

MNCA Website [dcmicrominerals.org](http://dcmicrominerals.org)  
**The Mineral Mite**



Vol. 47 – No. 2

Washington D.C. – A Journal for Micromineralogists February 2014

**Meeting: February 26 Time: 7:45 p.m. – 10 p.m.**

**Long Branch Nature Center, 625 S. Carlin Springs Rd. Arlington, VA 22204**

**Program: How many specimens can you fit on the head of a pin?: How to mount sub-millimeter size specimens or how I reinvented the wheel.**

Eric Grundel, MNCA member since 1970s will demonstrate his homemade apparatus (=reinventing wheel) which allows him to mount sub-millimeter size specimens as small as 0.05 mm (?0.002 in). How the device was made will be explained, with the aim of encouraging others to make one for themselves. Those in attendance will be given the opportunity to try the device.



Such small pieces are 1-2 orders of magnitude smaller than normal micromount specimens. Such tiny specks represent significant challenges to all steps of the micromounting process. One has to learn new ways of doing things in order to make a good mount. I am still trying to make good ones.

It depends on the pin and the specimens. The best I have done so far is six but I suspect in the right hands dozens!



**Come and explore a new frontier in micromounting with Eric Grundel.**

**President's Message:**

By: Dave MacLean



Thanks to foresight and quick action by Kathy Hrechka, our conference chairperson that we have a committed place for our conference 4-5 April. Our new place is the Springhill Suites by Marriot in Alexandria, VA on Route 1 just south of the Beltway. Parking is easily accessible to the meeting room and lots of restaurants nearby. We need volunteers to sign up in two of our slots to demo micromineralogy at the CLMSMC show at the Montgomery County Fairgrounds in Rockville, MD 10AM to 6PM Saturday 15 March and 11AM-5PM Sunday 16 March. I ask approval of the MNCA 2014 budget which is deferred from our snowed out January meeting.

**Photo of the Month**



**Austinite**,  $\text{CaZn}(\text{AsO}_4)(\text{OH})$ , from the type locality, Gold Hill Mine, Deep Creek Mountains, Tooele County, Utah. Field of view = 4 mm. The overall specimen is 26 mm x 20 mm x 14 mm, and features at least 10 Austinite crystal groups. This striking specimen will be available for bidding at the upcoming Atlantic Micromount Conference auction.

## Micromineralogists of the National Capital Area, Inc.

### Previous Meeting Minutes: 1/22/14

By: George Reimherr

Our meeting was cancelled due to weather.

### Previous Program Reviewed 1/22/14

Our meeting was cancelled due to weather, so Eric Grundel has been rescheduled for February 26 meeting.

### MNCA Atlantic Micromounters Conference News April 4-5, 2014

By Kathy Hrechka, Conference Chair

The 41<sup>th</sup> Atlantic Micromounters Conference is scheduled for Friday evening 6-9 pm, and 8:30 am - 9 pm on Saturday at the Spring Hill Suites by Marriott in Alexandria, VA. Our featured speaker will be Joe Marty from Salt Lake City, Utah.. We will discuss pending conference details at our next meeting. Conference registration is in this month's Mineral Mite.

### Call for Micromineral Donations

By Michael Pabst

**Members of MNCA: Please don't forget to donate some specimens to the auction at the upcoming Atlantic Micromount Conference on April 4-5 in Alexandria.** Cynthia Payne has donated 20 beautiful specimens, and Michael Pabst has donated 8 specimens, one of which is shown below, and another of which is the Photo of the Month. **Please bring your donations to Michael Pabst, at either the February 22 Field Trip at James Madison University, or at the regular February 26 meeting at Long Branch Nature Center.** It is important that the photography and descriptions are completed soon. Thank you for your support of our Atlantic Micromount Conference.



**Kinoite**,  $\text{Ca}_2\text{Cu}_2(\text{H}_2\text{O})_2[\text{Si}_3\text{O}_{10}]$ , and Apophyllite,  $\text{KCa}_4(\text{Si}_8\text{O}_{20})(\text{F},\text{OH})\cdot 8\text{H}_2\text{O}$ , from the Christmas Mine, Banner District, Gila County, Arizona. Field of view = 2 mm.

