



MNCA Website [dcmicrominerals.org](http://dcmicrominerals.org)

# The Mineral Mite



Vol. 51 – No. 4

Washington D.C. – A Journal for Micromineralogists

April 2018

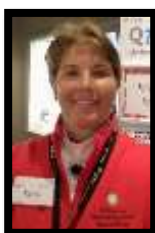
**Atlantic Micromounter's Conference – Herwig & Belgian Chocolates pp. 9-12**

**April 25 Time: 7:30 pm – 10 pm**

**Long Branch Nature Center, 625 S. Carlin Springs Rd. Arlington, VA 22206**

## **Program: Smithsonian's Mineral Treasures of the Mineral Science Department**

Presenter, Kathy Hrechka, editor



Kathy will take you behind the scenes of the Mineral Sciences Department, as well as her favorite exhibits in the Geology, Gems, and Mineral galleries. Micro Workshop to follow.

## **President's Message:**

By Dave MacLean



Thank you for all who helped at our demo of micro mineralogy at the Gem Lapidary Mineral Society of Montgomery Co. GLMSMC show on March 17-18. We attracted an eager crowd of more than half children who like to look through a loupe or microscope. One person belonged to a micro mineral group in Cleveland.

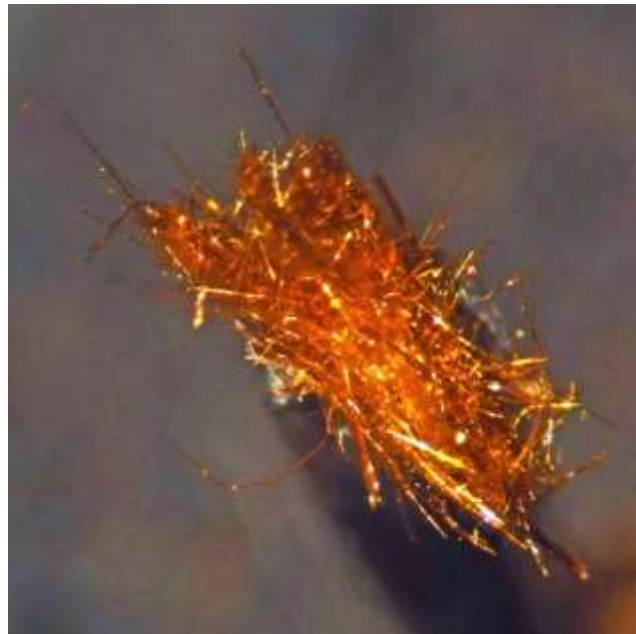
Thank you, Bob Cooke who brought the equipment, to demo at the Sangster Elementary School, Fairfax Station PTA science fair on 15 March. A lot of eager children and parents "oohed and ahed" over the crystals as seen through a loupe or microscope.

Our annual Midatlantic Micromounters' Conference comes up Evening Friday 6 April and all-day Saturday 7 April at the Holiday Inn, 6055 Richmond Highway (US Route 1) Alexandria, VA. We will need help on setup Friday afternoon and Saturday afternoon. I am eager to hear our speaker Herwig Pelckmans, president of the Mineralogical Society of Antwerp, Belgium.

\*\*\*\*\*

**Ludlockite** is  $\text{PbFe}^{3+}_4\text{As}^{3+}_{10}\text{O}_{22}$ . This tiny specimen has superb orange-red color, but it is not on matrix. Ludlockite is triclinic, with a silky luster. Tsumeb is the type locality. Ludlockite is rare, and usually commands a ridiculous price. I have looked at thousands of specimens, selecting goodies for the auction, but I have come across only this one specimen of Ludlockite. The lucky winner of this specimen was Karen Pabst.

## **Photo of the Month**



**Ludlockite**, Tsumeb, Namibia. FOV 2 mm.  
Photomicrography by Michael Pabst

This specimen of Ludlockite from Tsumeb, Namibia was featured at the Auction at the Atlantic Micromounters Conference on April 6-7, 2018.

## Micromineralogists of the National Capital Area, Inc.

### Previous Meeting Minutes: 3/28/18

By Bob Cooke, Secretary

President Dave MacLean convened the meeting at 7:45 PM. No past presidents were present. Members present were: Michael and Karen Pabst, Dave Hennessey, Barry Remer, Kathy Hrechka, Bob Cooke, Dave Fryauff and Dave MacLean. The President welcomed guest Ken Rock.



The President

Kathy Hrechka discussed the upcoming (April 6/7) Atlantic Micromounters Conference at the Holiday Inn Express in Alexandria, VA. There are 23 confirmed reservations. Al Pribula and Rob Rothenberg will have vendor tables. It is uncertain whether Andy Dietz will be able to attend and be a third vendor. Kathy reviewed work assignments. MNCA will have access to the Holiday Inn conference room all day Friday; Kathy suggested members come as early as 2 PM to begin setup.

