



# Rocky Reader

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

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## PRESIDENT'S MESSAGE

Happy Summer Everyone!

Actually, summer is fast getting away from us, and it has been a busy one! Which means the Show is right around the corner. As the Committee works diligently to prepare everything, we ask that you as members contribute when and where you can. Deb Hoffmaster and Kathy Peterson, who are actively trying to reach all of you for time commitments to staff the various areas of the Show, would greatly appreciate prompt responses to emails and phone messages. They are spending hours to make the contacts, but it should only take a moment for each of you to respond!

We always ask that each adult member commit to at least one shift – that's two hours. In exchange, you not only get the joy of helping your club, but free admission to the Show for that day! If you don't work, you pay regular admission as the general public. It is a big help to us to be able to know in advance that we have every area covered, and none of the work is demanding – so please do your part!

As always we are also collecting donations of good raffle prizes, samples and prizes for kids, material for the Club Sale and Silent Auction, and food commitments for the hospitality area. This is a good time to clean out your shelves and boxes for excess material – we can use it! Bring your items to the Club Meeting in August, to the Craft Center at any time it is open or to the Show on Thursday and Friday during set-up.

Thank you all in advance for tremendous support!

Jerri Heer, President

## TG&RC 2009 SHOW

By now, everyone should have received a mailing with raffle tickets and coupons to pass out and will be getting a phone call if you haven't already. I can't stress enough how important member support is to the success of our show. This show is the club's biggest source of annual income and offsets a lot of the club's daily operating expenses. In other words, it affects everyone by allowing us to keep membership costs low.

This is YOUR show!! Please get involved!

## TG&RC MEETING MINUTES – July 15, 2009

The meeting was called to order by President Jerri Heer at 7:08 after the pledge of Allegiance.

**Secretary's Report:** Tom Marok noted there was a typo with his name misspelled. Tom then moved to approve the minutes as corrected. Jim Leslie seconded and the motion was approved.

**Treasurer's Report:** Steve Shimatzki said it has been a fairly slow month in terms of expenses. The books are balanced. Harold Burleson moved to approve the treasurer's report as read. Jacque Martindale seconded and the motion was approved.

**Old Business:** none

**New Business:** Jerri mentioned that the Richland Gem and Mineral show would be the last weekend in July. Flyers were available.

### Group Reports:

**Juniors:** There has not been a juniors meeting for 3 months. There will be an announcement in the next Rocky Reader about upcoming meetings.

**TBG:** Chet King asked people to sign in or correct volunteer hours for April-June.

1st Sunday in August, August 2<sup>nd</sup> will be Open Art Days & Arts in the Garden from 11-5pm. All of the buildings and studios in TBG's Artists Village will be open. If members want to set up a table and sell their work, they must fill out a form beforehand. Club members will be doing demos.

For the second year TBG will host Arts Gone Wild. The Kick-Off Celebration is Thursday August 6, 6:00-9:00 p.m. with Jazz in the Garden at a reduced ticket price.

*Arts Gone Wild Festival:* Friday, August 7- Saturday, August 8, 10:00 a.m.- 5:00 p.m. There is no charge for admission. There will be free open cutting in the craft center during the events.

Jerri Heer had additional information about TBG from her meeting with TBG officials. The Garden Gallery is now closed but will reopen as a visitor center. The Spectrum building is also closed with some water damage.

TBG wants various groups to submit their date requests for next year in August.

**Gemcrafters:** Chet said the gemcrafters are considering buying another machine. They are also considering setting up a faceting class. Eli Ghanime said people interested in a faceting class should let him know. A notice will be put in the Rocky Reader.

**Metalcrafters:** Jim Leslie reported for Deb Hoffmaster. Meetings will remain at their usual times. Deb and Scott will be in the Garden the first Sunday in August. There is a chainmaille class with Kathy Peterson at the Open House. It will be a Persian bracelet design.

**Faceteers:** no report.

**Beaders:** Nancy Grove said the next class would be earrings on Monday, July 20<sup>th</sup> at 6:30 p.m. In August the beaders group will be working on a Dutch spiral.



**Rocky Reader:** Suzanne Shimatzki asked that people have material to her by late July, as she will be out of town.

**Membership:** John Capuano said there were 26 members in attendance, including 2 new members and 1 junior. There were also 2 guests present.

