

# ***Nittany Mineralogical Society Bulletin***

Nittany Mineralogical Society, Inc.

P.O. Box 10664

State College PA 16805

[www.ems.psu.edu/nms/](http://www.ems.psu.edu/nms/)

Editor: David C. Glick (see p. 8)

December, 2007

**December 19th, 6:30 p.m. to ~9:00:**

Note special location:

**Quaker Steak & Lube Restaurant**

## ***Holiday Social & Sale***

by Bob Altamura and Dave Glick

*Our December meeting will be held Wednesday the 19th at 6:30 p.m., in the private room of Quaker Steak & Lube Restaurant at 2235 North Atherton St., State College. See directions on this page.*

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

Our December meeting will be our annual Holiday Social & Sale, now a 9-year tradition in NMS. It is open to all NMS members and their guests; there is no admission fee. Doors will open for the membership at 6:30 p.m. and close at about 9:00 or later; everyone may come and go on their own schedule. Minerals, fossils, jewelry and other artistic creations will be shown and offered for sale by this year's Holiday Sale vendors: NMS members Bernie Pisarchick, Kathy St. Martin, and Willard Truckenmiller (please see details on page 3). We are grateful to them for participating and helping make the event possible. This event serves as a fundraiser for NMS, and 15% of a seller's total sales excluding sales tax are to go to NMS.

We will have a cheese and meat platter from the restaurant, and NMS will be providing some beverages. Members are encouraged to bring other party food, particularly dessert items and veggies. Of course the restaurant and bar are available to attendees throughout the evening; you can have a full dinner there.

The club will have a variety of sizes of NMS T-shirts for sale for \$9.00 as usual. Our educational sets of 18 minerals (mostly single crystals or parts of single crystals) will also be available for \$20.00. We do not plan to have door prizes at this meeting.

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

### **ATTENDING THE DECEMBER MEETING?**

This event is free and guests are welcomed!

Your additional snacks will be welcomed.

**January 16, 2008:**

## **Active Volcanoes of Costa Rica**

by Bob Altamura

The January meeting presentation will involve a picture tour of a past geological field expedition to Costa Rica by NMS member Bob Altamura. He and his former Master's degree advisor from Wesleyan University conducted field study and collected volcanic rock samples for the purpose of petrographic and geochemical analyses. Field pictures of the volcanoes, volcanic rocks, the land, jungles, and people of this tropical country, as well as some rock samples from the volcanoes, will be highlighted. H

## **JUNIOR ROCKHOUNDS**

### **Programs in the New Year**

Starting in January, we are scheduling the Junior Rockhounds programs for the Monday after our main meetings, starting **Monday, January 21, 2008**. This schedule will allow us to publicize the Juniors program via the Bulletin and the regular meeting during the same month. H

## **Directions for December Meeting at Quaker Steak & Lube Restaurant**

**Directions:** From **downtown State College**, take North Atherton about 3 miles. After passing Colonnade Drive (which goes to Wegman's and Target) on the right, you'll go down a long hill and may see Quaker Steak & Lube (white and green building) and the Fairfield by Marriott set back off the road to the right. There is a small right turn lane which will take you toward the Quaker Steak parking lot. If you miss that, continue to the traffic light at the bottom of the valley; turn right on Hawbaker Industrial Drive, and then take the first right at the "Enter" sign and up the hill to the parking lot on the left..

**From Route 322 / 220:** Take the exit for North Atherton St (Business 322) / Valley Vista Drive. At the traffic signal at Lowe's / Sheetz, take Business 322 toward State College; go over the hill and at the traffic light in the valley, turn left on Hawbaker Industrial Drive. Take the first right at the "Enter" sign and go up the hill to the Quaker Steak parking lot on the left.

