Nittany Mineralogical Society Bulletin

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

Editor (see back page): David C. Glick

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

December 21st meeting:

Annual Holiday Dinner at Quaker Steak & Lube Restaurant 6:00 p.m. Wed. Dec. 21

Please join us!

Sign up by Dec. 15 if you can

On Wednesday, Dec. 21, 6:00 p.m., rather than our usual meeting, we'll have our Holiday Dinner at a new location, Quaker Steak & Lube Restaurant, 501 Benner Pike (across Benner Pike from the Nittany Mall), State College, PA 16801.

NMS will pay for appetizer plates to be shared by all those present, then attendees can order and pay for their own dinners. We'll have some door prizes also. If you expect to attend, please **RSVP** to Bob Altamura, raltamura@comcast.net or 814-234-5011 to help us plan. If you haven't signed up and you want to come anyway, that's fine too - **please join us!**

We are bringing back our tradition from a few years ago: members can have a table at the dinner to sell minerals / fossils/ gems / jewelry / rock crafts. Sellers need to collect PA sales tax. NMS will charge a commission fee at 10% of the vendor's pre-tax sales. If you are interested in selling, please contact Bob Altamura (see above) as soon as possible to see if there are any openings left.

Minerals Junior Education Day Saturday, April 1, 2017 Please Volunteer

Frank Kowalczyk will be coordinating NMS's 22nd Annual Minerals Junior Education Day. It is set for Saturday, April 1, at Central Pennsylvania Institute of Science & Technology at Pleasant Gap, the same location as the last two years. Please save the date and think about how you might help bring this great event to families in our community.

At this event, kids get an empty egg carton when they check in, then go to a series of stations, each concerning a different aspect of mineral properties, rocks, fossils, etc. They learn about the topic from a demonstration or discussion, and receive a properly labeled specimen or educational item related to the topic, so they gather a whole collection in their egg carton. There is also a sales table with kid-friendly prices.

We are starting early to prepare for the 2017 event, seeking **volunteers** to help to present the stations, and ideas for stations which we (or you) might present. We also welcome advance donations of identified minerals, tumble-polished material, fossils, books, etc. which can be sold at child-friendly prices.

If you
- can volunteer to be in charge of a station
- can help with a station or in some other way
- have an idea for a station which teaches about some aspect of minerals, fossils, geology, gemstones, etc.
- have about 200 pieces of minerals, fossils, etc., which might be useful as giveaways at a station
- have items such as mineral specimens, fossils, books, etc., that we might sell at child-friendly prices,

please contact Frank J. Kowalczyk:
frank.j.kowalczyk@gmail.com
or 814- 238-8874

FEDERATION NEWS

Nittany Mineralogical Society, Inc., is a member of EFMLS, the Eastern Federation of Mineralogical and Lapidary Societies, and therefore an affiliate of AFMS, the American Federation of Mineralogical Societies. We present brief summaries here in order to encourage readers to see the entire newsletters.

The **EFMLS Newsletter** is 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 December issue, President Dave Korzendorfer reviews some discussion from the October annual meeting, including projects to study the number and effectiveness of current committees and to evaluate use of communications technologies. Awards presented at the convention are listed, and Minutes are printed. Cheryl Neary reviews the many attractions of the annual convention, as an invitation to the 2017 convention and show (October 20-22, Bristol, Connecticut). Donations are invited for the Eastern Foundation Fund auction to be held there. Registration will open on January 1 for the May 22-28 Wildacres Workshop session; Bob Jones will return as the Speaker-in-Residence.

The **AFMS Newsletter** is available by the same methods. Incoming President Ron Carman tells more about his long and interesting mineral collecting history. The death of Fred Schaefermeyer, Past President of EFMLS (1989-90) and AFMS (1994-95) is noted with a memorial article. The conservation & legislation article reviews the legal definition of recreational rockhounding on public lands.

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

NMS Display Completed in Penn State EMS Museum

Bob Altamura has recently completed a display entitled **Geological Terrane Model of Pennsylvania & Selected Rock and Mineral Samples** at the Penn State Earth & Mineral Sciences Museum on the ground floor of Deike Building. This continues Bob's and NMS's program to periodically provide a new display. Watch for more information in a future Bulletin issue.

Geo-Sudoku

by David Glick

This puzzle contains the letters AEIGHNPRS. One row or column spells something that glaciers are constantly doing to their surroundings. 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.

