

# Rocky Reader

The Monthly Newsletter Of The  
**Toledo Gem And Rockhound Club**

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April 2010

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## GEMCRAFTER AUCTION APRIL 21<sup>st</sup>

The gemcrafter auction benefits the purchase and repair of the gemcrafter equipment. Recently the gemcrafters have added a new slab saw and another Genie diamond machine. In addition, many improvements have been made to the water supply system to the machines. These changes and purchases are possible with monies raised by the gemcrafter auction.

This is a live auction. If you have things to donate, please bring them to the meeting and place them on the tables that have been set up for this purpose. Donations of lapidary material, rough and equipment, specimens, etc are welcome. For the buyer, this is a great opportunity to purchase lapidary materials and neat specimens as well as used equipment to flesh out your home workshop.

## PRESIDENT'S MESSAGE

I'm still waiting for Spring.... As the cold wind blows this morning, I keep hoping that the snow is over for the year. We've got too much going on to be mired in bad weather. I'm dying to get out collecting again. I hope that some of you have connected with Harold to work on developing new field trips.

As President, I keep my ear to the ground listening for indications of the needs and interests of our club members. I have been approached about starting several new groups and am appealing to you all this month to see if any of you would wish to help, participate of lead these groups. A group does not need to meet weekly, once a month is enough to get the ball rolling.

The first group I have been approached about is a Wire Wrapping Group. At one time we did have a group that specialized in wire wrapping, but it has been a few years. If anyone has skills or experience and would like to make the time to help develop this group, please contact me. If you are interested in participating, please contact me as well, so that I can create a pool of members.

The second group I have been approached about is Fossils: the study, preservation, identification and search for fossils. I know that several of our members enjoy this subject, so I expect this will not be too difficult to establish. If anyone has skills or experience and would like to make the time to help develop this group, please contact me. If you are interested in participating, please contact me as well, so that I can create a pool of members.

The third group I want to talk about is the Juniors. I have been moderating this group for about a year now, and I believe it to be firmly established. What I am looking for is someone, or several persons to assist me or take over for a session if I have a schedule conflict. Although, I have yet to have a session where all 20 students attend, but it is possible, and help would be appreciated. It would also be great to have other members' expertise to share with the group; I can do a lot, but I don't know everything by a long shot! These Juniors may be our future and I want to really encourage their interests.

Thank you! Jerri A. Heer

## TG&RC MEETING MINUTES – March 17, 2010

At 7:06 p.m., President Jerri Heer called the meeting to order beginning with the Pledge of Allegiance.

**Secretary's Report:** Tom Marok moved to approve the minutes as written. Jim Leslie seconded. The motion carried.

**Treasurer's Report:** Steve Shimatzki said the treasury is healthy. The insurance premium is due this month. Steve raised the issue of equipment coverage, and Elie Ghanime said he would get an updated list of Gemcrafters' equipment prepared. Deb Hofmaster said she already has made an updated list of Metalcrafters' equipment with prices paid and pictures. Steve wondered if the equipment was insured for replacement coverage or market value and said he would check.

Steve said he and John Kalinoski had worked on the printer/copier issue and one was purchased for the club. John Kalinoski moved to accept the report as presented. Linda Maiani seconded. Motion carried.



**Old Business:** see notes on printer.

**New Business:** Jerri Heer said the club had received a letter from BGSU thanking us for the scholarship donation. Steve said UT had sent a thank you letter directly to him.

Jerri read a proposed amendment to the Midwest Federation By-Laws which would strike the clause stating that the host club will donate 25% of its net show profits to the federation. Jerri said she wanted the feeling of the club before casting the vote. Members demonstrated their support for the amendment with a show of hands in favor.

Flyers for upcoming shows were presented by Jerri.

**Gemcrafters:** Elie asked about juniors and their ability to use equipment. Jerri said they can only use the equipment if the minor has an adult come with them who has been trained on the equipment to supervise the junior. There was discussion about setting up a machine that could go home with a junior on a rotating basis. Members asked questions about liability for club. Jerri said parents would need to sign a release of liability.

Elie also noted that during the Open House Kathy Peterson is having a class so there will be no open cutting or polishing on Saturday.