The phone number for the restaurant is 814-234-8900. You'll see us in the room at the parking lot end of the building. H

**Lapidary and Collecting Corner**  
**featuring**  
**Willard Truckenmiller**  
 by Bob Altamura

This month I would like to feature the lapidary workshop of member Willard Truckenmiller. Willard has been a rockhound for 33 years. He first became interested in lapidary after taking a family trip out west to states that included South Dakota and Utah, where he collected rocks that he hoped might be polished. After this Willard moved to Florida where he learned that those rocks were not suitable for cutting or polishing, but he made it his business to learn about preferred lapidary materials. While living in Florida, he joined a rock club where he continued his interest in lapidary and built his first workshop.

His current collection of lapidary rough and slabs is considerable. Some was self-collected during field trips, including a recent NMS field trip to Flint Ridge, Ohio. Willard has been a member of the Nittany Mineralogical Society for four years, participating in many of our outreach activities including the Nittany Gem & Mineral Show and Minerals Junior Education Day. He also participated as a vendor during the '06 Social & Sale and will again do so this year. Even after all this experience he has found that there is so much more to learn, hence his membership in our club. Willard and his wife Joann live in nearby Howard where his workshop is located.

Willard has a couple of diamond-bladed slab saws (photo below) that are used to create slabs for display as well as for making cabochons. A diamond-bladed trim saw is used to shape blanks for cabbing and tumbling. A silicon-carbide grinding wheel and a Lortone cabbing unit (photo at right) serve Willard's cabbing and grinding needs. Willard also creates tumbled stones using a belt driven unit that can handle multiple drums. Slabs (photos at top right and bottom right) and cut geodes or thundereggs are polished on a vibrating lap.

Willard has a stockpile of hundreds of pounds of lapidary rough and a large collection of mineral samples. The variety of lapidary rough is considerable. During a recent visit to Willard's shop by myself and club member Daniel Bontempo, I obtained a slab of opal-bearing rhyolite and a sample of milky quartz that I plan to cab or tumble.



A wide variety of petrified wood

Some time ago, I gave a lapidary demonstration of my cabbing machine at a club meeting, and during the presentation I showed a slab that I called "bacon agate." It looked like bacon, and it had been identified by that name by the previous owner. Some weeks later, Willard introduced himself to me and presented me with a slab.



Lortone cabbing unit



Some of the many cabochons in Willard's collection



An 18" slab saw deals with the big rough.



Willard's collection of slabs

All photos by R. Altamura

He said that he had attended the presentation and that he wanted to show me a sample of what he calls "bacon agate." Willard's "bacon agate" was ribboned and showed less white (fat) than the sample I owned, and it was even in the shape of a strip of bacon. It would have made a good addition to the "Rock Food Table" shown in "Rockhounds – the Movie" (our April '07 program). If you see Willard at one of our meetings or at the Holiday Social & Sale - try him on for size and share in his lapidary fun!

## *Holiday Sale Items*

*at our December 19th meeting*

by our sellers

### **Bernie Pisarchick** reports:

I will have my usual eclectic mix of silver jewelry, mineral specimens, fossils, meteorites and lapidary rough. I do have a nice collection of exotic cabbing and faceting rough and slices. If anyone is looking for anything special, please let me know at (814) 265-8887 at least a day before the meeting and I'll try to bring it.

### **Willard Truckenmiller** reports:

I'll have primarily lapidary rough and slabs acquired from a number of old-time collectors. Their material was mainly collected from the Western U.S. (Rocky Mtn. areas). Some of the old time materials (Plume, Biggs and petrified woods) from this area are included. Other countries represented are from Africa, Australia, South America and Europe (hard-to-get Goldstone from Italy). Some lapidary tools and accessories, along with small amounts of minerals and jewelry will also be available.

### **Kathy St Martin** writes:

People know me around town as the "Bead Lady," since I owned and operated Isabelle's Bead Shoppe on Pugh St. [now closed], for into 8 years. As a published instructor on basic methods of jewelry making, I have brought my traditional goldsmith experience to the public.

I will be showcasing my work at the Holiday Mineral Sale this year. My pieces will range from unusual stone beads like Fire Agate and Imperial Jasper, to finished set pieces with bezels which I make out of a material called PMC (Precious Metal Clay), a pure silver metal media which I teach how to use all over the country. I will also have a list of upcoming local classes. Pieces range from \$12.00 through \$70.00 and I do have a couple of more elaborate items for sale. I take personal checks and cash. Watch for information on classes for NMS members in the New Year.

