

Nittany Mineralogical Society Bulletin

Nittany Mineralogical Society, Inc.

P.O. Box 10664

State College PA 16805

Editor (see page 8):

David C. Glick

November, 2014

Visit our web site: www.nittanymineral.org

November 19th meeting:

The WAIS Divide Ice Core Project; Mineralogy and Physical Properties of Ice



by

Donald Voigt

Penn State
Department of
Geosciences

Our November meeting will be held Wednesday the 19th in room 114 (large auditorium) of Earth & Engineering Sciences Building on the west side of the Penn State campus in State College, PA. Maps are available on our web site.

6:30 to 7:30 p.m.: Social hour, refreshments in the lobby

7:30 to 8:00 p.m.: announcements, questions, answers

about 8:00 p.m.: featured program

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

Between 2007 and 2012 the National Science Foundation's US Antarctic Program supported the drilling of a 3405-meter deep ice core at the ice divide of the West Antarctic Ice Sheet (WAIS Divide). I was Chief Scientist for three years of the project. Our role at Penn State was to examine the physical properties of the ice in order to validate the climate record derived from the ice core. In order to accomplish this an understanding of the unusual mineralogical properties of ice is necessary.

This presentation will touch on the special properties exhibited by ice and how these properties affect the behavior of glaciers, and our work with the WAIS Divide Ice Core Project (with pictures). ❄



Don Voigt in Antarctica... Come to the November 19th meeting to learn and see more!

December 17th Meeting: Holiday Dinner

We expect to return to Hoss's Steak & Sea Restaurant, 1450 North Atherton Street, State College PA 16803 for our annual holiday dinner at 6:00 p.m. on Wednesday, December 17. See the December Bulletin for updates and details.

October Election Results

Officers were elected at the October 15 Annual Meeting. See page 8 for the list and their contact information. They'll need your help to keep the Society running smoothly! Please volunteer!

ATTENDING THE NOVEMBER MEETING?

Donations of labeled **door prize specimens** are invited.

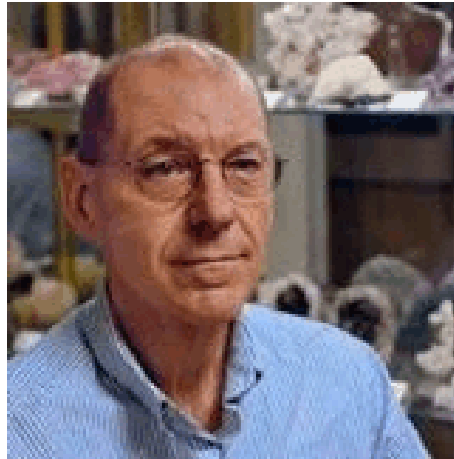
Your donated snacks and drinks will be welcomed.

Bring a friend!

JOHN PASSANEAU

1949 - 2014

by
David Glick,
NMS President



John's Facebook self-portrait

We are deeply saddened to report that our friend, avid mineral collector and Nittany Mineralogical Society

founding member John Elbridge Passaneau died October 16, 2014, in the hospital in Pittsburgh. After battling pulmonary fibrosis, he had received a lung transplant in the summer, but never recovered enough to leave intensive care.

John was born May 13, 1949 in Lansing, Michigan. He said he was a mineral hobbyist from the age of ten years, and later described his start on his mindat.org home page: "My interest in rock collecting started one warm summer day when friends and I were setting around doing the "what do you want to do?, I don't know, what do you want to do?" dance. As someone had just given me a copy of the Little Golden Book of mineral collecting, I suggested that we start rock collecting. We all did..." and John stuck with it for the rest of his life.

