

Nittany Mineralogical Society Bulletin

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

Editor (see page 8):

David C. Glick

February, 2016

Visit our web site: www.nittanymineral.org

February 17th meeting:

A Geological Tour of Hawaii

by

Dr. Charles E. Miller, Jr.

Our February meeting will be held Wednesday the 17th in room 114 (larger auditorium) of Earth & Engineering Sciences Building on the west side of the Penn State campus in State College, PA. Maps are available on our web site.

6:45 to 7:45p.m.: Social hour, refreshments in the lobby

7:45 to 8:00 p.m.: announcements, questions, answers

about 8:00 p.m.: featured program

The event has free admission, free parking, and free refreshments, and is open to all; parents/guardians must provide supervision of minors. Bring your friends and share an interesting evening!

Please come through the cold and snow to our February meeting. We will enjoy a presentation by Dr. Charles Miller on A Geological Tour of Hawaii, illustrated in part with photographs from his recent visit there. See the complete article with photographs on **pages 4-7**.



On the island of Hawaii, lava entering the ocean produces thin sheets of spatter known as "limu o Pele" (Pele's seaweed). Photo by T.J. Takahashi, U.S. Geol. Survey (public domain image) 2/10/88, TT028838, photo file RIFT_045. <http://pubs.usgs.gov/dds/dds-80/album.html>

ATTENDING THE FEBRUARY MEETING?

Donations of **a few high quality, labeled door prize specimens** are invited.

Your donated snacks and drinks will be welcomed.

Bring a friend!

Our annual event for kids:

Minerals Junior Education Day - April 9

Registration will start mid-March for time slots starting 9:30 a.m. to 1:00 p.m. on April 9

Spread the word!

Our annual Minerals Junior Education Day is fun and rewarding for kids and parents who attend, as well as NMS volunteers who present the event. The event will be held at the same location as last year:

Central Pa. Institute of Science & Technology

540 North Harrison Rd

Pleasant Gap, PA 16823

Students in grades 1-8 and their parents are invited to come and learn about minerals, crystals, gemstones, and fossils. At this event, kids get an empty egg carton when they check in, then go to a series of stations, each concerning a different aspect of mineral properties, rocks or fossils. They learn about the topic from a demonstration or discussion, and receive a properly labeled specimen or educational item related to the topic, so they gather a whole collection in their egg carton. \$5 admission per child covers the costs. We're planning the stations right now, and will include a sales table at kid-friendly prices.

PLEASE tell your friends and relatives and their kids to save the date - Saturday, April 9!

We'll have more information in our March Bulletin

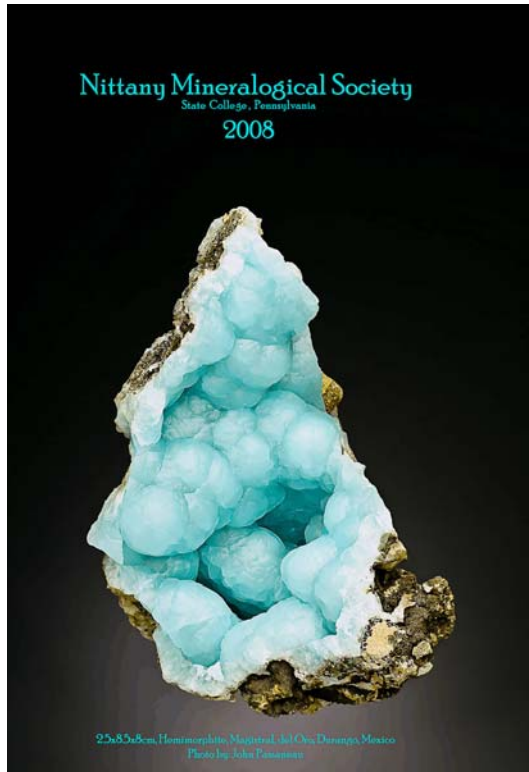
We are seeking **volunteers** to help to present the stations, and ideas for stations which we (or you) might present; contact Dave Glick (see page 8). We also welcome advance donations of identified minerals, tumble-polished material, fossils, books, etc. which can be sold at child-friendly prices. *For updates, directions and maps, see www.nittanymineral.org*

JUNIOR ROCKHOUNDS Monthly meetings for kids:

We are actively working on setting up monthly Junior Rockhounds meetings at 4:00 p.m. on Friday afternoons in State College this season. Please watch our web site for announcements, or e-mail Dave Glick <xidg@verizon.net> to be put on an e-mail list to receive news directly.

