The Trilobite

Volume 71 Number 04 *Wisconsin Geological Society* **April 2015**

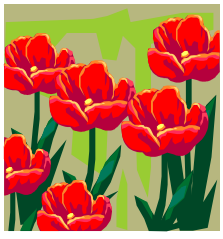
NEXT WGS MEMBERSHIP MEETING & PROGRAM
Monday, April 13, 2015

Immaculate Heart of Mary Church Hall
(Downstairs, Enter at back of building)
1260 South 117th Street (Just North of Greenfield Ave):
West Allis, Wisconsin

7:00pm: Business Meeting:

7:30 pm: Program: Fatimah Patiman, a student at UWM, will talk about how magnetic mineralogy in volcanic glasses changes with time and the long-term/short-term effect of this change in geomagnetic paleointensity. Please see below for a brief introduction.

Earth's ancient magnetic field plays an important role in understanding the Earth's early evolution. Geomagnetic intensity and direction vary with geologic time; understanding the magnetic reversals and their intensity changes over time is critical to many scientific questions such as geodynamo, plate tectonics , etc. Upon and during eruption, hot lava cools quickly when encountered the cooler temperature at the surface of the Earth or under the sea. Tiny (nanometer-scale) magnetic mineral particles such as magnetite forms among other minerals and "remember" the geomagnetic field present. The magnetic property or the "memory" of a magnetic mineral is decided by many different elements, such as the geomagnetic field strength and its direction, the magma origin, eruption environment, cooling rate of the magma, as well as the preservation environment and so on. In my PhD research I am focused on the volcanic glassy material properties and their relationship with the geomagnetic paleointensity. Field collected basaltic and silicic glass samples are studied at the paleomagnetic laboratory, UWM employing rock magnetic and paleomagnetic research tools. Recently I delivered an oral presentation at AGU's 2014 conference on a set of samples from Yucca Mountain, Nevada. Those 12.7 Ma-old samples have shown a lower field intensity (~27 uT) than present day field (~40 uT). I will present and share these finding with WGS members, I will bring those Tuff samples to the audience.



WGS Minutes March 9, 2015
Immaculate Heart of Mary Church Hall

The meeting was called to order at 7:03 PM by our President Pierre Couture.

Our guest speaker, Ashley Dineen, did her presentation. The business meeting resumed at 7:45PM.

The minutes of the February meeting were printed in *The Trilobite*. Paul Schmidt made a motion to accept the minutes as published. Another member seconded. The motion was approved.

New Memberships: There were no new memberships.

Guests: Our presenter, Ashley Dineen. Peter Peterson and his wife also attended the meetings.

Kitty Klein read the Treasurer's Report. Tom Kuhlinger made a motion to accept the current report for audit. John Hammeter seconded. The motion was approved.

Committee Reports:
The Show Committee: Paul Schmidt said set-up is at 10AM the day before the show. There are sign-up sheets in the back. The Zamoras need cashier's for the kitchen. Paul also needs to know if you plan to exhibit. There are also flyers in the back. The Zamoras would also like to serve hot food both days.

The Field Trip Committee: Saturday April 11 11AM Jim Boyd's Dinosaur Museum in Elkhorn, Wisconsin. W6502 County A in Walworth County. Contact Mike Macali for more details. Six people have already signed up.

Unfinished Business: Last month we talked about recruiting new members at the show. A few years ago we gave them a free three operating month membership if they received the newsletter electronically. Lloyd Brown made the proposal. Steve Klein seconded. The motion was approved.

New Business: Pierre Couture suggested the members bring up suggestions for website improvements at the next meeting.

Announcements: Lloyd Brown went to the Tuscon Show in February. He definitely recommends members go to the show if they ever have the chance. The Porubskys also donated some specimens to the club. The Kettle Moraine Show will be this weekend. Jim Boyd will be speaking at the show.

