

# The FOSSILETTER

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## March Meeting

The March section meeting is on Tuesday, March 1, at 7:30 PM. This meeting will be conducted as a virtual meeting on Zoom. Details on how to login in are in the accompanying email.

Theropod ('wild beast foot') dinosaurs include some of the most iconic and well-known dinosaurs. These include *Allosaurus*, *Velociraptor*, *Deinonychus*, *Coelophysis* (proposed to be the official New York State dinosaur), *Dilophosaurus*, *Spinosaurus*, and *Tyrannosaurus rex*. These two-legged, three-toed, mostly carnivorous dinosaurs have hollow bones and are very similar to birds. In fact, as most of us know, scientists have realized for quite some time that modern birds descended from older theropods and are the only surviving dinosaurs. They have a common ancestor with *T. rex*, which was among the very last of the non-avian dinosaurs.

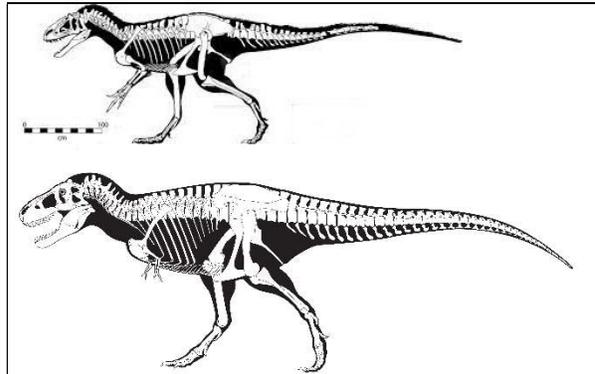


Dr. Sara Burch

Whether they are wings or arms, Dr. Sara Burch is very interested in them. She is a theropod specialist, and we are excited to have her with us as our guest this month. Her talk is titled “Forelimb Function in Predatory Dino-

saurus” and she will share her current research.

Dr. Burch is Associate Professor of Biology at SUNY Geneseo where she instructs in Evolutionary Biology, Ornithology, and Anatomy & Physiology—all closely related to her research interests. She provides us with the following summary and introduction for her talk. “The forelimbs of theropods have become greatly



Top, *Yutyrannus huali*, top, an early tyrannosaur that lived about 125 million years ago (MYA). *Tyrannosaurus rex*. bottom, from approximately 65 MYA. Why are *T. rex*'s arms proportionally so much shorter and were they as useless as often believed?

reduced in several different lineages, each time with vastly different results. Despite growing interest in theropods forelimb use, the function and evolutionary history of reduced forelimbs remains a mystery. Whether the reduced forelimbs of theropods were functional or vestigial is a matter of contention. Both abelisaurids and tyrannosaurids are often considered to exhibit



Dr. Sara Burch posing with one of her favorite modern dinosaurs, a Golden Eagle. This photo was taken in Ulaanbaatar, Mongolia when she was there for a collections visit a while ago. (From Dr. Burch's collection)

transitional morphologies on a trajectory toward degeneration and loss, but these taxa also possess a number of specializations in the forelimb that suggest their evolutionary story is more complex. Using soft tissue reconstruction, geometric morphometrics, and 3D musculo-skeletal modeling, this talk will investigate the question of atrophy in the forelimbs of theropod dinosaurs and discuss the evidence for possible alternative functions for these unusual and intriguing structures.”

### President's Report by Dan Krisher

The Section's February 1st meeting was via ZOOM. The meeting opened with a brief business portion in which the members were updated on the status of outreach events, ideas around field trips and an initial solicitation for Section elections which will be held in a few months. The second portion of the meeting featured a talk by Dr. Christopher Berry, Senior Lecturer in Earth and Environmental Sciences of Cardiff University in Wales. He talked on the diversification, evolution, and impact of large land plants in the Devonian with a particular focus on the Middle and Upper Devonian of New York. We had a total attendance of approximately seventy-four including twenty-six Section members.

### Buffalo Geological Society's 52nd Annual Gem-Mineral-Fossil Show

by Jerry Bastedo, Show Chairman

“Fossils of New York” will be featured at the Buffalo Geological Society's 52nd Annual Gem, Mineral and Fossil Show on March 19-20, 2022, featuring Fossils of New York, at the Erie County Fairgrounds in Hamburg in the Grange, Market and NYS Police Buildings.

