Nittany Mineralogical Society Bulletin

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

December, 2008 **www.ems.psu.edu/nms/** *Editor: David C. Glick (see p. 8)*

December 17th, 6:30 p.m. to ~9:00:
Note new, special location:
Prospector's Restaurant

Annual Holiday Social & Sale at Prospector's

by David Glick

Our December meeting will be held Wednesday the 17th at 6:30 p.m., in the private room of Prospector's Allegheny Rib Company at 2080 Cato Avenue, just off West College Ave. (PA 26 South) across from Harner Farms. See directions on this page.

The event has free admission, free parking, and free refreshments, and is open to all – please come, bring your family and guests, and share an enjoyable evening! -Editor

Our December meeting will be our annual Holiday Social & Sale, now a 10-year tradition in NMS. It is open to all NMS members and their guests; there is no admission fee. It will be at Prospector's restaurant (directions at right); our event will be in the private room (from the front door, it's straight ahead to the back section, then turn right and continue to the room). Doors will open at 6:30 p.m. and close at about 9:00 or later; everyone may come and go on their own schedule.

Lapidary rough and slabs, polished stones and more will be shown and offered for sale by this year's Holiday Sale vendor, NMS member Willard Truckenmiller. We thank Willard for participating and adding to our event, and for providing a portion of his sales to NMS. His material generally includes materials from some old-time collectors in the western U.S., such as plume agate, Biggs jasper and petrified woods.

We also plan to show the 2005, 2006 and 2007 "What's New in Minerals" video programs featuring Jeff Scovil's photography; these are borrowed from EFMLS.

Some snacks and appetizers from the restaurant will be provided by NMS, and individuals can order beverages and food from the restaurant. Members may bring other party food, particularly your favorite holiday baked goods or dessert items. Of course the restaurant and bar are available to attendees throughout the evening; you can enjoy a full dinner in their dining room before, during or after the event. They are open all evening.

We do not plan to have door prizes at this meeting. The club will have for sale NMS T-shirts ($9.00), mineral sets ($20.00), and posters (unmounted, $16.00).

We hope you can make it. Each year we have a good time socializing while selecting from the interesting items for sale. ❄

Junior Rockhounds Meeting

The final Junior Rockhounds meeting of the season will include hands-on, fun and educational activities. It's in room 117 EES Building, at 7:00 p.m. on **Thursday, Dec. 18.** The topic will be **Identifying Metamorphic Rocks.**

Check the web site for any updates, or call Dr. Andrew Sicree at 814-867-6263 for more information. - *Editor*

Directions to *Prospector's*
for the December meeting

From downtown State College, Atherton St & College Avenue near campus: go "west" on West College Avenue (PA Route 26 South) away from town 3.0 miles. Just past Dix Honda, turn left on to Cato Avenue, then immediately turn right into the parking lot. If you're still on West College when you get to State College Ford and Sheetz at Whitehall Road, you've gone too far. - *Editor*

ATTENDING THE DECEMBER MEETING?
This event is free and guests are welcomed!
Your additional snacks will be welcomed.

Tax-deductible donations welcomed

by David Glick, NMS President

NMS received 501(c)(3) status from the IRS during 2008, which means that your donations to NMS are tax-deductible. Your donations will help fund our educational purpose and programs. Please make checks payable to 'NMS, Inc.,' include a memo noting that it is a donation, and send to the P.O. Box (in banner, above). Or contact the president or treasurer (see p. 8) for more information.

Nittany Gem & Mineral Show
June 27 - 28, 2009

Just in time for this writing, we've learned that we have written approval from the school district to use Mt. Nittany Middle School for our 4th Annual Nittany Gem & Mineral Show on June 27-28, 2009 (set-up on Friday, June 26). Vendor contracts will be going out as soon as possible, first to 2008 show vendors, then those from earlier years (particularly because our schedule prevented some of them from participating in 2008), then those on the waiting list. - *Editor*

History of NMS at January meeting

As part of the January meeting, we expect to have a segment on NMS history in recognition of our 15th anniversary. If you have any stories, photos, or other materials which were not included in the 10th anniversary program, or would like to participate, please contact Dave Glick (see p. 8). - *Editor*

Geo-Sudoku

by David Glick,
adapted from pdtreasures.com

This puzzle contains the letters CEIMOSTUV, and one row or column spells out the name of a mineral in the mica group. Each block of 9, each row, and each column must contain each of the nine letters exactly once. The solution is on page 8.