John was still young when his father died, and was always grateful that his mother, Annie, encouraged and supported his mineral collecting hobby, driving him or arranging for rides to meetings, mineral shows, and collecting trips. He worked for mineral dealers at shows, earning some money to buy specimens, learning how to recognize the best specimens, and receiving good deals from dealers who enjoyed encouraging an enthusiastic young collector. He also participated in competitive displays of mineral specimens at shows, winning many prizes through the years, and he used those skills in his home display cases as well. He always enjoyed finding a mineral specimen bargain at shows or on ebay, and was expert at trimming a specimen to retain only its best aspects, improving its appearance and value. Among his areas of specialization in mineral collecting were zeolites, quartz, twin crystals, fluorescent minerals, and micromounts. He was an excellent mineral photographer, first with film and later with digital. He made use of computerized digital focus-stacking techniques to produce photographs which were amazingly sharp from foreground to background, and then used optimization programs to print them in the best possible manner, including the series of posters he made as fund-raisers for Nittany

Mineralogical Society. He shared some of these "mineral portraits" on his Penn State web page , <<http://www.personal.psu.edu/users/j/x/jxp16/>>.

Another major interest was electronics; he was active in his in junior high school's ham radio club, and continued to be a very enthusiastic "ham" throughout his life, making radio contact with friends all over the globe.

He was a very active member of the Nittany Amateur Radio Club, serving them in many capacities and volunteering at their events.

He attended Lansing Community College, receiving an Associate degree to start his career in electronic engineering. He worked at Michigan State University until his research group moved to Penn State, and then worked as a Research Engineer in the Physics department at Penn State for 26 years, retiring in 2010. John liked to joke that his job description as an engineer in the Physics Department could be "I make toys for physicists." In reality, he worked on a variety of advanced projects, including anti-matter containment vessels, which he traveled to Europe to use. Later he was in charge of maintaining and setting up the very wide variety of equipment for interesting demonstrations in physics lecture classes. His skills allowed him to both design and assemble electronic circuit devices on the job, for his hobbies, and as a service to the community.

John held a range of offices in The Central Michigan Lapidary and Mineral Society. He was a founding member and newsletter editor of the Sycamore Valley Lapidary and Mineral Society in Michigan. After moving to Pennsylvania, he set about connecting with the mineral collecting community; the club in State College at the time was more focused on lapidary. The 1993 symposium of the Friends of Mineralogy - Pennsylvania Chapter, held at Penn State, brought local collectors together, and in 1994 John was one of the collecting enthusiasts who founded the Nittany Mineralogical Society. From that time, he was continuously on its Board of Directors, serving at various times as President, Vice President, Treasurer, and Membership Chair. He was an enthusiastic volunteer at the club's events, brought specimens to share and discuss in social hours, hosted the club's garage sale, visited schools and other groups to present programs about minerals to children, and much more. He always wanted to encourage people of all ages by including them in club activities and helping them personally.

In recent years he was a member of Penn State's Earth and Mineral Sciences Museum Advisory Board, and created the control circuits for the present display of ultraviolet-fluorescent minerals in the museum gallery.

One of his activities with Nittany Mineralogical Society was presenting illustrated programs on various topics in mineral collecting. Among those topics was cataloging one's collection, and planning for its continued

use and enjoyment by other collectors after one was gone. We do not yet have the details of the disposition of John's collection, but will report them when we do.

A memorial service is planned, but details are not yet available.



John, and his mother Annie Passaneau, volunteering at NMS 2002 Minerals Junior Education Day, demonstrating piezoelectricity of tourmaline crystals. *A. Sicree photo.*



Quartz, var. amethyst, Las Vigas, Mexico.

J. Passaneau photo.



Cerussite on barite, Mibladen, Morocco.

J. Passaneau photo.



John with his newly constructed splitter, Mount Pleasant Mills, PA, 2005. *D. Glick photo.*



Fluorite, Carthage, Tennessee.

J. Passaneau photo.

NEWS FROM THE FEDERATIONS

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 available through the link on our web site www.nittanymineral.org, or remind Dave Glick to bring a printed copy to a meeting for you to see. In the November issue, new President Merrill Dickinson writes about the coming year: possible changes to the Federation system, and the Convention and General Meeting, March 27-29 2015 in Hickory, North Carolina. News about the convention is presented, including a the appearance of the "Somewhere in the Rainbow" private collection and a second field trip, to the Propst Farm for corundum crystals in various colors (see next article). The Bulletin awards and related matters are reviewed. Submissions for the Each One Teach One, All American Club, and AFMS Club Rockhound of the Year awards are invited. The safety column addresses the dangers of getting into a rut with repetitive tasks and not paying attention - so we should stop, look and listen while doing those activities.

