244c5efe9e9>.

**Weather Cancellation:** If the Metro Denver area declares the roads are on Accident Alert during a snowfall on meeting night, consider the club meeting canceled.

## Jr. Geologists – Learn about Geodes

Our first meeting in 2017 is **Wednesday, January 18**, when Howard Gordon will join us to talk about geodes. We will learn about the different types of geodes and how these wonderful rocks full of crystals are formed. Come with your geode questions for Mr. Gordon.

Beginning in January, we are moving our meeting place to the Meadows Branch Library at 4800 Baseline Rd, Boulder, CO 80303 (behind the Kaiser Permanente medical offices). See

<https://www.google.com/maps/place/Boulder+Public+Library+-+Meadows+Branch/@39.9976487,-105.2362068,17z/data=!3m1!4b1!4m5!3m4!1s0x876bed90f59e418f:0x675e64c1e78e55c4!8m2!3d39.9976487!4d-105.2340181> for a map of the location. Meetings will continue on the third Wednesday of each month.

The Jr. Geologists program is open to all Flatirons Mineral Club families. Each month we learn about different aspects of geology, minerals, and fossils, plus earn badges for different earth science activities. For information about the Jr. Geologists program, please contact Dennis Gertenbach at [gertenbach@comcast.net](mailto:gertenbach@comcast.net) or 303-709-8218.



Craig Hazelton helping Jr. Geologists identify minerals  
Photo from Isaac Huang

## Quartz Crystals

Annika Jacobson, Age 8

Quartz crystals can be in any shape or size, smooth or jagged. Sometimes if layers of quartz in a rock are thin enough, they can appear a little see-through in places. Dents and creases in the rock can get dirt stuck in them and over a few years they can mold into the rock and become part of the rock's original colors. Quartz is a mineral, a mineral that show up in every earth rock. So if you are looking for a meteorite, you'd better check for quartz before you say it's a meteorite.

A quartz crystal can be three different colors, snowy white, dust gray, and white blended with pink. This rock can be used for a lot, and by a lot I mean bricks and other building materials, decorative stone, crushed for aggregate, armor for sea walls, railway ballast, countertops, statues, monuments, and finally jewelry. Quartz can cause some trouble for geologists in one way or another. The reason is that geologists are warned to take extra good care when they have to hit it with a hammer. Its use in the construction of world is very limited because its hardness causes some damage to building equipment. This amazing strength comes from the quartz grains that have interlocked patterns within them.

Egypt had quartz for a popular statue stone. Pharaohs, such as Amenhotep III, had enormous quartz statues of themselves built and placed in temples.

Gold can be found in quartz rocks. Quartz that looks very glossy in appearance can have as much as 70 ounces of gold per ton!

*Editor's Note: Annika is looking forward to coming to her first Jr. Geologists in January. She is excited to learn more about rocks and minerals.*



Two of Annika's quartz specimens

## Sky Lounge Renovations Mean Uncertain Meeting Places for Some Meetings

After our February 2017 meeting in the Sky Lounge, Frasier Meadows is going to start a renovation project for the room. This project will extend to the end of 2019 and this means our wonderful meeting place will be out of commission. We have been lucky to meet at Frasier Meadows for the past year and hope to continue into the future. As a non-profit organization Frasier Meadows does no charge us to use their facility. This is an amazing deal since meeting sites in Boulder are quite expensive.

The good thing about our situation is that Frasier Meadows has scheduled us in one of their other meetings rooms for 2017. For most of our regular meetings we will be meeting in the 4<sup>th</sup> Floor North Community Room. But some of our meetings do not have a location yet. The problem meetings are those that require a number of tables for the activity. We need to find meeting locations for the April Silent Auction, the July Mineral Bagging Meeting, the November Towel Show, and the December Holiday Party.

The critical meeting right now is the April Silent Auction meeting since it includes many participants from outside our club and they will need to find us. We need to find a location for that meeting soon. Can you help us find a location for these meetings? Are you connected to a church or workplace that has a meeting room that can accommodate at least twelve 8-foot tables and 30-40 people? Please contact Gabi Accatino at [accatino@colorado.edu](mailto:accatino@colorado.edu) with any helpful information.

## Rocks & Rails

Last month's Rocks & Rails show with the Boulder Model Railroad Club was a great success. Over 3,300 guests attended our show over the weekend, which added \$4,928 to our club's general fund. In addition, grab bag sales and Kids Corner games made \$679 for college scholarships next year.



2016 Rocks & Rails Show

The show could not have happened without the hard work of the Show Committee under Ray Gilbert's direction. Many thanks to Char Bourg and Eileen Fitzgerald for all of their work in the planning the Kids Corner area and for coordinating

all of the club's show volunteers this year. Brian Walko and Gerry Naugle put together the fabulous fluorescent minerals displays, Ray Gilbert set up the gold panning, Tally O'Donnell coordinated the dealers and artisan's table, Terry O'Donnell set up the lapidary area, and Dennis Gertenbach coordinated the display cases. All of these were very popular with attendees.

Char reported that 37 club members helped with the show and we want to thank club members Jacque Mahan and granddaughter Morgan, Mary and Nadia Maxwell, Robert Hesse, Andy Proctor, Arnold Scheer, Char and Mel Bourg, Ray and Joyce Gilbert, Brian Walko, Sharon King, Karen Simmons, Brad Willkomm, Carol Oakes, Gianna Sullivan, Eli Minson and son Maxwell, Barry Knapp, Gerry Naugle, Dennis Gertenbach, Greg Cordes, Norman Ryken, Ellen Scheffler, Tally and Terry O'Donnell, Trick Runions, Deborah Knox, Victor Norris, K.C. Currathers, Jeffrey Peacock, Nico Caballero, and Gabi Accatino for lending a hand.

