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America's Oldest Gem & Mineral Club

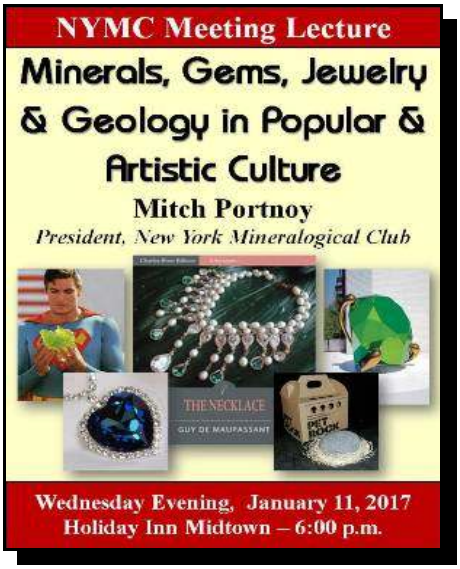
Founded 1886 ◆ Incorporated 1937

Bulletin of the New York Mineralogical Club

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

Volume 131, No. 1 *America's Oldest Mineral & Gem Club* **January 2017**

January 11th Meeting:
Mitch Portnoy: "Minerals, Gems, Geology and Jewelry in Popular & Artistic Culture"



At the end of a lecture from last year, almost as an afterthought, the speaker mentioned some minerals "in the popular culture." When walking out of the hotel a number of members, including Mitch Portnoy, agreed that this would be a great topic for an entire lecture.

The lecture you will hear tonight is the result.

Mitch will present minerals and gems, often fictional, that are found in literature, art, comic books, advertising, cartoons, movies, television and more! This will be an engaging and fun lecture filled with images, music, videos and visual motion.

Mitch Portnoy has lectured to the Club frequently in the past with lectures about malachite, pink marble, mineral frauds and many other topics.

Send in Your 2017 Club Dues

It is time to send in your 2017 club membership dues! All memberships run from January 1 to December 31 of each year (with a few exceptions).If your mailing label says "2016", you owe your 2017 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.

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Diverse Lectures & Events Coming in 2017 for the NYMC

By Mitch Portnoy

An engaging and diverse schedule of meeting lectures, auctions and other events is on the horizon for the New York Mineralogical Club in 2017.

The **lecture topics** will range from meteorites (Steve Okulewicz) to diamonds (Alan Bronstein) to Russian minerals (John Sanfaçon) to iris quartz (Alfredo Petrov). Our expanded calendar, which now includes a meeting in July, will feature a lecture by gem enthusiasts Anna Schumate and Naomi Sarna about phenomenal gems!

As of today, only May is open so if have an idea or referral or suggestion for a speaker for that meeting, please let me know!

It may sound a little crazy but planning for the **October 2017 Gala Banquet**, whose theme is "amethyst", is already in the works. A lecture will be given by Elise Skalwold of Cornell University. (You might remember her excellent presentation about the school's gem collection given to us a few years ago.) The banquet's primary gift will be a 2018 calender illustrating worldwide amethyst specimens!

Another social event is planned for August. Cheryl Neary will host an **open house/barbecue** at her house out on Long Island in August. Event specifics and details will follow later in the year.

The NYMC will participate again in both **NYC Mineral & Gem Shows** sponsored by Excalibur Mineral Corp (Tony Nikischer). We will have our usual booth as you enter and feature a lecture on each day of each show. Details are still being worked out but if you missed the lecture about opal given at the 2016 banquet, it will be repeated in March!

The **June Benefit Auction** will once-again feature a splendid variety of minerals, gems, lapidary arts and fossils. I can state this at this time this because I know how many wonderful items were donated to us by all the dealers at the November 2016 NYC Mineral Show AND the March 2017 Show still has to happen! An illustrated auction catalog will be posted online on our website.

I have been informed recently that another major donation to the Club of minerals might be in the works. If this happens, a **Special Benefit Sale** will be scheduled for some time in January 2017. Details will be sent via email or postcard to all members. (Friends and family are invited as well!)

I hope to see you at many of these events and activities so you can experience how valuable and fulfilling a **membership in the NYMC** really is. And remember, ideas and suggestions are ALWAYS welcome!

Issue Highlights

President's Message

By Mitch Portnoy

The NYMC had its first **Chinese Auction** in January of 2015. A Chinese auction is a combination of a raffle and an auction. The difference between a raffle and a Chinese auction is that in a raffle with multiple prizes, there is one "hat" from which names are drawn, but in a Chinese auction each prize has its own "hat". This allows ticket buyers to choose which prize to focus on, as opposed to having a first, second, third, etc. prize.

This meeting event has proved to be VERY popular so this year we will be upgrading the prizes, thanks to a donation of minerals by Richard Rossi. Chinese auction highlights are listed on page 7.

Please don't forget to renew your **NYMC membership for 2017** by sending in your dues. You can use regular mail and send in the form on page 11 with your check. Or, for the more digital crowd, you can use **PayPal or a Credit Card** to pay your dues directly. Go to the Membership Page on the Club's website and follow the instructions.

The History Page, with its Archives Section on the NYMC Website has inspired members from around the USA to send me some amazing items!

Archival Treasures Recently Obtained:

- Late 19th/Early 20th Century Photos
- Booklet: *A Mineralogist Abroad* by Fred Pough (1936)
- 50th Anniversary Exhibition Invitation
- 75th Anniversary Banquet Signed Program (includes a *Robert Oppenheimer autograph*!)
- 100th Anniversary Celebration Cocktail Party Invitation
- 100th Anniversary Banquet Tickets
- Mary Murphy Campaign Materials for NYMC President (1985)

All of the above have been added to the appropriate sections or files on the History Page of the NYMC Website. Enjoy!

Club Meeting Minutes for December 14, 2016

By Vivien Gornitz, *Secretary*

Attendance: 43

President Mitch Portnoy presided

Announcements:

- The monthly mineral and gem raffle was held.
- Members were reminded that membership dues for 2017 were due; Mark Kucera had the 2017 membership cards for distribution.
- Book and mineral donations from the past few months are still available; please come over!
- Geology Kits are available for purchase – they make amazing gifts!
- The day's historic events were presented.
- A song about pseudomorphs, set to music from *Pippin* was enjoyed.
- A game about minerals with a Mohs hardness of 5-6 was played; the main prize was a famous pseudomorph from Argentina.
- The items remaining for sale (books, pens, backpacks, note cards, etc.) were listed. Two new card sets were shown, one about ***beryl*** varieties and the other about ***geodes***.
- Free club postcards were distributed.
- **2016 Opal Banquet packets and 2017 Opal Calendars are still available. Please let me know if you want one!**
- 2016 NYMC End-of-Year Awards were deferred to next month.
- Upcoming clubs events were listed.

Special Lecture: Howard Heitner–
"Pseudo – What???"

Serious mineral collectors often seek the rare, unusual, or strange-looking specimen to add to their collections. One such category includes pseudomorphs--mineral tricksters that have assumed the shape of another mineral (*pseudomorph*, literally, false shape). Dr. Howard Heitner, retired chemist and long-time Club member, showed numerous examples of such mineral curiosities from his and other collections, and also informed members of how these minerals form.