The **AFMS Newsletter** is available by the same methods. The November issue kicks off the 2015 AFMS Endowment Drawing with illustrations (in color in the online version) of the first four prizes. New President Marion Roberts introduces himself and his plans and requests for increased communication among Federation officers and committees. Past President Richard Jaeger signs off. Jim Brace-Thompson looks forward to the second ten years of the FRA Badge program for juniors. Several Club Rockhounds of the Year are introduced. Nominations are sought for the Micromounters Hall of Fame, founded by the Baltimore Mineral Society (see <http://www.baltimoremineralsociety.org>).

Please see the web sites for the complete Newsletters. There's a lot there! - *Editor*

2015 EFMLS Convention News

by Larry Huffman

from EFMLS Newsletter November 2014

To Be Presented For Your Viewing Pleasure

At the March 27-29, 2015 EFMLS Convention to be held in conjunction with Catawba Valley Gem & Mineral Show there will be many once-in-a-lifetime gems to see. "Somewhere in the Rainbow" is a privately owned collection from the Phoenix AZ area.

This collection first started in 2008 with the purchase of several world class faceted stones. Since then the collection has grown to several hundred items which are comprised of 40% finished jewelry and 60% unmounted stones/carvings. The focus of this collection is to make the collection accessible to the public for educational purposes through exhibits in museums, galleries, jewelry associations, and shows. With over \$10,000,000 in value, this collection is considered to be of the highest and unique quality. A portion of this collection will be available for your viewing at the convention; an extremely rare opportunity to see such rare gems. This will be the first showing East of the Mississippi.

Several important area representations will be available for your viewing:

- A World Class Hiddenite, NC Emerald in a designer necklace
- A newly found flawless 3.25 Hiddenite from Hiddenite, NC
- A 48.30ct Jackson Crossroads, GA Amethyst of rich deep color. (These last two items will be displayed in memory of Terry Ledford who tragically was killed in a mining accident in September of this year. Terry was a long time friend and an exhibitor at the CVGMC Show.)

Added Field Trip

The CVGMC show has added a 2nd field trip. On Monday Harry Polly, Field trip advisor, will lead a group to the Propst Farm, in north Lincoln County, North Carolina.

Propst Farm has for decades been a source of large euhedral corundum(Sapphire) crystals in various colors, including red, pink and deep blue. Corundum was first discovered by locals as loose crystals in their plowed fields and gardens. When the Propsts stopped farming the land, they began to allow rock hounds to access the fields and adjacent forest to collect for a small fee. Mrs. Propst, now a widow, continues to allow rock hounding on her property, but she greatly frowns on having large groups show up all at once. It is my understanding that her dislike of large groups is mostly due to a certain unsavory former member of a rockhounding club who, while on a club trip there, threatened to kick her dog. Upon seeing this, she banned that person and all clubs from the site. However, it didn't take Mrs. Propst long to mellow so that she now allows individuals and small groups to access the property for a fee of \$5 per person.

There will be more information about this 2nd field trip in next month's news article. Don't miss this great extended weekend the CVGMC has planned for the delegates and guest to the EFMLS convention.

Challenges to Accepted Geologic Concepts

Dr. Charles E. Miller, Jr.
Geologist
State College, PA

Introduction

The history of geology is replete with challenges to long-accepted concepts. Well-known examples are: continental drift (now called plate tectonics), plutonism versus Neptunism, and existence of carbonatites. Continental drift or plate tectonics is a radical departure from the idea of fixed continents. Decades of studies show: Earth is divided into plates that move, oceanic crust is recycled, ocean bottoms are not featureless, and continental plates have collided to form various landmasses. These conclusions conflict with, and supersede, some previously accepted ideas about Earth's crust. The plutonism vs. Neptunism debate centered on whether igneous rocks were formed from volcanic or sedimentary activity. Today, one wonders how Neptunist could have ignored observations at active volcanoes, where basalt – the world's most-common lava – is seen forming from a molten state, totally independent of sedimentary processes. Carbonatites are igneous rocks containing more than 50 percent carbonate minerals. One could think of them as igneous limestones. A hundred years ago it seemed preposterous that carbonates could crystallize from magma. Subsequent studies show numerous examples around the world.