Enjoy pictures for our show.



Craig Hazelton, one of our dealers



Terry O'Donnell teaching lapidary



Gold panning with Ray Gilbert



One of the fluorescent mineral displays



Jr. Geologist Morgan Mahan with her display case



Brian Walko with his display case



Charlotte Bourg running the kids games



Kevin Notheis at the artisan's table

Photos from Brian Walko, Gabi Accatino, and Dennis Gertenbach

## Holiday Party

The club show was over and it was time to celebrate with our annual holiday party. Thirty club members of all ages joined the party, exchanging gifts and enjoying the holiday snacks. Great to see so many folks come together.



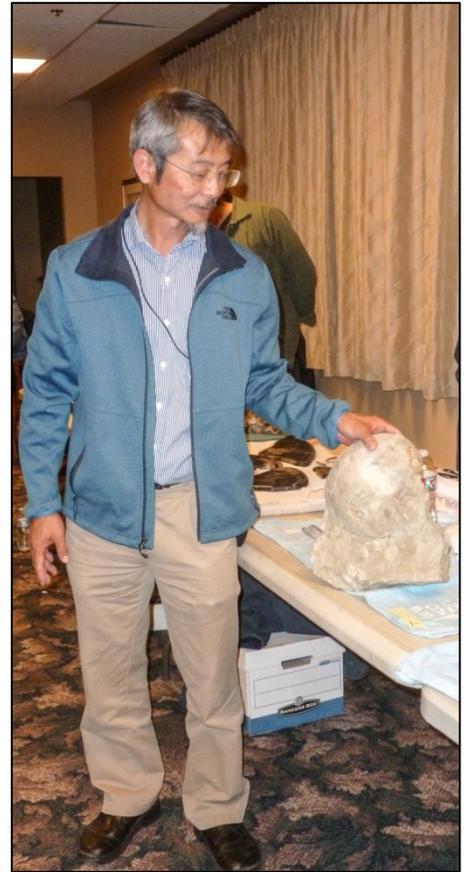
The gift exchange at the holiday party Photo by Craig Hazelton

## Towel Show

Each November, club members show off the specimens they collected and lapidary projects they completed this past year, displaying them on a towel (hence the name Towel Show). This year's Towel Show featured displays by both adults and juniors with lots of great minerals, fossils, rocks, and lapidary projects.

Everybody gets to vote for their favorites and Barnes and Noble gift cards are given to the best displays, including prizes for ugliest rock and best towel. Here are this year's winners.

Category	First Place	Second Place
Best Club Trip		
Adult	Brian Walko	Ellen Sheffler
Junior	Rohan Boonapalli	Piper Rausch
Best Personal Trip		
Adult	Gianna Sullivan	Fred Hall and Kelly Manley
Junior	Piper Rausch	Shea Maceachern
Best Minerals		
Adult	K.C. Karruthers	Arnold Sheer
Junior	Rohan Boonapalli	Anna Maceachern
Best Fossils		
Adult	Masaki Tsukada	Dennis Gertenbach
Junior	Aden Bicknell	Egan Rausch
Best Lapidary/Jewelry		
Adult	Eric Walls	Carl Bird
Junior	Egan Rausch	
Ugliest Rock		
Adult	Mel and Char Bourg	Keith Notheis
Junior	Anna Maceachern	Rohan Boonapalli
Best Towel		
Adult	Eric Walls	Mary Maxwell
Junior	Shea Maceachern	Aden Bicknell



Masaki Tsukada with large clam from the Kremmling field trip



Piper showing her specimens



Enjoying the displays

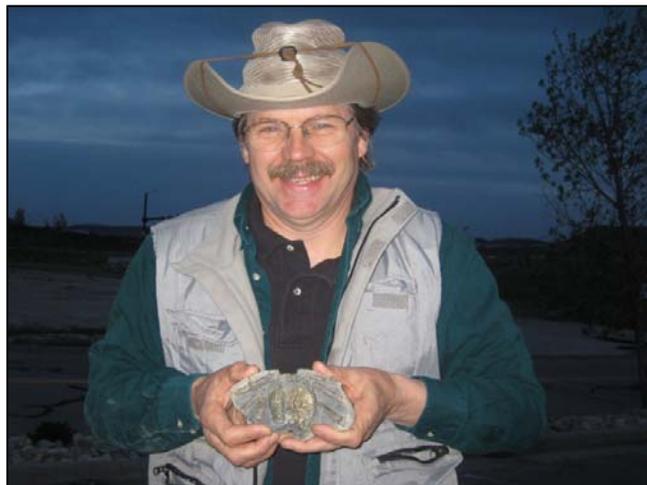


Arnold Scheer displaying obsidian he collected



Rohan with his Towel Show display

Photos by Brian Walko



Trick Runions with the fossil crab, *Zygastrocarcinus tricki*. Photo by Jude Burton

