

Nittany Mineralogical Society Bulletin

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

September, 2017

Visit our web site: www.nittanymineral.org

Editor (see back page):

David C. Glick

September 20th meeting:

Nicolaus Steno, founder of mineralogy

by
Andrew A. Sicree, Ph.D.
Penn State

Our September meeting will be held Wednesday the 20th 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!

Although not widely known, Nicolaus Steno (born Niels Steensen in Denmark, Jan. 1, 1638, died in Germany, Nov. 25, 1686) remains an immensely



Portrait of Nicolas Steno. See note at end of article, page 2.

important figure in the history of geology, paleontology, and mineralogy. Collectively, "Steno's laws" are taught to every undergraduate student of historical and structural geology – they form the foundation of the geological sciences. His conclusive identification of the *glossopetrae* ("tongue stones") as the fossils of sharks' teeth initiated the modern field of paleontology. And his

Continued on page 2

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, presents the following slate of candidates:

President	David Glick
Vice President	Bob Altamura
Secretary	John Dziak
Treasurer	Stuart Bingham

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 20.

The Board truly needs **additional volunteers** 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!**

Membership Dues - Online or Snail Mail

We are continuing last year's option of payment via Paypal and dues form submission via fillable PDF form (available for download from <http://www.nittanymineral.org/mem>). The old way is still fine too - fill in the printed form and mail it in with a check, or bring them to the September meeting. Members receiving the printed Bulletin, who have not already paid for the coming year, will find a printed dues form enclosed. Payment in September helps avoid additional expense of sending more forms in October. Dues are due by the end of October.

Upcoming NMS Programs

Oct. 18 brief annual meeting and election of officers (see above); program to be announced.

Nov. 15 program to be announced.

Dec. 13: NOTE probable date change: **SECOND WEDNESDAY**. Holiday Dinner to be announced

ATTENDING THE SEPTEMBER MEETING?

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

Your donated snacks will be welcomed.

Bring a friend!

Nicolaus Steno

Continued from page 1

discovery of the law of constancy of crystal angles was foundational to the study of minerals. Steno carefully studied the interfacial angles of a variety of quartz crystals and was the first to measure those crystal angles rigorously. He came to realize that these angles were always the same for all crystals of the same mineral. He was also the first to describe the nature of the striations found on pyrite crystals. Steno's discoveries were published in an introductory text referred to as *De Solido*. Because of these and other discoveries Steno can rightly be called the father of mineralogy.

Steno's discoveries occurred precisely because he was a meticulous experimentalist. Originally an anatomist, at a time when anatomy marked the cutting edge of science, Steno conducted careful dissections in order to discover the true structure of the body. His discoveries include the follicles of the ovary in 1667, the vitelline duct, the glands that produce earwax, and the parotid duct (*ductus Stenonianus*). This discipline of careful observation of the natural world – the exposition of that which is inside – led him from anatomy to his discoveries in geology and mineralogy.

Typically, Steno's scientific accomplishments may be briefly acknowledged in many texts, precisely because they are so fundamental, but other aspects of his life are often ignored. Raised in Denmark, Steno studied medicine at the University of Copenhagen and then began a life of moving about Europe, working with a variety of important scientists in the Netherlands, Italy, France, Germany, and Austria. Eventually arriving in Florence, he joined the famous Accademia del Cimento in 1666. His conversion from Lutheranism to Catholicism in 1667 is deliberately ignored by some authors. Other authors report his ordination to the priesthood in 1675 as Steno abandoning science for religion, even though Steno was again studying the structure of the brain in 1684. Consecrated as the titular bishop of Titipolis in 1677, Steno was sent to Hanover to minister to Catholics in that heavily Protestant region. (It is interesting that few authors call him "Bishop Steno" even though they will uniformly refer to "Bishop Ussher" in the same texts.) Steno received permission to set aside his missionary activities for a sabbatical, but he died in 1686 at the age of 47 before he could return to Italy.