As far back as the early 19th century, scientists became aware of minerals that had forms characteristic of another mineral. Johann Reinhard Blum (1802-1883) wrote one of the earliest books on the subject titled "Pseudomorphosen." Strunz, in 1982, devised a systematic classification of pseudomorphs. His first class was that of "paramorph"—minerals sharing the same chemical composition, but differing in crystal structure, for example acanthite after argentite, Ag_2S, or rutile after brookite, TiO_2.

(Continues on page 10)

Members in the News

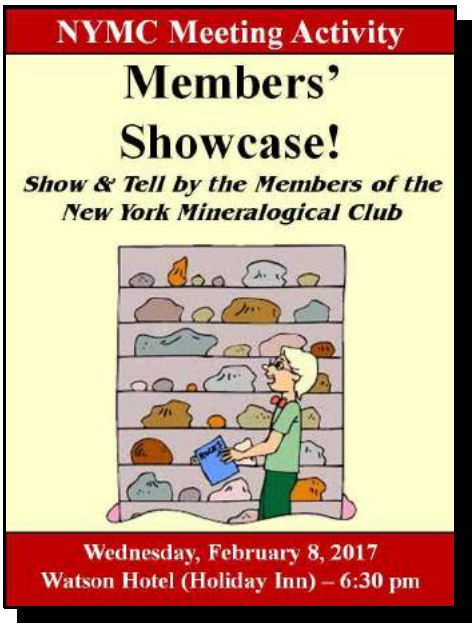
- **Naomi Sarna's** award-winning tanzanite carving (right) is now featured in **Hayley Henning's** fabulous new book: Tanzanite: Born From Lightning.
- **Irving Horowitz** will be giving his popular talk about quartz lecture at the Glen Oaks branch of the Queens Library in May of 2017.

Welcome New Members!

Sarah Arden . . . . . NYC, NY
Tony Cadiz . . . . . NYC, NY
Crystal Suh . . . . . Brooklyn, NY

In February '17: Mohs Game

Also Coming Next Month . . .



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.

Missing Mars Carbonates Found

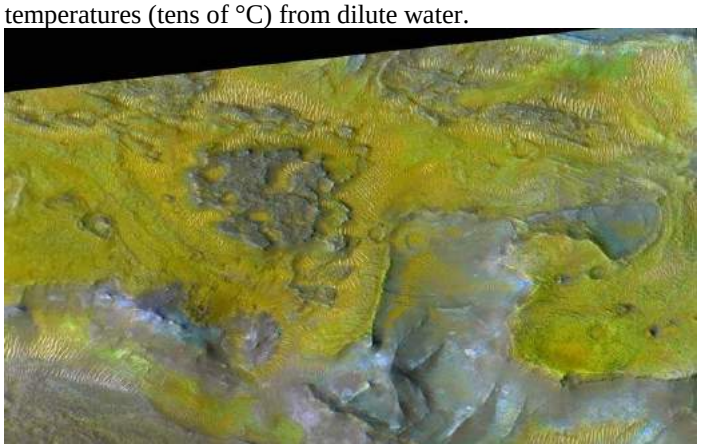
One of the enduring mysteries of Mars has been the near-absence of carbonate minerals on the surface of the red planet. Although Mars, at present, possesses a very thin atmosphere (less than one percent of Earth) dominated by carbon dioxide (CO_2), geomorphological features hint at once much thicker atmosphere now largely lost to space and a more watery ancient history. Under current atmospheric pressure and surface temperature conditions, liquid water on Mars is unstable and exists only as vapor or ice. However, one might expect that in a wetter past CO_2 would have reacted with H_2O to form carbonic acid (H_2CO_3), which would have dissolved to yield HCO_{3-}, and CO_{3-} ions. These ions, in turn, would have combined with calcium, magnesium, or iron to deposit carbonate minerals. Instead, several space probes to Mars failed to detect the elusive carbonates.

Infrared spectrometers on board some of the earlier orbiting spacecraft including Mariners 6, 7, the Thermal Emission Spectrometer (TES) aboard Mars Global Surveyor (MGS), and the mini-TES on the Mars Exploration Rovers (MER) reported suspected carbonates, but these detections were either equivocal or occurred in very low abundance. The north polar region showed some apparent indications of carbonates in the soils. However, the trace amounts spotted in the IR by TES or in the near-IR by Mars Express OMEGA puzzled scientists. The cold dry climate that persisted for most of Martian history was blamed for their absence. Other researchers speculated that subsurface water reacted with silicates to form clays, largely shielded from the once CO_2–rich atmosphere, thus favoring silica and secondary silicate minerals (e.g., phyllosilicates) over carbonates. The presence of sulfate minerals also implied that any lakes or seas on early Mars would have been too acidic for carbonates to form. Nevertheless, carbonate minerals have been identified in the lab in confirmed Martian meteorites. So we had good reason to believe that carbonates should exist on Mars. The issue was to find them.

Zooming in at higher spatial resolutions, the orbiting spectrometers gradually began to uncover signs of magnesium-rich carbonates in outcrops next to the Isidis basin, and also on the ground by the Spirit Rover in Gusev crater. Reports also began to appear of Fe/Ca and Mg carbonates found in craters in various parts of Mars. But did these outcrops merely reflect unusual local conditions, or were carbonates indeed more widespread, just largely hidden from view?

A comprehensive search using the Mars Reconnaissance Orbiter's Compact Reconnaissance Imaging Spectrometer for Mars (CRISM) finally located the missing carbonates, which are widely distributed over large parts of Mars. CRISM samples the ~0.4-3.9 micrometer (µm) spectral range at a resolution of 6.55 nanometers (nm) per channel. Carbonate minerals display spectral features at wavelengths of ~7, 11.5, and ~14 µm in the infrared, and strong overtones and combination bands at ~3.4-3.5 and ~3.9 µm, although some of these bands may be obscured by strong H_2O-related features around ~3 µm. Other much weaker bands appear at 2.3-2.35 µm and 2.5-2.55 µm, which remained undetected by earlier instruments. The near-IR bands in the 2.3-2.55 and 3.3-3.9 µm ranges were used to identify carbonate minerals. The CRISM spectra were matched to a library of lab spectra showing individual carbonates, phyllosilicates (clays), and other likely-occurring minerals for positive identification.

Based on these new spectral observations, carbonate minerals appear widely distributed across the equatorial regions of Mars, in ancient heavily-cratered terrain. Most of the detections are clustered in two major groupings, one north of the Argyre impact basin and the second between the large Hellas and Isidis impact basins. In many locations, carbonate minerals co-exist together with clays. Ancient (pre-3.8 billion-year old) Fe/Ca carbonates (e.g., siderite, ankerite) were likely deposited in deeply-buried layers, which were subsequently excavated during giant impacts, such as that which created the Hugyens impact basin northwest of Hellas. The Fe/Ca carbonates likely formed at moderate temperatures (tens of °C) from dilute water.