Door Prizes: Rocks from the Campion and Porubsky collections were donated. Ed Miller also donated some specimens. The winners were: Bernice McCloskey, Jody Rymaszewski, Paul Schmidt, Pierre Couture, Peter Peterson, Tom Kuhlinger, Marilyn Smits, Fran Zamora, Bear DeVitt, John Hammeter, Wanda Riel, Steve Meyer, Chuck, Mike Macali, Ed Miller, Phillip, Ashley Dineen, Sandra Peterson, and Lloyd Brown.

Adjournment: Tom Kuhlinger made a motion to adjourn. Another member seconded. The motion was approved. The meeting adjourned at 8:22

Barbara Brown, Secretary

CALENDAR OF EVENTS

March 28-29 2015: Monroe WI
Badger Lapidary & Geological Society, 45th Annual, Rock, Gem, Mineral, & Fossil Show.
Dates: Saturday March 28th & Sunday March 29th 2015. Hours: **9**AM-**5**PM
Location: Monroe Senior High School, 1600 26th St., Monroe, WI 53566.
Description: Ten dealers, excellent speakers, many beautiful club displays, fluorescent mineral tent, lapidary demonstrations, club sales table, hourly door prizes, educational films.
Activities for kids: Fishpond, spinner game, scavenger hunt, quarry quest, rock polishing, and roving rock wizard.; **Food:** Full Menu; **Free Show** - Free-will donation and free parking.
Show Contact: Teri Marche, 5415 Lost Woods Ct., Oregon, WI 53575; tmarche555@gmail.com
Website: www.badgerrockclub.org

March 28-29 2015: Cedar Rapids IA
Cedar Valley Rocks and Minerals Society 51st Annual Show.
Hawkeye Downs Expo Center, 4400 6th Street SW, Cedar Rapids IA
Sat 8:30 - 6:00, Sun 9:30 - 5:00:

April 18-19 2015: Eau Claire, WI
Chippewa Valley Gem & Mineral Society 52nd Annual Show
Eau Claire County Expo Center, Lorch Rd.; Sat 9-5, Sun 10-4

May 2-3 2015: Marshfield, WI
Heart of WI Gem & Mineral Society 42nd Annual Show
Marshfield High School Fieldhouse, 1401 Becker RD. Sat 10-5, Sun 10-4

May 23-24: **MWF Convention & Chicagoland Gems & Minerals Association 39th Show**,
Dupage County Fairgrounds, 2015 West Manchester Roas, Wheaton IL
All MWF meetings to be held Saturday, in the Café Building #5 at the north end of the fairgrounds; Retail Show in the Main Exhibit Bldg. #1; Wholesale Show in the Home Economics Bldgs #2 & 3; Talks in 4H Bldg #4.
E-mail CGMA@sbcglobal.net Rich Dillon at (630) 377-0197

2016 Agate EXPO : Cedarburg WI
July 7th 2016: Agate Symposium
July 8-10 2016: Exhibit and Sales Floor open
July 9 2016: Evening Banquet and Celebration

The Midwest Federation website has an extensive calendar of shows and activities throughout the Midwest. **http://www.amfed.org/mwf/Calendar/calendar.html**

An extensive list on mineral shows is also at: **http://www.the-vug.com/vug/vugshows.html**

Rock and Gem magazine also maintains a calendar of Shows in the magazine and at their web site at **www.rockngem.com**

WGS STUDY GROUPS

WGS LAPIDARY STUDY GROUP

The Lapidary Study Group meets at the McGovern Park Community Center,
4500 West Custer Avenue, Milwaukee, 53218.

The April meeting of the lapidary study group is scheduled for Tuesday, April 14th at 11:30 am in the the craft room of the McGovern Park Senior Center, 4500 West Custer Avenue, Milwaukee.

This is the final meeting of the lapidary study group for this semester. Our next meeting will be in September.

The lapidary showcase will use the theme of a laminated scarab appearance.