Auction of John Passaneau Mineral Collection

The estate of late NMS member and officer John Passaneau is selling his cataloged mineral collection. A flyer with all the specifics of the written bid auction is available at <http://tinyurl.com/JPEminerals> along with photographs and a catalog of the specimens. It includes contact information for estate executor C. Prestia. Bidders can view the collection during February by scheduling an appointment; bids are due by March 11, 2016. Please feel free to pass this information on to anyone who might be interested.



Among the specimens in the John Passaneau mineral collection is this hemimorphite from Mexico, which John photographed for the NMS 2008 poster.

The flyer says, in part: The collection consists of over eight hundred specimens individually collected over 40 years or purchased from established dealers and catalogued, by a collector with a great eye for aesthetics and value. Specimens range from thumbnail to cabinet size and represent worldwide coverage. There is some emphasis on zeolites and fluorites. The collection is being sold together (as John specified), not divided into lots or individual pieces. Included in the sale are the following:

- The individual mineral specimens and their display tags.
 - Two physical card files indexing the collection.
 - A digital index of the collection in Microsoft Excel format.
- NOT included in the sale are the display cases or filing cabinets that currently house the collection.

John's micromount collection, specimens other than the cataloged display collection, and large specimen splitter have been donated to Nittany Mineralogical Society. A household auction planned for June 5 is expected to include the empty mineral display cabinets, some lapidary equipment, cameras and photographic equipment, and computer equipment. ❄

NEWS FROM THE FEDERATIONS

Nittany Mineralogical Society, Inc., is a member of EFMLS, the Eastern Federation of Mineralogical and Lapidary Societies, and therefore an affiliate of AFMS, the American Federation of Mineralogical Societies. We present brief summaries here in order to encourage readers to see the entire newsletters.

The **EFMLS Newsletter** is available through the link on our web site www.nittanymineral.org, or remind Dave Glick to bring a printed copy to a meeting for you to see. The February issue starts with the web site competition. President Larry Heath describes the Operating Procedures for the various officers and committees. More information on the Wildacres Workshops Speakers-in-Residence, Helen Serras-Herman in May and Alfredo Petrov in September. The juniors article provides some thoughts on visiting museums.

The **AFMS Newsletter** is available by the same methods. The February issue opens with news that the Scholarship Foundation team is in place and donations can be accepted; a new treasurer is being sought. President Matt Charsky provides some possible New Year's resolutions for rockhounds. The 2016 Program Competition is discussed. The AFMS Convention will be Thursday July 28, followed by the Willamette Agate and Mineral Society Show in Albany, Oregon, on the 29th - 31st. The conservation article discusses grassroots methods to keep mining and collecting areas from being declared Wilderness Areas. The Midwest Federation is having a poster contest for kids in grades 1-8 throughout the US on the theme "Amazing Agates"; entry details are provided. The seventh annual website competition is introduced, and an Internet Posting Policy is shown.

Please see the web sites for the complete Newsletters. There's a lot there! *-Editor*

STUDENTS! SATURDAY, APRIL 2!
EMEX - Earth and Mineral
Sciences Exposition at Penn State

from the web site
<http://www.ems.psu.edu/emex>



The Earth and Mineral Sciences EXposition (EMEX) is the College's annual student-run Open House. All high school students, current Penn State students, and transfer students who are considering an EMS major are invited to attend. Faculty, staff, students and alumni are available to answer questions about EMS majors, curriculum requirements, career opportunities, student life, and special features of the College. We will also have College tours, demonstrations, and speakers. Please join us to learn how EMS can broaden your horizons and expand your opportunities for success in school, in your career, and in life. This Saturday event is FREE and open to the public.