It was noted that MNCA sales of micromounts might be unfair competition to the vendors. Members agreed that club materials would not be displayed for sale until after both of Saturday's auctions.

MNCA loupes are an entry-level product suitable for sales at mineral shows and are not of the quality desired by AMC attendees. However, MNCA loupes will be available at AMC if they should be needed. Meeting adjourned at 9 PM.

#### Membership Dues: 2018

Single = \$15. Family = \$20.

Payable to MNCA - Michael Pabst, Treasurer  
270 Rachel Drive Penn Laird, VA 22846

### Previous Program Reviewed: 3/28/18

By Bob Cooke

The evening's feature program was a presentation originally given by Michael C. Michayluk at the Tucson Mineral Show on "Exploring the Minerals of Wind Mountain: An Alkaline Intrusion near the Border with Texas." Michael kindly provided Dave Fryauff a copy and authorized its presentation to MNCA members.

### Osarizawaite

By Dave Hennessey



At our last club meeting I came home with a box of micromounts labeled "O2". I think there was an O1 box that went home with somebody else. Since the minerals were in alphabetical order, the person with the O1 box no doubt got the obertite, odenite, ogdensburgite, ohmilite, ojuelaite, and okenite. In my O2 box there was olivenite, olivine, orpiment, osumilite, otrellite, owheeite, and a mineral called osarizawaite. Actually, there were 15 micromounts of osarizawaite in the box! So, what is osarizawaite? I'd never heard of it. Time for my usual strategy – a visit to my old friends "Mindat" and "Google" to learn more.

Osarizawaite is a relatively rare lead copper aluminum sulfate hydroxide, with the formula  $PbCuAl_2(SO_4)_2(OH)_6$ . It was first described in 1961, found in the oxidized zone of the Osarizawa Mine, Akita Prefecture, Honshu Island, Japan. Work at the mine began in the year 708AD, initially seeking gold; however, over the centuries the mine thrived because of its extensive copper deposits. It closed for mining in 1978, due to a depletion of the minable minerals and slumping prices but continues to operate today as a tourist attraction.

Obviously, the mineral name osarizawaite came from the name of the mine where it was originally found. However, all 15 specimens in the O2 box are from the Silver Hill Mine, Pima County, Arizona. Per Mindat, the Silver Hill Mine was a small underground Cu-Ag-Pb-Au mine group. Mineralization is a replacement deposit with lensing veins and some limestone replacements containing copper and lead carbonates and sulfides along faults and fractures in Paleozoic limestone and quartzite. Workings include one shaft 400 feet (121.92 meters) deep, one drift 300 feet long, and one 100-ton ore bin. Originally prospected in the late 1800's and worked sporadically from 1916 to 1947, the mine produced at least 16,000 tons of ore averaging about 3.5% Cu, 3.5 oz. Ag/T, 0.6% Pb and minor Au.

Osarizawaite crystallizes in the trigonal system and specimens from the type locality are yellow-green. In contrast, specimens from the Silver Hill Mine are more of a blue-green color. Continued next page

### Osarizawaite continued

They are minute tightly-packed crystal clusters, and very aesthetic. All 15 specimens in the O2 box are extremely attractive. One of the specimens also has nice cerussite crystals and another has both cuprite and native copper. Please do a search and take a look at the osarizawaite pictures available on Mindat. I think you'll like them. And if you don't have an osarizawaite in your collection, come see me. I have about a dozen to trade!



Osarizawaite Honshu Island, Japan @ mindat

### Gems and Minerals of the Bible

(New King James Version)

By Kathy Hrechka

Rocks, minerals, metals and gemstones have always played an important role in the lives of humans. Even before recorded history began, they were being used for tools and decorative purposes. They also played an important role in the lives of the Children of Israel and in lessons taught by writers in both the old and new testaments. The following are highlights of those Biblical references.

**Gems of New Jerusalem:** Revelation 21:18 - 20

**v18:** "The construction of its wall was of **jasper**: and the city was pure **gold** like clear glass.

**v19:** "The foundations of the wall of the city were adorned with all kinds of precious stones: The first foundation was **jasper**, the second **sapphire**, the third **chalcedony**, the fourth **emerald**,

**v20:** the fifth **sardonyx**, the sixth **sardius** (ruby), the seventh **chrysolite** (peridot), the eighth **beryl**, the ninth **topaz**, the tenth **chrysoprasus** (quartz), the eleventh **jasinth**, and the twelfth **amethyst**."

Adapted from website

<http://www.rocksandminerals.com/bible/bible.htm>

**Note from Kathy in the Smithsonian's Geology, Gem & Mineral Gallery:** I encountered two guests

seeking all the minerals listed in Revelations 21: 18-20. Together, we found each mineral, which was quite the adventure. While volunteering, I presented "Periodic Table of Elements in a Smart Phone" on a cart within the gallery.



