

Nittany Mineralogical Society Bulletin

Nittany Mineralogical Society, Inc.

P.O. Box 10664

State College PA 16805

Editor (see page 8):

David C. Glick

November, 2013

Visit our web site: www.nittanymineral.org

November 20th meeting:

Interesting Geology in Grand Teton and Yellowstone National Parks

by Dr. Charles E. Miller, Jr.
Geologist

Our November meeting will be held Wednesday the 20th in the room 114 auditorium of Earth & Engineering Sciences Building on the west side of the Penn State campus in State College, PA. Maps are available through 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;

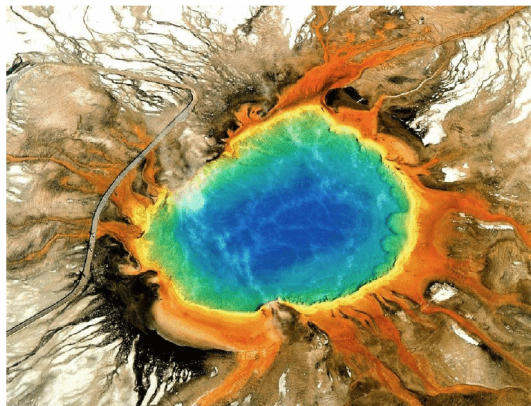
*Annual Meeting of the Corporation
including elections; door prize drawings*

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.*

Spectacular and varied scenery in our national parks affords many opportunities to study geology. This is reflected in a popular college course "The Geology of National Parks." Two of those parks - Grand Teton and Yellowstone - are in the top ten most-visited national parks in the United States. Both offer interesting scenery, wild life, a n d geology.

See Dr. Miller's complete article starting on page 4.



Junior Rockhounds Meetings are on hold until January. Please watch for news then.

Dues are Overdue!

by David Glick, NMS President

Our membership year ended on October 31, so if you haven't paid yet, please do so! We don't want to lose you! The rate remains at \$20 for an individual member, with other options available. Forms may be downloaded from our web site, and forms and payment can be brought to the November 20th meeting or mailed in.

The dues form includes a line for "don't send a printed Bulletin." If you read the Bulletin on the web site anyway, you can help reduce our printing and mailing expenses by checking this line. You can go back to the printed version, or request individual printed issues, at any time.

Annual Meeting and Elections

by David Glick, NMS President

At the October 16th Annual Meeting of the Corporation, with no other volunteers or nominations having been received, the incumbent officers were elected by acclamation:

President: David Glick

Vice-President: Robert Altamura

Treasurer: John Passaneau

Secretary: Ellen Bingham

The Board has also appointed Ellen Bingham to be Acting Treasurer while John Passaneau is on leave of absence as Treasurer.

- Editor

Gems and Minerals on TV

Two gem and mineral shows are currently available on cable TV channels. The Weather Channel is showing the second season of Prospectors, set on Mt. Antero and nearby areas of Colorado. It's on Sundays at 9:00 p.m., with previous episodes being repeated several times during the week and earlier on Sunday evenings.

The Travel Channel is showing the first season of Gem Hunt, Tuesdays at 10:00 p.m. It's described as a "behind-the-scenes look at the high-stakes industry of gemstones..." There are video clips and more on the Travel Channel web site <http://www.travelchannel.com/tv-shows/gem-hunt>. The show includes occasional trips into underground mines. Earlier episodes of Gem Hunt are available on Comcast/State College video on demand service.

ATTENDING THE NOVEMBER MEETING?

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

Your donated snacks and drinks will be welcomed.

Bring a friend!

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. The October-November issue includes an introduction from the Federation's new President, Hazel Remaley of Pennsylvania. Hazel has been active in the Che-Hanna Rock & Mineral Club in Sayre, PA, and the EFMLS for some years. She asks for input from the member clubs and reports on what clubs and officers have been up to lately. Outgoing president Cheryl Neary concludes the narrative of her Journey through the presidency, noting the importance of our motto "Communication and Involvement are the Keys to our Success." The safety article covers "Please read and follow these instructions" and the AFMS Code of Ethics. Web site and Bulletin competition winners in EFMLS are listed.

