Nittany Mineralogical Society Bulletin

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

May, 2025 **Visit our web site: www.nittanymineral.org** *Editor (see back page): David C. Glick*

May 21st meeting:

The Dolomite Problem

Cole McCormick, Ph.D.
Carbonate Geochemist
Postdoctoral Scholar, The Pennsylvania State University

AT CENTRE LIFELINK

Our May meeting will be held Wednesday the 21st at Centre LifeLink, 125 Puddintown Road, State College, PA 16801. Maps can be found on our web site.

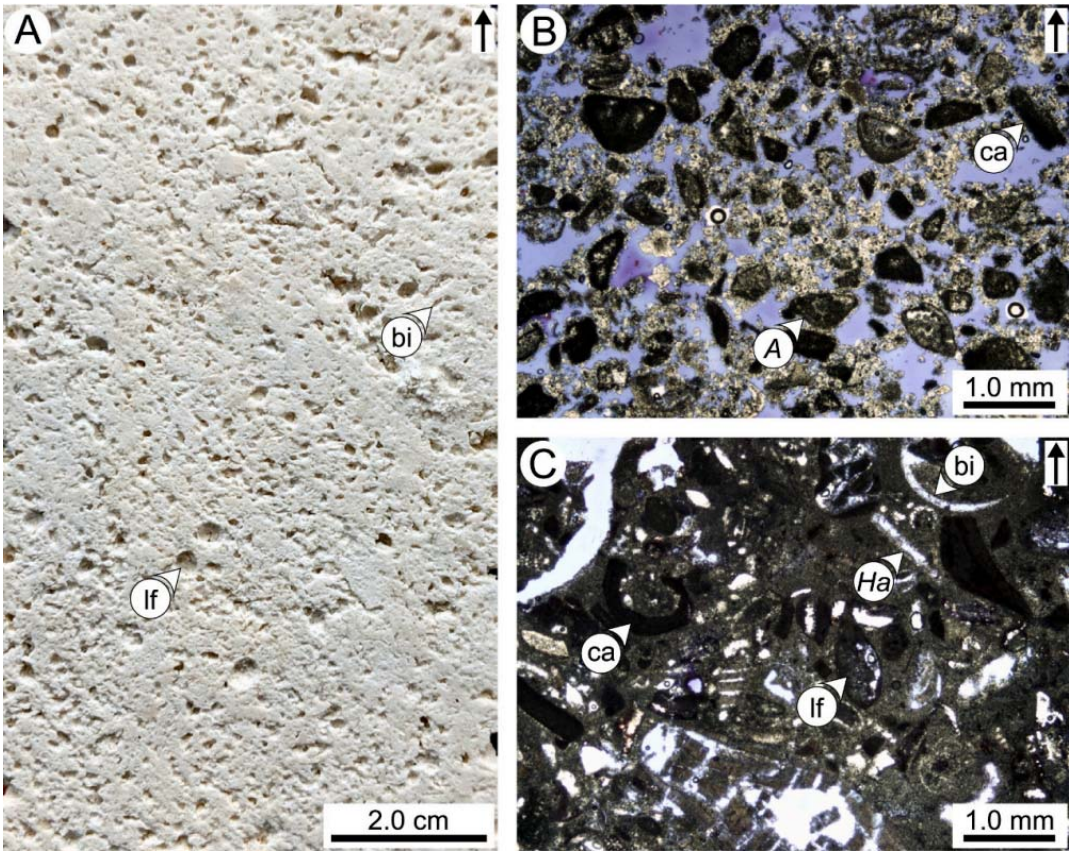
7:00 to 7:45 p.m.: Social "hour," refreshments
7:45 to 8:00 p.m.: Announcements, door prizes,
about 8:00 p.m.: featured program

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

Dolomite [$CaMg(CO_3)_2$] is a mineral that is thermodynamically stable at Earth surface conditions, forming thick accumulations of sedimentary rocks in the crust. Although dolomite forms a significant proportion of ancient carbonate rocks, it has rarely, if ever, been observed to form in natural geological settings and we have never been able to synthesize it in the laboratory at low-temperature (<50°C). The apparent contradiction between the abundance of dolomite in the geological record, its absence in modern settings, and the inability to form dolomite in the laboratory is a long-standing mystery known as 'The Dolomite Problem'. This talk will present the fundamentals of dolomite petrology and mineralogy, with a discussion of natural examples from the geological record where we have shed light on "The Dolomite Problem."