**Micromineralogists of the National Capital Area Meeting:** The 4th Wed. of each month 7:30 -10 p.m.  
(Except Easter & December)

Long Branch Nature Center,  
625 S. Carlin Springs Road, Arlington VA 22204

**MNCA Purpose:** To promote, educate and encourage interest in geology, mineralogy, and related sciences.

President: Dave MacLean, dbmaclean@maclean-fogg.com

Vice President: David Fryauff

Secretary: George Reimherr, greim@cox.net

Treasurer: Michael Pabst Michaeljpabst@yahoo.com

Editor: Kathy Hrechka, kshrechka@msn.com

The society is a member of:

\* Eastern Federation of Mineralogical and Lapidary Societies

(EFMLS) [www.amfed.org/efmls](http://www.amfed.org/efmls)

\* American Federation of Mineralogical Societies (AFMS) [www.amfed.org](http://www.amfed.org)

## 2014 Dues are Due

**Dues:** MNCA Membership Dues for 2014

\$15 (single) or \$20 (family)

**Payable to MNCA**

**Michael Pabst**

**270 Rachel Drive**

**Penn Laird, VA 22846**



**Editor's**

**Notes:**

**Kathy Hrechka**



Each month I will feature a club member's original article. Also, if you enjoy a particular article in an electronic form, forward it to me to be included in the next Mineral Mite. Photos are great too.

**Club Article Deadline is 10<sup>th</sup> of each month.**

**The Mineral Mite will be emailed on 15<sup>th</sup>.**

**AFMS Editors Award  
First Place 2011 - Mini Bulletins**



**Feb. Articles:**

\* Michael Pabst

\* Kathy Hrechka

\* Rob Clemenzi

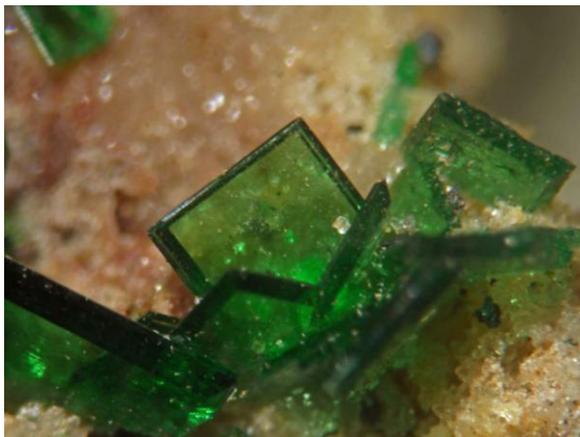
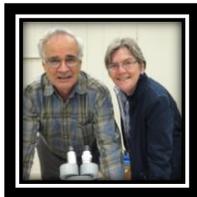
\* Tom Tucker



## Torbernite and Autunite

By Michael Pabst

As a micromineral enthusiast, I am occasionally forced to admit that a big mineral specimen can be beautiful. Among uranium minerals, larger specimens of Cuprosklodowskite and Torbernite have prompted feelings of envy and financial inferiority. The stunning deep green crystals of Torbernite from Musonoi, Katanga, D R Congo, occur in gorgeous fist-size specimens that are as beautiful as any micromount. Luckily, little crystals of Torbernite are also beautiful, and they are available from many locations around the globe. We have seen Torbernite in the background with other uranium minerals featured in previous articles, for example, associated with Curite or Kasolite. Now we will put Torbernite in the spotlight.



**Torbernite** from Musonoi, Katanga, Shaba, D R Congo, *Field of view = 3 mm (top) = 1.5 mm (below)*



Torbernite,  $\text{Cu}(\text{UO}_2)_2(\text{PO}_4)_2 \cdot 12\text{H}_2\text{O}$ , is a member of the Autunite group of minerals. Members of this group often form plates with perfect basal cleavage, leading to the nickname “uranium micas”. Torbernite is tetragonal, and other tetragonal forms like bipyramids are also common.

Autunite itself is  $\text{Ca}(\text{UO}_2)_2(\text{PO}_4)_2 \cdot 11\text{H}_2\text{O}$ , and is orthorhombic. The crystal structure of this family allows for substitution of the cation  $\text{Ca}^{2+}$  with Cu, Ba, Mg, Fe, Ni, Al, etc.; and also for substitution of the phosphate group ( $\text{PO}_4$ ) with arsenate ( $\text{AsO}_4$ ). This substitution leads to dozens of similar minerals in the Autunite group. (For a list, look up Autunite group on [www.mindat.org](http://www.mindat.org).)

