

# BULLETIN

"An organization of people interested in the Natural Sciences"



October 2024; Vol. 78, #8

## President's Message

### Fall Paper Session

This Fall, on Saturday, November 16th, we will host the **50th Annual RAS Fall Scientific Paper Session**. The paper session will be held at *SUNY Brockport*.

This event provides an opportunity for local college and university science students and faculty to gather and share their research interests and results. For more information and to register go to [rasny.org/paper-session](https://rasny.org/paper-session). We do need members as volunteers to help organize the Paper Session and to help run it on the day. We are pleased that Dr. John A. Tarduno has accepted our invitation to deliver the keynote address as our 2024 Larry King Memorial Lecturer.



Dr. John A. Tarduno in the Sahara Desert.  
Courtesy University of Rochester

If you look for science articles in your daily news, you may have seen one in early May covered widely in the popular press about the origin of multicellular life as we know it. Typical headlines included "Earth's Magnetic Field 'Near-Collapse' Boosted Evolution" (Newsweek) and "Life boomed on Earth half a billion

years ago." (Washington Post). These were from a University of Rochester press release announcing the publication in *Nature* of a study from their Paleomagnetic Research Group, headed by Dr. Tarduno.

**Save the Date!**  
**Saturday, November 16th, 2024**  
**RAS Scientific Paper Session**  
**SUNY Brockport**

This team specializes in analyzing crystals from ancient igneous rock. When the crystals form in cooling magma, they capture information in inclusions on the strength and polarity of the earth's magnetic field at that time. Previous studies by this group using zircon crystals have pushed back the known geomagnetic field age from 3.45 billion years ago to 4.2 bya (2015) and found that the field was strong even then (2020).

In the May 2024 published study of feldspar and pyroxene crystals from Ediacaran Era rock, the team found that Earth's magnetic field strength reached the weakest known to date—up to 30 times weaker than today—and lasted at least 26 million years. This enabled hydrogen to escape into space leaving more free oxygen in the atmosphere instead of water vapor. Solar radiation reaching the surface also would cause more biologic mutation driving evolution.

The Ediacaran Era was the 96 million years—635 to 539 mya—preceding the Cambrian Period. The Ediacaran had a multicellular fauna apparently unrelated to modern forms. However, modern bilaterally-symmetric mobile animals arose in the Ediacaran and now dominate animal life on Earth.

Dr. Tarduno is Dean of Research, Arts, Sciences & Engineering, the William R. Kenan, Jr. Professor of Earth and Environmental Sciences, and Professor of Physics and Astronomy at the University of Rochester.

This paper is available at <https://www.nature.com/articles/s43247-024-01360-4>

\* \* \*

### Volunteer Needed

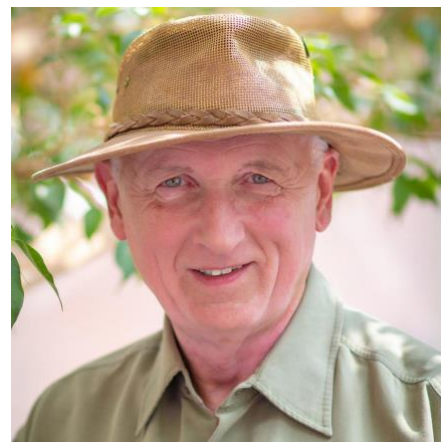
Help is needed in preparation for our annual Scientific Papers Session.

**Classified Advertisement**  
**↓ Volunteer Opportunity ↓**

**RAS Scientific Paper Session**  
**Registrars**

Rochester Academy of Science,  
Rochester, NY.

Part-time **Volunteer Registrar** to receive registration emails from attendees from mid-September through mid-November and transfer data to registration spreadsheet. Expected number of registrants is 300. Registrar sends spreadsheet to committee weekly. This job can be shared. Send note of interest - [mgrenier@frontiernet.net](mailto:mgrenier@frontiernet.net).