ATTENDING THE MAY MEETING?
Donations of **one or two high quality, labeled door prize specimens** are invited.
Larger quantities can go in a giveaway box.
Bring a friend!

No Meetings in June or July
Watch for news of
August 20 meeting



Low-temperature (20 to 40°C), fabric-retentive dolomite [$CaMg(CO_3)_2$] that formed by the replacement of calcite [$CaCO_3$] in a Mg-rich fluid, Cayman Formation (Miocene), Grand Cayman, B.W.I.

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 encourage our readers to read their monthly newsletters, which are linked from the left sidebar of our web site, <http://www.nittanymineral.org>.

The AFMS <https://www.amfed.org/newsletter> May newsletter begins with President JC Moore's report on the AFMS/EFMLS Convention in North Carolina, and AFMS business and decisions made there. AFMS will transition their newsletter to an all-electronic version in the coming year. Public Relations Chair Jim Brace-Thompson continues his series of articles. Dinosaur trackway and stromatolite articles from club newsletters are reprinted.

The Eastern Federation's <https://efmls.org/> May Newsletter includes president Andrew "Rockhound's" report on the recent EFMLS/AFMS Convention in North Carolina, reprinted at right. An article describes interesting Omarolluk Formation greywacke pebbles with voids left by weathering of calcareous inclusions, found throughout glaciated Great Lakes areas. The annual Treasurer's Report is shown. - *Editor*

Geo-Sudoku

by David Glick

The puzzle below contains the letters ABDGLNOPS. One row or column includes possible additional collecting equipment. If you've read all of this issue, you've seen it. 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.

B		N	A				D	
A	L					O	B	
P	G	O	S		D	A		
		B	L	N		P	O	D
						N		
						L	A	G
L				D				O
				L			G	
O	D	G		A	B			L

EFMLS President's Message

from
Andrew Rockhound

EFMLS News v. 72 no. 5
May 2025

May is here, spring has begun across the East Coast, club activities are ramping up and Wildacres is only a couple weeks away! It's an exciting time of year for all rockhounds, so while you're out digging with the club, take some pics and share them with us! We want to see how you and your club are having fun under the sun (safely), and we'll post them on our social page for everyone to enjoy. Our newly increased insurance coverage this year should allow clubs more access than ever to quarries, so let's see them!

Has your club checked out the Future Rockhounds of America (FRA) badge program yet? Youth across the country have been earning badges and learning more about rocks with FRA's monthly "Crack the News" newsletter! It only takes one interested youth and an adult to get the program started for your club. Learn more at https://www.juniors.amfed.org

Last month I mentioned I am working on a "Day as EFMLS President at the Convention" Dirtman Report, well it's almost done, and will be released this month, stay tuned! As always, feel free to email me with any questions or suggestions, and follow me on Facebook for all my Dirtman Report releases and updates on all my geological outreach in the community!

Safety in Numbers

Ellery Borow

from EFMLS News
vol 72 no 32
March 2025

Perhaps you have seen this in a nature program? There is a herd of grazing animals out on the savannah. Quietly waiting in the underbrush, we see a patient and observant predator watching the herd. Suddenly there is action. The predator charges the grazing animals to secure its lunch. The action continues with the intended prey either escaping or becoming a meal. What are the odds of escaping? Are the odds better if the herd is large? What are the odds if the prey is disabled, a bit

slower than the others, or in some other way compromised?

Let us bring that into the here and now. Suppose one's partner goes out to the lapidary shop. After an hour or so the first partner still has not heard any noise from the shop, so they go out to check on the person in the shop. Hopefully the person in the shop is quietly cleaning the equipment and not laying on the floor with a medical issue.