**Micromineralogists of the National Capital Area, Inc.**

Geology club  
Meetings 4th Wed monthly: no July/Aug  
7:30 pm - 10pm  
Long Branch Nature Center  
625 S. Carlin Springs Road  
Arlington, VA 22206  
\* Spring Symposium

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



## Hübnerite

By Michael Pabst PhD

Perhaps the prettiest tungsten mineral is Hübnerite, which is manganese tungstate  $MnWO_4$ . Hübnerite is the manganese end-member of the Ferberite- Hübnerite series. Like Ferberite (described in last month's article), Hübnerite is monoclinic  $2/m$ , but its beta angle is slightly more than  $90^\circ$  ( $\beta = 91.18^\circ$ ), so unlike Ferberite with  $\beta = 90.0^\circ$ , we don't have to explain why Hübnerite is monoclinic. Visually, though, large thick "black" crystals of Hübnerite can be hard to distinguish from Ferberite. Luckily, micromount crystals of Hübnerite are easy to spot by their red color.

My first specimen of Hübnerite comes from the Silverton District of Colorado. This is one of my bigger rocks, and it is covered with delicate Hübnerite crystals. In the second photo, I zoomed into one group of crystals to show the nice red-brown color.



**Hübnerite** from Adams Mine, near Silverton, San Juan County, Colorado. Macro lens, stack of 6. FOV 100 mm. Photo by Michael Pabst.



**Hübnerite**, closeup of preceding specimen, taken with stereomicroscope, stack of 22. FOV 8 mm. Photo by Michael Pabst.

My second specimen of Hübnerite comes from the famous Sweet Home Mine in Colorado, which is the source of the famous Rhodochrosites. This specimen features a pale green Fluorite crystal next to a blade of dark red Hübnerite.



**Hübnerite** and Fluorite (light green) on Quartz, Sweet Home Mine, Alma, Park County, Colorado. Stack of 5 taken with macro lens. FOV 13 mm. Photo by Michael Pabst.

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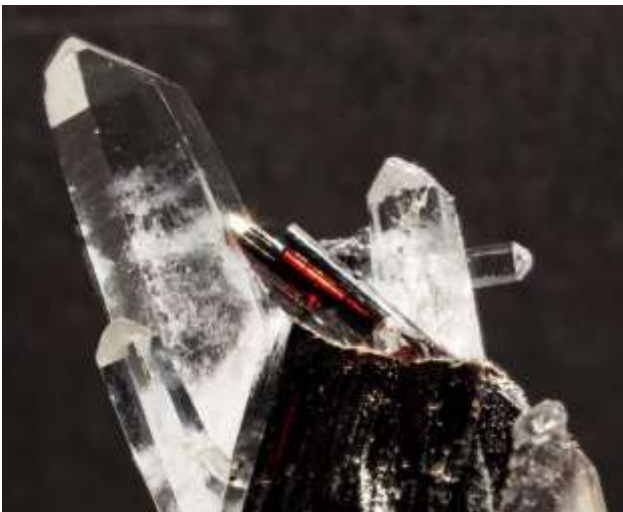
## Micromineralogists of the National Capital Area, Inc.

A third specimen is from the Silverton, Colorado area. I strongly illuminated this specimen so that the back lighting could show off the deep cherry red color.



**Hübnerite**, American Tunnel, Standard Mine, near Silverton, San Juan County, Colorado. Macro lens, stack 5. FOV 2 mm. Photo by Michael Pabst.

A fourth specimen from Silverton shows Hübnerite with some nice Quartz. The flare in the photo, where Hübnerite intersects the Quartz was unavoidable to illuminate the Hübnerite and show its red color.



**Hübnerite**, Yukon Mine, Silverton, San Juan County, Colorado. Macro lens, stack 25. FOV 16 mm. Photo by Michael Pabst.

My fifth and sixth specimens of Hübnerite come from the well-known Black Pine Mine in Montana. The next two photos are of different crystal groups, both from the fifth specimen.