**Sunshine:** Bonnie Wheelers' mother Joann Eisenbrandt passed away on June 29, 2009.

**Field Trips:** There is a field trip to Bancroft Ontario in September (23<sup>rd</sup>-27<sup>th</sup>) On August 8<sup>th</sup>, Silica quarry in Sylvania will be open from 8-11am. MSHA requirement is not known at this time so anyone interested should contact Harold ahead of time. Basic safety equipment such as hard hat, safety glasses, sturdy shoes/boots will be required. Harold said it would be nice to have field trips to one of the quarries during the Midwest Federation convention in 2011.

**Show Committee:** Suzanne Shimatzki said coupons and raffle tickets would be mailed to members late this month. Flyers are available to post. Volunteer signup sheets are also ready and members are asked to work 2-hour shifts. Hospitality will need contributions for Thursday and Friday am setup. The club still needs displays for Way Public Library and Sanger Library for the month of August.

Yard signs will be available at the August meeting. Yard signs are reusable so members need to make sure to return them after the show.

Two committees still need chairs. Su Drake has had to withdraw from hospitality due to a family illness. Carla Burleson volunteered to chair hospitality. That leaves kids area in need of a chair.

Nancy Grove reminded members that if they wanted to have a display at the show, they needed to fill out a form. Displays must be in place from Friday noon until 5pm on Sunday. There are prizes for Peoples' Choice winners.

**Open House:** Carla Burleson said the Open House would be November 14-15<sup>th</sup>. She has some tables available on a first come basis. Information will be in the next Rocky Reader.

There being no further business, the raffle was drawn and the meeting was adjourned at 8:15 PM.

Respectfully submitted, Lyn Kalinoski, Secretary

## CLASSES

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

**November 14. 10AM. Chainmaille.** Instructor Kathy Petersen. Fee \$85. This is the Full Persian bracelet designed by Kathy and published in the February 2009 issue of Bead and Button Magazine. The fee includes all materials: a designer bead set from Hager Studios, a designer clasp, and sterling silver jump rings. Call Kathy to register for the class. As you know, these classes fill up quickly, so be sure to register early. *There are currently only 3 spots left!*

**November 15. 10AM. Coloring on Copper workshop.** There is NO Charge for this repeat of the class offered last year, BUT you must supply your own copper. If you want to participate, you MUST give the copper you want patinated to Debby Hoffmaster at the OCTOBER club meeting. I will supply colored pencils, spray and turpentine.

**January 23 & 24. 10AM. Chasing Tools and Patterning Mokume.** Instructors Hans Ruebel and Debra Hoffmaster. Fee \$40. Limit 6. This class will consist of two sessions: the first will be devoted to the construction of steel chasing tools. It will be taught by Hans Ruebel of the Toledo Museum of Art. The second session will be devoted to the patterning of a Copper/brass mokume-gane billet. It will be taught by Debra Hoffmaster. Students will be provided with tool steel and the mokume billet.

**February 13. 10AM. Solder Inlay.** Instructor Debra Hoffmaster. Fee \$30.00. Limit 6. This class will introduce the technique of solder inlay to add color to your designs. To be eligible for this class, students must have completed their introductory pendant.

**March 13. 10AM. Copper trinket box.** Instructor Debra Hoffmaster. Fee \$40. Limit 6. Students in this class will construct an oval copper trinket box with a cabochon top. To be eligible for this class, students must have completed their introductory pendant.

**April 10. 10AM. Enameling on copper.** Instructor Harriet Nearing. Fee \$30. Limit 6. 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.

### **Interested in Faceting?**

Chet King and Elie Ghanime are organizing a training course on faceting. Chet is kind enough to lend us his five-faceting machines for the training, after that you have to invest in your own equipment. The course will be divided into two segments. If you are interested, please email Elie at [eghanime@buckeye-express.com](mailto:eghanime@buckeye-express.com)

#### **First Segment: "INTRODUCTION TO FACETING"**

Elie will give the first one and it will explain the basics to get started, the different type of faceting machines, definitions, how they work, equipment needed, types of Diamond and Polishing laps, polishing compounds, dopes and how to use them, stone transfer, Stone Design Basics and General Terms. The introduction to faceting will prep you for the actual faceting course eliminating the time needed to explain any terminology and what is what in order to have more hands-on faceting.