In this close-up view of a region of ancient, eroded terrain in Nili Fossae, carbonates (bright green) formed a few billion years ago when water interacted with the mineral olivine (yellow). Clays (light blue), which also formed in water, lie beneath the olivine and carbonate rocks. (Image: NASA/JPL/JHUAPL/U of Arizona/Brown U)

On the other hand, Mg-rich carbonates may have formed at higher temperatures from brines concentrated by evaporation or by freezing. Exposed along the walls of Her Desher Vallis, a winding canyon in the highlands NW of Argyre, are layered outcrops of Fe/Mg-clays overlain by hydrous sulfates. In other regions of Mars, somewhat younger Mg-rich carbonates (magnesite, dolomite, magnesium calcite) appear in shallow layers, overlying Al- and Fe/Mg-rich clays. They possibly date to a period when sulfate minerals were forming under more acidic conditions elsewhere on Mars. No outcrops have yet been found where both carbonate and sulfate minerals co-exist. This supports the hypothesis that more acidic solutions, associated with sulfate-formation, would have either prevented carbonates from depositing, or would have destroyed any pre-existing carbonates.

The discovery of widespread occurrences of carbonate minerals in deeply buried layers exposed as a consequence of giant impact events offers a unique window into a long-past time when the climate of Mars was quite different from today and may have presented amenable conditions favorable for the possible origin of life. Depending on the full geographic extent of the hidden carbonate reservoir, the recent spectral observations may also finally help solve the long-vexing puzzle of the missing carbonates on Mars.

Further Reading

Gornitz, V., 2016. The minerals of Mars—an update. *Minerals News* 32(4):4-5, 7-9.

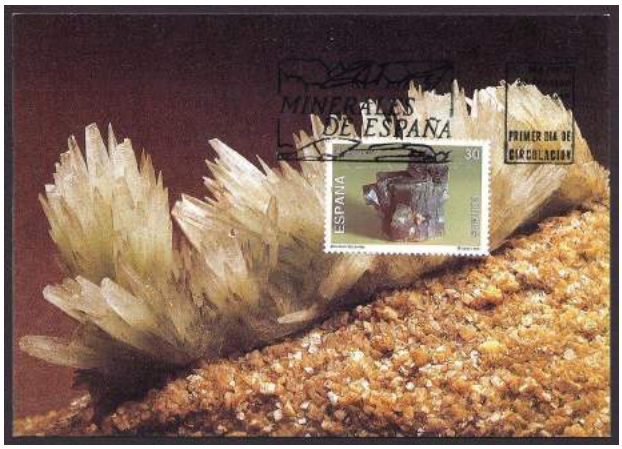
Wray, J. J. et al., 2016. Orbital evidence for more widespread carbonate-bearing rocks on Mars. *Journal of Geophysical Research: Planets*, 121, doi:10.1002/2015JE004972.

A version of this article originally appeared in *Mineral News* June 2016

Aragonite on Stamps

Daniel Rabinovich, Department of Chemistry
The University of North Carolina at Charlotte
e-mail: drabinov@email.uncc.edu

What exactly is aragonite? I had just received from a dealer a group of new stamp issues and there was one from Slovenia that came out a few months ago and depicts a specimen of aragonite. I've heard the name many times before, as I'm sure many of you have, but I just couldn't remember exactly what it was. The answer is remarkably simple: **aragonite**, together with **calcite**, are the most common and abundant *polymorphs* of **calcium carbonate**, $CaCO_3$ (*i.e.*, they have the same composition but different crystal structures). Both tend to be white or colorless, usually with shades of red, yellow, brown, green or blue.



The type location for aragonite, which gives rise to its name, is Molina de Aragón in the city and province of Guadalajara in central Spain. Large deposits are also found at various locations in Morocco, Slovakia and the Southwestern Unites States, the cities of Bastennes (France) and Girgenti (Sicily, Italy), the small village of Leadhills in Scotland, the Cumberland region in Northwest England, the state of Carinthia in Austria and the Tsumeb mine in Namibia.

Interestingly, aragonite forms naturally in almost all mollusk shells as well as in pearls and corals and it is also found around hot springs and in caves. In addition to aragonite and calcite, other forms of calcium carbonate include limestone, chalk and marble.

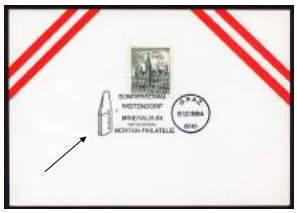
A beautiful habit of aragonite, particularly popular among mineral aficionados, is commonly known as *Flos Ferri* ("flowers of iron" in English, "eisenblute" in German) and appears in an Austrian stamp issued in 1984 on the occasion of a provincial exhibition of iron mineral ores (never mind aragonite does not contain appreciable amounts of iron . . . !).

Other stamps displaying samples of aragonite that are not illustrated in this article include one from Morocco issued in 1975 (Scott #313A), a stamp from the Republic of Malagasy issued the following year (Scott #550) and one from a set of six stamps with a mineral theme issued by Benin in 1997 (Scott #1070a).

Other Carbonates on Stamps

There are many stamps that display samples of other carbonates, some of which are included in the table below and will be the subject of future contributions to *Philatelia Chimica et Physica:*

Mineral	Formula
magnesite	$MgCO_3$
strontianite	$SrCO_3$
witherite	$BaCO_3$
rhodochrosite	$MnCO_3$
siderite	$FeCO_3$
sphaerocobaltite	$CoCO_3$
otavite	$CdCO_3$
cerussite	$PbCO_3$



Source: Philatelia Chimica et Physica, Vol. 29, No. 3 —Summer 2007

The Jewelry of Downton Abbey

Downton Abbey was one of the most popular shows on television, and its authentic costumes and jewelry were part of its charm.

Lady Violet Crawley (seated far right) and Lady Mary Crawley (standing center right) wear jewelry and tiaras created by Prince. Lady Edith Crawley (seated far left), Lady Cora Crawley (standing center left), and Lady Rose MacClare (standing third in from right) also wore pieces by Prince during seasons three and four.

When Caroline McCall, costume designer for the show, wanted jewelry for seasons three and four, she turned to Andrew Prince, a designer with an encyclopedic knowledge of jewelry history and impeccable credentials. Prince created tiaras and jewelry for the 2005 British comedy, *Mrs. Henderson Presents* (starring Dame Judi Dench); jewelry for the 2009 film, *The Young Victoria* (starring Emily Blunt and Miranda Richardson); and is a successful designer of his own collection of period pieces.

Working for a show like *Downton Abbey* is a considerable achievement, and Prince shared his thoughts with GIA about the experience: "It was an absolute thrill to work with Caroline McCall and to be associated with such a hugely successful series. It's wonderful to see my jewelry being worn by this amazing cast, and adding a little more sparkle to the sumptuous costumes and surroundings of Downton Abbey."

Lady Cora Crawley (Elizabeth McGovern) wears a tiara created by Prince.