This annual show provides an instant museum of Buffalo Geological Society Members' fossils, minerals, and jewelry; demonstrators; the famous Mini-Mine for young collectors; the new mining operation for children and adults; mineral and fossil identification; and a variety of non-profit exhibitors. This highly educational family event affords attendees the opportunity to interact with demonstrators who work with minerals and gems.

Demonstrators include fossil preparation, jewelry designers, and other lapidary artists. In addition, over 30 dealers selling gems, beads, minerals, fossils, and jewelry, selling their items from around the world. A food vendor and hourly door prizes will be available.

**A Reminder For 2022**  
The Buffalo Geological Society, Inc.  
*Presents Our 52nd Annual*  
**GEM MINERAL FOSSIL SHOW**

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**FOSSILS OF NEW YORK**

**Sat., March 19, 2022 · 10am–6pm**  
**Sun., March 20, 2022 · 10am–5pm**

Admission \$6 • 2 Days \$9  
**CHILDREN 12 YRS & UNDER FREE**  
Demonstrations • Jewelry • Mini-Mine for Children  
Exhibits • Dealers with Minerals and Fossils

**FREE PARKING**      **Plus**      **FAMILY FUN**  
**DRAWINGS & REFRESHMENTS**

**A GREAT FIELD TRIP FOR THE FAMILY**  
**& a real learning experience**  
This card is NOT a ticket for admission.

Young scientists can visit the “Mini-Mine” that offers them the chance to search for mineral specimens in a simulated mine setting. The mining operation is for young miners who can search for minerals and fossils in a bag of sand that they wash. All who attend can experience hands-on fun and learn something new about the geological sciences. Professional Geologists will be available to discuss what geologists do and what types of jobs are present in the area for geologists.

This event draws over 4,500 attendees annually. Families come from all over Western and Central New York, Pennsylvania, Ohio, and Canada to take part in this event. This is a perfect family field trip to learn more about the geological sciences. Boy Scouts, Girl Scouts, students, teachers, the public, and rock hounds are welcome. Adults are \$6 each, scouts in uniform and children under 12 are FREE. A 2-day admission for \$9 each is also available. Door prizes are drawn hourly. FREE parking. Wheel chair and stroller

accessible. For any additional information or questions, please contact Jerry Bastedo, Show Chairman, at [jcbastedo@gmail.com](mailto:jcbastedo@gmail.com).

## Spring 2022 Central NY Earth Science Student Symposium

We are thrilled to hear now that the Central New York Earth Science Student Symposium is not another victim of the pandemic but WILL be held. We have our invitation from the Syracuse University Department of Earth Sciences to join them for on **Saturday April 9th, 2022** at Heroy Geology Laboratory.



We will organize a car pool from Rochester. There is a \$5.00/person registration fee and this gets you a complimentary breakfast and lunch!

The keynote speaker this year is Katherine H. Freeman, the Evan Pugh University Professor of Geosciences at Pennsylvania State University and a co-editor of the peer-reviewed scientific journal, *Annual Review of Earth and Planetary Sciences*. Her research interests are organic geochemistry, isotopic biogeochemistry, paleoclimate, and astrobiology. Her talk will be at 3PM and her title is, "Put a Ring on it: Aromatic Signatures of Fire and Life," on how environmental processes recorded in molecules are used to reconstruct ancient environments.

The event will also feature presentations by students in Upstate and Central NY colleges and universities, a lava pour demonstration, and tours of the Department of Earth and Environmental Sciences.

### Schedule

9:30-10:00 AM: Registration (coffee and light breakfast)  
10:00 - 11:00 AM: Poster Session 1  
11:00 - Noon: Student Talks Session 1  
Noon - 1 PM: Lunch

1:00 - 2:00 PM: Student Talks Session 2  
2:00 - 3:00 PM: Poster Session 2  
3:00 - 4:15 PM: Keynote Presentation  
5:00 - 5:30 PM: Lava Pour (Comstock Art Building)  
5:30 - 8:30 PM: Reception

## 2022 International Trilobites Conference

The 7th International Conference on Trilobites & Their Relatives will be held at Cincinnati Museum Center in Cincinnati, Ohio, U.S.A, July 14 to 18, 2022. Registration and abstract submission are now open with a deadline of March 15, 2022 for both, at <https://www.cincymuseum.org/7th-international-conference-on-trilobites-and-their-relatives/>,

Participants from all corners of the globe will meet in Cincinnati's iconic 1933 Art Deco Train Station, Union Terminal. (Learn more about the history and architecture of this national historic landmark <https://www.cincymuseum.org/union-terminal/>)

This international conference occurs every 4 years and attracts professional scientists, graduate and undergraduate students, serious amateur paleontologists, and interested members of the public. The goals of the conference are to present and discuss recent progress in studies on all aspects of trilobites and their relatives (e.g., morphology, evolution, phylogeny, ecology, development, and geography).

