



A monthly publication of the Clear Lake Gem & Mineral Society

VOLUME 50

JUNE 2024

NUMBER 6



NEXT MEETING: **Tuesday, June 18, 2024**

TIME: **7:00 p.m.**
LOCATION: **Helen Hall Library
 100 W Walker St.
 League City, Tx 77573**

INSIDE THIS ISSUE

June Meeting	1	<u>June MONTHLY MEETING</u>
Board/General Meeting Minutes Upcoming events Field Trips	2-3	We will have another awesome speaker, Steve Blyskal. He will be presenting the Agate Rock Hunts in Alpine, Tx. Please come and join us for a good educational event. Show and tell.
Lithium Lithium Mines	3-8	http://www.clgms.org/
Upcoming shows	9	

MINUTES OF THE May CLGMS GENERAL MEETING

Our directory is getting ready to be finalized and if you want to send a picture, so that other members can put a face to a name. Please send Mike your picture and why you like our club and how long you have been a member.

Field Trip (July): Johnson's Rock Shop in Livingston, TX. The store has 10 rooms to go through and look at items for sale. 238 N Lincoln Wiggins St. Livingston, TX 77351 phone # 936-563-4438. They take cash, credit cards, and checks. It's about 2 hours away and we will meet there on 7/13 at 10am with a late lunch at 1pm and then start to come back to Houston at 3pm.

Winners for our school scholarships will be getting their letters sent to them and getting their checks during our July general meeting.

The newsletter was good, and no changes were made.

No Treasury report at that time.

MINUTES OF THE June CLGMS BOARD MEETING.

There was no June 2024 BOD meeting.

Our next show will be February 22-23, 2025.

Upcoming events - We are looking forward to the following programs.

STEVE BLYSKAL PRESENTS
Kokernot o6 Ranch in Alpine, TX
Agate Rock Hunts

June 18- 7 pm
Helen Hall Library
100 W Walker St
League City, TX 77573

CLGMS 50th Anniversary

Monthly Meetings held
3rd Tuesday of the Month
www.clgms.org

Steve Blyskal, head of the Mineral Section of HGMS and a long-time collector, will give a presentation at our next meeting in June. His topic will be the new agate collecting locality in West Texas, the Kokernot o6 Ranch, which has been open for agate rock hunts since 2021. Steve will give us a presentation on the regional and local geology of the Davis Mountains and specifically on the Kokernot o6 Ranch, a 105,000-acre spread that covers parts of two counties in the Alpine/Fort Davis area. Steve has just returned from his 6th weekend hunting agates on the ranch and he and his wife Sigrid have visited many of the documented localities where various types of agate are found. He will bring with him 4 flats of his polished agate collection from the ranch, as well as slabs and nodules and seam agate pieces from their finds, some of which will be for sale.

You may recognize Steve and his wife Sigrid from our annual Gem Show at the Pasadena Convention Center as they are one of our annual vendors. Truscon Minerals specializes in providing mineral specimens to collectors from beginning to intermediate levels. They carry specimens from thumbnail to large cabinet size. They are known for having a great variety of affordable specimens from localities all over the world. In addition they carry a good selection of quartz minerals and geodes from many localities. They have been in business for 20 years and do local shows in the Houston Metropolitan Area.

Steve Blyskal has been collecting minerals as a hobby for over 50 years. He has been a member of the Houston Gem and Mineral Society since 1977 and currently holds the positions of Mineral Section Chairman, School Collections Chairman and Show Dealer Chairman. He holds two degrees in geology and worked in the petroleum industry for over 30 years. He started Truscon Minerals in 2000 as an online mineral business and recently shifted focus to doing local shows in the Houston area.

Truscon Minerals can be reached at: Facebook: - <https://www.facebook.com/Truscon.Minerals.48/>

Instagram: trusconminerals Website: www.trusconminerals.com

Please check out our Facebook page: **[Clear Lake Gem and Mineral Society](#)**.

Field Trips Announcement

Saturday, July 13. Johnson's Rock Shop in Livingston, TX.

If you have a good location for our club field trip – please contact:
annabel.brownfield@gmail.com or call/text: 281-486-1866.

