Nittany Mineralogical Society Bulletin

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

Editor (see page 8):
David C. Glick

August, 2016 **Visit our web site: www.nittanymineral.org**

August 17th meeting:

Annual Show and Tell

by
the members and guests

Our August meeting will be held Wednesday the 17th in a room to be announced, 1st floor Earth & Engineering Sciences Building on the west side of the Penn State campus in State College, PA. Maps are available on our web site.

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

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

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

ATTENDING THE AUGUST MEETING?
Donations of **a few high quality, labeled door prize specimens** are invited.
Your donated snacks will be welcomed.
Bring a friend!

Upcoming NMS Programs

Sept. 21 Fluorite - Dr. Andrew Sicree

Oct.19 A Geological Tour of California - Los Angeles to San Francisco - Dr. Charles E. Miller, Jr.

Nov. 16 The Rogue Kimberlites of Indiana County, PA - Dr. Duff Gold

NMS Picnic September 11

We are once again planning our leisurely annual picnic & cookout at the home and shady deck and back yard of Ellen and Stuart Bingham, 145 Goddard Circle, Pennsylvania Furnace, PA, 16865. It's a great opportunity to relax and socialize. It will be held on Sunday, September 11, 2016, 4 to 7 p.m. Please **RSVP** - see page 3. *-Editor*

OFFICIAL NOTICE: Annual Meeting and Elections in October

by David Glick, NMS President

The October 19th 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, will meet on September 8 to set its recommended slate of officers. If you would like to volunteer to be on the ballot, or nominate someone, it would be most convenient if you would contact the President or other Board member (see page 8) by then.

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

Lapidary Demonstration August 27

Come and see, or come and help - see page 2.

A variety of tiger eye cabochons made by Bob Altamura, to be used in pendants.

August NMS Meeting Door Prizes

By Bob Altamura

As door prizes for the August meeting we are fortunate to have an interesting example of hydrothermal minerals associated with basalt and a very nice slab suitable for lapidary or display. The hydrothermal sample exhibits translucent clear to white calcite crystals on a widespread coating of botryoidal prehnite on basalt. The locality of this sample is unknown, but probably is from near Paterson, New Jersey. The slab is a fascinating "scenic dolomite." Both came from the estate of John Passaneau.

Those attending the meeting are welcome to donate one or two attractive, interesting samples for the door prize drawing, at the table in front of the auditorium. A label providing whatever information is available for the specimen should be included.

Remember that we also have a "freebie table" (in the lobby to the right of the refreshments) where members can share whatever they want. It would be best if these were identified with at least one label per batch of similar specimens (NMS will provide extra blank labels for recipients to copy the information). This will continue the tradition of providing a way for extra, useful but perhaps less impressive specimens to find their way to new owners who would appreciate them. Comments on door prizes can be submitted to Bob Altamura, <raltamura@comcast.net>.

Prehnite and calcite crystals on basalt. Locality probably is Paterson, New Jersey. Dime shown for scale.

"Scenic dolomite" slab. Locality unknown.

Lapidary Demonstration at Maker Week in State College

By Bob Altamura

As part of State College's Maker Week, NMS member and vice-president Bob Altamura will offer a station on Lapidary on Demonstration Day, August 27th, from 10:00 a.m. to 2:00 p.m. Plans are to block off the 200 block of South Allen Street downtown to allow for a variety of demonstration stations. For more on Maker Week see http://makerweek.schlowlibrary.org/

Altamura plans to exhibit machines and materials that he uses to make (carve and polish) gemstones for use in jewelry. The use of several machines will be demonstrated. On hand will be a lapidary grinding wheel, diamond-edged slab saw, and both a rotary and vibrating tumbler. A variety of rough rock, slabs and pre-form shapes for gemstones will be on display as well as some finished pieces of gemstone jewelry. Material for viewing will include ocean jasper, tiger eye, picture jasper, and many more colorful and textured rough rocks.

Demonstrations will include carving and polishing using the grinding wheel and tumbling using a rotary tumbler and a vibrating tumbler. Souvenir tumble polished stones will be given out to visitors as a courtesy of NMS. **Anyone interested in helping,** including set-up, take-down and talking to visitors should contact Bob, 814-234-5011 or <raltamura@comcast.net>.

Geo-Sudoku

by David Glick

This puzzle contains the letters AEHILOPNX. One row or column includes a distance relationship useful in understanding tides. As usual, if you've read this issue, you've seen the word. 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.