The Spring session of Wildacres Workshops is announced for the first time; the dates will be April 7-13, 2014. General information about these week-long retreats with lapidary and mineral classes and good times can be found at <http://efmls-wildacres.org/>. The **2014 EFMLS Convention and show**, hosted by the Philadelphia Mineralogical Society and Delaware Valley Paleontological Society, will be held March 29-30 (EFMLS meeting Friday, March 28) at the lulu Temple, 5140 Butler Pike, Plymouth Meeting, PA.

The **AFMS Newsletter** is available by the same methods. The November issue starts with the AFMS Recognition Award going to Shirley Leeton of California, who is well known for serving in many positions in AFMS, including President (2007-8). Richard Jagger introduces himself as the incoming president, and thanks the Jacksonville Gem & Mineral Society for hosting the AFMS convention. Jim Brace-Thompson's column on Junior Activities is about Albert B. Dicks' *101 American Geo-Sites You've Gotta See*, a guidebook for sites to visit for their educational value rather than collecting. Uniform rules changes for competitive displays are reviewed, and Club Rockhounds of the Year are introduced. Web site contest and Bulletin contest winners are listed.

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

Ode to My Rock Brothers

by Owen Martin

Member of the Houston Gem & Mineral Society
from The Backbender's Gazette
(7th Place - AFMS Adult Poetry)

Once on a rock that sat in a creek
A rock brother I did meet.
Became good friends and hunted together,
Finding rocks makes friends forever.
Hunting now we dig our holes,
And some old guys now call us Trolls.
We like the name and wear it with pride.
It fits so well on our rock hunting ride.
So I thank the Lord for me and you
And most of all my Rock Brothers, too!
And Rock Sisters...

Geo-Sudoku

by David Glick

This puzzle contains the letters AEFGLMORU, and one row or column includes another word for steam vent in Yellowstone. 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.

	G		E					A
	R		G	L	M		O	U
			O			M	G	
	O	F			G	U		R
R	M							
		G			A			
		R		E		O		
F	U		A		O	L		
O	E		M			A		

Ten Years Ago in NMS

In November 2003, our meeting program was "Meteorites, Asteroids, Comets and Impact Craters," by Dr. Andrew Sicree and Dr. David P. Gold. The sixth annual Carnegie Gem and Mineral Show in Pittsburgh was coming up later in the month; it would include display of "The Incomparable," at over 407 carats the world's largest internally flawless diamond and the third largest polished diamond.

Friends of Mineralogy - PA Chapter Symposium and Field Trip

by David Glick

On November 2, 2013, FM-Pa members and others met on the campus of Franklin & Marshall College in Lancaster, PA, for their annual symposium. There were four presentations on Pennsylvania minerals, geology, collecting and other topics; refreshments; giveaways; a silent auction; selected dealers; and lots of opportunities for meeting fellow collectors.

On Sunday November 3, the group reconvened at Cornwall, Pennsylvania, for a mineral collecting field trip. Two different dump sites, representing rock types from different zones of the historic iron mines, were visited. The weather was pleasant and a variety of specimens were found.

More information about the organization can be found at <http://www.rasloto.com/FM/>

All photographs shown were taken by David Glick.



The silent auction later covered these two tables



The audience appreciated the comfortable auditorium at F&M.



Bob Beard (left), author of Rockhounding PA & NJ and (coming soon) Rockhounding New York, and Arnold Mogel, who was finishing his stint as President of the FM-PA Chapter.



Giveaways and refreshments were popular during the breaks.



First field trip stop at Cornwall Materials quarry.



Second field trip stop on dumps next to open pit.

