The BULLETIN

OF THE NEW YORK MINERALOGICAL CLUB, INC

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America's Oldest Gem & Mineral Club
Founded 1886 ◆ Incorporated 1937

Bulletin of the New York Mineralogical Club

Founded 1886 ♦ New York City, New York ♦ Incorporated 1937

Volume 132, No. 11 *America's Oldest Mineral & Gem Club* **November 2018**

November 14th Meeting:
Roland Scal: "The Microscope and Minerals"

The microscope is an indispensable tool for the mineralogist and the gemologist. It can be a source of beautiful new views of minerals, of which the micromounter is well aware, but many people have not had the opportunity to experience.

The talk will introduce the novice to the latest inexpensive and fancy microscopes, digital cameras, and other necessary equipment. The website eBay provides many wonderful research microscopes at steep discounts, but there are pitfalls that will be explained.

An example of a brand new microscope, a used quality microscope, and camera systems will be placed into context by giving examples of the presenter's recent work, and related to gemological examples, mineralogical oddities, etc.

About Our Speaker

Associate Professor Roland Scal teaches geology at Queensborough Community College. He is particularly interested in sedimentary rocks (including fossils) and gemstones. Much of his research, over the years, has centered on microscopy and particularly on analysis of sedimentary rockslides and their mineralogy. Recently he has been teaching and researching on the topics of gemology and local geology of New York City.

Have an idea for a story?
Write for the *Bulletin of the NYMC.*
You'll be glad you did!

Fall NYC Gem & Mineral Show Occurs November 10-11, 2018

By Mitch Portnoy

The annual **Fall New York City Gem & Mineral Show** will take place on **November 10-11, 2018** (Saturday & Sunday) at the Watson Hotel (57th Street between 9th and 10th Avenues).

The New York Mineralogical Club will continue its successful partnership with the show sponsor, **Excalibur Mineral Corp.** (Tony Nikischer, *President*) and host this event.

A list of the **diverse dealers** that will be selling their fine wares at the show can be found on page 6 – you should recognize most of them – but we do have one new dealer this time – **Global Curiosity Studio**.

Since we have no direct commercial interest in the show, we do ask each dealer for a donation to the **Club's May Benefit Auction** as a token of thanks for all the work we do to help promote and manage the show. These items tend to be the best lots in the whole auction so please come and **patronize these top-quality dealers**.

As a thanks in advance (or maybe just for some encouragement), we will give each dealer one of the Club's remaining 2019 gift calendars that we distributed at the October 2018 gala banquet.

The **Club's booth** will be in its regular location (to the left as you enter the show). There you can obtain a free Fall Show Souvenir Card (pictured above) or show information, or just say hi to your fellow NYMC members. This is also a good time to **renew your NYMC membership** and pay your dues for 2019 if you have not already done so.

Items that you and the public will be able to purchase at the booth include the popular floaty gemstone pens, mineral publications, club CD-ROMS, drawstring backpacks, gem & mineral note card sets, and several recently published books, authored by friends of the NYMC.

There is a **lecture** on each day of the show. The specifics for each day are provided on the mini-posters on page 6.

There will be free minerals given out to children (donated by Tony Nikischer) as well as attractive minerals given to all new members (also donated by Tony Nikischer) as an enticement to join the NYMC.

Gift items remaining from the October Carnelian Banquet (posters, carnelian information packets, carnelian cabochons, 2019 NYMC wall calenders) will be distributed to members in good standing while supplies last.

We now have a **Show Page** as part of our very successful website. Intended mostly for the public, a discount coupon can be printed directly for the Show. More detailed show information can be downloaded as a PDF from the **Calendar Page** as in the past.

Questions? Email or call me and ask.

See You at the Show!

Issue Highlights

President's Message

By Mitch Portnoy

All of the dealers know that the holidays are coming soon so they make sure to have their best inventory and widest selection at the Fall NYC Mineral Show. I hope to see all of you there!

New Show Page on NYMC Website

Our new Show Page on the NYMC Website has become the de facto NYC Show Site. It will be interesting to get the activity report in December to see how much it was accessed this year.

Send in Your 2019 Club Dues

It is time to send in your 2019 club membership dues! All memberships run from January 1 to December 31 of each year (with a few exceptions).**If your mailing label says "2018", you owe your 2019 dues.** Please take the time now to mail in your dues in order to prevent uninterrupted delivery of your bulletin. A handy form appears on page 12. Dues are $25 for individual, $35 for family. Mail to: Membership Coordinator, N.Y. Mineralogical Club, P.O. Box 77, Planetarium Station, NYC, NY 10024-0077.