What Is Lithium?

Live Science by Staphanie Pappas (Oct. 23, 2018)

The lightest known metal can also lighten your mood. Lithium, atomic number 3, is an element of many uses. It's used in the manufacture of aircraft and in certain batteries. It's also used in mental health: Lithium carbonate is a common treatment of bipolar disorder, helping to stabilize wild mood swings caused by the illness.

Lithium has a flashy discovery story — literally. A Brazilian naturalist and statesman, Jozé Bonifácio de Andrada e Silva, discovered the mineral petalite ($\text{LiAlSi}_4\text{O}_{10}$) on the Swedish isle Utö in the 1790s, according to the Royal Society of Chemistry (RSC). The mineral is white to gray, but when thrown into fire, it flares bright crimson.

In 1817, Swedish chemist Johan August Arfwedson discovered that petalite contained a previously unknown element. He wasn't able to isolate the metal entirely, but he did isolate one of its salts. The name, lithium, comes from "lithos," the Greek word for "stone."

It took until 1855 for someone to isolate lithium: British chemist Augustus Matthiessen and German chemist Robert Bunsen ran a current through lithium chloride to separate the element.

Physical properties

According to the Jefferson National Linear Accelerator Laboratory, the properties of lithium are:

Atomic number (number of protons in the nucleus): 3

Atomic symbol (on the Periodic Table of Elements): Li

Atomic weight (average mass of the atom): 6.941

Density: 0.534 grams per cubic centimeter

Phase at room temperature: Solid

Melting point: 356.9 degrees Fahrenheit (180.5 degrees Celsius)

Boiling point: 2448 degrees Fahrenheit (1342 degrees Celsius)

Number of isotopes (atoms of the same element with a different number of neutrons): 10; 2 stable

Most common isotopes: Li-7 (92.41 percent natural abundance), Li-6 (7.59 percent natural abundance)

The brain on lithium

Lithium is a special metal in many ways. It's light and soft — so soft that it can be cut with a kitchen knife and so low in density that it floats on water. It's also solid at a wide range of temperatures, with one of the lowest melting points of all metals and a high boiling point.

Like its fellow alkali metal, sodium, lithium reacts with water in showy form. The combo of Li and H₂O forms lithium hydroxide and hydrogen, which typically bursts into red flame.

Lithium makes up a mere 0.0007 percent of the Earth's crust, according to the Jefferson Lab, and it's only found locked up in minerals and salts. Those salts have the power to change the brain: Lithium salts were the first drugs approved by the Food and Drug Administration to treat mania and depression, according to the National Institute of Mental Health.

Today, lithium carbonate is the compound most often sold as a pharmaceutical. No one knows exactly how lithium works to stabilize mood. Studies show multiple effects on the nervous system. In 2008, for example, researchers reported in the journal *Cell* that lithium interrupts the activity of a receptor for the neurotransmitter dopamine. It also appears to plump up brain volume, according to a 2011 study in the journal *Biological Psychiatry* (though this research is hotly contested).

In a study with worms, biologists at MIT found that lithium inhibits a key protein in the worms' brain, making neurons linked to an avoidance behavior go dormant. Essentially, the worms stopped avoiding harmful bacteria without that protein. The findings, which would need to be replicated in humans, suggest the element silences certain neurons in the brain and may have a calming effect, the researchers reported in 2016 in the journal *Current Biology*.

Lithium in space

Lithium, as well as the first and second lightest chemical elements (hydrogen and helium, respectively), are the only elements created at the birth of the universe, according to NASA. However, according to the Big Bang Theory, the universe should hold three times as much lithium as can be accounted for in the oldest stars, an issue called the missing lithium problem. This "missing lithium" discovery was first made in the 1980s, said Pasquale Serpico, a cosmologist at the National Center for Scientific Research (CNRS) and the University of Savoy Mont Blanc in France. It created a "tension," Serpico said, between what the Big Bang data and the observations of stars were telling researchers about lithium's abundance.

