

# THE BACKBENDER'S GAZETTE

NEWSLETTER OF THE HOUSTON GEM & MINERAL SOCIETY



*The Logan Sapphire, Sri Lanka, with diamonds.*

## SAPPHIRE, SEPTEMBER BIRTHSTONE

More on Page 9

## TABLE OF CONTENTS

President's Message	3
Vice-President's Message	3
Section Reports	4
Shop News	6
Library News	8
A Lapidary Opinion	8
Education	8
Sapphire, September Birthstone	9
2022 Scholarship Awardees!!	12
Viking Sunstones In Saga and Science	14
Board of Directors Meeting Minutes	19
General Meeting Minutes	23
Upcoming Shows	26

---

About Us: <https://hgms.org/>

---

Upcoming Meetings and Events: <https://hgms.org/events/>

---

Calendar: <https://hgms.org/calendar>

---

Officers and Contact Information: <https://hgms.org/contact-us/>

---

*Permission to use material originating in this newsletter is given freely providing that credit is given to the author and the source. Every article published in the BBG is edited for grammar and content. No flaming is allowed.*

### BACKBENDER'S GAZETTE SUBMISSION DEADLINES

*Articles are due on the 15th day of the month before the date on the BBG issue.*

*Copy is due for the next issue by the 15th of this month. Email content to [editor@hgms.org](mailto:editor@hgms.org)*



*The*

# BACKBENDER'S GAZETTE



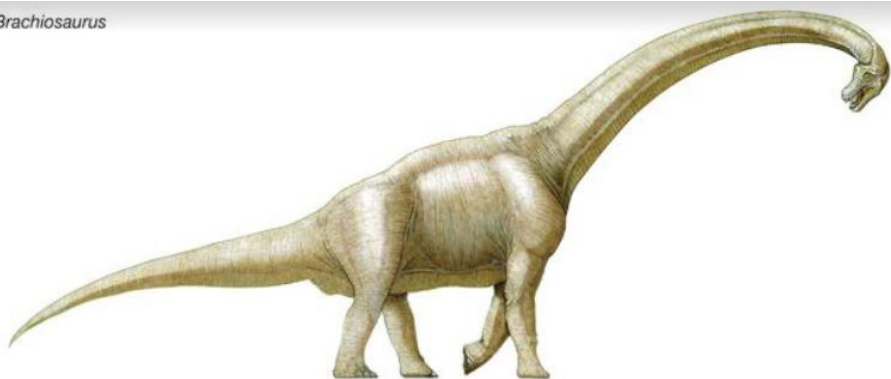
*The Newsletter of the Houston Gem & Mineral Society*

## PRESIDENT'S MESSAGE

*by Nancy English*

Usually, I skip right past the news alerts when I open my computer. But tonight, an article grabbed my attention. The largest dinosaur ever found in Europe has been uncovered in Portugal. The skeleton of a massive sauropod was discovered in a man's backyard in Pombal, Portugal. It measured about 39 feet tall and 82 feet long. The most important elements of the skeleton have been collected from the site, which include the vertebrae and ribs of a possible brachiosaurid sauropod, or brachiosaurus, the news release said. The dinosaur species roamed the Earth 160 to 100 million years ago.

*Brachiosaurus*



Cool, right? The article is a nice distraction from the final preparation for the garage sale, move, and closing. We got to see the new apartment today which helps to visualize our future. By the time you read this, we will be settled into our new apartment overlooking the pool and surrounded by our favorite things.

The outside of the HGMS building has been painted. The lighted exit signs are installed. The parking lot lighting has been upgraded. The 2022 HGMS Annual Show will have a new fluorescent booth set-up. Planning for the Show is underway right now!

The new Clubhouse Team is in place. The volunteers that make it all happen are working behind the scenes to continue improvements. Be sure to take a moment to thank the shop foremen, the board of directors, your Section Chairman, Committee Chairmen, and anyone you see working to maintain the Association we all appreciate.

## VICE-PRESIDENT'S MESSAGE

Steve Blyskal will be giving the September General Meeting program on that superb mineral location, Naica, Chihuahua.

## SECTION REPORTS

As always, please see the [Upcoming Programs](#) section under Events on the HGMS website to learn more about planned future meetings.

### BEADING SECTION (3RD SATURDAY AT 12:30 PM)

On Saturday, September 17th from 12:30 PM to 3 PM Beading Section members will work to complete a Peyote Tassel Pin as shown in the photo below. We will also create beaded spiders for sale at the HGMS Show in November. Any and all people interested in learning to bead are welcome.



Would you like to receive notifications about upcoming Beading Group activities? E-mail [beading@hgms.org](mailto:beading@hgms.org) to be added.

NOTICE: Do you have a bracelet or necklace that needs restringing? The Beading Section will carefully restring your piece at an hourly rate of \$15.00 + materials. Contact [beading@hgms.org](mailto:beading@hgms.org) to make arrangements. All funds will go to the Beading Section.

### DAY LIGHT SECTION (1ST WEDNESDAY AT 1:00 PM)

For our previous meeting on August 3rd, Margaret Hardman-Muye gave a lesson in creating an object from Precious Clay. On September 7th, the section will host Neal

Immega who will lead the section in learning to identify rocks. Neal will bring examples and is always an interesting speaker and very knowledgeable.

## GEMSTONES AND FACETING (2ND THURSDAY AT 6:30 PM IN PERSON AND VIA ZOOM)

In July, we continued to work on classes and have a few new people interested in getting started! Our member count also continues to grow, with an additional 3 new signups this week alone! I think we have gotten a little attention with the addition of Neal and his fascination with our robots "which we don't count as members!" Yet...

After watching a video on the origins of alexandrite, members Heidi and John Lee graciously showed us some awesome examples of natural and synthetic materials both of which possess the distinct and unique color change properties of alexandrite.



Origins of Alexandrite: <https://www.youtube.com/watch?v=t7i7NbbVPZY>

At left: examples of faceted synthetic alexandrite, famous for its color change.

With the help of Logan Sr. and the GemID equipment, we were able to show everyone some of the interesting properties of the material our section holds. Thanks to Randy for bringing the material and talking about it!

We have transferred the duty of equipment manager from Logan Sr. to Heidi Shelley since she's been a great help to the group and Logan Sr. along with LT are now covering maintenance for the lapidary room.

We are also looking into ways to keep the section interactive between our once-a-month meetings. That way we can better answer questions and keep an archive of the interesting things we've come across as a group. I'm currently tossing the idea of using a Discord channel as our means of communication which is easier to navigate than other social media platforms and comes with group voice, text, and video streaming built in. we can chat, leave articles and discuss all the questions we have outside our once-a-month meetup.

Discord is a free-to-use group voice, text, and video streaming program much like zoom but it's on 24/7. I've run one of these channels for my gaming friends for quite some time now and it's a lot easier to navigate than Facebook or other types of "social media". If you have any other ideas, again let us know!