This article discusses four less-familiar challenges of accepted geologic concepts. Like their better-known examples above, these, too, reflect how science works. Established concepts are only valid as long as they stand up to continued scrutiny.

Meanders of Conococheague Creek

Well-developed meanders of Conococheague Creek are conspicuous features on a map or aerial photograph of the southern Cumberland Valley of the southern Cumberland Valley of Pennsylvania and of Hagerstown Valley in

Maryland (Figure 1). This creek begins in South Mountain, flows through Chambersburg, and continues south to the Potomac River. Not only are the meanders well developed, but they are also incised or entrenched to a depth of 100 feet. Classic examples of incised meanders are the Colorado River in the Grand Canyon and the San Juan River in Gooseneck Park at Mexican Hat, Utah. In the former, meanders are incised to a depth of 5000 feet and in the latter to 1000 feet.

Incised meanders are a paradox. When meander belts first develop, the stream segment responsible for them has low gradient. Most of the stream's energy involves lateral erosion and deposition; there is little channel deepening. An example is the lower portion of the Mississippi River. However, to incise or down-cut those same meanders, a stream requires increased gradient – a change in stream dynamics. How does the stream segment change from low to increased gradient, sufficient enough to deepen the meanders? A common explanation for the Colorado and San Juan Rivers is regional uplift. Such uplift increases gradients, producing higher flow velocities, and enabling rivers to erode deeper. A similar explanation is given for origin of incised meanders of Conococheague Creek (Stose, 1909). Local, instead of regional, uplift is cited as rejuvenating the Conococheague.

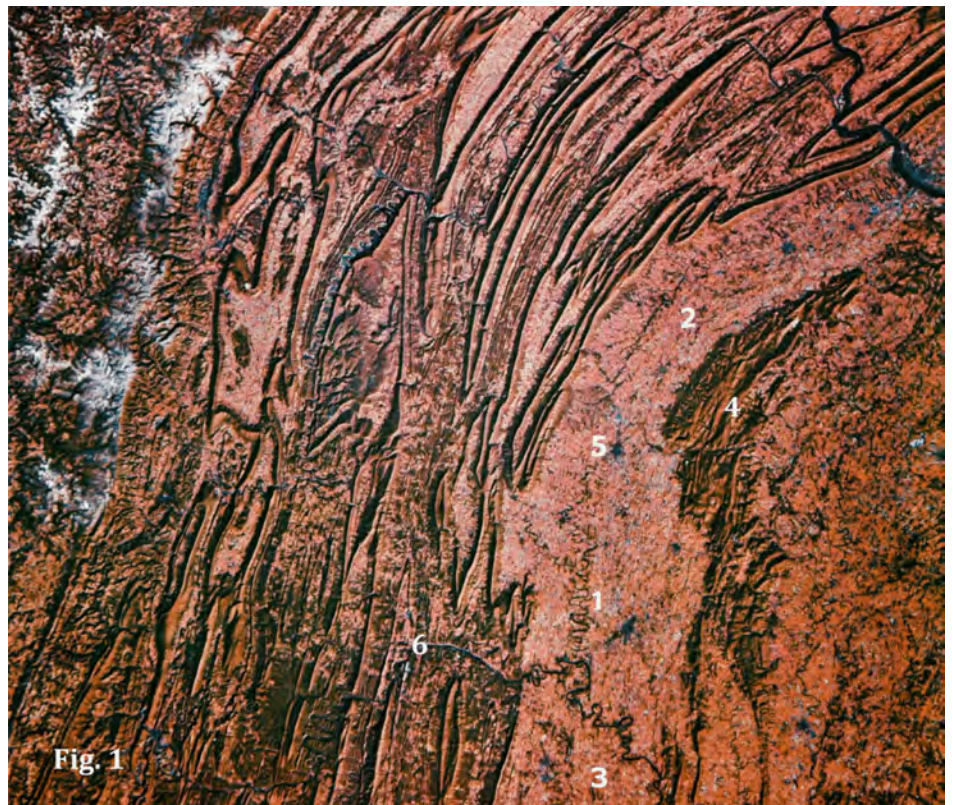


Fig. 1: Landsat image of central-southern Pennsylvania and north-central Maryland. 1= Conococheague Creek. 2 = Cumberland Valley. 3 = Hagerstown Valley. 4 = South Mountain. 5 = Chambersburg (PA). 6 = Potomac River.