P			E	S				N
A	S			R	G		P	H
E			P					I
H		N				P	A	
						G		E
G			A				I	S
I		A					E	
	E				P			G
		G	R			H		A

Mineral Specimens for sale

I am preparing to sell a large percentage of my worldwide collection and thousands of Pennsylvania specimens, many self collected and old classics. There's plenty of variety, and plenty for different levels of collector interest. Anyone interested should call to set up an appointment. Thanks,
Skip Colflesh, Hershey, PA
phone 717-805-2027

COLLECTION FOR SALE

Wide-ranging, good-sized collection; concentration on a nice variety of mineral crystals but also metallic specimens, several types of hematite, some gemstones and rough for cabbing or faceting, volcanic material, fossils. Most fairly small, most purchased from dealers through the years. Prefer to sell the collection as a whole, although sale of certain subsets (hematite, quartz, gemstones, or fossils) is possible. Located in Burnham, PA. Contact Mike, <mikerockcutter@aol.com> or 814-571-9672.

Ice: The Mineral that Shapes the Earth

by Dr. Vivien Gornitz
The New York Mineralogical Club

from:
Bulletin of the New York Mineralogical Club,
June, 2015
(2nd Place – AFMS Bulletin Editor's Contest - Original Adult Articles- Advanced)

Ice—The Mineral

Ice is a mineral—the solid, crystalline form of water. The world of ice occupies a vast realm—the cryosphere—that extends from the frigid poles to ice-laden polar seas, lofty mountain peaks, and frozen tundra. Its realm encompasses snow, lake and river ice, floating ice (sea ice, icebergs, ice shelves), land ice (ice sheets, ice caps, and glaciers), and permafrost (frozen soil). Antarctica houses the vastest store of ice by far–a vast continental ice sheet comprising 87 per cent of the total by volume, followed by Greenland (10 percent), and ice shelves (2.3 percent), with smaller volumes in sea ice, permafrost, and mountain glaciers. However, permafrost and sea ice cover the largest area, followed by the Antarctic and Greenland ice sheets, and ice shelves.

Snowflakes form when water vapor condenses and solidifies onto nuclei of mineral dust (kaolinite, feldspar, quartz, or volcanic ash), organic matter, soot, even artificial particles (dry ice, silver iodide) at temperatures below 0ºC (32ºF).

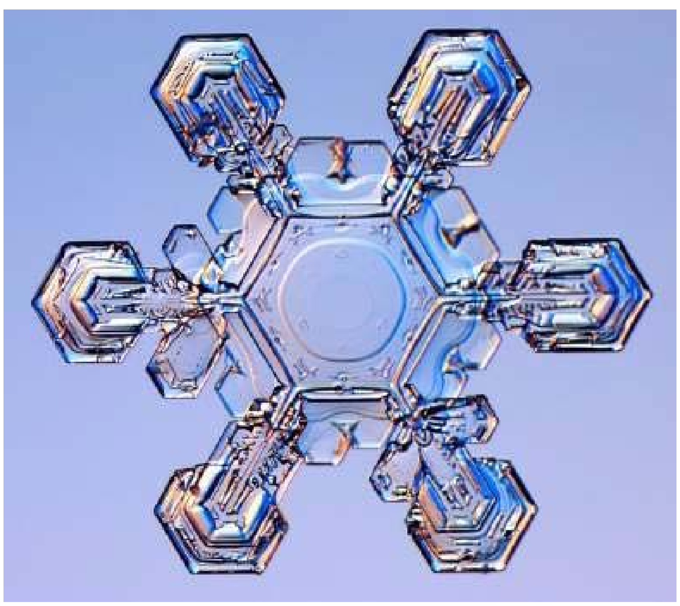

Figure 1. Snowflake showing 6-fold symmetry. (Source: Kenneth G. Libbrecht, Caltech, 1999. http://www.its.caltech.edu/~atomic/snowcrystals/primer/primer.htm).

The hexagonal shape of a snowflake reveals the internal arrangement of atoms within the ice crystal. In ice, oxygen and hydrogen atoms are linked to adjacent H_2O molecules, forming tetrahedral bonds at 109.5º angles. The tetrahedra are stacked into a three dimensional lattice with overall hexagonal symmetry (as in the snowflake)[1]. (Ice, however, exists in at least 15 separate polymorphs with different crystal structures, over a broad range of low temperatures and high pressures). Because hydrogen bonds that connect adjacent H_2O molecules create an open structure, ice, unlike most solids, is less dense (0.917 g/cm^3 at 0ºC) than its liquid phase—water (0.9998 g/cm^3). Hence, ice floats on water.