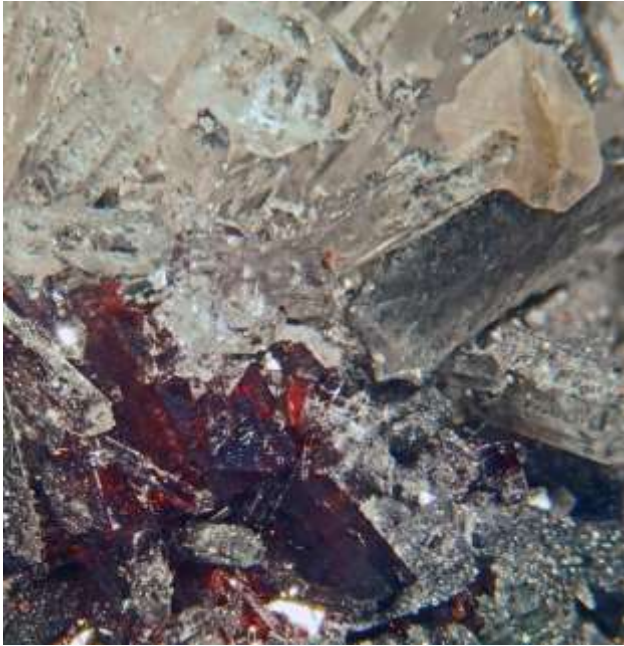
**Hübnerite**, Black Pine Mine, Philipsburg District, Granite County, Montana. Stereomicroscope, stack 12. FOV 4 mm. Photo by Michael Pabst.



**Hübnerite** and Quartz, Black Pine Mine, Philipsburg District, Granite County, Montana. Stereomicroscope, stack 17. FOV 8 mm.

Continued next page

The sixth specimen shows Hübnerite and Quartz associated with Stolzite (PbWO<sub>4</sub>). This is the same specimen illustrated in my recent article on Stolzite.



**Hübnerite** (red) and Stolzite (tan, upper right) with Quartz, Black Pine Mine, Philipsburg District, Granite County, Montana. Stack 16. FOV 6 mm.

There is an interesting photo on Mindat, showing blocky Stolzite crystals on an elongated Hübnerite crystal: [www.mindat.org/photo-851095.html](http://www.mindat.org/photo-851095.html).

There are 12 pictures of this combination of Stolzite and Hübnerite on Mindat, so this association is not rare.

Next month, we will look at one last tungsten mineral, Tungstenite.

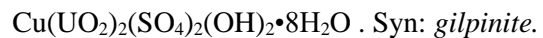
Editor's note: Michael is a regular contributing (federation award winning) writer for *The Mineral Mite*. He and his lovely wife Karen prepare and photograph microminerals for our Atlantic Micro-mounters' Conference each year. I am truly grateful for their contributions to our geology club.



### GeoWord of the Day and its definition:

**axial-plane cleavage** Cleavage that is, in the hinge of a fold, parallel to the hinge surface of the fold and whose intersection lineation with bedding is parallel to the fold hinge. Axial-plane cleavage may be everywhere parallel to the fold hinge surface, but normally cleavage fans or changes its orientation systematically with position about the fold. Cf: *bedding-plane cleavage*; *fan cleavage*; *transecting cleavage*.

**johannite** (jo'-han-nite) A secondary green or yellowish-green triclinic mineral:



All terms and definitions come from the

[Glossary of Geology, 5th Edition Revised](#).

GeoWord of the Day is brought to you by: Rayfract! Check them out at [rayfract.com](http://rayfract.com).

### Microminerals 101 with Bob & Dave

By Bob Cooke, Secretary

MNCA club members, Bob Cooke and Dave MacLean set up a stereo microscope with micro minerals for students to view at the Sangster Elementary School PTA Science Fair in Burke, VA on March 15. Photo courtesy of Bob Cooke



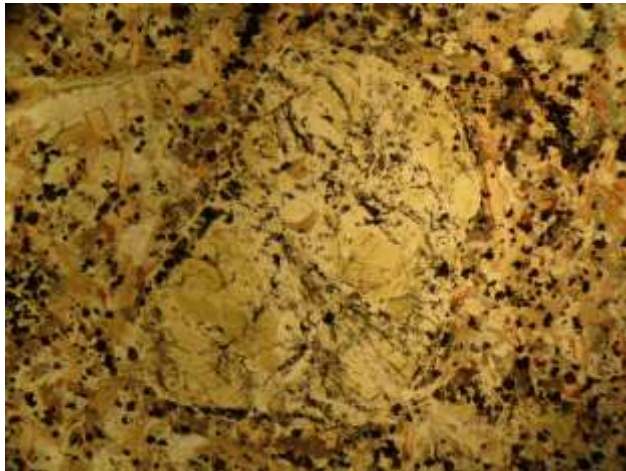
**NOVA's Thin Section Field Day**

By Kathy Hrechka, Editor

On March 24, local geology club members gathered at the Annandale campus of Northern Virginia's Community College to study geo "thin section" identification with John Weidner. As we entered the geology lab, John introduced us to polarizing microscopes, along with a wide selection of rock and mineral thin sections, which he chose for us. First, we viewed the samples with regular lighting, then polarized lighting. I photographed some of my favorites for this article. I hope you like them too.



