

Nittany Mineralogical Society Bulletin

Nittany Mineralogical Society, Inc.

P.O. Box 10664

State College PA 16805

Editor (see page 8):

David C. Glick

August, 2014

Visit our web site: www.nittanymineral.org

August 20th meeting:

Geology from the Air

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

Our August meeting will be held Wednesday the 20th in room 114 (If there's a change we'll have a sign in the lobby) 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, and free refreshments, and is open to all; **parents/guardians must provide supervision of minors.** Bring your friends and share an interesting evening.

Aerial photographs and images, both examples of remote sensing, are valuable geologic tools. Their geologic applications include topographic maps, soil surveys, and geologic maps. They are also useful in economic geology, land-use planning and environmental studies, military geology, geomorphology, and water-well locating.

Landsat and other Earth-orbital images showing geology are familiar to many people. These images are available on the Internet through various providers. However, one under-utilized source of aerial imagery is from commercial passenger aircraft. Window-seat passengers can photograph a wide variety of geologic features and processes. This talk discusses at least 34 such examples, most of which the author photographed from passenger planes.

Photographing geology from the air largely involves physiography or geomorphology - the study of landforms. These studies include fluvial, glacial, folded, faulted, coastal, mountain, eolian, volcanic, arid, mass wasting, and karst features. Aerial photography provides perspectives for studying these features not available to ground-based settings. Watersheds or drainage basins are examples.

Continued with photographs on page 4

ATTENDING THE AUGUST MEETING?

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

Your donated snacks and drinks will be welcomed.

Bring a friend!

Picnic!

On **Sunday, August 24**, our club will once again have its annual picnic at the home and shady deck and back yard of Ellen and Stuart Bingham, 145 Goddard Circle, Pennsylvania Furnace, PA,

16865. See page 3 for more information, and **RSVP** if you plan to attend.

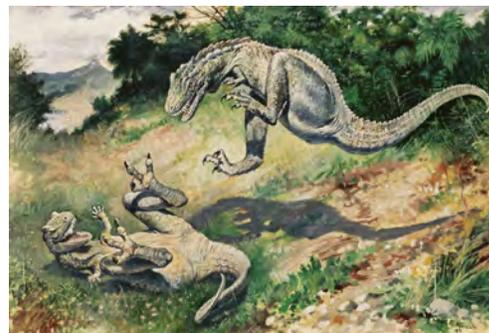


October 15: Charles R. Knight- Art and Geology



NMS Fall Schedule

by
David Glick,
NMS
President



We've moved our usual Show and Tell program to the September 17th meeting so that we can have Dr. Charles Miller's interesting and well-illustrated talk on **Geology from the Air** this month. The **October 15th** meeting will be an event of wide-ranging interest; Dr. Charles E. Miller, Jr., will speak on **Charles R. Knight - Art and Geology**. Knight (1874 - 1953) was the artist responsible for widely seen paintings of dinosaurs, extinct mammals and more, which illustrated museum displays and books through the 20th century. An exciting feature of the program is that Knight's granddaughter, **Rhoda Knight Kalt**, will be giving the introduction. Please tell any friends who might be interested!

December is expected to be a holiday dinner as usual. The November meeting topic has not yet been determined; please contact Program Chair Duff Gold (see p. 8) or the president if you might be able to present a program.

Charlotte Smith 1930 - 2014



Long-time NMS member Charlotte Smith died on May 19 at age 83. She lived outside Stormstown in Centre County. An extensive obituary appeared in the Centre Daily Times on May 21; see <http://www.legacy.com/obituaries/centredaily/>

Charlotte Smith in 2001, helping present Nittany Mineralogical Society's annual Minerals Junior Education Day. *A. Sicree photo*

Along with her late husband Paul, she ran the family's dairy and beef farm, later including thoroughbred horses. She worked as a lab technician in the Department of Veterinary Science at Penn State for 20 years. She continued to enjoy keeping and riding horses, and helping others with animals, in her later years. Charlotte is survived by three daughters, two grandchildren, and other family. The obituary covers many more of her numerous activities.