Prince brought an art historian's eye to his jewelry. Even the stones were fashioned to mirror the cutting styles of the Edwardian and Art Deco eras. Unlike most costume jewelry used on movie and television sets, Prince's was made of bronze, brass, sterling silver, palladium, Swarovski crystals, cubic zirconia, and synthetic gemstones.

McCall selected items from Prince's collection, and asked him to create appropriate pieces of jewelry for Lady Violet Crawley (played by Dame Maggie Smith), Lady Cora Crawley (Elizabeth McGovern), Lady Mary Crawley (Michelle Dockery), and several of the other actresses. The jewelry Lady Violet Crawley wears in the photo on the left says much about her personality.

Prince shared his thoughts on the cast photo. He explained that Lady Violet wore the most splendid, formal gems with an air of complete nonchalance, while the beautiful younger ladies had fun with more modern styles. By season four, Lady Edith Crawley (Laura Carmichael) has become much more fashion conscious and daring, while her wild young cousin, Lady Rose MacClare, (Lily James) has embraced all the latest styles of the Jazz Age.

Lady Mary Crawley wore this iconic hairpiece, which Prince created.

Two Russian tiaras inspired Prince when he created this piece.

Prince reimagined the famed Sancy Diamond as a pendant worn by Lady Rose MacClare.

These earring made by Prince for Lady Rose.

Another character whose jewelry is telling is Lady Cora, who married into British aristocracy. Prince noted that, as an American heiress, Lady Cora would have had the money and access to the greatest designers of the age. These individuals could be very demanding, insisting on the latest designs and the highest quality. He added that there was no British reserve to hold them back.

The show has since moved through time, from the Belle Epoque period (1871 - 1914) to the Art Deco era (1920s - 1930s). Lady Rose is a spirited and rebellious young woman who epitomizes the fashionable flapper of the 1920s. Her personality is revealed by a glittering bandeau.

Prince shared some final thoughts on the artistic periods that are so much a part of Downton Abbey:"l particularly love the Belle Epoque – such refinement and delicacy. Design mattered more than the monetary value of the stones and precious metals used. The beauty of jewelry from that age lay in its construction. It was all so different and opulent."

Now that you know something about the creation and selection of jewelry for the characters of Downton Abbey, you might. enjoy another aspect of the show. And you may find that you have a deeper understanding and appreciation of period jewelry — knowledge that's essential for industry professionals.

Source: GIA.com

Giant Jade Boulder Discovered

A giant jade stone weighing 175 tons has been uncovered by miners in Myanmar. The stone is 4.3m (14ft) high and 5.8m (19ft) long, and is reportedly worth an estimated $170m (£140m). It was found in a mine in the jade-producing Kachin state, in the north of the country. Myanmar, also known as Burma, is the source of nearly all of the world's finest jadeite, a near-translucent gemstone.

The Anthropocene: Geologists Take up the Question of a New Epoch

By Irina Zhorov

Hermann Pfefferkorn's office, at the University of Pennsylvania, spills across a large, well-lit room that seems to have closed in on itself with shelves and cabinets and papers generated during his 43 years there. Pfefferkorn is a geologist and, naturally, has some rocks and fossils laying around. He picked up a small, black stone with a white fossil in it, straight like a straw, with subdivisions.

"If I look at some rock that has fossils for about an hour, I can tell you their ages," Pfefferkorn said.

He examined the rock, declared the fossil a relative of the octopus, and said it formed in the Ordovician. The Ordovician, on the geologic time scale, lasted from about 490 to 445 million years ago. He picked up another rock and repeated his party trick.

Pfefferkorn was able to do this because the geologic time scale is strictly correlated to tangible rocks, which are, in turn, defined by their relative position to other rock sections and a marker, like a unique fossil.

The first time fossils were used to determine rock age was in 1815, by a geologist and surveyor named William Smith. "When he was building canals, he found again and again the same sequence of rocks," Pfefferkorn said. Smith arranged the rocks in the order they were formed and looked at their fossils; he created a relative time scale, with ages expressed in relation to other rocks.

Although geologists eventually figured out how to attribute specific years to the units of the time scale, the physical evidence of rocks remains essential. It's so important, in fact, that when geologists define a time unit and find a representative rock bed that shows where it started, they drive a golden spike into the rock face to mark the spot.

Pfefferkorn disappeared behind one of his bookcases and emerged holding an old railroad spike he had painted gold. "Here's the golden spike!" he said. He held it up triumphantly.

He used to give these to geologists on field trips, doing the hard work of investigating new boundaries, the ultimate nerd souvenir. He said the geologic golden spike actually looks different, like an oversized pin, but the idea for it came from the railroad. When the eastern and western tracks first met in May of 1869, a golden railroad spike joined them.

"The image is actually useful," he said. "Because it says here is the place, two things come together here."

Right now, scientists around the world are seeking out a new golden spike site to mark the beginning of a fresh geologic epoch: the anthropocene.

The most recent epoch, the Holocene, has lasted for about 11,000 years, since glaciers covering much of the earth during the last great glaciation melted. The anthropocene's defining trait, say those who support acknowledging the new epoch, is that humans have shaped it.

Human Evidence

"In science, if something is real, if something is a distinct phenomenon, we tend to give it a name," said Jan Zalasiewicz, a geologist in England.

The word has been increasingly used in popular culture to talk about our current time period, mostly in reference to human-caused climate change. In 2008, a group of scientists published a paper saying it's time geologists took up the term and figured out if it merited official recognition on their time scale. Zalasiewicz was the lead author.

One thing led to another, and Zalasiewicz ended up head of a working group examining this question for the group that oversees the time scale, the International Union of Geological Sciences.

Geologists, when evaluating a potentially new time unit, look for signs of it in the rocks. "You need to lay out evidence that both the earth system function has changed substantially and effectively, permanently. And also that change is reflected in rocks and strata," Zalasiewicz said.

Since Zalasiewicz started this work, he's published more papers, saying, basically, yes, the evidence is there. "So, for instance, looking out of the window now, I can see roads and buildings and I know that under those roads and buildings I know there's a mass of reworked ground which likely has bits of asphalt and concrete and brick and plastic, ceramic, all that kind of thing within it," he said. Those human artifacts could function as markers in the rock strata, in the same way fossils do.

Then there are chemical signals from pollution; radioactive traces from atomic bombs; and biological signs in the form of extinctions and redistribution of animals around the globe.

"So there are a wide range of signals that reflect important kinds of global change, earth system change, which are being petrified already intro strata now forming," he added.

Is it in the Rocks?

Not everyone is on board with Zalasiewicz. Lucy Edwards, a U.S. Geological Survey geologist in Virginia, recently published a paper saying the evidence isn't good enough.

"I'm kind of a wait and see person," she said.

She acknowledges that humans are affecting the planet and signs of that are all around us. But she's not convinced that the geologic record clearly reflects this, yet. And many geologists are with her.

"I guess if you had to pin me down, I'd say I think it's premature, because I can't go out and put my finger on a lot of rocks that I would call anthropocene," Edwards said.