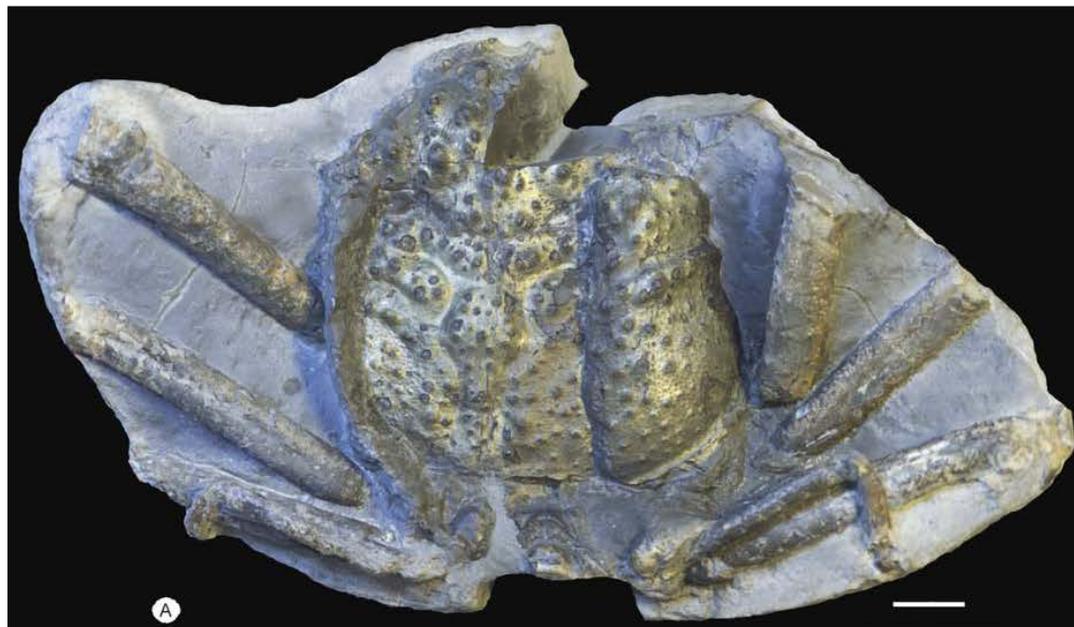
### Fossil Crab Named for FMC Member

Club member Trick Runions had the honor of having a fossil crab named for him. The specimen was collected in 2003 by Trick on a Western Interior Paleontological Society (WIPS) fieldtrip to Baculite Mesa in Pueblo County, Colorado. Because Trick found the crab and donated it to science, it was named *Zygastrocarcinus tricki* in his honor.

The fossil has been described in the paper "A new homolid crab, *Zygastrocarcinus tricki* sp. nov., from the Pierre Shale (middle Campanian), Baculite Mesa, Pueblo County, Colorado, USA" by authors Torrey Nyborg, Malcolm Bedell, Alessandro Garassino, Neal L. Larson, and Gale A. Bishop in the book *Acta Geologica Polonica* Vol. 66, No. 4, 2016. This book is published

in memory of William Aubrey “Bill” Cobban, a world-famous Denver paleontologist who passed away this past year at the age of 98. The paper can be downloaded at <https://geojournals.pgi.gov.pl/agp/article/view/25615/17505>.

The fossil crab a giant for the Pierre Shale, with an almost complete carapace (top shell) measuring 6.2 cm or about 2½ inches across. Most fossil crabs from the Pierre Shale are only thumb size. Seven of the eight legs are present, but the claws (if it had them) are missing. One other remarkable feature of this fossil crab is the patina of pyrite covering shell, where it preserved within the ironstone concretion. This gives the shell a beautiful golden color.



*Zygestrocarcinus tricki*  
fossil crab  
(scale = 1 cm)  
Credit: Nyborg et al.,  
2016/ *Acta Geologica*  
*Polonica*

## Our Club and Its Relationship to Other Rock and Mineral Clubs

The Flatirons Mineral Club is not a lonely little club out there on the plains! We are part of a couple of bigger organizations. One is the Denver Gem and Mineral Council. It is made up of 8 clubs in our region. This is the organization that puts on the Denver Gem & Mineral Show in September in which we participate. The bigger organization of which we are members is the Rocky Mountain Federation. It was described to me by Richard Jaeger, the Past President of the RMFMS in the following statement:

“The Rocky Mountain Federation is one of seven Regional Federations which make up the American Federation of Mineralogical Societies. The AFMS has a President, President Elect, and 5 Regional Vice -Presidents. These positions are rotated among the seven Regional Federations. These people, in addition to an elected Treasurer, Secretary, and the Presidents and Vice Presidents of the Regional Federation make up the Executive Committee of the AFMS. They meet once a year at the AFMS Convention & Show, which this year was held in Oregon in July 2016.

The RMFMS' designated area covers the entire states of Arizona, Utah, New Mexico, Colorado, Wyoming, Oklahoma, and Kansas. It also covers the western half of Nebraska, South Dakota, and North Dakota. In addition to that we do have one club each in Arkansas, Texas, and Nevada. The Executive Committee of the RMFMS consists of a President, Vice President, Secretary, Treasurer, Historian, and the two immediate Past Presidents. It also includes nine State Directors, those being: Arizona/Nevada, Utah, New Mexico/Texas, Colorado, Wyoming, Oklahoma/Arkansas, Kansas, South Dakota/Nebraska, and North Dakota. The State Directors serve to help tie their state clubs together with the RMFMS. The Executive Committee meets once per year at the RMFMS Convention and Show which was held from April 22-24 in 2016 in Wichita, Kansas. If issues come up during the year, the Executive Committee can handle those by an e-

mail and/or postal mail vote. At the RMFMS there is also a Delegates Meeting in which each club in the RMFMS can be represented by two Delegates or Proxies. Most of the business of the Federation has to be approved at the House of Delegates. This of course includes the election of officers, changes to Operating Procedures, sites of future RMFMS shows, and many other items. We are governed also by the Articles of Incorporation, By-Laws, and Operating Procedures. Each club is supposed to have a copy of each of those items, but I imagine that most clubs don't any longer know where their copy is. There are going to be updates to the Operating Procedures voted on in Wichita. After that I hope to distribute a copy to each member club of the RMFMS.