**Michael Grenier, RAS President**

# Events for October, 2024

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## **Oct 1 Tues: Fossil Meeting**

7:30 p.m. Meeting will be held in a new location, the Pittsford Community Center, room 019, 35 Lincoln Avenue Pittsford, NY 14534. It will also be broadcast on Zoom and is open to all RAS members and guests. Our guest speaker is Dr. William Korth, Professor of Geology, Nazareth University (retired); Research Associate, Rochester Museum and Science Center; and editor, Rochester Institute of Vertebrate Paleontology. He will speak on "Taphonomy of Miocene Fossil Sites in Kansas or How Did Those Fossils Get There?" Bill is a researcher on the evolution of small mammals such as primates and rodents early in the Cenozoic, the "Age of Mammals." He'll describe what he has learned about how the fossil animals he has collected and studied died and why they were accumulated and preserved the way they were. For meeting details and Zoom login info, see the RAS October *FossilLetter* or contact Michael Grenier at [paleo@frontier.com](mailto:paleo@frontier.com).

## **Oct 2 Wed: Astronomy Board Meeting**

7:00 p.m. – 9:00 p.m. Farash Center. ASRAS Members are welcome to attend. Contact: Anthony Golumbeck at [semp@use.startmail.com](mailto:semp@use.startmail.com).

## **Oct 4 Fri: Astronomy Members Meeting**

7:30 p.m. – 9:30 p.m. RIT Image Science Building. Dominique Segura-Cox from the University of Rochester will speak about ProtoStars. Contact: Anthony Golumbeck at [semp@use.startmail.com](mailto:semp@use.startmail.com).

## **Oct. 9 Wed: Herbarium**

12:00 p.m. - 3:00 p.m. The Life Sciences section will hold a workshop at the RAS Herbarium, located in the basement of the Rochester Museum and Science Center (RMSC). We will be continuing to organize plant specimens in preparation for digitizing the collection. If you plan to attend, please send an RSVP to [rasherbarium@gmail.com](mailto:rasherbarium@gmail.com). At RMSC go to the front desk to meet other participants. For more information, contact herbarium curators, Tim Tatakis and Steven Daniel, by emailing [rasherbarium@gmail.com](mailto:rasherbarium@gmail.com).

## **Oct. 10 Thurs: Life Sciences Lecture**

7:00 p.m. The meeting will be held remotely via ZOOM and is open to all RAS Members and guests. Our guest speaker is Dr. Heather Coleman, Associate Professor, Syracuse University. She will speak on "What makes a tree a tree: wood formation in poplar." She'll discuss the latest studies in the genetics of wood formation, the Syracuse University Life Sciences Greenhouse where her team does their research, and the potential for poplar to be a major renewable biofuels source to reduce dependence on fossil fuels. For meeting details and Zoom login info, see the **Life Sciences News** inside this issue of RAS Bulletin. Contact Michael Grenier at [mgrenier@frontiernet.net](mailto:mgrenier@frontiernet.net) for more information.

## **Oct 13 Sun: Astronomy Open House**

12:00 p.m. – 3:00 p.m. Farash Center, 8355 County Road 14, Ionia. Contact: Anthony Golumbeck at [semp@use.startmail.com](mailto:semp@use.startmail.com).

## **Oct 16 Wed: RAS Board Meeting**

7:00 p.m. - 9 p.m. Pittsford Community Center, room 206, 35 Lincoln Ave, Pittsford. Zoom option available. For details, contact Michael Grenier at [mgrenier@frontiernet.net](mailto:mgrenier@frontiernet.net).

## **Oct 22 Tues: Mineral Members Meeting**

7:00 p.m. Meeting information TBA. Meet in the Pittsford Community Center, 35 Lincoln Ave, Pittsford, Room 19. Come in person to socialize and see our new venue! Zoom optional. Contact: Jutta Dudley at [juttasd@aol.com](mailto:juttasd@aol.com).

## **Oct 23 Wed: Astronomy Members Forum**

7:30 p.m. Farash Center and Zoom. Retired Planetarium Director Steve Fentress will speak on the topic "Constellations for Beginners." Contact: Anthony Golumbeck at [semp@use.startmail.com](mailto:semp@use.startmail.com).

## **Oct 25 Fri: Astronomy Public Observing**

7:30 p.m. – 11:00 p.m. Farash Center, public welcome. Contact: Anthony Golumbeck at [semp@use.startmail.com](mailto:semp@use.startmail.com).

## **STRASENBURGH OBSERVATORY:**

ASRAS will operate the telescope at the Strassenburgh Planetarium on mostly clear Saturday nights, dusk until 10:30. For more information, contact: Jim Seidewand at (585) 703-9876.