Steno's life is marked by his great intelligence and curiosity, but he was beatified in 1988 by John Paul II (beatification is the step before canonization in the Catholic Church) for his personal piety and holiness (reportedly, he even sold his bishop's ring and cross to help the needy). This is why you will often see Steno referred to as "Blessed Nicolas Steno." We get a glimpse into Steno's thought when we read that he wrote that the

purpose of anatomy is to "lead the audience by the wonderful artwork of the human body to the dignity of the soul and by the admirable structure of both to the knowledge and love of God". Steno combined his science and his faith; he explored the way things were made, whether it was the human body or a quartz crystal, precisely as a way to lead people to God. Eventually, Steno may be canonized and mineralogists and geologists will then be able to claim one of their own as the patron saint of mineralogy and geology.

PORTRAIT NOTE: Portrait of Nicolas Steno (1666–1677). Unsigned but attributed to court painter Justus Sustermans. (Uffizi Gallery, Florence, Italy). From <https://en.wikipedia.org/wiki/Nicolas_Steno>.

SYMPOSIUM ON PENNSYLVANIA MINING AND MINERALOGY

Mineral Collecting Enthusiasts Meet and Learn

November 4-5, 2017

Franklin and Marshall College, Lancaster, PA
Please Register in Advance

The Friends of Mineralogy – Pennsylvania Chapter will hold their 2017 Symposium and field trip on the first weekend in November. Mineral collectors in attendance on Saturday will meet in the Hackman Physical Sciences Building at Franklin & Marshall College, Lancaster, PA., to hear several talks by experts on minerals, geology and mining in Pennsylvania and beyond. On Sunday, a field trip for those registered for the symposium will provide an opportunity for mineral collecting.

The following four presentations have been scheduled for the symposium, and another may be added.

Stan Mertzman, PhD: Through the "Looking Glass": Optical Mineralogy and Common Igneous and Metamorphic Minerals and Rocks.

Ron Sloto, PG: The Dyer Diabase Quarries, Berks County, Pennsylvania

Bill Stephens, PG: Lapidary Grade Agate and Other Semi-Precious Gemstones from the Penn-MD Serpentine Quarry, Lancaster County, PA.

Bill Kochanov: The Occurrence of Smoky Quartz Crystals in Northeastern Pennsylvania

All interested mineral collectors are invited to register and attend. As usual, select mineral dealers will be present, and there will be a silent auction, give-away table, refreshments, and plenty of opportunities for visiting with fellow enthusiasts. Lunch is available at restaurants within walking distance. Details, updates, and a registration form will soon be available at <www.rasloto.com/FM/>.

NEW NMS T-SHIRT ORDER!

NMS will be doing a new printing run of our T-shirts and selling them for an estimated \$10 each in the colors Royal Blue, Galapagos Blue (a bluish teal) and Texas Orange. Each shirt is printed on both sides using white ink, with map on the front and specimens and WWW address on the back (colors shown below, or see www.nittanymineral.org/merchandise.htm#shirts). Sizes available are: Adult S, M, L, XL, 2XL to 5XL; Youth Y-S (6-8), Y-M (10-12), Y-L (14-16), Y-XL (18-20). We will order extras for future sales but to ensure you get your size & color you should contact Bob Altamura: call 814-234-5011 or e-mail raltamura@comcast.net. The order will be placed immediately after the October monthly meeting. Order by October 18 and pick up your shirt(s) at the November 15th monthly meeting or by other arrangement through Bob. We can also mail them at extra cost and a little extra time.



Geo-Sudoku

by David Glick

This puzzle contains the letters ACDEKMNRS. One row or column includes the country of birth of this month's featured historic scientist. 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.

	A	R			S	M	K	
			A	K				
		S		M		R		
	M							S
		N	S	R	K			D
C						A		
				E	D	K	A	
K			M	A				D
		A	K	S		E		R

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 September issue begins with details on the EFMLS Annual Convention and Show in Bristol, Connecticut, on October 20-22. President Dave Korzendorfer writes about the strengths of the Federation in helping its member clubs, and how we can improve. Scholarship Foundation News includes our own Society's recent donation (more on our donations in a future issue). Ellery Borow's safety article covers some things we ought to know - but might not - about safety. It is announced that the Connecticut Museum of Mining and Mineral Science will soon open a new wing, The Hall of Connecticut Geology. A trip from the Convention will provide a preview of the new exhibits. There's much more news on Federation activities and projects, such as Each One Teach One, Eastern Foundation Fund, Club Rockhound of the Year, and the Editors' competition.