I would like to give the opportunity for someone to give a lesson or show us something cool about faceting for our September 8th meeting. If you are interested in giving a lesson at our next meeting let me know! We are currently 3 weeks away, so you have some time to get a subject together!

## **LAPIDARY AND SILVERSMITHING SECTION (3RD MONDAY AT 7:00 PM)**

For our August 15th meeting, we learned about finishing techniques for silversmithing projects.

For the September 19 Meeting - Big rings are in! We will make a bold ring using larger cabochons. We will have some available for purchase (from 25x18mm to 30x22mm), or bring your own. The stone can be oval or freeform - please avoid geometric shapes like squares and rectangles. The Section will have materials kits for this project which include silver sheet, plain or patterned wide wire for the ring shank, and bezel wire to set the stone. Kits are \$20 payable by cash or check at the meeting.

## **MINERAL SECTION (3RD WEDNESDAY AT 7:30 PM (VIA ZOOM))**

After a summer hiatus, the Mineral Section met via Zoom with 12 attending and everyone showed off recent acquisitions. Steve Blyskal gave a talk on skarns. Many ore bodies are skarns, the result of local metamorphism.

A member of the section, Dean Lagerwall, will give a talk on dendrites at the September 21st meeting. Dendrites are often found in mineral specimens and lapidary material.

## **PALEO SECTION (3RD TUESDAY AT 7:30 PM)**

The subject in August was life on earth, and how it evolved, particularly photosynthesis.

The subject for our September 20th meeting will be identification of ammonites using specimens from the Irene Offeman collection. Bring your ammonites and we will try to identify them.

## **YOUTH SECTION (1ST AND 3RD SATURDAYS FROM 10:00 AM TO 12:00 PM)**

We will continue our regular activities working in the shop.

## **SHOP NEWS**

Saturdays Larry Gardner comes into the shop for a half a day to help out. Welcome!

Neal says: My work on the Trim Saws is Done!!!! All known projects are finished. Non-rusting flanges and stainless-steel nuts. No overload switches to trip. What is left to do? Rusty spot touchup on the saws and grinders, labeling the stainless-steel fittings storage. Any suggestions?

The first grinder on the left is now equipped with sintered wheels (60, 140, 325) to handle rough rock that would destroy the usual sanding wheels. (That means people working on big rocks and rough material should use this machine!) The wheels are arranged in grit order and new bearings have been put in. Thanks to Larry Gardner!

Steve Blyskal reported a problem with the 18-inch transparent top saw in the back right corner and it turned out to be one that can easily be fixed. This is an old saw, and the pulleys and shafts are built to use a 1/4-inch spline (rather than the currently more com-



mon 3/16-inch size). When someone put this saw together, they use the smaller spline in the bigger slot. If the pulley set screw comes loose (and they all do), the pulley is not tightly fixed to the shaft and damage is likely. The fix is obvious, get the right size spline (for pocket change). When the little stick of steel arrived, made the saw better (and used Loctite to keep the set screws from wandering).

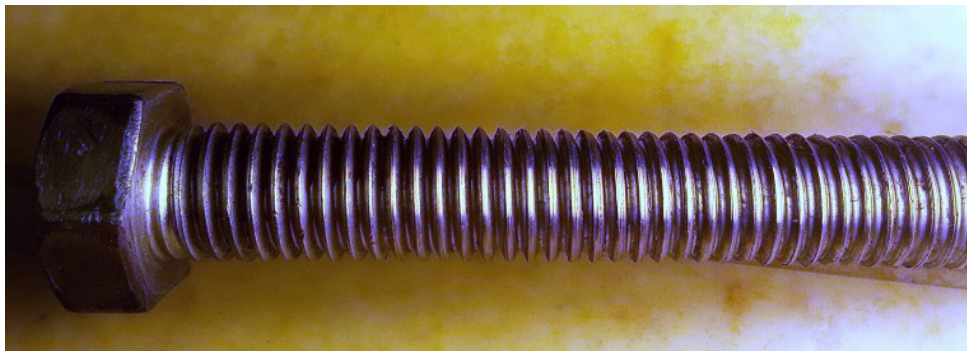
The "Texaco" is our primo hydraulic feed 2-inch saw. It cuts more rock than all the rest of the saws combined. Last Saturday I trained up Blyskal in how to trouble shoot a problem. He reported that the diamond blade did not spin. Perfect training event. Usually that problem is either a broken or loose belt, a loose setscrew, loose nut holding the blade or something worse. First step is unplug the unit and take the belt guard off. Spin the belt. What is not spinning? The motor shaft!

The set screw had come loose, and the spline fell out and was sitting under the saw. Ok. First step is to align the pulley and the drive shaft spline slots. Tap in the spline (gently). Set all the pulleys to be in the same plane. Remove the set screw and coat lightly with blue label Loctite (should hold the tightened set screw in place after 30 seconds). Tighten hard with the Allen wrench and wait a bit. Done.

Exotic chemistry: the Loctite is an anaerobic cement. It sets up when contained. Engineers like Gary swear by it. I just swear and use it.

I am also going to replace the clamping screw. People have taken the warning on loose rocks too seriously and have tightened the rock clamp as much as possible. I had been using a #2 bolt but they are too soft for our vigorous clampers and the threads are just wiped off the bolt. I replaced the big tightening wrench with a ratcheting STUBBY wrench to make it more difficult to over-tighten. Next, I will replace the #2 bolt with a much stronger #8 bolt. This will either last longer or it will destroy the steel plate that moves the rock clamp. I will watch it and let someone know.

Note that the threads in the middle have been about 1/2 scraped off. The bolt has not failed but I expects the #8 to last a good deal longer.



Ancient History - More than 20 years ago we had a problem with our primary 24-inch HP slab saw (it is now located just behind Texaco). It uses a Wentworth spline (looks like 1-inch half moon) to attach the drive shaft to the pulley. The Wentworth spline only has a small area of contact and the shaft chipped. Today, I would have just asked John Cooper to cut a slot for a normal spline, but he was not around 20 years ago. Gary said we could just GLUE the pulley to the shaft and Gary was running the shop then, so I did it. We used RED label Loctite (permanent) to stick the thing together and it has held just fine. Wow.

Splines: I just knew you wanted to know more about splines. They are square pieces of metal that fit into a slot in the shaft and a slot in the pulley. They lock them together with the help of a set screw.

I forgot to tell you one of the trifling problems with splines. Since they only come from China, there is a little problem with the Chinese Inch vs the American Inch. The spline as delivered is a little oversize to 1/4 of an inch and does not fit. Fortunately, I have lots of grinding machines and could use the lap plate to trim the spline. I wonder what people do who do not have as nice a shop as we do.