Once this family of minerals is removed from a damp mine, they tend to lose some water, resulting in them being named “meta”, as in Metatorbernite. Extensive loss of water can cause crystals to separate into sheets and to lose their transparency. Even nice transparent crystals, like those shown above from Musonoi, have probably lost some water. Partial dehydration and separation are evident in the Torbernite specimen from Mexico shown below. (My granddaughter Helen (age 8) thinks that this group of metatorbernite crystals looks like a dinosaur fossil skeleton. I did not see it until she mentioned it.)



**Metatorbernite** from Santa Cruz Mine, Level 2, Villa Matamoros, Chihuahua, Mexico. *Field of view = 12 mm.*

Big crystals of Autunite are known, and some cabinet specimens are impressive, but not really beautiful to my eye. However, little bright yellow autunite crystals are lovely. Autunite is famous for being strongly fluorescent as well as radioactive.

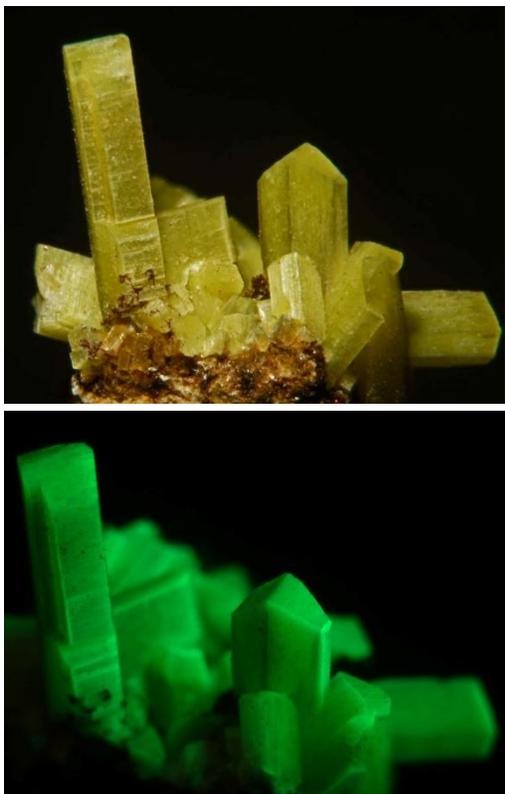
## Micromineralogists of the National Capital Area, Inc.

Many other members of the Autunite group are also fluorescent, although Torbernite is not. In the set of three pictures of Autunite below, the picture on the right, made with a mixture of visible and UV light, seems to be the most clear.



**Autunite** from Cunha Baixa Mine, Mangualde, Portugal. Fov = 3 mm. *Left: Halogen light, Middle: Long-wave UV, Right: Mixed Light.*

Other members of the Autunite family look similar to Autunite. Autunite is orthorhombic, Saléeite,  $\text{Mg}(\text{UO}_2)_2(\text{PO}_4)_2 \cdot 10\text{H}_2\text{O}$ , is monoclinic, and Nováčekite,  $\text{Mg}(\text{UO}_2)_2(\text{AsO}_4)_2 \cdot 12\text{H}_2\text{O}$ , is either triclinic or monoclinic depending on hydration, but it is hard to distinguish them visually when they occur as thin sheets. Like other members of the Autunite family, Saléeite can occur as prismatic crystals, as in the photo below.



**Saléeite** from Cunha Baixa Mine, Mangualde,

Two other members of the Autunite family that are hard to distinguish visually are Torbernite (a phosphate) and Zeunerite (an arsenate),  $\text{Cu}(\text{UO}_2)_2(\text{AsO}_4)_2 \cdot 12\text{H}_2\text{O}$ , which are both tetragonal.



**Zeunerite** from Majuba Hill, Pershing Co., NV. Field of view = 2 mm.

Uranospathite,  $(\text{Al}, \square)(\text{UO}_2)_2(\text{PO}_4)_2\text{F} \cdot 20(\text{H}_2\text{O}, \text{F})$ , is orthorhombic. In my specimen, the fluorescence seems weaker than that of Autunite. The picture with UV light on the right below is reminiscent of an X-ray; it appears to reveal a second mineral with stronger fluorescence in the bottom center.