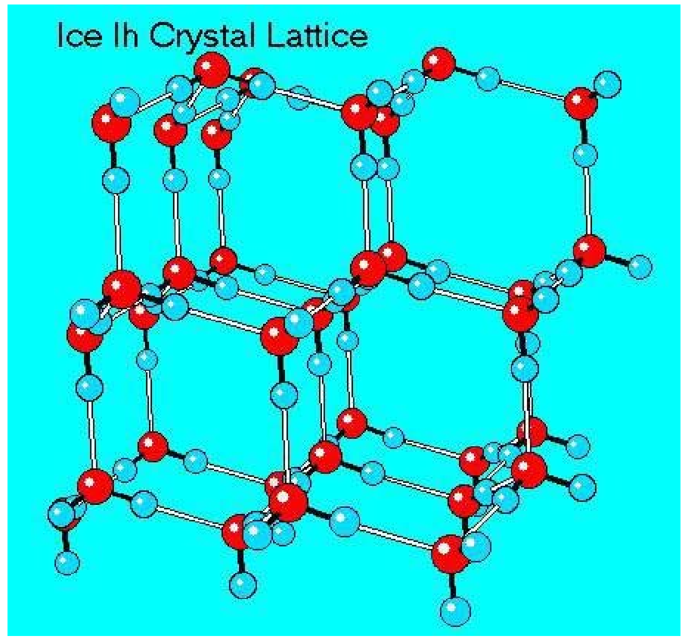

Figure 2. Crystal structure of ordinary ice.
[Red (darker) balls are oxygen atoms; blue (lighter) are hydrogen atoms].

The growth of a snowflake is extraordinarily sensitive to minor variations in atmospheric temperature and water vapor concentration. This creates a wide variety of crystal shapes that range from flat hexagonal plates, hexagonal prisms, hollow prisms, to six-sided dendritic plates, and endless combinations of these. More rapid growth along crystal edges and side branches under supersaturated conditions produces hollow, stepped crystals (hoppers) or dendritic branches. The growing snowflakes, buffeted by gusts of wind, encounter random fluctuations in temperature and degrees of water vapor saturation. Constantly in motion, the crystals are exposed to similar conditions in all directions from moment to moment. This enables them to maintain the hexagonal symmetry dictated by their atomic structure. However, the rapidly changing environmental conditions cause numerous alternations in crystal growth that ultimately generates complex and diverse shapes. Thus, no two snowflakes are exactly alike.

The Birth of a Glacier

Randomly falling snowflakes mark the birth of a glacier. Individual snow crystals eventually grow large and heavy enough to fall. Several crystal can aggregate into pellets or partially melt, as sleet. Fresh snow is very porous. As more snow accumulates over time, the intricately branched shapes of snowflakes gradually grow rounder and larger; older snow compresses and recrystallizes. Snow that survives the summer is called firn—the first step in snow's transition to ice. A growing succession of many years' loosely-packed snowfalls gradually transforms firn into ice. After multiple freeze-thaw cycles, continued compaction and recrystallization, firn reaches the density of pure ice, completing its transformation to ice.

Originally randomly-oriented, ice crystals adopt an increasingly non-random arrangement, or crystal fabric under the increasing weight of overlying ice at depth inside a glacier. The glide planes in ice crystals begin to align in the direction of flow, roughly parallel to the glacier's bed[2]. Ice that has developed this preferred orientation can slide many times faster than randomly oriented crystals. The arrangement of crystals therefore underpins the ability of ice to flow in glaciers and ice sheets[3].

Ice is not only a mineral, but also a rock. Glaciers and ice sheets are massive aggregates of millions and millions of individual crystals. Ice is also a metamorphic rock–one that has recrystallized and become deformed under the force of gravity. Contorted layers and stripes of rocky debris trapped in ice reveal the stresses to which the glacier ice has been subjected during its downward journey–not unlike the wavy and twisted bands and folds seen in schist outcrops in Central Park—stark remnants of several episodes of mountain building, uplift, and subsequent erosion hundreds of millions of years ago.