The **AFMS Newsletter** is available by the same methods; the September issue begins with the 2017 AFMS Recognition Award honoring Jim Brace-Thompson, Chair of the AFMS Junior Program and holder of many leadership positions in the California Federation and AFMS. Many other awards and contest results are noted. President Ron Carman writes of his continuing travels to regional federation conventions.

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



Geode with dogtooth calcite crystals, approx. 4" across, a featured door prize for the September meeting. Locality unknown, probably southern Indiana. From the estate of our late member John Passaneau. *D. Glick photo*

A Photo Tour of Garnets... Now In Every Color

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

by Dion Stewart
part 2 of 2

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



Merelani Mint* – Grossularite



Hessonite* – Grossularite



Pink Grossularite – No trade name yet.

TSAVORITE*: This variety of intense green grossularite deserves special attention because it is now outcompeting emerald as the green gem of choice among knowledgeable buyers. Peter Torraca, a gem cutter who regularly uses tsavorite, made the now often quoted remark that "Tsavorite is the green that emerald wishes it could be." This garnet has a higher dispersion (ability to break white light into colors) than an emerald. It is a close

match to the hardness of the emerald but the tsavorite is much more durable and tougher. Given a tsavorite and an emerald of equal splendor the tsavorite is only a fraction of the price, even though it is much rarer than the emerald.



Tsavorite - Isometric Crystal



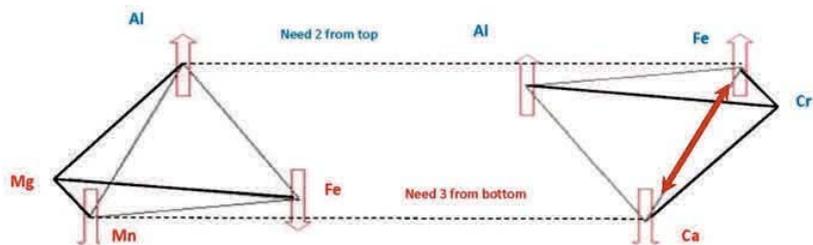
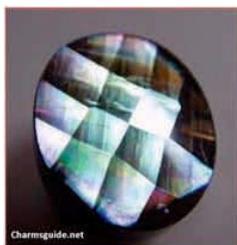
Green of Tsavorite



Blue flash in corners is due to dispersion

The coloring agent is not on the composition diagram; the color is the result of trace amounts of chromium or vanadium. The color is amazingly uniform within tsavorite jewelry. The name "tsavorite" was only coined in 1974 by Tiffany & Company for Tavor National Park in Kenya, where a major deposit was discovered; the name caught on very quickly and is now used worldwide.

ANDRADITE: Pure andradite has a high trivalent iron concentration and this rarely makes for a gemstone as iron imparts a nondescript, dark yellowish brown to almost black color that is so strong the mineral often appears opaque. Some andradite crystals grow in a series of stratified microscopic layers, which impart an iridescence to the andradite; jewelry pieces made from such crystals are called rainbow garnet*.



There are several distinctly colored varieties of andradite resulting from some chemical substitutions in its formula; below are two of these. Melanite*, which is jet black is on the left, and topazolite*, whose color varies from being similar to that of the famous imperial topaz to a yellowish olive green, is shown on the right. Melanite has titanium substituting for the iron at the top back corner of the inverted pyramid. Most melanite (often called “black garnet”) is opaque, the light entering the gem is completely absorbed within the stone, so any “sparkle” is the result of reflections off the surface of the cut. Therefore most faceted stones utilize a cut without a table or a cut with an oversized table to give maximum surface reflections.



DEMANTOID*: This deep green variety of andradite is one of the rarest and most valuable of all garnet gemstones, and deserves a more in-depth consideration. The deep green color is again due to chromium substitution; in demantoid the Cr substitutes for some of the iron, whereas in tsavorite the Cr substitutes for some aluminum.