An alternate, more contemporary explanation involves the Pleistocene Ice Age. During the Pleistocene, ocean level was approximately 400 feet lower than it is today. That lower level was due to water withdrawn to produce snow and ice. This lower elevation became the new base level for rivers flowing into the ocean. One of those was the Potomac River. The net effect of a much lower base level was to significantly increase the Potomac's gradient. Maps depicting the east coast during the Pleistocene show deep-cut canyons, now below water. These deep canyons are evidence of a gradient change from lowering of sea level. The Potomac is a master stream, acting as local base level to tributaries flowing into it. One tributary is Conococheague Creek. In a chain-reaction fashion, the Pleistocene Ice Age lowered sea level, causing increased gradient in the Potomac, and, that, increased the gradient in Conococheague Creek. When that happened, Conococheague Creek incised preexisting meanders.

Soil creep and curved-tree evidence

Soil creep is slow-flowage mass wasting in which soil and debris move imperceptibly down slopes. Usually those slopes are steep. Because it is imperceptible movement, soil creep is detected indirectly through various lines of evidence such as trailing root systems, as well as fences, trees, telephone poles, and gravestones tilting down slope. In addition, textbooks have routinely cited curved tree trunks as evidence. For some, curved-tree-trunk evidence was so inculcated in their minds that it was axiomatic. Curved tree trunks on slopes meant soil creep.



Fig. 2: Curved tree trunks; Mt. Rainier National Park, WA; 8-9-2008. Image by the author.

In 1974 the US Geological Survey published a paper "The Soil Creep-Curved Tree Fallacy" that questioned tree deformation as an indicator of soil creep. Studies failed to support trailing root systems, downslope tilting of trees, or

curved tree trunks being indicators of soil creep. The latter two are the most common tree deformations cited as evidence of soil creep. Trees on slopes tend to lean downslope as a phototropic response. Floods, ice or snowstorms, falling or fallen trees, snow or earth slides, and any situation in which the relative light intensities on various sides of a tree result in curved tree trunks.

Tiger's-eye

Tiger's-eye (Figure 3) is a popular, chatoyant gemstone, usually showing yellowish-brown or brownish-yellow bands. Mineral chatoyancy is a movable wavy or silky sheen changing its position when the mineral is turned. It occurs when light is reflected from minute, parallel fibers, cavities or tubes, or needle-like inclusions in the mineral. This quality makes tiger's-eye alluring.

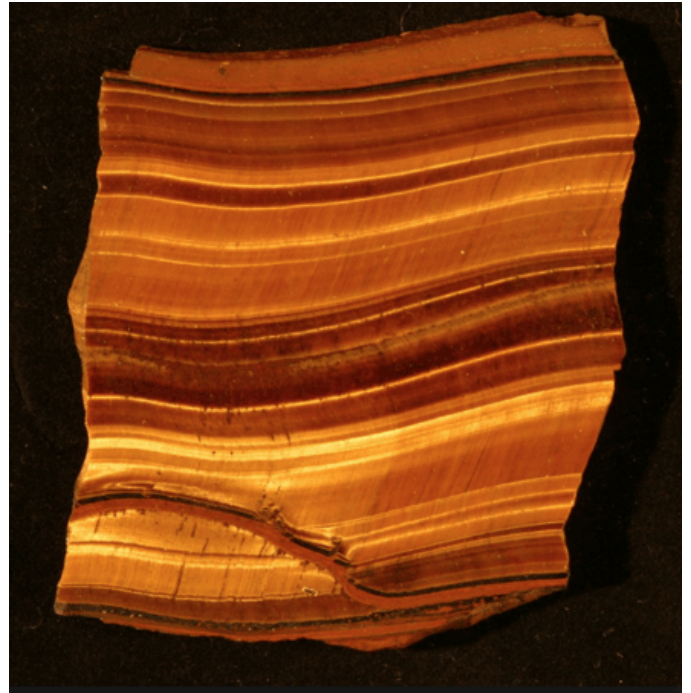


Fig. 3: Tiger's-eye showing distinctive yellowish-brown bands.

