

Four Corners Gem and Mineral Club

October 2024 Newsletter



Message from your President

I hope you are all enjoying the start of fall. This is my final newsletter to the Club. It has been a pleasure serving this organization, and I want to thank the membership for giving me a chance to help out. I wish the Club well and hope it can meet its future challenges with renewed energy and increased membership and service to our community.

My Challenge to the Board and Membership

When this Club was originally organized there was a major emphasis on “rock hounding” and exploring different areas in the Four Corners.

Our Bylaws state:

**The mission of Four Corners Gem and Mineral Club shall be to:
Provide residents of the Four Corners region with opportunities to learn about and explore topics in earth sciences, lapidary and allied arts.**

Over time the focus on earth sciences has diminished even though there is still great interest in this aspect of our mission amongst many of our members. My challenge to the Board and Membership is to provide more opportunities for education and experiences with geology and earth sciences.

Every year there is a demand for more field trips, but when the request goes out to find people to lead field trips there is not much response. If the Club values these types of activities, then it is time to make them happen. The newly created Events Committee welcomes the opportunity to have members give presentations or lead other activities.

Parroting the words of John F. Kennedy: Ask not what the **Club** can do for you, ask what you can do for the **Club**. Offer to lead a field trip, give a presentation, teach a class on an earth science topic or some other activity. You can also contribute by helping out at the Club,

volunteering for the Gem Show or other events. The Board cannot expect a handful of people to always be the “ask” for these activities. It will take a larger part of the membership to make changes.

Classes in October

Classes offered in October include Introduction to Micro Stone Setting - Flush Setting Class (October 12-13), Introduction to Silversmithing and Statement Ring (October 25-26), and Cutting and Polishing Cabochons (October 27) If you are interested in any of these courses, check this link <http://www.durangorocks.org/events.html> for the times, cost, and other information.

Social Hour on October 30

The Events Committee has organized a social hour from 6:00-7:30 pm on October 30 at the Club. This is a chance to meet new people and reconnect with old friends. Bring a scary rock and spooky snacks.

Open Shop

A full schedule of Open Shop is listed at <http://www.durangorocks.org/events.html>.

Field Trip on October 19

I am going to offer a field trip on Saturday, October 19 to explore the geology of Animas Valley. This trip will be focused on the geologic history with stops at a few interesting outcrops. This trip will be limited to 12 participants since we will make stops with restricted space for cars. Details of the trip be posted on our website soon. If you want to know a little more about the rocks and history of this area, this is your chance.

Events Around the Region

If you are interested in finding shows and other events in the area, you can find them at <https://www.rockandmineralshows.com/>

FCGMC Steward Coordinator

Charlotte Lenssen is our Steward Coordinator for the Club. If you have questions for Charlotte or want to become a shop steward the please contact her at charlotte_lenssen@yahoo.com

Reminder about Membership Dues

It is easy to forget to pay your membership dues, but they are particularly important to support the activities and events that we offer, as well as tools and equipment. You can renew with a Steward at the Club during Open Shop or online at <https://www.durangorocks.org/join-clubrenew.html>

Results of Club Elections

October 1 was our annual elections for officers and directors. The 2024-25 Board members are:

President: Angela Folk

Vice President: Carl Lindeman

Treasure: Cindy Pugsley

Secretary: Emelie Frojen

The Directors are: Heather Bates, Shauna Dooley, Denise Galley, Charlotte Jenssen, Carlos Mañón, and Toby Mourning.

State of the Clubhouse

In case you have not noticed, our Clubhouse is showing its age. Each year the building shows signs of the “end is near.” We had a bit of good fortune this year to learn that our lease will be renewed another 10 years when our current lease terminates. It is imperative that the Board and the Building Committee make an effort to get a new building constructed. This effort will again require designing the building, getting approval from the City, and generating enough funds to build it. This is no small task and it will need to happen sooner rather than later. I am not sure the floor and roof of the Clubhouse can last another 10 years. If you are interested in serving on the Building Committee, please contact one of officers.

My Final Essay

For my final essay to the Club, I am getting back to my passion, geology. In this essay I will discuss how a particular mineral can change composition. Garnet is a perfect example. The physical properties of all garnets are similar, but the chemical compositions and colors vary. This phenomenon is possible because of the atomic structure of the garnet group. The general chemical formula for the garnet group is $A_3B_2Si_3O_{12}$. The A position can house cations with a 2+ charge such as Ca, Fe, Mn, and Mg. Cations with a +3 charge such as Al, Cr, and Fe can snuggle down in the B position. This happens because of the restrictions in the atomic lattice to insure charge balance and energy stability. As long as cations in the A or B positions have similar atomic charge and size these substitutions can occur which leads to a range of colors and garnet names such as grossularite (Ca, Al) or almandine (Fe, Al). A similar process happens in sphalerite where Zn and Fe can substitute to create (Zn, Fe)S. The iron rich variety is called “black jack sphalerite” and zinc rich variety is called “ruby blende.”

Another good example is the silver content in galena. Galena is well known for lead which is expressed in its chemical formula (PbS), but it is also a major source of silver. In fact, many of the mines around Silverton extracted silver from galena and tetrahedrite, not native silver. How can this happen? Well, this leads us into another type of chemical magic called coupled substitution. It is a type of atomic “swapping.” Don’t get too excited just yet. According to George et al (2015; American Mineralogist) “substantial incorporation of Ag and Bi into galena via the well-established coupled substitution $Ag^+ + (Bi_3^+, Sb_3^+) \leftrightarrow 2Pb^{2+}$.” Because Pb has a 2+ charge there must be charge balance in the structure. Silver can substitute for Pb only if there are other ions to balance the charges. This substitution also causes the cleavage in galena to warp creating curved planes rather than the typical flat cleavage planes. Coupled “swapping” also happens in plagioclase feldspar to create the full range to Na to Ca plagioclase.

To a geologist, understanding these phenomena are critical to interpreting rocks and earth history. To the lapidary artist these processes give rise to the various colors and properties of many minerals that can be expressed in the final wares.

I hope you have enjoyed my essays and learned a little more about science and geology. Perhaps one of you could write for the newsletter.



The variety of colors in the garnet group are related to the different cations that substitute into the atomic lattice. Photograph from GIA, <https://www.gia.edu/garnet-quality-factor>