Ed Fyrnys

Contact Ed Fyrnys for more information.
Phone 414-453-3456

WGS MINERAL STUDY GROUP AND FOSSIL STUDY GROUP

The Mineral Study group meets the 3rd Thursday of the month at Bernice McCloskey's.
Fossils will also be addressed at this time if specimens of interest are brought for discussion.

Please phone Lloyd Brown at 414-943-5556 before coming to any study group meeting to confirm that it will be held, and to get directions to the location.

WGS Show News

The 58th Annual Wisconsin Geological Society Gem, Mineral, and Fossil Show will be held on Saturday May 16th and Sunday May 17th 2015 from 10:00am to 5:00pm each day.
The Show will be held at Hart Park as usual.

Setup will begin on Friday after 10 am in the main hall. We will have access to the other rooms after 1:00 pm

The Zamora family is in need of someone to handle the cash box for the kitchen. 10 am to 2 pm each day. Someone please volunteer. We also have some time slots needing coverage at the admissions table. Volunteers for Security patrol are also needed.

Paul Schmidt, Show Chairman, 414-771-8668

March 6, 2015
NASA's Dawn spacecraft has become the first mission to achieve orbit around a dwarf planet. The spacecraft was approximately 38,000 miles (61,000 kilometers) from Ceres when it was captured by the dwarf planet's gravity at about 6:39 a.m. CST) Friday March 6.
Mission controllers at NASA's Jet Propulsion Laboratory (JPL) in Pasadena, California received a signal from the spacecraft at 7:36 a.m. CST that Dawn was healthy and thrusting with its ion engine, the indicator Dawn had entered orbit as planned.
In addition to being the first spacecraft to visit a dwarf planet, Dawn also has the distinction of being the first mission to orbit two extraterrestrial targets. From 2011 to 2012, the spacecraft explored the giant asteroid Vesta, delivering new insights and thousands of images from that distant world. Ceres and Vesta are the two most massive residents of our solar system's main asteroid belt.

http://www.nasa.gov/dawn.

DVDs available!

Just in time for The New Year – 3 new DVD presentations by notable scholars for a mere $20 dollar donation for each to go to the MWF Endowment Fund. The three presentations were given at the 2012 Geo-fair in Cincinnati, Ohio. Not only are the, scholar's great speaker's they are also nationally known. Jeff Scovil for his photography and a collector of minerals. Dr. Carl Francis, Harvard Museum's former mineral curator, and Dale Gnidovec, well known Ohio paleontologist. All the titles of these DVD's are as follows:

"The Beauty of Carbonates" by Jeff Scovil

"Collectable Carbonates" By Dr. Carl Francis

"Teeth Jaws and Claws" by Dale Gnidovec

Again for only a $20 dollar donation you will receive a DVD of your choosing. No cash please, order today you will not be disappointed satisfaction guaranteed. This donation will be credited to your club or the individual making the donation. Regardless your donation is tax deductable.
Please enclose an additional $3.00 for postage for each.

Send your request to MWF Endowment Fund Treasurer Alan Hukill 15785 Park Lake Road, East Lansing MI 48823. Please make the check payable to 03903074MWF Endowment Fund.

Name:_____ Date:_____
Address Video will be mailed to:_____
City:_____ State:_____ Zip:_____
Amount enclosed:_____

DVD : (Circle) The Beauty of Carbonates Collectable Carbonates Teeth Jaws and Claws

Wisconsin Geological Society

2015

Gem, Mineral, and Fossil Show

Saturday May 16th
Sunday May 17th
10am - 5pm both days

Children's Activities!
Exhibits!
Dealer and Club Sales!
Free Parking

Fossils	**Admission: $3.00**
Minerals	**2 for $5**
Lapidary	**accompanied**
Jewelry	**Children Free**

Indoors in the Muellner Bldg.
at Hart Park
Wauwatosa WI

Enter at 72nd and State Street

http://www.wisgeologicalsociety.com/

THIRTY OF TOP 100 SCIENCE STORIES FOR 2014

Each year Discover Magazine publishes the top 100 science stories for the past year. I have compiled and condensed info that would be of more interest to subject of geology and palentology, as a quick summary.