			V		E			
M	T						I	
		T						O
U	M	E	T					
	I							M
			C		U			E
		U					S	
	C	V				T		

ISN'T IT A FACT

by Nellie Morgan

Rocks on the lawn, rocks in the shed,
Shovels and hammers under the bed.
Boots and knapsacks beside the door,
Clay and grit all over the floor.
Slabs and specimens on the chairs,
Boxes of crystals on the stairs.
A Rockhound's home is a disgrace,
But, Oh, it's such a happy place!

- *via Diana Dare in the SCRIBE 2008 CD-ROM*
(maybe the title should be
"Your Editor's House" - *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.

The **EFMLS Newsletter** is available through the link on our web site **www.ems.psu.edu/nms/** or remind Dave Glick to bring a printed copy to a meeting for you to see.

In the December issue, a new website contest is announced. EFMLS President Mary Bateman urges clubs to communicate with their regional vice presidents. Junior Activities and Uniform Rules Committee chairs are still open. In the year-end summary of AFMS Scholarship Foundation donations, Nittany Mineralogical Society is in the list for our donation in memory of Jay Lininger. Donations are requested for the Eastern Foundation Fund, which is used to support various useful programs and services. The first of two 2009 **Wildacres Workshop** sessions will be held April 17-23, with details available in the January Newsletter. Mike Wise of the Smithsonian will be the Speaker in Residence. Fall workshop dates will also be announced soon.

The **AFMS Newsletter** is available by the same methods. In the December/ January issue, Rock & Gem is announced as the official magazine of the American Federation. Following the Houston annual business meeting which was cancelled due to Hurricane Ike, Federation business was conducted by mail, resulting in these officers being elected for 2009:

Joy Bourne, President (EFMLS)
Emerson Tucker, President-elect (SCFMS)
Bob Miller, 1st Vice President (MWF)
Lauren Williams, 2nd Vice President (NFMS)
Ann Monroe, 3rd Vice President (SFMS)
Richard Jaeger, 4th Vice President (RMFMS)
Colleen McGann, 5th Vice President (CFMS)
Pat LaRue, Treasurer (2-year term)
Anne Cook, Sec'y (continues, no election this year)

The webmaster contest, which starts a three-year trial, is described. Winners of the prizes (which have been illustrated in color in previous issues) from the Endowment Fund drawing are announced. The safety article covers some aspects of lapidary shop safety from the AFMS Safety Manual. Public Relations Chair Fran Sick discusses "Public Relations or Publicity - Is There a Difference?" The Juniors column describes youth education programs at the big Houston Gem and Mineral Show. Entries for the Program Competition (on CD, DVD, VHS tape, or slides) are invited. An Inter-Regional Rockhound Rendezvous, May 20 - 25, 2009, in the Davis Creek/ Lassen Creek area of northeastern California for obsidian, is described. The status of the American Lands Access Association, and communication regarding legislation which would limit access to public lands, are reviewed.

Please see the web sites for the rest of these articles and many others in both Newsletters. There's a lot there! - *Editor*

IN THE NEWS?

NMS members Andrew Sicree and John Passaneau are providing a series of articles and photographs on central Pennsylvania minerals and geology to the Centre Daily Times newspaper in State College. They are published in the monthly Family Pages magazine supplement. These two photos of specimens from the State College area are part of the series.

Celestine on dolomite, micromount, Oak Hall Quarry, Oak Hall, Centre County, PA.

J. Passaneau micromount specimen and photo.

Strontianite, Oak Hall Quarry, Oak Hall, Centre County, PA.

Specimen provided by A. Sicree. J. Passaneau photo.

DONNA'S LAW

by Donna Silberrad

Everywhere I wander,
Everywhere I roam,
Each time that I bend over,
Another rock comes home.