Or Renew Online with PayPal!

PayPal™

Club Meeting Minutes (Banquet) for October 17, 2018

By Vivien Gornitz, *Secretary*

Attendance: 92 (!!)

Themes: *Carnelian & Halloween*

President Mitch Portnoy presided

Announcements & Proceedings:

- The evening began with the annual silent auction (6:00 pm), followed by dinner and several desserts (7:00 pm); a beverage cart, which included a wine & beer selection, was available.
- Thanks to **Robin Wildes** for adding some seasonal fresh cider to the overall beverage selection.
- Extensive banquet room decorations included multiple posters, tablecloths, candles, banners, table centerpieces and a rotating orange light!
- The dinner opened with the song *"Festivity Tonight"* sung to the tune of *"Comedy Tonight"* from *A Funny Thing Happened on the Way to the Forum* by Stephen Sondheim with new lyrics by Mitch Portnoy.
- An fruit and cheese platter was on each table as it was in 2017 BUT we added a new pasta course this year – pumpkin ravioli!

- **Rich and Judy Rossi** sponsored the cupcake dessert course this year, working with master baker and club members **Lee Laurie & Paul Vitaris**. Half had "Carnelian" and the other half "Halloween" decorations.
- Lee was presented with a bejeweled cupcake hat pin, pictured above.
- A spectacular "Carnelian Geode / Halloween Cake" was created and donated, like last year's equally spectacular Amethyst Geode Cake, and was auctioned to benefit the Club. It realized $110!
- Lee also donated a cupcake baking class for two; it was auctioned for $80 to benefit the Club.

(Continues on page 11)

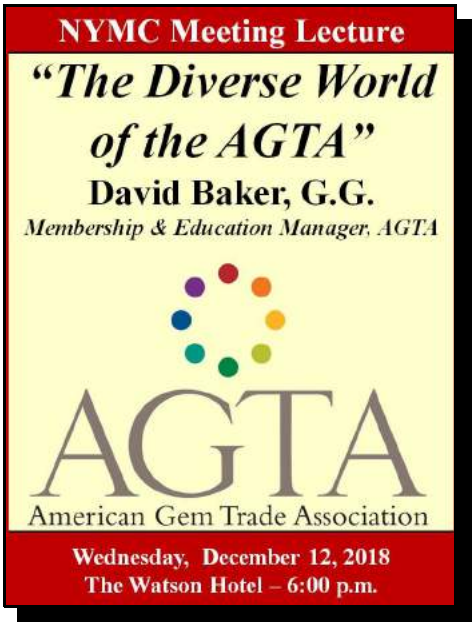
Members in the News

- The Spring 2019 Speaker-in-Residence at the EFMLS Wildacres Retreat will feature **Renée Newman**, and the Fall 2019 Speaker- in-Residence tentatively will feature **Elise A. Skalwold**. Both have lectured to the NYMC several times in the past.

Welcome New Members!

Ted Hamway. . . . . Brooklyn, NY
Lisa Jarnot. . . . . Jackson Heights, NY
Anthony Pesce . . . . . Brooklyn, NY

Coming In December



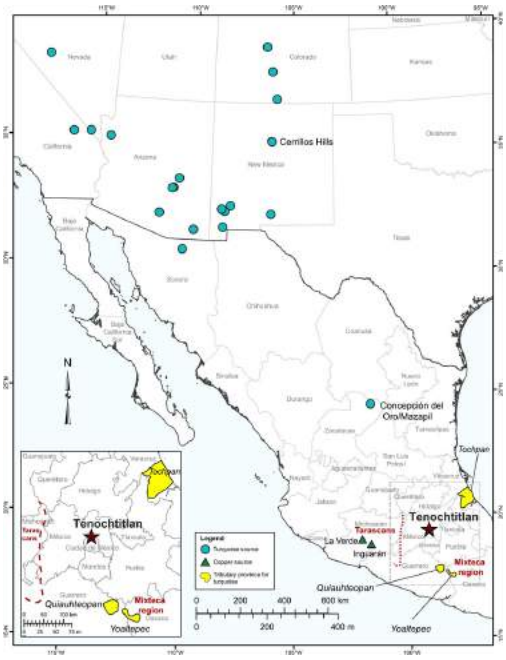
The World of Minerals

The *World of Minerals* is a monthly column written by Dr. Vivien Gornitz on timely and interesting topics related to geology, gemology, mineralogy, mineral history, etc.