The web site <http://www.ems.psu.edu/emex> includes contact information, an online registration form, flier, tentative schedule, map, and video. The event will be held Saturday, April 2, 2016, at The College of Earth and Mineral Sciences, Deike Building, University Park Campus, 8:15 a.m. to 2:00 p.m.

Classifieds

Ads may be submitted to the Editor (see p. 8)

FOR SALE: 2 Homemade Lapidary saws for sale - 14" and 18". Both come with working motors, arbor, belt, pulley, rock clamp/carriage, and a blade. Both are mucked-out and ready to move. Both could use a little TLC. For more info contact Mike Zelazny at fabricatefilm@yahoo.com

FOR SALE: Microscope & Accessories, Mineral Specimens, Crystal Models.

Avid collector wants these to be purchased by someone who would appreciate them. Contact Frank & Gail Beall, 724-789-7290. See much more complete listing at www.nittanymineral.org/beall.pdf and in earlier NMS Bulletin issues.

**Pennsylvania Geology Magazine:
 Penn State Alumna Gale Blackmer
 now State Geologist**

The Pennsylvania Geological Survey's magazine, Pennsylvania Geology, can be found on their web site; volume 45 number 3 is now available. In the editorial, Dr. Gale C. Blackmer introduces herself as the new State Geologist, the first woman in that position. She holds a PhD from Penn State. The issue includes articles on Conodoguinet Cave, in Carlisle, and the 2015 Field Conference of Pennsylvania Geologists, which met in the anthracite coal region. Among the new Survey publications announced are the second edition of Educational Series 11, Sinkholes in Pennsylvania, by William E. Kochanov. This and most other Survey publications are available for download from <http://www.dcnr.state.pa.us/topogeo/publications/>

It has been some time since this Bulletin covered Pennsylvania Geology magazine. One article of mineralogical interest was in the Winter 2014 issue (vol. 44, no. 4): Mineralogy at the Pennsylvania Geological Survey - 1973 Versus Now, by John H. Barnes and Robert C. Smith, II.

Geo-Sudoku
 by David Glick

This puzzle contains the letters DEFILORSU. One row or column is one of classes of gaseous compounds released from volcanoes. As usual, if you've read this issue, you've seen it. Each block of 9 squares, each row, and each column must contain each of the nine letters exactly once. The solution is on page 8.

U					D		I
R			L		I		O E
	L				F		S
				L E		F U	
	I L			D U		E	
E		U I				D L	
		O		I		L	
I F			E				
L			S R				

A Geological Tour of Hawaii

by
Dr. Charles E. Miller, Jr.

Introduction

The name “Hawaii” refers to both the Hawaiian Islands and the Big Island of Hawaii. This talk will use the word both ways. The presentation will mostly reference Oahu and Hawaii.

When one thinks of Hawaiian geology, volcanoes usually come to mind because the islands are volcanic. There are two national parks preserving volcanic features. The Big Island is home to Hawaii Volcanoes National Park and Haleakala National Park is on Maui. The former features active vulcanism of Kilauea and Mauna Loa and the latter the dormant Haleakala Volcano. Virtually everywhere you look on the islands, one can see basalt – the most common lava on Earth. Nearly every home on the islands is either built on, or covered with, basalt. However, geology of the islands is also diverse, ranging from glacial features to coral reefs. Of these features, several superlatives are worth noting. The tallest mountain on Earth, Mauna Kea, is on the island of Hawaii, rising 33,500 feet above the floor of the Pacific Ocean. That is 4471 feet higher than Mt. Everest, as measured from sea level. Probably the tallest, documented wave, ever, on Earth occurred on Lanai, depositing broken coral 2300 feet up on the island. Papakolea Beach on Hawaii is one of four green sand beaches in the world.