Of course, the backbone of the RMFMS is the local clubs such as yours. Communication is so important! We do have the Newsletter, Website, and Directory which provide information. If your club doesn't already do so, please have someone maintain a group e-mail list and pass on each monthly Newsletter to all your club members. I think it would be a very positive step if each club in our Federation would do this.

Please go to our website: [www.rmfmts.org](http://www.rmfmts.org). It has a wealth of information on what the RMFMS does and can offer for individual clubs. If you go to 'Information' and then click on 'By-Laws' you'll see both the Articles of Incorporation and the By-Laws. The first paragraph of the Articles of Incorporation gives the original purpose for forming the Federation."

## **BLM Rules are Changing for Collecting Fossils – Your Input Is Needed**

Many of you have heard about the Bureau of Land Management (BLM) implementing new fossil collecting rules, as required by the Paleontological Resources Protection Act passed by Congress in 2009. The Forest Service has already implemented their rules to comply with the act, and the BLM is now seeking public comments about their proposed rules.

There has been a lot of misinformation approaching near hysteria about the BLM closing all of their lands to fossil collecting by the public. This is untrue. Below is a factual summary of the proposed regulations from the MyFossil Newsletter of the FOSSIL Project. Each of us who enjoys collecting fossils should read the proposed rules, found at <https://www.gpo.gov/fdsys/pkg/FR-2016-12-07/pdf/2016-29244.pdf> (this is a pretty dry reading) and then send your comments on the proposed rules. The steps to follow in submitting your comments can be found in the graphic provided by the FOSSIL Project on the next page. Addresses to submit your comments, either by mail or electronically, can be found at <https://www.federalregister.gov/documents/2016/12/07/2016-29244/paleontological-resources-preservation>.

Please remember as you comment:

- Provide first and last name, city, state, & country. All other fields of information are optional. Keep in mind that much of this information is publicly viewable.
- Comments may be typed in the box provided or they may be uploaded as attachments (Word docs or PDFs only).
- Comments may be brief or in-depth/well-researched. Comments with facts to support them are much more useful (e.g., examples of overlooked scenarios). Keep comments civil and straightforward. Comments using offensive terms, threats, or other inappropriate language will be disregarded.

**Remember, the deadline to submit your comments is February 6, 2017.**

## FAQ ON THE DEPARTMENT OF INTERIOR'S PROPOSED RULES FOR FOSSIL COLLECTING

### I thought the Paleontological Resources Protection Act (PRPA) is already law. What is this about?

PRPA was signed into law on 30 March 2009, and federal agencies were tasked with writing their own rules for how they would put the law into effect. The rules for the Department of Agriculture went into effect on 18 May 2015. Now, the Department of Interior has finished the draft of its rules, and it is open for comments until 6 February 2017.

### Preservation of paleontological resources sounds like a great idea. Why are so many concerned?

Indeed, the rules for PRPA will be effective in protecting scientifically valuable rare fossils, such as many vertebrates. Because many non-vertebrate sites have fossils that are orders of magnitude more abundant, invertebrate paleontologists, paleobotanists, micropaleontologists, ichnologists, as well as some vertebrate paleontologists have raised several concerns about the proposed rules, including:

- A process that requires obtaining permission to release or publish the coordinates on fossil localities, hindering the ability to use paleontological data collected on federal lands in databases such as the Paleobiology Database.
- A permitting process that can take several months and that could delay graduate student research.
- Restrictive limits on the amount of material that could be collected by amateur paleontologists, who can meet the requirements needed for obtaining a permit only if they apply with a professional paleontologist.
- Creating storage and reporting burdens on museums, yet offering no funding to meet these burdens.

### PRPA allows for casual collecting without a permit. Can't we just collect our fossils that way? Wouldn't reconnaissance collecting be a form of casual collecting?

No. If you collect fossils for research, that is not considered casual

**HOW TO COMMENT ON THE PALEONTOLOGICAL RESOURCES PRESERVATION ACT (PRPA) PROPOSED RULE**  
BROUGHT TO YOU BY  
WWW.MYFOSSIL.ORG

**FIRST STEPS**  
Open your web browser and navigate to [www.federalregister.gov](http://www.federalregister.gov)  
This is where Federal agencies publish documents, including proposed and final rules, public notices, and Presidential actions.

**SEARCH FOR IT**  
Use the search box at the very top of the page OR the search box in the middle of the page (labeled Search All Federal Register Documents Since 1994) for 1093-AA16, the PRPA's Regulation Identification Number.

**CLICK IT**  
Searching for 1093-AA16 should open a search result with one document. Click on the text that reads "Paleontological Resources Preservation," it opens a new page to the proposed rule.

**READ IT**  
The whole document is important, but amateur paleontologists will find Subparts A, B, D, and I particularly important to them. Professional paleontologists will find Subparts B-D and G of particular interest.

**COMMENT ON IT**  
Comment by clicking on the dark grey speech bubble on the left hand side of the page OR the green "submit a formal comment" button at the top of the page. Comments that will be of most use are those that present thoughtful and meaningful feedback as to the implications of the proposed rule.