On the Trail of Ancient Turquoise

Turquoise was treasured by many diverse cultures, including those of ancient Egypt, Persia, Tibet, and the Americas. To Native Americans (as for ancient Egyptians and Tibetans), the blue-green hues of turquoise symbolize the sky above and particularly water—a precious commodity in arid lands. Green evokes lush vegetation ever-dependent on falling rain, hence fertility and life itself.

Most turquoise found at Mesoamerican archeological sites (primarily associated with the Aztecs and Mixtecs) was long-believed to have come from areas within the southwestern United States. Not only do numerous turquoise deposits occur in Arizona, New Mexico, Nevada, California, and Colorado, but many modern localities also yield evidence of ancient mine workings, as well. Much of the turquoise found at Chaco Canyon in northwestern New Mexico—a major prehistoric center for processing and trading turquoise—has been traced to Cerrillos, around 20 miles southwest of Santa Fe, New Mexico. Mesoamerican artifacts, including colorful macaw feathers, cacao, and copper bells found at southwestern sites suggested extensive pre-Columbian trade networks. Southwestern turquoise was regarded as an important trade item.



However, new research involving isotopic analysis has cast doubt on this theory. Earlier studies using a "fingerprinting" technique called neutron-activation analysis had linked Mexican artifacts to specific mines in the Southwest, including Cerrillos. But geochemist Alyson Thibodeau, Dept. Earth Sciences, Dickinson College, Carlisle, Pennsylvania and colleagues from other institutions challenge these findings, stating that the neutron-activation data were never published, preventing an objective evaluation. Furthermore, due to marked variations in physical and chemical characteristics of turquoise even within a single mine, finding an exact match between mine and artifact becomes challenging. Instead, Thibodeau and her team used lead (Pb) and strontium (Sr) isotopes as a more advanced means of investigating U.S. and Mexican turquoise deposits.

Turquoise, $CuAl_6(PO_4)(OH)_8 \cdot H_2O$, usually forms as veins, nodules, or in open pore spaces within altered and weathered felsic igneous rocks, such as monzonite, trachyte, and latite, within 100ft of the surface. A key assumption is that turquoise therefore derives from weathering of pre-existing copper, aluminum, and phosphorus-bearing minerals (in the U.S. Southwest, largely associated with shallow portions of porphyry copper deposits). The weathering has not significantly disturbed the original Pb or Sr isotope composition of the host rocks, which in turn inherited their isotopic makeup from the underlying Precambrian basement rocks. Thus, turquoise deposits from different geographic regions and geologic provinces can be separated on the basis of distinctive Pb and Sr isotopic ratios.

Thibodeau and colleagues applied the method to the U.S. Southwest, finding that $^{87}Sr/^{86}Sr$ ratios of turquoise from the Rio Grande Rift Valley in central New Mexico and south central Colorado are distinctly lower than those from southeastern Arizona and California. Californian turquoise, furthermore, shows much higher lead isotope ratios than Rio Grande or Arizonan specimens. Use of all available Pb and Sr isotope ratios therefore can effectively separate specimens from these various geographic source regions.

In the most recent research, the Thibodeau team extend their methodology to pre-Columbian artifacts, in particular 43 small turquoise mosaic tiles, most of which came from the Templo Mayor, a major Aztec archeological site in present-day Mexico City. Results show that the Pb and Sr isotope ratios for most of the Mexican tiles fall outside of the range of analyzed Southwestern turquoise deposits. The samples also fall within a tight cluster, suggesting that most of them "derive from the same or geologically similar source(s)." But determining the locations of these sources remains an unsolved puzzle. The researchers find that Pb isotope ratios in particular, closely match copper mineralization from Michoacan, to the west of Tenochtitlan, the Aztec capital (now Mexico City), where mining and smelting activities began as early as 650 CE. They speculate on trade connections between local Tarascan peoples and Aztecs, also suggesting other possible alternative Mexican locations.

While clearly demonstrating that the analyzed turquoise artifacts did not originate in the U.S. Southwest, but more likely within Mexico, Thibodeau et al. still need to further narrow down possible locales. Since the earlier 1990s neutron-activation research, improved non-destructive trace element analysis techniques, such as energy dispersive x-ray fluorescence spectroscopy and particularly laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) have become available. These may help pinpoint Mexican turquoise sources more accurately.