[www.KISTTecniques.com](http://www.KISTTecniques.com), [www.isabellesbeadshoppe.com](http://www.isabellesbeadshoppe.com)

**Joe and Jeanne Dague** can't make it this year. They send their regards and we look forward to seeing them at our events in the future.

## NEWS FROM THE FEDERATIONS

Nittany Mineralogical Society 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/](http://www.ems.psu.edu/nms/) or remind Dave Glick to bring a printed copy to a meeting for you to see. The December issue notes changes to the EFMLS bylaws which will be voted on at the Jackson convention in February. An increase in dues for both EFMLS and the share passed through to AFMS are expected to be approved, and would take effect a year from now.

The dates for the 35<sup>th</sup> year of EFMLS workshops at **Wildacres** will be April 18-24 and Sept. 8-18, 2008. Classes for both sessions are listed; our own Inga Wells will be teaching introductory and advanced soapstone carving at both sessions. A Wildacres registration form is included (none will be accepted prior to January 1), and the tuition of \$330 per person is the same as last year. The safety article points out the high monetary cost of not being safe - it makes sense to be alert, put a few dollars into safety glasses, gloves and proper tools, and reduce the risk.

The 2008 EFMLS Convention will be held in Jackson, Mississippi, February 22, 23 and 24. It's hosted by the Mississippi Gem & Mineral Society, which will be celebrating its 50<sup>th</sup> year as a chartered organization. The theme will be 'Gold' for the 50<sup>th</sup> anniversary, and some old-time exhibits and equipment will be shown. They also hosted the AFMS Convention for their 50<sup>th</sup> anniversary. See page 8 of this Bulletin for more.

The AFMS Newsletter is available by the same methods. The December - January issue covers a lot, including methods for making an attractive display of specimens; a full list of the 2007 Scholarship Foundation honorees and student recipients; detailed information on the Tri-Federation Rockhound Rendezvous, May 21-26 2008 in Texas Springs, Nevada; a review of some important concepts for club publicity in Fran Sick's column

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

- Editor

## 100 years ago in The Mineral Collector magazine

The December 1907 issue began with a 7-page article on 'How Quartz Crystals Form' by Edgar T. Wherry. A newspaper report told of a meteor disintegrating in the Pottsville PA area. Ward's Natural Science Establishment advertised worldwide meteorite specimens of 10 grams each, a set of 14 for \$10 or a set of 21 for \$15.00.

- Editor

# *Popular Mineralogy*

*Mineralogy and earth science for the amateur mineralogist and serious collector - #7*

## Chrome, Rubies, Emeralds, and Alexandrite

by Andrew A. Sicree

### One element, two colors

Ruby. Emerald. One is red, the other green. But both derive their vibrant colors from the same element: chromium.

Ruby is the red variety of the mineral *corundum* (hexagonal aluminum oxide,  $\text{Al}_2\text{O}_3$ ). Blue sapphire is another variety of corundum. Yellow gems occur as well, but in its purest state corundum is colorless or white. The rich luminous red color of ruby is due to an impurity within the aluminum oxide crystal structure. Traces of chromium (as chromic ion,  $\text{Cr}^{3+}$ ), replace aluminum ( $\text{Al}^{3+}$ ). In ruby, about one atom of aluminum per hundred is replaced by a chromium.

What is the effect of this small amount of  $\text{Cr}^{3+}$ ? When white light (which, you will recall, is composed of red, orange, yellow, green, blue, and violet light) passes through a ruby, violet light is strongly absorbed along with green-yellow light. Blue light and red light are transmitted. Transmission of red, however, is much stronger than that of blue, so the ruby looks red. Ruby's particularly rich red color comes from this strong red transmission, enhanced by a little bit of blue.