**SPREAD THE WORD**  
The comment period ends February 6, 2017. Everyone with an interest in paleontology has a voice in this matter: use yours and encourage others to do the same.

collecting. If you are conducting research, you must obtain a permit.

### The law is the law. Can anything be changed?

Federal agencies have considerable latitude in how they implement the law, because they are required to implement the law in accord with good scientific practice. The Department of Interior could readily enact several changes that would better balance the needs of invertebrate paleontologists, paleobotanists, micropaleontologists, and ichnologists, as well as those that collect common vertebrate fossils. Officials with the Department of Interior are enthusiastic about working with paleontologists, but they need specific suggestions. Several changes would substantially improve the proposed rules, including:

- Allow a researcher to request non-confidentiality of the location of fossil sites when they apply for a permit. This would allow local managers to aid the science and focus protection efforts on those sites that need it.
- Expedited permitting for surface collection of common fossils, including the ability to obtain an on-the-spot permit at regional offices. At the outside, approval of surface collection of common fossils in non-sensitive areas should take no more than 10 days.
- Allow flexibility in the limits for casual collecting.

### How do we request changes to the Department of Interior's implementation of PRPA?

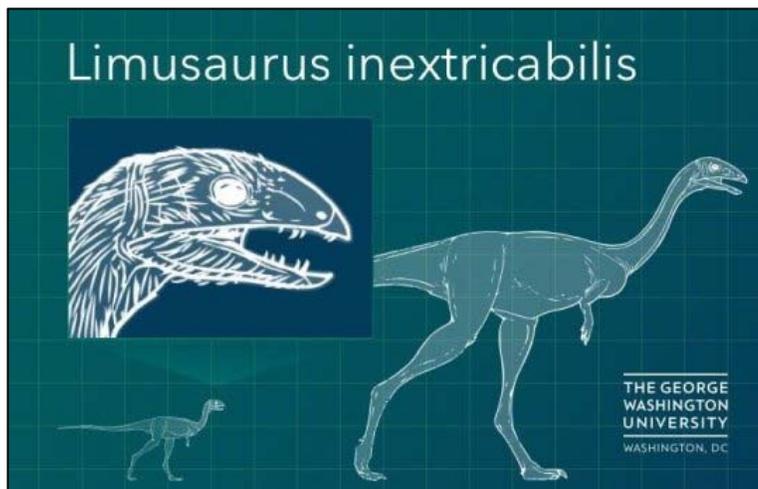
Go to the Federal Register website before 6 February 2017 to read the proposed rules and comment on them. The rules begin on page 88187, so you'll need to skip over the first several pages. Your comments will be most effective comments if they make specific changes to the wording of specific rules. Be sure to cite the rule (e.g., Subpart A, section 49.25), your proposed rewording, and a brief justification. The law is in place, and using the comments just to complain about it will not help. We have an opportunity to work with the Department of Interior to develop rules that promote paleontology for all.

### My colleagues have already done this. Do I need to?

Yes. The best way to get changes that promote paleontology is to let federal agencies know how the rules should be changed to meet the needs of all paleontologists. Even if a colleague has made the same comments as you, hearing from many paleontologists helps the Department of Interior know the importance of particular rule changes.

## Fossils in the News

Dennis Gertenbach



As *Limusaurus* grew from adolescent to adult, it lost its teeth and did not grow a new set. Credit: George Washington University

### Dinosaur Had Teeth as Babies, but Lost Them as They Grew Older

Researchers have discovered a species of dinosaur, *Limusaurus inextricabilis*, that lost its teeth in adolescence and did not grow another set as adults. The finding, in *Current Biology*, may help to explain why birds have beaks but no teeth. The research team studied 19 *Limusaurus* skeletons from a bone bed discovered in the Xinjiang Province of China. The dinosaurs ranged in age from baby to adult. The baby skeleton had small, sharp teeth, but the adult skeletons were consistently toothless.

These fossils indicate that baby *Limusaurus* may have been carnivores or omnivores, but changed their diets to be herbivores as they became adults. The sharp teeth would be needed to chew meat but not plants. The chemical makeup in the fossilized bones supports the theory of a change in diet between babies and adults. *Limusaurus* is part of the theropod group of dinosaurs, the evolutionary ancestors of birds, and the fossils also could help to show a pathway of how theropods such as birds lost their teeth.

Information for this article was found at <https://www.sciencedaily.com/releases/2016/12/161222131647.htm>.

### Feathered Dinosaur Tail Found in Amber

Another great dinosaur fossil find was also reported recently in *Current Biology*, a dinosaur tail complete with its feathers trapped in a piece of amber. The new fossil preserves a tail consisting of eight vertebrae from a juvenile surrounded by feathers, preserved with exquisite microscopic detail. Because the tail vertebrae are not fused as in modern birds, the feathers were identified as coming from a dinosaur not a prehistoric bird. Lida Xing from the China University of Geosciences in Beijing discovered the remarkable specimen at an amber market in Myitkyina, Myanmar in 2015.



A feathered dinosaur tail preserved in 99 million year old amber, along with several ants, a beetle, and bits of plant material. Credit: Ryan C. Mckellar/Royal Saskatchewan Museum

The feathers suggest the tail had a chestnut-brown upper surface and a pale or white underside.

Researchers were amazed to see all the details of a dinosaur tail, including bones, flesh, skin, and feathers. They speculate that this little dinosaur got his tail caught in the resin and then presumably died because he could not wrestle free.