A reminder about water supply to the shop foremen: There are 2 valves controlling the water to each grinder. The first one is a gray and black needle valve to control the water pressure. The second one is a 6-way valve to adjust the amount of water going to each wheel. We have this two-stage system because the 6-knob valve will not take much pressure. So, first adjust with the single valve to get the flow about right and then twiddle with the 6-way to distribute the water. Would anyone like to learn more about these subjects?

## LIBRARY NEWS

New Book reviewed by Neal Immega- A Prehistory of Houston and Southeast Texas, Landscape and Culture. Jeanean Slamen showed her copy around and I got one for the library. I could not find a better place to put it, so it went into the Texas section. Terrific book! It will be on the new book table, and I will show it around on Meeting night this week. Book quote: The Karankawa were cannibals, but they did not eat the Frenchmen they killed because they said "We do not eat Frenchmen." I wonder how you get on this list? Too much garlic or snails?

## A LAPIDARY OPINION FROM NEAL

Turquoise and Lapis: Neal says, get the good synthetic stuff from Tucson and stop messing about with natural turquoise and lapis.

Only Tony has the natural stuff. Who knows what you have been sold?



## EDUCATION

We are seeking teachers to expand our class selections. Specifically: PMC, Dichroic Glass, Enameling, Mosaics, and bead weaving instructors are needed. Contact [Classes@HGMS.org](mailto:Classes@HGMS.org) for more information on teaching or taking classes. We are planning to offer more short & easy summer-time classes for those interested in making some fun projects.



## INTRODUCTION TO ENAMELS CLASS

This class will be taught by Jeanean Slamen on Thursday, September 8th from 4 PM to 8 PM in the Center Classroom and Jewelry Studio. Join us to learn foundation enameling skills using a butane torch. This four-hour class will explore both opaque and transparent lead-free enamels on copper forms using safe and efficient processes.

Completing this class will give you the skills to take more specialized enameling classes coming this Fall and work on your own at home or in the HGMS studio. For safety, students must bring a close-fitting mask (not a pleated-style mask) to wear while sifting the enamel powders.

Cost: HGMS members \$57; Non-Members \$72. Cost includes a \$12.00 Material Fee. There is a minimum of two students and a maximum of five students per class session. Students must complete registration 48 hours prior to the class meeting so that materials and tool kits can be assembled.

Jeanean may provide additional enameling classes in the future: Exciting Enameling Surfaces, Foils & Wire in Enamels, Drawing & Painting on Enamel Surfaces, Textured Metal for Enameling, Raku & Crackle Enamel, and Making Settings for Your Enamels

## SMALL TORCHES FOR JEWELRY MAKING (STJM-091622-JS)

This class will be taught will be taught by Jeanean Slamen on Friday, September 16th from 5:00 PM to 8:00 PM. This hands-on class will benefit aspiring jewelry makers who are "torch-curious", or hesitant about operating a torch. Affordable and portable butane "micro torches" come in a variety of sizes and capabilities. You'll test test-drive several types of micro-torches in a safe environment while trying out annealing, fusing, melting and soldering fine silver and sterling silver. The instructor will discuss torch safety, demonstrate torch techniques, and discuss how to set up a soldering station at home. All materials are included in the class price.

Cost: HGMS Members \$55.00; Non-Members \$70.00 Minimum 2-students; Maximum 4-students.

## SAPPHIRE, SEPTEMBER BIRTHSTONE

*by Sigrid Stewart*

If you have a September birthday, this variety of corundum is the stone for you. Sapphires consist of aluminum oxide ( $\text{Al}_2\text{O}_3$ ) crystallized in the trigonal system. They are hardness 9 on the Mohs Hardness Scale; diamond, at 10 on the scale, is harder. As well as being the September birthstone, Sapphire is the traditional gift for a 45th wedding anniversary.

The designation of the other corundum gemstone, ruby, is reserved for only those stones of shades of red or reddish pink. All others are classified as sapphires, although in the popular imagination, sapphires are cornflower blue. As it turns out, the best and most famous sapphires are blue, and the name is derived from the Greek word "sapheiros" and the Latin word "saphirus", for blue. "Fancy" sapphires in yellow, purple, orange, and green colors owe their colors to trace amounts of iron, chromium, titanium, beryllium, vanadium, or magnesium. Pinkish-orange gemstones are called "padparadscha." The cost of a sapphire varies with color, clarity, size, cut, and quality. Untreated sapphires

are worth more than treated gemstones. Both are worth more than lab-created stones. Geographical origin also has a major impact on price. For gems of more than one carat, a certificate from a laboratory such as the Gemological Institute of America is recommended.

According to Fire Mountain Gems, "Sapphire is said to be the wisdom stone, stimulating concentration, enhancing creativity, and promoting depth of thought. It is believed to focus and calm the mind as well as remove unwanted thoughts, depression, and tension." Blue-as-heaven sapphires suggested the favor of the gods.

According to Wikipedia, Pope Innocent III decreed that rings of bishops should be made of pure gold, set with an unengraved sapphire, as possessing the virtues and qualities essential to its dignified position as a seal of secrets, for there be many things "that a priest conceals from the senses of the vulgar and less intelligent; which he keeps locked up as it were under seal."

Historically, Sapphires were found in Sri Lanka, an island off the coast of India known to the Greeks, Persians and Romans and mentioned in the Bible. It was one of the stones of Aaron's breastplate. Also known as Ceylon, Seilam, Tabropane and Serindib, it is the Ratna Dweepa or 'Island of Gems' of ancient Sanskrit. The stones have been mined from alluvial gravels for thousands of years.

Today, Sapphires are found in Australia, Colombia, Montana, Africa (Ethiopia, Madagascar, Kenya, Malawi, Mozambique, Nigeria, Rwanda, Cameroon, Tanzania), and Asia (Thailand, Vietnam, Laos, Cambodia, Myanmar, China, Afghanistan, India and of course Sri Lanka). Sapphire and rubies are often found in the same locality but in different formations. For example, both ruby and sapphire are found in Mogok, Myanmar, but the rubies are found in marble, and the sapphires in granitic pegmatites or syenites. Madagascar is the current world leader in sapphire production, surpassing Australia.



*Teardrop Sapphire by LesFacettes*

Although the most valuable sapphires are completely natural, such as the classic metamorphic sapphires from Kashmir, Burma, or Sri Lanka, treatment of sapphires (and other gemstones) by heating is believed to go back to Roman times. Different methods can be used to improve the clarity and color of sapphires, for instance, by heating the stones in furnaces to temperatures between 800 and 1,800 °C for several hours. With such treatment, the stone becomes bluer in color, but loses some of the needle-like rutile inclusions (also called silk), becoming clearer under magnification.

The Yogo sapphires found in Montana are not heat treated because they are usually free of inclusions and often of the desired cornflower blue color. Although they are beautiful gemstones, they are usually less than a carat in size.