*CLIMATE IN CRISIS: West Antarctic Ice Sheet collapses. Increasing amounts of ice are breaking off across West Antartic Ice Sheet, which is contributing to nearly 10% of increase in global sea levels.
*ROSETTA'S COMET RENDEZVOUS MAKES SPACE HISTORY: On August 6, the European Space Agency's Rosetta spacecraft went where no probe had gone before: into orbit around a comet. It was the end of a 4-billion-mile journey and start of a 17 month orbital mission designed to understand the changes comets go through as they approach the sun. Helps to understand evolution of the solar system and origin of water on Earth. Rosetta delivered the sharpest-ever views of a nucleus (the frozen mass of rock and ice inside the comet.). Rosetta scheduled to drop a lander named Philae onto the comet's surface, mapping comet's surface, analyze chemical composition, and study gases and dust ejected as the sun heats the ice.
*FIRST DINOSAUR TO MENACE LAND & WATER: A new specimen of the dinosaur *Spinosaurus aegyptiacus* , uncovered in Saharan Morocco, confirms that the 50-foot carnivore was the largest land predator ever known. It is also the only aquatic dinosaur identified.
*LAB-MADE FUSION: Researchers are getting closer toward tapping the power of lab-made fusion. Near San Francisco, 192 lasers on a plastic sphere the size of a BB. Inside were ingredients for a powerful fusion reaction. When lasers were turned on, they found that more energy came out of the fuel than went in.
This is a crucial milestone to tap power of lab-made fusion.
*A RIVER RESURRECTED: A binational agreement between Mexico and U.S. unleashed an 8-week pulse flow from a small dam on the border to help restore the Colorado River delta. It was the first time in more than 60 years that the 1,450 mile river was reunited with the Sea of Cortez.
*HEAVYWEIGHT DINOSAUR OF THE WORLD: In 2005, Argentine Patagonia, Paleontologist Lacovara discovered a 6-foot-long femur. Research has concluded, after years of excavation, that this specimen *Dreadnoughtus schrani* is a top contender for the largest land animal ever: It was 65 tons and 85 feet long, with a 30-foot tail.
*FREEZING LIGHT IN ITS TRACKS: Physicists froze light into a crystal-like state. They allowed photons to interact with each other and lose energy, like water molecules losing heat and freezing.
*DANGERS OF CHEMICAL SPILLS: We try to keep our waterways clean, but there is a loophole in 1976 Toxic Substances Control Act, which exempted chemicals already in use when the law was passed.
One is MCHM (4-methycyclohexane methanol) which is used to purge impurities so coal burns more cleanly. But the cleaner itself is not so clean. The compound flowed from a ruptured storage tank in Charleston, WVa and had hundreds crowding hospital emergency rooms with nausea and other complaints. At first it was said that the contaminant posed little risk to public health, but six days later, officials warned that pregnant women, children and other vulnerable residents should not drink the water. Thousands of industrial chemicals lack sufficient health & safety information.

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TOP 100 SCIENCE STORIES FOR 2014 cont….

