

*A newsletter for Gem and Mineral enthusiasts in and around the Raleigh, North Carolina area.*

## Special Interest Articles:

- Prez Sez
- Third-ever natural quasicrystal found in Siberian meteorite
- Geologists Find Largest Exposed Fault on Earth
- These guys hunt for space rocks

## Individual Highlights:

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## Prez Sez By Daniel Cathey

Happy New Year and welcome to 2017. Come see Jeff Schlottman of Crystal Perfection present our January program on Fluorite. Jeff has done presentations to several groups and we know him perhaps best from the annual show.

I am very excited about the coming year's programs/activities. I hope we can begin an outreach program where we contact schools and other groups and share our knowledge and interest in the hobby. More on this later.

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## Third-ever natural quasicrystal found in Siberian meteorite by Leah Crane

THERE'S more than one way to cook a quasicrystal. A third example of these weird, rule-breaking solids has been found in a Siberian meteorite – and it's the only one not to have been first created in the lab.

Paul Steinhardt at Princeton University has doggedly hunted for quasicrystals since he predicted their existence in the early 1980s. The first synthetic one was grown in the lab in 1982, and more than 100 types have been made since.

Before then, we knew of two types of solids: crystals, in which every atom is arranged neatly in a repeating lattice, and amorphous solids, which have no such order.

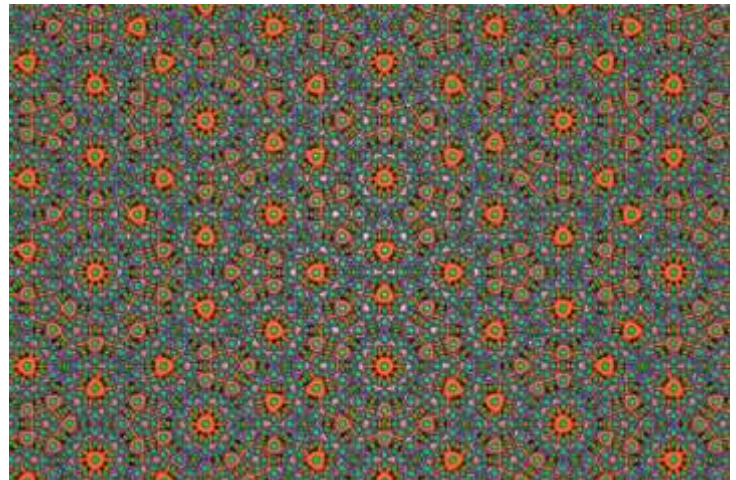
Quasicrystals are not quite crystals because their neat patterns never exactly repeat.

The new one is only the third type found in nature. All three have come from the Khatyrka meteorite in north-eastern Russia. The

approximate composition of the first two had been created in a lab beforehand.

Finding a fresh example in nature allows us to continue writing a recipe for creating new quasicrystals from scratch,

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**Tar Heel Gem & Mineral Club, Inc.**

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**We're on the Web!**  
See us at:  
[www.tarheelclub.org](http://www.tarheelclub.org)

**Program & Refreshments**

REFRESHMENT SCHEDULE:

Coordinator: Loretta Turcotte  
[rosevilla@nc.rr.com](mailto:rosevilla@nc.rr.com)  
(919) 263-8523

January TBD

PROGRAM SCHEDULE:

January	Jeff Schlottman – Crystal Perfection: The World of Fluorite
February	Shirley Smith and Tom Todaro: What to Bring on a Collecting Trip and Safety Concerns
March	Grab Bags and Postcards
April	Potluck and Show Discussion
May	Linda Searcy: Faceting Stones – My Experiences
June	Rachel Smith – NC Museum of Natural Sciences: Meteorites and Search for Life in the Solar System
July	Cathy Young – Mid-Atlantic Nature and Fossil Adventures: Fossil Collecting in the Mid-Atlantic
August	Ice Cream Social
September	Fletcher McDonald-Micro-mineral Collecting and Preparation
October	Nominations, Grab Bags
November	Elections

Remember, the club will reimburse you for up to \$85 (bring your receipts to the treasurer).

