



Granite State Geologist

The Newsletter of the Geological Society of New Hampshire,
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In this issue:

- Election results
- Anchorage earthquake
- NH legislation tracking
- News about the newsletter
- February 1, 2019 – Earth is saved from destruction...again
- Eruptions in Iceland – again a world-wide problem?
- [What is your Board doing?](#)
- 50th anniversary of Earthrise photo
- [Upcoming Events](#) and much more!

MESSAGE FROM THE PRESIDENT

October election results are posted within. This posting got me thinking about the steady changes at GSNH. From my observations, the GSNH is rare bird as far as societies go. Its routines are well established from long practice. The Society holds regular meetings and annual field trips and puts out quarterly newsletters. Members expect these and thanks to our dedicated board members, their expectations are met.

One society that may be reinvigorated is the Massachusetts Geological Society. There is talk of them co-hosting a joint meeting in January with the AEG; and GSNH is also discussing setting up a possible joint meeting with MaGS at a later date.

Another change that you should read about inside: For many years, the Society has owned a very respectable three-volume set of Hitchcock's *The Geology of New Hampshire*. Unfortunately, the Society had no way to display or allow use of this treasure. These volumes sat in a cabinet kindly provided by the USGS office in Pembroke. At the June Board meeting GSNH Board members voted to donate the three-volume Hitchcock set to the NH Historical Society where it can be viewed by many.

And speaking further about rejuvenation, I'm going to take off my figurative president's hat and put on my just as imaginary newsletter editor's hat. This edition begins my eighth year editing the GSNH newsletter. The December 2011 edition was my first as editor, so that makes this edition is my 29th. I think I have a thirtieth left in me, but it is time for a new editor or perhaps co-editors. If you have an inkling to edit, let me know.

"The more things change, the more they stay the same." Rejuvenation is change, but change that keep us going. So as we change, and years pass, my hope is that the next rank will continue to step up to carry on with the Society's programs and goals.



Frosty trees along Kancamagus Highway November 30, 2018. Photo by J. Keeler



Rocky mountain near steep grade along Kancamagus Highway, November 30, 2018. Photo by J. Keeler

FALL LEGISLATIVE COMMITTEE REPORT by Thomas Fargo – December 2018

Below is a list of 2019 Legislative Service Requests (LSRs or draft bills) that have been submitted as of December 7, 2018 that are potentially relevant to members of the Geological Society of New Hampshire. The subject/content of these LSRs is only currently available as titles. The GSNH Legislative Committee will be following these bills and others as the 2019 Legislative Session begins in January.

LSR Number	Title
Key Word "Environ"	
2019-0398	requiring the commissioner of the department of environmental services to revise rules relative to arsenic contamination in drinking water.
2019-0623	establishing a stormwater management and flood resilience fund within the department of environmental services
2019-0713	appropriating funds to the department of environmental services for the purpose of funding eligible wastewater projects under the state aid grant program.
2019-0783	establishing a water resources fund in the department of environmental services.
2019-0784	authorizing the department of environmental services to license, lease, or dispose of state-owned property.
Key Word "Water"	
2019-0168	abolishing fluoridation in water
2019-0191	relative to exemptions from the groundwater permit application fee.
2019-0214	establishing a committee to review and update the penalties for contaminating drinking water and groundwater .
2019-0215	relative to settlement money from actions pertaining to the contamination of groundwater or drinking water .
2019-0535	establishing a commission on drinking water
2019-0617	establishing a commission to study health impacts in certain New Hampshire communities known to be related to exposure to perfluorinated chemicals in drinking water .
2019-0619	relative to blood testing for individuals exposed to perfluorinated chemicals in private or public water supplies.
2019-0713	appropriating funds to the department of environmental services for the purpose of funding eligible wastewater projects under the state aid grant program
2019-0734	relative to municipal watering restrictions.
Key Word "Wetland"	
2019-0396	establishing a grant program to support municipalities in updating their wetlands regulations.
2019-0397	relating to the protection of wetlands
2019-0555	relative to the definition of prime wetland
Key Word "Shoreland"	
2019-0626	establishing a shoreland septic system study commission
Key Word "Waste"	
2019-0133	excluding municipal solid waste facilities from eligible renewable generation electrical facilities under RSA 362-H.
2019-0134	relative to the incineration of construction and demolition waste .
2019-0782	relative to combustion of wood residue at municipal waste combustors
2019-0815	relative to the storage of nuclear waste

Key word searches with no returns: **geology, rock, soil.**

Key Work searches with no returns related to geology or geologists: **professional**

WHAT IS YOUR BOARD DOING? Submitted by Shane Csiki, Secretary

The last Board of Directors meeting, held on December 13, 2018 at the NHDES offices involved some transition of roles with some Board members changing positions. Outgoing Treasurer Bill Abrahams-Dematte will be passing the financial baton over to Abby Fopiano, our new Treasurer. They will be working together during the next couple of months to complete this transition, and prepare the books for auditing by the Board in March. Jenny Lambert, of Nobis Engineering, is a new member-at-large.

The Events Committee, under the leadership of Sharon Lewandowski and Lee Wilder, continues to do much work “behind the scenes” in order to make the quarterly dinner meetings a successful reality. This includes working with the restaurants that GSNH utilizes to plan dinner menus and logistics, to ensure that Board members are available to check attendees in, and to coordinate and conduct the raffles. While speakers are lined up for January and April 2019, the Board is seeking ideas for speakers, on geology topics, for the fall. If you have suggestions, please contact any GSNH Board member. slfd

The next GSNH Board meeting will be held on March 7, 2019, at Nobis Engineering, 18 Chenell Drive in Concord, starting at 6:00 PM. All GSNH members are welcome to attend.



Fall in the North Country. Photo by Josh Keeley.

NEW HAMPSHIRE EXPLORES TURNING RUGGLES MINE INTO STATE PARK by Holly Ramer
AP, July 14, 2018 Concord, N.H.

This mine is your land? A 215-year-old mineral mine — site of an enormous pit with tunnels and caverns that make up the oldest and largest mine of its kind in the United States — could someday belong to you and me. State officials are in the early stages of exploring whether to buy the Ruggles Mine in Grafton and turn it into a state park. Amy Bassett, spokeswoman for the Division of Parks and Recreation, said Director Phil Bryce recently floated the idea to the State Park System Advisory Council, which recommended looking into it.