*DIAMONDS CONTAINING WATER?: After emerging from a volcanic explosion at the edge of the Amazon rainforest, a pile of diamonds were found and examined by a Canadian geochemist. These diamonds were formed at least 325 miles underground hundreds of millions of years ago. They were being examined for clues about evolution and origin of the mantle, the thickest of Earth's inner layers. After shining a laser into hundreds of diamonds, a speck of a mineral called ringwoodite was found, previously seen only in meteorites or synthesized in labs. Within the ringwoodite, a tiny bit of water was found. This evidence gives a clue that there is more water when we need it.
*ASTEROID WITH RINGS FOUND: Celestial circles were found around an asteroid named 10199 Chariklo. It has two icy rings , one 4 miles wide, and one 2 miles. The asteroid is only 154 miles wide.
*ARCTIC DINOSAUR HOBBIT *T.rex FOUND:* The only tyrannosaur ever found outside temperate latitudes, this dinosaur roamed the Arctic 70 million years ago. It was found near Alaska's North Slope. It was barely 2/3 the size of regular tyrannosaurs.
*ORIGAMI ROBOTS ENTER THE FOLD:A crab walker robot was formed from about $20 worth of parts, and walks without human direction. It marks an advance for inexpensive and versatile robots.Researchers at Harvard and MIT created them out of paper and 3-D sheets of polystyrene (Shrinky Dinks). They can go to places humans can't easily go.
*JUPITER'S MOON EUROPA HAS TECTONIC PLATES: A team of planetary geologists digitally deconstructed one region of the moon's surface into icy pieces, and then tried to fit them back together. They found a 7,700-square-mile piece missing, thus realizing that it had moved over warmer layers until it collided with another plate and was forced beneath the surface. This process called subduction creates mountain ranges, volcanoes and trenches on Earth. This could mean that the movement of material from the inhospitable surface down into the ocean could supply crucial chemical nutrients for possible living organisms in the global ocean.
*SATURN'S MOON ENCELADUS HAS WATER: A huge lake is about 20 miles under the surface ice. It is a five-mile-deep reservoir the size of Lake Superior. Over a hundred geysers were also found on the moon, which would allow pathways for the water and other ingredients for life to burst up through the surface.
*STONEHEDGE BURIED SECRETS UNCOVERED: A new geophysical survey includes several previously unidentified burial mounds and a long barrow used for excarnation (the act of removing flesh from bones in preparation for burial. Seventeen additional Neolithic shrines were hidden beneath the area around this site, which is about 90 miles west of London.
*JUPITER'S SHRINKING SPOT: The planet of Jupiter has a trademark weather pattern called the stormy Great Red Spot. .Astronomers have known that this spot is shrinking. In May, using the Hubble Space Telescope, they learned that the spot has been shrinking at a faster rate. In 1979 it was 14,500 miles wide. Now it is 10,250 miles wide and shrinking by 580 miles per year. The cause of this big shrink is a mystery.
*PLANET MERCURY IS SHRINKING: NASA's spacecraft, MESSENGER, produced a comprehensive survey of the planet's features. It has shrunk between 4 and 7 kilometers over the past 4.5 billion years. They would like to know more about the interior of the planet.

Cont on next page…….

TOP 100 SCIENCE STORIES FOR 2014 cont….

*TWO FACES OF OUR MOON: The moon's two faces look nothing alike. The far side has fewer of the dark patches which were formed by ancient lava flows. The lunar crust is thicker there, making it harder for asteroids to break through and release magma. But why was the crust thicker to begin with? Pennsylvania State astronomers theorize that it dates back to when the moon was formed., when a Mars-size body collided with Earth 4.5 billion years ago, the material that went into orbit eventually became the moon, One side always faces the Earth. The crash heated our planet to 7,000 +degrees Celsius and the energy kept the near side of the moon in a molten state longer. The far side cooled sooner, making conditions more favorable to condense there. That material became lunar rock, resulting in a thicker crust.

*MARS HAD LAKES IN RECENT PAST: Brown University researcher is presenting evidence that Arsia Mons volcano on Mars melted glaciers some 210 million years ago, creating oases for possible Martian microbes. As lava was vented beneath the ice sheets, it released liquid water within the glacier. Two reservoirs were big enough to fill Utah's Great Salt Lake twice over. Life-friendly environments might have existed more recently than at the sites explored by NASA's rovers. The water survived, entombed in ice for hundreds or thousands of years, not long enough for new life to evolve, but certainly enough to form a habitat for dormant microbes.:

*BIO-INSPIRED BATTERY: With the help of organic chemistry,, batteries might be able to last longer. Looking to nature , they saw that quinones, a carbon-based class of chemicals plays a role in animal & plant matabolism, moving electrons in chemical reactions we use to store energy. Researchers suspected that quinones could also move electrons in flow batteries. They picked a quinone, called AQDS, A prototype system is now being developed .A prototype metal-free battery developed by Harvard researchers relies on electrochemistry of naturally abundant, small organic molecules to store electricity generated from renewable, intermittent energy sources.