### Fluorescence of ruby

Rubies look even better outdoors. There is a fraction of ultraviolet light in natural sunlight and the luminous glow of a cut ruby outdoors results from a red fluorescence which is, coincidentally, almost identical to its red color. In the dark, under an ultraviolet lamp, rubies will fluoresce a beautiful red. In 1960, this fluorescence was utilized by Theodore H. Maiman the Hughes Research Laboratory in California to make the world's first laser. Maiman's laser was constructed using a rod of ruby with silver-coated ends; it was "pumped" (powered) with a high-intensity xenon flash lamp. Xenon flash lamps produce a bright pulse of both ultraviolet and visible light. The first laser used red fluorescence of ruby to produce its red beam of light.

### Rubies are red, emeralds are green

"Okay," you say, "but if chromium gives us the red color in ruby, how can it give us a green color in emerald?"

Emerald's color is so distinctive that only the term "emerald green" describes it well. Emerald is a variety of the mineral *beryl*,  $\text{Be}_3\text{Al}_2\text{Si}_6\text{O}_{18}$ . Like pure corundum, pure beryl is also colorless. (Natural colorless beryl is sometimes called *goshenite*, after the town of Goshen, Massachusetts, one locality for the variety.)

As in ruby, the green color in emerald is due to chromium impurities. The chromic ion,  $\text{Cr}^{3+}$ , replaces aluminum ( $\text{Al}^{3+}$ ) in the mineral's structure in a manner very similar to that in ruby. But slight differences in the bond strengths between ruby and emerald lead to slight shifts in the absorption and transmission bands. Violet light is still absorbed but the green-yellow absorption band of ruby shifts to absorption of yellow-red light in emerald. This diminishes the transmission of red light so that the transmission of blue-green light (corresponding to the weak transmission blue light in ruby) is now strongest and becomes most important in determining the color of the emerald.

Like ruby, emerald fluoresces red under ultraviolet light. If iron is present in either, the fluorescence is quenched (i.e., doesn't fluoresce).

### The alexandrite effect

Drastic differences in color occur from the introduction of chromium impurities into beryl or corundum. What happens when chromium is present as an impurity in other minerals? *Chrysoberyl* is  $\text{BeAl}_2\text{O}_4$  and is colorless when pure. Add a trace of chromium and chrysoberyl becomes the *alexandrite* variety. When chromium is present as an impurity, the resulting bond strengths are intermediate between those in ruby and emerald. The result is a mineral in which the blue-green transmission band closely matches the red transmission band in intensity.

*Alexandrite (cont'd)*

So what color is chromium-rich chrysoberyl? Is it the red of ruby or the green of emerald? It turns out that the color of alexandrite depends upon the light shining upon it. Sunlight and fluorescent tube light are both rich in blue-green light. On the other hand, incandescent light (such as that coming from normal light bulbs with tungsten filaments) and candlelight are rich in red light. Shine an incandescent light on alexandrite and the stone appears deep red in color akin to ruby. Put the stone under a fluorescent bulb or carry it outdoors and it shows a blue-green color somewhat similar to emerald. This color change is known as the *alexandrite effect* and it shows up in a few other minerals such as monazite from near Badin, Montgomery County, North Carolina, which is light green under fluorescent light, yellow-orange in daylight, and reddish-orange under incandescent light (cf. "Monazite from North Carolina having the alexandrite effect" by Lawrence R. Bernstein in *The American Mineralogist*, 1982, v. 67, p. 356-359).

Note: The term alexandrite effect originally referred stones that showed a shift from greenish color to reddish color when moved from sunlight to incandescent light (cf. "The Alexandrite Effect: An Optical Study" by William B. White, Rustum Roy, J. MacKay Crichton in *The American Mineralogist*, 1967, v. 52, p. 867-871). But it has come to be used for all types of color changes resulting from different light sources. For instance, the term is used for pyrope garnets from the Gates-Adah kimberlite dike in Fayette County, Pennsylvania, that are pinkish-purple or raspberry-colored under incandescent light and bluish- to greenish-gray under fluorescent light (cf. "Blue Gray by Day and Pinkish Purple by Night: Pennsylvania's Pyrope Garnets" Robert C. Smith and John H. Barnes, *Pennsylvania Geology*, 2006, v. 36, no. 4, p. 4-12).

