Nittany Mineralogical Society Bulletin

Nittany Mineralogical Society, Inc., meeting in State College, Pennsylvania
Contact information on back page

August, 2017 **Visit our web site: www.nittanymineral.org** *Editor (see back page): David C. Glick*

August 16th meeting:

Annual Show and Tell

by

the members and guests

Our August meeting will be held Wednesday the 16th in room 114 (the large auditorium) Earth & Engineering Sciences Building on the west side of the Penn State campus in State College, PA. Maps are available on our web site.

6:45 to 7:45 p.m.: Social hour, refreshments in the lobby
7:45 to 8:00 p.m.: announcements, questions, answers
about 8:00 p.m.: featured program

The event has free admission, free parking, and free refreshments, and is open to all; ***parents/guardians must provide supervision of minors.*** *Bring your friends and share an interesting evening!*

The program topic for August will be **Show and Tell,** presented by anyone and everyone who would like to "show and tell" for 5 or 10 minutes or so. This is a great chance to bring in new specimens, lapidary work, books, photos, equipment, projects in progress, interesting contrasts and comparisons, **anything you like** which represents some area of interest in our hobby or science, and share it with others. You can speak about it as informally or formally as you'd like. Stories or questions on their own are fine, too. You can connect with other members who have similar interests, or awaken an interest or spark an idea in someone else. We've had many fun and interesting presentations in the past, and look forward to more this time around. *-Editor*

ATTENDING THE AUGUST MEETING?

Donations of **a few high quality, labeled door prize specimens** are invited.

Your donated snacks will be welcomed.

Bring a friend!

Upcoming NMS Programs

Sept. 20 Dr. Andrew Sicree will speak about Nicholas Steno, originator of Steno's law of constancy of crystal angles, defining principles of stratigraphy, and much more.

Oct. 18 will include a brief annual meeting of the membership and election of officers; program to be announced.

Nov. 15 program to be announced.

NMS Picnic
Sunday
September 10
4 - 7 p.m.
R.S.V.P.!

We are once again planning our leisurely annual picnic & cookout at the home and shady deck and back yard of Ellen and S t u a r t Bingham, 145 Goddard Circle, Pennsylvania Furnace, PA, 16865. It's a great opportunity to relax and socialize. It will be held on Sunday, September 10, 2017, 4 to 7 p.m. Please **RSVP** - see page 2. *-Editor*

Check the web site for any updates or changes

OFFICIAL NOTICE: Annual Meeting and Elections in October

by David Glick, NMS President

The October 18th meeting will be the **Annual Meeting of the Corporation**, and will include election of officers. In accordance with our bylaws (available on the web site), the Board of Directors, acting as the Nominating Committee, plans to meet in early September to set its recommended slate of officers. If you would like to volunteer to be on the ballot, or nominate someone, it would be most convenient if you would contact the President or other Board member (see page 8) by September 5.

The Board truly needs **additional volunteer**s to get involved with running the Society, providing **new energy and fresh thinking** and some new names on the ballot. In many cases it would be useful to have newcomers spend some time on committees and attending Board meetings before stepping into elected office. **All members: please consider volunteering!**

MYSTERIES AT THE MUSEUM

A segment of the Travel Channel's Mysteries at the Museum program, featuring the Penn State Earth & Mineral Sciences Museum and Art Gallery, and its Director Dr. Russ Graham, has been recorded and is expected to air this fall. Watch our web site for news.

Nittany Mineralogical Society Annual Picnic 2017

Sunday, September 10th, 4 to 7 p.m. at 145 Goddard Cir., Pa. Furnace, PA 16865

RSVP to *nittanymineral.org@gmail.com* or *(814)234-4532*

NMS will supply the dogs and burgs, buns, and drinks.
Please bring a snack, side dish, or dessert to share.

Friends and Families welcome!

FEDERATION NEWS

Nittany Mineralogical Society, Inc., is a member of EFMLS, the Eastern Federation of Mineralogical and Lapidary Societies, and therefore an affiliate of AFMS, the American Federation of Mineralogical Societies. We present brief summaries here in order to encourage readers to see the entire newsletters.

The **EFMLS Newsletter** is now being distributed electronically; a link is available on our web site **www.nittanymineral.org**. The June-July issue notes that Fall Wildacres Workshop session is coming up on September 4-10. The President's note reports on upcoming conventions; Wildacres, and Federation Internet resources including the EFMLS Newsletter. An article from the Northwest Federation covers junior rock club activities supported by helpful adults.