For more than a century, pseudomorphism was the explanation for the origin of tiger's-eye. Specifically, it was pseudomorphic substitution of quartz after preexisting crocidolite asbestos. Textbooks and other references, including the American Geological Institute's *Glossary of Geology* and the twenty-second edition of *The Manual of Mineral Sciences* (after James D. Dana), give this explanation.

Heaney and Fisher (2003) challenged the long-standing, conventional explanation. Textures they observed in tiger's-eye do not support quartz

pseudomorphism after crocidolite. Alternatively, fabrics are consistent with formation by a discontinuous crack-seal mechanism – a vein-filling process. Crocidolite, not quartz, causes shimmer in tiger’s-eye. Variable chatoyancy that is the gem’s signature is a record of the parent rock’s structural path during past tectonic events.

Exhumed landfills

Environmental geology includes a wide array of topics involving man and geology. A common topic is solid-waste disposal and its potential problems. Through time, solid-waste disposal transitioned from open dumps to sanitary landfills. The latter reflect advances in solid-waste disposal. Sanitary landfills have been used in this country since 1937. During the ensuing 76 years, conventional wisdom developed about sanitary landfills.

From 1987 to 1995, the University of Arizona undertook the Garbage Project as an archaeological investigation. This involved nine sanitary landfills, some at least 40 years old. The objective was to see what was happening inside landfills. Were they operating according to conventional wisdom? Although some landfills had previously been dug into to install methane pipes, no systematic observations were made of landfill workings.

Project findings challenge much conventional wisdom about sanitary landfills. That wisdom often consists of misleading or wrong myths and assertions. For example, it had long been assumed that significant biodegradation occurs at sanitary landfills. People defend paper disposal at landfills because, supposedly, it biodegrades while plastics last forever. Observations do not support that assumption. Landfills are more static than commonly supposed. For some organic refuse, biodegradation goes on for a while and then nearly stops. For other kinds, biodegradation never begins. Most excavated organic material was identifiable - including whole hot dogs, carrots, and onions - several decades old as well as 40-year-old newspapers. In reality, sanitary landfills are not great composters but rather great mummifiers.

References

- Heaney, P., and Fisher, D., 2003, New interpretation of the origin of tiger’s eye: *Geology*, v. 31, pp. 323-326.
- Phipps, R., 1974, The soil creep--curved tree fallacy: *Journal Research U.S. Geol. Surv.*, v. 2, no. 3, pp. 371-377.
- Stose, G., 1909, *Mercersburg-Chambersburg Folio*, Pennsylvania: U.S. Geol. Surv. Atlas of U.S., Folio 170, p. 17.
- Wallace, R., 1980, *Incised Meanders of Conococheague Creek*: U. of Maryland, unpublished senior thesis, 31 p.



Geo-Sudoku

by David Glick

This puzzle contains the letters ILMNOPSTU, and one row or column spells a once-controversial view that igneous rocks are deposited from a molten state. 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.

	T				P	S	I	
	S				M	N		
	N							U
I		T		M	O	L		
	U	L	S		I		P	O
S	M			L		T		
T		N	M	I	S			P
			T			I	S	
M	I							N

Classifieds

Ads may be submitted to the Editor (see p. 8)

FOR SALE: Long-time Pennsylvania collector John ‘Pen’ Ambler in Hollidaysburg has books, specimens and more for sale. Pen reports: “I have some 10 – 15 cartons of books on mineral and mineral related subjects. My cataloged collection consist of upwards of 6,000 specimens some of which were the Ed Carper collection. The specimens are cabinet, small cabinet, hand-sized, miniature, thumbnail and micro minerals. Many of the minerals are PA and eastern U.S.; however, it is a varied collection. There are lapidary materials (slabs and some bulk); limited fossils; tumbled stones including PA amethyst; UV materials and equipment; supplies (boxes, etc.)” Please contact Pen by email: bridger@atlanticbb.net

FOR SALE: 2 Homemade Lapidary saws for sale - 14" and 18". Both come with working motors, arbor, belt, pulley, rock clamp/carriage, and a blade. Both are mucked-out and ready to move. Both could use a little TLC. For more info contact Mike Zelazny at fabricatefilm@yahoo.com

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.