Information for this article was found at <https://www.sciencedaily.com/releases/2016/12/161208141637.htm>



Examination of 131 million years old *Eoconfuciusornis* feathers shows both the pigment and surrounding structures that gave the feathers their color. Credit: Xiaoli Wang

### Cretaceous Bird Feather Color Revealed

Another study of fossilized feathers has been reported by Mary Schweitzer and colleagues in the *Proceedings of the National Academy of Sciences*. A 130-million-year-old bird fossil holds a clue to ancient color. The feathers of *Eoconfuciusornis* contain not only microscopic pigment pods called melanosomes, but also evidence of beta-keratin, a protein that surrounds melanosomes. Using an electron microscope, Schweitzer and colleagues found round, 3-D structures of melanosomes surrounded by fibrous filaments of keratin. Based on this, they could refute arguments that the round structures were bacteria, not melanosomes.

Information for this article was found at [https://www.sciencenews.org/article/cretaceous-bird-find-holds-new-color-clue?utm\\_source=Society+for+Science+Newsletters&utm\\_campaign=d95fcf6220-SN\\_editors\\_picks\\_week\\_of\\_112116&utm\\_medium=email&utm\\_term=0\\_a4c415a67f-d95fcf6220-93295497](https://www.sciencenews.org/article/cretaceous-bird-find-holds-new-color-clue?utm_source=Society+for+Science+Newsletters&utm_campaign=d95fcf6220-SN_editors_picks_week_of_112116&utm_medium=email&utm_term=0_a4c415a67f-d95fcf6220-93295497)

### Human Ancestor Lucy was a Tree Climber

Since the discovery of the fossil dubbed Lucy 42 years ago, paleontologists have debated whether the 3 million-year-old human ancestor spent all of her time walking on the ground or instead combined walking with frequent tree climbing. Now, analysis by scientists from The Johns Hopkins University and the University of Texas at Austin of the bones of the female hominin suggests that Lucy spent considerable time in trees. As reported in their research study in the journal *PLOS ONE*, detailed CT scans of Lucy's arms and shoulders showed that the internal bone structure was more similar to tree-climbing chimpanzees. This supports the idea that Lucy spent time climbing and used her arms to pull



Reconstruction of Lucy by paleoartist John Gurche. Credit: Smithsonian Institution Human

herself up. In addition, her foot was better adapted for upright walking, rather than grasping, indicating that Lucy pulled herself into the tree with her arms, resulting in more heavily built upper limb bones.

Lucy, a 3.18 million-year-old specimen of *Australopithecus afarensis*, is housed in the National Museum of Ethiopia and is among the oldest, most complete fossil skeletons ever found of any adult, erect-walking human ancestor.

Information for this article was found at

<https://www.sciencedaily.com/releases/2016/11/161130144004.htm>

## How to Learn How the Earth Formed? Check the Big Diamonds



The black specs in big diamonds like this one hide secrets of earth's history. Credit: Jae Liao/Gemological Institute of America

Evan Smith, a diamond geologist at the Gemological Institute of America, wanted to get his hands on the world's biggest diamonds. Not because of their value, but for what secrets they held inside. These most valuable diamonds of all contain some of the most scientifically valuable secrets of the Earth's beginnings.

Because of their rare size and quality, Smith thought these diamonds might have come from somewhere different, though no one knew exactly where. He thought they could be scientifically valuable, because they come from a deep part of the Earth that humans can't access and don't know that much about. To answer that question, he needed to look inside the diamonds at tiny specs of material no wider than a human hair that were within the diamond crystals. These inclusions had journeyed from deep in the earth with the diamonds.

But Smith's budget at the Gemological Institute of America was way too small to purchase several of the large, rare diamonds, and no one would let him crack open their valuable gems to access the tiny inclusion. Instead, he convinced the Gemological Institute of America to buy eight fingernail-sized chunks of those big diamonds, pieces leftover from when the rough diamonds were cut into jewels. Smith ground down these pieces to expose the inclusions for a series of analytical techniques to determine the composition of the inclusions.

Smith found that many of the stones contained bits of garnet with a silicon content indicating that they formed under very high pressure. He also found iron and nickel, shrouded in invisible envelopes of fluid methane. "That's unusual. This is the first time I've seen methane around an inclusion," Smith says. When he took a nondestructive look at 53



Diamond pieces used to study the history of the earth. Credit: Evan Smith/Gemological Institute of America

other diamonds passing through the Institute for quality grading, he found that 38 of them contained the same unusual materials.

As Smith and his colleagues described in the journal *Science*, these diamond pieces revealed two important things. One, these large, exceptional-quality diamonds originate from extreme depths in the Earth, about 200 to 500 miles below the surface. Two, the diamonds had formed inside oxygen-deprived patches of liquid metal. This is the first hard evidence that the Earth's mantle is not a uniform mix of oxygen-rich rocks, but is composed of pockets of liquid metal within the silicate rocks.

Scientists expected that the mantle, the part of the planet between the continental plates and its core, would be pretty thoroughly mixed, with oxygen distributed throughout. But these diamonds show that until relatively recently,

there were pockets that somehow managed to resist that mixing. It is unclear if these pockets are still around. Nevertheless, it means that the planet and its past could be different than previously thought and geoscientists need to rethink Earth's earlier history.



Tiny inclusions like these in diamonds contained material from hundreds of miles underground. Credit: Evan Smith/Gemological Institute of America

Information from this article came from <http://www.npr.org/sections/thetwo-way/2016/12/15/505386423/big-diamonds-bring-scientists-a-message-from-superdeep-earth>.

## Other Rockhounding Events and Activities in the Area

Here is a list of rockhounding-related activities in the area for both adults and juniors that you might be interested in.