Ruggles produced mica and other minerals for 160 years before the Searles family bought it in 1960 and turned it into a tourist attraction. The 235-acre (95-hectare) property, which also has a gift shop and a small museum, attracted thousands of visitors annually until 2016, when Geraldine Searles, then 90, closed the mine and put it up for sale. The current asking price: \$900,000.

Cheryl Senter, who spent summers in Grafton growing up and now owns a cottage there, recently started an online petition promoting the state park idea. She's discussed it with the commissioner of the Department of Natural and Cultural Resources, which oversees the parks division.

"Everywhere I go, when I bring it up, there is someone in the group who's gone to Ruggles Mine," she said. "Kids love hunting for treasure, and so do adults. The possibility that you might uncover something really cool is the hook. As a kid, that was thrilling to me."

The property has plenty of room for a campground and would be an ideal base from which to explore other regions of the state, said Senter, a photographer who has done work for The Associated Press.

"It has so much going for it, and it would be such a boost," she said. "I have such fond memories of Ruggles Mine. It just sparks my imagination every time I see it up in the hills there."



This June 7, 2016 file photo, shows flooded caves at Ruggles Mine in Grafton, N.H. —*The Associated Press*

ROGUE BLACK HOLE - UNH RESEARCHER DISCOVERS MASSIVE BLACK HOLE

“WANDERING” AT EDGE OF ITS GALAXY By Beth Potier, UNH Communications And Public Affairs

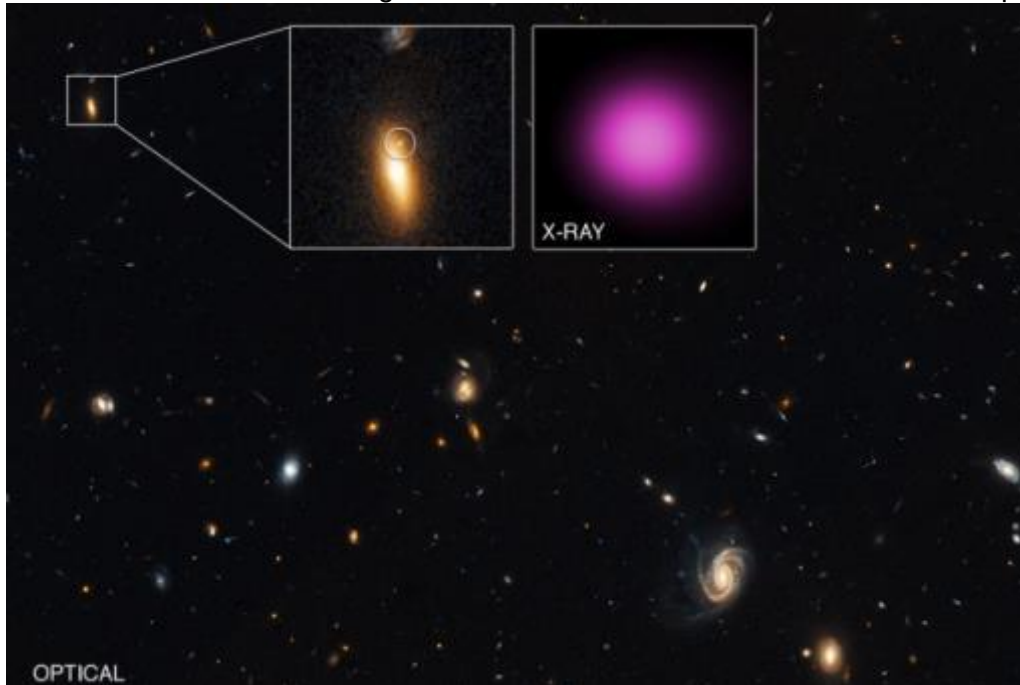
<https://www.unh.edu/unhtoday/2016/10/rogue-black-hole>

It sounds like the stuff of science fiction: researchers discover a massive black hole wandering at the edge of a galaxy about 4.5 billion light years away. But it's science fact, and the discovery of this unusual phenomenon is key to understanding how galaxies form. UNH Space Science Center research scientist Dacheng Lin is the lead author of an article in *The Astrophysical Journal* that

describes the finding.

“From the theory of galaxy formation, we expect a lot of wandering massive black holes,” says Lin, of the Institute for the Study of Earth, Oceans and Space. “But there are very, very few that we know of, because they are normally very quiet and very hard to detect.”

This massive black hole is technically called intermediate-massive, with a mass that's about 100,000 times that of



Within this optical light image from the Hubble Space Telescope, the massive black hole and its host galaxy are in the box in the upper left. The inset on the left is a close-up view of the galaxy, with what may be the source associated with this black hole circled. The inset on the right is Chandra's X-ray image of the massive black hole.

the sun; intermediate-massive black holes fall between the more abundant small black holes and supermassive black holes, which can have a mass of up to 10 billion times the sun's and are at the centers of most galaxies.

Lin used data from NASA's Chandra X-ray Observatory and the European Space Agency's XMM-Newton X-ray observatory to find evidence for this wandering massive black hole. Between 2000 and 2002, the two X-ray telescopes, orbiting thousands of miles in space, observed an extremely luminous flare of X-rays outside the center of its parent galaxy, known as GJ1417+52. Future observations of this source show its brightness has declined by at least a factor of 14 between 2000 and 2015, indicating the earlier observation showed something unique. “It is interesting in that it looked like the source was discovered when it was ‘eating’ a nearby star,” says Lin. As a star comes too close to a black hole, the gravity of the black hole tears it apart. Gaseous material from the star falling toward the black hole caused this X-ray flare, which is about ten times more luminous than the brightest X-ray source ever seen for a wandering black hole. Lin describes the computational effort to discern what he calls the “spectral DNA” of this source from about half a million X-ray sources as finding a needle in a haystack.

“Evidence for the existence of wandering massive black holes has been very vague,” he says. “Discovery of a strong candidate like this means that we have many more massive black holes than were known to exist in the universe.”