Isometric Crystal – Demantoid

High dispersion = many colors

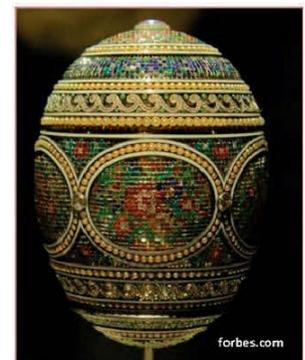
Dematoid in Russian Antique

matching diamond - demantoid



Modern Faberge

Demantoid has one of the highest dispersions and when coupled with its high index of refraction it has the ability to sparkle in different colors. When making jewelry with multiple stones it is often desirable to have the various gems be of equal splendor; thus demantoid was often the choice to compliment the diamond studded jewelry of the Czars, and it was featured in many of the Faberge Eggs that were their yearly Easter gift, as seen in the 1914 Faberge Egg on the right. Even to this day many Faberge pieces, such as the modern one on the left, couple demantoid and diamonds. This rich history is in part due to the first major deposit of demantoid being located in the Ural Mountains of Russia. Russian demantoid has long silky inclusions called “horsetails”, and the status associated with having the Russian gem is such that the occurrence of these inclusions is an asset when evaluating the worth of this gemstone. Later a major deposit of demantoid was found in Namibia, that lacks horsetails, giving an “eye clean” clarity to the stone, but many feel that the Namibian demantoids are a bit weaker in color. A North American deposit of demantoid with horsetails occurs at the Jeffery Mine in Canada, but the color is definitely



1914 Faberge



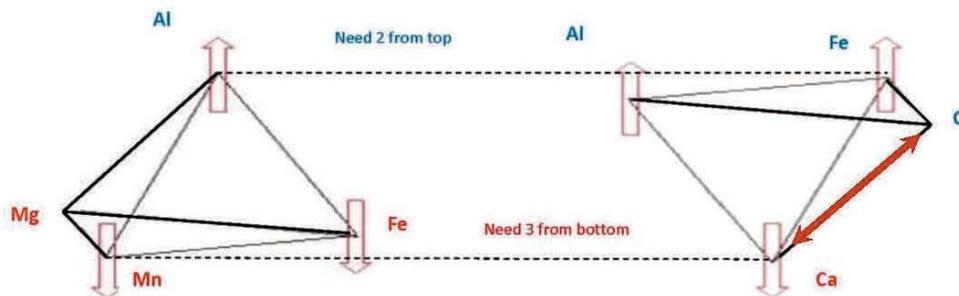
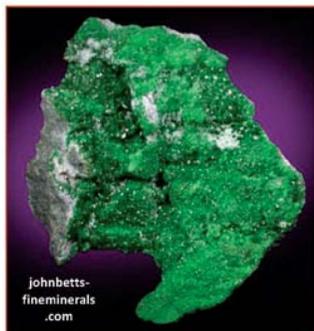


weaker than that of the Russian demantoid. The colors of demantoid and tsavorite can be quite similar, and there is a simple test that will separate them. Purchase an N-52 magnet, which is very strong for its size (found at many train hobby stores or on-line for about \$5) and attached it to the head of a bolt... demantoid is the only green mineral that will be picked up by the magnet. As a side note, magnetism is a highly effective, but underused, property for distinguishing certain minerals, and a visit to the following website shows a video on using magnetism for gemstone identification <http://gemstonemagnetism.com/>.

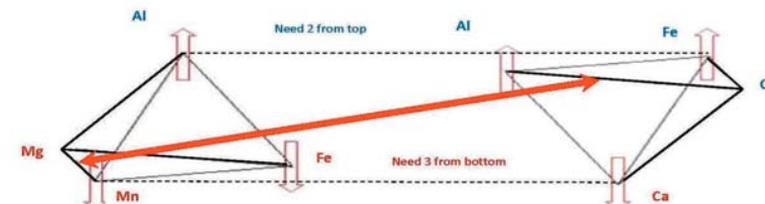


following website shows a video on using magnetism for gemstone identification <http://gemstonemagnetism.com/>.