### Schedule:

*Sunday, July 10 to Thursday, July 14* - Pre-Conference Field Trip. Trilobite paleobiology in its stratigraphic context: the upper Cambrian Croixan succession of the northern Mississippi Valley. The trip will assemble in Madison, Wisconsin on the afternoon of Sunday, July 10 and will end in Madison on the morning of Thursday, July 14.

*Thursday, July 14, 5 to 10 p.m.* - Registration and ice breaker event at Rhinegeist Brewery

*Friday, July 15* - Sessions at Cincinnati Museum Center at Union Terminal

8:30 to 9 a.m. Welcome Address  
9 to 10:15 a.m. Morning Session I  
10:45 to 11:30 a.m. - Morning Session II  
1 to 2:15 p.m. - Afternoon Session I  
2:45 to 4:30 p.m. - Afternoon Session II

Saturday, July 16

- 9 to 10:15 a.m. - Morning Session I
- 10:45 to 11:30 a.m. - Morning Session II
- 1 to 2:15 p.m. - Afternoon Session I
- 2:45 to 4:30 p.m. - Afternoon Session II

Sunday, July 17 Intra-Conference Field Trip to the Type-Cincinnatian Series Trilobite beds (Upper Ordovician; Katian) in the Cincinnati area. This one-day, mid-meeting trip will provide participants with an overview of a few of the classic Cincinnati trilobite beds including offshore faunas with *Triarthrus* and *Cryptolithus* found in dark shales and shallower mudrock facies dominated by *Flexicalymene*, often enrolled, and *Isotelus*.

Monday, July 18

- 9 to 10:15 a.m. - Morning Session I
- 10:45 to 11:30 a.m. - Morning Session II
- 1 to 2:15 p.m. - Afternoon Session I
- 2:45 to 4:00 p.m. - Afternoon Session II
- Evening - banquet

Tuesday, July 19 to Saturday, July 23 - Post-Conference Field Trip. Ordovician-Devonian trilobites of the Niagara region. This four-day post-meeting trip will feature trilobite localities in the classic Ordovician-Devonian of the Mohawk and Niagara-Lake Erie regions of western New York State.

### Trilobite Belt Buckle by Michael Grenier

Speaking of trilobites, here I run free advertising for a vendor selling *Eldredgeops rana* buckles (identified as *Phacops rana*, of course).



You can get this handsome item from <https://www.etsy.com/>, search for "trilobite belt buckle" and you'll find [tcustom](#) with a top 5-star rating from 4,152 reviews. They also have trilobites earrings and other items. I already have

mine as a gift this past Christmas and I love it (★★★★★).

### Fossil News

## Largest flying dinosaur found in Scotland

Asha C. Gilbert  
USA TODAY

Scientists say they have discovered the largest Jurassic pterosaur in history, with a wingspan of more than 8 feet and a mouth full of sharp teeth.

According to a peer-reviewed journal published in Cell, the dinosaur, *Dearc sgiathanach*, was found in Isle of Skye, Scotland, in 2017. Its skeleton was embedded in limestone.

Pterosaurs were the earliest known animals to evolve for flight.

"While some of the last-surviving species were the size of airplanes, pterosaurs were long thought to be restricted to small body sizes from their Triassic origins through the Jurassic," the journal said.

The bones showed this reptile was young and still growing when it died.

"When this thing was living about 170 million years ago, it was the largest animal that had ever flown, at least that we know of," Steve Brusatte, co-author of the research from the University of Edinburgh, said.