*PROPOSED CANAL IN NICARAGUA:A century ago, the Panama Canal beat out Nicaragua to create a canal that would link the Atlantic & Pacific oceans, creating a shorter trade route between East & West. A new canal in Nicaragua is planned, triple the length of the Panama Canal .It would swath through two nature reserves, home to rare cloud forests and several endangered species of animals. The canal would be 90 feet deep, requiring dredging 65 miles across Lake Nicaragua, Central America's largest lake, and key source of drinking water. There are also geologic concerns, as volcanic and seismic activity .

*NEW GASES DAMAGE OZONE LAYER: While progress had been made to deal with recovering the protective ozone layer , last spring new ozone-destroying gases were found. Four new ones are three chlorofluorocarbons (CFC) and one hydrochlorofluorocarbon (HCFC) , amounting to 81,000 tons.In June they found 3 more: two CFC and HCFC, bringing the total to seven. The emissions may have come from insecticides, refrigerants or solvents.

*DEATH VALLEY'S SAILING STONES RIDDLE SOLVED: Death Valley National Park is home to a natural wonder that has baffled scientists for decades. Large rocks mysteriously trudge across a barren lakebed, leaving trails in their wake. In August researchers caught the rocks in motion. What happens is that a perfect balance of sun, rain, wind and ice sets the rocks into motion. When the sun's heat broke apart ice that formed atop a pond, the wind pushed the large, yet thin, sheets of ice into the rocks. Ice accumulated behind the stones, providing the push necessary for the rocks to "sail".

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TOP 100 SCIENCE STORIES FOR 2014 cont….

*TINKERING WITH THE COSMO'S CONSTANTS: Underlying the universe is a variety of physical constants, values not based on anything, they just are. This year experiments refined two of them. Scientists updated gravitational constant, which governs how strongly massive objects attract each other. A new experimental setup was used in Italy. The new value differs from the old by less than a tenth of a percent. The relationship between energy and frequency was studied . They found a more precise value for Planck's constant (integral value used in quantum mechanics). These new values won't change how we see the universe, but it makes our understanding more precise and eventually much deeper.

*OTHERWORLDLY SPRING FOUND IN ARCTIC: In June it was announced that the world's northernmost perennial spring was found in the Canadian High Arctic. It is called the Ice River Spring and they do not know the source of the spring since it is in a polar desert. The average temperature is MINUS 3.46 degrees Farenheit. Precipitation can't explain the cascade, gushing through the Arctic permafrost at nearly 137 gallons per second. There is a strong resemblance to an area on Mars with the same type of channel.

*NEW TYPES OF BATTERIES CONSIDERED: Lithium batteries potentially will increase cell phones battery life. Stanford U. researchers are checking into this, although it will take 3-5 years before this product could be ready to store energy for the electric grid, solar cells, and wind farms. Lithium batteries have 3 parts: the ANODE that discharges the electrons, the CATHODE that absorbs them, and an ELECTROLYTE that carries ions between the two.

*THE NEW BLACK: A British company publicly released a material so black that it absorbs 99.96% of light, making it the most absorbent thing on Earth. This outrageously obsidian material is called Vantablack. Its darkness is created by having a set of vertically aligned carbon nanotubes, each about 10,000 times thinner than a human hair. They are suspended in plasma and coated directly onto materials like aluminum foil. The nanotubes are packed so tightly that incoming light particles bounce around between them until the nanotubes absorb them. Some uses are to withstand from launching a rocket into space, long-term vibrations and extreme temperature fluctuations. It could probably improve telescope accuracy by reducing stray light within their instruments.