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Dr. Andrew A. Sicree is a professional mineralogist and geochemist residing in Boalsburg, PA.. **Popular Mineralogy** provides technical answers to your general mineral questions. If you have a question you'd like to have answered, please send email to [sicree@verizon.net](mailto:sicree@verizon.net)

### *Is Chromium Good for You?*

One curious fact about the element chromium is that it is both a poison and a nutrient. Many mineral nutrients are toxic if administered in too large a dose. But for chromium the difference between toxicity and nutrition depends upon its chemical valence. Trivalent chromium(III) is thought to be required by humans in order to metabolize sugars. But the hexavalent chromium(VI) is toxic and carcinogenic. - A.A.S.

## The Discovery of Chromium

Born in Langenhennersdorf, Saxony, in 1719, Johann Gottlob Lehmann was a German mineralogist and geologist who played an important role in the discovery of chromium. Originally educated as a doctor, Lehman taught mining and mineralogy in Berlin, then moved to St. Petersburg, Russia, where he became director of the Imperial "cabinet" (the museum) and studied ores. In 1761, Lehmann discovered an orange-red mineral at the Beresof mines in the Ural Mountains that he called "Rotbleierz" ("red lead"). Unfortunately, he misidentified it as a compound of lead, with "selenitic spar," and iron. Lehman died in 1767 in a chemical explosion without knowing that his orange-red mineral was really a chromate of lead: the mineral we now call *crocoite* ( $\text{PbCrO}_4$ ).

In 1770, the German zoologist Peter Simon Pallas (1741-1811) visited the Beresof mines and encountered the same "red lead" mineral. He noted that it crushed to yield a beautifully strong yellow powder and that this powder could be used as a pigment. Mining of "red lead" for paint pigments commenced and the bright yellow color of Siberian red lead became fashionable, used to paint carriages of the nobility in England and France.

### Vauquelin gets chromium from crocoite

A French analytical chemist, Louis Nicolas Vauquelin (1763-1829), received samples of crocoite ore in 1797. Vauquelin reacted the ore with hydrochloric acid to generate chromic oxide, and, in 1798, reduced chromic oxide to chromium metal in a charcoal oven. He gave chromium its name from "khrôma," the Greek word for color, appropriate for a new element derived from brilliantly colored crocoite and used to such good effect as pigment. Further investigations by Vauquelin detected traces of chromium in ruby, chrome mica, and emerald.

In the following year, chromium was discovered in the black chrome iron spinel mineral now called *chromite*,  $(\text{Fe,Mg})\text{Cr}_2\text{O}_4$ . Chromite, found in the Urals, in France and, in 1827, along the boundary between Pennsylvania and Maryland, greatly increased the world supply of chromium. Crocoite was no longer the only source of chromium. Pennsylvania-Maryland chromite deposits dominated the world trade in chromium from the 1830s until the U. S. Civil War. As the Pennsylvania-Maryland chromite mines played out, mines near Bursa in Turkey came to the forefront. Turkey remained the world leader in chromium production until the early 1900s when chromite production began in India and South Africa.

Although still used in making pigments, chromium began to be used in other applications in the late 1800s and early 1900s. Chromium compounds were used in tanning leather, in making refractory bricks, and in the manufacture of stainless steel.

### ***Chromite is the major source***

Today, South Africa dominates world production of chromium. South African mines exploit chromite-rich horizons in the huge Bushveld layered igneous intrusive complex (an unusual type of igneous rock that is also the source of South Africa's platinum). Most chromite is not smelted to produce pure chromium metal. Rather, smelters produce a master alloy, *ferrochromium* (a mixture of iron and chromium), that is then added to iron during the manufacture of chrome steels such as stainless steel.

– A. A. Sicree

### ***Meteorite Meets Meteorology***

An F5 tornado is as bad as it gets. On the evening of May 4th, 2007, a tremendously powerful F5 tornado razed the city of Greensburg, Kansas, and nearly destroyed one of America's most famous meteorites.