Further Reading

Gornitz, V., 2016. Tracking turquoise trails. *Bulletin of the New York Mineralogical Club*, Feb. 2016, p. 3-4.

Gornitz, V., 2011. Cerrillos turquoise—past and present (Parts I and II). *Bulletin of the New York Mineralogical Club.*

Gornitz, V., 2011, in *New York Mineralogical Club 2011 Gem & Mineral Almanac*, p.49-52.

Thibodeau, A.M., et al., 2018. Was Aztec and Mixtec turquoise mined in the American Southwest? *Science Advances* 4: eaas9370, 8p.

A Huge Lake of Liquid Water Found on Mars

By Jonathan O'Callaghan

An ESA spacecraft detected a signal of water at the south pole. ESA/INAF/Davide Coero Bora

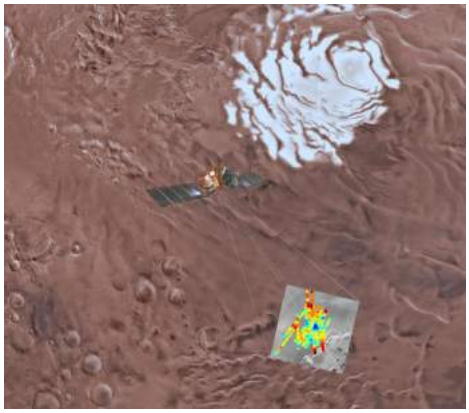
Reported in the journal Science, researchers led by Dr Roberto Orosei from the National Institute of Astrophysics (INAF) in Rome say they have found a vast reservoir of water beneath the south pole of Mars. So vast, in fact, that it looks similar to a subglacial lake on Earth – one where life could arise.

"This is potentially the first habitat we know of on Mars," Dr Orosei told IFLScience. "It's the first place where microorganisms like those that exist today on Earth could survive."

The large reservoir of water was found by a radar instrument, the Mars Advanced Radar for Subsurface and Ionosphere Sounding (MARSIS) instrument, on board ESA's Mars Express spacecraft. The team used data collected by the spacecraft from May 2012 to December 2015.

The data showed that 1.5 kilometers (0.9 miles) below the surface, in a region called Planum Australe, there was a source of liquid water spanning about 20 kilometers (12 miles) across. The team do not know how deep this reservoir of water is, but note it is at least deeper than a few tens of centimeters, and possibly more.

It was detected by sending 29 sets of radar pulses under the surface, with reflections showing a radar signal almost identical to that from lakes of liquid water found beneath the ice of Antarctica and Greenland on Earth, heavily suggesting it is liquid water. However, the exact nature of the water at the moment is unclear.



The lake was discovered using radar pulses from the Mars Express spacecraft. USGS/ASU/ESA/INAF/Davide Coero Borga

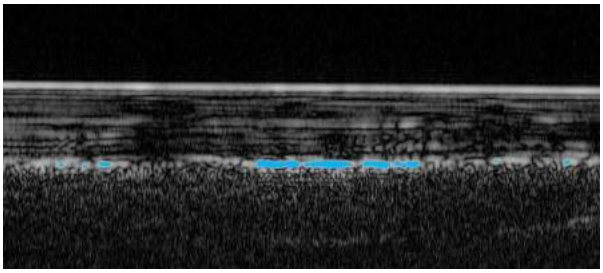
"It's very difficult to say what we're really looking at," Dr Anja Diez from the Norwegian Polar Institute in Tromsø, Norway, who wrote an accompanying perspective on the research, told IFLScience. "It could either be a thin layer of water, a large layer, or water in sediments."

The team said they considered some other possibilities for the signal, including a layer of carbon dioxide ice or very low-temperature water ice. They suggest these are unlikely, however, because they would not have caused as a strong a reflection as seen in the data.

The characteristics of this suspected water are complicated by the conditions it is in. On Earth, subglacial lakes reach temperatures of about -60°C (-76°F). But the intense pressure of the ice above lowers the melting point of the water, to the point where it exists as a liquid in large freshwater lakes.

Under this region on Mars, however, it's thought the temperatures drop to about -68°C (-90°F). In order for the water to remain liquid here, it is likely full of salts like magnesium, calcium, and sodium and thus briny, rather than like the freshwater lakes found under ice on Earth. We do have some briny lakes on Earth, though.