## Life Sciences News

### October Life Sciences lecture

As noted in the Calendar, the Life Sciences Section has a lecture meeting on Thursday, October 10, at 7:00PM with speaker Dr. Heather Coleman, Syracuse University Biology Associate Professor. The meeting will be held remotely via ZOOM and is open to all RAS Members and guests. She will speak on "What makes a tree a tree: wood formation in poplar." She'll discuss the Syracuse University Life Sciences Greenhouse where her team does their research, the latest studies in the genetics of wood formation, and the potential for poplar to be a major renewable biofuels source to reduce dependence on fossil fuels.



*Dr. Coleman, Syracuse University*



*Most of the west wing fifth floor of the Syracuse University Life Sciences complex is covered by a research greenhouse. This facility is used by many of the biology labs, including Dr. Coleman's.*

Dr. Coleman sends the following notes: "The plant cell wall fulfills important roles, ranging from structural functions in elevation of leaves, stem strength and the transport of water and nutrients, to functions in cell signaling and activation of plant defense responses. In addition to these

essential roles, the secondary cell wall (SCW), comprised primarily of cellulose, hemicellulose, and lignin, is a potential source of renewable energy that can be harnessed and used to support the transition to carbon-free energy in industrial applications such as air transport, and to support important climate initiatives such as the increased sequestration of carbon. Research in the Coleman Lab at Syracuse University focuses on understanding SCW formation, the environmental and genetic controls thereof, and the resultant effects on plant growth and development."



*Poplar Trees in Syracuse University Greenhouse Coleman Lab.*

Contact [mgrenier@frontiernet.net](mailto:mgrenier@frontiernet.net) for more information.

Here's the Zoom Meeting link:

<https://us02web.zoom.us/j/84077589472?pwd=S1l5ZkZ4ZDFULzgzczNaVUFjRjBIUT09>

**Meeting ID:** 840 7758 9472

**Passcode:** 413593

Call (585) 764-8635 if unable to get in.

One tap mobile

+19292056099,,84077589472#,,,,\*413593# US (New York)

(If difficulty, try

+13017158592,,84077589472#,,,,\*413593# US (Washington DC)

**Dial-up if you are on telephone only,** or if you want to use your phone for the audio.

+1 929 205 6099 (New York) (If difficulty, try +1 312 626 6799 (Chicago) or +1 301 715 8592 (Germantown)

\* \* \*

## Washington Grove Guided Tour

Seven members visited Washington Grove on August 29. This is an undeveloped 26-acre old-growth oak-hickory forest surviving in Rochester's Cobb's Hill Park. The Friends of Washington Grove give only two guided tours each year, but the grove is open for self-guided tours anytime. The trees are not cored just to determine their age, as that can introduce insects and infections. However, it is known from dead trees that the oldest are aged at over 250 years. Dead trees are allowed to stand until they fall.



*It took four of us holding hands to encircle this old red oak.*

Bird watchers should note that 142 species of birds have been recorded here. Pileated Woodpeckers are often seen.



*One of the two glacial kettles there. Privately purchased and donated to the city in 1912, the grove was dedicated to George Washington in 1932 on the bicentennial of his birth.*





Rochester Academy of Science  
Larry King Memorial Lecture

**Dr. John Tarduno**

William Kenan, Jr. Professor  
Earth and Environmental Sciences  
University of Rochester  
Paleomagnetic Research Group

***Did a magnetic field  
collapse trigger the  
emergence of animals??***



Scan for more  
information

(University of Rochester illustration / Michael Osadciw)



**Public Lecture**

▣ Saturday, November 16, 2024 ▣

**SUNY BROCKPORT**

Edwards Hall, 191 Holley Street

Brockport, NY 14420

**1:00 p.m. ▣ Free**

## Space Watch by Michael Grenier

The News media have extensively reported that the earth will have TWO MOONS for the next month.

USA TODAY (Sept. 19) reported that, "The Earth will soon have a second mini-moon, although it will be a brief visit. . . . It will be captured in Earth's gravitational pull between Sept. 29 and Nov. 25. After that, it will escape Earth's orbit and be pulled toward the sun before continuing its travels around our solar system. . . . During its 56-day orbit, Asteroid 2024 PT<sub>5</sub> will travel in a horseshoe-shaped trajectory before leaving Earth's gravity."