**January Treasurer's Report**

January Treasurer's Report

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**December/January B-Day Members**

- Carolyn Beck
- Karen Glaser
- Obsidian Harris
- Becky Healy
- Janet Jones
- Maureen & Roger Mercer
- Carole Shore
- Claudia Sieminski
- Kenneth Young
- Marion Broadway
- Ken Carlson
- Tracy Criswell
- Jack Fried
- Cyndy Hummel
- John Nigro
- Mary Obenchain
- Christina Perry
- Alyssa Ploeger
- Kerry Sapple
- Janet Sever
- Greg & Connie Shay
- Jacob Stephens



Membership applications may be mailed to:

Tar Heel Gem & Mineral Club, Inc.  
Attention: Treasurer  
10609 Chelsea Drive  
Raleigh, NC 27603

**Tar Heel Gem and Mineral Club, Inc. - November Meeting Minutes**

Tuesday, November 19, 2016

No Minutes for November

Respectfully Submitted

Melissa Whitfield,

Secretary, Tar Heel Gem and Mineral Club, Inc.

**Prez Sez****Continued from Page 1**

Shirley has agreed to continue as the Field Trip Chairperson with assistance from several other members. I look forward to as many trips as they can set up.

Finally, I would like to acknowledge all the hard work done by Cyndy and look forward to learning from her this coming year.

Most Sincerely,

Daniel Cathey

President,

Tar Heel Gem and Mineral Club, Inc.

**Tar Heel Gem and Mineral Club Programs - 2017**

<b>Date</b>	<b>Speaker and Program</b>
January 17, 2017	Jeff Schlottman – Crystal Perfection: The World of Fluorite
February 21, 2017	Shirley Smith and Tom Todaro: What to Bring on a Collecting Trip and Safety Concerns
March 21, 2017	Grab Bags and Postcards
March 31- April 2, 2017	Annual Gem, Mineral and Fossil Show
April 18, 2017	Potluck and Show Discussion
May 16, 2017	Linda Searcy: Faceting Stones – My Experiences
June 20, 2017	Rachel Smith – NC Museum of Natural Sciences: Meteorites and Search for Life in the Solar System
July 18, 2017	Cathy Young – Mid-Atlantic Nature and Fossil Adventures: Fossil Collecting in the Mid-Atlantic
August 15, 2017	Ice Cream Social
September 19, 2017	Fletcher McDonald-Micro-mineral Collecting and Preparation
October 17, 2017	Nominations, Grab Bags
November 21, 2017	Elections
December 2017	No Meeting

## January Treasurer's Report

By Corinne Hummel

Oct. Ending /	
Nov. Beginning Balance	\$4,557.47
-----	
Deposits (+)	
Dealers*	\$6,440.00
Auction	865.00
Membership	25.00
Savings Transfer	266.90
-----	
Sub total	\$7,596.90
-----	
Checks Written (-)	
Newsletter	\$106.22
Advertise show/Dealers*	245.00
Demo area Elect cords*	29.83
SEFMLS Insurance & Dues	420.00
-----	
Sub Total	\$801.05
-----	

Nov. Ending /	
Dec. Beginning Balance	\$11,353.32
-----	
Deposits (+)	
Dealers*	\$1,213.75
Membership	\$70.00
-----	
Sub total	\$1,283.75
-----	
Checks Written (-)	
Trailer lot rent 1 year	\$720.00
PO Box rent 1 year	228.00
Demo area Elect cords*	25.00
-----	
Sub Total	\$973.00
-----	
Dec. Ending /	
Jan. Beginning Balance	\$11,664.07

\*Show Items

## THIRD-EVER NATURAL QUASICRYSTAL FOUND IN SIBERIAN METEORITE

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says Steinhardt.

The new quasicrystal has a similar molecular structure to the first one, but slightly different chemistry: both are made of aluminum, copper and iron, but in different proportions. Steinhardt and his team had collected samples of the Khatyrka meteorite in 2011, and found the new material in a chip less than half a millimeter across (Nature Scientific Reports, doi.org/bvm6).

"It's hard to look systematically for these things, because we're talking about grains which are typically tens, or maybe a few hundred microns, in size, and you have to look through a gigantic meteorite at each little grain that size, says Steinhardt. "Unless you were completely crazy like we were, you wouldn't be doing that.

Steinhardt and his team hope that this discovery will lead to further systematic searches.

In looking to nature, they aimed to learn more about how quasicrystals form. Based on the structure and melt patterns in the Khatyrka meteorite, it seems the quasicrystals formed through a violent impact in space, possibly a collision between two asteroids.