**Uranospathite** from Vénachat, Compreignac, Haute-Vienne, France. Field of view = 1.5 mm. *Right: Long-Wave UV.*

## Torbernite and Autunite continued

Lack of fluorescence alerted me to a possible misidentified mineral that was labeled Uranocircite,  $\text{Ba}(\text{UO}_2)_2(\text{PO}_4)_2 \cdot 10\text{H}_2\text{O}$ . Uranocircite is known to be fluorescent, but the specimen in question does not show any trace of fluorescence. So, what is the unknown radioactive mineral that looks like Uranocircite, but is not fluorescent? Or is it possible that some genuine samples of Uranocircite are not fluorescent? Visually, the non-fluorescent "Uranocircite" resembles some specimens of Carnotite,  $\text{K}(\text{UO}_2)_2(\text{VO}_4)_2 \cdot 3\text{H}_2\text{O}$ , which is not fluorescent. Phosphuranylite,  $(\text{H}_3\text{O})_3\text{KCa}(\text{UO}_2)_7(\text{PO}_4)_4 \cdot \text{O}_4 \cdot 8\text{H}_2\text{O}$ , is another possibility. Or Sabugalite,  $\text{HAl}(\text{UO}_2)_4(\text{PO}_4)_4 \cdot 16\text{H}_2\text{O}$ . If anyone has a guess or opinion, please let me know.



**Left: Uranocircite** (?) from Aveiro, Portugal. (radioactive, but not fluorescent). Field of view = 1 mm. (Photo by Pabst).

**Right: Carnotite** from Oljeta Mesa, Goulding, Monument Valley, San Juan Co., UT. Field of view = 0.6 mm. (Small detail from a photo by Stephan Wolfsried, [www.mindat.org](http://www.mindat.org), photo ID 169483).

**Just a final note : If anyone has a specimen that they would like to have me try to photograph, please feel free to ask me. And if anyone has an idea or the specimens for an article that they would like write, with or without my help with writing or photography, please feel free to contact me and contribute an article. Also please don't forget to send Kathy pictures for the Photo of the Month. In the meantime, I have more articles about secondary uranium minerals in progress.**

## Field Trip: 2/22/14 8:30 am - 3pm Dr. Lance Kearns - Mineralogy Laboratories and Museum at James Madison University

By Tom Tucker



Dr. Lance Kearns has again invited the MNCA Micromounters along with the Northern Virginia Mineral Club and the DC Mineral Club - to visit the mineralogy labs and the fabulous mineral museum at James Madison University, in Harrisonburg, Virginia. We'll "pass the hat" so everyone will have an opportunity to make a small donation to the mineralogy department.

The Museum alone is worthy of a trip to Harrisonburg, being the finest collection of minerals in the entire State. There are a dozen or so large wall cabinets filled with minerals from around the world, but with an obvious emphasis on Virginia specimens, like the turquoise from Lynch Station, or apophyllite from Centreville or aragonite from Buchanan. After your visit I'm sure you will have selected your own favorites. There is also a small room with a stunning fluorescent mineral display.

Lance will be available to identify those unknown specimens you have accumulated over the years. The mineralogy labs are in the Geology Department which is in Memorial Hall ( the former Harrisonburg High School building ), on South High Street. For a map of the campus go to the University website: [www.jmu.edu](http://www.jmu.edu), and at the upper right corner request "directions/map". On the index map, the Memorial Area is an inset at the upper right. Click the small map, and a detailed area map will appear.

If you plan to attend please go to Volunteer Spot <http://vols.pt/CjiR4z> -- and RSVP -- indicating the number in your party, so that we can let Lance know how many to expect for coffee and buns.