Astrophysicists continue to conduct research to find this "missing" lithium or to explain why it's missing. In fact, researchers recently found a giant star holding 3,000 times more lithium than normal "giants," they reported in August 2018 in the journal *Nature Astronomy*. They came up with two possible explanations: the giant star swallowed its planet, absorbing the onboard lithium; the lithium also may have formed inside the star, reaching its surface before the heat of the deep layers vaporized it, according to a statement on the finding.

More about lithium

Lithium-ion batteries are the key to lightweight, rechargeable power for laptops, phones and other digital devices. According to the U.S. Geological Survey, Argentina and Chile increased their lithium production 15 percent each in 2014 alone to meet the growing demand. Worldwide, production jumped 6 percent that year.

Lithium and another battery component, cobalt, could become scarce as demand increases, Stefano Passerini and Daniel Buchholz, both at the Helmholtz Institute Ulm in Germany, said in a statement describing their analysis of the future availability of those elements published in 2018 in the journal *Nature Reviews Materials*. In addition, both are concentrated in less politically stable countries, the study revealed. As such, the researchers urged the development of new battery technologies based on other, non-toxic elements.

The United States has one lithium mine, in Nevada, according to the USGS. Chile and Australia produce the most lithium in the world.

Naturally occurring lithium in drinking water correlates with lower levels of suicide, according to a 2009 study that highlights lithium's role in the brain. But psychiatrists are careful about prescribing lithium in high doses, particularly because it can pass through the placenta and have unknown effects on the developing fetus.

On a lighter note, the element is part of celebratory fireworks shows: A mix of lithium and strontium salts, along with some other chemicals, creates the show's brilliant red color.



The Largest Lithium Mines In The World

Worldatlas.com

Lithium's vital role in energy production and storage has earned its spot as one of the most mined materials in the 21st century. Australia is the world's leading lithium producer, producing over 62,000 tonnes, with Chile and China trailing at 39,000 and 19,000 tonnes. This alkali earth metal is of great importance in the electric industry since its low atomic mass and unique electron configuration have made it an efficient and sustainable component in phones, vehicles, and ionic batteries. Lithium has also

attracted environmentalists for its role in sustainable electrical storage since it facilitates the reuse of drained batteries. The lithium market volume is projected to grow by roughly 12% from 2023 to 2030, with investors favoring it over other precious metals due to its promise, particularly due to its introduction of electronic vehicles (EVs) in Germany and China.

Greenbushes Lithium Operations: Albemarle Corp

The world's largest mine is Albemarle's Greenbushes mine in Western Australia. The mine is located south of Perth and is accessible via the South Western Highway between Bunbury and Bridgetown to Greenbushes Township as well as via the paved Maranup Ford Road to the Greenbushes Mine. Albemarle's shares are primarily split between the Chinese firm, Tianqi Lithium Industries, and American-based Albemarle Corp owns the remaining 49% of shares. The mine is expected to operate until 2039 and produce 155.8 thousand tonnes of lithium in 2022. The company completed its expansion plan in 2020 and created 300 jobs thanks to that project. Three existing pits will be combined to boost mining rates by 16 million bank cubic meters.



Salar De Atacama Mine

The second largest lithium mine is located in Antofagasta, Chile. It produced 135.4 thousand tonnes of lithium in 2022 and is set to stay functional until 2030 under the administration of Sociedad Química y Minera de Chile (SQM). The mine is located in the Atacama Desert, a rich environment that contains almost 9.2 million tonnes in reserves. Therefore, Chile was responsible for 26% of lithium production in 2021. Albemarle and Chilean SQM have invested \$2.3 billion in 2022 and are responsible for excavation in the Atacama Desert. There have been some challenges in mining due to the demand for mining technologies that do not rely on water and conventional evaporation techniques. Therefore, some projects that do not adopt new environmentally friendly technologies have not had a substantial effect on the mass drilling and production of lithium, but have set all eyes on the new technologies Chile will bring to the mining scene and increasing investments.