					O		X	A
H	E				A	L		P
			X	H	L		I	E
P				N		X	L	O
N				O				H
	O	A						
E	X			A				
	P		E	L	I	O		X
		O		X	P			L

Nittany Mineralogical Society Annual Picnic 2016

Sunday, September 11th, 4 to 7 p.m. at 145 Goddard Cir., Pa. Furnace, PA 16865

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

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

Friends and Families welcome!

Field Trip Proposed: Earthen Paradise, Prospect, Virginia

from Ed Echler, Field Trip Chair

I would like to propose a field trip to Earthen Paradise in Prospect, Virginia, where we can dig kyanite, garnets and quartz and do gold panning in the stream. See the photographs, courtesy of Jessica Callen, owner of Earthen Paradise.

This Field Trip would take place towards the end of September. The drive is about 5 to 6 hours from State College. This is a fee dig mine; at this time the fee is 20 dollars a day. Sometime this fall the fee will change. If I have enough interest in this trip I can negotiate the fee. If you are interested in going on this trip, please email Ed Echler at eechler@comcast.net.

Using astronomy, meteorology, and oceanography to collect ammonites at the Chesapeake and Delaware Canal

Dr. Charles E. Miller, Jr.
Geologist

Probably the best fossil collecting in Delaware is at the Chesapeake and Delaware © & D) Canal (Figure 1), a 14-mile canal connecting the Delaware River and Chesapeake Bay. The U.S. Army Corps of Engineers owns and operates this waterway that carries ships in and out of the Port of Baltimore. Since its construction in the late 1820s, Cretaceous (146-66 million years ago) fossils have been found at the canal. The fossils are prolific, both in actual numbers and in taxa. Most collecting is in spoil along the canal, dumped there when the Corps periodically dredges. This makes for easy fossil collecting.

Fossils found here include: microfossils, foraminifera, sponges, coral, bryozoans, brachiopods, mollusks (gastropods, pelecypods, cephalopods), annelids, arthropods (ostracods, crabs, shrimp), echinoderms (crinoids, star fish, sea urchins), and vertebrates (sharks, rays, skates, mosaurs, turtle, fish). The reader is referred to the Internet for individual descriptions. Ichnofossils (trace fossils) are also found. Especially common in the spoils are pelecypods (clams) and belemnites. The latter are straight-shelled, squid-like cephalopods that caught prey with hooks on arms. Usually, the only body part preserved as a fossil is the bullet-shaped rostrum or guard that formed the internal part of the tail. Figure 2 shows exquisite, unusual preservation of a belemnite featuring body morphology, including hooks on arms and the rostrum. The belemnite species *Belemnitella americana* is one of the most common fossils here and is Delaware's state fossil.

Figure 2: Exceptionally preserved belemnite showing arm hooks and rostrum. From Wikipedia: (By Ra'ike (see also: de:Benutzer: Ra'ike) - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=4559216)