The issue is rocks take a long time to form, and the anthropocene is recent. We'll probably see our handiwork in future rocks, but those rocks don't exist, yet, say critics.

Knowing when the anthropocene started is another issue. One milepost that's been thrown around is the start of the atomic age. Like a human-made meteor, the atomic bomb left its mark worldwide.

If the launch of the first atomic bomb is accepted as the start of the anthropocene, said Edwards, "that is a very short time period. And that means a lot of what humans have done and have left as deposits would no longer be anthropocene. A Roman road. An indigenous people's campsite. And on and on and on."

If scientists pick an arbitrary start date that doesn't encompass all human traces in the rocks - *anthropo*, after all, stems form the Greek word for human - the anthropocene doesn't live up to its definition.

Pfefferkorn, for one, doesn't mind an arbitrary start date, as long as it's clearly defined.

Zalasiewicz has taken these critiques seriously. He said he gets that a lot of people don't want to separate the time scale from the rock record. That's why the golden spike is so important, it reconnects the idea of the anthropocene to physical rocks.

But before anyone can put a new golden spike anywhere, the International Union of Geological Sciences will have to formally approve the addition of the anthropocene. That means evaluating evidence and potential golden spike sites, a process that could take years.

Source: The Pulse from October 21, 2016

US Jewelry Company Showcases a Bit of Lady Liberty With New Collection

By Enjoli Francis and Eric Noll

A popular jewelry company is helping to bring a little piece of Lady Liberty to its customers with a new collection.

Carolyn Rafaelian, the owner of Alex and Ani, which released its Liberty Copper pieces in September, said the Statue of Liberty represented what Americans strive to be.

"She is liberty enlightening the world . . . she is the epitome of freedom, of our human rights, of this fabulous country," Rafaelian said.

On Friday, the Statue of Liberty celebrates its official dedication 130 years ago.

Rafaelian said the idea for Liberty Copper started a few years ago after she received a call from a priest asking if she was interested in using copper from the Statue of Liberty in her jewelry.

The priest put her in contact with Rick Stocks, who paid $1 million to the Statue of Liberty-Ellis Island Foundation for all of the materials left over from a renovation that took place in the 1980s.

Stephen Briganti, the foundation's president and CEO, called Stocks a "guardian" of the restoration's leftovers. The foundation and National Park Service have final approval before Stocks shares any materials.

The scraps included copper pieces, iron bars, handrails and lamps. Using his funds, Stocks then stored the pieces in warehouses in Florida and Tennessee.

"I always knew there was a greater purpose, something greater we could do," Stocks said of the materials he'd bought.

Rafaelian told ABC News that she was especially interested because of her family's connection with Ellis Island. She has the suitcase that her grandfather carried as he landed on Ellis Island after leaving Armenia in 1913.

"It is my prized possession," she said.

"He (Stocks) called in and we met and he looked at me after he had a nice tour about the business, about who I am and he literally had tears in his eye and he's like: 'I found you!'" she said.

All of Alex and Ani's products are made in Rhode Island. The company said that more than 10,000 thousand pieces bearing a copper flame, an exact replica of Lady Liberty's, have been sold so far.

"We are an American brand and she is an American icon so it kind of all works together in the [symbolism]," she said.

Rafaelian said that some of the money made from collection would go to funding an Ellis Island museum, which is in the works. She said that the company had raised more than $30 million in the last five years for different charities across the world.

Briganti, who was involved in the restoration, said efforts like the Liberty Copper collection was what the foundation had hoped would happen when it sold the materials to Stocks.

"That's the best way we can share a little bit of Liberty with people who don't come to New York and can't see it but yet feel the important of the Statue of Liberty," Briganti said of the Liberty Copper collection. "They can actually have a piece of something of their own."

Source: ABCNEWS.COM from Oct. 28, 2016

3rd Annual Chinese Auction Highlights

Thanks to Rich Rossi for donating several items to "upgrade" this event!

1. Green Beryl in Matrix . . . . . Connecticut
2. Mimetite . . . . . Durango, Mexico
3. Variscite Nodule Slice. . . . . Fairfield, Utah
4. Barite . . . . . British Columbia, Canada
5. Sulfur . . . . . Mexico
6. Cerussite . . . . . Flux Mine, Arizona
7. Arsenic. . . . . British Columbia, Canada
8. Hanksite . . . . . California
9. Proustite . . . . . Chile
10. Pyromorphite . . . . . China
11. "Green" Gypsum . . . . . Australia
12. Polished Beach Glass . . . . . NA
13. Purple Fluorite. . . . . Illinois
14. Large Split Geode . . . . . Indiana

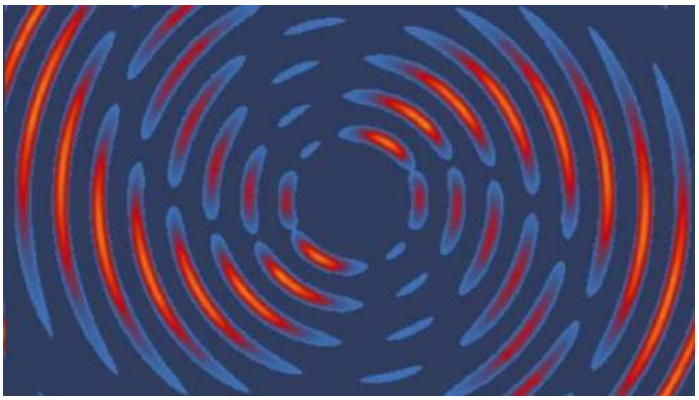
And even more will be added at the meeting!

New State of Matter Might Help with High-Temperature Superconductors

By Alfredo Carpineti

When cooled down to almost absolute zero, some materials become superconductors and suddenly transmit electricity without resistance. If we could operate superconductors at room temperature, we could have more efficient electronics and cheaper electric bills, but so far the hottest temperature we can have them at is -135°C (-211°F).

We still don't understand where the high-temperature superconductivity arises from in materials, which is why scientists are hoping to work it out by studying how atoms and electrons are distributed in the material as it becomes superconductive.



Visual representation of the break of inversion and rotational symmetry in the pseudogap. Hsieh Lab/Caltech

Now, an international team of researchers has had a breakthrough: They discovered that a phase superconductors experience when they are cooled down, called pseudogap, is actually a different state of matter. The results are published in Nature Physics.

"A peculiar property of all these high-temperature superconductors is that just before they enter the superconducting state, they invariably first enter the pseudogap state, whose origins are equally if not more mysterious than the superconducting state itself," said David Hsieh, professor of physics at Caltech and principal investigator of the new research, in a statement. "We have discovered that in the pseudogap state, electrons form a highly unusual pattern that breaks nearly all of the symmetries of space. This provides a very compelling clue to the actual origin of the pseudogap state and could lead to a new understanding of how high-temperature superconductors work."

In superconductors, electrons form pairs when the temperature is low enough. Near absolute zero, the natural vibrations of the material push electrons to overcome their repulsive forces. This doesn't happen at higher temperatures as the energy from vibrations can't bind the electrons strongly enough. The crucial step appears to be the pseudogap.