UVAROVITE: This is the green “true species” of garnet. The trade varieties of demantoid* and tsavorite* had some substitutions of chromium for the trivalent ions in the species called andradite. When the trivalent ion is only Cr the species is recognized in the mineralogical profession as uvarovite. Uvarovite, to my knowledge, has never been found in large carat pieces; it almost always occurs as a druzey coating. Its deep green color and the sparkle off the minute faces of the druzey crystals still makes this gemstone worthy of being in many pieces of jewelry, but the usual settings are as pendants, earrings, and bracelets.



COLOR CHANGE GARNET: Not that long ago there was saying; “If it is blue, it is not a garnet!”. This is no longer true as there are garnets on the market now, worldwide, that display a distinct blue color in fluorescent lighting.



“Pyrospite” Garnets
 Pyrope .. Mg + Al
 Almandine.. Fe + Al
 Spessartite .. Mn + Al

.....

“Ugrandite” Garnets
 Uvarovite .. Ca + Cr
 Grossularite .. Ca + Al
 Andradite ... Ca + Fe

This unusual variety has not been given a trade name partly because its composition bridges the gap between the pyrospite subgroup and the ugrandite subgroup. It combines a mixture of pyrope-spessartite for the garnets having divalent ions,

and a mix of grossularite-uvarovite for the garnets having trivalent ions, with some vanadium substitution for the chromium.

The color change is often red to blue for East African varieties, but there are substantial differences in the colors from various localities ranging from Norway to Idaho. The color change can be as dramatic as that displayed by the most famous of color change gems – alexandrite. The color shift in garnet has been known since the 1970's, but it was not popular in jewelry until deposits were found in Tanzania and Madagascar (1980-90's) and Kenya in 2009 that displayed color changes that rivaled those of alexandrite.



ajsgems.com—[Madagascar ColorChange](#) -- rocksandco.com

[KenyaColorChange](#) – gem2000.com

It is now true, as you can see from the above “tour of colors” that garnet can be found in every possible color. This is wonderful for jewelry makers and trade-names, but it presents an array of problems in finding the correct mineralogical name. The correct name, and where a particular gemstones lies within the wide range of solutions that are possible is now usually determined by the measurements of the refractive index, the specific gravity, and magnetic susceptibility.

If you are interested in knowing more about garnet compositions, the Gemological Institute of America Inc. has extensive literature on how to determine the exact composition of a given garnet at <http://www.gia.edu/search/articles?subject=Chemical%20Composition&gemfilter=Garnet>

REFERENCES:

- Bonewitz, R.L. **RockandGem – A Smithsonian Project**. DK Publishing, Inc – New York, NY. 2008
- Burns, R.G., ed. **Orthosilicates–ReviewsinMineralogy.Volume5**. Mineralogical Society of America – Chantilly, VA. 1980
- Hoover, D.B. “Determining garnet composition from magnetic susceptibility and other properties.” **GemandGemology**. V. 47, n. 4 (2011) – Gemological Institute of America – Carlsbad, CA
- Klein, C. and Dutrow, B. **ManualofMineralScience**, John Wiley & Sons, Inc. – New York, NY. 2008
- Lauf, R.J. **ACollectorsGuidetotheGarnetGroup**, Published by Schiffer Earth Science Monographs. 2012
- Manson, D.V. and Stockton, C.M., “Gem garnets in the red to violet color range.” **GemandGemology**. V.17 n. 14 (1981) Gemological Institute of America – Carlsbad, CA
- Manson, D.V. and Stockton, C.M., “Pyrope-spessarite garnet with unusual color behavior.” **GemandGemology**. V.20, n.4 (1984) Gemological Institute of America – Carlsbad, CA

Notes: 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.

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/annualshow.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.

October 28, 2017: South Penn Rock Swap, by Central Penn. & Franklin County Rock & Mineral Clubs. South Mountain Fairgrounds, west of Arendtsville, PA on Route 234. Contact: tsmith1012@comcast.net

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 selling 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	A	R	N	D	S	M	K	C
M	N	C	A	K	R	D	S	E
D	K	S	C	M	E	R	N	A
R	M	K	D	C	A	N	E	S
A	E	N	S	R	K	C	D	M
C	S	D	E	N	M	A	R	K
S	C	M	R	E	D	K	A	N
K	R	E	M	A	N	S	C	D
N	D	A	K	S	C	E	M	R

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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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.