November 22 - 23, 2014: 23rd Annual Gem, Mineral & Fossil Show, by Northern Virginia Mineral Club & GMU Dept of Atmospheric, Oceanic & Earth Sciences, at The HUB Ballroom, George Mason Univ., Route 123 & Braddock Rd, Fairfax VA. Sat 10-6, Sun 10-4. www.novamineralclub.org

January 24, 2015: Mineral & Fossil Swap & Sell, by Phila. Mineralogical Soc. Cathedral Village, 600 East Cathedral Rd., Philadelphia PA 19128. Sat. 9-1 www.philamineralsociety.org

March 7-8, 2015: Annual Gem, Mineral & Fossil Show, by Delaware Mineralogical Soc. Delaware Technical & Comm. College, 400 Stanton-Christiana Rd., Newark, DE <http://www.delminsociety.net/marchshow.htm>

March 27-29, 2015: EFMLS Convention and Show, Hickory, North Carolina. Field trips.

March 28-29, 2015: Philadelphia Mineral Treasures and Fossil Fair, by Phila. Mineral. Soc. & Delaware Valley Paleo. Soc. Lulu Temple, 5140 Butler Pike, Plymouth Meeting, PA

March 28-29, 2015: Rock & Mineral Show by Che-Hanna Rock & Mineral Club. Athens Township Vol. Fire Hall, 211 Herrick Ave., Athens PA. <http://www.chehannarocks.com/show.html>

April 18-19, 2015: North Museum Rock, Mineral & Fossil Show, by North Museum of Natural History & Science. Farm & Home Center, 1383 Arcadia Rd. Lancaster PA

May 2-3, 2015: Treasures of the Earth 2015, Annual Show & Sale by The Mineralogical Society of Northeastern Pennsylvania. Oblates of St. Joseph, 1880 Hwy 315, Pittston PA 18640. Sat 10-5, Sun 10-4.

May 16-17, 2015: World of Gems and Minerals Show, by Berks Mineralogical Soc. Leesport Farmer's Market, Route 61, Leesport, PA.

June 6, 2015: Spring Mineralfest, by Penna. Earth Sciences Ass'n. Macungie Memorial Park, Poplar St., Macungie PA. Sat. only, 8:30-3:00.

Geo-Sudoku Solution

U	T	M	O	N	P	S	I	L
L	S	P	I	U	M	N	O	T
O	N	I	L	S	T	P	M	U
I	P	T	N	M	O	L	U	S
N	U	L	S	T	I	M	P	O
S	M	O	P	L	U	T	N	I
T	O	N	M	I	S	U	L	P
P	L	U	T	O	N	I	S	M
M	I	S	U	P	L	O	T	N

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!

SOCIETY OFFICERS

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Dr. Bob Altamura (Vice-President) 814-234-5011 (h)
e-mail: raltamura@comcast.net

Ellen Bingham (Secretary)
e-mail: emb22@psu.edu

Stuart Bingham (Treasurer)
E-mail: sebing145@comcast.net

OTHER CONTACTS

Field Trips: Ed Echler 814-222-2642
e-mail preferred: eechler@comcast.net

Junior Rockhounds: Dr. Andrew Sicree
814-867-6263 (h) e-mail: sicree@verizon.net

Membership Chair: David Glick (see above)

Programs: Dr. Duff Gold 865-7261(o), 238-3377(h)
e-mail: gold@ems.psu.edu

Door Prizes: *volunteer needed!*

Refreshments: *volunteer needed!*

Facebook: Mike Zelazny e-mail: maz166@psu.edu

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. If you include photographs or graphics, 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.

Visit us at www.nittanymineral.org