MINERAL EXPLORATION CORE RESCUED! Robert G. Marvinney, Maine State Geologist, robert.g.marvinney@maine.gov – Reprinted from the Geological Society of Maine newsletter - http://www.gsmmaine.org/wp-content/uploads/2018/10/GSM_V44N3_20181019.pdf

While attending a geological meeting in Presque Isle a few years ago, Fred Beck approached me brimming with excitement. “I just found something I’ve been seeking for the past 20 years!” he said. “What’s that?” I asked. In answer, Fred reached into his bag and pulled out several short sections of drill core. What Fred had rediscovered in nearby Easton were thousands of boxes of drill core from mineral exploration drilling at Mount Chase and Ore Mountain, among the most significant ore bodies in Maine. With this rediscovery began a several-years-long effort to carefully inventory and move the core to a permanent, secure location.

In the late 1970s and early 1980s, Getty Mining Company carried out a mineral exploration program in the vicinity of Mount Chase near Patten, seeking base and precious metal deposits. In the first borehole at a depth of 134 feet, the drill intercepted over 20 feet of massive sulfide, with zinc grades to 2.90% – the initial discovery of the Mount Chase deposit (now called Pickett Mountain by the new owner, Wolfden Resources Co.). A total of about 100 holes were drilled over the next few years to prove out the distribution and tonnage of the deposit, reported then to be 2.4 million tons grading 11.3% zinc and 4.8% lead. Nearly 100,000 feet of drill core were carefully placed in cardboard boxes, ten feet of core to each, and stored for later examination. After Getty left the project and through several changes of ownership, the cores remained in warehouses at the Huber manufacturing plant in Easton, their whereabouts long forgotten by those involved with the project. Huber, having sold the mineral rights to both the Mount Chase and the Ore Mountain properties, no longer had any interest in the cores they had been storing for 30 years.

At the time Fred rediscovered these drill cores, time, weight, and weather had taken their toll on the boxes and their contents. While cardboard core boxes stacked carefully no more than three feet high on pallets, protected from the elements, and secured in a rodent-free setting might have an indefinite lifespan, changing just one of these conditions can lead to catastrophic loss. Unfortunately, at the Huber warehouses all three of these conditions were compromised. Pallets were staked pallet upon pallet upon pallet, the boxes in the bottom layer succumbing via simple shear to the weight above, spilling their contents irretrievably. Over the decades, a few sections of roof and walls had torn away, exposing the boxes to the ravages of the elements. And a few animals had made comfortable homes among the boxes. The prospect of sorting through the mayhem to retrieve intact core was daunting, to say the least!

With funding from the National Geological and Geophysical Data Preservation Program administered by the USGS, with enormous assistance from managers at Huber, and with free space offered by the Presque Isle Industrial Council, we plunged once more into the breach! Prof. Chunzeng Wang from U Maine PI spearheaded the project to bring the cores home. With an able crew of students lead by Caleb Ward (see photo at the end of the newsletter), the cores at the Huber warehouses were systematically triaged – those intact boxes that would be moved, those that required TLC to recover, and those that were lost.

Over the course of several months this summer, the core boxes were carefully extracted from the jumbled disorder, organized by hole number, and restacked on pallets. Once a load of pallets was ready, they were shipped via flatbed to the storage building in Presque Isle, and restacked onto new core racks by the same crew. In all, some 11,000 boxes of core were moved. At about 20 pounds per box, that’s 110 tons of core that were moved and restacked. With a minimum of two lifts per box (onto pallet and off pallet) each team member moved about fifty(!) tons over the course of the summer! I advise against challenging any of them to an arm wrestling match!

While perhaps not the most convenient to access due to the goal of recovering as much valuable core as possible, the current storage is secure, out of the weather, boxes are not overloaded, and the space is rodent-free (we hope!). Very special thanks are due to Jim Reed and employees (Huber Engineered Woods, LLC) for donated forklift work that was essential to the success of the project; to Tom Powers (Presque Isle Industrial Council) for free storage space and forklift services; to Fred Beck for his determination to locate the core and guidance during the project; to Chunzeng Wang for hours of donated effort to keep the project on task and on schedule; and to the students who reported to work faithfully each day. This project has been a superb example of Maine’s can-do spirit!

**DONATION OF THE GEOLOGICAL SOCIETY OF NEW HAMPSHIRE'S THREE VOLUME SET:
C. H. HITCHCOCK'S 1874-1878 *THE GEOLOGY OF NEW HAMPSHIRE* By Lee Wilder**



In January 2004, the GSNH was offered the purchase of a set of these historical volumes. The set was in very good condition, having been stored and not out for use by the public. After discussion, the GSNH Board voted to buy the set. Upon receipt of the set, Rich Moore, USGS Pembroke NH office, kept them safely stored, until recently, when the current GSNH Board discussed seeing that the volumes could be more available to the NH public. Lee Wilder contacted the NH State Library, to see if these would be of use to them. They already had a set available for use by the public at the library, as well as a stored set.

However, the NH Historical Society (30 Park Street, Concord, NH) only had one set and wished to see ours. Upon inspection, they said they would like it for their archival collection.

Thus, on July 7, 2018 the GSNH gifted ***The Geology of New Hampshire***, 3 volume set by C.H. Hitchcock, 1874-1878 to the NH Historical Society.

Malia Ebel, on behalf of the New Hampshire Historical Society, accepts C. H. Hitchcock's 1874-1878 three volume set: *The Geology of New Hampshire* from Lee Wilder, on behalf of the Geological Society of New Hampshire.

ELECTION RESULTS from Abby Fopiano, Nominations Committee

In election results, 33 votes were cast at the Fall Annual meeting of the Society, all in favor of the nominees. The following were elected for the GSNH Board of Directors on Thursday October 18, 2018 at Makris Lobster and Steak House in Concord.