Some large and famous sapphires are mentioned in the chart below:

Sapphire ♦	Origin ♦	Size ♦	Cut ♦	Color ♦	Location ♦
Bismarck Sapphire <sup>[77]</sup>	Myanmar	98.56 carats	Table	Blue	National Museum of Natural History, Washington
Black Star of Queensland <sup>[18]</sup>	Australia, 1938	733 carats	Star	Black	Anonymous owner
Blue Belle of Asia <sup>[78]</sup>	Sri Lanka	392.52 carats	Cushion	Blue	Anonymous owner
Logan Sapphire <sup>[79]</sup>	Sri Lanka	422.99 carats	Cushion	Blue	National Museum of Natural History, Washington
Queen Marie of Romania <sup>[80]</sup>	Sri Lanka	478.68 carats	Cushion	Blue	Anonymous owner
Star of Adam <sup>[17]</sup>	Sri Lanka, 2015	1404.49 carats	Star	Blue	Anonymous owner
Star of Bombay	Sri Lanka	182 carats	Star	Blue-violet	National Museum of Natural History, Washington
Star of India	Sri Lanka	563.4 carats	Star	Blue-gray	American Museum of Natural History, New York
Stuart Sapphire	Sri Lanka	104 carats		Blue	Tower of London

Sapphires are laboratory-grown for both jewelry and Sapphire’s many uses in modern technology. Thin wafers of sapphire, due to their excellent electrical insulating properties, can be used as a substrate upon which silicon is deposited to make the integrated circuits known as silicon on sapphire. Single crystal wafers can also be used for substrates for deposition of Gallium nitride, which is used in blue LEDs and lasers. Sapphire also has high thermal conductivity. CMOS chips on sapphire are especially useful for high-power radio-frequency applications like cellular telephones and satellite communication systems.

Sapphire “glass,” transparent and scratch resistant, is used as a window material for applications as diverse as spectroscopy, barcode devices, watch crystals, iPhone camera lenses and fingerprint readers. Often the sapphire for these uses is grown in single crystal boules aligned on the c-axis, then sliced and polished.

Sapphires are usually faceted but can be cut en cabochon. An example are star sapphires, stones that exhibit asterism: a six-rayed star, although even 12-rayed stars are known. The "star" pattern is due to needles, usually of rutile, a titanium dioxide mineral, inter-grown with the sapphire.

Sapphires are found in Australia, Colombia, Montana, Africa (Ethiopia, Madagascar, Kenya, Malawi, Mozambique, Nigeria, Rwanda, Cameroon, Tanzania), and Asia (Thailand, Vietnam, Laos, Cambodia, Myanmar, China, Afghanistan, India and of course Sri Lanka).

Sapphire and rubies are often found in the same locality but in different formations. For example, both ruby and sapphire are found in Mogok, Myanmar, but the rubies are found in marble, and the sapphires in granitic pegmatites or syenites.



Star Sapphire with six-ray star

## References:

<https://en.wikipedia.org/wiki/Sapphire>

<https://gem-a.com/gem-hub/around-the-world/ancient-sapphires-and-adventures-in-ceylon>

<https://www.tsarinagems.com/post/padparadscha-the-queen-of-sapphires>

## Photos:

Star sapphire photo by Mitchell Gore - Own work, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=321268>

Logan sapphire with diamonds, photo by Chip Clark, Smithsonian staff of the Museum of Natural History, Smithsonian Institution, Image Number: 95-40288 Catalog Number: G3703 and Gem Gallery, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=17325598>

## 2022 SCHOLARSHIP AWARDEES!!

Starting with the 2022 academic year, the Houston Gem and Mineral Society has increased the number of annual scholarships by two additional \$2,500 awards, for a total of \$7,500 in scholarship funds for deserving students. The scholarship committee also spent additional time and effort reaching out to colleges and universities across Texas to spread awareness of our scholarship program with amazing results. This year we received 15 applications, by far the most in a single year in since the middle of last two decades! Of course, we are disappointed that we cannot help all of them as each applicant was deserving, but the committee did come to agreement and are pleased to be able to lessen some of the financial burden of achieving the educational goals for the following three awardees:

Eden Lagnado, University of Texas at Austin

Eden attended Bellaire High School, and is pursuing a Bachelor's degree in environmental science "in order to better understand and prepare us for our future as well as be a part of the solution to improve the planet's condition and avert any future environmental crises."

She volunteers with two organizations: Geoscience Ambassadors Program, and GLOW (Geoscience Leadership Organization for Women). She focuses her outreach on the Girl Scouts of Austin, where she developed an introductory lesson plan on rocks and minerals, a virtual mineral identification lab, and a bracelet crafting workshop!



Sounds like she is a natural future leader for HGMS! "I want to thank you and the HGMS Scholarship Committee for awarding me the 2022 HGMS Earth Science/Jewelry Arts Scholarship, I am more than excited to have received this award!"

Mathew O'Brien, University of Houston

Mathew is a Houston resident and attends the University of Houston pursuing a Master's degree in geology, focused on hydrogeology and the interaction of dissolved chemicals with clays in the south Texas sediments.

He has been learning the techniques of environmental drilling, logging, and sampling of groundwater, and volunteers with the Association of Engineering and Environmental Geoscientists (AEG), and hopes to continue his work with groundwater in his professional career.

"Groundwater is an important resource that needs to be properly maintained for the years to come." We could not agree more!

"Thank you so much for this award, and I will strive to continue with my successes into the coming year."

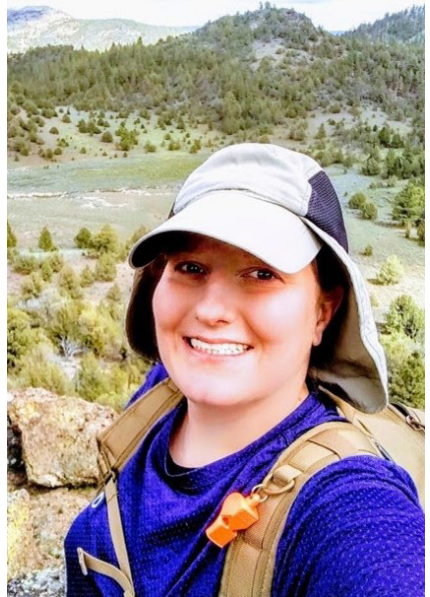


Molly Peplau, University of Houston – Downtown

Molly is a Houston-area resident who is striving for a Bachelor's degree in petroleum technology at the Downtown campus of the University of Houston. She has been elected as President of the UHD Geology Club, where they've resumed some local field trips, volunteered at the Reach for the Stars event, and work to have their club reinstated with the American Association of Petroleum Geologists (AAPG) student chapter soon.

She fully intends to continue her education with an advanced degree after graduation. Her picture is in the Cascade Mountains obtaining volcanic rock specimens to use Uranium-Lead radiometric age dating to date the eruption in that specific area.

