

# The Lake George Gem and Mineral Club -

## Club News

November, 2016



### November 12 Meeting Starts at 10:00 AM

Steven Veatch and the Lake George Gem and Mineral Club Study Group will be providing, by popular demand, a repeat presentation of their first research project for the November club meeting on Guffey. The town of Guffey and the Freshwater Mining District, in Park County, Colorado, is situated in a very scenic area near the base of three ancient volcanoes. Guffey was started by prospectors on a chance there might be another rich gold strike like the one in the nearby mining camp of Cripple Creek. Guffey became the center of activity in the Freshwater Mining District, where copper, lead, zinc, mica, feldspar, and other minerals were produced. Although enormous gold discoveries were forecast, it was the mining of other minerals that kept the small town going. Nearby cattle ranches and lumber operations sustained the small community during periods when mining brought in little money. Two local cowboys discovered a large nickel-iron meteorite just outside Guffey in 1907, making it the largest one ever found in Colorado. This presentation will cover the history of Guffey and present rare, historical, and recent photos of the town and the mines. Don't miss this program.

A **Silent Auction** will also be held at this meeting. Donate your extra specimens, books, or other Earth-science-related items to sell for the benefit of the Club! Bring some cash!

### Coming Events

✓ ✓ Several mineral, fossil, and geology clubs meet relatively nearby and encourage visitors. These include:

> **Cañon City Geology Club**, meets on the 2<sup>nd</sup> Monday of the month at 6PM in the United Methodist Church, Cañon City;

> **Colorado Springs Mineralogical Society**, meets on the 3<sup>rd</sup> Thursday of each month at 7PM in the Colorado Springs Senior Center, 1514 N. Hancock Ave., Colorado Springs;

> **Columbine Gem & Mineral Society**, meets on the 2<sup>nd</sup> Thursday of each month, 6:30PM in the meeting room, Mt. Shavano Manor, 525 W. 16<sup>th</sup> (at J St.), Salida;

> **Pueblo Rockhounds**, meets on the 3<sup>rd</sup> Thursday of each month at 6:30PM in the Westminster Presbyterian Church, 10 University Circle, Pueblo.

✓ ✓ **Pete Modreski** sent notices of the following upcoming events:

**Lake George Gem and Mineral Club**

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**Sat.-Sun., Oct. 29-30, Book, Fossil and Mineral Sale** at the **Colorado School of Mines Geology Museum**. 9 a.m. to 4 p.m. each day; 1310 Maple St., Golden, CO. A sale of material that is surplus or has been donated to the CSM museum. Lots of items, bargain prices!

**Wed., Nov. 2, 4:00 p.m., CU Geology Colloquium, What does the deglacial carbon isotope minimum tell us about changes in atmospheric CO<sub>2</sub> and climate?**, by Jean Lynch-Stieglitz, Georgia Tech. Benson Earth Sciences Building, Auditorium (Room 180), CU Boulder campus. All are welcome; refreshments at 3:30 on the 3<sup>rd</sup> floor. See <http://www.colorado.edu/geolsci/colloquium.htm> for the full colloquium schedule.

**Fri., Nov. 4, 5:30 p.m.**, the Friends of Dinosaur Ridge holds its annual “**Rock Out for the Ridge**” dinner, lecture, and fundraiser at Pinehurst Country Club, W. Quincy Ave., Denver. The after-dinner speaker will be Dr. Ken Carpenter, on “**Acrocanthosaurus, Inside and Out**”. For details see <http://www.dinoridge.org/fundraising.html> .

**Nov. 8, 3:00 p.m.**, Earth Sciences Colloquium at the Denver Museum of Nature & Science, **Exploring the Eocene Forests of Colorado**, by Steve Manchester, Florida Museum of Natural History. In the VIP Room. All are welcome, museum admission is not required.

**Sat.-Sun., Nov. 12-13, 37th annual New Mexico Mineral Symposium**, at New Mexico Institute of Mining & Technology, Socorro, NM; Always a very interesting and worthwhile weekend program and rendezvous for mineral collectors, mineralogists, geologists, and rockhounds; it includes a day and a half of lectures, a Sat. eve. banquet a Sunday afternoon silent auction, mineral dealers, and some optional field trips on Thursday and Friday. See <https://geoinfo.nmt.edu/museum/minsymp/home.cfm> for full program and registration information.