What if a group of people, happily digging in a quarry, has one member decide that they want to wander over the ridge and explore what might be collected there? Who will check on that explorer after an hour or so if no one even knew they had left the group?

In both the above narratives, the person in the shop, and the person doing the exploring, could have perfectly safe outcomes. However, in matters of safety, the number we like is at least two. Having a second person check on the first, having a second person know when the first might be back, having a second person carry the safety supplies when the first one, for some reason or another cannot, all rely on that vital second person to help with the safety of the first.

So how does safety in numbers work?

No matter the activity, have a check-in schedule.

If one must venture out alone, make sure there is another person who has the traveler's destination and expected time of return.

If there are multiple paths or trails to the destination, make sure the other person knows which trail is being used.

Even if back roads are used, some roads are less traveled so let the other person know the route / roads just in case.

If one is venturing alone be prepared with cell phone, safety supplies, with a flashlight, food, and water among those supplies.

Having paper trail maps can be a good idea instead of relying on GPS coordinates, especially in remote areas.

Know the situation, circumstances, weather, and whatever might influence having a safe outcome because every activity has its variabilities.

Too often one hears of one person working alone in the woods and a tree falls the wrong way, or the chainsaw kickbacks, or the chain on the tractor slips and a serious injury occurs, all with no one nearby to help. So maybe there are no trees for miles around your area, what then? There may be no trees but, there are those who surf alone, collect alone, swim alone, explore the desert alone, hike mountain trails alone, and so many other activities, where having a second person could have been there to help in case of emergency.

Oh, in that herd of grazers? All of them escaped safely in that episode.

Please consider keeping the numbers high when engaging in any rock and mineral hobby. Please keep others apprised of your activities to help ensure there will always be safe out-comes. Your safety matters.

Penn State Arboretum
H.O. Smith Botanic Gardens
CAVE SIM
Saturday, June 21, 2025

from
https://arboretum.psu.edu/events/cave-sim/

When: Saturday, June 21, 2025
10:00 am - 4:00 pm

Registration is required - Free - Register Now on the web site for a time slot

Where: H.O. Smith Botanic Gardens

Discover the wonders of our underground world through an immersive exploration of a mobile cave, brought to the Arboretum by CaveSim!

Activities are appropriate for ages 3 and up.

The mobile cave is **best for ages 5 and up**, but can be explored by children ages 3–4 if they are accompanied. Register on web site for a time slot.

The cave is not wheelchair accessible.

Participants must be able to understand the CaveSim rules.

This free program is made possible by the Mark Jay Tygel Endowment for Educational Programs at The Arboretum at Penn State.

NMS members: If you have Penn State's required clearances to work with children, and would like to lead or participate in an NMS station on caves / karst at Cave Sim day, please contact Dave Glick (see p. 8).

11 years ago in the NMS Bulletin...

Chert, the popular variety of silicon dioxide

by David (Duff) Gold
Emeritus Professor of Geology
Department of Geosciences
Penn State University, University Park, PA 16802

Chert is a state of matter of silica-rich material that includes crystalline (macro-, micro- and crypto-crystalline) varieties of quartz as well as amorphous and hydrated gels of opaline silica. The states represent a progression of changes (dehydration and increasing crystallinity) referred to as diagenesis (increasing age and metamorphism); hence the plethora of names for a material linked by density, rigidity, hardness and Hertzian fracture properties. If the impact point is close to a free surface, the proximal Hertzian cone is bulbous (bulb of percussion) that spreads radially outwards into an essentially planar fracture surface with smooth concentric ribs as the impact energy dissipates distally. Overlapping Hertzian fracture cones generated from adjacent impact points close to a free surface can produce "flakes" with sharp edges or points that were important to Stone-age cultures. High surface energy associated with crystallites can be released as a glow upon impact.