My favorite; **Actinolite Schist** polarized lighting



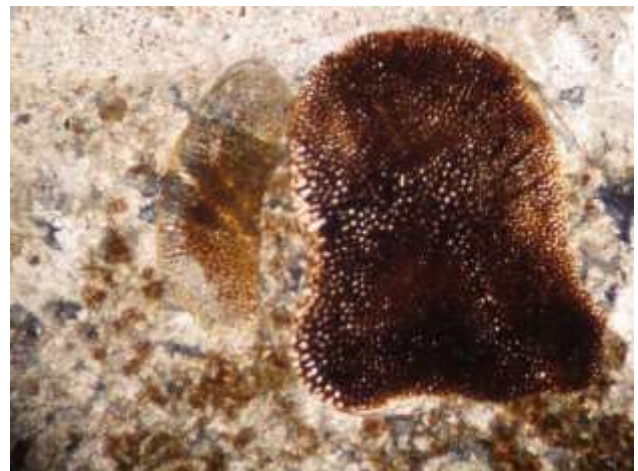
**Peridotite**, igneous ultra mafic



**Peridotite** under polarized light

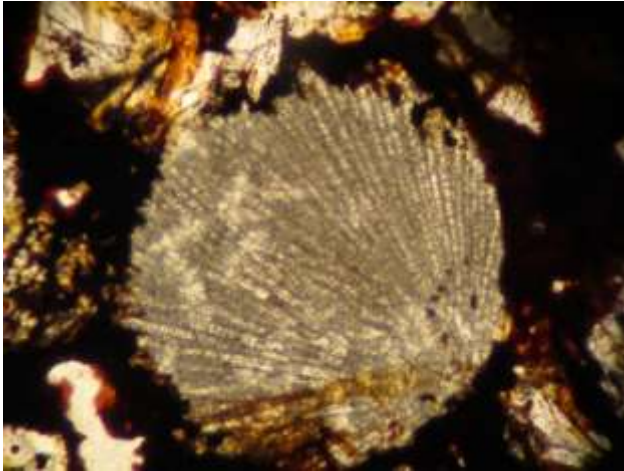


**Fossil**

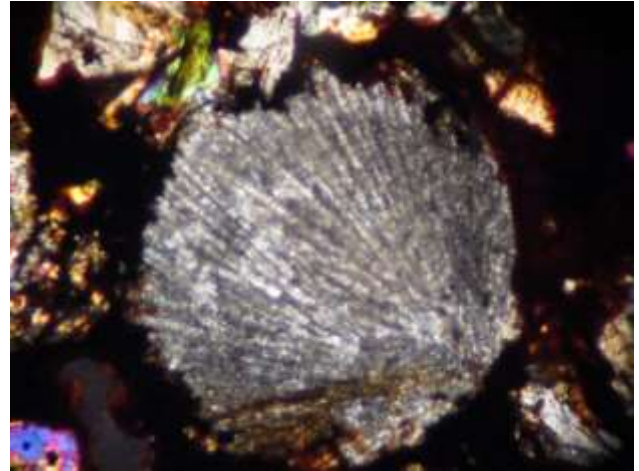


**Fossil** under polarized light

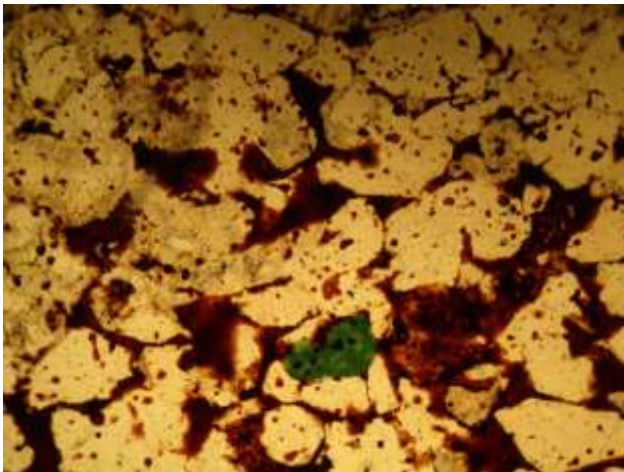
**Micromineralogists of the National Capital Area, Inc.**



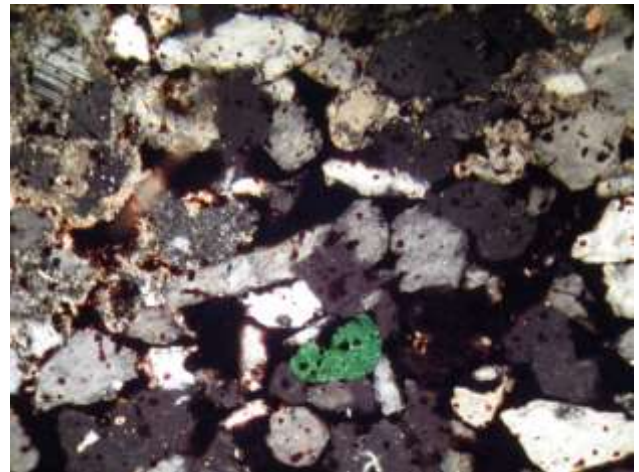
**Meteorite** ordinary stone - chondrite