If you have questions - **RSVP**  
**Email:** [threedogtom@earthlink.net](mailto:threedogtom@earthlink.net)  
**Phone Tom at 540/280-7427**  
See you there, Tom Tucker



## 29.5 Carat Blue Diamond Discovered at the Cullinan Mine near Pretoria, South Africa

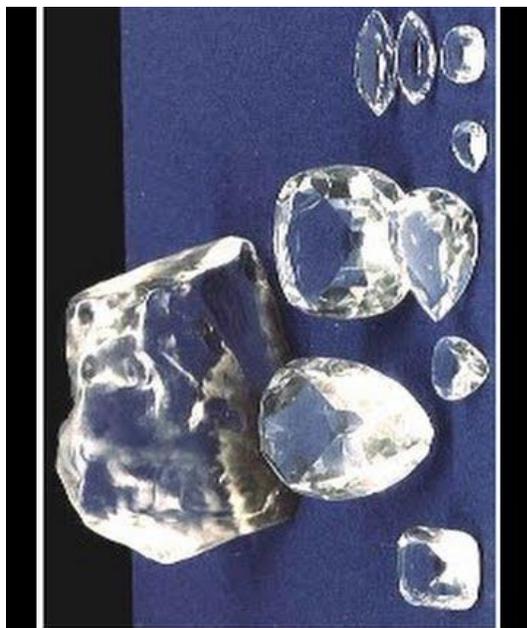
By Kathy Hrechka

On January 21, 2014, a miner discovered a 29.6 carat blue diamond, one of the rarest and most coveted in the world at the Cullinan mine near Pretoria, South African, owned by Petra Diamonds since 2008.



### History of the Cullinan Mine, formerly known as the Premier diamond mine:

On January 26, 1905, a 3,106 carat diamond was discovered accidentally by Thomas Cullinan, the owner of the Premier diamond mine. It was described as the largest rough gem diamond ever recovered in history, making it the largest ever gem-quality rough diamond to be discovered in the world. The diamond was named after Sir Thomas Cullinan.



The original 3,106 carat Cullinan Diamond has been cut into nine major stones, and ninety eight minor stones.

**Cullinan I** - The Star of Africa is the largest of the Cullinan diamonds, with a pear-shaped cut and weighing 530.20 carats.



On the orders of King Edward VII, the Cullinan I was mounted on the head of the Royal Scepter, and it is now on display in the Tower of London.



**The Cullinan II**, the lesser Star of Africa is the second largest Cullinan diamond, with a cushion shape, weighing 317.4 carats mounted on the band of the Imperial State Crown of Great Britain.



**The Cullinan III** weighing 94.40 carats has a pear-shaped cut and is mounted in the finial of Queen Mary's (Queen consort of King George V) Crown, but when required Cullinan III could be combined with Cullinan IV to form a pendant-brooch, and most of Queen Mary's portraits show her wearing this combination.



**Cullinan IV**, with a cushion-cut weighs 63.60 carats, and like the Cullinan III was originally mounted on Queen Mary's Crown, but as stated above, subsequently dismantled and combined with Cullinan III to form a brooch.



## Micromineralogists of the National Capital Area, Inc.

**Cullinan V**, with a triangular pear-cut or heart-shaped cut, weighs 18.80 carats, and also had a dual use, one as a piece of jewelry, mounted in a brooch or as the detachable center of the emerald and diamond stomacher of the Delhi Durbar Parure designed in 1911 for Queen Mary and the other to be worn in the circlet of her crown, as a replacement for the Koh-i-Noor.



**Cullinan VI** is a marquise-cut stone, with a weight of 11.50 carats. King Edward VII purchased the diamond and presented it to his Queen consort, Queen Alexandra, as a personal gift. Queen Alexandra got the Cullinan VI mounted in the front cross patee of her regal circlet.



**Cullinan VIII** 6.8-carat diamond is as its centerpiece in 1911. The combination came to be christened as the Cullinan VI & VIII Brooch.

**The Cullinan VII** is also a marquise-cut stone, weighing 8.80 carats. The permanent setting of the Cullinan VII is as an asymmetrical pendant to the Delhi Durbar Necklace.



**Cullinan IX**, with a pear-shape and weighing 4.4 carats. The cut employed on the diamond is a pear-shaped modification of the round brilliant-cut known as the pendeloque. The Cullinan IX was set in a platinum ring for Queen Mary 1911.



The nine main faceted and remaining Cullinan diamonds belong to the personal collection of Queen Elizabeth, and are displayed in the Tower of London's vault.

## Centenary Diamond discovered in 1986 at the Premier diamond mine

The Centenary diamond was the third-largest diamond ever recovered from Premier mine in South Africa, weighing 599 carats.



