

**March —
April 2012**

Officers—2012

- **President**
Kathy Hollenback
586-2105
davekathy@q.com
- **Vice President**
Linda Johnson
587-2117
- **Treasurer**
Cheryl Bennett
585-7879
- **Secretary**
Christine Day
586-2953
- **Officer at Large**
Dan Carter
586-4552

Inside this issue:

Unofficial No-	2
Fluorite photos	2
Fluorite	3
Fluorite—con't	4
Fluorite—con't	5
Programs	6

A Stone's Throw

The Bozeman Gem and Mineral Club

Let's hear from our President, Kathy Hollenback

Hi everyone,
Please com to the meet-
ings—we are trying to
keep them short so we can
have more time to discuss
rocks and enjoy the silent
auction. The Dobson-
Freese Collection has
some great specimens and
we have had a great time
looking at and buying
them for our own collec-
tions. A big thank you to
Joyce and Eric Shepard
and to Jerry Hancock.
They bring the rocks in for
the tables - where the
rocks are displayed and
labeled. Others on the
Dobson-Freese Collection
Committee help with the
auction also.

Last year we had some
terrific animals as well
as paintings on rocks by
our artistic members.
The kids love these and
they are money-makers.
Please collect rocks that
can be painted and
glued. Please wash
them beforehand. That
night we also want to
fill the grab-bags with
polished rocks. Jerry
has been working hard
tumbling these rocks.
Thanks.

Kathy Hollenback,
Club President



Meeting Dates:

March 20, 2012

April 17, 2012

Gem and Mineral Show
May 12 & 13

May 15, 2012

June 19, 2012

Upcoming Events and Rock Collecting

Currently we do not have any field
trips planned. One of the first out-
ings of the year is usually to Ruby
Reservoir area for garnets and/or
fossils or rhyolite.

**Ruby Rhyolite is much pretter
than this sample.**



Stay Tuned.



Unofficial Minutes of the February meeting—Feb. 21th

Meeting was called to order at 7:00pm
Ken Zahn talked about the 2012 Tucson Mineral Show. He showed many specimens that he purchased there as well as several books and magazines that he purchased.

for labor, for a total of \$40,000. If accepted by the County, it will give us 8 to 9 years of free rent. The final draft contract is not yet back for our signature. The vermiculite report is back - there is no asbestos.

Minutes were read and approved.

Old Business: The cost of the case going to the airport was estimated to be about \$1000. Ken Zahn has now been able to arrange for charitable donations of new tempered glass at no cost to the club. Valley Glass will pay for one large sheet. Ken will donate one large piece. All City Glass will donate the two side pieces. Ken will try to get someone else to transport the case and install the glass at the airport at no cost. We will ask for a different location for the case because the location they suggested is too tight.

Clubhouse status: We can't be "paid" for our time working on the building. We are going to give a bid to the Fairgrounds for the cost of our time and the materials. Jerry worked up a bid of \$10,000 for the materials and \$30,000

New Business: We would like to have membership lists sent to members. Linda will include and "as-of" date on the lists. Linda Johnson will be sending these out to members with email accounts. We will have copies at the next meeting. After a proposal by Cheryl Bennett, Ken Zahn made a motion to make long-time member Jackie Edens an honorary member. Chuck Borland seconded. Motion passed.

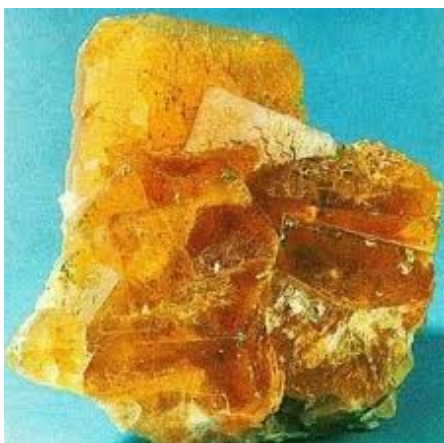
Show items. We should set a meeting to create pet rocks for the kid in March or April for the May show. Grab bags - we need to more of them for the show. We should get the next size larger bag. Christine made a motion to purchase more bags for the show. Cheryl seconded. Motion passed.

There were no Committee reports.

Meeting was adjourned at 8:40.



Fluorite
samples.



This Month's mineral is *Fluorite*.

<http://www.galleries.com/>

"The Most Colorful Mineral in the World"

Chemistry: CaF₂, Calcium Fluoride

Class: [Halides](#)

Uses: As a flux (hence the name) in iron smelting, a rare [gemstone](#), a source of fluorine, as special optical lenses and a popular mineral specimen.

[Physical Properties.](#)

[Specimens](#)

Fluorite is a mineral with a veritable bouquet of brilliant [colors](#). Fluorite is well known and prized for its glassy luster and rich variety of colors. The range of common colors for fluorite starting from the hall-mark color purple, then blue, green, yellow, colorless, brown, pink, black and reddish orange is amazing and is only rivaled in color range by [quartz](#). Intermediate pastels between the previously mentioned colors are also possible. It is easy to see why fluorite earns the reputation as *"The Most Colorful Mineral in the World"*.