- via Diana Dare in the SCRIBE 2008 CD-ROM

ON IDENTIFICATION

(author unknown)

I've looked into Pough's
And I've memorized Mohs.
I've even paid Dana a visit.
But when it's all said,
I still scratch my head,
And sit here and wonder –
"What is it?"

- via Diana Dare in the SCRIBE 2008 CD-ROM

POPULAR MINERALOGY

Mineralogy and earth science for the amateur mineralogist and serious collector - #19

Deadly Minerals: Uranium and Thorium Minerals

by Andrew A. Sicree

Many mineral collectors avoid uranium and thorium minerals because they are radioactive and thus dangerous. But, while radioactives do present a health hazard, they can be collected, displayed, and stored with safety. A little bit of understanding of the nature of their radioactivity goes a long way toward protecting yourself sensibly without becoming paranoid about the dangers of radiation.

A primer on radioactivity

The first fact to be mentioned is that "radiation" is everywhere. For instance, sunlight, infrared light, and ultraviolet light are all forms of electromagnetic radiation, although their energies are low and their abilities to harm us are consequently lessened. Visible light doesn't do us harm, although it can cause some minerals (such as realgar) to decompose or discolor. Short-wave ultraviolet light (which is higher-energy ultraviolet radiation) can cause tanning, give sunburns, and even eventually contribute to skin cancer, but it is substantially different in impact than the energetic particles or rays that come from the nucleus of certain atoms. Radiation from the nucleus of an atom is called nuclear radiation or *radioactivity*.

Radioactivity is the release of energetic particles and/or rays during the decay of an unstable nucleus. The nuclei of certain *isotopes* of all elements are unstable or radioactive. This means that they will, given enough time, decay. They do not decompose completely, but they will breakdown into smaller nuclei and emit some particles and/or rays in the process. For many elements, the unstable isotopes decay so quickly that they do not exist in nature on the Earth. They only exist if they have been made in a nuclear reactor, or the explosion of an atomic bomb. Stars also make them – but that is another story. Collectors are primarily concerned with natural sources of radioactivity.

Natural sources

It is impossible to escape from radioactivity. The radioactive isotope carbon-14 is continuously created in the upper atmosphere and it permeates the air, water, living plants, and our bodies. All uranium is radioactive, and there are traces of uranium in most granites and many other rocks. Some petrified wood and some dinosaur bones are very radioactive because they contain a fair amount of uranium and along with its radioactive decay products. Potassium-40 is another very long-lived radioactive isotope; this means that all potassium is radioactive. (This is another reason that granites are radioactive – they contain potassium feldspars.) So even our bananas are radioactive!

Usually, when people worry about radiation, they are worried about the type of radioactive particles and rays produced by fallout from nuclear bombs and waste from nuclear reactors. This radioactivity has substantially higher energies than ultraviolet radiation. Naturally radioactive minerals release the same types of high-energy radioactive particles and/or rays, but they are always much lower in activity than are bombs and reactors.

Radioactivity in minerals

In the mineralogical world, there are three types of radioactivity that concern us: *alpha*, *beta*, and *gamma* radiation. Alpha (scientists use the symbol α) particles and beta (β) particles are particles. Beta particles are electrons, and alpha particles are particles that are the same as the nuclei of helium atoms (i.e., they are particles made up of two protons and two neutrons). Gamma (γ) rays are high-energy photons.

Alpha particles are easiest to stop. They're stopped by five or six inches of air and they won't pass through your skin. Beta particles are more penetrating. It takes a thin sheet of aluminum or even steel to stop most of them. Gamma-rays are essentially high energy X-rays and they are very penetrating. They will zip right through your body. Unlike ordinary x-rays, a thin lead sheet doesn't stop gamma-rays. It takes six or more inches of solid lead to stop these little beasties.

Alpha particles may be the easiest to stop, but they can do the most damage if they get inside your body. Because of the penetrating ability of gamma-rays, it really doesn't matter if a gamma-source is inside or outside your body. The gamma-rays will do the same damage either way. But alpha particles are big particles. They strike with much more impact than a gamma-ray does. If a particle of dust containing an alpha-emitter is sucked into your lungs, the alpha particles do not have to penetrate your skin to get at you. If they are emitted within your lungs they will have a direct impact on lung tissues. They'll kill cells and damage DNA, possibly leading to lung cancer. This is why it is a good idea to wear a dust mask when trimming radioactive mineral specimens.