President – Wayne Ives

Society VP – Doug Allen

Council VP – Thomas Fargo

Treasurer – Abby Fopiano

Secretary – Shane Csiki

Member-at-Large (Three Positions)

Sharon Lewandowski

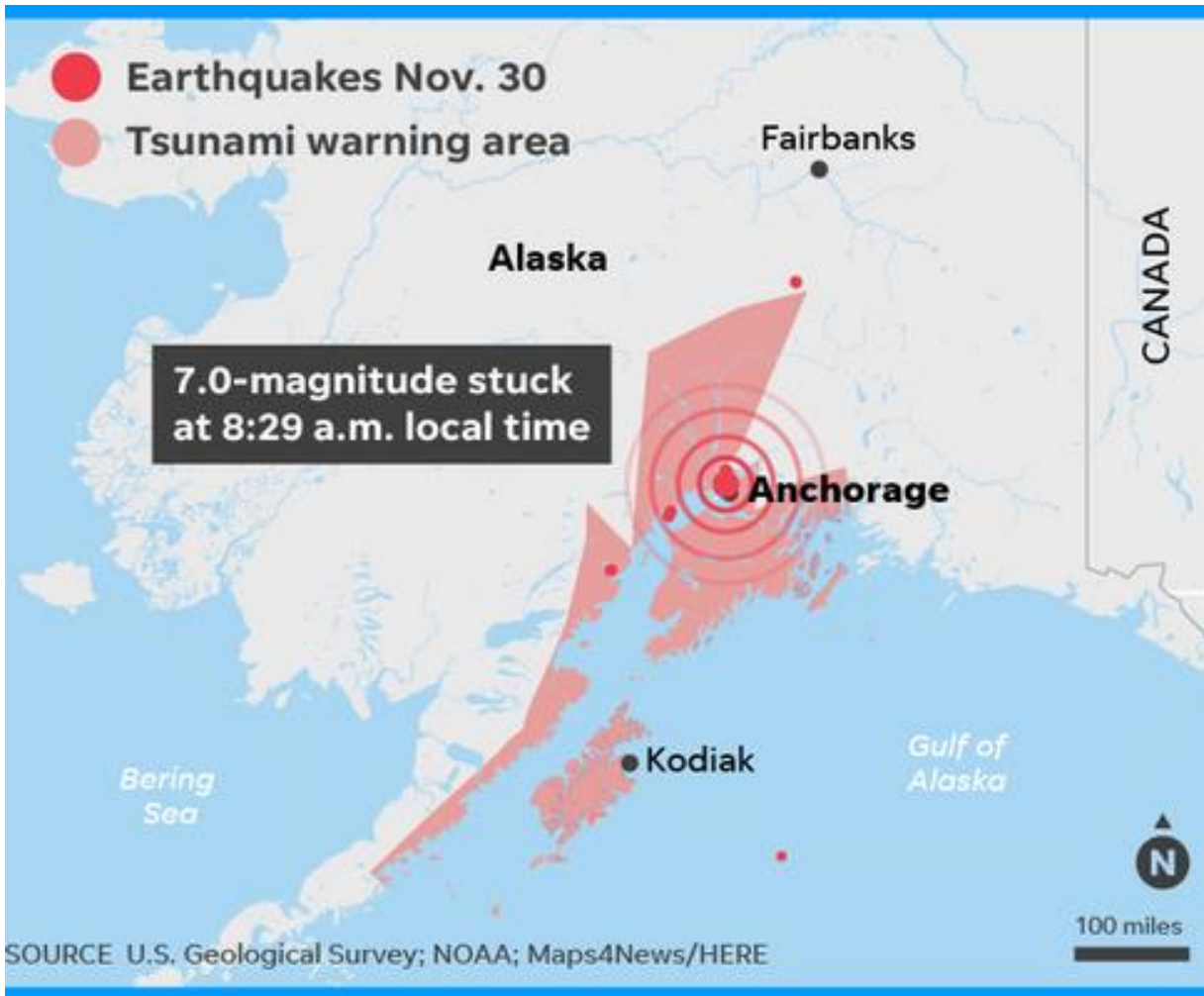
Bill Abrahams-Dematte

Jennifer Lambert

MASSIVE EARTHQUAKE IN ALASKA

ANCHORAGE -- Friday, November 30, 2018 05:14 PM

Back-to-back earthquakes measuring 7.0 and 5.7 rocked buildings and shattered roads Friday morning in Anchorage, sending people running into the streets and briefly triggering a warning to residents in Kodiak to flee to higher ground for fear of a tsunami.



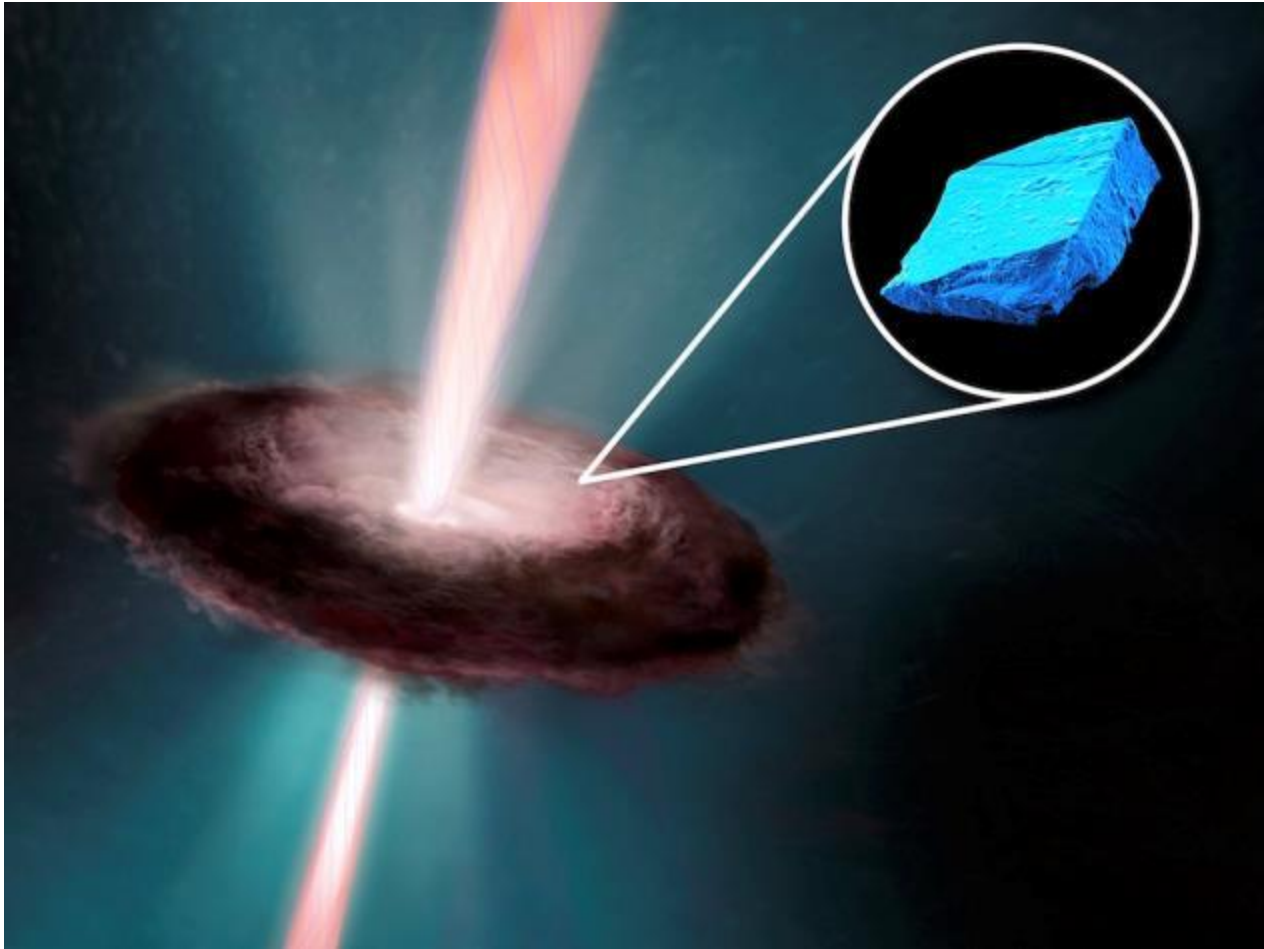
The tsunami warning was lifted without incident a short time later. There were no immediate reports of any deaths or serious injuries.