The many colors of fluorite are truly wonderful. The rich purple color is by far fluorite's most famous and popular color. It easily competes with the beautiful purple of [amethyst](#). Often specimens of fluorite and amethyst with similar shades of purple are used in mineral identification classes to illustrate the folly of using color as the sole means to identify minerals.

The blue, green and yellow varieties of fluorite are also deeply colored, popular and attractive. The colorless variety is not as well received as the colored varieties, but their rarity still makes them sought after by collectors. A brown variety found in Ohio and elsewhere has a distinctive iridescence that improves an otherwise poor color for fluorite. The rarer colors of pink, reddish orange (rose) and even black are usually very attractive and in demand.

Most specimens of fluorite have a single color, but a significant percentage of fluorites have multiple colors and the colors are arranged in bands or zones that correspond to the shapes of fluorite's crystals. In other words, the typical habit of fluorite is a cube and the color zones are often in cubic arrangement. The effect is similar to [phantomed](#) crystals that appear to have crystals within crystals that are of differing colors. A fluorite crystal could have a clear outer zone allowing a cube of purple fluorite to be seen inside. Sometimes the less common habits such as a colored octahedron are seen inside of a colorless cube. One crystal of fluorite could potentially have four or five different color zones or bands.

To top it all off, fluorite is frequently [fluorescent](#) and, like its *normal light* colors, its fluorescent colors are extremely variable. Typically it fluoresces blue but other fluorescent colors include yellow, green, red, white and purple. Some specimens have the added effect of simultaneously having a different color under longwave UV light from its color under shortwave UV light. And some will even demonstrate [phosphorescence](#) in a third color! That's four possible color luminescence in one specimen! If you count the normal light color too. The blue fluorescence has been attributed to the presence of europium ions (**Eu +2**). Yttrium is the activator for the yellow fluorescence. Green and red fluorescent activation is not exactly pinned down as of yet, but may be due to the elements already mentioned as well as other rare earth metals; also manganese, uranium or a combination of these. Even unbonded fluorine trapped in the structure has been suggested. The word [fluorescent](#) was derived from fluorite since specimens of fluorite were some of the first fluorescent specimens ever studied. The naming followed the naming precedence set by *opalescence* from [opal](#); ergo *fluorescence* from fluorite.

To be continued on page 4 or printed if you don't have e-mail.

This Months mineral is Fluorite.**<http://www.galleries.com/>***Continued from page 3*

Another unique luminescent property of fluorite is its [thermoluminescence](#). Thermoluminescence is the ability to glow when heated. Not all fluorites do this, in fact it is quite a rare phenomenon. A variety of fluorite known as "*chlorophane*" can demonstrate this property very well and will even thermoluminesce while the specimen is held in a person's hand activated by the person's own body heat (of course in a dark room, as it is not bright enough to be seen in daylight). The thermoluminescence is green to blue-green and can be produced on the coils of a heater or electric stove top. Once seen, the glow will fade away and can no longer be seen in the same specimen again. It is a one shot deal. Chlorophane (which means *to show green*) is found in very limited quantities at Amelia Court House, Virginia; [Franklin](#), New Jersey and the Bluebird Mine, [Arizona](#), USA; Gilgit, Pakistan; [Mont Saint-Hilaire](#), Quebec, Canada and at Nerchinsk in the Ural Mountains, Russia.

Fluorite has other qualities besides its great color assortments that make it a popular mineral. It has several different crystal habits that always produce well formed, good, clean crystals. The [cube](#) is by far the most recognized habit of fluorite followed by the [octahedron](#) which is believed to form at higher temperatures than the cube. Although the cleavage of fluorite can produce an octahedral shape and these cleaved octahedrons are popular in rock shops the world over, the natural (e.g. uncleaved) octahedrons are harder to find.

A rarer habit variety is the twelve sided [dodecahedron](#) however it is never seen by itself and usually modifies the cubic crystals by replacing the edges of the cube with one flat face of a [dodecahedron](#). The [tetrahexahedron](#) is a twenty four sided habit that is also seen modifying the cubic habit. But instead of one face replacing each cubic edge, two faces modify the cube's edges. Occasionally combinations of a cube, dodecahedron and tetrahexahedron are seen producing an overall cubic crystal with no less than three minor parallel faces replacing each cubic edge. A fifth form is the [hexoctahedron](#) which modifies the cube by placing six very minor faces at each corner of the cube. [Twinning](#) is also common in fluorite and symmetrical penetration twins, especially from Cumberland England are much sought after by collectors.