The **AFMS Newsletter** is available by the same methods; the summer issue has been covered here.

The Federations encourage everyone to see the web sites for the complete Newsletters. There's a lot there!

-Editor

Geo-Sudoku

by David Glick

This puzzle contains the letters ADEGINRTU. One row or column spells a subgroup of garnets. As usual, if you've read this issue, you've seen the word, or a variation of it. Each block of 9 squares, each row, and each column must contain each of the nine letters exactly once. The solution is on page 8.

						R	G	
		U	G				E	
	A				T	D		I
D	I	T			U	N	R	
			N		I	A	D	G
		A					I	
A					R	E	T	
	E		T	D	A		N	
		R		U	G		A	

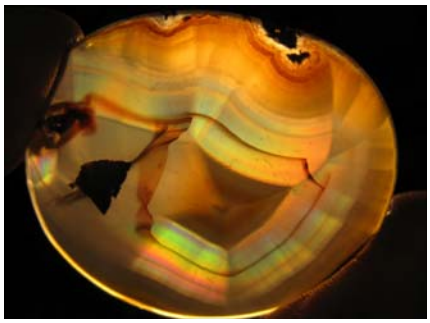
Shadow and Iris Agates

by Terry Roberts, from Rock -- Rose, November 2015.
3rd Place AFMS Adult Articles contest winner

When I read "The Beauty of Banded Agates" by Michael R. Carlson several years ago, I was awed by the beauty of these agates. Most rockhounds are familiar with the outstanding patterns and colors exhibited by Laguna, Brazilian, Dryhead, Fairburn, Condor, Queensland and other banded agates shown in the book. However, the author showed two types of agates that I was determined to find. These are the Shadow and Iris agates. Mr. Carlson provides an excellent description of each phenomenon in his book.

Shadow Agates display a shimmering optical effect caused by a phenomenon known as parallax. The shadow is caused by regularly spaced bands that are alternately clear and opaque. The opaque band is usually white in low quality agates, but can be bright colors in high quality agates. As light enters the agate at an angle to the surface of the bands, the opaque band will cast a shadow in the clear band since light is not reflected out of it. By moving the stone back and forth, the shadow will move across the bands. This can be seen in the photo where the shadow moves along the upper left side of the cabochon. A word of caution: This is not "chatoyance" which is an optical effect caused by the reflection of light from some fibrous material as seen in tigereye.

The Iris effect is often, but not always, found in low quality agate that a collector may be tempted to discard. I finally found a good example of this phenomenon in an ordinary Brazilian agate slab that had no noteworthy patterns and very little color. This can be seen in the photos which show the Brazilian agate in reflected light and again in transmitted light from an incandescent bulb (the cab has pieces of lint on the surface from the polishing cloth that appear to be scratches).



This phenomenon is produced when light passes through a clear agate with extremely fine bands (up to 10,000 bands per inch). The bands act as a diffraction grating where the edges of the bands have alternately high and low refractive indices which cause the light to break into spectral colors. Since not all agates have evenly spaced bands and refractive indices suitable for separating colors in white light, the iris effect varies in quality and the number of colors that will be displayed.

In order to get the best colors from this cabochon, I had to grind it down to a thickness of about 2.5 mm in the center of the dome and 1.5 mm at the edge. If the agate cab had been any thicker, the colors would not have been noticeable. So, if you find a clear agate slab that appears to have wavy shadows that are caused by microscopic bands, you might try to grind it to a very thin slab. You may be rewarded with a beautiful Iris Agate.

A Photo-Tour of Garnets... Now in Every Color

The article on pages 4-7 is the first half of the First Place winner in the category Original Adult Articles - Advanced, from the American Federation of Mineralogical Societies Bulletin Editors' Contest, 2016. Contest entrants grant permission for other Federation bulletins to reproduce their winning articles, with credit. The article is from Cobb- L-Stones, the bulletin of the Cobb County Gem and Mineral Society, Georgia, March 2015. We will print the second half in a future NMS Bulletin. A note at the end of the second half states: "The author is Dr. Dion C. Stewart, who has a PhD in mineralogy from The Pennsylvania State University. He examined more than 3,000 images of garnets to select those that he felt best illustrated the colors for this article, and corresponded with more than 50 different individuals at the named websites in collecting permissions for photo use and photo credits. The colors illustrated are those deemed "best" by the author; other individuals within the mineralogy profession and jewelry trade may have different opinions regarding the best matching colors for the various trade names."