Studying the quasicrystals and the meteorite they came from in detail could teach us about the environment in the early solar system that led to their existence.

Finding new quasicrystals could also pave the way towards fresh methods for producing them in the lab. With the composition of this latest quasicrystal in hand, it should be easy to synthesize it. "Once you know the answer, it's not that hard to reproduce, says Steinhardt.

But as with the other quasicrystals, nobody is quite sure what it could be used for. Steinhardt has a quasicrystal-coated frying pan in a corner of his office that takes advantage of this material's hard, slippery nature, but no other practical applications have been found yet.

Part of the point of looking for new quasicrystals is "to find new quasicrystalline alloys that might have some use, because none of the ones discovered so far really have any use other than 'wow, this is cool' ", says Paul Asimow at the California Institute of Technology, who helped study the origin of these materials. "But it's not out of the question that someone will find a really good use for quasicrystals one of these days.

*This article appeared in print under the headline "Exotic quasicrystal found in Siberian meteorite*

<https://www.newscientist.com/article/mg23231045-100-thirdever-natural-quasicrystal-found-in-siberian-meteorite/>



## Geologists Find Largest Exposed Fault on Earth

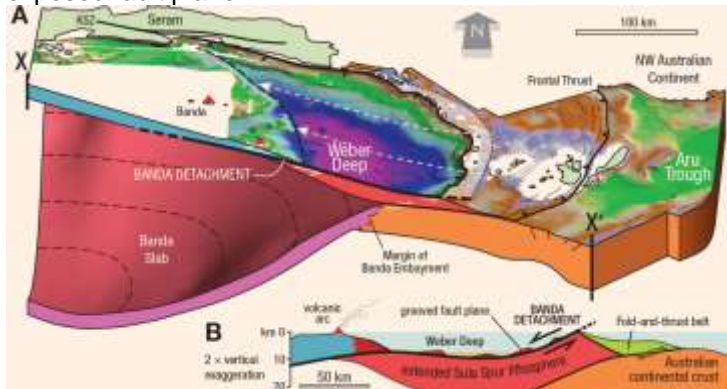
By Jonathan M. Pownall

An international team of geologists from the Australian National University and Royal Holloway University of London has for the first time documented the Banda Detachment fault in eastern Indonesia and worked out how it formed. The research is published in the journal *Geology*.

The find will help researchers assess dangers of future tsunamis in the area, which is part of the Ring of Fire – an area around the Pacific Ocean basin known for earthquakes and volcanic eruptions, said lead author Dr. Jonathan Pownall, from the Australian National University.

The abyss has been known for 90 years but until now no one has been able to explain how it got so deep.

Our research found that a 4.3-mile (7 km) deep abyss beneath the Banda Sea off eastern Indonesia was formed by extension along what might be Earth's largest-identified exposed fault plane.



The Banda Detachment fault beneath the Weber Deep basin. A – cross section through eastern Banda arc, cut parallel to grooves on fault surfaces and proposed direction of rollback; geometry of proto-Banda Sea slab is inferred from earthquake hypocenter locations catalogued by International Seismological Centre Online Bulletin; KSZ – Kawa shear zone. B – enlargement of Banda detachment showing schematically the configuration of over-riding continental allochthons (dark red); red triangles represent volcanoes. Image credit: Jonathan M. Pownall et al, doi: 10.1130/G38051.1.

By analyzing high-resolution maps of the Banda Sea floor, Dr. Pownall and co-authors found the rocks flooring the seas are cut by hundreds of straight parallel scars.

These wounds show that a piece of crust bigger than Belgium or Tasmania must have been ripped apart by 74.5 miles (120 km) of extension along a low-angle crack, or detachment fault, to form the present-day ocean-floor depression.

This fault, the Banda Detachment, represents a rip in the ocean floor exposed over 14.8 million acres (60,000 sq. km), Dr. Pownall said.

The discovery will help explain how one of the Earth's deepest sea areas became so deep.

This was the first time the fault has been seen and documented by researchers, said co-author Prof. Gordon Lister, also from the Australian National University.

We had made a good argument for the existence of this fault we named the Banda Detachment based on the bathymetry data and on knowledge of the regional geology.

I was stunned to see the hypothesized fault plane, this time not on a computer screen, but poking above the waves, Dr. Pownall said.