Charlotte field collected minerals and fossils and shared her enthusiasm with members of the Nittany Valley Rock and Mineral Club (1970s), Nittany Mineralogical Society (since its founding in 1994), and Friends of Mineralogy - PA Chapter. She helped organize and present club mineral shows, field trips, and Nittany Mineralogical Society's Minerals Junior Education Day in State College. *-Editor*

Central PA Club Show in Harrisburg September 13 -14

The Central Pennsylvania Rock and Mineral Club will hold its big annual show on Saturday Sept. 13 (10 a.m.- 6 p.m.) and Sunday Sept. 14 (10 a.m. - 5 p.m.). The location is the Zembo Shrine Center, 2801 N. 3rd St (3rd and Division Streets), Harrisburg PA 17110. In addition to over 25 vendors, there will be prize drawings, kids' activities, displays, a silent auction, and more. Complete information is available on their web site, www.rockandmineral.org under "annual show," along with a \$1 off admission coupon. Scouts in uniform get free admission, and there will be a Boy and Girl Scout merit badge booth (sessions at 11 a.m. and 2 p.m. each day; more information on web site). Geologist Jeri Jones will present several programs during the day: Fun with Rocks and Minerals; Volcanoes; Fossils; Earthquakes; Tracking Dinosaurs.

-Editor

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 June-July issue begins with Steve Weinberger's report that enrollment for the **Wildacres Fall session** has improved slightly since the alarm was sounded in previous months, but more attendees are still needed! See the web site efmls-wildacres.org (or the May NMS Bulletin) for more information on the September 1-7 session. President Hazel Remaley encourages the use of the AFMS Club Rockhound of the Year Award to recognize members who make important contributions to our clubs; Ellery Borow, chair of that committee, does likewise. Historian Andy Celmer writes about some interesting figures who made important contributions to our scientific and technical knowledge, particularly about metals, and oxides of metals: Agricola, Hooke, Boyle, and Priestley

The **AFMS Newsletter** is available by the same methods. The May-June-July issue includes photographs and descriptions of prizes 14 through 27 from the AFMS Endowment Fund drawing held in July. President Richard Jaeger writes about disagreements within and among clubs, and agreeable shows including the recent EFMLS convention in Pennsylvania. The Conservation and Legislation column covers some of the public-land collecting rights granted by 2009 legislation, and their less than ideal wording. Another article clarifies the permanent grants (not claims) of rights-of-way made under RS 2477, which existed from 1866 to 1976 (when existing grants were specifically reaffirmed). The safety column covers our eyes and vision - keep those safety glasses or goggles with you, keep them in good condition, and use them! Club Rockhounds of the Year are introduced, and there's an obituary for Glenn Lee; he and late wife Dorothy were very active leaders in the Northwest Federation and American Federation, helping greatly with the AFMS Scholarship Foundation.

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

- Editor



NMS Picnic



Nittany Mineralogical will provide hot dogs, burgers, condiments, & canned drinks. You bring yourself and a friend and a side dish or dessert to share.

August 24th, 2014, 4 to 7 p.m.

Ellen and Stu Bingham's house

145 Goddard Circle

Pennsylvania Furnace, PA 16865

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



Geology from the Air Continued from p. 1

Overviews of moderate- to large-sized watersheds can only be seen from high-altitude vantage points. Similarly, regional physiographic provinces can best be shown with aerial imagery. One of the most recognized physiographic provinces in the country is the Appalachian Ridge and Valley of central Pennsylvania (Figure 1). Plunging folds characterize this province, distinguishing it from others. In contrast, some other physiographic provinces such as the Gulf Coastal Plain are less unique. Flat and rolling topography typifies this province. However, some subsections of this province are different enough to easily be identified. For example, aerial photography of central Florida reveals thousands of sinkholes and sinkhole ponds (Figure 2). This is one of four major karst regions in the United States. Aerial photography is useful in inventorying sinkholes.



Fig. 2: Sinkholes and sinkhole ponds in central Florida. (Image by the author.)