The May 4<sup>th</sup> Greensburg tornado (rated EF5 on the new, Enhanced Fujita scale) destroyed 95% of the town and killed at least 10 people. Winds hit up to 205 mph. Greensburg is famous for two reasons: it is home to the Big Well, reputedly the world's largest hand-dug well, and it houses a 1000-pound chunk of the Brenham pallasite. A pallasite is a rare stony iron meteorite consisting of bright green olivine crystals in a matrix of nickel-iron metal. The Brenham pallasite was housed in the Big Well Museum in Greensburg.

When the Big Well Museum was destroyed by the tornado, the meteorite also passed through the storm. In the immediate aftermath, it was reported that the pallasite was missing. Fortunately, the meteorite was later found intact, buried under debris at the site. A.A.S.

### ***What is a pallasite?***

Say the word meteorite, and most people picture a black mass of solid iron streaking through the sky, plummeting to earth. But not all (or even most) meteorites are solid metal. Although some meteorites are masses of nickel-iron metal, many others are mostly stony. And there are other, intermediate types. The *pallasite* is one rare type of stony-iron meteorite.

Cut through a pallasite and an unusual texture is revealed: picture Swiss cheese made of silvery metal with its round air holes filled with emerald. While pallasites do not really contain emeralds, they do have centimeter-scale round green blebs of gemmy olivine crystals (the

peridot variety) in a matrix of nickel iron. Mineralogically, olivine is a group of iron magnesium silicate minerals that occurs as a continuous series ranging from forsterite,  $Mg_2SiO_4$ , to fayalite,  $Fe_2SiO_4$ .

Nickel-iron (or iron-nickel) is an alloy of iron with some nickel. Nickel-iron is an intergrowth of two minerals: kamacite and taenite. Kamacite is the lower-nickel phase, called alpha-(Fe,Ni). Taenite is the higher-nickel phase, gamma-(Fe,Ni). Pallasites may also contain blebs of schreibersite, a rare iron nickel phosphide mineral, or the sulfide mineral troilite (FeS).

One theory about the formation of pallasites is that they're remnants of the core-mantle boundary of a large differentiated asteroid. By differentiated, meteoriticists mean that the interior of the asteroid was segregated into a metal-rich core surrounded by a rocky mantle. A tremendous collision with another asteroid ripped open the pallasite parent asteroid and fragments of the core-mantle boundary rocks were scattered into space. Some of these fragments found their way to the Earth to land as pallasites.

The pallasites are named for Peter Simon Pallas (1741-1811), a German zoologist. In 1776, Pallas was the first to describe a pallasite. He found a 680 kg mass of stony-iron near Krasnojarsk in Siberia. The Krasnojarsk pallasite is thus the type specimen.

Interestingly, in the 18<sup>th</sup> Century, few scientists believed that rocks could fall from the sky. And many clergymen believed that such falls were indeed possible – this was one case in which the scientists were wrong and the religious leaders correct.

Pallas' Krasnojarsk specimen played a key role in convincing scientists that rocks could indeed come from outer space. In 1794, Ernst Florens Friedrich Chladni (1756-1827) published a description of Pallas' Krasnojarsk specimen titled *On the Origin of the Pallas Iron, and Others Similar to It...* Chladni argued that meteorites had extra-terrestrial origins and based his argument on the fact that while Pallas' was unlike any other rocks or ores near where it was found, it was similar to other metal specimens found great distances away. At 680 kilograms (1496 pounds) the Krasnojarsk specimen was too heavy to have been carried to the location where it was found in Siberia.

Although ridiculed by scientists, Chladni's theory of extra-terrestrial origin of meteorites received serious support when Jean-Baptiste Biot (1774-1862) investigated the 1803 meteorite fall at L'Aigle in France. Biot's report of eyewitness evidence to the L'Aigle fall was critical to convincing many scientists of the reality of meteorite falls. Incidentally, the mica mineral *biotite* is named for Biot.