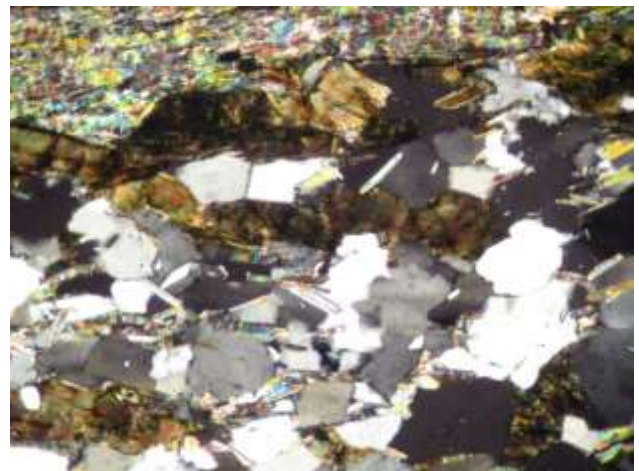
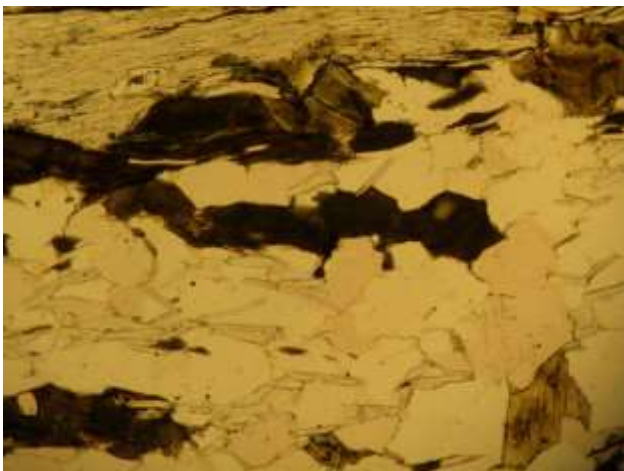
**Meteorite** under polarized light



**Bituminous Sandstone**, sedimentary sandstone



**Bituminous sandstone** under polarized light





## 45<sup>th</sup> Annual Atlantic Micromounters' Conference Review #I: April 6-7, 2018

By Dave MacLean, President

**Featured speaker; Herwig Pelckmans from Antwerp, Belgium: “Belgium and Mineralogy”**

Herwig Pelckmans, president of Mineralogical Society of Antwerp (Mineralogische Kring Antwerpen MKA) and retired data base administrator described his experience related to minerals, Belgium, its geology, and mineralogy.

After reading a comic book story on the origin of earth, Herwig became intensely interested in fossils. He found whale bones in the Tertiary sediments of northern Belgium. His interest shifted to minerals. After getting his degree in geology at the University of Ghent, he served in the army as a data base administrator until he retired.

Belgium is one of the Benelux countries Belgium, Netherlands, and Luxembourg, the “low countries”. The Benelux countries are flat with the highest elevation of 693 meters (m) in Belgium. The North half of the country is underlain by tertiary unconsolidated sediments; clay, sand and silt. The south half is underlain by mainly Devonian shale, limestone, and sandstone with a few magmatic intrusions in the central areas. There are some places with low grade weakly metamorphosed rocks.

291 minerals have been found in Belgium. He described and showed macro and micro photographs of minerals with their localities such as a 30 cm quartz crystal group from the Bastogne area, calcite, 0.3-gram gold nugget from Luxembourg province, cacoxenite, turquoise and amethyst scepters from Luxembourg province. 19 Belgian minerals including willemite, ferristrunzite, koninckite and fraipontite, are from “type localities” since they were first found in Belgium.

Herwig described the work of 19<sup>th</sup> and 20<sup>th</sup> century Belgian mineralogists/geologists. Guisepe Cesaro 1849-1939, a self-taught mineralogist and appointed a professor at the University of Liège, described cornetite.

In the 1870's King Leopold of Belgium conquered the Congo (now the Democratic Republic of Congo DRC) as his personal possession recognized in 1880 by the USA as the Congo Free State until 1904. The province of Katanga in the SW DRC is very rich in minerals including many varieties of copper, cobalt, and uranium minerals.

Almost all the geologists in Katanga worked for Union Minière. Herwig described the work of mineralogists in Katanga including and not limited to Henri Buttgenbach 1874-1964 who wrote *Les Minéraux de Belgique et du Congo Belge* and Alfred Schoep 1881-1966 who described kasolite.