Another physiographic province shown on Figure 1 is the

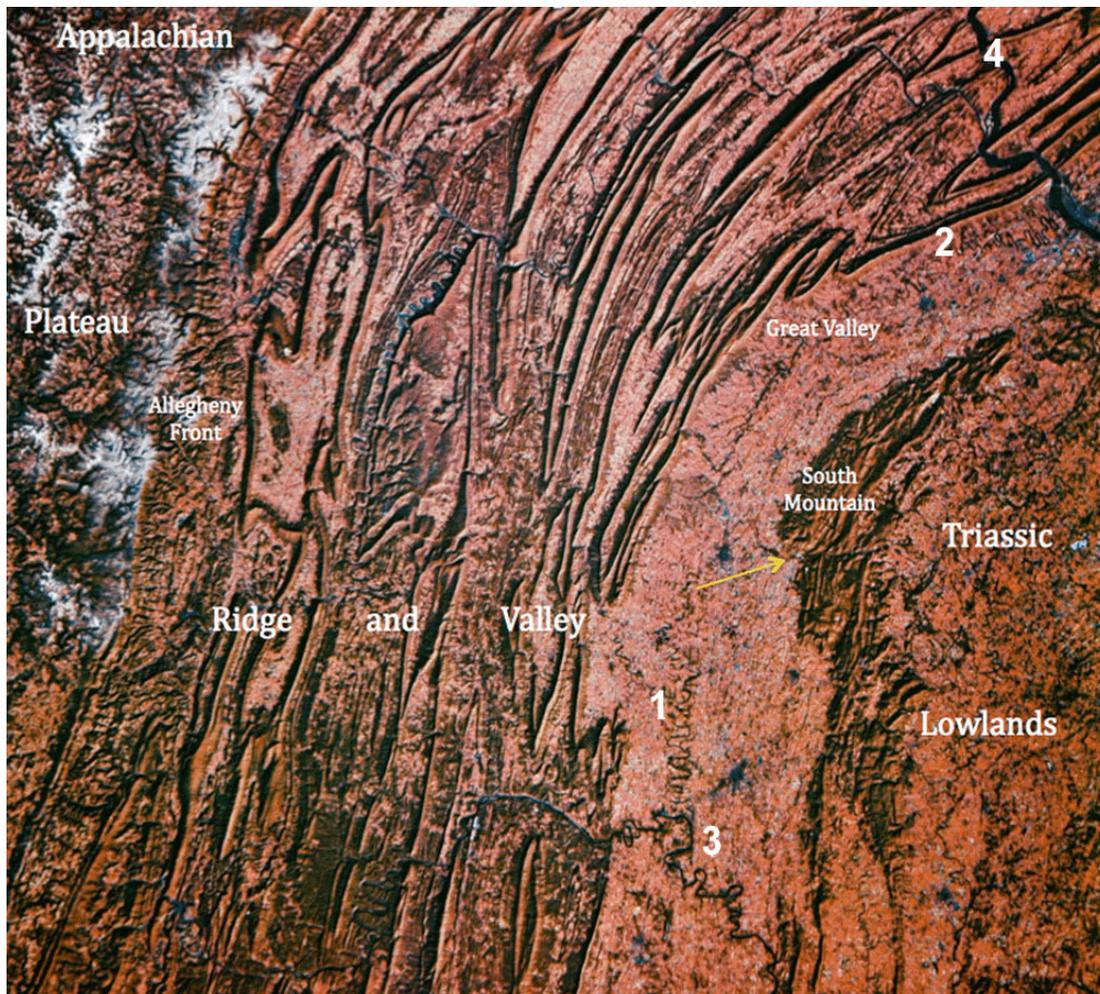


Fig. 1: Landsat image of central Pennsylvania and northern Maryland. (NASA image.)
 1 = Conococheague Creek. 2 = Conodoquinet Creek. 3 = Potomac River. 4 = Susquehanna River.
 Yellow arrow (right of center)= Carbaugh-Marsh Creek Fault.

Great Valley, locally called the Cumberland Valley in Pennsylvania and the Hagerstown Valley in northern Maryland. Like north-central Florida, the Great Valley is one of four major karst regions in the country. Conspicuous on Figure 1 are the well-developed meanders of Conococheague and Conodoquinet Creeks. The former drains south to the Potomac River and the latter north to the Susquehanna River. The drainage divide between these two creeks is sometimes used as the boundary between the two valleys. Meanders of both creeks are incised or entrenched. Those of Conococheague Creek are entrenched to a depth of 100 feet and those of Conodoquinet Creek to 200 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 and Conodoquinet Creeks. Local, instead of regional, uplift is often cited as rejuvenating these creeks. This talk discusses an alternative, more contemporary explanation.

Another interesting feature on Figure 1 is the Carbaugh-Marsh Creek Fault (yellow arrow) that transects South Mountain. This is a left-lateral strike-slip fault as compared to the San Andreas Fault that is right-lateral strike-slip. The Carbaugh-Marsh Creek Fault is a result of the Alleghenian Orogeny approximately 250 million years ago. However, it has a much more recent significance - a contributing role in the Battle of Gettysburg.

Of the many existing landforms, fluvial features are particularly common and conspicuous from the air. Mark Twain's "Old Times on the Mississippi" comes to mind as one views river meanders. Cutoffs, meanders, oxbow lakes, meander scars, point bars, and floodplains are readily identifiable (Figure 3). Meandering rivers in low-relief settings

are of particular interest because of potential flooding. As political boundaries, such as between states or countries, meandering rivers are problematical. Rivers are dynamic systems, ever changing. One change involves meander cut-offs that reroute water and shorten rivers. When cut-offs occur at political boundaries, legal issues arise. Does a political entity gain land as the adjacent one loses it? In which political jurisdiction are people now finding themselves on a different side of the river? How are these issues resolved?