The paper by Carlos de la Fuente Marcos and Raúl de la Fuente Marcos announced the discovery of Asteroid 2024 PT<sub>5</sub> on August 7 by the Asteroid Terrestrial-impact Last Alert System (ATLAS). It was published in the September 2024 issue of the *Research Notes of the American Astronomical Society*. This asteroid is approximately 10 meters in size and is likely to be one

of the Arjuna asteroids, a group of Near Earth Objects (NEOs) that share earth's orbit. Marcos & Marcos note that "Earth can regularly capture asteroids from the Near-Earth object (NEO) population and pull them into orbit, making them mini-moons."

There are two types of mini-moons. First, "flybys never complete one revolution around Earth . . ." The two known examples are asteroids 1991 VG (briefly captured in February 1992) and 2022 NX<sub>1</sub> (in 1981, in 2022, and returning in 2051). 2024 PT<sub>5</sub> follows a path that resembles that of 2022 NX<sub>1</sub>, a flyby. So, only a fraction of an orbit.

Second, "temporarily captured orbiters complete one or more [orbits]." The known examples are 2006 RH<sub>120</sub> (bound to Earth from July 2006 to July 2007) and 2020 CD<sub>3</sub> (escaped early in May 2020 after being bound to Earth for several years). Since the first case of a mini-moon was identified 32 years ago, there have been six known cases (1981, 1992, 2006, 2020, 2022, and now)

involving five asteroids. There have likely been some others not identified. Not a rare occurrence.



*Any pictures you see like this are made up, "for illustrative purposes only." 2024 PT<sub>5</sub> has not been photographed or even seen yet. (from aurora-israel.co.il)*

The closest 2024 PT<sub>5</sub> will get to earth is .012 au, about 1.115 million miles, about 4.66 times further than the Moon. It will be a magnitude 22 speck about 30 or so feet across. Don't look too hard for it.

The Marcos & Marcos paper is open access at

<https://iopscience.iop.org/article/10.3847/2515-5172/ad781f>.

## Volunteer Needed

Help is needed on our Governance Committee to make our By Laws compliant with State law.

*Classified Advertisement*

↓ **Volunteer Opportunity** ↓

**RAS By Laws Revision Committee  
Chair**

Rochester Academy of Science,  
Rochester, NY.

Part-time **Volunteer Team Leader** to assess our By Laws against NYS requirements and recommend appropriate changes to the Board of Directors. New York State has revised their Consolidated Laws of New York for Not-for-Profit Corporations. Sense of detail needed. Send note of interest - [mgrenier@frontiernet.net](mailto:mgrenier@frontiernet.net).



Naven Photography

*Milky Way with Meteor, Michael Naven,  
September 10, 2024.*

## Volunteer Needed

We have an opening on our Student Grants Committee. This is one of our important annual programs.

*Classified Advertisement*

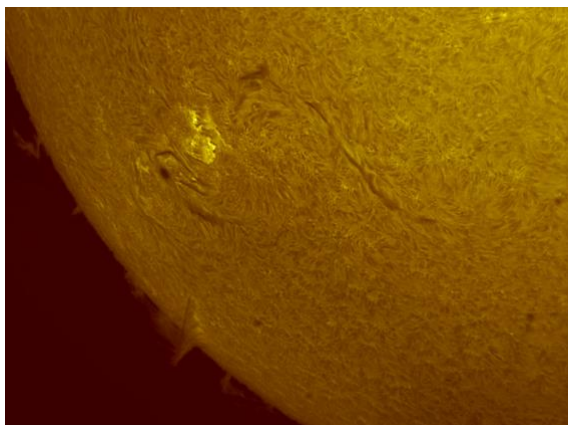
↓ **Volunteer Opportunity** ↓

**Grant Application Assessor**

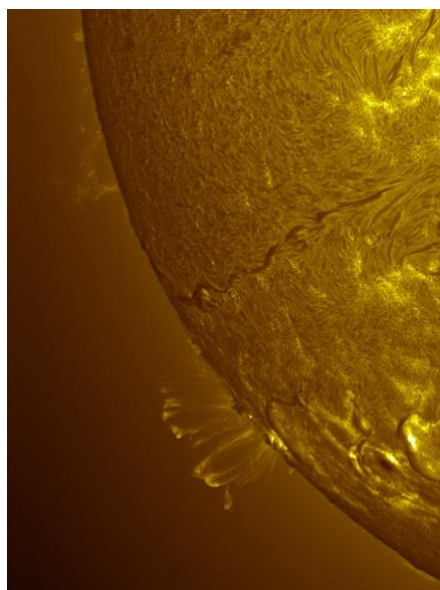
Rochester Academy of Science,  
Rochester, NY.