Hertzian cone fracture in glass, photo by user Polyparadigm, 2005, used under CCA-SA 3 license

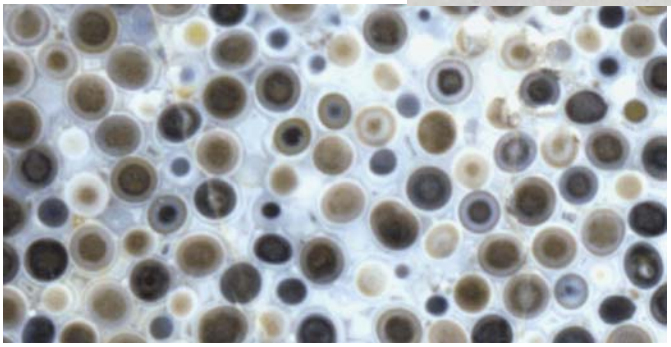
A use-based nomenclature is difficult to reconcile in the mineral world. If classified by origin and setting, then C-cherts represent precipitates from sea water, F-cherts the precipitates in fractures from silica-rich fluids, and S-cherts are the replacements of pre-existing rocks by pore fluids. Critical factors are the solubility of silica, alumina and iron in the weathering cycle, a porous medium for silica-rich fluids to migrate to an environment with a paucity of clay particles, low temperature, pressure and pH and/or a high partial pressure of CO_2 in a turbulent free setting. The volumetrically dominant deposits are the **Bedded Cherts** that form from diagenetic dissolution and reprecipitation in turbidites and graywacke assemblages, and deep water oozes.

Banded chert nodule with included limestone, 12 inches across, from the Axemann Formation. *D. Glick photo*

Close-up of Axemann Fm chert nodule shown above; field of view approx. 1 inch. *D. Glick photo*

Banded chert nodule, 1.5 inches across, from the Bellefonte Formation. *D. Glick photo*

Right: State College oolitic chert pendant by Robert Altamura.
Below: Close-up of polished oolitic chert from another Robert altamura piece; individual ooids approx. 1mm across. *D. Glick photos*.



Older rocks harbor the more stable phases, with a restriction of the Banded Iron Formations to the Archean and Proterozoic. The nodular and bedded cherts in shallow marine carbonate assemblages tend to be confined to Paleozoic and Mesozoic age strata: the nodular and bedded chert in North America is hosted in the Middle Ordovician and Devonian carbonate formations, while the widespread flint deposits of Europe occurs in the Upper Cretaceous chalks deposits. Agates occur mainly in geodes (gas bubble filling) in lavas. Metastable silica deposits occur only in post-Early Cretaceous strata, with

Mottled chert nodule, 2.5 inches across, from the Bellefonte Formation. *D. Glick photo*

Continued on page 8

Tools and Equipment for Field Trips

Article and photos by Tim Raney
Richmond Gem & Mineral Soc. Field Trip Committee

From The Collecting Bag, Richmond Gem & Mineral Society, Richmond, Virginia, July & August 2024
via EFMLS News vol. 71 no. 9, September 2024

This article is about the tools and equipment we would need for field trips sponsored by the Richmond Gem and Mineral Society (RGMS). Field trips can include quarries, old mine dumps and other rock/mineral collecting sites. Things we might need include basic items appropriate for almost any locale and those for more specific situations. Please remember though, the list of tools and equipment cited herein are not all-inclusive. In addition, personal safety equipment is covered only briefly.

We will cover the basic items first followed by specialized tools or equipment. The sources for these items include hardware stores, home centers and online retailers. Nothing listed is difficult to find or exorbitantly expensive. Though regarding this latter point, buy the best you can afford. Importantly, this short article just barely covers this topic. Cited sources contain much more detail. And though I might make specific recommendations based on personal experience, they are not the "last work" on the subject by a long shot.