The U.S. Geological Survey said the first and more powerful quake was centered about 7 miles (12 kilometers) north of Anchorage, Alaska's largest city, with a population of about 300,000. People ran from their offices or took cover under desks.



METEORITE CRYSTALS OLDER THAN EARTH REVEAL EARLY SUN SECRETS

By Erika K. Carlson - July 30, 2018



Artist's illustration of the dusty disk of the early Solar System with an inset microscope image of a hibonite crystal. (Credit: Field Museum, University of Chicago, NASA, ESA, and E. Feild (STSC))

Tiny crystals in meteorites were witness to the sun's unruly behavior in its earliest years. The sun sends a lot more than sunshine and rainbows our way. High-energy particles capable of messing with the nuclei of atoms stream off our star constantly. Earth's magnetic fields shield us from many of the harmful effects of this energetic particles shower but not every solar system object is as protected.

The sun was even more active, researchers found, in the earliest years of the solar system, before Earth existed. Scientists investigated tiny crystals from the Murchison meteorite that fell to Earth in 1969 — crystals called hibonites. These crystals were probably some of the earliest minerals to form in the solar system, emerging even before Earth did some 4.5 billion years ago. Scientists found that the hibonite crystals had lots of helium and neon atoms, a result of being bombarded by tons of energetic particles from an infant sun. The results were described Monday in *Nature Astronomy*.

Murchison meteorite - On 28 September 1969 at about 10:58 am local time, near the town of Murchison, Victoria, in Australia, a bright fireball was observed to separate into three fragments before disappearing,^[1] leaving a cloud of smoke. About 30 seconds later, a tremor was heard. Many fragments were found over an area larger than 13 square kilometres (5.0 sq mi), with individual mass up to 7 kilograms (15 lb); one, weighing 680 grams (1.5 lb), broke through a roof and fell in hay.^[1] The total collected mass exceeds 100 kilograms (220 lb). https://en.wikipedia.org/wiki/Murchison_meteorite

Ancient Crystals - Astronomers have observed that young stars are generally very active and emit a lot of high-energy particles compared to stars farther along in their lives. To confirm whether the sun went through an active phase like this, scientists have been studying the chemical composition of meteorites to look for tell-tale signs of reactions caused by energetic particles. In the past, they'd found

METEORITE (CONTINUED)

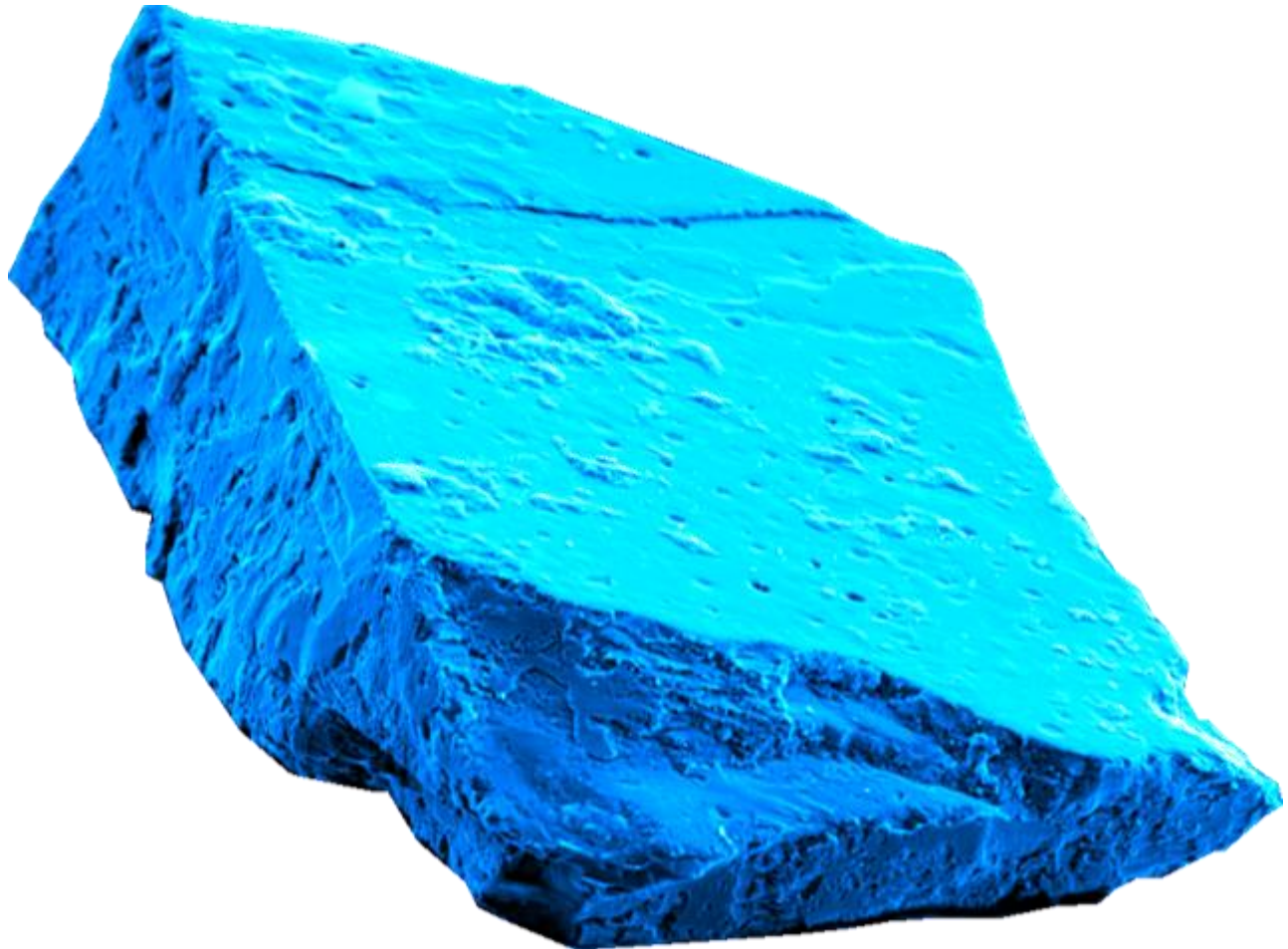
evidence suggesting the sun had an active early phase thanks to other known elements in the meteorites, but these helium and neon measurements in hibonite crystals are the most conclusive evidence yet.