-Editor

A Photo-Tour of Garnets... Now in Every Color

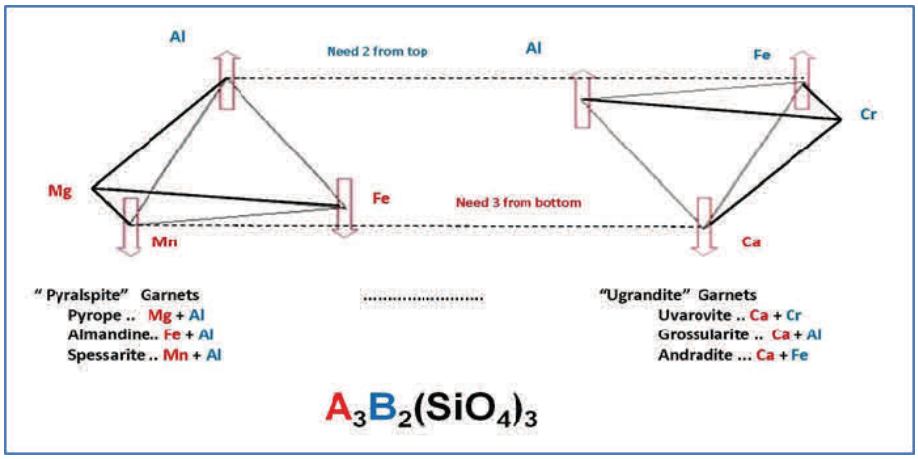
1st Place Winner, Adult Articles - Advanced, 2016 AFMS Bulletin Editors' Contest

by Dion Stewart

From Cobb-L-Stones, Cobb County Gem and Mineral Society, Georgia; March 2015

Almost everyone is familiar with the standard red garnet that is January's birthstone, but the common red color is just one of an array of beautiful colors that can be found in this mineral group. This article is a photographic tour of the colors of garnets coupled with a compositional diagram showing the chemical make up that determines the color in each variety of garnet. Many of the popular names used to categorize a distinctly colored garnet are known as a "variety" or a trade-name, and such name are often not recognized by the professional world of mineralogists as a true species. Trade names will be noted with an asterisk at the end of the garnet name in this article.

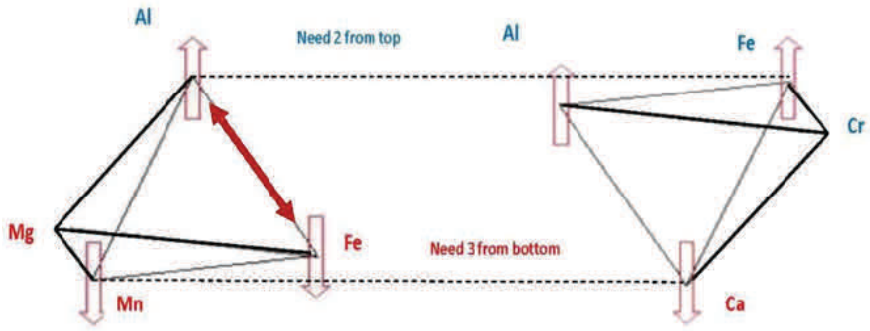
The cause of a garnet's coloration is said to be "idiochromatic", meaning the color is due to the chemical composition that is usually reflected in the minerals formula. To depict a garnet's chemical make-up, I created a "3-D" diagram showing two side-by-side pyramids – one points up and the other points down.



For a garnet to be electrically balance it must take three ions from the bottom of the diagram, which are placed in the red "**A**" spot in the formula; and two ions from the top of the diagram, which are placed in the blue "**B**" spot in the formula. The common combinations are shown by the sloping black lines that make the sides of the pyramids. Garnets forming in the right-side-up pyramid are a subgroup called "pyralspites" whereas garnets in the upside-down-pyramid are the subgroup called "ugrandites". These sub-group names are combinations of the species names that occur in the subgroups. In general, pyralspites form by metamorphism of basalt and shale and are found in schist and amphibolite rocks, whereas ugrandites are more common in metamorphosed limestone and are associated with marbles. Now to the colors, which are usually 100% natural; meaning they have not been enhanced in any way by heating, irradiation, or other man-made techniques that commonly are used on rubies, sapphires, topaz, diamonds, emeralds...etc. (it is surprising how few gemstones are NOT enhanced in one way or another). For each color discussed a doubled-pointed, thick, red arrow will show where the composition occurs within the double-pyramid diagram.