Some common radioactive minerals

Commonly collected uranium minerals include carnotite [$K_2(UO_2)_2(VO_4)_2 \cdot 3H_2O$], uraninite [$UO_2$], and autunite [$Ca(UO_2)_2(PO_4)_2 \cdot 10H_2O$]. Thorianite [$ThO_2$] and thorite [$ThSiO_4$] are among the thorium minerals. "Gummite" is a general term for any of the yellow- and orange-colored secondary uranium oxide minerals (in other words the radioactive yellow stuff that forms when uranium ores weather). Uranium has a rather complicated chemistry so there are a wide variety of uranium minerals. Some of the rarer uranium minerals can be found in pegmatites, concentrated in the center. Uranium minerals also occur in some phosphorus and vanadium deposits because uranium tends to form phosphate or vanadate minerals. Weathering of primary (original) uranium deposits creates a slew of secondary oxidized uranium minerals – many of which are brightly colored yellow or orange.

Dinosaur bones and petrified wood logs will concentrate uranium because the organic matter originally in these fossils created a reduced zone within the fossil. Uranium tends to precipitate in reduced zones so uranium dissolved in groundwater will tend to "drop out" (precipitate) from the water when if encounters buried bones or wood.

Potassium-containing minerals, such as orthoclase ($KAlSi_3O_8$), are radioactive by virtue of containing potassium-40. But this radioactivity is hard to detect in minerals because the decay products are stable (non-radioactive) so, unlike uranium and thorium, there is no chain of radioactive daughter-products. Also, with a long half-life of 1.3 billion years, the rate of decay is very low.

The uranium-238 decay series

All uranium and thorium minerals are radioactive. This is because of the radioactive isotopes uranium-238, uranium-235, and thorium-232. Each of these isotopes is unstable, but they have very long half-lives so it takes a long time for them to decay away. Uranium-238 has a half-life (the time it takes one-half of the isotope to decay) of 4.5 billion years, uranium-235 has a half-life of 700 million years, and thorium-232 has a half-life of 14 billion years – a pretty long time! Eventually, a stable atom of lead-206 results from the decay of uranium-238. Likewise, stable lead-207 results from uranium-235, and stable lead-208 is the end result of the radioactive decay of thorium-232.

Radon gas

All minerals containing uranium will emit a small amount of radon gas. How is this gas generated? When uranium-238 decays it produces thorium-234, which decays to protactinium-234m then to uranium-234. Uranium-234 decays to thorium-230, which in turn produces radium-226. Up until this point the parent (uranium-238) and its daughters have mostly remained within the uranium-bearing mineral, but when radium-226 decays, it produces an atom of radon-222. Being a noble gas, the radon doesn't bind to atoms in the mineral and so it will slowly seep out of the mineral along cracks and cleavage planes if it gets the chance.

Once radon gas is in the air, it doesn't do much damage. You can breathe it into your lungs and it will be exhaled without reacting with your body. Only if the radon happened to decay when it was inside your lungs would it present much of a problem. However, radon-222 will decay to polonium-218, which is also an alpha emitter. When a free-floating atom of radon-222 decays to polonium-218, the resulting polonium-218 atom is ionized (it has a charge). This polonium-218 ion is left floating in the air but, unlike radon, polonium is not a noble gas. It has a strong tendency to react with fine dust particles (or fine smoke particles) in the air. If you breathe one of these polonium-218-laced dust particles into your lungs, you then have an alpha-emitter in direct contact with lung tissues – it isn't going to kill you immediately, but it isn't the best recipe for good health.

All uranium minerals continually produce small amount of radon, so they do present a modest health risk.