Personal Safety Equipment. Using personal protective equipment is mandatory for all RGMS sponsored trips. Examples include safety glasses or goggles, steel toe boots, gloves, and hardhats. For more information on this topic, please see the article in the April 2024 issue of "The Collecting Bag" [and EFMLS News safety articles - *NMS Ed.*]

Where Do We Start? If you are new to gem, mineral or rock collecting, asking other members about what tools and equipment they use is a good start. Ask them about their most often used items for different collecting sites, e.g., quarries and mine dumps. Any RGMS member would be happy to help and offer their perspectives.

Other RGMS members might have specific tools and equipment for a given site. They might even be kind enough to share or let you try the item to help you make an informed buying decision. In addition, many books on mineral and rock collecting include tools and equipment we might need. Online sites are another resource for this kind of information. The list below starts with basic items suitable for almost any field trip to the more specialized tools and equipment for certain locations.

Hand Lens or Loupe. These small magnifiers are very useful for seeing details of crystals up close for identification purposes. Decent ones are available online for $20 to $30.00. Recommend getting one with 10X magnification and a 23mm diameter lens (good field of view). Higher magnifications are fine, but the field of view is smaller. They are also tricky to keep focused. These loupes are generally rugged enough for field use and they have an integral protective case.


A typical hand lens. Add a lanyard and hang it from your neck.

Field Notebooks. Are taking notes a really good idea or a menial chore? Having a field notebook is important for documenting your finds. And it is best to give a little thought to the format and focus on what kind of information it should contain, especially if you intend to use its contents for writing articles or papers. Nothing elaborate is required. Taking notes "on site" is best when a discovery is fresh in our minds. In fact, I will emphasize what you likely know by now: some of us actually do not have perfect memories. Really. With these points in mind, here is a quote from one of my high school science teachers in ancient times: "If you do not keep notes on your experiments [or mineral collecting], you are just tinkering". Same applies to a field notebook. Keeping such a notebook helps to reinforce the new knowledge and skills we might learn and offers pretty good protection against an imperfect memory.

Rock Hammer. As tools go, the hammer is arguably the most important for field work. Though hammers are hammers, right? Well, not exactly. For the most part, hammers are designed for specific purposes, e.g., claw hammers for carpenters and ball peen hammers for metalworkers among many others. As you might expect and many of you know, geologists have their own hammers suited for their line of work. If you are looking for a good quality hammer, Estwing hammers are

excellent and just under $60.00 for a 24-ounce model (check Amazon and other sources). They are the archetypical geologist's hammer. You can also find Estwing (or other) masonry hammers available locally. They work fine: I have used a Craftsman masonry hammer for over 30 years. You have some latitude in hammer selection and variables like weight, having a chisel or pointed tip; wood, fiberglass, or steel handle; cushioned grip and others. Recommend exploring what is available and asking other RGMS members about their preferences. Lastly though, get the best hammer you can afford.

This geologist's hammer is also known as a masonry hammer. Opposite the head is a chisel-shaped end; good for prying. This end of the hammer could also have a point. Both versions are very useful.

Crack and Sledge Hammers. The term "crack hammer" denotes smaller hammers (under 5-pounds) with maybe a 12" long handles. Sledge hammers are longer handled with heavier heads (6-pounds and over). In my experience, six (6) and 9-pound hammers with shortened handles work very well for breaking-up rocks. Yes, they are a little heavy to lug around, but they excel at making big rocks into little rocks. All I did was cut the handles to a comfortable length for me. The shorter handle allows you to kneel and strike rocks accurately. TheFieldStudent.com website [written by a geologist] has more details on hammers and other collecting equipment.

Rock Chisel. Also known as cold chisels, (for metal) or masonry chisels they are available at hardware stores and home centers. Eventually, having small, medium, and large chisels are very useful, especially for quarry trips or mine dumps where you are breaking big rocks. Chisel size is based on the blade width and overall length. In my experience, I have used a large chisel with a 7/8" wide blade the most followed by medium chisels with 3/4" to 1/2" wide blades. All are about 6" to 8" long. The large and medium size distinction in this case is arbitrary. I have seldom used smaller chisels [based on my limited experience]. Chisels with protective handguards work great. The added cost compared to plain chisels are reasonable given the added safety benefits.