ALMANDINE: This deep red species often displaying a strong violet tint is the most common garnet in nature. The color is often so dark, due to the Fe^{2+} (divalent iron) in it, that almandine is commonly hollowed out or cut thin to Allow the color to be seen.

Almandine from Alaska's Wrangell Island



Because of garnet's high refractive index or R.I. (the poser to bend light) ancient lore claimed that almandine gave off its own light. Noah is said to have sailed the Ark by the light emitted from a garnet. The R.I. can capture even a distant light beam and light up specific areas within a faceted stone.AAug

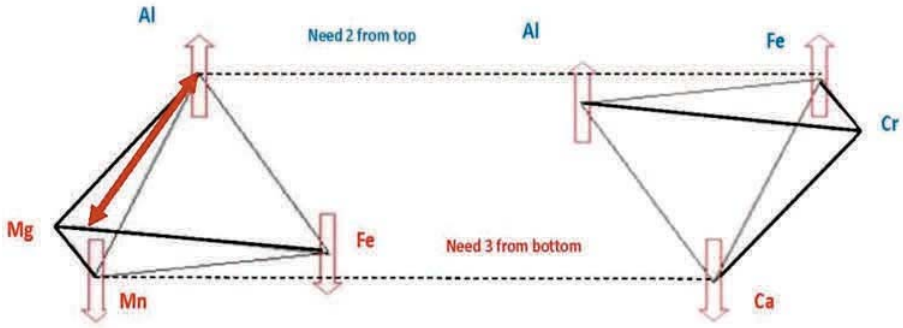
Color visible due to coring of beads

Selectively lighted facets

Pomegranate Seeds

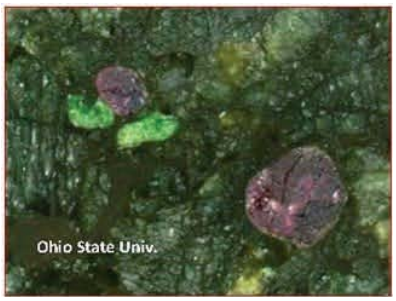
PYROPE: This species is a bright red garnet often with a light purple tint. It is the most common red garnet gemstone and is likely the source of the name "garnet", which came from the red pomegranate seeds that had the Latin name "Garanatus" and is an exact match to pyrope's color. Theoretically when pyrope is pure, all the magnesium should replace all the iron, however most pyrope has some iron as well as other trace coloring agents within its structure.

The bright red of pyrope



Some pyrope garnets form deep in the mantle of the Earth, and are brought to the surface by volcanic eruptions. These high pressure varieties can be lavender due to very low iron content and some chromium substituting for aluminum.

Victorian Pyrope Hairpin

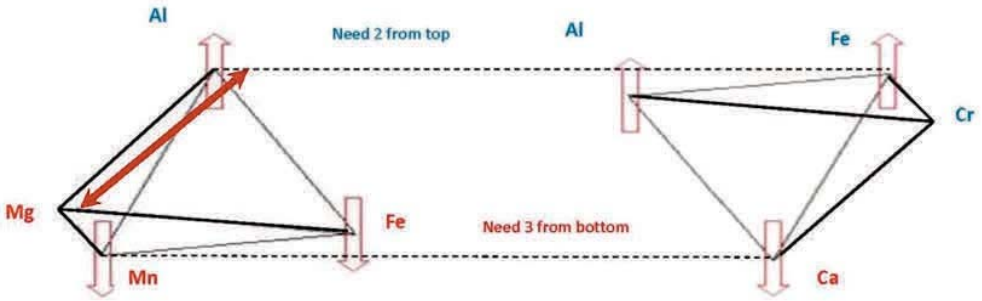


Lavender Pyrope in mantle xenolith

Pyrope from William Larson Collection

There are several different trade names that occur with mixtures of pyrope and almandine as various color tints begin to dominate the stone, but the most commonly accepted variety is called rhodolite*.