– A. A. Sicree

# Crystal Matrix Crossword

## Minerals & More

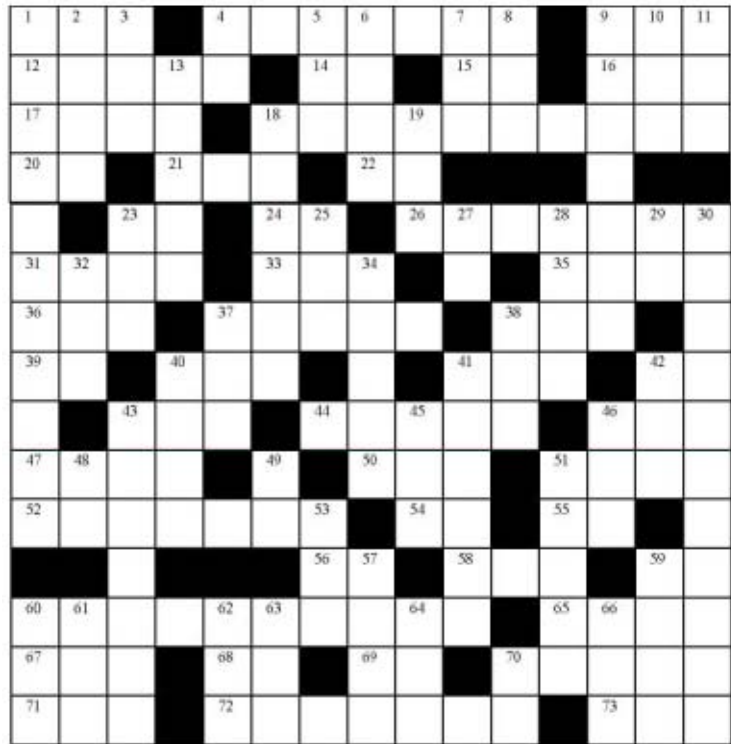
### ACROSS

- 1 lion in the sky
- 4 oxide of copper
- 9 auto help
- 12 smell of sulfide mineral
- 14 Galilean moon of Jupiter
- 15 Economic Geology
- 16 part of computer
- 17 good; favor
- 18 it might hang down but it doesn't
- 20 hazard from uranium minerals
- 21 time standard
- 22 Russian for si
- 23 just say it
- 24 \_\_\_ Sr mineral dating method
- 26 Indian chief
- 31 pointed object
- 33 mischief causer
- 35 volcano
- 36 Nb location in Quebec
- 37 0.2 gram
- 38 quantity
- 39 Marie Curie found it
- 40 platinum, palladium, etc.
- 41 south
- 42 poisonous element
- 43 holds back mine tailings
- 44 phosphate mineral source
- 46 just do you know
- 47 waste rock
- 50 group of docs
- 51 veggie color of rhodo
- 52 what to do to a mineral
- 54 Cornwall mines location
- 55 rhenium
- 56 Cornwall mine location
- 58 geologic time
- 59 K/\_\_\_ rock dating method
- 60 type of stony meteorite
- 65 \_\_\_-anthracite
- 67 K+, Ca++, etc.
- 68 \_\_\_-shucks
- 69 Old English (ab.)
- 70 land out at sea
- 71 conjunction
- 72 low glaciated hill
- 73 what prospector seeks

### DOWN

- 1 spar with schiller
- 2 \_\_\_. geology
- 3 gold
- 4 cadmium
- 5 open \_\_\_ mine

- 6 mine \_\_\_\_\_
- 7 British drink
- 8 dino fossil
- 9 found in mine waters
- 10 lapidary is an \_\_\_\_\_
- 11 had lunch
- 13 valuable block
- 18 fine lines on crystal
- 19 for polishing slabs
- 23 gun group
- 25 basal metabolic rate (ab.)
- 27 Tri-State District state
- 28 crystal system (ab.)
- 29 anorthosite (ab.)
- 30 tin mineral
- 32 alias
- 34 \_\_\_\_\_ New Guinea
- 37 metric system
- 38 quid pro \_\_\_\_\_
- 40 type of fossil wood
- 41 mine dump danger
- 42 yes
- 43 cubic carbon
- 45 atomic mass unit
- 46 \_\_\_ to dig
- 48 Indians made it of stone
- 49 tin
- 51 made of copper and zinc
- 53 close to surface
- 57 smallest unit
- 59 USA (ab.)
- 60 spies
- 61 sweetie
- 62 pop
- 63 40th US president
- 64 slippery fish
- 66 rock group
- 70 element