There are some repairs that need to be made to the space and the garage needs to be cleaned out. Tom Marok asked about getting a new answering machine.

Elie made one further comment: people need to remember to park efficiently when using the club building. Jerri said if the parking lot is full, people may park by the caretakers so long as they don't block his garage or cars.

**Metalcrafters:** Deb Hofmaster said the report will be in the Rocky Reader. Kathy Peterson said the class has two spots left.

**Beaders:** Nancy Grove said the group met for the first time this year on March 15 and for the next couple of months will meet at 6 p.m.

**Extreme Beaders:** Kathy Peterson said the group works on bead embroidery the first and third Tuesdays of the month from 2-7p.m. Due to spring break, the next meeting will be the first Tuesday in April at 9 a.m.

**Faceteers:** no report

**Faceteers II:** Elie said the next class will be May 1<sup>st</sup> and 2<sup>nd</sup>.

**Juniors:** Jerri said 8 attended the last meeting. This month they will have a third session on using lapidary equipment on March 28<sup>th</sup> at noon.

**Rocky Reader:** the deadline for submission is Monday, March 22<sup>nd</sup>.

**Membership:** Tonia said there were 39 members present and 3 guests one of which was a junior.

**Sunshine:** no report. He reported that the Midwest Federation Secretary, Anne Cook, had a stroke and is now recovering well.

**Field Trips:** Harold said the next Joel Vicary trip will be to Kentucky in April. The MSHA class in March had 28 attendees. Jerri said Joel is an OSHA official and club members can teach the MSHA class without his presence as long as his information and guidelines are followed.

**Show:** Need a raffle Chair and assistant. 22 dealers had confirmed they will attend.

**Open House:** Carla Burleson said she is almost full.

Steve Shimatzki said he would be collecting donations for a memorial for Peggy Jones through the end of the month.

There being no further business, the meeting adjourned for the program which was on Ohio geology. The meeting adjourned at 7:51p.m.

Respectfully submitted, Lyn Kalinoski, Secretary

## GEMCRAFTERS

All new members or existing members that need to work in the Gem-craft center to cut and polish cabochon **for the first time**, please call or email Elie or Chet to schedule a meeting slot for your training to complete your first cabochon AND PLEASE LEAVE YOUR FULL NAME AND CONTACT INFORMATION.

## DAYTIME GEMCRAFTERS

This new group meets every Thursday from Noon to 4 PM. To date, we have had six or more members every session. If you find Weds nights too busy, and you have a Thursday afternoon free - come and join us! For more information contact Jerri Heer: 419-344-9999 or [jheerx6@aol.com](mailto:jheerx6@aol.com)



### Thelma Postlewaite's Family News

#### April Birthdays:

- 1 Su Drake
- 5 Ruth Jacobs
- 9 David Hoback
- 9 Suzanne Shimatzki
- 12 Tracy Moore
- 12 Linda Scharer
- 16 Susan Hall
- 16 Linda McConahey
- 16 Chloe Varner
- 17 Brittan Tolford
- 18 Jessica Hofacker
- 19 Connie Shaw
- 19 Kerri Varner
- 24 Lou Ann Frey
- 26 Kathy Riddle
- 29 Becky Knorek

## METALCRAFTERS

The metalcrafters will meet April 8, 6:30-8:30, 18, 1:30-3:30 and 22, 6:30-8:30. If you are not on my e-mail list, and you wish to be, send me note to [dhoffmaster1@verizon.net](mailto:dhoffmaster1@verizon.net).

If you **HAVE NEVER ATTENDED**, please call or e-mail Debra Hoffmaster (see directory) to schedule a three meeting slot to complete your instructional pendant. When you do so, **PLEASE LEAVE YOUR FULL NAME AND CONTACT INFORMATION**.

Debby Hoffmaster, moderator

## JUNIORS

Juniors will meet on Sunday March 28, from noon to 2 PM at the Craft Center. This will be the last session for lapidary instruction. We will also discuss what the group would like to do next or again or more in depth. To participate in a Junior session, your and/or your family membership must be in place prior to the meeting. This is for liability reasons.