"The discovery of broken inversion and rotational symmetries in the pseudogap drastically narrows down the set of possibilities for how the electrons are self-organizing in this phase," added Hsieh. "In some ways, this unusual phase may turn out to be the most interesting aspect of these superconducting materials."

The next step for the researchers is to look at how electrons are organized in the pseudogap. If that goes well, we might be a step closer to having superconductors at room temperature.

Source: IFLScience.com from November 25, 2016

The Truth about the Mysterious "Pyramid" Discovered in Antarctica

By Alfredo Carpineti

It's a new day on the internet so there's a new conspiracy theory: a mysterious new pyramid has been discovered in Antarctica thanks to Google Earth.

Except it's just a mountain. And even the "new" part of the conspiracy theory is just a re-hashed version of a story that has been reported for years on pyramids in the South Pole.

So let's discuss the first Pyramid (AKA mountain). It was discovered by the British Antarctic Expedition of 1910-1913. It was then kept secret from every other person in the world by calling it "The Pyramid" and then use that name on every single geological survey of the area.

These geologists thought they were clever with this double bluff, but they couldn't imagine that 100 years later "truthers" would see through their ploy and discover that the Pyramid is actually a pyramid, probably created by an alien civilization, or Atlantis. Maybe. Definitely.

Now a second mountain has restarted the wheel of conspiracy theories. It can be found at the coordinates 79°58'39.25"S, 81°57'32.21"W. It's clearly a mountain.

"The pyramid-shaped structures are located in the Ellsworth Mountains, which is a range more than 400 km long, so it's no surprise there are rocky peaks cropping out above the ice. The peaks are clearly composed of rock, and it's a coincidence that this particular peak has that shape," Dr Mitch Darcy, geologist at the German Research Centre for Geosciences in Potsdam, told IFLScience.

"It's not a complicated shape, so it's not a special coincidence either. By definition, it is a nunatak, which is simply a peak of rock sticking out above a glacier or an ice sheet. This one has the shape of a pyramid, but that doesn't make it a human construction."

Although it's all very mysterious because somebody on the internet said so, pyramid-shaped peaks are very common: the Matterhorn in the Alps and Mount Bulandstindur in Iceland are notable examples.

On top of everything, there's literally no advantage in having a secret base in Antarctica. If there were the world governments would have already had a fight over its resources. Luckily, all the South Pole is rich in is natural diversity and scientific opportunities, and long may it stay that way.

Source: IFLScience.com from November 28, 2016

Topics in Gemology

Topics in Gemology is a monthly column written by Diana Jarrett, GG, RMV, based on gemological questions posed to her over the years by beginners and experts alike. Contact her at diana@dianajarrett.com.

The Big One that Didn't Get Away

What a difference a day makes. Economic reports by the end of October 2015 lamented the demise of the diamond mining boom in Botswana. "The honeymoon is over in Botswana, where the diamond industry that led the world has fallen on hard times," cried Bloomsberg reporter Mike Cohen in The Nerve Africa, a news platform covering Africa's economic climate. In the case of Botswana, 'diamonds aren't forever' was the gist of that gloomy report.

Botswana's Evolution

Over 50 years ago, Botswana miraculously morphed from dusty boondocks into Africa's snazziest urban society where wealth was evident at every turn; shopping, clinics, schools, office blocks, malls, and the whole shebang. Botswana's credit ranking was also tippy-top. Driven by the diamond trade, the region stayed in great shape until diamond prices started heading south and China put on the brakes. The ease of diamond yield in that region also impacted its output. Diamond harvests there occurred relatively near the surface. But digging deeper made the process more costly with ever dwindling returns.

If Not Diamonds, What?

A shift in Botswana's diamond production by 2014 made Russia the world's top producer, risking the closure of some mines with job losses for the first time in its dazzling diamond-rich history. "They have had so much easy money for such a long time, claimed Charles Wyndham, a former sales director at De Beers. "They are perhaps a victim of having all their eggs in one basket." What a basket it was while it was full. To counteract the unfortunate downturn, Botswana looked outward for other viable avenues of economic diversity. Minerals like copper, coal, iron ore and nickel are also produced there. But pundits point to a governmental weakness in those alternate channels. While production of the natural assets was viable, they fell flat in the export department, according to government insiders.

And Then . . . and Then . . . Wait for It!

All that 'what will we do' chatter was still percolating in November. And then something happened. Something unimaginable turned up at Lucara Diamond Corp., a small outfit operating in Karowe mine, Botswana. The 2nd largest diamond ever found had just been recovered. For the first time in over a century, a mine turned up a crystal over 1,000 carats. No one at this deposit had ever seen anything like it.

Weighing in at 1,111 carats, the stone also proved to be a rare pure variety; a type IIa diamond. Less than 2% of all diamonds are classified as type IIa. The designation identifies crystals free from nitrogen impurities which are the culprits of that undesirable yellow tinge found in most stones. Type IIa are a collector's dream, and priced accordingly, on the north side of 60K per carat.

On a Roll

The diamond world gasped at this new discovery with its hefty avocado size and magnificent clarity. The news released about the discovery shot Lucara's stock through the stratosphere. And that was fine with investors. Because the very next day, and you can't make this stuff up; the mine turned up another jumbo crystal. The mammoth Lucara Diamond's big reveal overshadowed thier second news release of an 813 carat diamond which would be the world's 6th largest diamond, and then a 374 carat stone. When does an 800+ carat stone go unheralded, or its 374 carat sidekick for that matter?

What's Next?

Small though the mine is, apparently it's centered on a mother-lode of a deposit. Since opening three years ago, the family-owned mine has produced 95 diamonds of 100 carats or more. Exciting as that is, does this change the entire diamond situation for the nation of Botswana? Hardly. But these energizing discoveries bring a welcome nuance to the conversation about what might lie ahead for Botswana.

And what about that ginormous initial find? Is there a chorus of eager buyers lurking in the wings? Well, yes and no. Almost in real time to the news release of the 1,111 carat Lucara diamond discovery, offers from around the globe poured in. "The Hong Kong one came through this morning," claimed Lucara's CEO, William Lamb. "My boss wants to buy the diamond, no matter what the price" the caller alleged. But the company is in no rush to sell. "I think there's more value to be gained for Botswana if we actually can extend it and make it into more of a story." Looks like that has happened already.

What Are All The Elements In The Periodic Table Actually Used For?

By Tom Hale

There are 118 elements in the periodic table. Everybody knows calcium is the stuff in milk and bones, chlorine goes into swimming pools, and helium floats balloons. But, besides sitting in some scientist's cupboard, what's the use of molybdenum, antimony, or gallium?

Keith Enevoldsen has created an interactive periodic table that shows the everyday applications of all the known elements, except for the superheavy elements, which are short lived, don't exist in nature, and are only really used in atomic research.