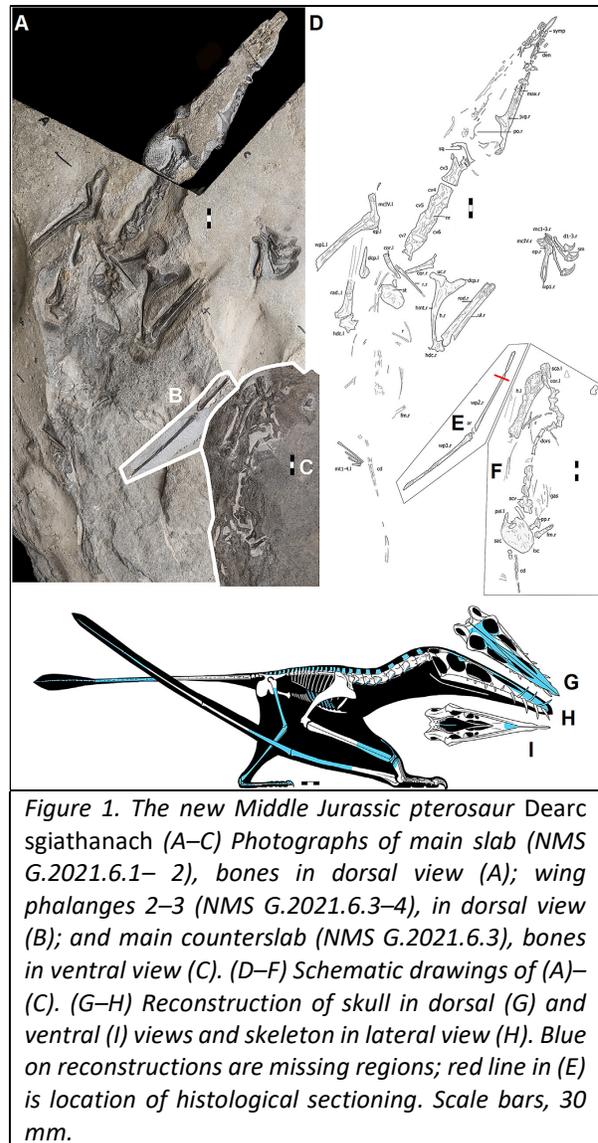
Brusatte said that birds evolved from dinosaurs during the time this pterosaur was living, and the new discovery challenges the understanding of pterosaurs' history.

You would be forgiven for thinking after reading this article (Rochester Democrat and Chronicle, February 22, 2022) that the "largest flying dinosaur" had just been found in Scotland. A flying dinosaur is, of course, a bird, and this is nothing of the sort—it is a pterosaur. Dinosaurs and pterosaurs did have a common ancestor

about 237 million years ago in the Carnian epoch of the late Triassic, but it was neither. Pterosaurs are not dinosaurs and dinosaurs are not pterosaurs. The author clearly does not understand the difference, and does drag birds into it in the last paragraph as though all things that fly must be the same. I can only imagine that as a child, Asha was given a bag of dinosaur toys and it included a pterosaur and probably a mammal-like sail-backed reptile *Dimetrodon* and concluded that both of those were dinosaurs. I also forgive her for ignoring insects as animals, including those from the Carboniferous such as *Meganeura monyi* with a wingspan ranging up to to over 70 cm (28 in) and which clearly flew 130 million years early than the newly discovered *Dearc sgiathanach*. I also forgive the typesetter who failed to italicize the name.

But forgive my rant against easy-to-correct paleontology errors being presented wrong yet again in the popular press and let's move on.

Jagielska et al. report a fossil pterosaur skeleton from the Middle Jurassic (ca. 167 million years ago) of Scotland, belonging to a new genus and species, *Dearc sgiathanach*. With a wingspan of over 2.5 m, it was the size of the largest modern-day flying birds and shows that pterosaurs developed to a large size earlier than previously thought. The following is the abstract/summary published with the paper released Feb. 22 describing a new pterosaur genus and species from the Middle Jurassic of Scotland. "Pterosaurs were the first vertebrates to evolve flight and include the largest flying animals in Earth history. While some of the last-surviving species were the size of airplanes, pterosaurs were long thought to be restricted to small body sizes (wingspans ca. <1.8–1.6 m) from their Triassic origins through the Jurassic, before increasing in size when derived long-skulled and short-tailed pterodactyloids lived alongside a diversity of birds in the Cretaceous. We report a new spectacularly preserved three-dimensional skeleton from the Middle Jurassic of Scotland, which we assign to a new genus and species: *Dearc sgiathanach* gen. et sp. nov. Its wingspan is estimated at >2.5 m, and bone histology shows it was a juvenile-subadult still actively growing when it died, making it the