Pry Bars. Most of my collecting experience has been in quarries or similar sites. Pry bars are very handy in those settings. Given the paragraphs above, once you crack a rock via hammers and chisels, the pry bar is next in widening that crack further. Pry bars of different sizes are readily available at hardware stores, home centers and online sellers. It is a good tool to have when collecting in a locale where you will need to reduce larger rock masses to get reasonably sized specimens. Of course, "reasonable size" is subjective.

Tools and Equipment for Field Trips – Part 2

This article continues with summaries on tools and equipment we would need for field trips sponsored by the Richmond Gem and Mineral Society (RGMS). Summaries on a few basic items appear below along with more specialized tools or equipment.

Shovels. If the minerals are buried, you will need some kind of shovel. Shovels were very handy for digging in the dirt during the April field trip to claims leased by the Central Virginia Gold Prospectors. In other instances, small garden shovels and folding camp or "Army shovels" (entrenching tools) work well. If you do not want to buy a purpose-made shovel for occasional use, just use a shovel you might have in the garage or shed. Shorter shovels are easier to carry in the field, but long ones work too. One-handed garden or masonry trowels work well. You might have these tools already, but they are also available at hardware stores or home centers.

Buckets, Carts, Wagons and Collecting Bags. The ubiquitous and rugged 5-gallon paint buckets can hold more rocks than many of us can lift. There are smaller plastic paint buckets too. They are available at any home center for only a few dollars. If you can find (or make) a paint bucket cart with wheels for varied terrain, other RGMS members will envy you. Other options include "repurposing" your kid's wagon or getting a garden utility wagon. It just depends on how much you want to haul. Lastly, I lumped collecting bags in this category since they can carry a few sample specimens or tools. As an example, I use a reproduction US Army M1936 canvas "musette" or messenger bag for under $30.00 (Amazon). The bag is good for carrying tools, hand lens,

Rugged, readily available and inexpensive.

notebook or other items you might need in the field.

Brown "Drop Cloth" Paper. This paper works fine for wrapping and protecting specimens for the ride home. This common product is available at any home center or hardware store's paint department. I do not recommend newspaper since the ink can contaminate the specimen and give a "false positive" when trying to identify the mineral with an ultraviolet (UV) mineral lamp.

Ultraviolet Lamp for Mineral Identification. A shortwave UV light[1] can help identify minerals via their natural fluorescence [or not]. Good quality lamps usually cost over $100.00. Much less expensive longwave UV lamps do not activate as many fluorescent minerals. The battery powered lamps work well for field use. You can use a tarp to cover yourself and the lamp during daytime collecting. Doing so works ok…pretty much. In this case, night collecting is better with the requisite precautions. Some UV mineral lamps have both long and shortwave outputs; they cover any fluorescent minerals we might find. A few words of caution though. Do not look directly at the lamp. The UV radiation can damage your eyes. Follow the manufacturer's warnings. In addition, you might find used UV lamps, but the special glass UV filters have a finite lifespan. Not knowing how many hours the lamp's filter has accrued makes that "real bargain" less so. Filters can cost as much or more than a new lamp.

Handheld UV lamp. Battery powered types are good for field sites.

Brushes. Old toothbrushes and cheap chip brushes are good to have for cleaning specimens. Nail or scrub brushes with nylon bristles work well too. Use the right brush for the job. In other words, do not use a stiff brush on acicular crystals of any mineral – they are much too fragile. I do not recommend any kind of wire brush (brass, stainless or carbon steel). You could potentially damage the specimen and leave a metallic residue on it (especially with brass brushes).

Other Items You Might Need. Examples could include sifting screens, sluices or gold pans. A sluice is not something we might buy for one trip. A screen is another such item, but you can make your own or even use a kitchen sieve. In fact, a screen is nothing more than a wood frame with something like a turkey wire to screen out large rocks from dirt you dump into it. Alternatively, perhaps you can share one at the collecting site.

Wish you had one of these, don't you?