**Nov. 17, “Terrestrial Ecosystems During the Mesozoic”** by Joe Sertich, Colorado Scientific Society, Shepherd of the Hills Presbyterian Church, 11500 20<sup>th</sup> Ave., Lakewood.

**Nov. 18-20, Denver Area Mineral Dealers Show**, Jefferson County Fairgrounds, Golden.

**Sat., Nov. 19, 11 a.m. – 4 p.m., Silent Auction**, held by the Littleton Gem and Mineral Club. All are welcome. Columbine Hills Church, 9700 Old Coal Mine Avenue, Littleton, CO. “Setup 11 a.m., silent auction starts at noon, verbal auction starts at 1 pm, checkout starts at 3:30 pm.”

**Tues., Dec. 6, 3:00 p.m.**, Earth Sciences Colloquium at the Denver Museum of Nature & Science, **Pterosaur paleobiology: Insights from photogrammetric Ichnology**, by Brent Breithaupt and Neffra Matthews, BLM.. In the VIP Room. All are welcome, museum admission is not required.

**Wed., Dec. 7, 4:00 p.m., CU Geology Colloquium, Colorado’s geothermal resources and thermal springs: a simple groundwater flow model**, by Paul Morgan, Colorado Geological Survey. Benson Earth Sciences Building, Auditorium (Room 180), CU Boulder campus. All are welcome; refreshments at 3:30 on the 3<sup>rd</sup> floor. See <http://www.colorado.edu/geolsci/colloquium.htm> for the full colloquium schedule.

**Fri-Sun., Dec. 9-11, Gem and Mineral Show/“Rocks and Rails”**, sponsored by the Flatirons Gem and Mineral Club; together with the Boulder Model Railroad Club; at the Boulder County Fairgrounds, Main Exhibit Building, 9595 Nelson Rd., Longmont, CO. 10 a.m. – 5 p.m. daily.

✓ ✓ **Steve Veatch** plans to re-start the LGGMC Study Group this year. Here’s a report:

#### **RETURN OF THE LGGMC STUDY GROUP**

The Lake George Gem and Mineral Club is pleased to announce the return of the club's study group. The group will study Tarryall. Today, Tarryall is an unincorporated town of random cabins and old buildings in eastern Park County, Colorado. The town is located on Tarryall Creek in the eastern edge of the South Park, between Lake George and Jefferson. The town was founded in 1896 as Puma City, based on mineral discoveries in the area. The town quickly reached a peak population of about a thousand residents.

The study group will start this fall and winter by working with

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- Historic newspaper articles
- Historic photographs
- Archival research
- Library searches
- Oral histories
- Interviews
- Mining history
- Ranching history
- Geology
- Mineralogy
- Maps

In the spring and summer we will follow this agenda:

- Field trips to the area
- Photography of the area today
- Preparation of a paper and presentation

The study group organized in the past to do an in-depth study each year. Guffey, Victor, and the Alma area were the first areas the group researched.

The results of the group's previous work was presented at the towns studied to local audiences. Presentations were also made at the New Mexico Mineral symposium. Papers were published by the symposium and by *New Mexico Geology*. Money was raised by an art auction for historic preservation.

Any interested club member is urged to email Steven Veatch at [steven.veatch@gmail.com](mailto:steven.veatch@gmail.com) to an express interest in being part of the study group or to find out more about it. **NO EXPERIENCE** is necessary. **All training is provided.** A spot will be found for each person on this study group. **The size of this group is limited, so sending an email of interest early is encouraged.**

✓ ✓ Here's some information from Newmont Mining about their new Cripple Creek overlook:

On Tuesday, September 29, 2016, Newmont CC&V opened its new Grassy Valley Mining Overlook with a ribbon cutting ceremony!

Community members, their elected representatives, members of the press and Newmont CC&V personnel, celebrated with a delightful fall day, a few speeches, much conversation and some delicious refreshments.

This new observation area, which features an amazing CAT 793 Haul Truck Bed converted to an observation deck, provides a safe and dynamic way for community members and visitors to view our modern mining operations. Plus, the 360-degree view takes in the historic Grassy Valley; a beautiful angle of Pikes Peak; and one of Newmont CC&V's historic mining preservation sites known as the Hoosier Complex. It's a must see area for anyone exploring the area's ongoing mining heritage!