“What came together here was that we looked at samples that are probably the oldest or among the oldest materials that we have access to from a meteorite, because it was important to look at very old materials, and then we looked at helium and neon,” says geoscientist Levke Kööp, the first author of this study.

Helium and neon atoms found in the crystals were the giveaway. Since helium and neon are in the family of elements called noble gases, they almost never form chemical bonds and wouldn't have bonded to the hibonite crystals as they were forming. So how did these noble gas elements get there?

Hibonite crystals are made up of several elements, including calcium and aluminum. When high-energy particles like those from the Sun hit some of these atoms, they can split into smaller atoms — like helium and neon. Kööp and her collaborators conclude that since these noble gases couldn't have bonded into the crystals as they formed, the helium and neon atoms they found in hibonite crystals must be the products of this splitting caused by high-energy particles.

The researchers found that other grains from the meteorite did not show the particle radiation's effects to the same degree. This implies that a lot of the energetic particle bombardment that affected the hibonite crystals must have happened very early on in the history of the solar system, when the crystals were still young and hadn't been incorporated into larger rocky bodies that would eventually fall to Earth as meteorites.



A microscope image of a tiny hibonite crystal, only about as wide across as a few human hairs. Scientists say these hibonite crystals found in meteorites were some of the earliest minerals to form in our solar system and are older than the Earth.
(Credit: Andy Davis, University of Chicago)

METEORITE (CONTINUED)

Something Changed

Comparing the old hibonite crystals to crystals that formed later in the solar system's history revealed that the sun was very active early in its life, but something changed dramatically in the early solar system so that later crystals did not experience as much energetic particle radiation.

"Something changed in the irradiation condition," Kööp says. "For some reason the hibonites were irradiated, but the later formed materials were not. And we don't know exactly why that is."

Kööp says it could have been some change in the properties of the dusty disk of the early Solar System, which would have shielded minerals from some of the sun's radiation, or it could have been a change in how much energetic particle radiation the Sun was emitting very early on.

Next steps, Kööp says, would be to look for the same helium and neon effects in other early Solar System minerals. She also thinks this work will be useful for simulations modeling the evolution of the early Solar System and its dusty disk properties.

In any case, Kööp is happy that the helium and neon atoms managed to stick around inside these tiny crystals for so long.

"It actually worked out so nicely, that the signature was so clear," she says. "There are many, many reasons why we might have not seen it. So actually it seemed like all the stars aligned."

<http://blogs.discovermagazine.com/d-brief/2018/07/30/meteorite-crystals-reveal-sun-secrets/#.XBKMPeTbJnc>

ASTEROID 2002 NT7 WILL NOT HIT EARTH ON FEB 1, 2019

by Robert Walker October 26, 2018

It's normal for asteroids to be removed from sentry impact table.

https://www.science20.com/robert_walker/2002_nt7_will_not_hit_earth_feb_1_2019_known_since_aug_1_2002_normal_for_asteroids_to_be_removed_from_sentry

and by Calla Cofield, Space.com Senior Writer- <https://www.space.com/39440-asteroid-wont-hit-earth-in-february.html>

In recent days [ed. – as of January 20, 2018], a few media outlets have reported (in some cases, rather sensationally) that a "potentially hazardous" asteroid will fly close to Earth on Feb. 4. Are the reports correct? Absolutely! Is there any need to panic? Absolutely not!

It's true that the building-size asteroid 2002 AJ129 will pass by Earth within about 10 times the distance from Earth to the moon (about 2.6 million miles, or 4.2 million kilometers), according to NASA. The asteroid is about 0.3 to 0.75 miles (0.5 to 1.2 km) in diameter — for comparison, the world's tallest building is 0.51 miles (0.82 km) tall, while the new World Trade Center building in New York is 0.33 miles (0.53 km) tall.

NASA representatives say there's no chance that it will collide with Earth.

"We have been tracking this asteroid for over 14 years and know its orbit very accurately," Paul Chodas, manager of the Center for Near-Earth-Object Studies at NASA's Jet Propulsion Laboratory, said in a statement. "Our calculations indicate that asteroid 2002 AJ129 has no chance — zero — of colliding with Earth on Feb. 4 or any time over the next 100 years."

Nonetheless, with no context, asteroid 2002 AJ129's close flyby might seem remarkable. But what many outlets failed to mention is that rocks of this size fly close to Earth somewhat regularly; in fact, two space rocks came significantly closer to our planet just this week.