**Mount Marion Lithium Mine**

The Mt Marion lithium mine has made significant improvements to optimize its production, such as advancements in communication, LNG-fired power stations, and sustainable water security solutions. The mine is located southwest of the Kalgoorlie mine in western Australia and has produced almost 56 thousand tonnes of lithium hydroxide in 2022. It is owned by Mineral Resources which is jointly working with Jiangxi Ganfeng Lithium Co. The mine is set to remain in production till 2047.

Mount Cattlin Lithium Mine

Mount Cattlin's Lithium Mine has a resource estimate of 12.2 Mt at 1.3% Lithium Dioxide. The open pit mine is located two kilometers north of Ravensthorpe and commenced operations in 2016. Since the mine relies on solar power and renewable energy resources, it has been able to cut costs and deliver increases in Mineral Resource tonnage from 21% to 13.3Mt at 1.2% Li₂O in 2022. The mine is set to operate till 2025 and is fully owned by the Argentinian company, Allkem. In April 2022, a new project was launched in a major 147-hole to increase the longevity of the mine and revise reports regarding mineral resources and ore reserves.

Pilgangoora Project

The Pilgangoora Project is a surface mine that is also located in western Australia. It is located south of Port Hedland in the Pilbara region and is projected to remain functional till 2060. This mine has made several technological advancements in the automation of vehicles and drills. Cutting costs and optimization have increased the firm's output by 100,000 dry tonnes annually. The company intends to add more projects at the end of 2023 with the primary purpose of expanding operations to reach full capacity and yield. The Pilgangoora project is estimated to contain proven and probable reserves of 214.2Mt grading 1.19% Lithium Oxide. The project uses open pit mining techniques and its concentrator plant has an ore processing capacity of 2 mtpa and is set to increase by more than 2 folds after the expansion of the mine.

Salar Del Hombre Muerto Mine

Located in Catamarca, Argentina, the greenfield mine is owned by the US-based Livent Co. which conducts operations in Singapore, Japan, China Korea, the United Kingdom, and Argentina. It is a main supplier of lithium consumers in big techs such as Tesla and BMW. The company's income has increased by 45483.3% from 2021 to 2022, as well as a 90% approximate increase in revenue. The mine has produced 32.8 thousand tonnes of lithium in 2022 and will remain operational till 2090. Livent primarily sells battery grade Lithium Hydroxide, High Purity Lithium Metal, and Butyllithium. The mine is located at a high altitude; the unique geographical characteristics such as low precipitation and inconsistent topography have caused water to evaporate at a faster rate than other mines, meaning that mining there has severe implications for the environment and greenhouse emissions. The firm intends to accelerate its project and expand it threefold despite the effects it has had on neighboring rivers and communities such as the Trapiche River.

**Salar De Uyuni Mine**

Located in Potosi, Bolivia, the greenfield mine is owned by Yacimientos de Litio Bolivianos and has yielded 14 thousand tonnes of Lithium in 2022. Even though Bolivia's salt flats contain large reserves of lithium and valuable metals, the Bolivian government has been unable to excavate or commence big-scale operations to extract lithium. However, Chinese and Russian companies have invested almost 1.4 billion to commence operations in the hopes of increasing the lithium yield which will reach 24 thousand tonnes in 2022. Despite the country being a small player compared to mass producers around the globe, recent turns of events have shed more light on the potential of the rich salt lands.

Bikita Mine

The Bikita Mine is located in Masvingo, Zimbabwe, and is owned by Bikita Minerals (PVT). It has produced almost 26 thousand tonnes of lithium in 2022. Other than the mine's production of Lithium, it is also a world-class producer of petalite and tantalite. The Bikita mine has lithium mineral resources estimated at around 65.4193 million tons of ore. The recent mineral processing and expansion projects are projected to commence operating in late 2023, meaning that there is an expected increase in the company's yield and reserves. The company was acquired by the Chinese firm, Sinomine Resource Group, in 2022 which proposed the implementation of a new spodumene concentrate plant and the expansion of the existing petalite plant.

Salar De Olaroz Lithium Project

The mine has yielded 13.8 thousand tonnes of lithium in 2022 under the ownership of Alkem. It is located in Jujuy, Argentina, and is projected to operate till 2030. The firm's partnership with the Japanese firm, Toyota Tsusho Corporation has funded plans for development at Olaroz. Compared to other mines in the region such as Atacama and Uyuni, the mine has a low magnesium to lithium yield, which is preferable in the extraction and refinery processes. The company has one of the lowest production cost ratios with their cash operating cost ranging between 3,500\$/t and 4,000\$/t.