"I want to say thank you so much for the opportunity to be the recipient of this scholarship! I am so grateful to the Houston Gem and Mineral Society for providing me with these funds so that I may further my education and achieve my goals."



We wish these deserving students the best of luck in their educational endeavors, and as always, if you know of any Earth Science or Jewelry Arts student currently residing in, or



previously (at any time in the past), or currently attending a school within Harris or one of the adjacent surrounding counties, please encourage them to apply for our scholarship. Any questions can be directed to [scholarships@hgms.org](mailto:scholarships@hgms.org).

Sincerely,  
Michael Sommers  
2022 Scholarship Chair

## VIKING SUNSTONES IN SAGA AND SCIENCE

A SYNOPSIS OF THE MAY PROGRAM PRESENTED BY DR. JENNIFER BARTLETT

*by Andy Thompson, MSDC Secretary*

*Reprinted from Mineral Minutes May 2022, the newsletter  
of the Mineralogical Society of the District of Columbia*

Dr. Jennifer Bartlett is an astronomer who is accustomed to interdisciplinary research. She shared with MSDC the idea that Iceland spar (calcite) or cordierite crystals could be the mysterious sunstones, reported in Viking sagas, that may have played an important role in supporting the Vikings' navigational competencies.



Calcite crystals have a property called double refraction (also referred to as birefringence), an optical phenomenon which causes light to bend (or refract) in two different directions, dividing the light into two polarized rays. Dr. Bartlett surmised that the that Vikings may have used this light-polarizing property to identify the hidden location of the sun on over-cast, sunless days, assisting in directional navigation.

As a trained celestial navigator, Jennifer made multiple training voyages with Coast Guard cadets. On a two-month Arctic voyage, she used Iceland spar and found it to be a credi-



ble navigational tool. She worked at the U.S. Naval Observatory specializing in predicting the availability of natural light for twilight and night-time naval operations. In August 2021, she transferred and took up her academic position with the U.S. Naval Academy. There, she continues with her research and holds the Kinnear Chair in the Physics Department. Dr. Bartlett also has had a personal interest in the history of science and has explored earlier technologies which have gotten us to the understanding we have today. That includes researching the lore about the Vikings and the rare references to their use of Viking sunstones and compasses. And, importantly, it also includes Jennifer's scientific research into predicting the availability of light and night-time navigation and exercises.

The split-image of the two photos shown below illustrate these two aspects of Jennifer's interest and competencies, as well as of her presentation to MSDC, namely, the Viking lore and the present-day science for instruments measuring light.



On the left is Jennifer as a historical reenactor. And on the right is Jennifer as a scientist. With regard to the question of the Vikings' possible use of sunstones to aid their navigation, Jennifer described two criteria for evaluating the Vikings' possible use of these calcite crystals:

- What we know from the historical written record of the actual use of these calcite crystals, as reflected in the Viking sagas, and
- What we know from science relative to the effectiveness of these calcite crystals and polarized light to help find the sun's position on an overcast day.

### THE SAGA OF VIKING SUNSTONES

The Vikings, of course, were Scandinavian seafarers whose name, she said, translates as "Bay Pirates," or those who raid others' ships. Their legendary navigational skills enabled trading missions throughout the Atlantic regions, Mediterranean Sea, and European rivers as evidenced by the artifacts found by archeologists. The Vikings' heyday was during

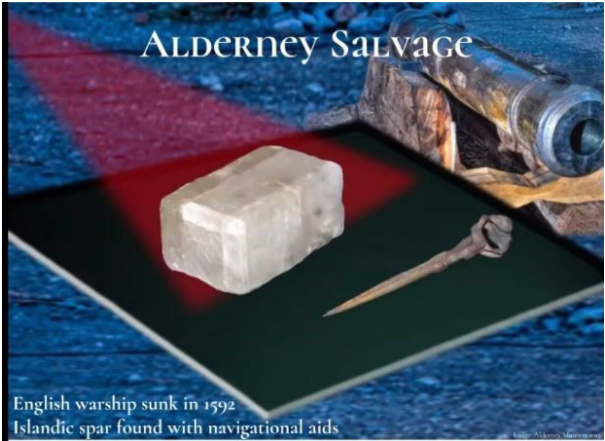
the 8th through 11th centuries. The written record offers little support for the widespread use of sunstones as a navigational tool. And yet the Viking culture had a vast travel network which established settlements in far-flung regions including Russia, the Baltics, and across the Atlantic. Their navigational technologies had to have been extraordinary, including exceptionally seaworthy ships and other supports for knowing their location vis-à-vis far-flung lands.



DISCOVERY OF SUNSTONES IN SHIPWRECKS?

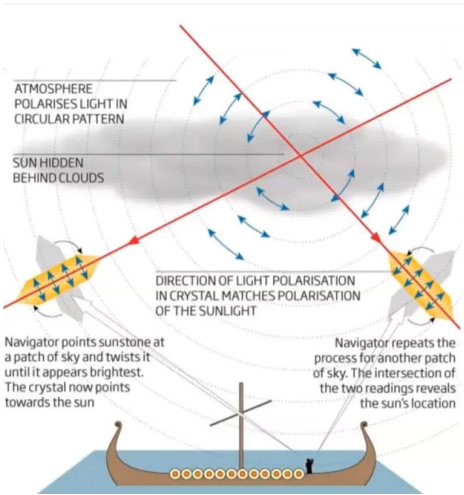
Not only is the information from Viking sagas thin, there is a similar dearth of evidence characterizing what maritime archeologists can tell us. Examination of recovered Viking ship wrecks has failed to find evidence of sunstones among the wreckage.

A British warship was sunk near the Alderney Channel Islands in 1592. In that wreck, maritime archeologists did find and salvage a cluster of navigational aids including a piece of Icelandic spar. So that provides a bit of evidence suggesting some possible use consistent with the Viking navigational sagas.



# THE SCIENCE BEHIND VIKING SUNSTONES

Jennifer explained the mechanics of how a navigator could have used the sunstone to identify the whereabouts of the sun when it was hidden behind an overcast sky. She explained that when sunlight passes through clouds, the light is scattered as it reflects off particles in the atmosphere. Also, the light, she said, is “lightly polarized.”



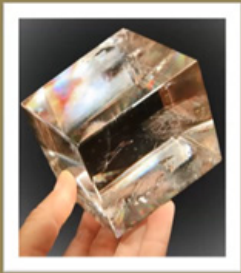
The image at left illustrates how the navigator detects the location of the hidden sun. The navigator holds the rectangular crystal up at eye level and points it toward the sky in a scanning motion. At its brightest point in the sky, the location of the sun will be 90 degrees off from the face of the crystal. The navigator can then repeat this process and point the crystal about 90 degrees opposite from the first scanned direction, moving across the sky as before. This second scanning can identify a second line of sight 90 degrees from the face of the crystal. As noted in the image below, the intersection of those two sight lines will be the location of the sun.