Ways of limiting your danger

First, collect fewer specimens. Store only those you really need. Second, limit your exposure to the radioactivity. This means to shorten the time you handle them, protect yourself from dust if you are trimming them, use protective shielding when possible (lead sheets, or leaded glass help), and keep the specimens as far away as possible. Even techniques such as placing radioactive specimens in the rear of a display case will decrease exposure. Store your specimens in a well-ventilated area, preferably one that is not in a living space. This prevents them from creating a radon problem in your house. In other words, don't keep them under the bed, in your basement (radon will migrate) or in a garage attached to your house. Putting them in a locked metal cabinet in a drafty detached garage or a shed is ideal.

You could in theory devise a shielded storage cabinet (with thick lead walls, for instance) that would truncate any alpha, beta, and gamma radiation, but it is very difficult to seal up a specimen so that it does not leak radon gas. Being a noble gas, radon won't react with anything in the rock, in the packaging materials, or in your body. Over time it will, however, tend to diffuse out of containers such as zipper-lock plastic bags. A container would have to be completely gas-tight in order prevent long-term leakage.

While it appears that federal regulations do not explicitly prevent collectors from owning or storing radioactive minerals, some state level regulations may come into play. Heightened security conditions may mean that it will become more difficult to transport radioactive specimens. For instance, some friends of mine were stopped at Niagara Falls when they tried to return to the U.S. after a mineral collecting trip in Canada. Apparently, they tripped some type of radiation alarm at the border. They opened the trunk of their car to show the customs officials their rocks and were allowed to pass.

Dr. Andrew A. Sicree is a professional mineralogist and geochemist residing in Boalsburg, PA. ***Popular Mineralogy** newsletter is published by Andrew A. Sicree, Ph.D., P. O. Box 10664, State College PA 16805. Write or call (814) 867-6263 or email sicree@verizon.net for more information. Supplements are available on a subscription basis to help mineral clubs produce better newsletter. Write for a free sample and subscription form.*

100 Years Ago in *The Mineral Collector*

reported by
David Glick

The Mineral Collector magazine was published in New York, edited by Arthur Chamberlain. The lead article in the December, 1908, issue described a visit to Penn's Cave, Centre County, PA. The participants took a tour from the Grange Encampment in Centre Hall, which was then held in October. The admission charge for the cave was $1.00 per group. The tour, by boat, sounds very much like a tour today, with viewing of the "Niagara Falls" and "Statue of Liberty" formations and retelling of the Princess "Nitanee" legend. The author noted the various colors of the cave formations and concluded with, "They forbid us taking any specimens."

The November 1908 meeting of the Philadelphia Mineralogical Club is described, including their reading a letter from Arthur Chamberlain calling attention to their unpaid subscription to *The Mineral Collector*! Several newly collected local specimens were shown, including rutile crystals from the Philadelphia and Conshohocken quarry; yellow beryl, tourmaline and garnet from Avondale; hyalite from Huntingdon Valley Station, Montgomery County; and smoky quartz from Delaware County.

In the sixth and final article of a series on calcite by Pennsylvania collector Charles Pennypacker, he comments, "Compared with quartz groups, calcite presents a far more diversified line of color and a greater variety of form. A calcite crystal can be found as clear as the clearest quartz crystal, and in its struggles toward perfection all sorts of basic planes and extra angles and extra planes have developed." The issue's longest article was part two of a series on geological distribution of gold. ❄