**January 18–February 8 (Wednesdays)** Invertebrate Paleontology 1: Precambrian and Paleozoic. Emmett Evanoff, Denver Museum of Nature and Science research associate, WIPS member, and geologist extraordinaire will lead this course. Trilobites, brachiopods, and crinoids were especially abundant during the early stages of invertebrates, represented in the late Precambrian and the Paleozoic, and ending with the Permian-Triassic extinction. With Emmett as your guide, examine the prevalent fossil groups using real Museum collections. Info and registration at: <http://www.dmns.org/learn/adults/classes/invertebratepaleontology-i-precambrian-and-paleozoic/>

**January 19 (Thursday)** Colorado Scientific Society Meeting presents Dr. Gifford Miller of INSTAAR and the Geological Sciences, University of Colorado, Boulder, giving a talk on **An Arctic Perspective on 20th Century Warming**. The meeting is at the Shepherd of the Hills Presbyterian Church, 11500 W. 20th Ave., Lakewood CO. Social time begins at 6:30, and the meeting and program starts at 7:00.

January 24 & 31 (Tuesdays) **Cretaceous Crash Course** Experience the vibrancy of the Cretaceous period, the end of the dinosaurs. Using Denver Museum of Nature and Science collections to tell evolutionary stories, four vertebrate paleontologists will guide your expedition through this in-depth crash course on the Cretaceous. Curators Joe Sertich and Tyler Lyson will cover vertebrates from dinosaurs to crocodiles, birds to turtles, lizards, and sea creatures. Research Associate Lou Taylor and Curator David Krause will tackle geology and biogeography in the Cretaceous during this fascinating two-evening study. <http://www.dmns.org/learn/adults/classes/cretaceouscrash-course/>

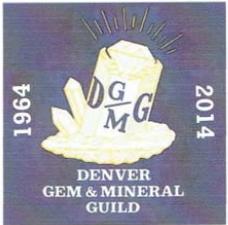
**February 9-12 (Thursday-Sunday)** is the **2017 Tucson Gem & Mineral Show**. This year's theme is **Mineral Treasures of the Midwest**. The largest, oldest and most prestigious gem and mineral show in the world, held at the Tucson Convention Center. For more see <http://www.tgms.org/show/>.



**February 24-26 (Friday-Sunday)** is the **DGMG Jewelry Gem & Mineral Show** at the Jefferson County Fairgrounds, 15200 W. 6th Ave. Golden CO. The show features gems, minerals, fossils, geodes, and jewelry. Enjoy dealers, gem cutting demonstrations, grab bags, door prizes, and mineral displays. Free parking and free admission. Hours are Friday: 10 a.m. - 6 p.m., Saturday: 10 a.m. - 6 p.m. and Sunday: 10 a.m. - 5 p.m. For more information, see <http://denvergem.org/Shows.html>.

# JEWELRY GEM & MINERAL SHOW

**FREE ADMISSION!**

Sponsored by the  DENVER GEM & MINERAL GUILD

## February 24- February 26, 2017

### JEFFERSON COUNTY FAIRGROUNDS

15200 W. 6<sup>th</sup> Ave – (W 6<sup>th</sup> Ave. & Indiana) Golden

Hours- 10-6, Friday, Saturday,  
10-5 Sunday



**Lapidary Supplies**



**Crystals and Fossils**



**Displays**



**Unique Jewelry**

**Gem and Mineral Dealers**

**GEM, MINERAL AND FOSSIL EXHIBITS**

**GEM CUTTING DEMONSTRATIONS**

**GRAB BAG SALES-** Proceeds applied to scholarship at Colorado School of Mines

# Become a Junior Geologist

An Evening for Kids and their Parents

The Jr. Geologist program is open to all of the club families. Parents are encouraged to join their kids at the meetings and take part in the activities.

The Jr. Geologists meet the third Wednesday of each month at 6:30 p.m in Boulder.

If you are interested in your children becoming Jr. Geologists, contact [geritenbach@comcast.net](mailto:geritenbach@comcast.net) or 303-462-3522



Jr Geologists are affiliated with the future Rockhounds of America Program and earn badges.

Go on **field trips** to discover rocks, minerals and fossils.

Learn how many of the things we use every day originally came from minerals and rocks from the earth.

Study about rocks and minerals, learn to identify minerals and crystal shapes, and put together an identification kit to help with mineral identification

Learn how fossils are formed, how to identify fossils, and how paleontologists use fossils to learn more about ancient earth.

Set up your field trip finds in your own display case.

## FLATIRONS MINERAL CLUB

Boulder, Colorado  
P O BOX 3331, Boulder, CO 80307-3331

The Flatirons Mineral Club is a non-profit organization, established March 9, 1957, dedicated to developing and maintaining interest in all aspects of earth science and associated hobbies.