Jennifer explained that there are two primary minerals that can be used to make this happen, cordierite (below, on the left) and Iceland spar, or calcite (below, on the right).

## Sunstone Candidates



Cordierite?



Iceland Spar or Silfurberg?

Jennifer provided the following explanation. A basic requirement is that both crystal specimens must have a high level of clarity or transparency. Also, both crystals must show the optical property of double refraction, or birefringence, meaning they split an incoming ray of light or image into two distinct pathways, resulting in a double image.

When the navigator is rotating the sunstone crystal, he or she is determining which direction the crystal is facing when the two rays or images become one. That establishes the direction from which the incident, or original ray of light is coming from the sun. Iceland spar, Jennifer noted, is a particular form of calcite having a high level of clarity and transparency. Historically it was mined primarily in the Nordic countries of Norway, Sweden, and Denmark and has been viewed as a common, rather than rare, mineral. Over the last two centuries, those Nordic mines, for the most part, have been tapped out. For about the past century, Mexico and South America have been the main sources of calcite and cordierite. Today those crystals still are used extensively in optical equipment. The properties of each are listed below.

PROPERTY	CORDIERITE	CALCITE
FORMULA	$\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18}$	$\text{CaCO}_3$
SYMMETRY	Orthorhombic	Trigonal
FREQUENCY	Abundant	Common
COLOR	Blue, Purple, Gray, Trichroic	Colorless, White Gray, Yellow, Brown, Red, Green, Blue, Black
STREAK	White	White
LUSTER	Vitreous to Dull	Vitreous to Pearly
DIAPHANEITY	Transparent to Translucent	Transparent to Opaque

Interestingly, Jennifer noted that the two early scientists who studied and theorized about light, Christian Huygens and Sir Isaac Newton, worked with and wrote about Iceland spar when they formulated their theories about the nature of light, respectively, as either a wave or as a particle (corpuscle).

### CONCLUSION

Jennifer asked the question: Could the Vikings have used Iceland Spar as a navigational tool? She answered with a definite “Yes!” But, did they? “Maybe” she replied. More research is needed.

The recording of Jennifer’s presentation is now online at: Iceland Sunstones in Viking Navigation - Saga and Science, with Dr. Jennifer Bartlett - YouTube

# HOUSTON GEM & MINERAL SOCIETY

## BOARD OF DIRECTORS MEETING MINUTES

August 2, 2022  
By Sharon Halton

X	President— Nancy English	x	Beading— Maggie Manley
X	1st Vice President—Sarah Metsa	X	Day Light—Fred Brueckner
X	2nd Vice President—Beverly Mace		Gemstones & Faceting—Randy Carlson
X	Treasurer—Michele Marsel	X	Lapidary & Silversmithing—Richard Good
X	Secretary—Sharon Halton	X	Mineral—Ray Kizer
X	Past President —Sigrid Stewart	X	Paleontology—Mike Dawkins

President Nancy English called the Zoom meeting to order at 7:34 p.m.  
A quorum was present.

Non-voting members in attendance: Former President Steve Blyskal and Past President Sigrid Stewart.

### PRESIDENT'S COMMENTS:

News from HGMS President Nancy English regarding Neal Immega resigning as Clubhouse Chairman: It is with regret that I accepted Neal Immega's resignation as Clubhouse Chairman. Neal made it clear to me earlier this year that the repairs in the shop are getting physically more difficult and he wanted to be phased out of doing the machine repair work and supervising the Shop Foremen. He said he wanted to focus on the Paleo Section and the Libraries. Recently he made it clear that working with the Board is becoming more frustrating for him because of the changes the Board is planning for the building.

Neal is a revered member of the leadership of HGMS. He is a valuable promoter of HGMS, the shops, the library, and the continued education. We all hope to see him in the Clubhouse frequently doing what he wants to continue to grow the Club.

Approval of Minutes: Sharon Halton: Michele Marsel moved via email to approve the minutes of the July 5, 2022, Board of Directors' Meeting. Ray Kizer seconded the motion. It was voted on via email and passed by a quorum of seven, on July 17, 2022

Treasurer's Report: Treasurer Michele Marsel sent the Treasurer's Report to members on August 2, 2022. Effective July 11, the interest rate on the Live Oak Savings account moved up to 1.4%.

### COMMITTEE REPORTS

BBG Notice: Beverly Mace notified members that the online version of the August BBG is

Donations, Sales, Auction Committee (DSAC): Michele Marsel – Some unknown person dropped off equipment and rocks in the parking lot and these have been brought inside. Some additional sales of equipment have occurred. Nothing else to report from the DSAC.

Education Committee: Maggie Manley: Nothing new to report.

Safety/Policy Committee Michele Marsel:

- Remediation Scope for Contractor Bid: Michele Marsel emailed the final list of remediation items that require a contractor bid to all Board members on Sunday 7/31 for discussion and review at the 8/2 Board Meeting. Michele discussed all items on the list and board members offered input. The Board decided to hold off on approval until a definitive “bid package” for the contractors has been distributed to the Board by Michele and approval can be performed by email. As soon as the bid package is available it will be distributed to the Board.
- Exit Lighting - Richard Good received a very favorable bid to install lighted exit signs and pathway lighting from Texas State Electrical. Our member Jim Burrell owns the company and is graciously charging a tiny amount for labor for the work. Jim is expected to complete the job in August.
- Exterior Lights - Yesco has the LED bulbs in stock now to convert our three parking lot lights and is expected to complete the work in August.

Scholarship Committee: Mike Sommers’ committee did a terrific job this year.

Membership Committee: Beverly Mace reported new and renewed memberships in July.

Member counts	New	Renewal
Singles	10	2
Couples	4	2
Families	1	
Youth	2	

Show Committee:

- The first half of the Humble Civic Association fee will be paid tomorrow. The Humble Civic Center price rate will increase annually over the next few years until we reach the new non-profit daily rate of \$7500. However, the price will be raised in increments each year for the next few years until that rate is reached. This year we will be paying \$6800 each show day.
- Clyde McMeans moved the Flourescent Display trailer to a member’s secure property, saving us \$123.00 a month.

Volunteer Committee: Nancy English announced that Daniel Rodriguez has joined her on the Volunteer Committee. He is tech-savvy and will be able to support the new volunteer program the committee needs. Thanks to Michele we will be choosing one later this month.



## SECTION REPORTS

Beading Section in person: third Saturday, 12:30 p.m., August 20, September 17, October 15, 2022.

Day Light Section in person: first Wednesday, 1:00 p.m., August 3, September 7, October 5, 2022.

Gemstones and Faceting Section Zoom Hybrid: second Thursday, 6:30 p.m., August 11, September 8, October 13, 2022.

Lapidary and Silversmithing Section in person: third Monday, 7:00 p.m., August 15, September 19, October 17, 2022.