Herwig listed information sources on Belgian and Belgian Congo now DRC minerals:

\*Malaise, Manuel de Minéralogie Pratique, four editions (1834 to 1916)

\*Buttgenbach, *Les Minéraux de Belgique et du Congo Belge* with about 150 mineral descriptions for Belgium, 1947

\*Melon et al., *Les Minéraux de Belgique*, 1976

\*Hatert et al., *Les Minéraux de Belgique*, 2<sup>nd</sup> edition, 2002

\*Detaille & Van Eerdenbrugh, *Chercheurs d' Or en Belgique*, 2014

The most important on-line information source on Belgian minerals is the monthly magazine *Geonieuws* published by the Mineralogical Society of Antwerp MKA. Issues that are six years or older can be downloaded for free at

<http://www.minerant.org/MKA/GN-digitaal.html>

The magazine (in Dutch) is also searchable by keyword(s) on the same page, and the thematic index is found on <http://www.minerant.org/MKA/GN-index.html>. Translating to English is easy using Google Translate.

The 50<sup>th</sup> anniversary issue of the magazine, dedicated to the minerals of Belgium, was translated in English for the many international friends of the MKA. A digital copy can be downloaded for free here: [www.minerant.org/download/mineralsbelgium.pdf](http://www.minerant.org/download/mineralsbelgium.pdf)

*The following conference photos are courtesy of Hillar Ilves, Mark Kucera, and Kathy Hrechka.*

## Micromineralogists of the National Capital Area, Inc.

### 45<sup>th</sup> Annual Atlantic Micromounters' Conference – Herwig Pelckmans & Belgian Chocolate Memories

By Kathy Hrechka, Conference Chair & Editor

Herwig Pelckmans, President of the Mineralogical Society, Antwerp, Belgian delighted our attendees with four amazing talks, along with a sweet distraction of hand delivered, Leonida chocolates from Belgian.



Herwig's topics included; Belgium and Mineralogy, The Many Faces of Fluorite, The Unknown Mineralogist, and Topaz and Friends. We valued the extensive research which was apparent in each of his presentations. Dave MacLean is detailing each program for The Mineral Mite. The first talk is published in this edition. The other talks will follow in the May and June editions.



I wish to thank our club members for their dedicated efforts to make our conference memorable.

**Dave MacLean** – registration table, auctioneer

**David Fryauff** – manage club & freebie table

**Bob Cooke** - Purchase food, etc., secure electrical cords, food service prep; homemade bread, deviled eggs, and brownies

**Karen Pabst** - food service prep, assist auctions, accounting assistant

**Michael Pabst** - Silent & live auction photos, auction designer, auctioneer

**John Kress** – luncheon service

**Dave Hennessey** – secure electrical cords, cashier silent & live auction, accountant

**Carolyn Weinberger** - technology support

Dealers: Al Pribula, Bob Rothenberg, & Jim Prentiss

**Herwig Pelckmans - Belgian chocolates for all!**

Attendees: thank you for joining us. If it weren't for you, we wouldn't be able to share our geo hobby.

Saturday evening, four attendees from Pennsylvania supported me in presenting Herwig with three pounds of Hershey chocolates, "the finest chocolates in the world" to share with our new mineral friends in Belgium. Thank you, sincerely, Kathy



Micromineralogists of the National Capital Area, Inc.



Micromineralogists of the National Capital Area, Inc.



**MNCA Demonstrates Micromounting  
at GLMSMC Show on March 17-18**

By Kathy Hrechka, Editor

Our club members demonstrated our “art of micromounting” at the Gem, Lapidary, and Mineral Society of Montgomery County, Maryland’s 54<sup>th</sup> annual show in Gaithersburg. We captured the interest of all age groups, as they viewed minerals through the microscopes. Dave Fryauff designed a display featuring micromineralogists. MNCA Volunteers included Erich Grundel, Dave MacLean, Dave Fryauff, Dennis Hedrick, and Kathy Hrechka. Dave Hennessey was a participating dealer.



## Micromineralogists of the National Capital Area, Inc.



**American Federation of  
Mineralogical Societies**

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



**Eastern Federation of  
Mineralogical Societies**

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

### **AFMS Purpose: 2018**

Purpose of the AFMS: To promote popular interest and education in the various Earth Sciences, and in particular the subjects of Geology, Mineralogy, Paleontology, Lapidary and other related subjects, and to sponsor and provide means of coordinating the work and efforts of all persons and groups interested therein; to sponsor and encourage the formation and international development of Societies and Regional Federations and by and through such means to strive toward greater international good will and fellowship.

The A.F.M.S. Newsletter is published monthly except January, July and August by the American Federation of Mineralogical Societies. Address corrections and changes Subscription Information, Distribution Questions: Each Regional Federation Club is entitled to receive three (3) copies of the AFMS Newsletter. These are usually sent to the President, Editor and Federation Director or Secretary.