You can find this overlook located just north of CC&V's active Wild Horse Extension Surface mine on Teller County Road (TCR) 82 (between Colorado Highway 67 and TCR 81). While in the area, don't forget to visit the quintessential Rocky Mountain towns of Cripple Creek & Victor, Colorado, for educational museums, unique shopping, delightful restaurants, and comfortable hotels.

Also, as Newmont CC&V moves forward into 2017, we will be working with leaders in our neighboring communities to establish plans for other potential overlooks that will provide access to additional historic sites and other scenic vistas in the area. We will keep you informed of these developments as soon as plans and permits are in place.

✓ ✓ And here is the latest installment of “Bench Tips” by Brad Smith ([www.BradSmithJewelry.com](http://www.BradSmithJewelry.com)):

## TEMPLATES

Whenever I have to make more than 2 or 3 exact copies of anything, I think of making a template. A template lets me easily draw the shape of an item. Art stores sell templates for common shapes like circles, ovals, hearts, etc. Other sources would include [cooltools.us/](http://cooltools.us/) and [kingsleynorth.com/](http://kingsleynorth.com/).

For nonstandard shapes, it's easy to make your own template. Simply cut the shape out of sheet plastic or thin sheet metal. My preference is brass. I carefully lay out the shape using a steel ruler, a set of dividers, a scribe, and a fine center punch.

One example is the brass template in the pic below that lets me quickly trace the design of ginkgo-leaf earrings onto silver sheet. Another is the nickel template, which makes it easy to drill a pattern of holes for pin inlay into wooden handles.



## DENTAL TOOLS

A ready source of free tools is your local dentist. Dental picks can be reworked into wax tools or straightened and sharpened to make a stylus for marking and layout. The steel in these tools is high quality, and the handles are designed for comfort.

A special note however - If you want to modify the shape of the tool, don't try to just bend it with pliers. Working this alloy of steel while it's cold will cause it to snap. Changing its shape can only be done when it's hot. I work it like a blacksmith; be sure you wear protective goggles. Prop your torch up on the bench so that you can use both hands for the work. Have a hammer and bench block ready. Heat the tip red hot, and hammer it straight or bend it with pliers. And don't forget to ask your dentist for some of the cutting burs they throw out. These are useful for a variety of things. It's best to call a week or two before your visit and ask the dentist or hygienist to put some of these tools aside for you. It's good practice also to ask that they run them through the sterilizer for you. If that's not possible, pop them in an oven at around 250 F.

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See all Brad's jewelry books at [Amazon.com/author/BradfordSmith](http://Amazon.com/author/BradfordSmith)

### Notes from the Editor

Bob Carnein, Editor

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Here's the first of what I hope will be a series of occasional articles about interesting properties of gem minerals. Let me know if you know of a topic you'd like to see included, or, better yet, write an article for the newsletter!

## Phenomenal Gemstones I: Sunstone by Bob Carnein

This is the first of a series of articles about phenomenal gemstones. I don't mean "phenomenal" as in "awesome" or "gigundous", although the effects shown by these stones are indeed awe-inspiring. What I mean by *phenomenal* is that they show unusual optical or other phenomena that make them attractive collectors' stones. Included are such things as *asterism*, *chatoyancy*, *labradorescence*, *opalescence*, *color change*, and the *girasol effect* (Figures 1, 2).



Figure 1. Asterism in rose quartz.  
([www.gemologyonline.com](http://www.gemologyonline.com))



Figure 2. Chatoyancy in scapolite.  
([www.gems-inclusions.com](http://www.gems-inclusions.com))

A stone that has recently caught my interest is **sunstone**. For years, I have seen sunstone from remote Lake and Harney counties, Oregon—a transparent variety of the common plagioclase feldspar called *labradorite*. Most Oregon sunstone is some shade of yellow, orange, or red, the color being caused by microscopic copper inclusions (Figures 3, 4). If the inclusions are larger, the stones may have a glittery appearance and are called *aventurine*. (Unfortunately, the same name is sometimes used for a variety of quartz with sparkly mica inclusions, whose color varies with the type of mica.) Alignment of the inclusions in sunstone can cause the stones to show an internal “flash” when turned in the light (Figure 3).



