

BULLETIN

"An organization of people interested in the Natural Sciences"



March 2024; Vol. 78, #2

President's Message

Free Eclipse Glasses

As a special membership reward, the Academy will provide FREE Eclipse glasses for you and your family. Individual members are entitled to six free pairs, Family memberships will get twelve free pairs.

If you haven't yet joined the RAS or renewed your membership, now is the time! New memberships are welcome!

To get yours, you may pick them up or order by mail. To order, send two First Class stamps for each six pair of glasses with your address to Michael Grenier, Rochester Academy of Science, 692 Maple Drive, Webster, NY 14580.

Write "Glasses" in the envelope lower left-hand corner. Feel free to include your ballot. These free glasses are a benefit of membership.

Please take the full allotment. If more than you need yourself, use the rest as outreach, giving them to friends and family that can use them. If you want to be an outreach hero, buy more.



It may be more convenient for you to pick up your glasses. Places and times are **WEBSTER, NY** 692 Maple Drive 14580, March 12, 13, & 15 noon to 8PM or by appointment, call 585-671-8738; **PITTSFORD, NY** 140 Railroad Mills Rd 14534, March 17, 18, 19 between 1 pm and 8 pm, call 585-385-2368; **HILTON, NY** 100 Hogan Point Road 14468, by appointment, call 585-392-8299; **CHURCHVILLE, NY** 416 Bromley Road 14428, by appointment, call 585-698-3147.

IF YOU NEED MORE, you can get as many as you want. Let us know how many you need. Please include a donation of \$2 for each additional one for the next six (unless you have already bought some from ASRAS), \$1.50 for each additional one for six after that, and \$1 each thereafter. (You may make payment by PayPal, credit card, or debit card at our RAS website or include with your order.)

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I thank the Life Sciences Section for their \$300 donation to help with three awards and also the anonymous members who donated to this fund. You enabled us to make one more award than we otherwise could have.

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The Rochester Academy of Science Annual Meeting & Spring Lecture is Thursday, April 25, 7:00 p.m.

This live meeting (with Zoom broadcast) will be at the Rochester Institute of Technology Chester F. Carlson Center for Imaging Science Room 1125 Auditorium, 54 Lomb Memorial Dr, Rochester, NY 14623 with directions in the April *Bulletin*. After a short introduction and a major award, the Board of Directors election will conclude the business meeting. A ballot is included on this page and as a PDF on the RAS website. Please show us your support by printing and mailing your completed ballot to RAS, P.O. Box 92642, Rochester NY 14692-0642. You will also be able to vote at the meeting through the Zoom Chat function. **Note that you must have renewed your membership by March 31st.** We cannot take email ballots, but we will send proxy directions next month.

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ROCHESTER ACADEMY OF SCIENCE
BALLOT FOR JUNE 2024 – MAY 2025 OFFICERS

OFFICE	NAME	✓	WRITE-IN CANDIDATE
President:	Michael Grenier	<input type="checkbox"/>	
Vice President:	Jeff Gutterman, P.E.	<input type="checkbox"/>	
Treasurer:	Tim Tatakis, Ph.D.	<input type="checkbox"/>	
Secretary:	Helen Downs Haller, Ph.D.	<input type="checkbox"/>	
Member, Board of Directors (2024-2027)	Michael Richmond, Ph.D.	<input type="checkbox"/>	
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Eclipse Watch by Michael Grenier

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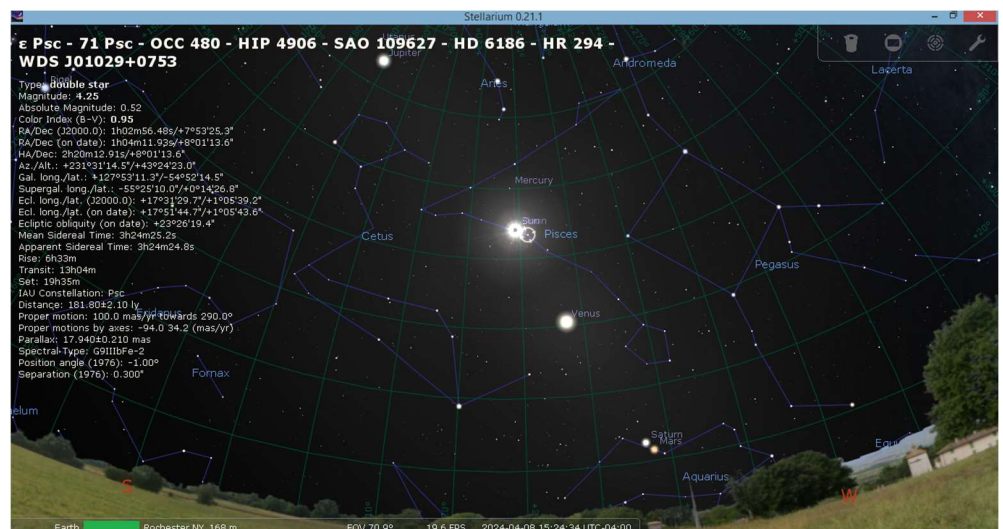
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Comet 12P Pons-Brooks: In the blackness of the night around the eclipse, you should be able to see Jupiter to the upper-left of the eclipsing moon and Sun and bright Venus to bottom-right. You may see Mercury just above the Sun if not washed out in the coronal glow. The Sun will be in Pisces but that constellation's stars are dim (the brightest—Alrescha and Fumalsamakah—are 4th magnitude), so look for the familiar and easy-to-find Orion constellation. Maybe, just maybe, if it has an outburst, you might be able to see the faint Comet