Glaciers slowly flow downslope under the pull of gravity. Glaciers and ice caps cover 0.73 million square kilometers of land worldwide, occupying a volume of 0.15 million cubic kilometers. Over three quarters of glaciers (by area) lie in the Arctic, Alaska, and the Himalayas. They blanket mountain tops on all continents, including the high peaks of the tropics. Small high altitude glaciers still whiten tropical peaks, such as on Mt. Kilimanjaro, Tanzania. However, these are among the world's most endangered glaciers, as the planet warms.

Glaciers are one of nature's most efficient landscape architects, constantly reshaping their environments through the processes of erosion, entrainment, transportation, and deposition.
R. D. Karpilo, Jr. (2009)

Figure 3. Folded layers in glacier ice—clear signs of deformation. Crusoe Glacier,Alex Heiberg Island, Canadian Arctic Archipelago. http://www.swisseduc.ch/glaciers/alex_heiberg/crusoe_glacier/crusoe_front_west/index-en.html?id=2/.

Ice as a Land Sculptor

Ice is a powerful land sculptor, creating rugged Alpine mountain scenery and excavating valleys and fjord basins. Mountain glaciers confined to narrow valleys flow downhill like rivers of ice. As a thick mass of ice slowly descends down the mountainside into the valley and beyond, it abrades exposed rocks, smoothing and rounding their surfaces, plucks boulders and transports them, and quarries shattered rock fragments from valley walls. Laden with broken rocks, pebbles, soil, and meltwater, the relentlessly advancing ice scours the underlying surface, scraping and wearing down bedrock and loose sediment. It leaves evidence of its passage in distinctively-shaped landforms, rock outcrops, and debris that accumulates in characteristic deposits. Continual grinding by an advancing glacier reduces entrained rocks to fine flour that, like jewelers' rouge[4], polishes bare surfaces to a high luster, also producing scars, such as scratches, grooves, and linear striations parallel to its flow direction. Scraped by the ice sheets of the last Ice Age, these scratch marks, or striations are still visible on smoothed rock outcrops of Central Park and other city parks.

Perched high on mountainsides, the heads of most glacial valleys occupy cirques, or bowl-shaped hollows. Sharp ridges, or arêtes, separate cirques between mountain slopes. Jagged pyramidal peaks, such as the Matterhorn in Switzerland, form where several cirques intersect. A glacier bulldozing its way downhill carves U-shaped valleys, in distinct contrast to the characteristic steep-sloped V-shaped mountain valleys etched by flowing rivers. Tributary glaciers remain stranded as *hanging glaciers* above the main glacier, which eroded a much deeper valley when the ice was more extensive. These glacial sculptures create the breathtaking scenery of the Alps, the northern Rockies, the Himalayas and other mountain chains. Meltwater emerging from a glacier's snout collects in streams or in small milky greenish-blue glacial lakes, colored by the high number of finely suspended ice-pulverized particles, or "rock flour".

Figure 4. Aletsch Glacier, Switzerland, largest glacier in the Alps. Dark wavy band in the middle are medial moraines. http://en.wikipedia.org/Aletsch_Glacier#/media/File:Aletsch gletscher_mit_ Pinus_cembra2.pdf.

Glacier ice often glows a deep aqua blue because ice preferentially absorbs longer wavelengths (i.e., yellow and red), scattering light mainly in the blue. The aquamarine glow shows up best in densely packed, well-crystallized ice with few included air bubbles, such as found in freshly exposed crevasses or calved icebergs.

As recently as 20,000 years ago, a massive continental-scale ice sheet covered much of Canada and the northern United States. As the ice sheet retreated, it left behind tell-tale signs of its former presence. Its signature may still be seen in New York City parks. Ice has streamlined exposed rocky outcrops into roche moutonnées (Fr., literally "sheep-like rock") that are smooth on the side facing the oncoming glacier, but shattered and jagged on the lee flank.

Ice overriding rock or sediments carved drumlins–streamlined hills, steeper and wider on the up-glacier side and gentler, more tapered on the lee side. Drumlins may occur alone or in swarms containing hundreds or thousands of mounds. The now-vanished ice sheets have also gouged out numerous lakes, such as the Great Lakes, or the Finger Lakes in upstate New York.

However, the work of glaciers does not end with erosion. Glaciers and ice sheets transport and deposit enormous loads ranging from huge boulders, gravel, and silt to fine-grained clay hundreds of kilometers from their source areas. They pile mounds of unsorted debris along valley walls (lateral moraines) and at their final advance (terminal moraine). The lateral moraines of two converging glaciers create a medial moraine where they join. Recessional moraines mark successive stages in a glacier's retreat.