#### **Second Segment: "LEARN HOW TO FACET"**

Chet will get the name of the trainer and it will be announced at a later date. However, in order to setup the time and dates, we need to know how many members are interested in taking the class? And please remember that we have only five machines (unless you bring your own), so the first class can be up to 15 people as room space permit and the second class will be for 5 members without the faceting machine and maybe two or three more with their machine "as space permits". If you are bringing your machine, please let me know. Signing for the class will be on first come first serve basis.

### **METALCRAFTERS**

The metalcrafters meet on the first and third Sunday at 1:30 and the second and fourth Thursday at 6:30. We ask that **those members who have never attended**, please call or e-mail Debby Hoffmaster to schedule a three meeting slot to complete their instructional pendant. When you do so, **please leave your full name and contact information**.

Debby Hoffmaster, moderator

### **GEMCRAFTERS**

The gemcrafters meet on Wednesdays (except the third) at 7PM in the craft center. Chet can give classes on any lapidary topic. If there is something that you are interested in learning, contact him.

### **FACETEERS**

The faceters are scheduled to meet the second Wednesday of the month. Contact Don Ault or Dick Bower for more information.

## BEADERS

The beadners meet on the 3<sup>rd</sup> Monday of the month (August 17<sup>th</sup>) at 6:30 PM in the craft center. Nancy Grove will provide instruction and materials needed for the meeting. The meeting is open to all skill levels.

A Beadners subgroup is meeting weekly during summer months to work on extended bead embroidered projects. This is a weekday class, and days are chosen weekly by the group to best fit the schedules of the participants. Some basic beading skill, particularly with peyote stitching and cabochon beading, would be helpful. Call Linda Markowiak, for information related to meeting days and necessary materials to join in on the projects.

## JUNIORS

Any junior members who would like to attend meetings, either you or your parents please contact Jerri Heer to express your interest. The last three meetings, have had no attendance, so I am holding off until I find definite interest! Call me at 419-344-9999 or email at [jheerx6@aol.com](mailto:jheerx6@aol.com)



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## ROCKY READER

Submissions for the September Rocky Reader must be received by noon on **Monday, August 24<sup>th</sup>**. All groups should be submitting monthly updates unless prior arrangements have been made directly with Suzanne.

## FALL OPEN HOUSE

Table space is available to members on a first come first serve basis for anyone wanting to sell. Contact Carla Burleson (419-533-7341) to reserve tables or to volunteer. Anyone needing to cancel their table space must call Carla directly (no emails!).

## FIELD TRIPS

Harold has arranged a field trip to Hanson Quarry in Sylvania, Ohio, on Saturday, August 8<sup>th</sup>, 2009 from 8:00 AM - 11:00 AM. Basic safety gear and MSHA certification is required. **Contact Harold Burleson at 419-704-6662 by 8/7/09 for confirmation.**

## COMING EVENTS

### from Chetty King's Flyer Table

**August 7-9:** Houghton, MI. Copper Country Rock & Mineral Club's Show; Portage Township Elementary School, 203 Jacker Ave.; Fri. 1-8, Sat. 10-6, Sun. 11-5; CONTACT Steve Whelan, 59880 Dektrom Rd., Calumet, MI 49913, (906) 337-2599, [swhelan@up.net](mailto:swhelan@up.net)

**Needle Arts Guild Show:** The dates for the 2009 Needle Arts Guild of Toledo show are Friday, September 25 and Saturday, September 26. The show will be held at Sanger Branch Library on Central Avenue. Hours on Friday will be 9:00 a.m. until 5:00 p.m. and on Saturday 9:00 a.m. until 4:00 p.m.

**The Falls of the Ohio State Park** will be having their **15th annual 2009 Falls Fossil Festival!** The event held September 19<sup>th</sup> - 20<sup>th</sup> will be held in Clarksville, Indiana - just across from Louisville, KY. There will be fossil rich Devonian age material brought in from their local quarry for digging, and many educational talks held with outdoor vendors selling fossils, minerals, books, geo-science themed items and food. For additional information email Alan Goldstein at [agoldstein@dnr.in.gov](mailto:agoldstein@dnr.in.gov) or visit [www.fallsoftheohio.org](http://www.fallsoftheohio.org)

**From the Orchid list, online forum for jewelers. 7/22/2009  
Subj: [Orchid] Largest known diamond in the galaxy**

For those who love gems and are interested in astronomy, here is an article from the BBC:

[BBC] Twinkling in the sky is a diamond star of 10 billion trillion trillion carats, astronomers have discovered.