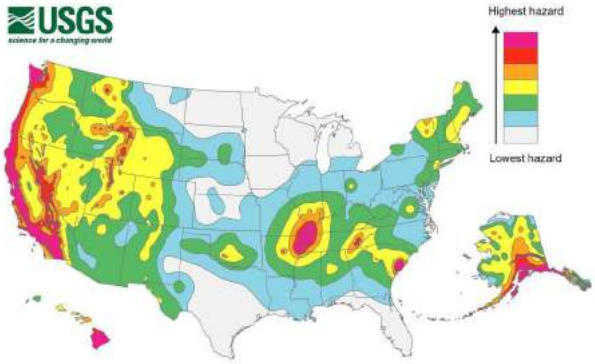
Take, for example, strontium. Other than being a distant memory of a chemistry lesson, this alkali Earth metal (just like calcium and magnesium) is a common component in red fireworks and flares. It's also used in clear batteries and medical diagnostic tracers.

There's also a downloadable PDF of the table, which makes for the perfect teaching tool. It doesn't look too overwhelming to kids, while containing the key features of a conventional periodic table. Alternatively, you can buy it in poster form from an online store if you're in need of a new wall hanging.

Head over to Enevoldsen's website elements.wlonk.com for the full interactive map. Here's a small sneak preview of it:

Source: IFLScience.com November 10, 2016

This Map Reveal How Vulnerable Your State Is To Earthquakes



It's well known that America experiences its fair share of earthquakes, and that California is bracing itself for the so-called "big one," but few truly appreciate how seismically active the US actually is. Fortunately, the United States Geological Survey (USGS) has on hand a few hazard maps that beautifully illustrate this.

Generally speaking, the redder an area is, the more at risk it is from a severe earthquake.

The unit used by the USGS is a slightly odd one known as "peak ground acceleration", or PGA. This refers to the acceleration of the ground during an earthquake. It is expressed as a fraction of the acceleration on Earth caused by the planet's gravitational field.

Essentially, the closer the value is to 1, the more violently the ground is moving. The most powerful, shallow earthquakes will produce the highest PGA values.

December 2016 Pseudomorph Lecture

(Continued from page 2)

In such cases, as temperatures and/or pressures change, the less stable mineral inverts to the more stable one under the new conditions. This may also result in "exsolution", in which the atoms in a single initial mineral rearrange themselves, forming two different minerals. A familiar example is the Widmanstatten structure in iron meteorites, in which a single Ni-Fe phase, taenite, breaks up into a Ni-poor phase, kamacite, and Ni-rich phase, taenite, during the cooling process.

Some pseudomorphs are "chemical cousins", e.g., hematite, Fe_2O_3 after magnetite, Fe_3O_4, malachite, $Cu_2(CO_3)OH_2$ after azurite $Cu_3(CO_3)_2(OH)_2$, or anglesite, $PbSO_4$ after galena, PbS. These chemical alterations often result from oxidation, as once-deeply-buried primary minerals are brought closer to the surface, where they are exposed to meteoric water and dissolved CO_2. Many primary metallic orebodies often contain such near-surface oxidation zones filled with colorful secondary minerals that are a collector's delight. Which mineral becomes a pseudomorph is often a question of atomic fit. In other words, the incoming atoms have to fit within the space occupied by the original crystal. If the new volume fit is too large, the new mineral will swell or break the crystal apart; if too small, the result is a porous mess.

Most pseudomorphs are probably replacements—new minerals with different chemical compositions that have reacted with and replaced pre-existing ones, as the composition of the circulating solutions, or magma, or solubilities changed over time. In many cases, where the reaction is incomplete, remnants of the original mineral may still be preserved at the core of the crystal. Familiar examples of replacement pseudomorphs include quartz after aragonite, copper after aragonite, calcite or clay after halite. In general, the more soluble, and/or less stable mineral is replaced by the more insoluble or stable species. Encrustations of one mineral with the form of another illustrate a sequence in which the encrusting mineral deposited over another, which subsequently dissolved, leaving a hollow encrusted shell. Meanwhile, another mineral later fills the void. An even more complex scenario unfolds if the crust is later dissolved, leaving the new mineral in the emptied space. Sometimes, the pseudomorphic process doesn't go to completion. The replacement is only skin-deep. Copper after aragonite, from Corocoro, Bolivia, may sometimes only be a thin coating over aragonite.

Howard leaves us with an interesting way to look at pseudomorphs: they represent "the ghosts of crystals past."

Please Send in Your 2017 NYMC Membership Dues!

Forget
Forget the hasty, unkind word:
Forget the slander you have heard;
Forget the quarrel and the cause;
Forget the whole affair, because,
Forgetting is the only way.
Forget the storm of yesterday;
Forget the knocker, and the squeak;
Forget the bad day of the week.
Forget you're not a millionaire;
Forget the gray streaks in your hair;
Forget to even get the blues -
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Please take the time to send in your 2017 NYMC membership dues if you have not already done so.

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G Amethyst G Fluorite G Garnet G Amber G Sapphire G Pyrite G New York State G Pseudomorphs
G The NYMC G Opal G International Year of Light G Mineral & Gem Textures G Emerald G Turquoise

G I'd like to get one of garnet-red drawstring backpacks which features the Club. (Each backpack for $5.00)

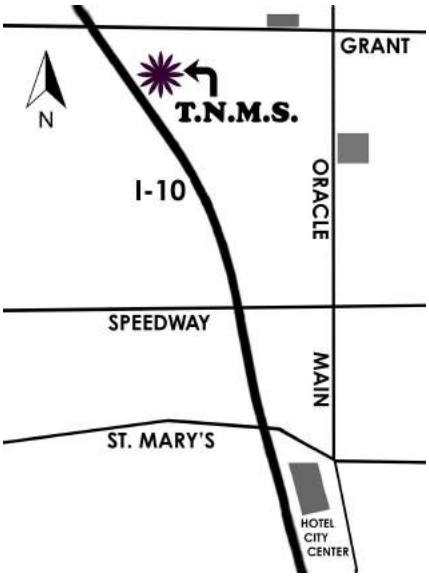
Mail this form (or copy) with your check to: Membership Coordinator, New York Mineralogical Club, Inc. PO Box 77, Planetarium Station, NYC, NY, 10024-0077

Tucson's New Mineral Show!

As many of you have heard, the large parking lot at the Hotel City Center (formerly "Inn Suites") in Tucson will no longer be available. This unexpected turn of events will certainly add to the chaos of the Tucson experience for all visitors but there is good news on the horizon.

A new, significant MINERAL show is opening at nearby Grant and Oracle, called "Tucson's New Mineral Show" (TNMS), with ample parking will ensure easy access for collectors and dealers alike. TNMS is a new event for the 2017 show season, starting on January 31 and continuing through February 6. Admission to and parking at TNMS are free. Show hours are 10-6 daily. Tucson's New Mineral Show precedes the Tucson Gem and Mineral Show® (Tucson Convention Center) and overlaps both the Fine Mineral Show (Westward Look Resort) and Arizona Mineral and Fossil Show (Hotel City Center, Ramada Inn).