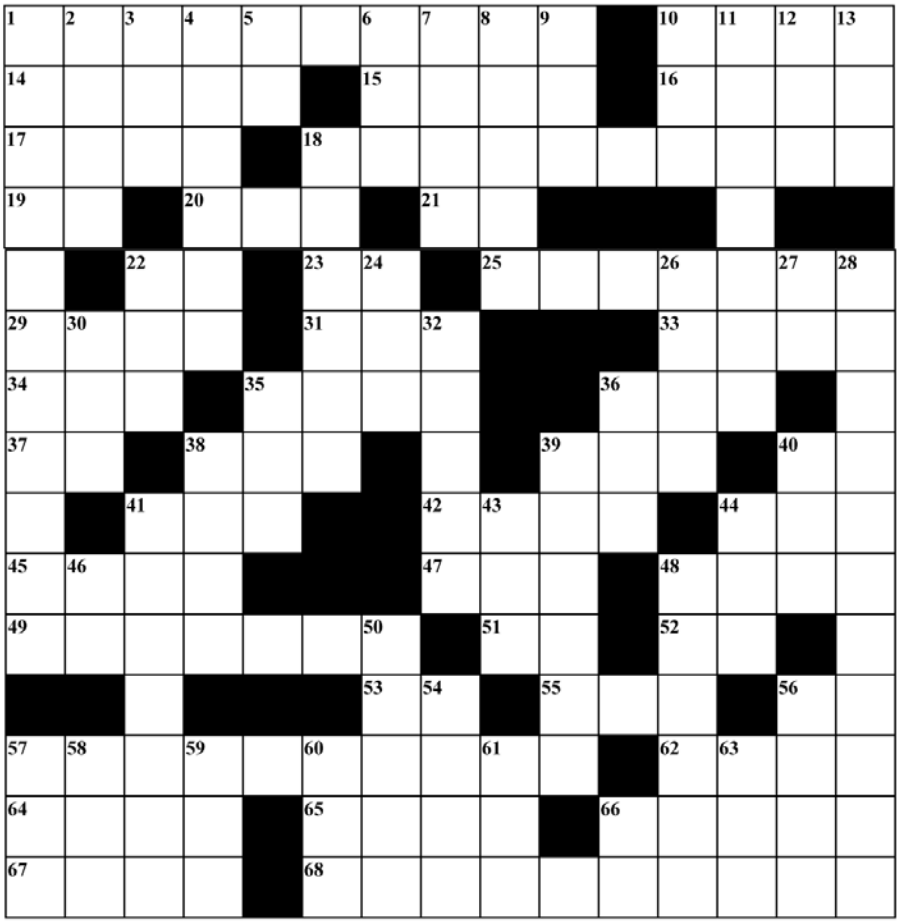
40 years ago in Rocks & Minerals

reported by David Glick

The December, 1968, issue of Rocks & Minerals had little mention of Pennsylvania except for the Current Events section of club news. The editor commented that "The Keystone Newsletter of the Mineralogical Society of Philadelphia,... makes the field trips (to the Phoenixville area lead-zinc mines) sound like trips to see Santa Claus," considering the long list of minerals there which any collector would welcome. News is reported from Tuscarora lapidary Society (Media), Che-Hanna Rock and Mineral Club (Sayre), Pennsylvania Earth Sciences Association (Lehigh valley), Mittel Appalachia Rock Club (Mapleton Depot), and the Rock and Mineral Club of Lower Bucks County (Fairless Hills). ❄

Crystal Matrix Crossword

Radio-Minerals



ACROSS

1 violet uranium oxide mineral
10 low rank soldiers
14 radioactive natural gas
15 Irish king
16 what a cat chases
17 Railroaders of American (ab)
18 yellow uranium vanadate mineral
19 press group (ab)
20 where rivers end
21 selenium
22 mountain state
23 cerium
25 radiation sensitive arsenic mineral
29 has curved beak
31 Samoan garland
33 electron particle radiation
34 what's up there
35 Great birds
36 motor homes
37 Volunteer State
38 Domestic Mail Manual
39 island in the Aegean Sea
40 Hello
41 Gas Research Inst. (ab)
42 smallest part of element
44 full of animals
45 big, bad, and ugly
47 ___tide - Christmas
48 Greek B
49 falls powerfully
51 element in Pepto-Bismol
52 Anno Domini
53 magazine for lapidaries
55 residue after oil
56 dinosaur boundary
57 a plagioclase feldspar
62 abominable in the snow
64 plural of datum
65 decay ____
66 opposite of tohate
67 coloring agents
68 thorium oxide mineral