Interesting Geology in Grand Teton and Yellowstone National Parks

Dr. Charles E. Miller, Jr.
Geologist

Introduction

Spectacular and varied scenery in our national parks affords many opportunities to study geology. This is reflected in a popular college course "The Geology of National Parks." Two of those parks - Grand Teton and Yellowstone - are in the top ten most-visited national parks in the United States. Both offer interesting scenery, wild life, and geology.

Yellowstone National Park

When people speak of Yellowstone, they mostly refer to thermal features. The most famous of these is Old Faithful geyser. This association is most likely due to Yellowstone having the largest concentration of thermal features in the world. Park geology also includes a spectacular Grand Canyon of the Yellowstone River, the world's largest petrified forest, and many other features. These relate to the Yellowstone Supervolcano that produced three of the largest volcanic eruptions in our country.

Yellowstone's thermal features include hot springs, steam vents, and mudpots. Hot springs are the most common thermal feature in the park. Surface water infiltrating to lower depths is superheated. Those hot springs with an open, unimpeded plumbing system do not erupt. If, however, the plumbing system is impeded, then the hot spring may periodically erupt as a geyser. A steam vent or fumarole is a thermal feature containing so little water that it boils away before reaching the surface. Gases are emitted, sometimes continuously. Mudpots are depressions in which surface water collects. Rising steam heats the water and alters surrounding rock into clay.

The color of outflow from thermal features can be used as a general indicator of its temperature. Algae and bacteria that thrive in the hottest water produce bright colors such as yellow and pink. Darker shades of orange, red, and brown indicate cooler temperatures. In addition to algae and bacteria, dissolved mineral matter, such as iron sulfide, can cause discoloration.

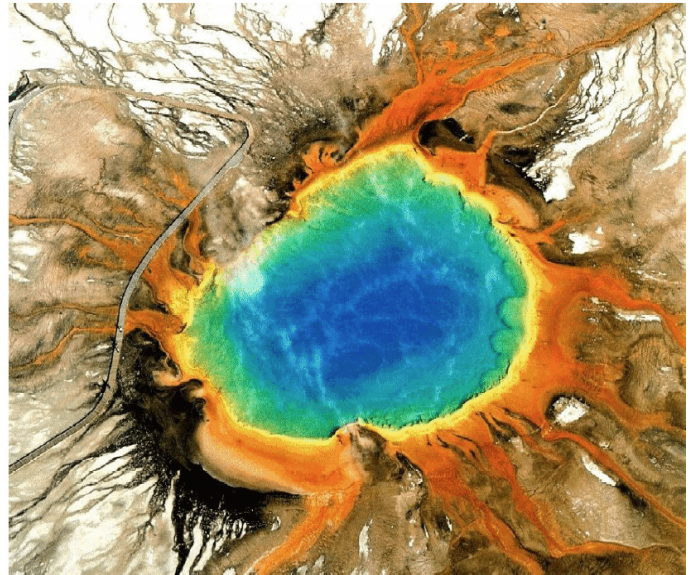


Fig. 1: Aerial view of Grand Prismatic Spring, Yellowstone N.P. The intense colors are due to thermophilic cyanobacteria. NPS image.

Interest in Yellowstone's thermal features is not limited to tourists. Astronomers and molecular biologists study thermal features because some harbor thermophile bacteria - those that tolerate high temperatures. Thermophile bacteria are one type of extremophiles - bacteria that thrive in extreme environments. If the search for life beyond Earth is successful, it is probably extremophile bacteria that will be found. Extraterrestrial candidate locations for extremophiles include Titan and Enceladus, both moons of Saturn, and Mars. One thermophile bacterium found in Yellowstone is *Thermus aquaticus*. Molecular biologists are particularly interested in this organism because it produces enzymes tolerant of high temperatures. This quality makes one of the enzymes (Taq) ideal for DNA amplification and the other useful in reaction studies where other enzymes lose activity. These enzymes from Yellowstone thermophile bacteria have spawned a \$300,000,000 industry. Success of this industry is not without controversy. The National Park Service received no money from the industry, despite the discovery having been in Yellowstone. Now thermal-spring researchers must sign "benefits sharing" agreements that would send a portion of later profits back to the Park Service.