The cosmic diamond is a chunk of crystallised carbon, 4,000 km across, some 50 light-years from the Earth in the constellation Centaurus. It's the compressed heart of an old star that was once bright like our Sun but has since faded and shrunk.

Astronomers have decided to call the star "Lucy" after the Beatles song, Lucy in the Sky with Diamonds. Twinkle twinkle. "You would need a jeweller's loupe the size of the Sun to grade this diamond," says astronomer Travis Metcalfe, of the Harvard-Smithsonian Center for Astrophysics, who led the team of researchers that discovered it.

The diamond star completely outclasses the largest diamond on Earth, the 546-carat Golden Jubilee which was cut from a stone brought out of the Premier mine in South Africa.

The huge cosmic diamond - technically known as BPM 37093 – is actually a crystallised white dwarf. A white dwarf is the hot core of a star, left over after the star uses up its nuclear fuel and dies. It is made mostly of carbon. For more than four decades, astronomers have thought that the interiors of white dwarfs crystallised, but obtaining direct evidence became possible only recently.

The white dwarf is not only radiant but also rings like a gigantic gong, undergoing constant pulsations. "By measuring those pulsations, we were able to study the hidden interior of the white dwarf, just like seismograph measurements of earthquakes allow geologists to study the interior of the Earth.

"We figured out that the carbon interior of this white dwarf has solidified to form the galaxy's largest diamond," says Metcalfe.

Astronomers expect our Sun will become a white dwarf when it dies 5 billion years from now. Some two billion years after that, the Sun's ember core will crystallise as well, leaving a giant diamond in the centre of the solar system.

"Our Sun will become a diamond that truly is forever," says Metcalfe.

**Cooked Brazilian Agate**

While reading an old 1957 lapidary journal magazine from an Estate Sale, I found the following handwritten recipe...

*Cooked Brazilian Agate:*

*Slabs at room Temperature. Place in unheated oven and set the temp at 200° for 15 minutes, then at 250° for 15 minutes. Continue to raise the temp 50° at a time for each 15 minute period until you reach 550°. Leave slabs for 25 minutes then shut off oven. Leave overnight to cool.*

**AT NO TIME OPEN THE OVEN DOOR!!!**

*Condolences*

*I'm sorry to report that Bonnie Wheeler's Mother, Joann Eisenbranat passed away peacefully on June 29, 2009. Our sympathy is with Bonnie and her family at this time.*

*Lucille Burgy*

I do not know the results, but hope you make some at the next potluck for everyone to share!

Submitted by, Steve Shimatzki

## ***POPULAR MINERALOGY***

*Interesting mineralogy and earth science for the amateur mineralogist and serious collector - #17*

# Magnetism and Magnetite, Lodestones and Lightning

by Andrew A. Sicree

## **The first lodestones**

According to ancient Greek legend, the first lodestone was found by a shepherd, *Magnes*, when the iron tip of his shepherd's staff stuck to the black stone. Unlike many such stories, this legend is quite plausible: being a natural magnet, the lodestone will attract iron metal or deflect the needle of a compass. Like the ancient Greeks, contemporary youngsters are fascinated by a magnet's ability to project an invisible force and almost every young mineral collector has a piece of lodestone in her or his collection.

## **A little bit of etymology**

The town or district of Magnesia is located in Thessaly in central Greece (was the location named for the shepherd or the shepherd named for the location?). Historically, this district produced black stones that attracted iron. The classical name *lithos Magnetis* or "stone of Magnesia" is the source of the modern term *magnet* from which we derive the mineral name *magnetite*.

Lodestone, on the other hand, is derived from the Anglo-Saxon *lād*, meaning "way" or "journey." Thus, a *loadstone* or *lodestone* was a stone that "showed the way." This was because an elongated lodestone could be suspended from a string and used as a navigational tool.

Being polarized, a lodestone would always point in the same direction – a helpful characteristic when one is sailing a ship on the sea beyond the sight of land. In Dutch, the navigational use of the lodestone was expressed in the word *zeilsteen*, from *zeilen*, "to sail," and *steen*, "stone." Thus a lodestone or *zeilsteen* was a "sailing stone."

## **A little bit of science**

A magnet is any object that possesses an external magnetic field. In common usage we use the term "magnetism" to describe phenomena such as a steel bar magnet sticking to the door of a refrigerator, or a piece of lodestone which, although too weak to hold its itself to the refrigerator door, deflects the needle of a compass. To scientists, these are two different, but related, displays of two important types of magnetic phenomena called *ferromagnetism* and *ferrimagnetism*.