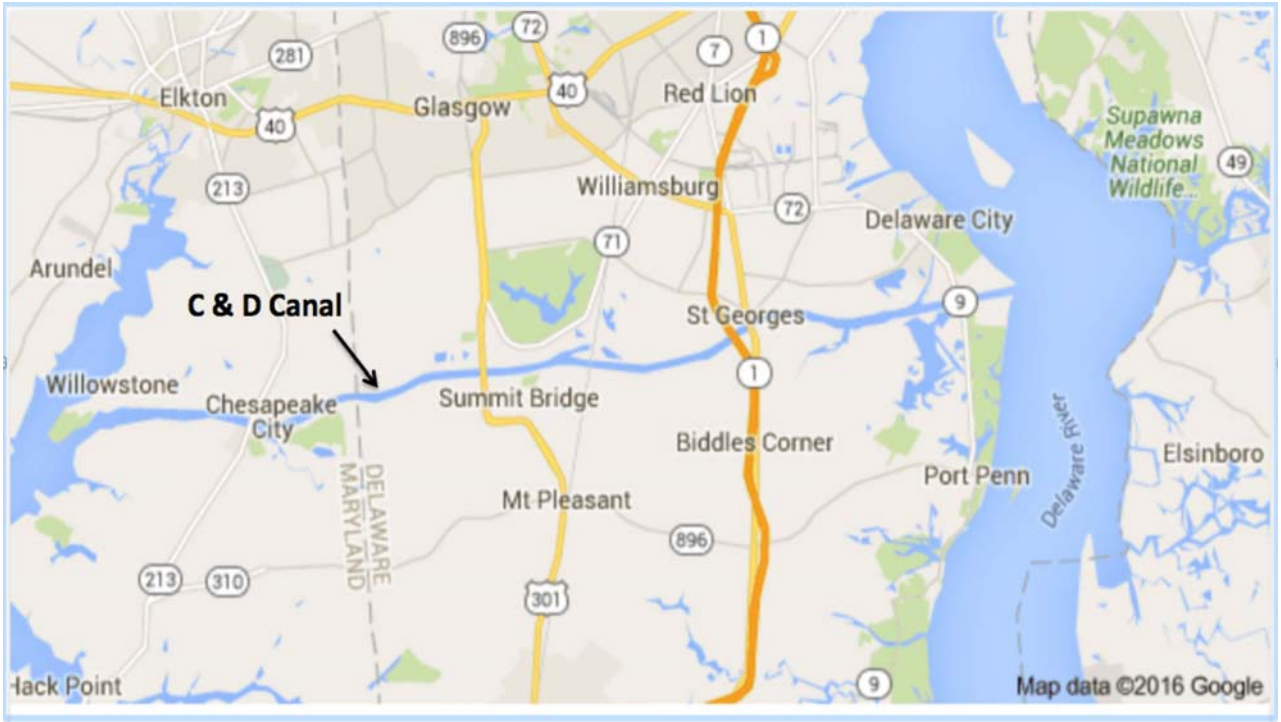

Figure 1: Location map showing the C & D Canal. (Modified from Google Maps; map data: Google, 2016.)

The Internet offers descriptions of a number of fossil localities along the canal. However, there are two caveats: (1) Dredging is usually once every few years. Old spoil is much picked over. Inquire as to when the next dredging will occur. (2) It is against federal law to collect fossils from the area to sell.

Most canal fossils are "steinkerns." These form when a fossil fills with mud that hardens. In some cases, the shell dissolves, although at the canal many original shells are also preserved.

Some of the most spectacular fossils from the canal are ammonites (Figure 3). Although they can be found in spoil, most of those are broken from dredging. Alternatively, whole ammonites, some exceeding 12 inches in diameter are in situ in the canal. Although the Corps prefers collecting be limited to spoil areas, fossils can be found in shallow water of the canal. However, the canal's shallow-water shelf is narrow and there is a 35-foot deep channel just offshore. Even in the shallows, the water is usually too deep for fossil collecting except under special conditions. Accessing these stratigraphic layers requires astronomy, meteorology, and oceanography data to predict the lowest, possible tides in the canal. Even, then, fossil collecting in the canal is in water during mid-winter. If one endures the cold and wet conditions, the fossil finds can be outstanding.

Tides are largely due to gravity of the Sun and Moon pulling on Earth. Because the Sun is so much farther away, the Moon creates the greater tidal force on Earth. Arrangement of these three celestial bodies determines the type of tide and tidal range. For example, when the three are at syzygy (three celestial bodies in a straight line), tidal forces of the Moon and Sun reinforce each other. This creates the highest high tides and lowest low tides. The exceptionally high tides during Earth-Moon-Sun syzygy are called spring tides. This name has no connection to seasons. A spring tide

Figure 3: Cretaceous ammonites. Specimens 4 and 5 were collected at the C & D Canal. (Richards, H.G., et al., 1958. The Cretaceous Fossils of New Jersey, Part I. N.J. Geological Survey)

occurs at every Earth-Moon-Sun syzygy – i.e., every full or new moon (Figure 4), or twice a month. In comparison, at quarter phases (Figure 4), the Moon and Sun are at quadrature or right angles to each other. At quadrature, the gravitational attraction of the Sun and Moon are not in a straight line and do not reinforce each other. As a result, tides on Earth during first and third quarter phases of the Moon are not as high or low as those at syzygy.

Other astronomical factors affect tides on Earth. These include perihelion/aphelion and perigee/apogee (Figure 5). Perihelion is the closest approach of Earth to the Sun. For the Northern Hemisphere, this occurs in earliest January. Aphelion is the farthest distance Earth is from the Sun. For the Northern Hemisphere, this occurs in July. Because Earth is closer to the Sun during perihelion, the Sun's gravitational influence on Earth's tides is greater than at aphelion. Perigee is the Moon's closest approach to Earth and apogee is the opposite. At perigee, the Moon produces a stronger gravitational attraction on Earth than at apogee. If perihelion and perigee coincide, the gravitational pull of the Moon and Sun reinforce each other.