largest known Jurassic pterosaur represented by a well-preserved skeleton. A review of fragmentary specimens from the Middle Jurassic of England demonstrates that a diversity of pterosaurs was capable of reaching larger sizes at this time but have hitherto been concealed by a poor fossil record. Phylogenetic analysis puts *D. sgiathanach* in a clade of basal long-tailed non-monofenestratan pterosaurs, in a subclade of larger-bodied species (*Angustinaripterini*) with elongate skulls convergent in some aspects with pterodactyloids. Far from a static prologue to the Cretaceous, the Middle Jurassic was a key interval in pterosaur evolution, in which some non-pterodactyloids diversified and experimented with

larger sizes, concurrent with or perhaps earlier than the origin of birds.”

The specimen is represented by a well-preserved fossil skeleton, including the brain endocast. It was not fully grown when it died and would have had a wingspan of >2.5 m. Pterosaurs evolved to a considerably larger size earlier than previously recognized.



Life reconstruction illustration provided with the paper



The excavated fossil being moved from the site. (JRT Post)

A good popular article is at <http://www.sci-news.com/paleontology/dearc-sgiathanach-10580.html>. This paper is open access at: [https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00135-X](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00135-X) (Jagielska, N., O’Sullivan, M., Funston, G.F., Butler, I.B., Challands, T.J., Clark, N.D., Fraser, N.C., Penny, A., Ross, D.A., Wilkinson, M. and Brusatte, S.L., 2022. A skeleton from the Middle Jurassic of Scotland illuminates an earlier origin of large pterosaurs. *Current Biology*.)

### New opabiniid diversifies the weirdest wonders of the euarthropod stem group

Some materials provided by Harvard University.

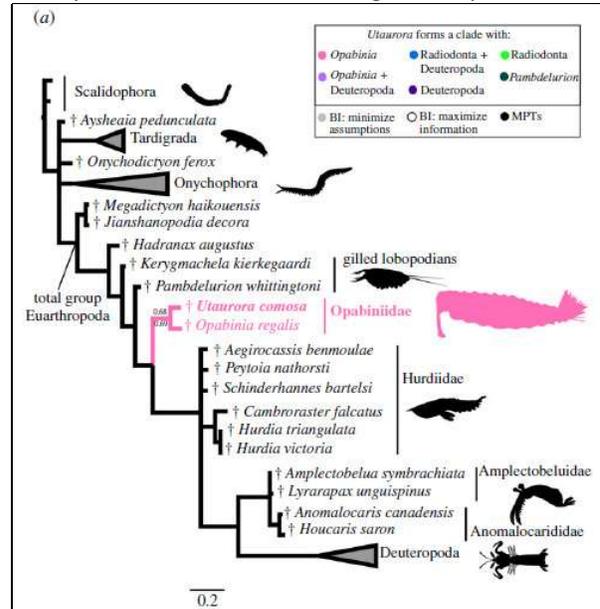
The Middle Cambrian Burgess Shale Lagerstätte from about 505 million years ago of British Columbia has yielded about 60,000 fossils and about 150 described species. One of the most

famous for its oddities is *Opabinia regalis*, featured in Stephen Jay Gould's book *Wonderful Life*, published in 1989. *Opabinia*, large for a Burgess Shale fossil at up to 7 cm in body length, probably lived on the seafloor, using the proboscis to seek out small, soft food. At first thought to be unrelated to any known phylum (a ‘weird wonder’) or perhaps a relative of arthropod and annelid ancestors, it is now, like *Anomalocaris*, known to be a lower stemgroup arthropod. But it is rare—fewer than twenty good specimens have been described, and it has had no known close relatives, until now.



Opabinia with its five eyes, a mouth under the head and facing backwards, and a clawed proboscis that likely passed food to the mouth. (Prehistoric Life Wiki)

In this new paper, the authors reinterpret a fossil from the Wheeler Formation of Utah as only the second known member of the opabiniid family, *Utaurora comosa* nov. gen. et sp.