Figure 3. Oregon sunstone (left, [www.pinterest.com](http://www.pinterest.com); right, [www.dustdevilmining.com](http://www.dustdevilmining.com))

Another variety of plagioclase, called *oligoclase*, sometimes contains tiny, oriented inclusions of hematite. This may give the stone a reddish or golden shimmer when light reflects off the hematite flakes. Sunstone or aventurine of this type occurs in Tvedestrad, Norway and other localities (Figure 5).



Figure 5. Norwegian sunstone. ([www.johnbetts-fineminerals.com](http://www.johnbetts-fineminerals.com))

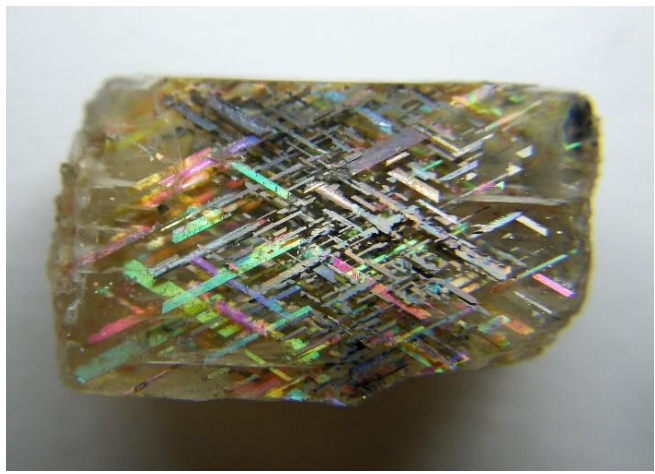
A few years ago, the writer found a granite fragment with small crystals of what was probably oligoclase sunstone at St. Marys "Glacier", north of Idaho Springs. Unfortunately, I left the specimen in Pennsylvania when we moved to Colorado, so I can't check its composition. (How about a field trip?)

Although the Oregon and Norway sunstones are quite attractive and interesting, they don't hold a candle to the spectacular "rainbow lattice sunstone" from Australia (Figure 7). After spending several hours on the Internet reading everything I could find about this, I became frustrated by accounts that conflicted about everything from the location to whether the deposit is exhausted. Finally, I found a note on YouTube that turned out to be written by one of the deposit's discoverers, Darren Arthur. Most of what follows came from him.

Rainbow lattice sunstone comes from the Rainbow Serpent mine, in the Harts Range, Northern Territory, Australia. The lease area is 500 x 600 m, but the productive area is only about 150 m long by 3 to 5 m wide. It is located about 200 km northeast (by road) of Alice Springs. The original find was made by Darren Arthur and Sonny Mason (now deceased) in 1985, while they were exploring an abandoned mica mine (Figure 6). The finders sent samples to the Gemological Institute of America (GIA), which published a short article in 1989 (Anonymous, 1989). That is the only published article I have found.



**Figure 6. Darren Arthur at the Rainbow Serpent mine. (Darren Arthur photo)**



**Figure 7. Rainbow lattice sunstone. (Darren Arthur photo)**

The Rainbow Serpent mine occurs in an area whose rocks have undergone regional metamorphism (they have been deeply buried, heated, compressed, and highly deformed). Predominant gneisses and schists are intruded by pegmatites and cut by quartz veins that appear to parallel a regional fracture system. Reports of almandine garnet suggest at least medium grade metamorphism. Satellite images of the mine area show a highly deformed terrane that is fractured, faulted, and intruded. According to Darren Arthur (personal communication, 2016), the best sunstone occurs as large (to several cm) crystals in “nodules” within a biotite-quartz-feldspar gneiss (Figure 8, 9). Lower quality material occurs in nearby pegmatite. Figures 9 and 10 show an in situ “crystal/nodule” in the excavation, from which the specimen in Figure 15 was collected. Typically, the sunstone and surrounding minerals are highly fractured, and quality stones larger than 1 to 3 carats aren’t common. A typical 4- to 5-kg “nodule” may yield 20 or 30 such stones (Darren Arthur, personal communication, 2016).