In with the new, out with the old

The traditional explanation for origin of the Hawaiian Islands is a mantle plume over which the Pacific crustal plate has moved for at least 65 million years. The plume is relatively stationary and creates the Hawaiian hotspot at the surface. The mantle plume theory is inculcated into most textbooks. That explanation has been criticized for years. Alternatively, a more recent explanation also invokes a hotspot, or crackspot – but not a mantle plume. The Hawaiian Islands form from a propagating extensional crack in the middle of the Pacific Plate. That crack is the



Figure 1: Panorama view of the shield volcano Mauna Loa in the background. (Image by the author.)

result of the Pacific Plate moving northwest, north, and northeast at the same time. This is the lithosphere crack theory.

Volcanic features

The two most conspicuous volcanic features on the islands are volcanoes and lava flows. Several types of volcanoes - shield, cinder, and spatter cones - can be seen. Of these, the largest and most common are shield volcanoes (Figure 1). These volcanoes are more gently sloped – only 2 to 3 degrees – than other types and are composed of layered lava.

The Hawaiian language provides two names for lava flows: aa and pahoehoe (Figure 2). Both have the same



Figure 2: Aa (foreground) and pahoehoe (background), Hawaii. (Image by the author.)

composition but differ in appearance. The former consists of rough, jagged pieces looking like clinker while the latter has smooth surfaces. Aa lava takes a toll on field boots. The two lavas can exist in juxtaposition to each other and pahoehoe sometimes changes into aa. This talk discusses how the two lavas of the same composition can develop significantly different appearances.

In 1883, Krakatoa - a volcano in Indonesia - catastrophically exploded. That explosion destroyed two thirds of the island it was on and created the loudest sound in modern history. The explosion was heard 3000 miles away. In contrast, Hawaiian volcanic eruptions are non-explosive. While localized damage occurs, mostly from lava flows, Hawaiian volcanoes do not blow themselves up. Reasons for these different volcanic eruptions are discussed.

A variety of other volcanic features are seen, including: columnar jointing, lava tree molds, steam vents, sulfur deposits, calderas, lava tubes, and tephra (pyroclastic) deposits. Each of these features will be discussed in the talk.

Volcanic gases in Hawaii (Figure 3) include water, carbon dioxide, sulfur dioxide, hydrogen sulfide, carbon monoxide, hydrogen chloride, and hydrogen fluoride. These gases, especially sulfur dioxide, create acid rain. Many residents on Hawaii depend on cisterns for their drinking water. When the acid rain falls on roofs, it leaches lead from roofing nails and paint, resulting in lead-contaminated rainwater in the catchment tanks. The sulfur dioxide also creates volcanic smog or "vog."

One popular volcanic feature is Thurston Lava Tube on Hawaii. Lava tubes form when flowing lava cools and forms a crust. The crust acts as insulation, allowing

liquid lava to flow below. When the lava supply below the crust stops, a tunnel is left behind. Study of lava tubes lends itself to lunar geology. Rilles on the moon, such as Hadley Rille where Apollo 15 astronauts landed, are usually collapsed lava tubes.

Calderas form when a volcano collapses back into itself. This occurs as magma flow stops, creating an empty chamber below the volcano. If that chamber collapses, a caldera forms. One well-known caldera is Crater Lake in Oregon. On Hawaii, the most famous caldera is that of Kilauea (Figure 3). This is commonly viewed from Volcano House, an iconic hotel on the rim of the Kilauea Caldera. From it one can see steam vents, Halemaumau and Iki Craters within the caldera, lava flows, and Mauna Loa.



Figure 3: Volcanic gases from Halemaumau Crater within the Kilauea caldera. Image by the author.

Pyroclastic fragments (tephra) ejected from volcanoes include ash, cinders (lapilli), and volcanic bombs. These range from less than 2 mm (ash) to greater than 64 mm (volcanic bombs). Some volcanic bombs can be the size of a car. The bombs begin as gobs of liquid lava ejected into the air

and, then, shaped from aerodynamic forces or impact with the ground. Common shapes include spherical-, ribbon-, twisted-, cow-pie- and bread-crust- bombs. The latter two are named after the features they resemble.