Thursday (Jan. 18), the car-size asteroid 2018 BD (discovered just this year) came to within 0.09 times the distance from the Earth to the moon (about 21,500 miles or 34,600 km), according to NASA's Solar System Dynamics website and the Minor Planet Center. And Asteroid 2018 BX, which is also about the size of a car or bus, made its close flyby of Earth late Friday night (U.S. Eastern time on Jan. 19 [2018]), zipping past Earth at a distance of about 0.73 times the distance from the Earth to the moon (about 174,400 miles or 280,670 km).

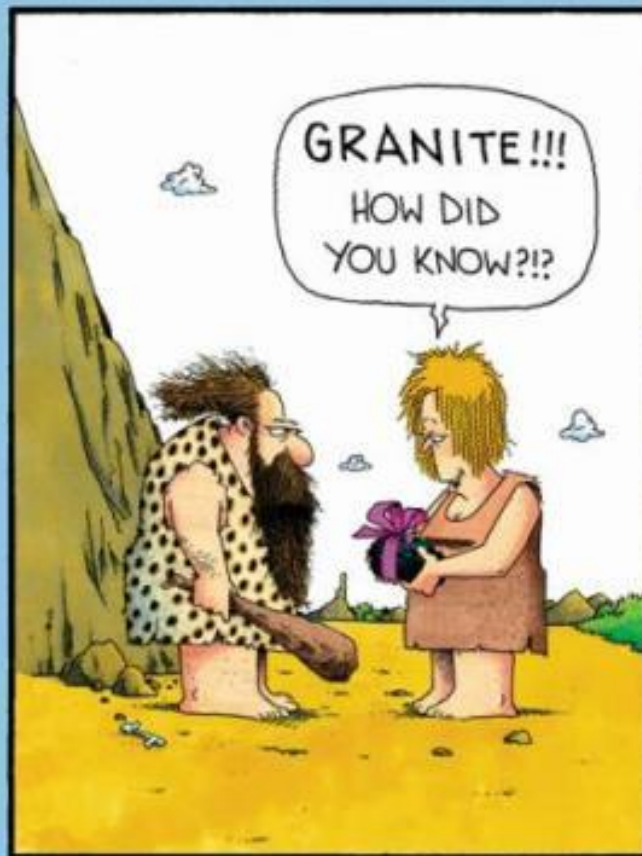
While those space rocks are smaller than 2002 AJ129, they came to within the altitude range where some communications and GPS satellites orbit, which means a worst-case scenario could have involved a collision between one of the space rocks and a satellite.

Asteroids much larger than 2002 AJ129 also make relatively close flybys of Earth somewhat regularly. On Sept. 1, 2017, the 2.7-mile-wide (4.4 km) Asteroid Florence passed within about 4.4 million miles (7 million km) of Earth, or about 18 times the distance from Earth to the moon. Another bus-size asteroid, known as 2017 SX17, zoomed within 54,100 miles (87,065 kilometers) of Earth on Oct. 2, 2017.

While NASA did designate 2002 AJ129 as a "potentially hazardous" asteroid, it's important to note that this designation is given to any asteroid larger than about 460 feet (140 m) in diameter that gets closer than 4.65 million miles (7.48 million km) to Earth.

Near-Earth asteroids can indeed pose a threat to the inhabitants of planet Earth, but remember that not all space rocks are to be feared.

You may also want to see the 2002 story: ***The world ends on Feb 1 2019 (possibly)*** at <https://www.telegraph.co.uk/news/science/science-news/3297518/The-world-ends-on-Feb-1-2019-possibly.html>



DATES TO REMEMBER

January 17, 2019 – **GSNH annual dinner meeting** at Makris Concord with Castleton University professor, Michelle Fame, speaking on Post-orogenic exhumation and glacial erosion of the Presidential and Carter Ranges in the White Mountains, New Hampshire.

March 15, 2019 - **2019 NH Water & Watershed Conference** Details at <https://campus.plymouth.edu/cfe/2019-nh-water-watershed-conference/>.

March 17-19, 2019 - **Northeastern Section Meeting of the Geological Society of America**
Portland, Maine. Details at https://www.geosociety.org/GSA/Events/Section_Meetings/GSA/Sections/ne/2019mtg/home.aspx#committee

March 28, 2019 – **2019 Maine Sustainability & Water Conference**, Augusta Civic Center. Details at <https://umaine.edu/mitchellcenter/news/maine-water-conference/>.

April 2, 2019 – **NHGS Mappers Workshop** – SAVE THE DATE!
April 18, 2019 - **GSNH annual dinner meeting** at Puritan Restaurant in Manchester

May 12-15, 2019 – **2019 Geological Association of Canada Annual Meeting**, Quebec City Convention Center. Details at <https://gac.ca/events/events-archive/gac-mac-annual-conference/>.

ICELAND VOLCANO ERUPTION 'COULD CAUSE GLOBAL DISRUPTION' WITH ASH CLOUD SIMILAR TO 2010 Adam Forrest - September 24, 2018



Provided by Independent Digital News & Media Limited

A volcano could cause global disruption if it erupts over southern Iceland, scientists have warned.

The Katla volcano is bigger than Eyjafjallajokull which created a giant ash cloud that affected worldwide air traffic eight years ago.

It has been releasing a much larger amount of carbon dioxide (CO₂) than previously thought, researchers have discovered.

Aerial footage of Icelandic volcano eruption filmed in 2014 Kalta, translates to “kettle” or “boiler”, last blew in 1918, having previously done so around every 50 years – leaving it overdue for another eruption. It sits near Iceland’s southern coastline around 25km from

Eyjafjallajokull. “There is no way of telling when it will erupt, just that it will,” Sarah Barsotti of the Icelandic Meteorological Office told *The Sunday Times*. She added that the level of disruption to air travel “depends on the intensity of the eruption and the direction of the winds at the time.”

A team of British and Icelandic researchers discovered that Katla, previously assumed to be only a minor gas emitter, is a “globally important source of atmospheric carbon dioxide”. They found the “highly hazardous” volcano was releasing between 12 and 24 kilotons of CO₂ every day. According to their report, published last week in the journal Geophysical Research Letters, Katla “is one of the largest volcanic sources of CO₂ on Earth, releasing up to 5 per cent of total global volcanic emissions.”