"Underneath the Antarctic ice sheet, water can be at its melting point because of the ice above," said Dr Diez. "On Mars it's a bit different, as really cold temperatures are expected under the ice. Water can only exist because it's briny."



The radar signal detected by the spacecraft. The water is shown in blue. ESA/INAF/Davide Coero Bora

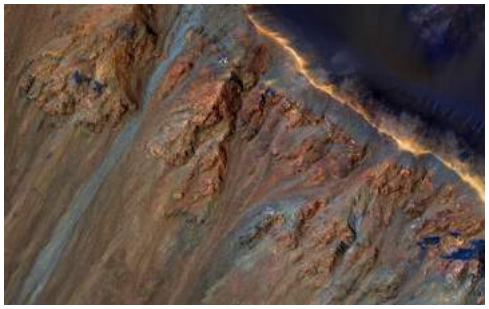
A handful of subglacial lakes have been drilled into on Earth, including Lake Vostok in Antarctica. These projects are not easy and it can take years to dig below several kilometers of ice. But the scientific payoff is huge – and every time we drill down, we find life.

Previously on Mars, we have found evidence for water trickling on the surface, known as recurring slope lineae (RSL). These features are short-lived, however, with the water quickly evaporating in the low-pressure environment on the Martian surface.

It's long been theorized, though, that there may be more stable bodies of liquid beneath the surface, as evidenced in this research. And if that's the case, it provides an exciting new habitat for microorganisms of the past or present on Mars.

"It's very important to know if this [reservoir] is a unique thing," said Dr Orosei. "If it's regional, not local, then you can have a whole system of subglacial lakes similar to what you see on Earth. You would have ways for living organisms, if they existed, to have a much larger environment and perhaps move around."

To answer this, the team hope to use more data from Mars Express over the coming years. The spacecraft is aging, though, and it's running out of fuel, so time is of the essence.



RSL on Mars (seen lower left here on the Krupac Crater) are our best previous evidence of water. NASA/JPL-Caltech/Univ. of Arizona

(Continues on page 8)

(Sung to the tune of "Comedy Tonight" from *A Funny Thing Happened on the Way to the Forum* by Stephen Sondheim)

A night to party,
Healthy and hearty,
Something for everyone:
Festivity Tonight!

A meal that's tasty,
Dine slow, not hasty,
Choices for everyone:
Festivity Tonight!

Auction, to start!
No counterpart!
A splendid choice of,
Nature's own art!

Awards are granted,
Honest and candid,
Be proud and gleeful,
It's your right!

Gloominess tomorrow!
Festivity Tonight!

Games with surprises,
That we've "devises",
Playtime for everyone:
Festivity Tonight!

Cupcakes, amazing,
Taste we are praising!
All thanks to Lee Laurie!
Festivity Tonight!

Make some new friends,
This we endorse;
Gifts will be given after,
of course!

Carnelian decor,
Posters and much more,
Halloween's also in our
sight!

Sobriety tomorrow,
Festivity Tonight!

Gems you can take back,
Orange and jet black,
All thanks to EMACO:
Festivity Tonight!

Also some patches,
Candles (no matches),
Handouts as souvenirs,
Festivity Tonight!

Place all your stress,
On the back shelf;
Let's just make sure you
enjoy yourself!

So much will take place,
Tonight, in this space.
You should be thrilled that
you are here!

Time to get it going!
Festivity Tonight!

(Sung to the tune of "How About You?" from *Babes on Broadway* by Burton Lane & Ralph Freed)

I like the orange stone,
Carnelian!
It's really great to own,
Carnelian!

Its color's iron-based,
Naturally!
It's great for jewelry, carvings, lapidary,
As you can see!

Often *en cabochon*,
Can't get my fill!
And a polished geode's looks,
Gives me a thrill!

A stone that motivates,
Or courage activates,
May not be true!
But I like it, how about you?

It's a chalcedony,
Carnelian!
It has a rare beauty,
Carnelian!

It's often labeled sard,
Historically!
Put into necklaces, cameos and signet rings,
As you can see!

Our banquet's gemstone theme,
Carnelian!
Also it's Halloween,
A key tie in!

So enjoy what you see tonight,
The gem's a pleasant sight,
That's all too true!
And I like it, how about you?
Oh yes, I like it, how about you?