Subscriptions are \$4.50 per year Remit payment to the AFMS Central Office Checks should be made payable to "AFMS"

Address maintenance and mailing labeling are the responsibility of the AFMS Central Office. All changes and questions should be sent to: AFMS Central Office Steve Weinberger PO Box 302 Glyndon, MD 21071-0302

<central\_office@amfed.org> 410-833-7926  
Content – Letters Editorial Comments – Submissions  
Any communication concerning the content or format of the newsletter should be sent to the Editor: Carolyn Weinberger PO Box 302 Glyndon, MD 21071-0302  
<editor@amfed.org> 410-833-7926

Deadline is the 1st of each month preceding publication (i.e. April 1 for the May issue)  
Material in this Newsletter may be duplicated for non-commercial purposes provided credit is given this publication and the aut

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

### **Geology Events:**

#### **April**

**21: Vulcan Manassas quarry trip** - Dave Lines of the So. MD club has invited us to join his group at the Vulcan Manassas quarry at 0715 sharp. Hard hats, steel toes, & eye protection are standard safety requirements for each person. Kids as young as 8 years old can join if they too have this personal protective gear and a parent/guardian is present. Please let me know if you are interested by this Wednesday, April 18<sup>th</sup> Cheers, Dave Fryauff  
Phone (240) 277-7206.

**23: Northern Virginia Mineral Club meeting**  
7:30–10pm Long Branch Nature Center,  
625 South Carlin Springs Road in Arlington, VA

**25: MNCA - Micromineralogists of the National Capital Area meeting** 7:30–10pm Long Branch Nature Center, 625 South Carlin Springs Road in Arlington, VA [www.dcmicrominerals.org](http://www.dcmicrominerals.org)

#### **May**

**19: 29th Annual Chesapeake Gem, Mineral, Jewelry & Fossil Show** 10 AM – 4 PM Attention New Location: Parkville Armory - Parkville, MD 3727 Putty Hill Ave. Parkville, Md. 21236 FREE ADMISSION - Top Mineral Dealers, Original Jewelry, Fossil Dealers, Rough & Cut Gemstones. Silent Auctions, Door Prizes, free minerals for kids.  
Directions: Take I-695 (Baltimore Beltway) to exit # 32- North (Rt. #1 Belair Rd). Proceed two traffic lights to Rossville Blvd. turn left and proceed to Putty Hill Ave. The Armory is on the Left.

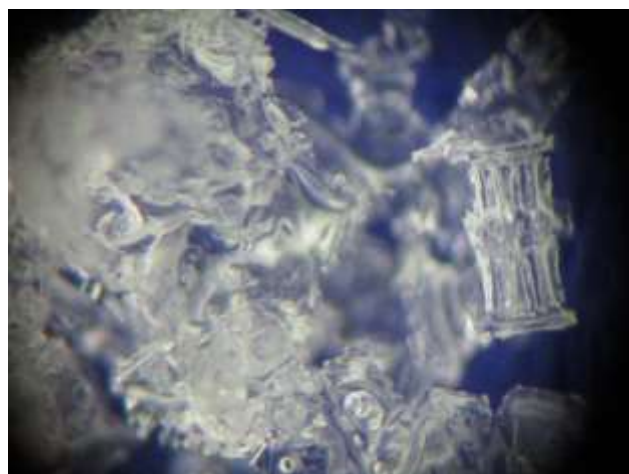
[www.chesapeakegemandmineral.org](http://www.chesapeakegemandmineral.org)

## Micromineralogists of the National Capital Area, Inc.

### Snow Crystals 2.0

By Kathy Hrechka

My last chance to photograph snow flakes was a rather desperate opportunity in Alexandria, Virginia on March 21. We had one last snow fall predicted to last for five hours. Even though the temperatures were above 32F, I decided to give it a try. I set up me scope on my front porch and listened to the quietness of snow-fall for about three hours, in anticipation for the perfect photo. I was in for a surprise. The high humidity delivered me an unexpected result, needles. By the way, melting snow crystals are also quite fun to watch under the scope.



**Micromineralogists of the National Capital Area Meeting:** The 4th Wed. of each month 7:30 -10 p.m.  
Long Branch Nature Center, (Except Easter & Dec.)  
625 S. Carlin Springs Road, Arlington VA 22204

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

Pres: Dave MacLean, [dbmaclean@maclean-fogg.com](mailto:dbmaclean@maclean-fogg.com)  
Vice Pres: David Fryauff, [fryauffd@yahoo.com](mailto:fryauffd@yahoo.com)  
Secretary: Bob Cooke, [rdotcooke@gmail.com](mailto:rdotcooke@gmail.com)  
Treasurer: Michael Pabst, [Michaeljpabst@yahoo.com](mailto:Michaeljpabst@yahoo.com)  
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**Editor's Note:**  
By  
**Kathy Hrechka**



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