Mineral Section Zoom program planned: Steve Blyskal will give a presentation on skarn mineralization at the next meeting. Third Wednesday, 7:30 p.m., August 17, September 21, October 19, 2022.

Paleo Section in person: third Tuesday, 7:30 p.m., August 16, September 20, October 18, 2022.

Youth Section in person: first and third Saturdays, 10:00 a.m. to Noon., August 6 and 20, September 3 and 17, October 1, and 15, 2022.

## OLD BUSINESS

BBG Editor: During the July 5, 2022 BOD meeting Fred Brueckner asked that Sigrid Stewart make sure that the page showing other Club Shows be returned to the BBG.

Nancy English asked "Is there a way you can publicize who to call or contact to get on the Calendar? Like Calendar@hgms.org or Website@hgms.org, whatever you think?" Nancy also suggested that the calendar be printed in the BBG again instead of as a link. That would make the calendar easier to handle via cell phone.

The BBG and Web Committees will review the requests at their August 16 meeting and get back to the Board.

Display Cases status: no report

A/C Maintenance - Lee Thompson performed our second quarterly maintenance service on July 23. It was a month late, and our new Club maintenance manager, Dean Wix, will make sure it stays on track going forward. The technician said the blower on the small unit in the main room is no longer working. We are expecting an estimate from Lee Thompson. A "do not use" sign has been placed on the thermostat for that unit.

Security System - Fred Brueckner had our outdoor camera checked by a local security system professional. The alarm box had pulled loose and that had knocked the camera cable loose as well. It has been repaired and the cost was \$50. We will set aside the idea of replacement or changes until the renovations are completed so that we know where the cameras need to be aimed.

Exterior Painting - Kirkconnell completed additional prep and paint work on our parking

lot door. Nancy will follow up with them on some drip marks before the job is considered complete. We have been advised not to tape signs on the metal door as the summer heat made the tape adhesive extremely difficult to clean off. The idea was proposed to use magnets to hold signs on the door instead of tape. Nancy English texted Kirkconnell today to request them to put one more coat on the door to cover the rain streaks, then she will authorize full payment.

Neal Immega Transition Date – As discussed previously, Neal Immega gave his resignation as Clubhouse Chairperson and Shop Manager to President English on June 12, 2022. The Board's acceptance was published by President English in Houston Gem & Mineral Society News - Week of June 19, 2022.

Michele Marsel assisted Nancy to prepare a matrix of Clubhouse Committee positions. We have filled all the positions except the Clubhouse Chairman and the Security Systems Administrator. A spreadsheet was distributed to the Board that describes the responsibilities.

President English announced our new Clubhouse Committee team:

- Lapidary Shop & Center Classroom Managers - Logan Wilcox and his son, L.T. Wilcox will manage and maintain these two areas. Richard Good will advise and assist them with equipment repairs as needed.
- Jewelry Shop Manager - Tony Lucci will manage and maintain the Silversmithing Shop.
- Air Abrasive Shop – Neal Immega will continue to manage and maintain this area.
- Club Maintenance & Service Contracts Manager - Dean Wix will handle Club Service Contracts (Cleaning, A/C Maintenance, etc.) and repairs outside of the Shops.
- Supply Manager for non-shop supplies Sharon Halton is our new general Supply Manager. Clyde McMeans will assist Sharon as needed.
- Access Lock Administrators: Michele Marsel remains the primary Administrator and Fred Brueckner is the backup.
- Library Committee: Neal Immega will continue to manage and maintain our Main Club Library as well as the Paleo library.
- Nominating Committee: Please asked the Section Board Representatives to talk to their Sections and the club members they know about joining the nominating Committee.

## NEW BUSINESS

Divider Partition for Main Room: Maggie Manley suggested a new room divider/screen setup that would allow privacy for classes being held in the main hall. She recommends the Screenflex product and she shared the price for one 6'tall x 16'9" long Standard room divider Excel Grey Smoke Fabric, which is \$1,474.00 + shipping. Click the link to see the divider options: <https://www.screenflex.com/products/standard-room-dividers/> Maggie will take measurements in our main meeting room when she returns in mid-August.

Field Trip to HMNS/ Dreher Masterworks Exhibit. Sarah Metsa coordinated this field trip to this world-renowned exhibit.

The next Board of Directors Zoom meeting will be on the first Tuesday, at 7:30 p.m., September 6, 2022.

The next General Meeting will be on the fourth Tuesday, at 7:30 p.m., August 23, 2022.

Sarah Metsa will provide a program on the Dreher Masterworks field trip.

Adjourn: Sharon Halton moved to adjourn the meeting. Mike Dawkins seconded the motion and it passed. The meeting adjourned at 9:32 p.m.

## **HOUSTON GEM & MINERAL SOCIETY GENERAL MEETING MINUTES**

August 23, 2022

*by Sharon Halton*

President Nancy English called the meeting to order at 7:38 p.m.  
She welcomed 12 members in the clubhouse and 3 by zoom  
No new members or guests were in attendance.

### **PRESIDENT'S COMMENTS:**

We received a sweet letter from Laura Dobson last week.

"Years ago my parents, Harold and Yvonne Dobson, were active members of the HGMS. My father has since passed away and my mother is in her 90's. I am looking for past or present members who remember her and would be interested in staying in touch (her address book with all that information has gone missing and I am attempting to reconstruct as much as I can).

Any help would be greatly appreciated.

Thanking you in advance,

Laura Y Dobson"

I am saddened to tell you that Bob Fischer died somewhere between Amarillo and Clarendon, TX just after midnight Sunday. As many of us know, Nancy was trying to get Bob to Houston for Hospice care. Please take a minute to contact Nancy. She is back in Houston.

The speakers used for the hybrid meetings are very sensitive. If you feel the need to have a personal conversation during the meeting or the program, please move to the garage.

Approval of Minutes: Sarah Metsa moved to approve the minutes of the July 26, 2022 General Meeting as published in the August 2022 BBG. Richard Good seconded the motion and it passed.

### **COMMITTEE/SECTION REPORTS**

Please look for reports of future Section meetings and programs in the BBG calendar, on the Website <https://hgms.org/events>, or by reading the weekly e-blast from Houston Gem and Mineral Society. If you are a member and not on our email list, please contact the Publicity Chair at [News@hgms.org](mailto:News@hgms.org), using the Subject Line: "New Member to be added." President English invited other Section Chairs and Standing Committee Chairs to make any additional announcements.

Donations, Sales, Auction Committee (DSAC): Michele Marsel: no report

Membership Committee: Beverly Mace The cost for membership for NEW members is \$20.00 for the rest of the year.

Education Committee: Maggie Manley reported via email: Look for another Small Torch Class and a series of Enameling Classes by Jeanne Slamen. Sharon Halton's Cabs 101 Classes have been popular. Sharon has promised to teach Dichroic Glass as well in the near future. Do you want to share your expertise? E-mail [Classes@HGMS.org](mailto:Classes@HGMS.org) and we can discuss it.