Coral reefs, beaches, and tidal Pools

The islands have extensive coral reefs. In 2000, 84 million acres of ocean were set aside as the Northwestern Hawaiian Island Coral Reef Ecosystem Reserve. Requisite conditions corals need are: sunlight and clear, usually warm, clean, salt water. The need for sunlight limits most coral growth to less than 165-foot water depths.

Hawaiian sand beaches come in four colors: white, black, green (Figure 4), and red (Figure 5). Because Hawaii does not have a continental source of quartz sand, white beaches are organically derived. These consist of broken fragments of marine organisms such as corals, algae, mollusks, and bryozoans. Black sand is eroded basalt. For obvious reasons, black beaches are common on the islands. On the Big Island is Mahana Beach, also known as South Point Green Sand Beach. Green sand beaches are rare. Only four exist in the world. This beach is composed of olivine crystals weathered from adjacent tuff (compacted volcanic ash)



Figure 4: South Point Green Sand Beach, Hawaii. Image by the author.



Figure 5: Red sand beach on Maui. (Internet image.)

and basalt rich in the mineral. Red sand beaches are also rare. Kaihalulu Beach (Red Sand Beach) is on Maui, located at the foot of a cinder cone rich in iron. The cinder cone is constantly eroding and weathering, producing the red color.

Hawaiian lava commonly flows into the ocean. Differential wave erosion of the lava creates tidal pools. Diurnal tides replenish the pools with water, sustaining a wide variety of marine life such as sea anemones, fish, crabs, sea urchins, algae, and coral.

Landslides and giant waves

Half of the flanks of the Hawaiian ridge are the result of huge landslides. These create a Hawaiian landscape with steep cliffs. One example is Nuuanu Pali (Figure 6), a tourist attraction on Oahu. It marks what is left after half of a caldera slid away as magma pushed into place. Sonar mapping shows a landslide debris field extending 140 miles. The same mapping also revealed about 70 giant landslides associated with these islands. Some of the landslides generated giant waves, such as one on Oahu causing a wave to cross over to Lanai, depositing broken coral up to a height of 2300 feet!

Is it paradise?

Despite lush botanical gardens and beautiful scenery, the Hawaiian Islands have geoenvironmental issues worth noting. Its fresh water supply will likely not be able to handle future water demands. On Oahu, its aquifers and streams have already declined over the past decade. Expanding urbanization, including

converting agricultural land, reduces aquifer recharge. The U.S. Army dumped 16,000 mustard gas bombs in deep water five miles south of Pearl Harbor after World War II. On Hawaii, four superfund sites have been recognized. These involve soil and groundwater contamination from agricultural and military operations. The Great Pacific Garbage Patch, a gyre in the central North Pacific Ocean, affects some beaches on Hawaii. Exceptionally high relative concentrations of plastics, chemical sludge, and other debris characterize the patch. Emissions from Kilauea volcano create a haze, or vog (volcanic smog), that affects people with pre-existing respiratory conditions.



Figure 6: Steep cliffs of Nuuanu Pali, Oahu. These are the remaining half of a caldera, the other half of which slid into the ocean. (Internet image.)

The Green Flash

The talk ends on a pleasant note with discussion of “The Green Flash,” an optical phenomenon occurring at sunrise or sunset. Green flashes are usually seen at unobstructed horizons, such as ocean views of which the Hawaiian Islands have many. The author and his wife witnessed their first ever “Green Flash” while dining at Waikiki Beach on Oahu (Figure 7).



Figure 7: Green flash. (Credit: Mike Quinn, EarthSky Facebook)

Some Upcoming Shows and Meetings

Our web site <http://www.nittanymineral.org> has links to more complete lists and details on mineral shows and meetings around the country. See www.mineralevents.com for more.