Figure 5. Roche moutonnée in Central Park, Manhattan. Author's photo.

Ice leaves various types of deposits (collectively known as glacial drift) in its wake. Foreign rocks and boulders, or glacial erratics, dumped far from their sources populate glaciated terrains. These exotic boulders—granite, metamorphic and sedimentary rocks from upstate New York, diabase from the Palisades across the Hudson River—lie scattered across New York City parkscapes. Sands and gravels deposited in channels or tunnels beneath stagnant or retreating ice form long, sinuous ridges, or eskers, when the ice melts. Streams or in ponds on the surface of a stagnant glacier fill hollows or depressions with layered sand. Once the ice melts, small mounds, knobs, or hummocks, called kames remain. Kettles form in depressions left by melting ice blocks. Outwash plains develop from sediments washed out by streams emerging at the edge of a retreating ice sheet. Much of Long Island, New York consists of an outwash plain south of the terminal moraine which roughly divides the island in half along its length from west to east. In New York City, the terminal moraine, which forms a ridge, stretches across parts of Queens, Brooklyn and into Staten Island.

Figure 6. Glacial Erratic in Central Park, Manhattan. Author's photo.

We build statues of snow, and weep to see them melt.
Sir Walter Scott (1771-1832)

Vanishing Ice

The world of ice is rapidly changing as the planet heats up. Almost half of the area once occupied by Alpine glaciers in 1850 had disappeared by 2000. The European Alps are not alone. Similar rollbacks have affected many widely separated glaciers across the globe: in southern Alaska, the Canadian Arctic, the Andes, New Zealand, to name a few. Mountain glaciers and ice caps are quickly wasting away, losing enough ice between 1993 and 2010 to raise sea level by 0.8 mm/yr (0.031 in/yr), if spread out evenly across the oceans. The two large ice sheets (Greenland and Antarctica) are adding another 0.6 mm/yr (0.02 in) to the oceans. These still fairly small ice losses are poised to increase substantially in the future, if global warming continues unabated. Elsewhere, floating sea ice over the Arctic Ocean has declined since 1979. Sea ice reached its lowest late summer minimum extent in September, 2012 and lowest winter maximum extent in late February, 2015. Permafrost, or permanent frozen soil, is thawing, leaving myriad thaw lakes and "drunken" trees tilting at odd angles, as the ground beneath turns to mush.

Not to worry—just yet. Plenty of snow and ice still blanket mountain peaks in winter, although much less so than formerly in many places. The Greenland and Antarctic Ice sheets are still intact—for now. And while Anchorage, Alaska basked in record warmth this winter, the northeast U.S. experienced one of the coldest and snowiest seasons on record. Enough snow for children to take time off from school to build snowmen, skiers and skaters to enjoy winter sports, and for anyone to marvel at the beauty of freshly fallen snowflakes and ice crystals sparkling like gems in the sunlight.

Further Reading

Balog, J., Williams, T.T. (foreword), 2012. *Ice: Portraits of Vanishing Glaciers.* Rizzoli International Publications.

IPCC (2013). *Summary for Policymakers. Climatic Change: The Physical Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* Alexander, L., Allen, S., Bindoff, L., Church, J., and others, eds. Cambridge University Press: Cambridge, UK and New York, NY, USA. http://www.ipcc.ch/ (see section on cryosphere).

Libbrecht, K., 2006. *Ken Libbrecht's Field Guide to Snowflakes.*

Libbrecht, K., 2003. *The Snowflake: Winter's Secret Beauty.*

Post, A. and Lachappelle, E.R., 2000. *Glacier Ice.* Toronto: U. of Toronto Press, with International Glaciological Society, Cambridge England.

Endnotes

(1) The tetrahedral arrangement of oxygen and hydrogen atoms in ice resembles that of silicon and oxygen in quartz, and in silicate minerals. O and H atoms in H_2O molecules (connected by black lines) are linked to adjacent water molecules by H-bonds (white lines) (Fig. 2). The latter are weaker than the tight covalent bonds between atoms in a water molecule.

(2) In the hexagonal system, the c-axis (and the optical axis) displays 6-fold symmetry. The main glide (basal) plane in ice (on which the crystals preferentially slide) is perpendicular to the c- axis.

(3) A thin layer of water at the base of the glacier also acts to lubricates it and facilitate flow.