*A ROCK LIKE NO OTHER: A Western Australian mining company came across some strange-looking purple-pinkish rocks in 2006. Geologist Peter Elliott of the South Australian Museum analyzed them and announced last spring that it was a previously unknown mineral. He dubbed it PUTNISITE. The shimmering mineral has an otherworldly look. It contains the elements strontium , calcium, chromium, sulfur, carbon, oxygen and hydrogen in a novel way.

*GLORY OBSERVED ON PLANET VENUS: A glory is a round rainbow of light. Sometimes they are seen outside of an airplane window. They occur at a point in the sky opposite the sun when light scatters off tiny liquid particles, usually water in our clouds, refracting into rings. The Venus Express probe released an image of a glory, which was about 750 miles across. Astronomers were surprised to learn that the planet Venus has clouds that are not pure sulfuric acid, but may include iron chloride and pure sulfur.

*STUDY OF EXOPLANETS CONTINUES: Exoplanets, (worlds around other stars) are studied. The known total doubled from last year to 1,800, and new "firsts" are exciting to observe. One stands out as the first approximately Earth-size world, with an Earthlike orbit, in a double-star system. Another called Kepler 186f has an Earth look-alike that also has a "Goldilocks" zone , where liquid water can persist on a planetary surface.

-Condensed from Discover Magazine, January/February 2015 By Verna Schmidt

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The Purpose of the Wisconsin Geological Society, Inc is to:

Create an interest in the study of Geology

Provide a means for personal development in Geology.

Disseminate knowledge concerning all phases of Geology.

The **Wisconsin Geological Society, Inc** is a member of the Midwest Federation of Mineralogical and Geological Studies, which is a part of the American Federation of Mineralogical Societies.
www.amfed.org/mwf

WGS WEBSITE ADDRESS:
www.wisgeologicalsociety.com

Wisconsin Geological Society, Inc
Committee Chairpersons:

All-American Club Entry....Barbara Brown;:414-258-5761
UW-Milw Liaison: ..... Jody Rymaszewski: 414-771-4780
Custodian-Librarian:..... To be announced
Education:..... To be announced
Field Trips:…… ..... Mike Macali: 414-321-9217
Jody Rymaszewski: 414-771-4780
Historian: ..... Jody Rymaszewski : 414-771-4780
Junior Rockhounds:……Ed Fyrnys
MWF Liaison……..Jody Rymaszewski: 414-771-4780
Nominations: ..... To be announced
Parliamentarian:..... Bear Devitt: 414-278-0323
Study Groups: ..... Fossil: Lloyd Brown: 414-258-5761
Lapidary: Ed Fyrnys: 414-453-3456
Mineral: Lloyd Brown: 414-258-5761
Show Chairman: ..... Paul Schmidt: 414-771-8668
WebMaster: ..... Chris Peychal: 262-446-6849
Sunshine Person:..... Margaret Pearson: 414-464-0781

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April 2015
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FIRST CLASS

To:

General Membership meetings are held each month (except July and August) on the second Monday of the month at 7:00p.m. in the Parish Hall (lower level) of the Immaculate Heart of Mary Catholic Church, 1260 South 117th Street; West Allis, Wisconsin.

All news, articles, and pictures to be included in the Trilobite should be forwarded to the editor by the 15th of the month. They can be mailed or e-mailed to:
Paul and Verna Schmidt
8213 Red Arrow Ct.
Wauwatosa WI 53213
pvs@wi.rr.com

WGS Members, Please Note:

Your Membership Dues are renewed in November.

$15.00 Single Membership
$20.00 Family Membership

Please remember to send your check to Club Treasurer Kitty Klein
(See page 11)

The check should be made out to WGS

The Wisconsin Geological Society, Inc is now in it's 77th year