Lesser-known geology features in Yellowstone are the petrified forests, such as at Specimen Ridge - part of the world's largest petrified forest. There, 27 fossil forests are preserved, one above the other. Many of the petrified trees are in original vertical growth position, contrasting with those in Petrified Forest National Park in Arizona. The vertical succession of petrified forests represents periods of forest growth alternating with repeated volcanic eruptions over



Fig. 2: Three petrified trees on Specimen Ridge, Yellowstone N.P. *Image by the author.*

20,000 years during the Eocene ((56-34 million years ago, ma). Study of these fossil forests provides clues about the climate when the trees grew.

The combination of thermal features, steep slopes, wild life, and millions of tourists provides ample opportunities for death and injuries. In 1995 The Court Wayne Press published *Death in Yellowstone: Accidents and Foolhardiness in the First National Park*. This should be requisite reading for visitors to the park. Two examples serve to illustrate the book's value.

The Grand Canyon of the Yellowstone River is a steep-sided canyon 1000 feet deep (Figures 3 and 4). The swift flowing river, rapids, and Upper and Lower Falls of the Yellowstone River beckon visitors. In 1924 a husband and wife came to these overlooks. After appreciating the scenery, they returned to their car. For whatever reason, the husband had trouble turning the car around in the parking lot. He eventually backed them over the canyon wall to their death approximately 800 feet below.

In 1981 two men visited Yellowstone and stopped at the Fountain Paint Pot parking lot. While looking at hot springs, a dog in their truck got loose and jumped into Celestine Pool. That pool had a water temperature of 202 °F. As spectators yelled, the two men ran to the pool. One of them dived in head first to save the dog. So hot was the water that he suffered third degree burns over 100 percent of his body. Most of his skin sloughed off and he died a few hours later.



Fig. 3: View showing extreme depth perception at the Grand Canyon of the Yellowstone River; Yellowstone N. P. The canyon is 1000 feet deep at this point. Colors in the canyon walls are from weathering of rhyolite. *Image by Phil Schaff.*



Fig. 4: Panoramic view of the Grand Canyon of the Yellowstone River in Yellowstone National Park. Waterfalls, rapids, and steep-sided canyon typify a stream segment with a steep gradient. The Lower Falls (top) are 308 feet high, or almost twice the height of Niagara Falls. *Image by the author.*

Grand Teton National Park

Tectonics and glaciation are the agents most responsible for the park's present geology. The former created the Teton Range and the latter shaped that range and adjacent land.

The Teton Range is the main geologic attraction in the park and the youngest mountain range in the Rocky Mountains. This mountain range began forming only 6 to 9 million years ago, quite young in geological terms. The Tetons are one of the best-known examples of fault-block mountains. They abruptly jut from the floor of Jackson Hole, rising to well over 13,000 feet (Figure 5). This abruptness is readily noticeable because no foothills exist on the eastern side of the range. The Teton Fault marks contact between the Teton Range and the floor of Jackson Hole. It is a normal fault along which 20,000 to 30,000 feet of displacement has occurred. The fault remains active, averaging one foot of displacement every 300-400 years.



Fig. 5: Oblique aerial view of the Teton Range and Jackson Hole. *NASA image.*

Ruggedness typifies the Teton Range. Sharp, angular features of the mountains are largely the result of Pleistocene (2.8-0.011 ma) glaciation. Alpine or valley glaciers produced cirques, horns, arêtes, cols, tarns, and U-shaped valleys. Glaciers in the valley of Jackson Hole were up to 2000 feet thick, producing an array of glacial features: kames, kettles, moraine deposits, and outwash plains. Even when the glaciers melted, they had an indirect effect on the local landscape. The Snake River has eroded terraces in glacial outwash (Figure 6). Each terrace represents a period of much higher flow from glacial melting. The oldest terrace is at the top and youngest at the bottom. Jenny Lake is a major focal point in the park. Glaciers pushing rock debris formed a terminal moraine that impounded the lake.