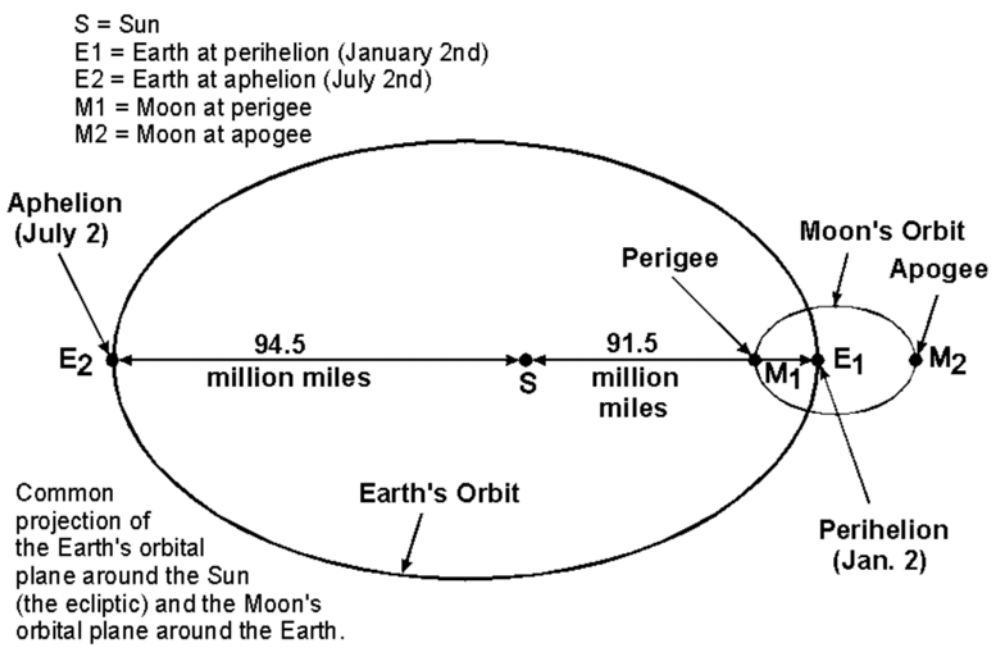

Figure 5: Diagram showing perihelion/aphelion of Earth and perigee/apogee of the Moon. (NOAA)