A word about the Gemcrafter instruction: Once a student has completed the Junior instruction on the machines and completed a cabochon, they can work again in the future either at other Junior sessions with the leaders or at the regular adult sessions if they have an experienced gemcrafter working with them. Please remember that as a minor, you must always have an experienced adult with you and directly supervising you.

For further information or questions, contact Jerri Heer: 419-344-9999 or [jheerx6@aol.com](mailto:jheerx6@aol.com)  
Jerri Heer, Junior Moderator

## 2010 SHOW

There will be a Show committee meeting at 6:30 PM April 21, right before the regular meeting. Anyone who wishes to help is welcome to attend. We are still looking for a Chair and Co-Chair for the Raffle.

I am looking for help developing a Fluorescent display, finding demonstrators, putting up library displays and more. There is something for everyone to do.

For more information contact Jerri Heer: 419-344-9999 or [jheerx6@aol.com](mailto:jheerx6@aol.com).

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## ROCKY READER

Submissions for the May Rocky Reader **must be received by noon on Monday, April 26<sup>th</sup>**. Many groups are not sending regular notices. From now on, if I do not receive a submission from your group or event, I will assume you have nothing to report. Submissions must be in writing and written as you wish it to be published.

## EQUIPMENT FOR SALE

Former member, Rob Althaus, has the following equipment for sale...

Leweco 8" trim saw, extra blade, with a Craftsman 1/3 HP motor

Gem Maker horizontal, 8" Whetstone with 12 extra discs from 100 to 600 grits, 1/3 HP motor and stepped pulley

Poly Product Rock dual wet grinder, 6" wheels, 100.220 grit, and buffing disc, 1/3 HP motor

Asking \$400. If interested call him during the day at 419-269-3238 (office)

## CLASSES

The following schedule is a listing of upcoming classes. To enroll, please send all fees to the instructor. **Unless otherwise indicated, fees must be received, at the latest, three weeks prior to the class,** however, many classes fill up well in advance of this deadline.

**April 10, 10AM. Enameling on copper.** Instructor Harriet Nearing. Fee \$30. FULL. Students in this class will learn the basics of enameling by producing a small enameled copper shape that may be set into jewelry. Students will be provided with copper and enamels.

**April 24, 9 AM to 4 PM.** Silver PMC Work Day. \$10 Studio Fee. This is a workshop open to members who have independent working skills with PMC. There is no formal instruction and there is a limit on the number of members who can work. If interested, contact Kathy Petersen or Tonia Wallace, for additional information and to register.

**May 1 & 2. Saturday 9AM to 5PM. Sunday 10AM to 4PM.** Faceting Class. Fee \$40 includes class material and one stone to cut "clear quartz". Spaces are limited to six (6) peoples using "Chet" faceting machines and up to four (4) more using their own machine. Please email Elie Ghanime at [eghanime@bex.net](mailto:eghanime@bex.net) to register (First come first serve). If you need to rent, borrow or buy a new or used machine, please contact Ed Reynolds at 419-340-8801 or email him at [ereynolds4@aol.com](mailto:ereynolds4@aol.com)

**May 8, 9 AM to 4 PM.** Bronze Clay Work Day. Studio fee \$10. This is a workshop open to members who have independent working skills with Bronze Metal Clay. There is no formal instruction and there is a limit on the number of members who can work. Pieces will be fired on Saturday of Open House, and need to be picked up on Sunday of Open House. If interested, contact Kathy Petersen or Tonia Wallace, for additional information and to register.

**May 15, 10 AM.** Chainmaille Class. Instructor Kathy Petersen. Two spaces left. Fee \$87 payable to Kathy **4 weeks prior to class.** The project is a Japanese 8 in 2 link sterling silver bracelet, with designer clasp.