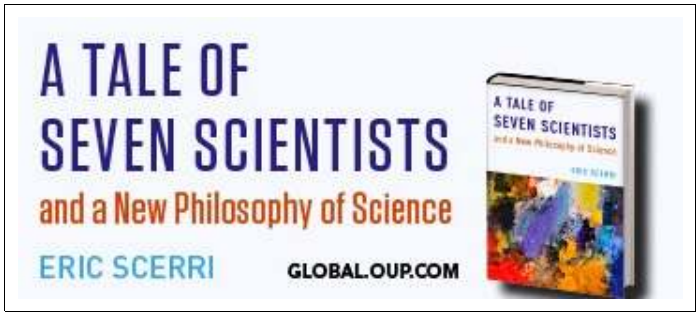
Tucson's New Mineral Show is an event for mineral collectors on any budget. The focus of TNMS is mineral diversity, with over 125,000 specimens available including display specimens, new finds, odd locality pieces, thumbnails, vintage collection pieces, historic and classic specimens, rare species, and new mineral species. Dealers agree to clearly identify their goods with both name and origin, and mark an asking price. Additionally, there will be mineralogical literature and educational materials, and also specimen display and storage supplies.



Tucson's New Mineral Show (TNMS) occupies a former movie theater. There are over 15,000 square feet of exhibition space, consisting of the main theater lobby and connected access hallways. The facility has excellent climate control, and appropriately sized restrooms. The venue has 1300 parking spaces. There will be 24-hour security, including an on-site Tucson Police Officer. TNMS will host a "round-up" of local food trucks with choices changing daily. This has the potential to become **THE EVENT** for mineral collectors!

(Note: The corundum pictured on this show poster was formerly in the collection of NYMC member **Will Heierman**!)

New Book Now Available!



In his latest book, **Eric Scerri** presents a completely original account of the nature of scientific progress. It consists of a holistic and unified approach in which science is seen as a living and evolving single organism. Instead of scientific revolutions featuring exceptionally gifted individuals, Scerri argues that the "little people" contribute as much as the "heroes" of science. To do this he examines seven case studies of virtually unknown chemists and physicists in the early 20th century quest to discover the structure of the atom. They include the amateur scientist Anton van den Broek who pioneered the notion of atomic number as well as Edmund Stoner a then physics graduate student who provided the seed for Pauli's Exclusion Principle. Another case is the physicist John Nicholson who is virtually unknown and yet was the first to propose the notion of quantization of angular momentum that was soon put to good use by Niels Bohr.

2017 Club Calendar

Date	Event	Location	Remarks & Information
January 11, 2017	Meeting at 6:30	Holiday Inn Midtown Manhattan	Special Lecture: Mitchell Portnoy – "Minerals & Gems in Popular Culture"; Chinese Auction
In February of 2017 the Holiday Inn Midtown Manhattan will be renamed the Watson Hotel!			
February 8	Meeting at 6:30	Watson Hotel, Manhattan	Annual Members' Show & Tell
March 8	Meeting at 6:30	Watson Hotel, Manhattan	Special Lecture: Steve Okulewicz – "Meteorites: Our True Extraterrestrial Visitors;
Third Wednesday! April 19	Meeting at 6:30	Watson Hotel, Manhattan	Special Lecture: Charles Snider (1st Timer!) – "The American Geode Story"
May 10	Meeting at 6:30	Watson Hotel, Manhattan	TBD
June 14	Annual Benefit Auction	Watson Hotel, Manhattan	Details to follow; Online catalog available!
July 12	Meeting at 6:30	Watson Hotel, Manhattan	Special Lecture: Anna Schumate & Naomi Sarna – "Phenomenal Gemstones"
July ??	Officer's Planning Meeting	Upper West Side, NYC	2017 Banquet; Club 2018 Calendar; Theme: Leveling Up!
August ??	Open House (Party!!)	Long Island, NY - Cheryl Neary Residence	Details to Follow
September 13	Meeting at 6:30	Watson Hotel, Manhattan	Special Lecture: John Sanfaçon– "Russian Mineralogy"

2017 Show or Event Calendar

Date	Event	Location	Remarks & Information
January 28	Rutgers Geology Museum Open House	Scott Hall, Geology Department, Rutgers, New Brunswick, NJ	Free! Presentations, Mineral Sale, Mineral ID; Easy train access
Early February 2017	Tucson Mineral Shows	Tucson, Arizona	Multi-week event, scores of locations!
February 18-19	Annual Mineral Show	New York State Museum, Albany, New York	For info: michael.hawkins@nysed.gov; Website: http://www.nysm.nysed.gov/
March 4-5	**Spring NYC Gem, Mineral & Fossil Show**	**Grand Ballroom, Watson Hotel (Holiday Inn), New York City**	**25+ diverse dealers; lectures; wholesale section (with credentials); NYMC Booth**
April 1-2	North Jersey Gem, Mineral & Fossil Show	Midland Park High School, Midland Park, N ew Jersey	Host: North Jersey Mineralogical Society; Website for Info: nojms.webs.com
June 9-11, 2017	AFMS Convention/Show	Ventura, California	Article Contest Results; Details to Follow
October 20-22, 2017	EFMLS Convention/Show	Bristol, Connecticut	Article Contest Results; Details to Follow
November 11-12	**Fall NYC Gem, Mineral & Fossil Show**	**Grand Ballroom, Watson Hotel (Holiday Inn), New York City**	**25+ diverse dealers; lectures; wholesale section (with credentials); NYMC Booth**

For more extensive national and regional show information check online:
AFMS Website: http://www.amfed.org and/or the EFMLS Website: http://www.amfed.org/efmls

The New York Mineralogical Club, Inc.

Founded in 1886 for the purpose of increasing interest in the science of mineralogy through the collecting, describing and displaying of minerals and associated gemstones.

Website: www.newyorkmineralogicalclub.org

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Dues: $25 Individual, $35 Family per calendar year. **Meetings**: 2nd Wednesday of every month (except August) at the Holiday Inn Midtown Manhattan (soon to be renamed the Watson Hotel!), 57th Street between Ninth and Tenth Avenues, New York City, New York. Meetings will generally be held in one of the conference rooms on the Mezzanine Level. The doors open at 5:30 P.M. and the meeting starts at 6:45 P.M. **(Please watch for any announced time / date changes.)** This bulletin is published monthly by the New York Mineralogical Club, Inc. The submission deadline for each month's bulletin is the 20th of the preceding month. You may reprint articles or quote from this bulletin for **non-profit usage only** provided credit is given to the New York Mineralogical Club ***and*** **permission** is obtained from the author and/or Editor. The Editor and the New York Mineralogical Club are not responsible for the accuracy or authenticity of information or information in articles accepted for publication, nor are the expressed opinions necessarily those of the officers of the New York Mineralogical Club, Inc.

Next Meeting: Wednesday Evening, January 11, 2017 from 6:00 pm to 9:00 pm

Mezzanine, Holiday Inn Midtown Manhattan (57th St. & Tenth Avenue), New York City

Special Lecture: Mitch Portnoy – "Minerals, Gems, Geology and Jewelry in Popular Culture"

New York Mineralogical Club, Inc.
Mitchell Portnoy, Bulletin Editor
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