Much of western United States is arid or semi-arid. Sparse or absent vegetation allows for easy viewing of geological features in aerial photography. Despite its scarcity, water is the major erosion agent in dry regions. Aerial photography shows this well, as in: retreat and dissection of plateaus (Figure 4),



Fig. 4: Headward erosion causing retreat and dissection of a plateau. (Image by the author.)



Fig. 3: Meanders, meander scars, oxbow lake, cutoffs, floodplain, and point bars. (Image by the author.)

alluvial fans and bajadas (coalescing alluvial fans), and stream piracy or capture.

The 1980 eruption of Mount Saint Helens in Washington was the deadliest and most economically destructive event in U.S. history. "Fifty-seven people were killed; 250 homes, 47 bridges, 15 miles of railways, and 185 miles of highway were destroyed (Wikipedia)". A massive debris avalanche reduced the mountain's elevation by more than 1000 feet, replacing it with a 1-mile-wide horseshoe-shaped crater. This geologic event provides photographic opportunities. The 1980 eruption still remains a topic of interest to many people. In 1981 and in 1982, the author flew over the volcano and photographed the destruction. Close-up views include lahar deposits, the new crater, and a dacite crater dome.

In at least one instance, aerial photogeology is used in a Hollywood television series. The original Star Trek episode "The Cloud Minders" aired in 1969. In this episode, the starship Enterprise arrives at the planet Ardana where miners live on the surface and elite city-dwellers live on the cloud city Stratos. In one scene, a miner who sneaked into the city, jumps over the edge to his death. As the jumper falls, viewers see the Wadi Hadramaut in the background. The background scene is a Gemini-astronaut photograph of the wadi (dry stream bed) in southern Saudi Arabia. On close inspection, this image shows headward erosion capturing numerous preexisting tributaries (Figure 5), reversing original surface flow.



Fig. 6: Deep crevasses in Alaskan glacier. (Image by the author.)

In "A Tramp Abroad" Mark Twain colorfully writes about a hike to a Swiss glacier. He discusses glacial features and glacial movement. His attempt to hitch a ride on the glacier is engaging. That story came to mind in 2006 when the author flew on a helicopter over Alaskan glaciers. Aerial photography from that flight provides views (Figure 6) similar to those in Twain's story. These are a basis for a general discussion of alpine glaciers.

Each northern-hemisphere winter thousands of tourists fly from northeastern states to Florida. Many of the flights go along our Atlantic coast, providing opportunities to view coastal geomorphology. The eastern coastline of the United States is known for barrier islands. Some better-known examples are Long Island, North Carolina's Outer Banks, Assateague Island, and Chincoteague Island. These and other features such as spits, bay-mouth bars, beaches, and tidal flats are easily viewed from passenger planes. All of these features are due to marine deposition. Their origins and environmental implications are discussed.

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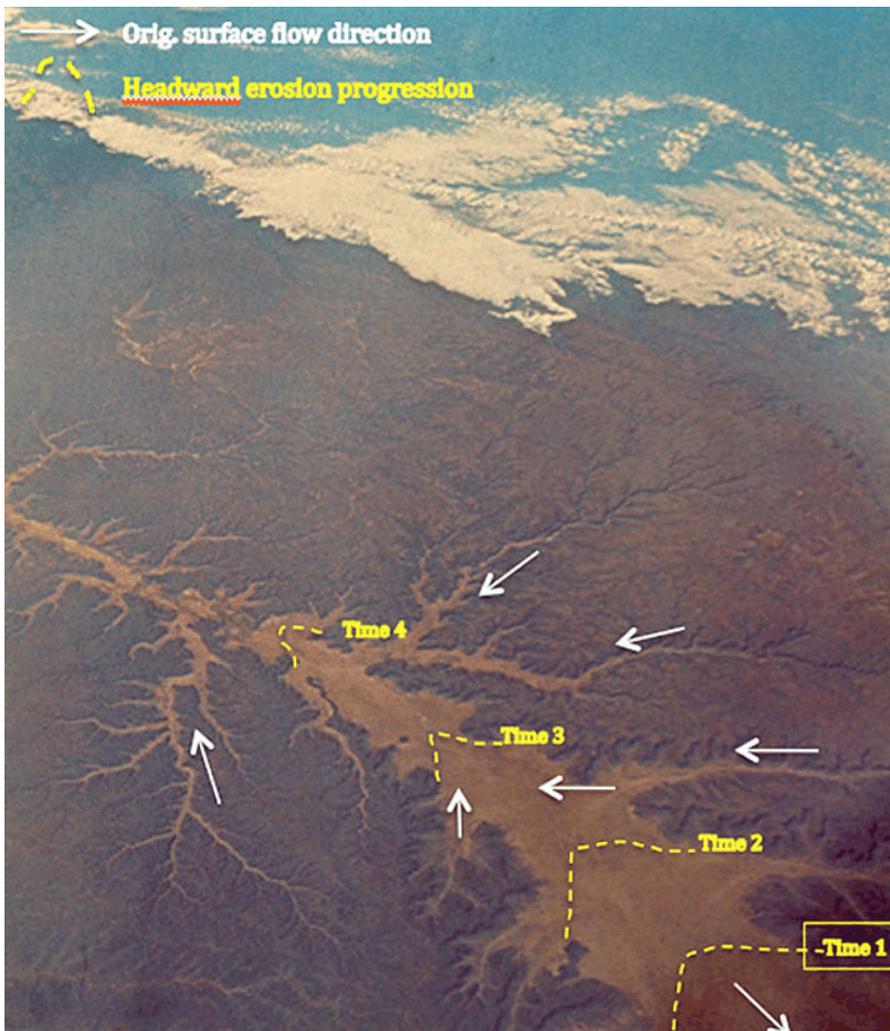