The Future Of Lithium

The largest consumers of Lithium are China and Korea due to their mass production of cars, batteries, and electric devices. Hydrogen tech has been trending and is well-known for its higher efficiency and sustainability compared to lithium batteries which corrode. Since hydrogen is more versatile and scalable in terms of the technologies that might rely on it, hydrogen will probably replace Lithium in batteries, but the breakthrough in hydrogen-reliant tech is yet to happen. Therefore, Lithium still assumes its position as the most vital metal in energy production and storage.

SCFMS and MEMBER CLUB GEM SHOWS

June 17-18 – Arlington G&MS Grapevine Convention Center, 1209 S Main St, Grapevine, TX 76051; https://www.therockninja.com/event-details/arlington-gem-mineral-show	Sarasota Fall Gem Show 8/02/2024 - 8/04/2024 10:00 AM - 5:00 PM Sarasota Municipal Auditorium 901 N Tamiami Tr Sarasota, FL 34236 https://hrgemshows.com/	St Petersburg Gem Show 8/30/2024 - 9/01/2024 10:00 AM - 5:00 PM The Coliseum Ballroom 535 4th Ave N St Petersburg, FL 33701 https://hrgemshows.com/	Colorado Mineral and Fossil Fall Show 9/06/2024 - 9/14/2024 10:00 AM - 6:00 PM Crowne Plaza DIA 15500 E 40th Ave Denver, CO 80239 http://www.coloradomineralandfossilshows
Houston Gem, Mineral, Jewelry & Fossil Show December 10-12, 2024 Humble Civic Center https://www.hgms.org	51st Annual Gem & Mineral Show. – Hosted by the Gem and Mineral Society of Louisiana. November 8 - 10, 2024 Alario Center 2000 Segnette Blvd. Westwego, LA 70094. www.gmsofla.org		

STONEY STATEMENTS

Clear Lake Gem and Mineral Society, Inc

PO BOX 891533

Houston, Texas 77289

Meeting 3rd Tuesday of the Month

7:00 P.M.

League City Library

100 W Walker St, League City, Tx 77573



Member of

Next Annual Show**February 22-23, 2025**

Pasadena Convention Center

CLGMS is on the Web:

<http://www.clgms.org>[FACEBOOK: CLEAR LAKE GEM AND MINERAL SOCIETY.](#)American
Federation of
Mineral SocietiesSouth Central
Federation of Mineral
Societies**Clear Lake Gem and Mineral Society, Inc**

MEMBER: American Federation of Mineralogical Societies and South Central Federation of Mineral Societies

PURPOSE: To promote education and popular interest in the various earth sciences; in particular in those hobbies dealing with the art of lapidaries and the earth sciences of minerals, fossils and their associated fields.

2023 OFFICERS:	President	Cynthia McGowan	281-546-2662
	Vice President	David Tjiok	832-423-4802
	Secretary	Christina Rankin	281-723-5408
	Treasurer	Monica Duran	281-705-7875
	Program Director	VACANT	
	Board of Directors:	Sandra Christiansen	Jim Hawkins
		Jeff Mills	John Caldyne
		Donna Nelson	
	Newsletter Editor	David Tjiok	

Annual Show 2024	Sandra Christiansen	Membership.....	Mike Flannigan
Constitution & Bylaws.....	Jim Hawkins	WWW System Admin..	Mike Flannigan
Community Benefits.....	Charlie Timme	Refreshments.....	Lori Westerman
Historian.....	David Tjiok	Education/Field Trips.....	Annabel Brownfield
Publicity.....	Annabel Brownfield		Casey Renner
Facebook.....	Cynthia McGowan		

Membership Dues Jan. to Dec. 2024: Adult \$15:00, Family Dues \$20.00 (4+) at same address. Send Dues to CLGMS, PO BOX 891533, Houston, TX, 77289