Fluorite, as mention above, has octahedral [cleavage](#). This means that it has four identical directions of cleavage and when cleaved in the right ways can produce a perfect octahedral shape. Many thousands of octahedrons are produced from massive or large undesirable crystals of fluorite (hopefully!) and are sold in rock shops and museum gift shops at a small cost. Fluorite mine workers are reported to sit down at lunch breaks and cleave the octahedrons for the extra cash. The octahedrons are very popular due to their attractive colors, clarity, "*diamond-shaped*" and low costs, but to a serious collector they are nothing more than "*cleavage fragments*".

Fluorite not only is attractive in its own right but is often associated with other attractive minerals. Fluorite crystals will frequently accompany specimens of silver gray [galena](#), brassy yellow [pyrite](#), [chalcopyrite](#) or [marcasite](#), golden [barite](#), black sparkling [sphalerite](#), intricately crystallized [calcite](#) and crystal clear [quartz](#), even [amethyst](#).

The origin of the word fluorite comes from the use of fluorite as a **flux** in steel and aluminum processing. It was originally referred to as *fluorospa* by miners and is still called that today. Fluorite is also used as a source of fluorine for hydrofluoric acid and fluorinated water. The element fluorine also gets its name

This Month's mineral is Fluorite.**<http://www.galleries.com/>***Continued from page 4*

a source of fluorine for hydrofluoric acid and fluorinated water. The element fluorine also gets its name from fluorite, fluorine's only common mineral. Other uses of fluorite include an uncommon use as a gemstone (low hardness and good cleavage reduce its desirability as a gemstone), ornamental carvings (sometimes misleadingly called *Green Quartz*) and special optical uses.

Fluorite is the most popular mineral for mineral collectors in the world, second only to quartz. Every mineral collection owned by even the newest and youngest of mineral collectors must have a specimen of fluorite. Fluorite is by far one of the most beautiful and interesting minerals available on the mineral markets.

THE PHYSICAL CHARACTERISTICS OF FLUORITE:

- **Color** is extremely variable and many times can be an intense purple, blue, green or yellow; also colorless, reddish orange, pink, white and brown. A single crystal can be multi-colored.
- **Luster** is vitreous.
- **Transparency:** Crystals are transparent to translucent.
- **Crystal System:** Isometric; 4/m bar 3 2/m

Crystal Habits include the typical cube and to a lesser extent, the octahedron as well as combinations of these two and other rarer isometric habits. Always with equant crystals; less common are crusts and botryoidal forms. **Twinning** also produces penetration twins that look like two cubes grown together.

- **Cleavage** is perfect in 4 directions forming octahedrons.
- **Fracture** is irregular and brittle.
- **Hardness** is 4
- **Specific Gravity** is 3.1+ (average)
- **Streak** is white.

Other Characteristics: Often **fluorescent** blue or more rarely green, white, red or violet and may be **thermoluminescent**, **phosphorescent** and **triboluminescent**.

Associated Minerals are many and include **calcite**, **quartz**, **willemite**, **barite**, **witherite**, **apatite**, **chalcocopyrite**, **galena**, **sphalerite**, **pyrite** and other **sulfides**.

Notable Occurrences include in addition to those mentioned above Cumberland, England; Spain; China; Brazil; Morocco; Bancroft, Ontario, Canada; Naica, Chihuahua, **Mexico**; Germany; Elmwood, Tennessee; Rosiclare, Illinois; Fort Wayne, Indiana; Pugh Quarry and Wood County, Ohio; Nancy Hanks Mine, Colorado and many other USA localities as well as many other localities from around the world.

Best Field Indicators are crystal habit, color zoning, hardness (harder than calcite, but softer than quartz or apatite), fluorescence and especially the octahedral cleavage.

Please consider bringing a few of your favorite fluorite specimens to the March meeting for "Show and Tell."

Programs

Ken Zahn, our Program Chairperson, arranges for presentations at our meetings.

During our April meeting we will be painting and decorating rocks for the "Spin and Win" table for the children. Last year we had some beautiful rock that even the adults liked. Please come help with this.

I am trying to schedule speakers for future programs: Recognizing Native-American artifacts in the field, Garnet Mining and Processing at the Alder plant, Collecting Sites in Wyoming and Discovery and Operation of the famous California Benitoite Gem Mine. Stay tuned!!! Ken



The Bozeman Gem and Mineral Club meets on the 3rd Tuesday of each month at the Belgrade Valley Bank building at 7:00 pm. The meeting room is downstairs. We have a program at the beginning, a social time with "show and tell", a silent auction of great mineral samples, and then our business meeting. We would like to start a Junior club if anyone has an interest or ideas to make this happen. We always encourage young people to attend meetings and rock outings.

Contact Kathy or another officer if you have questions or suggestions.

Bozeman Gem and Mineral Club
P.O. Box 11001
Bozeman, MT 59719-1001

A Stone's Throw

Kathy Hollenback
Phone: 406-586-2105
E-mail: kathyh@cs.montana.edu



We're also on Facebook.
Bozeman Rock and Gem Club