Part-time **Volunteer** to review & grade grant proposals from undergrad science students. Requires multi-disciplinary science background, critical eye, ability to apply standard criteria in scoring, & teamwork to achieve consensus in awarding cash grants. Must enjoy giving away other people's money. Send note of interest - [mgrenier@frontiernet.net](mailto:mgrenier@frontiernet.net).





*Sun in H Alpha, Doug Kostyk, September 15, 2024.*



*Solar Prominence, Doug Kostyk, September 1, 2024.*



*Lunar Eclipse, Joe Altieri, September 17, 2024.*



*Aurora at Webster Park, Nick Paratore, September 17, 2024*



*M101, Burney Baron, September 17, 2024.*

## Rochester Research in Review.

(These are Hot Links which when clicked lead to the press release on the Science Daily website.)

[How the immune system fails as cancer arises.](#) University of Rochester, Sept 12, 2024.

[New cancer cachexia treatment boosts weight gain and patient activity.](#) University of Rochester, Sept 19, 2024.

[State-by-state data boosts bird conservation planning.](#) Cornell University, Sept 1, 2024.

[AI can slash indoor farming energy use.](#) Cornell University, Sept. 9, 2024.

[Genomics reveals sled dogs' Siberian lineage.](#) Cornell University, Sept. 16, 2024.

[Antiviral-resistant variants of SARS-CoV-2 can emerge in immunocompromised people.](#) Cornell University, Sept. 18, 2024.

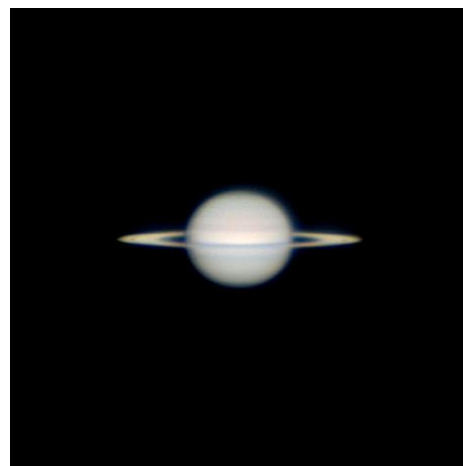
[Volcanoes may help reveal interior heat on Jupiter moon.](#) Cornell University, Sept. 19, 2024.

[Psychedelics excite cells in hippocampus to reduce anxiety.](#) Cornell University, Sept. 24, 2024.

[Air pollution harms mental health worse in New York's historically redlined neighborhoods.](#) University at Buffalo, August 22, 2024.

[World's highest-performance superconducting wire segment.](#) University at Buffalo, August 7, 2024.

[Early galaxies were not too big for their britches after all.](#) University of Texas at Austin, August 26, 2024.



*Saturn, Kevin Lyons, September 13, 2024.*

### ABOUT THE ACADEMY

The Rochester Academy of Science™, Inc. is an organization that has been promoting interest in the natural sciences since 1881, with special focus on the western New York state region. Membership is open to anyone with an interest in science. Dues are minimal for the Academy and are listed in the [membership application online](#). Each Section also sets dues to cover Section-related publications and mailings. We are recognized as a 501(c)3 organization.

For information, contact President Michael Grenier at (585) 671-8738 or by email [paleo@frontier.com](mailto:paleo@frontier.com).

The Academy Internet website is <http://www.rasny.org> or see us on Facebook at <https://www.facebook.com/Rochester-Academy-of-Science-792700687474549>.

This "BULLETIN" is produced monthly, except January, by the Rochester Academy of Science™. Submissions are due by the 10th of the month and may be emailed to the Bulletin Editor Robert Crumrine at [bob.crumrine@gmail.com](mailto:bob.crumrine@gmail.com).

**The Academy postal address is P.O. Box 92642, Rochester NY 14692-0642.**

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