**Figure 8. Sample showing an albite crystal (white, to right) and a sunstone crystal (gray, to left) with gneiss between. (Darren Arthur photo)**





**Figure 9. In situ crystal “nodule” in which sunstone occurs. (Darren Arthur photo)**



**Figure 10. Nodule with top removed and wetted to show features. Sunstone in center; biotite gneiss to left of center; pegmatite to right and top of sunstone nodule. (Darren Arthur photo)**

Some unanswered questions surround the nature of the sunstone itself, and the writer hopes to research the topic in more depth. Much of our current knowledge is based on the 1989 GIA study and on Darren Arthur’s experience as a lapidary and field explorer. Preliminary analysis of the material shows that the host feldspar is about 75 percent  $\text{KAlSi}_3\text{O}_8$  (orthoclase) and 25 percent  $\text{NaAlSi}_3\text{O}_8$  (albite). The feldspar displays *adularescence* and so can be classified as moonstone. Most of the crystals have no faces (they are anhedral), but a few exhibit one or two flat faces (they are subhedral).

Moonstone from the Rainbow Serpent mine commonly contains inclusions of several types. According to Mr. Arthur, hematite ( $\text{Fe}_2\text{O}_3$ ) occurs as small platelets, some of them hexagonal in outline, in one crystallographic direction within the feldspar (see Figure 12). This gives the stone its aventurescence and imparts a somewhat golden color. Ilmenite ( $\text{FeTiO}_3$ ) occurs as extremely thin blades, nearly invisible from the sides of the host feldspar crystals, that also are oriented in a single feldspar lattice plane [apparently (100)]; (Figures 11, 12, 13). At different “levels” within the host, these blades may be oriented in 2 or 3 consistent directions that intersect at 60-degree angles. When one looks down on the lattice planes containing the blades, one sees them intersecting to form rhombuses or equilateral triangles (Figure 11), resembling sagenitic twinning in rutile (Figure 14). These intersecting blades form the “lattice” of rainbow lattice sunstone.



Figure 11. "Lattice" pattern (looking down  $a$  axis. (Darren Arthur photo)



Figure 12. Oblique view of Figure 11. (Darren Arthur photo)



Figure 13. Side view of Figure 11, showing hematite flakes and very thin ilmenite blades in edge view. (Darren Arthur photo)

According to Mr. Arthur (personal communication, 2016), much of the ilmenite has oxidized or altered, producing the iridescent "rainbow effect" that gives the stones their unique attractiveness. Unaltered ilmenite blades are black, with a metallic or submetallic luster. This can be seen in several of the photos. The iridescence is confined to blades that intersect cracks; areas that are uncracked display fresh, black ilmenite. The iridescence may be caused by oxidation of iron in the ilmenite.

Not fully explained is why ilmenite, which typically occurs in thick, hexagonal plates or rhombohedra (Anthony, *et al.*, 1997), would form a trigonal pattern of intersecting blades within a monoclinic feldspar host. Although ilmenite is commonly twinned, the twins are usually simple pairs. However, rutile ( $\text{TiO}_2$ ), another titanium

mineral that commonly occurs with ilmenite and hematite, often forms twins and intergrowths that resemble the “lattice” pattern in rainbow lattice sunstone (Figure 14). Maybe this has something to do with the pattern.



Figure 14. Sagenitic rutile. ([www.tumblr.com](http://www.tumblr.com))



Figure 15. Rough rainbow lattice sunstone, showing (001) and (010) cleavage in the host feldspar. (Darren Arthur photo)

Whatever its origin, rainbow lattice sunstone is a truly “phenomenal” gemstone. It is far rarer than many more expensive stones, but prices are rising. An internet survey shows that prices vary widely, depending on the patterning and colors of available stones. Really nice ones are scarce and commonly sell for more than \$100 per carat. The locality continues to produce a trickle of fine stones, and Darren Arthur and his current business partner will have a booth at the 2017 Tucson Gem & Mineral Show (see below).

Acknowledgment. I am indebted to Darren Arthur, who immediately answered my e-mails with enthusiasm and provided many pictures. There are very few details he didn't want me to share. For those attending the Tucson show this winter, he will be set up as “Asterism Gems” at the River Park Inn between January 27 and February 8. He is also the owner of “Dazlyn Gems” (<https://dazylngems.com.au>).