March 5-6 2016: *Where in the World?*, 53rd Annual Gem, Mineral & Fossil Show, by Delaware Mineralogical Society, Del. Tech. & Comm. Coll., 400 Stanton-Christiana Rd., Newark, DE. Sat. 10-6, Sun. 11-5. <http://delminsociety.net/marchshow/marchshow.htm>

March 12, 2016: 40th Annual Micromount Show, sponsored this year by Leidy Microscopical Society. Northminster Presby. Ch., 140 Trenton Rd., Fairless Hills PA 9a.m. - 3 p.m.

March 12, 2016: Midwest Fluorites Sympos. by Friends of Mineralogy Midwest Ch.. Miami Univ., Oxford, OH. <http://www.friendsofmineralogy.org/symposia.html>

March 19-20, 2016: Gem, Mineral & Jewelry Show, by Franklin County R&M Club. Hamilton Heights Elem. School, 1589 Johnson Rd., Chambersburg PA

March 19-20, 2016: Gem, Jewelry, Mineral & Fossil Show, by Che-Hanna R&M Club. Athens Twp Fire Hall, Sayre, PA. <http://www.chehannarocks.com>

April 2-3, 2016: Philadelphia Mineral Treasures & Fossil Fair, by Phila. Min. Soc. & Del. Valley Paleo. Soc. Lulu Temple, 5140 Butler Pike, Plymouth Meeting PA 19462

April 14-17, 2016: Rochester Mineralogical Symposium, Rochester, NY. <http://www.rasny.org/minsymp/>

April 16-17, 2016: North Rocks! North Museum Gem, Mineral, Fossil & Jewelry Show. Farm & Home Center, 1383 Arcadia Rd., Lancaster PA. Sat. 10-5, Sun. 10-4. <http://www.northmuseum.org/events/>

May 14, 2016: South Penn Spring Rock Swap & Sale, by CPRMC & Franklin Cty RMC. South Mountain Fairgrounds, Biglerville, PA 17307. General admissions \$1.00/person.

May 14-15, 2016: World of Gems & Minerals Show, by Berks Mineral. Soc. Leesport Farmers Mkt, Rt 61, Leesport.

May 21, 2016: The Earth Science Show & Sale, by Rock & Mineral Club of Lower Bucks Cty. Fairless Hills, PA., 9 - 4

June 4, 2016: Spring Mineralfest, Macungie, PA Sat. only, 8:30 - 3:00. <http://www.mineralfest.com/>

June 17-18, 2016: Lancaster Cty. Club Show, Quarryville, PA

Geo-Sudoku Solution

U	S	E	F	O	R	D	L	I
R	D	F	L	S	I	U	O	E
O	L	I	U	E	D	F	R	S
D	R	S	O	L	E	I	F	U
F	I	L	R	D	U	S	E	O
E	O	U	I	F	S	R	D	L
S	E	O	D	I	F	L	U	R
I	F	R	E	U	L	O	S	D
L	U	D	S	R	O	E	I	F

INVITE A FRIEND TO JOIN THE SOCIETY

The Nittany Mineralogical Society prides itself on having among the finest line-up of speakers of any earth sciences club in the nation. Everyone is welcome at our meetings. If you'd like to be part of our Society, dues are \$20 (regular member), \$7 (student rate), \$15 (seniors), \$30 (family of two or more members, names listed). Those joining in March or later may request pro-rated dues. Your dues are used for programs and speakers, refreshments, educational activities, Bulletins, and mailing expenses. Please fill out a membership form (available at www.nittanymineral.org), make checks payable to "Nittany Mineralogical Society, Inc." and send them in as directed, or bring your dues to the next meeting.

We want to welcome you!

CONTACT INFORMATION

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The **Bulletin Editor** will welcome your submissions of articles, photos, drawings, cartoons, etc., on minerals, fossils, collecting, lapidary, and club activity topics of interest to the members. Please contact:

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Newsletter submissions are appreciated by the first Wednesday of the month. Photographs or graphics are encouraged, but please do not embed them in word processor files; send them as separate graphics files (TIF, or good to highest quality JPEG files, about 1050 pixels wide, are preferred). Please provide captions and name of photographer or artist.

Visit us at www.nittanymineral.org