The discovery of the Centenary Diamond was announced in 1988 on the occasion of the mining giant's 100th anniversary celebration, under the ownership of De Beers Consolidated Mines. It was officially unveiled in May 1991, as a faceted heart-shaped diamond of 273.85 carats with an unprecedented 247 facets along with two flawless separate pear-shaped diamonds. The Gemological Institute of America has certified the diamond's color as D and its clarity as internally and externally flawless. The Centenary diamond was sold in June 2008, by De Beers.

Other notable diamonds found in the mine include a 25.5 carat Cullinan blue diamond, found in 2013, and a diamond found in 2008.

## Smithsonian Gem Collection 2013



Cullinan Blue Diamond Necklace / Brooch Premier mine (Cullinan mine), South Africa. This silver and gold Edwardian style necklace/brooch is highlighted by nine blue diamonds, weighing a total of 5.57 carats, including the 2.6 carat Cullinan Blue diamond. Sir Thomas Cullinan, then chairman of the Premier diamond mine gave this necklace to his wife, Anne, around 1905, to commemorate the gift of the largest diamond ever found - the 3,106 carat Cullinan diamond to King Edward VII of England. Smithsonian Gem Collection *Gift of Steven Silver, Steven Silver Fine Jewelry, Menlo Park, California.* Photographed by Kathy Hrechka

**Kathy's Personal Note about the Cullinan jewels:**

I had a unique opportunity to tour the Premier mine in 1991, with Erika and her micromounter husband Horst Windisch in Pretoria. The mine had just unveiled the Centenary diamond, so security was tight. Even though I could not go collecting in or by the mine, my eyes were on high alert for any sparkle on the ground everywhere we walked.

It was this trip that inspired me to begin a micromount collection of diamonds. Once home, I managed to purchase a diamond from the Premier mine.



**Diamond**, Premier mine, Pretoria, South Africa  
Photomicrographer, Kathy Hrechka fov 10x

Christmas in 2009, our family went to London to visit the queen. We admired her personal jewelry collection at the Tower of London.



Source <http://www.internetstones.com/cullinan-diamond-famous-jewelry.html>. / Reuters

**Geology in the News:**

By Robert Clemenzi

Small asteroid slams into Mars, impact captured by orbiter. Perhaps planetary accretion is still occurring? A reminder that the universe isn't always friendly. A spectacular image of impact crater follows.

From NASA JPL



A dramatic, fresh impact crater dominates this image taken by the High Resolution Imaging Science Experiment (HiRISE) camera on NASA's Mars Reconnaissance Orbiter on Nov. 19, 2013. Researchers used HiRISE to examine this site because the orbiter's Context Camera had revealed a change in appearance here between observations in July 2010 and May 2012, bracketing the formation of the crater between those observations.

<http://wattsupwiththat.com/2014/02/05/small-asteroid-slams-into-mars-impact-captured-by-orbiter/>

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Check out MNCA new website

[www.dcmicrominerals.org](http://www.dcmicrominerals.org)

## Geology “Thin Section” Study at the Northern Virginia Community College, Annandale Campus 2/8/14

By Kathy Hrechka

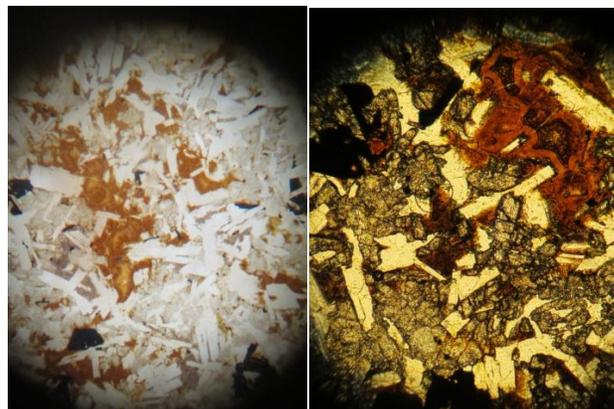
On Saturday, February 8 local mineral club members gathered for a lesson on “thin sections” at the NVCC Annandale campus. Under the direction of Professor Shelley Jaye, we were able to use polarizing microscopes to view a variety of thinly sliced rocks. John Weidner, lab technician taught some basic principles of polarization of rocks to us. He and Robert Cooke gathered a selection of thin sections for each of us to observe including biotite, hornblende, garnet, muscovite, quartz, and feldspar. Since I am a micromounter, I found this new study of rocks rather intriguing, as I enjoy using the microscope for studying my micro mineral collection. I found that the polarizing microscope is easy to use, while it takes geology to a new level of scientific instruction. Experimenting with my Cannon Power Shot camera I managed to photograph a few thin sections through the scope.