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## COMING EVENTS

### from Chetty King's Flyer Table

**April 16-18: ROSEVILLE, MI,** Annual Show, Mt Clemens Gem & Lapidary Society, Roseville Recreation Ctr, 18185 Sycamore, Fri 9:00-7:00, Sat 10:00-6:00, Sun 11:00-4:00, Contact Jackie Swain, 44314 Macomb Industrial Dr, Clinton Twp, MI 48038, (313) 729-5960, [jacswain018@aol.com](mailto:jacswain018@aol.com)

**April 17-18: COLUMBUS, OH,** Columbus Rock & Mineral Society, Veterans Memorial, 300 W Broad St, Sat 10:00-6:00; Sun 11:00-5:00, Contact: Ken Harsh, 297 E Selby Blvd, Worthington, OH 43085, (614) 433-9778, [karmakenha@aol.com](mailto:karmakenha@aol.com)

**June 12-13: Webberville, MI,** Michigan Geology and Gemcraft Society's 36<sup>th</sup> Rockhound Seminar and Midwest Faceters Guild Seminar, Hands-On Workshops, Demonstrations, Illustrated Lectures. Sat. & Sun. 9:00-5:00, Webberville High/Middle School, 309 E. Grand River, Webberville, MI (approx. 12 mi east of Lansing). Contact Don Brown, (313) 421-8159, [webmaster@mgags.org](mailto:webmaster@mgags.org). For info on faceting workshops go to: [www.midwestfacetersguild.org](http://www.midwestfacetersguild.org)

## Popular Mineralogy

Interesting mineralogy and earth science for the amateur mineralogist and serious collector - #25

# Diamond vs. Graphite

by Andrew A. Sicree

## Hard vs. soft

Most mineral collectors know that diamond and graphite are chemically the same, differing only in their crystal systems and their cost. Diamond is a cubic mineral while the mineral graphite possesses hexagonal symmetry.

Diamond, of course, is the hardest substance known. One characteristic of a good gemstone is that it has to be hard enough to stand up to the wear-and-tear of being worn on a ring, but even among gemstones, diamond's hardness stands out. On the Moh's Scale of Hardness, talc (H=1) is on one end while ruby/corundum (H=9) and diamond (H=10) are on the other. This scale gives the impression that diamond is only a step harder than corundum. But if we measure "absolute hardness" with a sclerometer – an instrument that gives a much more precise and meaningful measure of hardness – we find that, if talc has an absolute hardness of one, then corundum has an absolute hardness of 400. Diamond then has an absolute hardness of 1600, four times the hardness of corundum and 1600 times the hardness of talc.

On the other hand, graphite is stuck way down at the bottom of the Moh's Scale of Hardness. At  $H = 1\frac{1}{2}$ , it is among the softest minerals, almost as soft as talc. Graphite is so soft we can use it to make pencils – it is actually softer than the paper we write upon.

But the two differ in much more than hardness. Graphite is always a black, opaque mineral, while diamonds occur in every possible color and they can be clear or white or black and opaque. Although some diamonds may be semi-conductors, most diamonds are electrical insulators. Graphite, on the other hand, is a good conductor of

electricity. These two species have other dramatically different properties. But if both graphite and diamond are composed solely of carbon, why are their properties so drastically different? Can crystal structure be so much more important than chemical composition?

## Allotropy in carbon

Diamond and graphite are *allotropes* of carbon – pure chemical elements that share the same bulk chemical composition, but with the atoms bonded together in different arrangements. Two or more allotropes can exist for an element and each will have a different arrangement of atoms. Allotropes are analogous to *isomers*, which are chemical compounds with identical molecular formulae but different structural arrangements. Other allotropes of carbon exist, but only graphite and diamond are found in nature as minerals. In addition to diamond and graphite, the list of pure solid elemental carbon allotropes includes amorphous carbon, *fullerenes*, and other more exotic structures. Fullerenes (a.k.a. *buckminsterfullerenes*) are structures in which the carbon atoms form sheet-like structures, balls, or tubes. One fullerene, C-60, is composed of 60 carbon atoms and looks like a microscopic soccer ball.

Toner used in photocopiers and laser printers is simply a mixture of carbon powder (usually a mixture of fine particles of amorphous carbon and graphite) with a fusible (i.e., "meltable") polymer.

## Bonding in diamond

In any crystalline solid, atoms are arranged in a three-dimensional lattice. Each atom in a crystal lattice is bonded to its nearest neighbors in a

precise, repeating pattern. The strengths of the inter-atomic bonds and the geometry of the lattice control the properties of the solid. Differences in the atomic structural arrangements of diamond and graphite are the source of their radically disparate properties.