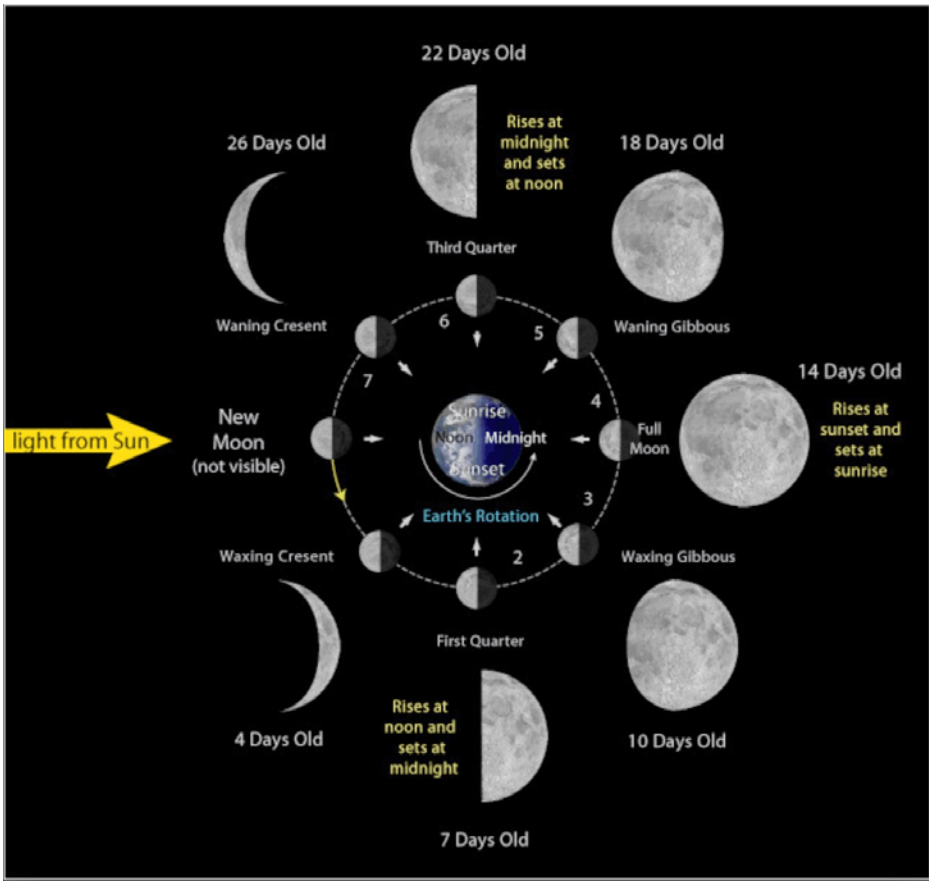

Figure 4: Diagram showing moon phases. (astro.unl.edu)

Weather can also influence tides, or, more precisely, tidal ranges. The tidal range is the vertical height, or amplitude, between high and low tide.

Sometimes, meteorological events amplify or diminish tidal ranges. Strong on-shore winds, as during a hurricane, create storm surges that cause higher high tides with coastal flooding. Conversely, strong offshore winds - as associated with a well-developed cold front along our east coast (Figure 6) - push water out toward the sea, causing lower low tides. In the eastern part of the country, cold fronts generally move west to east. If strong westerly winds are associated with passage of the cold front, some coastal water is pushed out to sea, causing lower low tides.

To collect fossils in the canal, the previous discussions are considered. During new- and full-moon phases, low tides will be at their lowest for that month. If collecting is also scheduled at Earth's

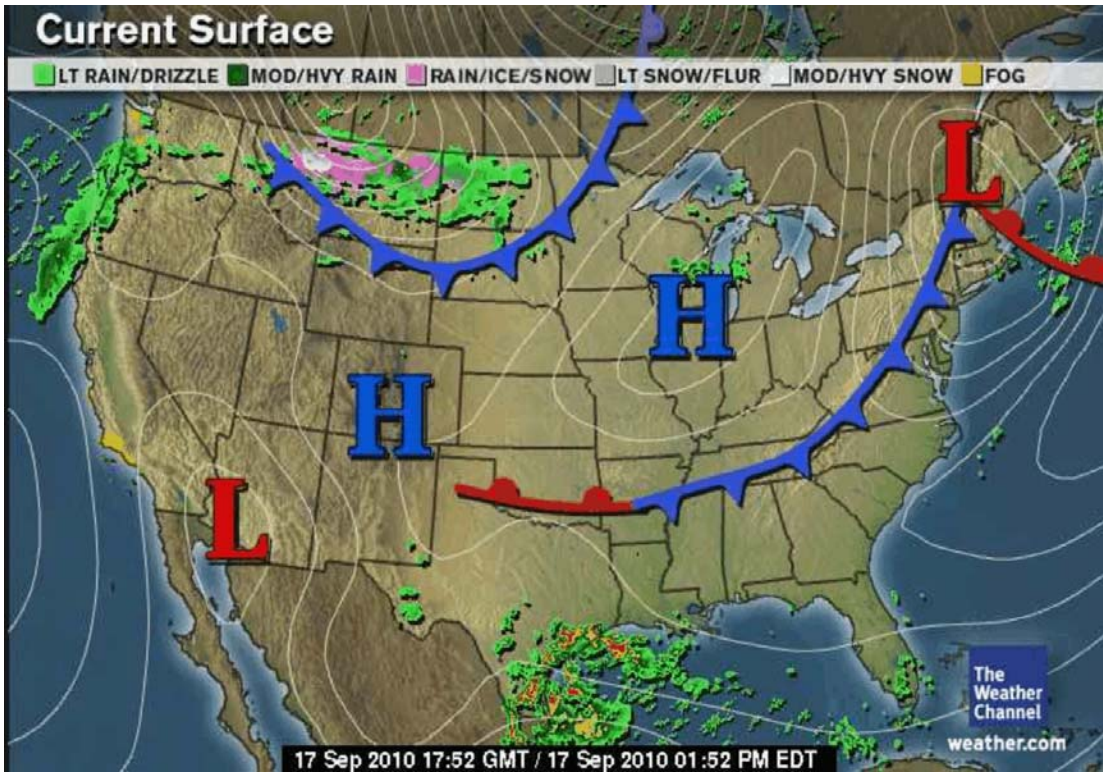

Figure 6: U.S. weather map showing cold front advancing toward Delaware. (The Weather Channel)