Conclusion. This brief article covered tools and equipment we would need for field trips sponsored by the Richmond Gem and Mineral Society. The items included those we would need for almost any collecting opportunity to more specialized equipment for specific situations. Importantly, the tools and equipment listed are not covered in very great depth. Ask other members about their most often used tools or equipment. Ask them what is best for a quarry, mine dump or other site. Lastly, check what is available from various local and online sellers. You can pretty much find anything you might need. And for those with the skills, making your own equipment is another option.

Online Source. The "Rock Seeker" website (https://rockseeker.com/ultimateguide- to-rockhounding-tools) has some pretty good suggestions:. See the article: "The Ultimate Guide to Rockhounding Tools and Supplies".

[1] Wavelength for shortwave UV lamps for mineral identification ranges from ~200 through 280 nanometers (nm). A quick check shows a few sellers cite "254nm" wavelength lamps; about the middle of the range. They will work fine. [*NMS Editor:* 254nm is the emission line from mercury arc lamp tubes that has been used for shortwave UV mineral fluorescence for decades. Small flashlight-style battery-powered LED short-, mid-, and long-wave UV lamps are now available and are worth investigating.]

UPCOMING EVENTS

Confirm details of events before attending.
https://efmls.org/events/
See other show calendar links on our web site.

June 7, 2025: Spring Mineralfest, by Pennsylvania Earth Sciences Association (PESA). Macungie Memorial Park, 50 Poplar St., Macungie PA. Free; Sat. only, 8:30 -3:00. https://www.mineralfest.com/

Sept. 27-28, 2025: 59th Annual Gem, Mineral & Jewelry Show, By Central Pennsylvania Rock & Mineral Club. Zembo Shrine Auditorium,2801 N. 3rd St., Harrisburg PA 17110. Sat. 10-6, Sun. 10-4.
Www.rockandmineral.org

Announcements from PSU Earth & Mineral Sciences Museum & Art Gallery

See the Museum's latest (April-June '25) newsletter: scroll down at <https://museum.ems.psu.edu/about>.

It notes that the "Museum Gallery will be **open for Summer Festivals.** Summer is right around the corner, which means it is almost summer festival season! Come see the "Pride Rocks" exhibit during State College Pride on June 7, or check out Steidle Art in "Smoky City" and "The Work of Art", during the Central Pennsylvania Festival for the Arts, July 9-13." *- Editor*

Chert, *continued from page 4*

opaline silica occurs mainly in vein and vugs in post Miocene strata. The bedded and nodular cherty deposits in Central Pennsylvania occur mainly in the dolomitic strata of the Gatesburg, Mines, Nittany, Axemann and Bellefonte formations of Cambrian and Ordovician age, and the Keyser and Old Port formations of Lower Devonian age. The brown jasper from a site south of Roaring Spring represents a local residual deposit of probable Eocene age.

Geo-Sudoku Solution

B	S	N	A	O	L	G	D	P
A	L	D	P	G	N	O	B	S
P	G	O	S	B	D	A	L	N
S	A	B	L	N	G	P	O	D
G	**O**	**L**	**D**	**P**	**A**	**N**	**S**	B
D	N	P	B	S	O	L	A	G
L	P	A	G	D	S	B	N	O
N	B	S	O	L	P	D	G	A
O	D	G	N	A	B	S	P	L

INVITE A FRIEND TO JOIN THE SOCIETY

The Nittany Mineralogical Society prides itself on having among the finest line-up of speakers of any earth sciences club in the nation. Everyone is welcome at our meetings. If you'd like to be part of our Society, dues are $25 (regular member), $10 (student rate), $18 (seniors), $35 (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 and form to the next meeting.

We want to welcome you!

CONTACT INFORMATION

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Publicity:

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
425 Armagast Rd. phone: 814-810-2116 (h)
Bellefonte, PA 16823-9762

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 (good to highest quality JPEG files, about 1050 pixels wide, are preferred). Please provide captions and name of photographer or artist.

Visit us at www.nittanymineral.org