#### References Cited

Anonymous, 1989, A beautiful new form of orthoclase: *Gems & Gemology*, vol. 25, No. 1, p. 47.

Anthony, J.W., R.A. Bideaux, K.W. Bladh, and M.C. Nichols, 1997, *Handbook of Mineralogy, Volume III: Halides, Hydroxides, Oxides*: Tucson, Mineral Data Publishing.

**2017 Membership Application, Lake George Gem & Mineral Club**

Box 171, Lake George, Colorado 80827

[www.LGGMClub.org](http://www.LGGMClub.org)

Date: \_\_\_\_\_ / \_\_\_\_\_ /20\_\_\_\_

Name(s) \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone ( ) \_\_\_\_\_ - \_\_\_\_\_ Email (please print) \_\_\_\_\_  
*(required to receive newsletter and field-trip info)*

Names/ages of family members (if family membership) \_\_\_\_\_

Dues for Jan 1 through Dec. 31 each year are as follows (please check membership type):

\_\_\_\_ Individual (18 and over).....\$15.00

\_\_\_\_ Family (includes dependents under age 18).....\$25.00

Dues are due on or before March 31. Members with unpaid dues will be dropped from the roster on April 1.

I agree to abide by the Club constitution, by-laws, and rules regarding field trips and club claim visits.

Signed \_\_\_\_\_ Date: \_\_\_\_\_ / \_\_\_\_\_ /20\_\_\_\_

I am or have previously been a member of Lake George Gem & Mineral Club. Yes \_\_\_\_ No \_\_\_\_

**My interest areas** include (check all that apply): Minerals\_\_\_\_; Fossils\_\_\_\_; Lapidary\_\_\_\_;  
Micromounts\_\_\_\_; Colorado geology\_\_\_\_; Pebble Pups (ages 7-17)\_\_\_\_; Mining History\_\_\_\_;  
Crystallography\_\_\_\_; Other \_\_\_\_\_

**I am willing** to give a talk/presentation to (the Club) or (Pebble Pups) on \_\_\_\_\_  
\_\_\_\_\_ and/or lead a field trip to (list) \_\_\_\_\_

**I am willing** to participate/help in the following ways (can choose more than one): Club Officer\_\_\_\_;  
Newsletter Editor/Writer\_\_\_\_; Local Show/Show committee\_\_\_\_; Nominating Committee\_\_\_\_;  
Winter Programs Committee\_\_\_\_; Field Trips\_\_\_\_; Art (badges)\_\_\_\_; Membership Coordinator\_\_\_\_;  
Website Assistance\_\_\_\_; Pebble Pups\_\_\_\_; Other (be specific) \_\_\_\_\_

**Questions about the Club or Activities? Visit the website or contact a Club officer.**

Updated 05/01/2015

Lake George Gem & Mineral Club  
PO Bo 171  
Lake George, CO 80827



**The Lake George Gem and Mineral Club** is a group of people interested in rocks and minerals, fossils, geography and history of the Pikes Peak/South Park area, Indian artifacts, and the great outdoors. The Club's informational programs and field trips provide opportunities to learn about Earth science, rocks and minerals, lapidary work and jewelry making, and to share information and experiences with other members. Guests are welcome to attend, to see what we are about!

The Club is geared primarily to amateur collectors and artisans, with programs of interest both to beginners and serious amateurs. The Club meets on the second Saturday of each month at the Lake George Community Center, located on the north side of US Highway 24 on the east edge of town, sharing a building with the county highway shops. **In the winter, we meet at 10:00AM. From April through October, we meet at 9:00AM, to allow more time for our field trips.**

Our organization is incorporated under Colorado law as a nonprofit educational organization, and is a member of the Colorado, Rocky Mountain, and American Federations of Mineralogical Societies. We also sponsor an annual Gem and Mineral Show at Lake George, where collectors and others may purchase or sell rocks, minerals, fossils, gems, or jewelry. Annual membership dues (Jan. 1 through Dec. 31) are \$15.00 for an individual (18 and over), and \$25.00 for a family (parents plus dependents under age 18).

**Our Officers for 2016 are:**

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