A glance at the periodic table tells us that carbon has four valence electrons. Thus each carbon atom usually forms four chemical bonds. Unlike elements such as sodium and chlorine, which react to form ionic bonds, carbon tends to form covalent bonds.

In the diamond structure, carbon's four valence electrons, one in an s-orbital and three in p-orbitals, undergo  $sp^3$  hybridization. This means that electrons in the s- and p-orbitals combine to produce a tetrahedral hybrid orbital. This hybrid orbital enables carbon to form four bonds, each bond having the same strength, and each bond forming at the corner of a tetrahedron with the carbon atom in the center. When multiple carbon atoms bond together with overlapping  $sp^3$  hybrid orbitals, each carbon atom connects to four other carbon atoms and the resulting structure is a three-dimensional tetrahedral lattice, much like an atomic jungle gym.

The three-dimensional lattice of diamond is extremely strong and it renders diamond impervious to dissolution, even in most strong acids. The structure also makes diamond the hardest substance known. And because the overlapping  $sp^3$  hybrid orbitals hold their bonding electrons quite tightly, diamond is a good electrical insulator. However, impure diamonds with small amounts of boron (substituting for some carbon atoms) are semi-conductors. These diamonds tend to be blue in color. The deep blue color of the famous Hope Diamond in the Smithsonian is thought to be the result of boron impurities.

## The structure of graphite

Alternatively, graphite's structure is based on  $sp^2$  hybridization. This means that one carbon s-orbital from hybridizes with two p-orbitals to yield

a trigonal planar hybrid orbital which is triangular rather than tetrahedral in shape. Each carbon atom with an  $sp^2$  hybrid orbital will then bond to three other carbon atoms in the same plane. The result is a sheet of carbon atoms arranged in a hexagonal pattern, like a sheet of chicken wire. The remaining unhybridized p-orbitals stick out above and below the sheet of carbon atoms. These p-orbitals provide the electrons that allow the carbon sheets to stick together. The sheet structures are stacked one on top of the other and are bonded together by the overlapping unhybridized p-orbitals, producing pi bonds.

Graphite's inter-sheet pi bonds are weak in comparison to the bonds formed between carbon atoms within a sheet. The slippery feel of graphite arises from these weak pi bonds because it takes only a small amount of pressure to break the pi bonds holding sheets together. Sheets of graphite begin to slide, one over the other. Graphite is thus quite soft and has a slippery feel. Also, because the non-hybridized p-orbitals overlap, the electrons in graphite's pi bonds are delocalized, meaning that they are free to move about within the space between the graphite sheet structures. In metals, such as copper, delocalized electrons are the cause of electrical conductivity. Graphite is a semi-metal. Graphite crystals have the highly unusual characteristic of being a poor conductor of electricity in directions perpendicular to its sheet structures but a good conductor in directions parallel to the sheets. This is because the conductive delocalized pi bond electrons can migrate in between the sheets but cannot easily cut across from one sheet to the next.

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Dr. Andrew A. Sicree is a professional mineralogist and geochemist residing in Boalsburg, PA. This **Popular Mineralogy** newsletter supplement may not be copied in part or full without express permission of Andrew Sicree. **Popular Mineralogy** newsletter supplements are available on a subscription basis to help mineral clubs produce better newsletters. Write to Andrew A. Sicree, Ph.D., P. O. Box 10664, State College PA 16805, or call (814) 867-6263 or email [sicree@verizon.net](mailto:sicree@verizon.net) for more info.

## Graphite and Lead in Pencils

Every schoolchild knows that pencil lead isn't really "lead" but rather it is graphite. Before graphite came to be used in pencils, charcoal or lead metal sticks were used for making marks.

Metallic lead is quite soft and will leave a gray streak on paper. Although graphite has replaced lead for writing purposes, we have retained the use of the word “lead” – much to everyone’s confusion.

In the 1500s, a huge deposit of bulk graphite was discovered near Borrowdale, in Cumbria, England. This material could be sawn into sticks, and because it was thought to be a form of lead, it was called *plumbago* (Latin for “lead ore”). Apparently, it was first used for marking sheep, but its value for writing on paper soon became apparent. And because it could withstand the heat of molten iron, it was also valuable for lining molds used for the manufacture of cannon balls. Graphite acted as a mold release agent, making it easier to remove a freshly-cast iron cannonball from the mold.