Rocks immediately below the fault include those brought up from the mantle. This demonstrates the extreme amount of extension that must have taken place as the oceanic crust was thinned, in some places to zero.

According to the team, the discovery of the Banda Detachment fault would help assess dangers of future tsunamis and earthquakes.

In a region of extreme tsunami risk, knowledge of major faults such as the Banda Detachment, which could make big earthquakes when they slip, is fundamental to being able to properly assess tectonic hazards, Dr. Pownall said.

Jonathan M. Pownall et al. 2016. Rolling open Earth's deepest forearc basin. *Geology* 44 (11): 947-950; doi: 10.1130/G38051.1

<http://www.sci-news.com/geology/largest-exposed-fault-earth-04405.html>

## These guys hunt for space rocks, and sell them for enormous profit

By Josh Lipton

At his office in Menlo Park, California, Jurvetson displays a rare treasure: the second-largest Mars rock in private hands. The textured, brownish-red rock, discovered in 1999 in the Dar al Gani desert in Libya, crystallized 180 million years ago. Today, it rests in a glass showcase in the hallway of Jurvetson's firm, Draper Fisher Jurvetson.

"It is quite moving to hold a piece of Mars in your hands," Jurvetson told CNBC, "and to reflect on its incredible interplanetary journey, and the science that gives confidence as to the origin of this unusual rock."

Jurvetson declined to say how much he paid for it, though he noted that it cost "more than my first house."

Tech power brokers often enjoy buying high-end sports cars, show horses and even private islands. Others who possess a passion for studying our vast solar system, like Jurvetson, spend their money on rocks from outer space. These ancient meteorites can be older than the Earth itself. The price tag is high: Just 100 grams of Mars rock, enough to fit in the palm of a hand, can demand \$100,000.

For help tracking down such rare rocks, private collectors turn to professional meteorite hunters. These adventurers earn their living by crisscrossing the globe, searching for astronomic treasures. The risks are real, including prison and death, but so are the potential rewards — rocks that can be flipped quickly for fortunes.



The man who sold Jurvetson his Mars rock is 44-year-old Michael Farmer. Since the late 1990s, Farmer has traveled to some 80 countries looking for these precious rocks. Perhaps his best-known find is a nearly 120-pound meteorite discovered in Canada, which he and his partners sold to the Royal Ontario Museum in Toronto for \$600,000.

"Any time you dig up a treasure worth more than half a million bucks, it's a good day," said Farmer, who works closely colleagues around the world tracking meteorite showers.

This work is not for the faint of heart. In 2011, Farmer was kidnapped, beaten and nearly killed by Kenyan thieves. That same year, he was charged with illegal mining in Oman and imprisoned for two months. Farmer says his motivation is not purely monetary, but rather the thrill of the chase.

"You can hold something in your hand that, just a week before, was well on the other side of the moon," he said. "That fascinates me. It's like holding a piece of history, but much older than anything we can imagine on this planet."

The rewards can be lucrative. Farmer says a meteorite paid for his house in Tucson, Arizona. Business partner Greg Hupe, 53, says he could have retired comfortably 15 years ago.

"This business has been very good to me," Hupe said. "I have no bills. I don't owe anything to anybody. That is all because of meteorites."

In November, Farmer and Hupe traveled to Bolivia, where they bought several meteorites from local Quechua people. The rocks were 4 billion years old, and found eager buyers: the two hunters sold them within 24 hours for \$60,000.

Another tech entrepreneur interested in space rocks is Naveen Jain, the founder of a start-up called Moon Express that intends to land on the moon this year. Hupe sold Jain two slices of a lunar meteorite, originally discovered in Morocco. Each slice weighs roughly a pound and costs "hundreds of thousands of dollars," according to Hupe.

Meteorite hunters often donate a portion of their discoveries to university labs in exchange for assistance with authentication. Through chemical analysis, scientists can validate the specimens. Carl Agee, a professor at the University of New Mexico who specializes in meteorites, says these hunters perform a valuable task for academics.

"If there were no hunters out there, we would not be getting new meteorites to study," Agee said.

Farmer and Hupe note that the business of making money in meteorites has changed dramatically. Years ago, they traveled to places like Morocco and Algeria and bartered personally with nomads in tents for sought-after space rocks. Today, many of these same locals use smartphones, and negotiate directly with private collectors through email or social networks like Facebook (FB).