Evgenia Ilyinskaya, a research fellow in the Institute of Geophysics and Tectonics at Leeds University, told The Sunday Times that the volume of CO₂ was “a clear sign we need to keep a close eye on Katla.” She added that the “findings confirm that there is something going on.” However, Ms Ilyinskaya later took to Twitter to play down reports that Katla was ready to erupt. She said “that we are in no position to say whether or not (the) Katla volcano is ready to erupt.” Any eruption is “unlikely to be as serious as in 2010” because the severity of the air traffic disruption following the Eyjafjallajökull event was “very unusual”, she said.

Magnús Tumi Guðmundsson, a professor in geophysics at the University of Iceland, described the emissions measurements as “remarkable” but said it was too early to tell whether the amount of CO₂ meant an eruption was imminent.

<http://www.msn.com/en-us/news/world/iceland-volcano-eruption-could-cause-global-disruption-with-ash-cloud-similar-to-2010-scientists-warn/ar-AAAzGTO?ocid=ientp>

ICELAND'S MID-ATLANTIC RIDGE Photo taken on November 1, 2018.

<https://epod.usra.edu/blog/2018/12/icelands-mid-atlantic-ridge.html>

The island of Iceland is one of the extraordinary places where you can view the Mid-Atlantic Ridge above sea level.



The ridge’s discovery was some of the first evidence supporting the theory of plate tectonics. Iceland is above the level of the sea not only because it's positioned abreast of the ridge, but

because it lies on a hot spot over the Earth's mantle. The upwelling of the buoyant magma from this hotspot has, over tens of thousands of years, pushed high enough to break the surface of the ocean.

This photo was taken from Thingvellir National Park, on the North American Plate side of the ridge, looking east across the rift valley to the Eurasian Plate.

THE NH GEOLOGICAL SURVEY GROUND WATER LEVEL NETWORK SUMMARY Submitted by Josh Keeley of the NHGS

The NHGS posts its monthly groundwater levels from its network of NH Observation Wells online at:

<http://www.des.nh.gov/organization/commissioner/pip/publications/geologic/groundwater-levels.htm>. The data for all of the wells in the NH Groundwater Level Network are shared with and posted on the USGS website at:

<http://groundwaterwatch.usgs.gov/statemap.asp?sc=33&sa=NH>. A map of both the New Hampshire and Vermont Groundwater Level Network is at

<https://groundwaterwatch.usgs.gov/netmapT2L1.asp?ncd=NHV>.



Church in Sugar Hill, Nov 30, 2018. Photo by J. Keeler

MOST RECENT MONTHLY NH GROUNDWATER REPORT

Groundwater Level Monitoring August 2018 is available here

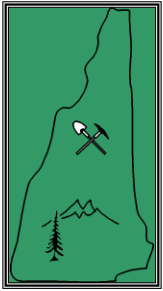
<https://www.des.nh.gov/organization/commissioner/pip/publications/geologic/documents/nhgs-gwlevels-aug-2018.pdf>

Monthly reports are available in the parent directory.

ICONIC APOLLO 8 EARTHRISE PHOTO TAKEN FIFTY YEARS AGO THIS MONTH: DEC. 24, 1968 – <https://www.nasa.gov/image-feature/apollo-8-earthrise>



This photo, taken aboard Apollo 8 by Bill Anders, shows Earth peeking out from beyond the lunar surface as the first crewed spacecraft circumnavigated the Moon.



Geological Society of New Hampshire

Topic: Post-orogenic exhumation and glacial erosion of the Presidential and Carter Ranges in the White Mountains, New Hampshire

Speaker: Michelle Fame, Adjunct Assistant Professor of Geology Natural Sciences Department at Castleton University in Vermont

Thursday, January 17, 2019

**Location: Makris Lobster House Restaurant
354 Sheep Davis Rd, Concord, NH 03301**

5:30 pm Social Hour - 6:30 pm Dinner - 7:15 pm Speaker Presentation

RSVP by 4 pm Friday, **January 11, 2019 to get the reservation price**
SPACE AT THIS VENUE IS LIMITED TO 80...RESERVE EARLY!

- | | | |
|-----------------------|---|---------|
| Advance Reservations: | _____ Member (Dues Paid) | \$27.00 |
| | _____ Non-member | \$30.00 |
| | • Students \$10.00 with valid student ID card (Reservation Requested) | |
| | • Member at the Door | \$29.00 |
| | • Non-Member at the Door | \$32.00 |

Checks payable to: GSNH.

Please indicate special food issues – leave blank for none.

GSNH will also accept dinner reservations by e-mail, which will then allow you to pay at the door.

Reply via e-mail to: Sharon.Lewandowski@des.nh.gov or

Mail to: **Sharon Lewandowski , GSNH Dinner Meeting,
PO Box 401,
Concord, NH 03302.**

Please note that e-mail reservations constitute an agreement with the Society for which you will be responsible to pay, whether you are able to attend or not, unless you cancel your reservation by noon the Tuesday before the dinner.

Name(s) _____

Address: _____

Your phone or e-mail: _____

The dinner and lecture program counts as 2.0 hours of CEU contact hour credit.



MEMBERSHIP & RENEWAL APPLICATION

Geological Society of New Hampshire

PO Box 401, Concord, NH 03302

Name: _____

(Please print clearly)

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Renewing Members: Only update this section if you have changes to your contact information (including email) or educational history.

New applicants: please complete this section.

Preferred address/email to receive GSNH Communication: ___Home or ___Business

Home Address:

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Business address lines (Employer):

Home Telephone: _____

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New Hampshire PG # (if applicable) _____

Education: Degrees received or in progress:

Table with 4 columns: Year, Degree, Major, College or University

I volunteer to help with one of the following committees or tasks:

- Membership Committee, Regulations Committee, Communications Committee, Legislative Committee, Education Committee, Giving a talk at a meeting, Events Committee, Other: (Newsletter or Website, circle preference)

Membership Category:

- Regular Member (Annual Dues \$20.00)
Student Member (Annual Dues \$10.00)...Please complete Education section above.

Make checks payable to "Geological Society of New Hampshire." Note that GSNH dues are not deductible as a charitable contribution, but may be deductible as a business expense. Please return this completed application form with any necessary corrections and a check for the appropriate dues to the GSNH at the address above. The Society's membership year runs from January 1 to December 31.

Signature: _____ Date: _____