Although the Borrowdale material could be sawn into usable pencil-like sticks of pure graphite, most of the world’s graphite wasn’t so pure. It had to be separated from other minerals. In the 1600s, powdered graphite was mixed with other materials (including sulfur and antimony) and molded into pencil-like sticks, but these every graphite composites were inferior to the sawn sticks of graphite. In the late 1700s, French and German inventors discovered that graphite could be mixed with clay, molded into rods, and then fired in an oven to produce composite that was ideal for writing. Moreover, by varying the clay content, hardness of the rods could be changed, and different darknesses of marks achieved. And thus the modern pencil lead was born.

A harder pencil makes a lighter mark and a softer pencil makes a darker mark. Modern pencils usually bear markings indicating the hardness and tone of the pencil. One system for indicating pencil hardness uses “H” (for hardness) to “B” (for blackness), and “F” (for fine point). Commonly used pencils progress from “B” to “F” to “HB” to “H”. Some manufacturers use numbers (1 = “B”, 2 = “F” to 2½ = “HB”, 3 = “H”). Specialty pencils can be harder than “H” (labelled “2H,” “3H,” “4H,” etc.) or softer than “B” (labelled “2B,” “3B,”

“4B,” etc.). Marking schemes vary from manufacturer to manufacturer.

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### ***Weird Geology: Diamonds in Space***

Not all diamonds on the Earth are native to our planet. Some meteorites are known to contain diamonds. Some of these extra-terrestrial diamonds formed when asteroids collided with each other. Because of their great speeds, the shock wave of the collision is so intense (high pressure) that graphite in the asteroid is changed into diamond. “Shock diamonds” are at most only one- to two millimeters in size and are typically highly fractured. Fragments of asteroids that land on the Earth are called meteorites.

Some meteoritic diamonds, however, are older than the asteroids. Indeed, they may be older than our solar system! They formed when the star that was the precursor to our Sun went supernova and spewed out the elements that subsequently built up our sun, the planets, and the asteroids. These “presolar” diamonds – even smaller than shock diamonds – got caught up in the formation of the asteroids, and were later carried to the Earth in meteorites. These diamonds are studied for clues to the origins of our solar system.

If you desire a truly humongous diamond, you must venture beyond our solar system. White dwarf stars are the remnants of burned out suns and they’re composed of carbon and oxygen. Recently, while studying a white dwarf star (technically named BPM 37093) located 50 light-years from the Earth in the constellation *Centaurus*, astronomers from the Harvard-Smithsonian Center for Astrophysics determined that the core of the Earth-sized little star had solidified into diamond. “The interior of this white dwarf has solidified to form the galaxy’s largest diamond,” reported astronomer Travis Metcalfe. This diamond is 2,500 miles (4,000 km) across and weighs 3 million trillion trillion times more than the 3106-carat (five carats equal one gram, so the stone was approximately 1.3 pounds) Cullinan, the largest diamond ever found on Earth!

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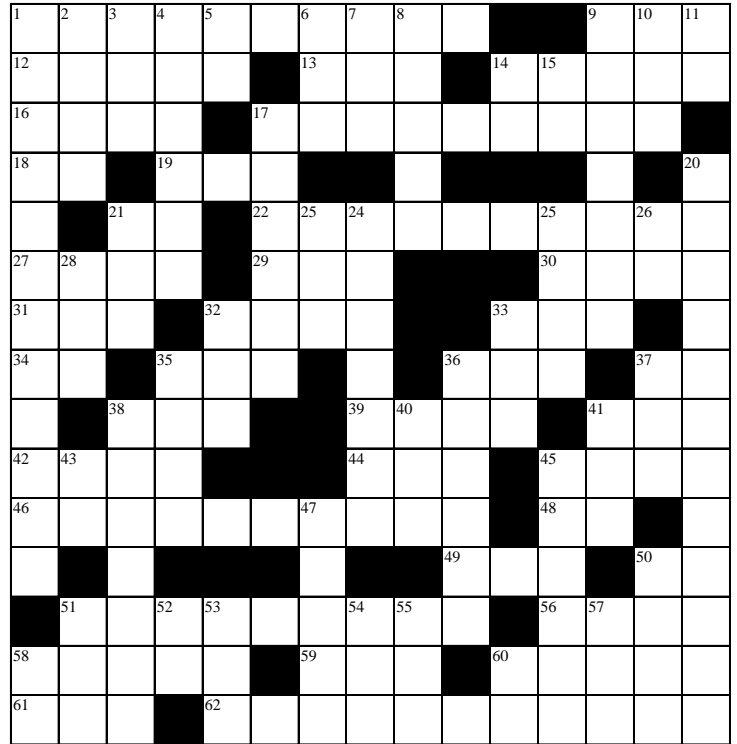
## Variety in Minerals