RHODOLITE *: This variety of a mixed almandine-pyrope has a purple to pink tint and a lighter red color due to an increase in magnesium compared to pure almandine. Magnesium does not cause any color so it merely dilutes the influence of the iron. Some trivalent iron commonly substitutes for the aluminum, and a small amount of manganese also is often present.

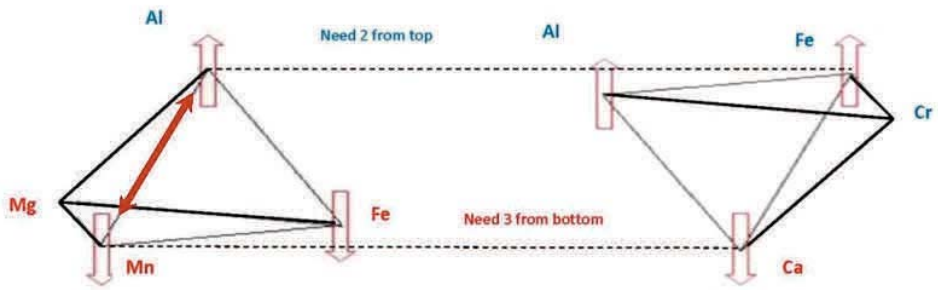


The purple/pink of rhodolite*

Interestingly as the pink color increases and the darker red diminishes the value of the stone decreases, but the popularity among the public has often increased (http://www.gemval.com/chart.php). Currently one of the most popular varieties is called the "Raspberry Rhodolite" with a strong pink tone.

Umbalite* garnet (Umba) and Tanga* garnets are sub-varieties of rhodolite that have minor variations in color from that of rhodolite. These sub-varieties are based on locality names, and there are no established color guidelines for the naming of such sub-varieties; such names are very unreliable for giving you valid information about the color of the garnet. Tanga* garnet (near right) is a rhodolite that commonly has an orange tint, whereas Umba* garnet (far righ) is a rhodolite with a more violet tint.

SPESSARTITE: This garnet (also called spessartine) in its pure form shows a very strong organge coloration with tints of red and yellow. As iron increases and manganese decreases the orange color diminishes and the red color grows stronger. Note that two other garnet varieties can have an orange tint; these are hessonite and topazolite, and they can be confused with impure spessartite, and their colors will be seen latter in this article.



The orange of spessartite

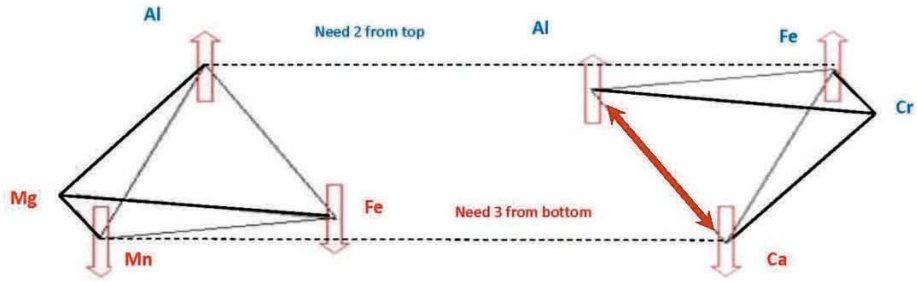
The decrease in red coloration seen in cut spessartite gems (displayed on the next page) show the wide color range on the market. The next to last color (the oval gemstone) in the line is interestingly called the "Fanta Orange" spessartite, named after the soft drink.

A group of variety names are also associated with spessartite; again, many of these are based upon locality and the true difference in color is often not distinguishable. The Malaya Garnet* has a peachy tint, and a range of these is displayed in the John J Bradshaw figure seen below on the left. The Mandarin Garnet* (below on right) has the strong orange color with yellow tints that is called the "Fanta Orange Garnet."

Malaya Garnet* - Spessartite

Mandarin Garnet * - Spessartite

GROSSULARITE: Most garnets are a true garbage pail of compositions, and it is rare to find a pure end-member species that matches the composition diagram. Most grossularite lie off the pure line having some iron and other impurities that give a host of colors, a few having their own variety name. Interestingly the pure calcium-aluminum specimens are so uncommon that when colorless this species has been given the variety name of leuco garnet*.



Leuco garnet*- pure grossular

Most grossularites have a tan color, often referred to as "honey brown", that can vary from very light to a quite rich tone having a distinct tint of orange and red, as seen seen from left to right below.