DOWN

1 radioactive bombardment
2 old folks group
3 Navy Disbursing Of. (ab)
4 cheers
5 Head Nurse (ab)
6 national baskeball grp.
7 charged particles
8 better than true
9 Europe (ab)
10 friend
11 on the edges
12 feline
13 suite (ab)
18 absence of gas
22 Russian peace
24 bigger than a deer
26 Landing Barge Vehicle(s)
27 where it's __
28 what U, Th minerals are
30 box to put things in
32 measure Au concentration
35 friend
36 read only memory
38 on the bottom of coffee
39 cordierite
40 slang for radioactive
41 radioactive rock
43 used for washing
44 a word for Z
46 a soldier
48 proton, neutron, etc.
50 Moslem God
54 Jet assisted take off (ab)
56 King Tut (ab)
57 not usual
58 not to stand up
59 vapor
60 cathode ray tube
61 Spanish to be
63 man's name
66 tantalum

LAST MONTH'S SOLUTION:
Common Minerals

F	O	R	S	T	E	R	I	T	E	■	R	A	U	L
R	A	N	C	H	■	T	R	U	E	■	O	S	L	O
A	R	C	H	■	G	E	O	L	O	G	I	S	T	S
N	S	■	I	M	A	■	N	I	■	■	■	A	■	■
K	■	M	S	■	L	I	■	P	L	A	T	Y	P	I
L	O	O	T	■	E	C	O	■	■	■	N	E	O	N
I	O	N	■	O	N	Y	X	■	■	P	P	D	■	O
N	H	■	P	L	A	■	I	■	Y	A	K	■	O	S
I	■	M	U	D	■	■	D	D	A	Y	■	F	R	I
T	E	A	M	■	■	■	E	O	N	■	G	E	O	L
E	U	R	A	S	I	A	■	A	K	■	N	B	■	I
■	■	B	■	■	■	S	B	■	E	Y	E	■	P	C
P	H	L	O	G	O	P	I	T	E	■	I	S	L	A
F	U	E	L	■	V	E	R	B	■	A	S	C	O	T
C	A	S	A	■	A	N	D	A	L	U	S	I	T	E

Some Upcoming SHOWS AND MEETINGS

Our web site http://www.ems.psu.edu/nms/ has links to more complete lists and details on mineral shows and meetings around the country.

May 20 - 25, 2009: Inter-regional Rockhound Rendezvous (by NFMS and CFMS), to Davis Creek. Lassen Creek, California, for obsidian. Information coming soon to www.cfmsinc.org

June 27-28, 2009: 4th Annual Nittany Gem & Mineral Show, State College, PA. See page 1.

July 30 - Aug. 2, 2009: AFMS and Northwest Federation conventions, Billings, MT

Oct. 17 - 18, 2009: EFMLS Convention, and Annual Gem & Mineral Show sponsored by the Bristol Gem & Mineral Club. Beals Community Center, Bristol, CT ❄

INVITE A FRIEND TO JOIN THE SOCIETY

The Nittany Mineralogical Society prides itself on having the finest line-up of speakers of any earth sciences club in the nation. 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). Your dues are used for programs and speakers, refreshments, educational activities, Bulletins, and mailing expenses. Please fill out a membership form, 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!

Geo-Sudoku solution from page 2

C	U	I	V	**M**	E	S	O	T
M	T	S	O	**U**	C	E	I	V
V	E	O	I	**S**	T	M	U	C
S	V	T	U	**C**	M	I	E	O
U	M	E	T	**O**	I	V	C	S
O	I	C	E	**V**	S	U	T	M
T	S	M	C	**I**	U	O	V	E
E	O	U	M	**T**	V	C	S	I
I	C	V	S	**E**	O	T	M	U

For sale / trade: Equipment & Materials

For sale: Very nice **rock and mineral collection** along with four **display cases**. Call Dale at 717-252-1363.

Mineral Business and personal collection for sale (hundreds of specimens plus supplies and equipment included). Call Terry at 570-672-2325 Mon. - Sat. 9:00 a.m. - 11:00 p.m. If I'm not there, leave a message.

For sale: Very large collection of gemstone material, prefer to sell as one lot; including much jade in various types & colors; mostly rough, plus some slabs; some fine Coober Pedy opal. Also equipment and jewelry making supplies from jewelry studio and production shop. Contact Daniel G. Reinhold in Mill Hall, PA; phone 570 748-3201 after lunch every day, or e-mail: dreinhold@suscom.net ❄

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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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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 the name of the photographer or artist.