perihelion, the additional gravitational pull of the Sun contributes to lower tides. Similarly, if collecting is scheduled at perigee, the Moon's gravitational attraction is greater and low tides will be lower. If perihelion and perigee coincide, the gravitational attractions of the sun and moon reinforce each other. Low tides will be lower. Combining as many of these factors assists in making low tides at the canal lower. Finally, coordinating the fossil collecting during a strong cold front has the advantage of westerly winds blowing coastal waters out to sea, causing lower low tides.

In conjunction with the aforementioned factors, oceanographic data in the form of tide schedules should be consulted. There is no need to consider the effects of a Sun-Earth-Moon syzygy, perihelion, perigee, and a passing cold front if one goes to the canal at high tide. Finally, because perihelion occurs in early January for the Northern Hemisphere, there are only nine hours of daylight. Therefore, it is possible that low tide may be inconveniently in the dark.

The methodology for locating in situ ammonites in the canal is rather unsophisticated. A probing tool of some sort, such as a pitchfork or a broom handle with a spike affixed to it, is needed to probe through the soft substrate. Some of the encountered solid objects are ammonites.

Fossils of the C & D Canal mostly represent Cretaceous life in a shallow sea. Sediments at the canal were eroded from the Appalachian Mountains to the west. Streams transported those sediments eastward, depositing them into the Cretaceous sea.

This article is an outgrowth of the writer having collected at the C & D Canal on several occasions. He has also seen ammonite collections resulting from following the ideas presented in this article. ❄

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. We will catch up with the new issue next month.

The **AFMS Newsletter** is available by the same methods. In the June issue, photos of the final additions to the American Federation Endowment Fund drawing which took place at the convention in July. President Matt Charsky writes on Mid-Year Accomplishments of the various regional federations in membership numbers, scholarships, and more. John Martin writes on public lands access, particularly the new national monuments in southern California.

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

Coming Soon - Your Dues?

With **next** month's Bulletin, we'll request that members pay their annual dues. They will be due by the end of October.

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. 17-18, 2016: Central Pennsylvania Rock & Mineral Club Gem, Mineral and Jewelry Show. Zembo Shrine, 2801 N. 3rd St., Harrisburg PA. Sat. 10-6, Sun. 10-5. www.rockandmineral.org/annual show.htm

Sept. 24-25, 2016: 60th Annual Franklin-Sterling Hill Mineral, Gem and Jewelry Show, by FOMS and Franklin Mineral Museum. Franklin Bor. School, 50 Washington Av., Franklin NJ. http://spmom3.wix.com/franklin-gem-mineral

October 1, 2016: Autumn Mineralfest, by Penna. Earth Sciences Ass'n. Macungie Memorial Park, Poplar St., Macungie PA. Sat. only, 8:30-3:00. www.mineralfest.com

October 21-23, 2106: Eastern Federation of Mineralogical and Lapidary Societies Convention & Show, Rochester, NY. http://www.rochesterlapidary.org/show/

November 5-6, 2016: FM-PA Chapter Symposium (Saturday) and Field Trip (Sunday). Franklin & Marshall College, Lancaster, PA. http://www.rasloto.com/FM/

March 4-5, 2017: Earth Science, Gem and Mineral Show by Delaware Mineralogical Society. NEW LOCATION: U. Del. Wilmington campus, Arsht Conference Center, 2800 Pennsylvania Ave (Rt. 52), Wilmington DE 19806. Sat 10-5, Sun. 11-5. Info and coupons at www.delminsociety.org

Geo-Sudoku Solution

L	I	N	P	E	O	H	X	A
H	E	X	N	I	A	L	O	P
O	A	P	X	H	L	N	I	E
P	H	I	A	N	E	X	L	O
N	L	E	I	O	X	A	P	H
X	O	A	L	P	H	I	E	N
E	X	L	O	A	N	P	H	I
A	**P**	**H**	**E**	**L**	**I**	**O**	**N**	X
I	N	O	H	X	P	E	A	L

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!

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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:

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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.