Safety/Policy Committee: Nancy English/Michele Marsel

Completed items:

- Michele Marsel worked with YESCO to upgrade the parking lot lights to LED and replace the faulty photocells in the outdoor cameras.
- Richard Good and James Burrell are responsible for the new lighted exit signs that have been installed.

The Clubhouse Chairman duties have also been rearranged. A new email for maintenance has been set up so if anything is noted to be wrong, please send an email to: [maintenance@hgms.org](mailto:maintenance@hgms.org). We wanted it to be easy to remember and not create a whole bunch of new emails for each position. All emails sent to [maintenance@hgms.org](mailto:maintenance@hgms.org) will forward to the personal email accounts of everyone on the Clubhouse Team. The new email and the information about it were posted on the Sunday, August 21 eBlast.

This is the perfect time to announce who is on the Team so far.

- Clubhouse (non-Shop) Supplies: Sharon Halton primary, Clyde McMeans backup.
- Clubhouse (non-Shop) Maintenance (like A/C, light bulbs, bathroom issues): Dean Wix
- Jewelry Fabrication Shop Manager: Anthony (Tony) Lucci
- Lapidary Shop & Center Classroom Managers: Logan Wilcox
- Access Lock: Michele Marsel primary, Fred Brueckner backup
- Library or Air Abrasives Room questions and concerns, you may contact Neal Immega at [nealimmega@gmail.com](mailto:nealimmega@gmail.com)

Show Committee: Scott Singleton/Sigrid Stewart met on August 15.

## OLD BUSINESS

President English asked members to look for the progress of Old Business items in the Board of Directors' Meeting Minutes in the latest BackBenders Gazette (BBG) on the HGMS Website <https://hgms.org> under Publications.

The City of Houston water leak has been fixed but the driveway has yet to be repaired. Dean and Michele have already hung the shade cloth on the front of the building. Dean has been very helpful and we've kept him busy already.

The exterior painting has been completed and paid for. Forrest pointed out that the base has not been painted.

Air conditioners have been repaired.

## NEW BUSINESS

President English asked for any further New Business.

A canopy (tent) with black cloth has been purchased and was erected in about 30 minutes, reported Clyde. This will be used for displaying florescent minerals during our upcoming show.

The next Zoom Board of Directors meeting will be on Tuesday, September 6, 2022, at 7:30 p.m.

The next Hybrid General Meeting will be on Tuesday, September 22, 2022, at 7:30 p.m. Presentation is to be announced.

Nancy English announced that she and Tom sold their house within 7 hours of it going on the market. They are having a garage sale on Saturday August 27, 2022, 8:00 a.m. to 3:00 p.m. Lots of furniture and stuff. (9822 Canoga in Spring Branch). Nancy has a spool polisher for sale.

Show-n-Tell: Nancy asked for presenters to limit items to 3 per person

- Richard Good showed a beautifully polished agate which he was asked to polish for the donation committee.
- Sharon Halton showed a seraphinite cabochon which is in a finding to make it look like a hot-air balloon. She also had a piece of amethyst which she found on her cousin's property (the only known amethyst location in Virginia). She also bought a booklet about the history of the "Lead Mine" which is at the lake where she vacations.

Drawing: Nancy English won the Montana agate which was the door-prize.

Before we Adjourn:

Refreshments were provided by Foster Kneeland.

Feed the Kitty! Your donations go to offset the cost of the snacks.

Thank the volunteers who made tonight possible.

Thank the volunteers who make all of what HGMS is available.

Adjourn: Sarah Metsa moved to adjourn. Sharon Halton seconded it.

Adjourned at 8:10 p.m.

Vice President Sarah Metsa presented the program on the Dreher Masterworks and the HGMS field trip to the feature at the Houston Museum of Natural Science.

## UPCOMING SHOWS

09/08/2022 – 09/18/2022

Denver Gem & Mineral Fall Showcase

For eleven days in September, Denver, Colorado, hosts 14 separate shows featuring 900-ish vendors and exhibitors displaying and selling rocks, minerals, lapidary rough and fossils.

<https://xpopress.com/showcase/profile/2/denver-gem-mineral-fall-showcase>

09/24/2022 - 09/25/2022

Lubbock Gem & Mineral Society Show

Saturday 10:00 - 6:00 Sunday 10:00 - 5:00

Lubbock Memorial Civic Center, 1501 Mac Davis Lane, Lubbock, TX 79401

Lubbock Gem & Mineral Society

<http://lubbockgemandmineral.org/>

09/24/2022 - 09/25/2022

Rock Gem & Jewelry Show

Saturday 10:00 - 5:00, Sunday 10:00 - 5:00

Wonderland of the Americas, I-10 and Loop 410 on Fredericksburg Rd, San Antonio, TX 78201

Southwest Gem & Mineral Society

<http://www.swgms.org/>

10/08/2022 - 10/09/2022

Tri-City Gem & Mineral Society Show

Saturday 9:00-6:00 – Sunday 10:00-5:00

Frank W. Mayborn Civic & Convention Center, 3301 N Third Street, Temple, TX

Tri-City Gem & Mineral Society

<https://www.facebook.com/groups/194934397585497/>

10/14/2022 - 10/16/2022

50th Annual Gem & Mineral Show

Friday and Saturday 10:00-6:00, Sunday 10:00-4:00

Alario Center, 2000 Segnette Blvd, Westwego, LA 70094

Gem and Mineral Society of Louisiana

<https://www.gmsofla.org/>

10/21/2022 - 10/23/2022

Austin Gem & Mineral Show

Friday and Saturday 9:00-6:00, Sunday 10:00-5:00

Palmer Events Center, 900 Barton Springs Rd, Austin, TX 78704

Austin Gem & Mineral Society

<http://www.agms-tx.org/>

11/05/2022 - 11/06/2022

Golden Spread Gem Mineral & Treasure Show

Saturday 9:00-5:00, Sunday 9:00-5:00

Amarillo Civic Center Complex, 401 S Buchanan St, Amarillo, TX 79108

Golden Spread Gem Mineral & Treasure Society

<http://www.amarillotreasure.com/>



11/11/2022 - 11/13/2022

HGMS Annual Gem, Mineral, Jewelry & Fossil Show

Friday and Saturday 9:00-6:00, Sunday 10:00-5:00

Humble Civic Center, 8233 Will Clayton Parkway, Humble, TX 77338

Houston Gem & Mineral Society

<https://hgms.org/>

11/19/2022 - 11/20/2022

Dallas Gem & Mineral Annual Fundraiser - 11/19/2022

Saturday 10:00-6:00, Sunday 10:00-5:00

Mesquite Convention Center, 1700 Rodeo Dr, Mesquite TX 75149

Dallas Gem & Mineral Society

<http://www.dallasgemandmineral.org/>