Farmer and Hupe now often earn their paychecks by acting as brokers between locals who discover the meteorites and collectors all over the world.

"I've become a kind of personal shopper for some collectors," Hupe said.

The hunters say that business is booming for meteorites. Supply is limited and demand is strong, not only in Silicon Valley but all over the world. Farmer says he retains a list of 20 clients who will pay \$1 million and more for the right rock.

For customers like Jurvetson, the appeal of meteorites remains the ancient and unique story that each rock reveals as well as their incredible scarcity. He notes that only 0.1 percent of meteorites are from the moon or Mars, making them rarer than pure diamond on Earth.

When asked whether meteorites represent a sound investment, Jurvetson responded: "Perhaps, but I think it provides more pleasure in the story it tells and as a trigger for the imagination."

<https://www.yahoo.com/news/m/44d2ed60-fce9-3c13-a5cf-08e7df974a25/these-guys-hunt-for-space.html>

## UPCOMING SHOWS

**March 31 - April 2, 2017: Raleigh, NC** – 41<sup>st</sup> Annual Capital Area Gem & Mineral Show. Tar Heel Gem and Mineral Club, Inc. Kerr Scott Building, NC State Fairgrounds, Raleigh, NC. The show is sponsored by the Tar Heel Gem & Mineral Club and includes 29 dealers. The Hospitality area sells grab bags with mineral specimens. Buy a rock at the Geode booth and be the first to see what is inside. The on-going Silent Auction has new items every hour. Dealers provide minerals, fossils, finished jewelry, gemstones, findings and beads for sale.. Hours: Fri 3-8; Sat 10-6; Sun 10-5. Admission: Free and Free Parking. Contact: Cyndy Hummel; 919-779-6220; [mchummel@mindspring.com](mailto:mchummel@mindspring.com); [www.tarheelclub.org](http://www.tarheelclub.org);

**January 21–22, 2017: Deland, FL** - 46th Annual Jewelry, Gem Minerals & Fossil Show & Sale. Sponsored by the Tomoka Gem & Mineral Society. Sat 10–6/Sun 10–5 at the Volusia County Fairgrounds, 3150 E. New York Ave, Deland, FL 32724. Admission \$4; children under 12 free. Contact: Susan Morris, 386.843.0152; [tgmsshow2017@gmail.com](mailto:tgmsshow2017@gmail.com); \$1-off coupon on the web: [www.tomokagms.org](http://www.tomokagms.org) or [www.tomokafacetersguild.org](http://www.tomokafacetersguild.org)

**February 25–26: Jackson, MS** - 58th Annual Gem, Mineral, Fossil and Jewelry Show. Sponsored by the Mississippi Gem and Mineral Society (MGMS). Sat 9–6/Sun 10–5 at the Mississippi Trade Mart on the State Fairgrounds, Jackson, Mississippi. Adults \$6, students \$3; Scouts and Leaders in Uniform \$2; Children 5 and under, free. Info at [rock2lanes@gmail.com](mailto:rock2lanes@gmail.com) or [www.missgems.org](http://www.missgems.org).

**March 11-13: Augusta GA** - 29th Annual Gem, Mineral & Fossil Show. Co-sponsored by the Aiken Gem, Mineral and Fossil Society and the Augusta Gem & Mineral Society. Fri & Sat 10–7/Sun 11–5. Julian Smith Casino / 2200 Broad St. / Augusta GA. Admission: \$3 per adult or \$5 Weekend pass; children under 12 FREE with an adult. Chair Richard McNutt [www.aikengmfs.org](http://www.aikengmfs.org) or [agam.club](http://agam.club).

## Vugsites

The following are some links to Web-Sites that may interest some of our members:

<http://www.tarheelclub.org> / <https://www.facebook.com/tarheelgemandmineralclub/> These are the official sites for the Tar Heel Gem & Mineral Club. I would strongly urge all members to check them out on a regular basis.

<http://www.amfed.org> / <http://www.amfed.org/sfms> These are the official sites for the organizing body that the Tar Heel Gem & Mineral Club is founded under. I would strongly urge all members to check them out on a regular basis.