(4) Jewelers' rouge used to polish metals is finely powdered hematite, or iron oxide, Fe_2O_3. Its hardness (5-6 on the Mohs scale, where graphite =1 and diamond=10) is somewhat less than most typical rock-forming minerals (Mohs hardness ~6-7). ❄

Rutgers Geology Museum
49th Annual Open House

SATURDAY, JANUARY 28, 2017

PRESENTATIONS IN SCOTT HALL ROOM 123

10:00 am to 11:00 am	**"Volcanoes and Life"** *Presented by Dr. James Webster* Department of Earth and Planetary Sciences, American Museum of Natural History
11:30 am to 12:30 pm	**"Dense Gas in Distant, Dusty Galaxies"** *Presented by Dr. Andrew Baker* Department of Physics and Astronomy, Rutgers University
2:00 pm to 3:00 pm	**"The Appalachians and how they got that way: Structure and dynamics of eastern North America"** *Presented by Dr. Maureen Long* Department of Geology and Geophysics, Yale University

Mineral Sale - Scott Hall Room 135 from 9:00 am to 3:00 pm

Credit cards, cash and checks now accepted

- *Rock and mineral identification* – Scott Hall Room 119 from 11:00am to 2:00 pm
- *Make-and-take stations for kids* (all ages) - Geology Museum from 11:00 am to 2:30 pm

Hands-on activity sessions for kids (ages 8+) in Scott Hall

10:30 am - 11:30 am	Room 103	**Drilling into Science**
	Room 104	**Volcanoes!**
	Room 105	**Hidden Minerals**
12:30 pm – 1:30 pm	Room 103	**Drilling into Science**
	Room 104	**Volcanoes!**
	Room 105	**Hidden Minerals**
1:30 pm – 2:30 pm	Room 103	**Drilling into Science**
	Room 104	**Volcanoes!**
	Room 105	**Hidden Minerals**

All events are free and no pre-registration is required.

CART Captioning Services will be available for all RUGM lectures. Contact the museum at 848-932-7243 or at museum@rci.rutgers.edu for more information about this event.

Check out our website at http://geologymuseum.rutgers.edu

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.

Jan. 28, 2017: Rutgers Geology Museum Open House See page 7 and geologymuseum.rutgers.edu/

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
 - - - **AND A Symposium** with a variety of topics and speakers; watch for details.

March 25-26, 2017: Che-Hanna Rock & Mineral Club Annual Show, NEW LOCATION: Wysox Volunteer Fire Company, 111 Lake Rd., Wysox, PA; Sat. 9-5, Sun. 10-4; $3.00, $1.00, under 8 free; 48th Annual Show. Club members exhibits, museum exhibits, lapidary demonstrations, door prizes. Kids' scavenger hunt. Kids mini mine. Fluorescent show. Geode-cutting. Dealers selling minerals, fossils, jewelry, lapidary; www.chehannarocks.com

October 21-22, 2017: EFMLS Convention & Show, Bristol, Connecticut.

Geo-Sudoku Solution

P	G	H	E	S	I	A	R	N
A	S	I	N	R	G	E	P	H
E	N	R	P	H	A	S	G	I
H	I	N	G	E	S	P	A	R
S	A	P	I	N	R	G	H	E
G	R	E	A	P	H	N	I	S
I	H	A	S	G	N	R	E	P
R	**E**	**S**	**H**	**A**	**P**	**I**	**N**	**G**
N	P	G	R	I	E	H	S	A

Visit us at www.nittanymineral.org

INVITE A FRIEND TO JOIN THE SOCIETY

The Nittany Mineralogical Society prides itself on having among the finest line-up of speakers of any earth sciences club in the nation. Everyone is welcome at our meetings. If you'd like to be part of our Society, dues are $20 (regular member), $7 (student rate), $15 (seniors), $30 (family of two or more members, names listed). Those joining in March or later may request pro-rated dues. Your dues are used for programs and speakers, refreshments, educational activities, Bulletins, and mailing expenses. Please fill out a membership form (available at www.nittanymineral.org), make checks payable to "Nittany Mineralogical Society, Inc." and send them in as directed, or bring your dues to the next meeting.

We want to welcome you!

CONTACT INFORMATION

mailing address:
Nittany Mineralogical Society, Inc.
c/o S. Bingham, Treasurer
145 Goddard Cir.
Penna. Furnace PA 16865

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
John Dziak (Secretary)
e-mail: jjd264@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: Dr. Bob Altamura (see above)
Facebook & Publicity: John Dziak: jjd264@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. 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.