Photo - Steve Smith, Ti Meredith, Joan Karrie & David Wells

### Granite Thin Section:

Top - Left: Viewed through a microscope.  
Right :Viewed through a plane polarized scope.



Bottom - Left: Cross polarized view.  
Right: Wave plate added to cross polarized view.

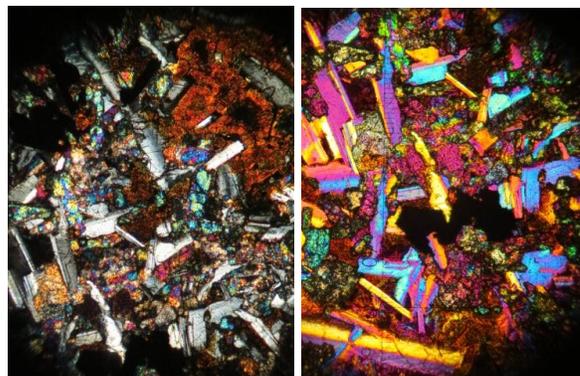


Photo - John Weidner, Professor Shelley Jaye

Photomicrographer - Kathy Hrechka fov 10x

Micromineralogists of the National Capital Area, Inc.



American Federation of Mineralogical Societies

(AFMS)  
[www.amfed.org](http://www.amfed.org)

**American Federation Show 2014**  
**July 9 – 13 Tulsa, Oklahoma**

**2014 Shows:**

**Eastern Federation**

March 29-30 Plymouth Mtg, PA

**Midwest Federation**

Oct. 18 - 19 Des Moines, IA

**Northwest Federation**

August 15-17 Hermiston, OR

**Rocky Mountain Federation AFMS**

July 9 - 13 Tulsa, OK

**South Central Federation**

Aug. 9-10 Baton Rouge, LA 2015

**2015 Shows:**

**Eastern Federation**

March 28-29 Hickory, NC

**Midwest Federation**

May 23 – 24 Wheaton, IL

**South Central Federation AFMS**

October 23-25 Austin, TX 2016

**Happy St. Valentine's Day**



Eastern Federation of Mineralogical and Lapidary Societies

(EFMLS)  
[www.amfed.org/efmls](http://www.amfed.org/efmls)

**Communication and Involvement**  
**Are the Keys to Our Success!**

**Eastern Federation Show 2014**  
**March 29 – 30 Plymouth Mtg. PA**

The 64th Annual EFMLS Convention & Show hosted by the Philadelphia Mineralogical Society & Delaware Valley Paleontological Society: LuLu Temple, Plymouth Meeting, Pennsylvania

**Geology Events:** By Matt Charsky

**February:**

**15** - MNCA Field Trip: Northern Virginia Community College Geology Lab- Thin Section Study 1pm - ?? . NVCC Little River Turnpike

**22** - MNCA Field Trip Dr. Lance Kearns - Mineralogy Laboratories and Museum at James Madison University, Harrisonburg 8:30 am - 3pm

**March:**

**1–2** 51st Annual Gem, Mineral and Fossil Show Delaware Mineralogical Society Newark, DE

**15-16** Gm, lapidary, and Mineral Society of Montgomery Co., MD Fairgrounds

**April:**

**4-5** Atlantic Micromounters's Conference Spring Hill Suites Alexandria by Marriott Rt. 1

**EFMLS WORKSHOPS AT WILDACRES**

Geology Retreat atop the Blue Ridge Mountains in North Carolina. Spring classes April 7 – 13, 2014 Fall classes September 1 – 7, 2014 Tuition is \$390. . EFMLS website <[www.amfed.org/efmls](http://www.amfed.org/efmls)>

**MNCA Weather alert:**  
**SNOW CONTINGENCY**

If schools in Arlington County are to be cancelled, or let out early, because of weather on the day of our scheduled meeting, we will have no meeting.