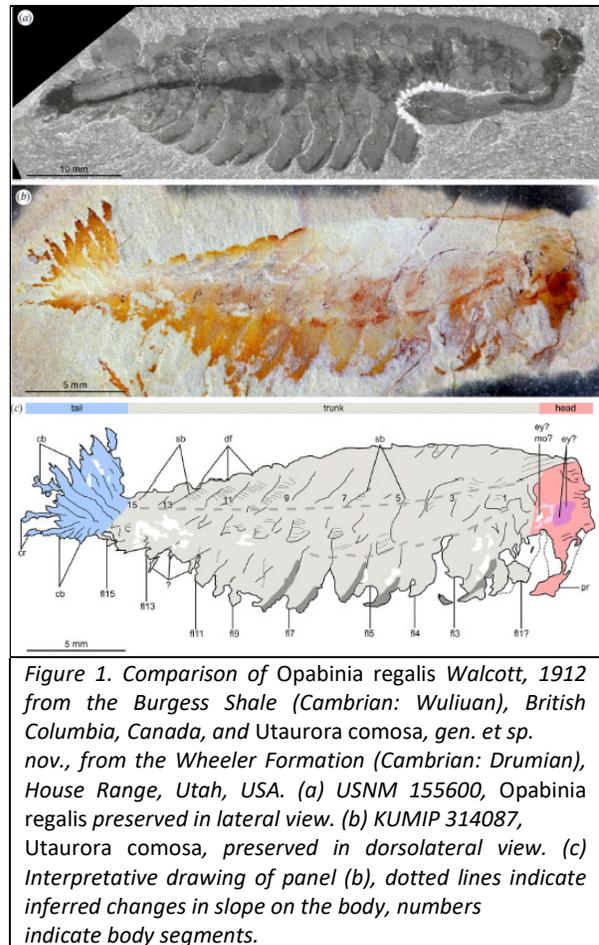
Computerized phylogenetic analyses were conducted using MRBAYES v.3.2.7 and TNT v.1.5

software and nested the two opabiniids together and clarified the relationships to other arthropods.

This paper is open access at:

<https://royalsocietypublishing.org/action/doSearch?AllField=New+opabiniid>

(Pates, S., Wolfe, J.M., Lerosey-Aubril, R., Daley, A.C. and Ortega-Hernández, J., 2022. New opabiniid diversifies the weirdest wonders of the euarthropod stem group. *Proceedings of the Royal Society B*, 289(1968), p.20212093.)



## CALENDAR OF EVENTS

### March

**Tuesday March 1, FOSSIL MEETING 7:30 PM. LOCATION: On Zoom.** Speaker Dr. Sara H. Burch, Associate Professor, SUNY Geneseo speaking on the biomechanics of the *T. rex* forelimb. Visitors welcome.

### April

**Tuesday April 5, FOSSIL MEETING 7:30 PM. LOCATION: To Be Determined.** Speaker to be determined. Visitors welcome.

Visitors are welcome to all Fossil Section meetings! For more information and the latest updates check the RAS Website ([www.RASNY.org](http://www.RASNY.org)). You can also contact Dan Krisher at [DLKFossil@gmail.com](mailto:DLKFossil@gmail.com) or John Handley at [jhandley@rochester.rr.com](mailto:jhandley@rochester.rr.com) for further information.

### ROCHESTER ACADEMY OF SCIENCE FOSSIL SECTION

Monthly meetings will be held on Zoom until at least February 2021. Meetings are held the first Tuesday of each month from October to December and from March to May at 7:30 pm. In person meetings, when they can be held again, are at the Brighton Town Hall, Community Meeting Room, 2300 Elmwood Avenue, Rochester, NY unless otherwise listed.

#### OFFICERS

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#### APPOINTED POSITIONS

Field Trip Coordinator: Dan Krisher	585-293-9033	DLKFossil@gmail.com
FossilLetter Editor: Michael Grenier	585-671-8738	mgrenier@paleo.com

The FossilLetter is published before each meeting month of the year. Please send submissions to [mgrenier@frontiernet.net](mailto:mgrenier@frontiernet.net) or by U.S. Postal Service mail to 692 Maple Drive, Webster, NY 14580. Deadline for submissions to the FossilLetter is the 15<sup>th</sup> of the month.

For scheduling changes and the latest updates please check the RAS Website ([www.rasny.org](http://www.rasny.org)) and click on the Fossil Section link. Last minute updates can also be found on the *General Announcements* page of the Academy Website.