Both the calcium and aluminum from the pyramid diagram are ions that do not impart color to a mineral, however, grossularite is easily colored by minor substitutions of "color causing" ions that produce many different colors. Two of the colored varieties of grossularite that have received trade names are Merelani Mint Garnet*, which has a light to medium green color (lower left), and Hessonite* , which has a distinct cinnamon color with its distinctive reddish brown tint (below middle). Some grossularites from Mexico and Tanzania have a light to medium pink coloration, and they are becoming quite popular. I feel certain that these pink colors will soon be given a variety name within the jewelry trade, but right now they are simply refered to as pink grossularite.

Some Upcoming Shows and Meetings

Our web site http://www.nittanymineral.org has links to more complete lists and details on mineral shows and meetings around the country. See www.mineralevents.com for more.

Sept. 16-17, 2017: 52nd Annual Gem, Mineral & Jewelry Show, by Central Penn. Rock & Mineral Club. Zembo Shrine Center, 2801 N. 3rd St., Harrisburg PA
Coupon, directions, more on web site:
http://www.rockandmineral.org/annual show.htm

Sept. 23-24, 2017: Franklin - Sterling Hill Mineral, Gem & Jewelry Show, by FOMS & Franklin Min'l Museum. Littell Commun. Ctr, 10 Munsonhurst Rd #12 Franklin NJ 07416

October 7, 2017: Autumn Mineralfest by PESA, Macungie, PA 18062. Sat. only 8:30 -3:00. http://www.mineralfest.com/

October 21-22, 2017: EFMLS Convention & Show, Bristol, Connecticut. EFMLS meeting Friday October 20.

Nov. 4-5, 2017: Friends of Mineralogy - Pennsylvania Chapter Symposium and Field Trip. Saturday Symposium at Franklin & Marshall College, Lancaster, Pa. Sunday field trip.

Nov. 4-5, 2017: Gemarama, by Tuscarora Lapidary Society. Theme: Agates Everywhere. Greater Phila. Expo Center, Hall D, 100 Station Ave., Oaks, PA 19456
http://www.lapidary.org/GEMARAMA/Gemarama.html

Classifieds

FOR SALE: I am preparing to sell a large percentage of my worldwide collection and thousands of Pennsylvania specimens, many self collected and old classics. There's plenty of variety, and plenty for different levels of collector interest. Anyone interested should call to set up an appointment. Thanks,
Skip Colflesh, Hershey, PA
phone 717-805-2027

Geo-Sudoku Solution

E	T	D	**U**	I	N	R	G	A
I	R	U	**G**	A	D	T	E	N
G	A	N	**R**	E	T	D	U	I
D	I	T	**A**	G	U	N	R	E
R	U	E	**N**	T	I	A	D	G
N	G	A	**D**	R	E	U	I	T
A	D	G	**I**	N	R	E	T	U
U	E	I	**T**	D	A	G	N	R
T	N	R	**E**	U	G	I	A	D

Visit us at www.nittanymineral.org

INVITE A FRIEND TO JOIN THE SOCIETY

The Nittany Mineralogical Society prides itself on having among the finest line-up of speakers of any earth sciences club in the nation. Everyone is welcome at our meetings. If you'd like to be part of our Society, dues are $20 (regular member), $7 (student rate), $15 (seniors), $30 (family of two or more members, names listed). Those joining in March or later may request pro-rated dues. Your dues are used for programs and speakers, refreshments, educational activities, Bulletins, and mailing expenses. Please fill out a membership form (available at www.nittanymineral.org), make checks payable to "Nittany Mineralogical Society, Inc." and send them in as directed, or bring your dues to the next meeting.

We want to welcome you!

CONTACT INFORMATION

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Penna. Furnace PA 16865

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The **Bulletin Editor** will welcome your submissions of articles, photos, drawings, cartoons, etc., on minerals, fossils, collecting, lapidary, and club activity topics of interest to the members. Please contact:

David Glick E-mail: xidg@verizon.net
209 Spring Lea Dr. phone: (814) 237-1094 (h)
State College, PA 16801-7226

Newsletter submissions are appreciated by the first Wednesday of the month. Photographs or graphics are encouraged, but please do not embed them in word processor files; send them as separate graphics files (TIF, or good to highest quality JPEG files, about 1050 pixels wide, are preferred). Please provide captions and name of photographer or artist.