Fig. 6: Terraces the Snake River has eroded into glacial outwash; Grand Teton National Park. *Image by the author.*

Gros Ventre landslide

Seven miles east of Grand Teton National Park is the Gros Ventre landslide (Fig. 7). It can easily be seen from within the park. This major landslide occurred in 1925 following melting snow and heavy rains. The landslide slid down Sheep Mountain, crossed over the Gros Ventre River, and moved up the opposing mountainside a distance of 300 feet. Landslide debris created a dam over 200 feet high and 400 yards wide across the Gros Ventre River, backing up water and forming Lower Slide Lake. At the time of the slope failure, a landowner and his horse escaped the landslide by a mere 20 feet.



Fig 7: Scar of the Gros Ventre landslide, 88 years after it occurred in 1925. *Image by the author.*

In 1927 a portion of the landslide dam failed, resulting in a massive flood that wiped out the small town of Kelly, six miles downstream. It is one of the world's largest known examples of recent mass wasting aside from volcanic eruptions. Just prior to the flooding at Kelly, that town was vying with Jackson as the county seat. It is obvious that Jackson won by a landslide. ❄

Shoebox Adventures: The ID Problem

by Mike Seeds

Baltimore Mineral Society

from *The Conglomerate*, July 2012

(2nd Place - AFMS Original Adult Articles Advanced)

There's this problem that lurks in the corner of every rock room like the unmentionable elephant -- Identification. Identifying minerals can be hard. Of course you can do a streak test, and use a little acid, and test for hardness. But what if your specimen is the size of a mosquito's nostril? A drop of acid would dissolve it or at least wash it away, and using a streak plate is a daydream. How do you ID it then?

I recently had that problem with a specimen that came out of my shoebox. It is part of a larger hunk of rock that was on the giveaway table at the Atlantic Micromount Conference last spring. The label said Bull Run Quarry Loudoun Co; that has to be the quarry in Virginia. Looking the rock over I saw lots of minerals that show up often from that quarry. Breaking the rock down was fun but didn't turn up anything really interesting until I looked into a little vug. There, standing on the edge of the vug like it was mounted in a display case, was a glass-clear rod less than a millimeter long encrusted with green blobs. It required the highest magnification to see it, and it was easy to lose as you turned the rock. Trimming it and getting into a micro box was a challenge, but the real challenge was the label. What is it?

It isn't reasonable to send this off to a lab to be put into an SEM. That's expensive to start with, and this is the only example I could find in the entire sample. If they shoot this one, I'll know what it was but it will be trashed.

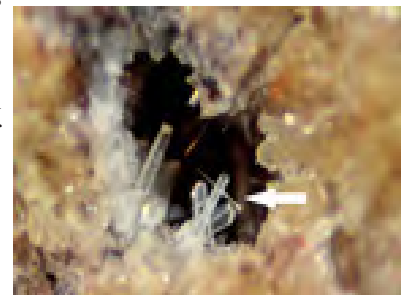
One way to proceed is to use Mindat.org to get the mineral list for this quarry. The list contains 46 minerals, and with a little thought you can cross off a bunch. It's not galena. It doesn't look like quartz. It's probably not calcite (but you can never be sure with calcite). Then you can look at the Mindat file of photos of mineral specimens from the quarry, and, once you have some suspects, you can check the photos from other sites. By a process of elimination



Prehnite on tourmaline
The rod is slightly less than a millimeter long and about 0.03 mm thick. Bull Run Quarry, Virginia.

you can narrow the ID down. The rod looks like tourmaline; Mindat doesn't list any photos of tourmaline from the Bull Run Quarry, but you can find tourmaline rods in the photos from other sites. The green blobs look like prehnite, which is found in the Bull Run Quarry, but none of the eight photos of prehnite from the quarry are attached to clear rods. Another possibility for the green blobs is pumpellyite, and the mineral list does include pumpellyite. But the blobs don't quite look right for that. The best ID seems to be prehnite on tourmaline.