[http://www.amfed.org/sfms/lodestar\\_newsletter.html](http://www.amfed.org/sfms/lodestar_newsletter.html) The SFMS Lodestar Newsletter

<http://www.carolinageologicalsociety.org/CGS/Home.html> This site provides numerous downloadable field-trip guide books, maps, and charts of the Carolinas. It will prove to keep any avid rock hound busy for years. Great Site!

[http://www.ncminerals.com/ncmineralswebsite\\_files/page0011.htm](http://www.ncminerals.com/ncmineralswebsite_files/page0011.htm) And while we are on the subject, try this link. Its titled: Links of Interest to Rock hounds in NC. It will take you to a list of links for North Carolina gems and minerals.

<http://www.rocksforkids.com/> Just like the name says, a nice place to steer the younger members.

Information & photographs of over 6300 specimens from the Glenn & Martha Vargas Gem & Mineral Collection.

<http://www.rockhoundlounge.com> Scott Laborde, a club member maintains his own web site that might be of interest to people collecting in and around Wake County.

[http://www.msnbc.msn.com/id/29726500/ns/technology\\_and\\_science-science](http://www.msnbc.msn.com/id/29726500/ns/technology_and_science-science) This site highlights a half dozen of the most recent significant fossil finds.

<http://appmodo.com/13971/mole-quest-for-the-terracore-gem-app-review-for-the-iphone-and-ipod-touch/> If you have an iphone or an ipod touch, this rock-hounding may be the game for you.

[http://diamonddanpublications.net/index\\_files/page0009.html](http://diamonddanpublications.net/index_files/page0009.html) Diamond Dan's Mini Miner's Monthly

I would like to encourage all members of the THG&MC that maintain their own presence on the internet to send me a link to their site to be published in future Vugsites so that other club members may learn and enjoy the craft, the art, the interests that many of us have in common.

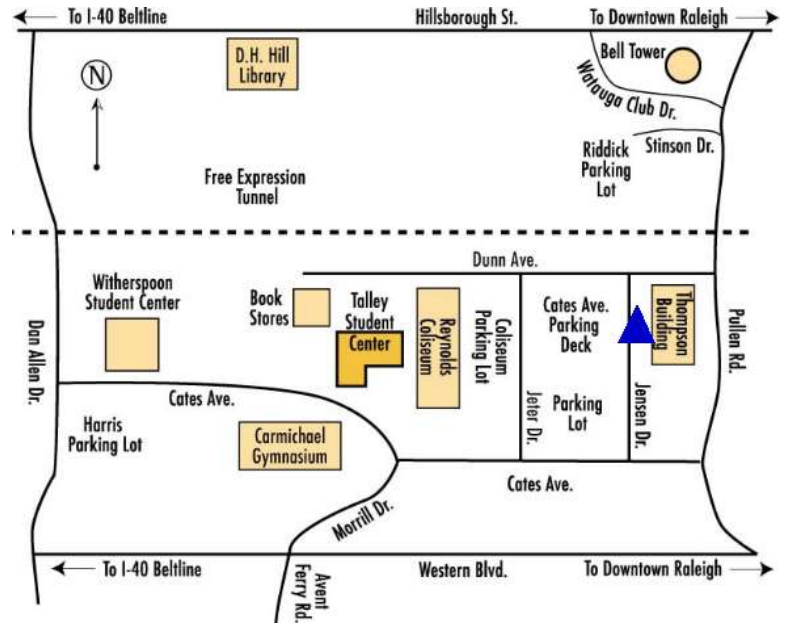
Park in the Cates Ave. Parking Deck off Jensen Dr. Enter Thompson Building directly across from the parking lot.

**Our Next Meeting is  
January 17, 2016 @ 7:30PM  
Thompson Building / NCSU Campus.**

***About Our Organization...***

The Tar Heel Gem and Mineral Club, Inc. was formed in 1974 as a nonprofit educational organization for people who enjoy the lapidary arts, earth sciences, and related subjects. The main objectives of the club are to investigate, preserve, and share knowledge of rocks, minerals, and precious stones, and to promote interest in mineralogy, paleontology, earth sciences, and lapidary techniques, among club members and among the general public. The club pursues these goals through publications, meetings, lectures, field trips, exhibits, demonstrations, and other activities.

**Come and be a part of the Fun!**



**TAR HEEL GEM & MINERAL CLUB**  
10609 Chelsea Drive  
Raleigh, NC 27603