### ACROSS

- 1 stibnite
- 9 scanning electron scope
- 12 Robbie the \_\_\_\_\_
- 13 what Owl says
- 14 pearly
- 16 Gulf with hydrothermal vents
- 17 arsenopyrite
- 18 not northeast
- 19 a Samoan village
- 21 the Extraterrestrial
- 22 zoisites from Tanzania
- 27 woodwind
- 29 “His Master’s Voice”
- 30 very low grade coal
- 31 pipe-playing Greek
- 32 cylinder pasta
- 33 Soviet Socialist Republic
- 34 yttrium
- 35 metal reed
- 36 Miocene (ab)
- 37 Georgia
- 38 play piece
- 39 to leave out
- 41 turnpike (ab)
- 42 already cited
- 44 \_\_\_\_\_ mot
- 45 a mix of fossils
- 46 variety of andradite
- 48 Dominicans (ab)
- 49 not cooked
- 50 anorthite (ab)
- 51 antimony sulfides
- 56 Lucy’s husband
- 58 tetragonal (ab)
- 59 the tea in golf
- 60 cave landscape
- 61 geologic period
- 62 orthoclase-like feldspar

### DOWN

- 1 mispickel
- 2 person, place, thing
- 3 to be expected (ab)
- 4 wuestite



- 5 mountain state
- 6 National Health Inst. (ab)
- 7 island in the Aegean
- 8 giant gemstones
- 9 quartz crystal variety
- 10 Tyrol village
- 11 Songo Pond state
- 14 state with emeralds
- 15 largest state
- 17 what crystal sits on
- 20 really bloedite
- 21 geologic time
- 23 to do something
- 24 capital of Kenya
- 25 meaning itself
- 26 each (ab)
- 28 flying mouse
- 32 opposite of zig
- 33 opposite of stand
- 35 \_\_\_\_\_ niter = Nitratite
- 36 guys who dig rocks
- 37 Global Positioning Sys.
- 38 transfers liquids (chem.)
- 40 bon \_\_\_\_\_
- 41 strike lightly w/ hammer
- 43 Baltimore & Ohio
- 45 up on an elephant
- 47 not the clergy
- 50 association (ab)
- 51 Soc. Economic Geologist
- 52 infrared
- 53 barite element
- 54 leafy brew
- 55 slippery as one
- 57 more geologic time
- 58 tantalum
- 60 kitchen duty

# April

# 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 Gemcraft 12-4p	2	3
4	5	6 Extreme Beaders 9:00a-6:00p Faceteers II 7:00p	7 Gemcraft 7:00p	8 Gemcraft 12-4p Metalcraft 6:30p	9	10 Enameling Class 10a
11	12	13	14 Gemcraft 7:00p Faceteers I 7:00p	15 Gemcraft 12-4p	16	17 Gemcraft 10a-12p
18 Metalcraft 1:30p	19 Beaders 6:00p	20 Extreme Beaders 2:00-6:30p Faceteers II 7:00p	21 Show Mtg. 6:30p Club Mtg 7:00p Gemcraft Auction	22 Gemcraft 12-4p Metalcraft 6:30p	23	24 PMC Workshop 9a-5p
25 Juniors 12-2p	26 Rocky Reader May Deadline	27	28 Gemcraft 7:00p	29 Gemcraft 12-4p	30	

Rocky Reader Editor  
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