All magnets are magnetic because of the motion of the electrons surrounding their atoms (moving electric charges generate magnetic fields). In a *ferromagnetic* material (such as iron metal, nickel, cobalt and most steels), the atomic magnetic fields align themselves parallel to an externally applied magnetic field, and produce a strong magnetic field of their own. In a *ferrimagnetic* material, the atomic magnetic fields align themselves both parallel and "anti-parallel" (parallel but with a polarity opposite to that of the parallel components) to the applied fields. The parallel components are stronger than the anti-parallel and thus the material is magnetic. Magnetite or lodestone is *ferrimagnetic*. (Note that older mineralogy texts sometimes called magnetite a *ferromagnet*; in the 1940's Louis Néel provided the theory to explain that magnetite was really a *ferrimagnet*. Yes, I know that there is only one letter difference between the two, but that one-letter difference represents a real difference in magnetic characteristics.)

Thus, we note that *ferrimagnetism* is a property intrinsic to the material itself. But, if this is so, why aren't all pieces of magnetite lodestones?

In order for a specimen of magnetite to display a strong external magnetic field (i.e., become a lodestone), the magnetic “domains” in the specimen must be aligned to give a net magnetic field. When magnetite first forms, its magnetic domains (you can think of them as many, many small bar magnets, each with a North and a South end, making up the magnetite) are more-or-less randomly oriented, thus the magnetite does not behave like a lodestone (the randomly-oriented bar magnets cancel each other out). If a strong electromagnetic field is applied to the rock, it will cause many of the domains to align themselves in the same direction. This aligned magnetite will be a lodestone.

### **A stroke of lightning**

So, if you want to make magnetite into lodestone, how do you apply a “strong electromagnetic field” to the rock? In Nature, a bolt of lightning does the trick. Lodestones are thought to form when lightning strikes magnetite in the rock. The pulse of lightning realigns most of the magnetic domains in the magnetite. When the North and South ends of most of its magnetic domains are aligned with the same orientation (all the bar magnets are arranged in the same direction), a magnetite specimen will produce an external magnetic field. Thus magnetite is transformed into lodestone. Apparently most, if not all, natural lodestones are produced by lightning strikes.

Evidence in support of this theory comes from the fact that on the ridge-tops and summits of mountains built of rocks containing small amounts of magnetite, one may typically observe strong deflections of one’s compass needle. Elsewhere, these same magnetite-containing rocks will not deflect a compass needle. This phenomenon is attributed to the effects of lightning striking the higher ground and converting mountain-top magnetite to lodestone.

Interestingly, you can change a lodestone back into ordinary magnetite if you heat it up. If you heat lodestone above about 575°C (1067°F), the “Curie point” for magnetite, and then cool it back down, it will become ordinary, non-lodestone magnetite.

### **The magnet test**

Magnetite is the most strongly ferrimagnetic mineral and of all ferrimagnetic minerals it will most vigorously respond to a bar or a horseshoe magnet. A magnet thus becomes a useful tool for determining the presence of magnetite. Any small but strong magnet hung on a pivot or suspended from a string will be attracted to rocks containing the mineral.

Some minerals other than magnetite are also affected by a magnet. These include pyrrhotite ( $\text{Fe}_7\text{S}_8$ ), greigite ( $\text{Fe}_3\text{S}_4$ ), maghemite ( $\gamma\text{-Fe}_2\text{O}_3$ ), goethite ( $\alpha\text{-FeOOH}$ ), feroxyhyte ( $\delta\text{-FeOOH}$ ), and jacobsonite ( $\text{MnFe}_2\text{O}_3$ ) – all of which are ferrimagnetic. In these minerals, the effect is considerably weaker than in magnetite and the property is thus harder to detect. Native iron (rare, but found on Disko Island, Greenland) and iron-nickel metal found in meteorites are also strongly attracted to a magnet.

One good magnet test technique is to crush a suspect mineral into small grains and place them on a smooth sheet of paper. If a strong magnet is brought close to the grains, some will jump onto it. Grains of weakly magnetic minerals may not cling to the magnet, but it may be possible to detect their weak magnetism when they are disturbed and moved slightly when the magnet is passed over them.