Regular club meetings are on the second Thursday of each month at 7 p.m. at Frasier Meadows, 350 Ponca Place, Boulder, CO 80303. All are welcome.  
[flatironsmineralclub.org](http://flatironsmineralclub.org) and Facebook

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# Officers, Directors, and Other Volunteers

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## President

Gabi Accatino, 303-809-4666  
[accatino@colorado.edu](mailto:accatino@colorado.edu)

## 1<sup>st</sup> Vice president: Program

Tally O'Donnell, 303-494-6061  
[phantom@indra.com](mailto:phantom@indra.com)

## 2<sup>nd</sup> Vice President: Field Trip Chair

Anita Colin, 720-556-9889  
[anitacoln@hotmail.com](mailto:anitacoln@hotmail.com)

## 3<sup>rd</sup> Vice President: Annual Show Chair

Ray Gilbert 303-774-8468  
[Hoss@g.com](mailto:Hoss@g.com)

## Secretary

Eileen Fitzgerald, 303 666-1399  
[elfitz891@hotmail.com](mailto:elfitz891@hotmail.com)

## Treasurer

Gerry Naugle, 303-591-2830  
[gnaugle@earthlink.net](mailto:gnaugle@earthlink.net)

## Past President

Mike Smith, 303-530-2646  
[m\\_l\\_smith@earthlink.net](mailto:m_l_smith@earthlink.net)

## Board of Directors

### Term Expires 2016

Charlotte Bourg, 970-278-0975  
[rckhnd4252@gmail.com](mailto:rckhnd4252@gmail.com)

Kevin Notheis, 303-325-5666  
[knotheis@gmail.com](mailto:knotheis@gmail.com)

### Term Expires 2017

Brian Walko, 303-931-4283  
[earthextractions@gmail.com](mailto:earthextractions@gmail.com)  
Brad Willkomm, 303 249-8877  
[bpwillkomm@yahoo.com](mailto:bpwillkomm@yahoo.com)

## Web Master

Kevin Notheis, 303-325-5666  
[knotheis@gmail.com](mailto:knotheis@gmail.com)

## Membership

Gerry Naugle, 303-591-2830  
[gnaugle@earthlink.net](mailto:gnaugle@earthlink.net)

## Newsletter Editor

Dennis Gertenbach, 303-709-8218  
[gertenbach@comcast.net](mailto:gertenbach@comcast.net)

## Scholarship

Donald Layden  
[donald@pmgresources.com](mailto:donald@pmgresources.com)

## Junior Geologists

Dennis Gertenbach, 303-709-8218  
[gertenbach@comcast.net](mailto:gertenbach@comcast.net)

## Denver Show & Council Rep

Carl Bird, 303-665-9794  
[carlmbird@comcast.net](mailto:carlmbird@comcast.net)

## Field Trip Co-Chair

Gabi Accatino, 303-809-4666  
[accatino@colorado.edu](mailto:accatino@colorado.edu)

## Club Claims

Brian Walko, 303-931-4283  
[earthextractions@gmail.com](mailto:earthextractions@gmail.com)

## Club Hospitality Chair

Deborah Knox  
[clanfelidae@yahoo.com](mailto:clanfelidae@yahoo.com)

## Club Show Committee Members

### Show Chair

Ray Gilbert 303-774-8468  
[Hoss@g.com](mailto:Hoss@g.com)

### Volunteer Chair

open

### Programs and Dealer Chair

Tally O'Donnell, 303-494-6061  
[phantom@indra.com](mailto:phantom@indra.com)

### Show Advertising and Admissions

Gerry Naugle, 303-591-2830  
[gnaugle@earthlink.net](mailto:gnaugle@earthlink.net)

### Kid's Corner Chair

Charlotte Bourg, 970-278-0975  
[rckhnd4252@gmail.com](mailto:rckhnd4252@gmail.com)  
Eileen Fitzgerald, 303 666-1399  
[elfitz891@hotmail.com](mailto:elfitz891@hotmail.com)

### Other Show Committee Members

Gabi Accatino, 303-809-4666  
[accatino@colorado.edu](mailto:accatino@colorado.edu)

### Grab Bags

Anita Colin, 720-556-9889  
[anitacoln@hotmail.com](mailto:anitacoln@hotmail.com)  
Charlotte Bourg, 970-278-0975  
[rckhnd4252@gmail.com](mailto:rckhnd4252@gmail.com)

### Meeting Door Prize Chair

Brad Willkomm, 303 249-8877  
[bpwillkomm@yahoo.com](mailto:bpwillkomm@yahoo.com)

### Denver Show Club Table

Dennis Gertenbach, 303-709-8218  
[gertenbach@comcast.net](mailto:gertenbach@comcast.net)

## A friendly reminder to pay your 2017 annual dues

Dues are still only \$18 per individual and their immediate family. You can pay in two ways:

**PAY** Gerry Naugle, Treasurer and Membership Chair, at any FMC monthly meeting. Gerry is at or near the sign-in table when you enter the room for the monthly meetings.

**SEND** a check made to "Flatirons Mineral Club" or "FMC" to P.O. Box 3331, Boulder, CO, 80307. Please do not send cash in the mail.

Your 2017 dues must be received by January 20th, 2017 in order to stay current with the member benefits, which include electronic club newsletters containing the information about club activities, club field trips information, annual show opportunities, silent auction opportunities, and the annual club summer picnic. Your receipt is your new annual 2017 FMC membership card.





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

## First Class Mail

### *Upcoming Events*

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Thursday, January 12, 7:00 pm	Club meeting featuring Ed Raines "The Leadville Limestone, a Rock of Consequence in Aspen"	Frasier Meadows
Wednesday, January 18, 6:30 pm	Jr. Geologist meeting on geodes and how they form	Meadows Branch Library
Thursday, January 19, 7:00 pm	After-Show Appreciation Party	Frasier Meadows
Thursday, February 9, 7:00 pm	Club meeting with Damon Hauschulz discussing "Colorado Basement and Large Scale Lapidary	Frasier Meadows
Wednesday, February 18, 6:30 pm	Jr. Geologists meeting	Meadows Branch Library

Save the Date: Silent Auction is Thursday, April 13