Another challenging specimen turned up in some rocks from the Wannenkopf Quarry in the Eifel Mountains of Germany. The rocks were full of wonderful crystals of various types, but one little vug less than a millimeter long contained something startling. A few clear crystals protruded from



the walls, and the chisel terminations identified them as topaz, something that was common in those rocks. But one of those topaz crystals had attached near its top a tiny needle of white material, and the end of that needle bristled out into a tiny paintbrush. Safely trimmed and mounted in a microbox, it was an ID challenge.

Mindat lists 52 minerals found at Wannenkopf and some thoughtful study can narrow the list. There are lots of photos to study, so many it is hard to paw through them all without further hints. Carolyn Weinberger suggested a web site called *The Wannenköpfe* by Fred Kruijen (<http://wannenkopfe.strahlen.org/>). That web site is filled with beautiful photos, and one or two suggest the tiny needle is topaz. Back to Mindat where the topaz photos include two photos of topaz rods with "paintbrush terminations." That seems to be a secure ID. The little paintbrush is topaz on topaz.

Are these IDs correct? They are the best you can do with such small minerals. The data and photos online are a big help. It seems very likely that these are labeled correctly. But, come on, this isn't DNA testing for a murder trial. We aren't sending astronauts to the moon. We do this for fun. Right?

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.

Nov. 23-24, 2013: Gem, Mineral and Fossil Show by Northern Virginia Mineral Club and GMU Dept. of Atmospheric, Oceanic and Earth Sciences. The Hub Ballroom (Student Union II Building) on George Mason University Campus, Braddock Rd & Route 123, Fairfax, Virginia. Use Parking Lot A, enter from Nottaway River lane, look for courtesy shuttle to mineral show. Sat 10-6, Sun. 10-4.

March 22-23, 2014: Che-Hanna Rock & Mineral Club Show. Athens Township Volunteer Fire Hall, 211 Herrick Ave., Sayre, PA. Dealers, exhibits, kids activities, demonstrations, fossil ID, special exhibit and silent auction by Carnegie Museum, fossil exhibit by Paleontological Research Institute. Sat. 9-5, Sun. 10-4. <http://www.chehannarocks.com/show.html>

March 29-30, 2014: EFMLS Convention and Philadelphia Mineral Treasures and Fossil Fair by Philadelphia Mineralogical Society and the Delaware Valley Paleontological Society. Lulu Temple, 5140 Butler Pike, Plymouth Meeting, PA 19462. Sat. 10-5, Sun. 10-4. <http://pms.moonfruit.com/#/mineral-show/4527879809>

April 18-19, 2014: First Gem, Mineral & Fossil Show for the non-profit **North Museum of Natural History and Science**. At Farm & Home Center, 1383 Arcadia Rd (off Manheim Pike), Lancaster, PA. Friday 10-6, Saturday 10-5. **VENDORS WANTED:** \$50.00 per table. Contact Alison Mallin, 717-358-7188 <amallin@northmuseum.org> for more information and to reserve a space

Geo-Sudoku Solution

M	G	O	E	U	F	R	L	A
A	R	E	G	L	M	F	O	U
L	F	U	O	A	R	M	G	E
E	O	F	L	M	G	U	A	R
R	M	A	U	O	E	G	F	L
U	L	G	R	F	A	E	M	O
G	A	R	F	E	L	O	U	M
F	U	M	A	R	O	L	E	G
O	E	L	M	G	U	A	R	F

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 to

Nittany Mineralogical Society, Inc.
P.O. Box 10664
State College, PA 16805

or bring your dues to the next meeting.

We want to welcome you!

SOCIETY OFFICERS

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Ellen Bingham (Secretary and Acting Treasurer)
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John Passaneau (Treasurer, on leave) 814-231-0969 (h),
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OTHER CONTACTS

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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