Fig. 5: Gemini photograph of the Wadi Hadramawt in southern Saudi Arabia. Headward erosion has pirated preexisting drainage courses. (NASA image)

Mount Pleasant Mills Field Trip

Nittany Mineralogical Society and the Moraine Rockbusters club from western Pennsylvania shared a field trip to the National Limestone Quarry at Mount Pleasant Mills, PA, on July 26. Some calcite and strontianite crystals were found in the main pit, where much material had been pulled away from the highwalls so that we could collect safely. We're very grateful to owner Eric Stahl for allowing access and for the extra effort which made our collecting safer and more comfortable. After some time in the main pit, the group moved to the sites on the road behind the ridge. Wavellite crystal aggregates and coatings of other phosphates were found.

- Editor

Geo-Sudoku

by David Glick

This puzzle contains the letters ADFLMNORS, and one row or column spells out some features that can be seen from the air. 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.

			S		N			M
				M	R	A	F	
O				A			N	R
F			A		M			
	O	D	L		F		R	
	M				D	L	O	
	R							O
			D	F				S
M			R			F		L



Strontianite crystal aggregate collected in the main pit on the field trip. *M. Dunton photo*



Main pit at National Limestone, Mt. Pleasant Mills, PA, where strontianite and calcite were collected. *M. Dunton photo*



NMS and Moraine Rockbusters members at the second wavellite excavation on the ridge at Mount Pleasant Mills. *D. Glick composite photo*

Classifieds

Ads may be submitted to the Editor (see bottom right)

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.

Sept. 13-14, 2014: Gem, Mineral & Jewelry Show by Central Pa. Rock & Mineral Club, at Zembo Shrine Center, 3rd & Division Streets, Harrisburg, PA. Sat. 10-6, Sun. 10-5. See page 2 and <http://www.rockandmineral.org/annual%20show.htm>

October 4, 2014: Fall Mineralfest - Mineral Fossil and Gem Show sponsored by the Pennsylvania Earth Sciences Ass'n. Macungie Memorial Park, Macungie, PA 8:30 -3:00. <http://www.mineralfest.com/>

November 1-2, 2014: Friends of Mineralogy - PA Chapter Symposium (Nov. 1, Lancaster, PA) and Field Trip (Nov. 2). <http://www.rasloto.com/FM/>

November 1-2, 2014: Gemarama, Rhapsody in Blue, by Tuscarora Lapidary Society. The School at Church Farm, Exton, PA . Sat 10-6, Sun. 10-5. <http://www.lapidary.org/GEMARAMA/Gemarama.html>

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

Geo-Sudoku Solution

R	F	A	S	D	N	O	L	M
S	N	L	O	M	R	A	F	D
O	D	M	F	A	L	S	N	R
F	L	R	A	O	M	D	S	N
N	O	D	L	S	F	M	R	A
A	M	S	N	R	D	L	O	F
D	R	F	M	L	S	N	A	O
L	A	N	D	F	O	R	M	S
M	S	O	R	N	A	F	D	L

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

David Glick (President) 814-237-1094 (h)

e-mail: xidg@verizon.net

Dr. Bob Altamura (Vice-President) 814-234-5011 (h)

e-mail: raltamura@comcast.net

Ellen Bingham (Secretary and Acting Treasurer)

e-mail: emb22@psu.edu

John Passaneau (Treasurer, on leave),

e-mail: jxp16@psu.edu

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