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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.*

### ***Native Iron from Disko Island***

Native iron is a very rare mineral. In spite of the fact that, on the Earth, iron is a plentiful element, it almost always occurs combined with other elements. It can be found in the form of oxide minerals (hematite, magnetite, goethite, etc.), sulfide minerals (pyrite, chalcopyrite, etc.), silicates (pyroxenes, amphiboles, etc.), or other minerals. Iron is usually in the oxidized or reduced form

rather than being present as an uncombined “native” element. Even the iron in iron meteorites usually occurs as the iron-nickel minerals kamacite ( $\alpha$ -Fe,Ni) and taenite ( $\gamma$ -Fe,Ni).

You may have heard it said that the core of the Earth is solid iron. The innermost core is solid metal and the outer shell of the core is liquid metal, but the composition of these layers is thought to be a mixture of iron and nickel rather than pure iron. In fact, metal in the Earth’s core probably is similar to the iron-nickel metal found in the iron meteorites.

Disko Island, off the east coast of Greenland, is famous for producing native iron. This iron occurs in the porphyritic feldspar basalt of Ovifak on Disko Island (a.k.a. Qeqertarsuaq). Native iron is usually found as small blebs in the basalt, but larger masses are found as well. One large mass weighed more than 20 tons.

Native iron formed when hot basaltic magmas erupted through local coal beds. The super-heated coal served as a reducing agent reacting with iron in the basalt to produce native iron metal. This is similar to what happens in a blast furnace when iron ore minerals are mixed with “coke” (essentially cooked coal) at a high temperature. The iron ore is reduced and molten iron is the result.

In addition to its fame as a locality for native iron, Disko Island is geologically quite interesting. Various mineral deposits and fossil beds occur, and more than 2000 hot springs are found on the island.

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## ***Cristobalite: Pseudo Quartz***

Quartz is a very plentiful mineral. It shows up in almost every mineral collection. Even beginning rock collectors quickly learn that quartz is hexagonal and has a simple chemical formula: SiO<sub>2</sub> or silicon dioxide.

But not all silicon dioxide is quartz. A number of polymorphs exist. These polymorphs have the same chemical composition as quartz but possess different crystal structures. Polymorphs of quartz include the minerals *coesite*, *stishovite*, *tridymite* and *opal* (which is amorphous).

Another polymorph of quartz is the mineral *cristobalite* (tetragonal SiO<sub>2</sub>). Cristobalite occurs in cavities in volcanic rocks such as obsidian and rhyolite. White “snowflakes” in “snowflake obsidian” are sprays of cristobalite crystals that crystallized out of the glassy obsidian matrix. It is even possible to break out spheres of cristobalite from the encasing obsidian.

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## ***Josephinite: A Rock Out of the Core?***

In the streams of Josephine County, southwestern Oregon, nuggets occur which are predominantly composed of nickel-iron. Known as josephinite, this material is more properly termed a rock rather than a mineral. Studies have shown that in addition to being made up of more than one nickel-iron alloy mineral, josephinites can also contain andradite garnets, iron-cobalt alloy minerals, iron-nickel arsenide and iron-copper-nickel sulfide minerals. Masses up to 100 pounds have been found but small nuggets are more common.

Even more fascinating than the composition of these nuggets are the controversial theories for their origins. One theory claims that josephinites resulted from reductive desulfurization during metamorphism – in other words, that they were produced from iron-nickel sulfide minerals. Evidence for this theory is based on josephinite mineral textures. Another theory claims that the nickel-iron was derived from deep in the Earth’s mantle, perhaps from the core-mantle boundary or even the outer core itself. The nickel-iron could have been carried upward by plastic flow of rock within the mantle, then obducted upward through the crust. Although some critics have derided this theory, other researchers have discovered that josephinites have excesses of the isotopes helium-3, neon-21, and xenon-129. This has been interpreted as support for the idea that josephinites came out of the Earth’s mantle. Thus, they could be the “deepest” rocks ever brought up the Earth’s surface and perhaps the only available samples of the materials making up the Earth’s core.

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# August

# 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2 Metalcraft 1:30p	3	4	5 Gemcraft 7:00p	6	7	8 Field Trip 8:00a
9	10	11	12 Gemcraft 7:00p Faceteers 7:00p	13 Metalcraft 6:30p	14	15
16 Metalcraft 1:30p	17 Beaders 6:30p	18	19 Show Mtg 6:00p <b>Meeting 7:00p</b>	20	21	22
23	24	25	26 Gemcraft 7:00p	27 Metalcraft 6:30p	28	29
30	31					

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