LAST MONTH'S SOLUTION - Micas



## 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.

**Jan. 27, 2008:** Annual Auction, by The Mineralogical Society of Northeastern Pennsylvania. Moosic Presbyterian Church Annex, 625 Main St., Moosic, PA. Featuring rock & gemstone rough, finished gemstones, faceted, cabochons, crystals, jewelry, fossils, mineral specimens, rockhounding tools, books, & much more. Free parking, free admission, public welcome. 1:00 p.m. - 4:00 p.m.

**February 22 - 23 - 24, 2008:** EFMLS Convention, Jackson, Mississippi. Show Saturday & Sunday. At the Trade Mart Building at the State Fairgrounds. The Regency Hotel and Convention Center at 400 Greymount Ave., within walking distance of the show, has been contracted for a double room rate of \$89.00 plus tax; phone the Regency at 601-969-2141 before January 21, 2008.

The Banquet, the Cracker Barrel, and the Editor's Breakfast will be held at the hotel. Advance registration must be received by January 21, 2008.

**May 3 - 4, 2008:** Annual Show & Sale by The Mineralogical Society of Northeastern Pennsylvania. Oblates of St. Joseph, 1880 Hwy. 315, Pittston, PA 18640. Sat. 10:00 - 5:00, Sun. 10:00 - 4:00.

**May 21 - 26, 2008:** Tri-Federation Rockhound Rendezvous, Texas Springs, Nevada. 4 to 6 different sites: pink limb casts, small limb casts and bogwood, snakeskin agate, jasp/agate limb casts, geodes, and more. Daily collecting trips, potluck dinners, daily Happy Hours, evening campfires, map exchange and tailgate displays. All AFMS members welcome. See Nov. AFMS Newsletter, <[www.amfed.org](http://www.amfed.org)> H

### 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 the

*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!*

## The Society's Schedule

We generally meet on the **third Wednesday** of each month, August through May, in the Earth & Engineering Sciences Building on the west end of Penn State's University Park campus, off White Course Drive. (Except Dec. 19, 2007, at Quaker Steak & Lube restaurant - see page 1. Always check our web site for a specific month's meeting.) Social hour with refreshments starts at 6:30 p.m., and the meeting starts at 7:30 p.m. Everyone is welcome!

**Board Meetings** are now generally held on the first Wednesday of the month at 7:00 p.m. Please contact the President to verify time and location for a particular month. Board meeting minutes may be requested from the Secretary.

### For sale: Equipment & Materials

**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](mailto:dreinhold@suscom.net)

**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. H

### SOCIETY OFFICERS

**David Glick (President)** 237-1094 (h) [xidg@verizon.net](mailto:xidg@verizon.net)

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

e-mail: [raltamur@fccj.edu](mailto:raltamur@fccj.edu)

**John Passaneau (Treasurer)** 814-863-4297 (o),

e-mail: [jxp16@psu.edu](mailto:jxp16@psu.edu)

**Frank Kowalczyk (Secretary)** 238-8874 (h, 8-9 p.m.)

e-mail: [fjk12@scasd.org](mailto:fjk12@scasd.org)

### OTHER CONTACTS

**Field Trips:** Ed Echler 814-222-2642

e-mail preferred [new]: [eechler@comcast.net](mailto:eechler@comcast.net)

**Junior Rockhounds:** Dr. Andrew Sicree 867-6263 (h)

e-mail: [sicree@verizon.net](mailto:sicree@verizon.net)

**Membership Chair:** David Glick (see above)

**Programs:** Dr. Duff Gold

**Publicity: Volunteers needed**

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](mailto: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 the name of the photographer or artist