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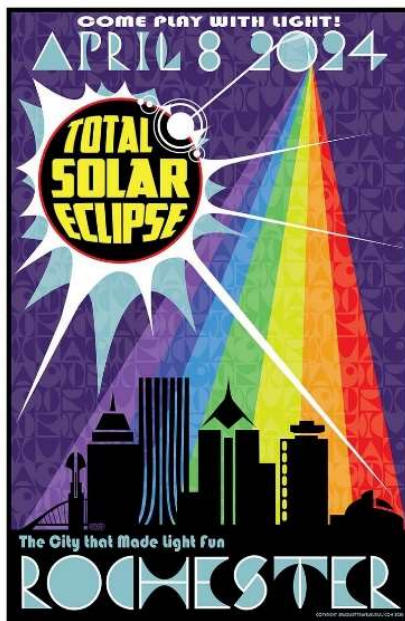
(<https://www.democratandchronicle.com/story/news/2024/02/20/solar-eclipse-2024-where-is-the-best-place-to-see-eclipse-april-rochester-ny/72665999007/>)

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Rochester Museum and Science

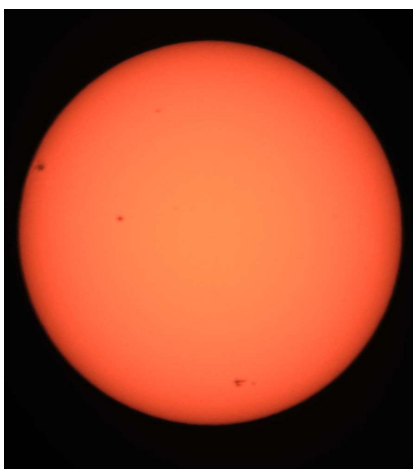
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Traveling Eclipse Art Exhibit:

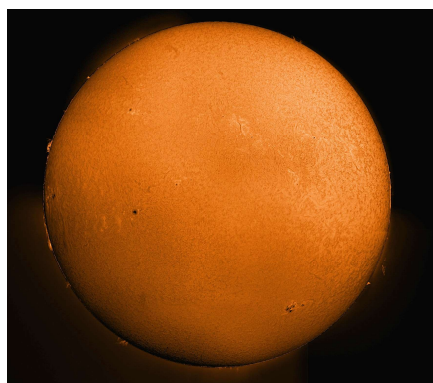


My favorite is his international poster which captures the feeling of pure joy—rapture even—that many eclipse viewers will feel.

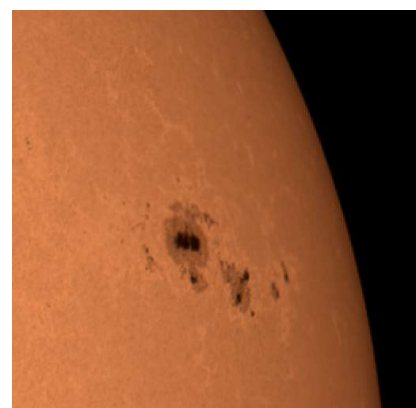
In November, I touted the traveling eclipse poster art exhibit, *The Art of the Eclipse: Works by Tyler Nordgren*. It has just finished its exhibition at the SUNY Brockport Tower Fine Arts Gallery & Rainbow Gallery on February 25th and will now be at the Rochester Museum and Science Center through to eclipse day, April 8th. I recommend seeing this 30-poster exhibit, consisting of eclipse posters from 2017 and 2024, as well as Dr. Nordgren's New York Parks series. I visited the exhibit when it was at the Webster Parks & Recreation building in December. Rochester, of course, has two posters by Tyler.



Solar disc in white light. Photo by Seth Zebrak, Feb 4, 2024.



Solar disc, Hydrogen Alpha light. Photo by Doug Kostyk Feb 5, 2024.



Solar disc in white light, closeup. Photo by Kevin Lyons, Feb 14, 2024.

Events for March 2024

Mar. 1 Fri: Astronomy Members Meeting

7:30 p.m. – 9:30 p.m. RIT, Carlson Building, room 1125. Dr. Michael Richmond of RIT will speak about Strömgen Spheres. Contact: Anthony Golumbeck at semp@use.startmail.com.

Mar. 5 Tues: Fossil Members Meeting

7:00 p.m. **Note earlier than usual start time!** The meeting will be held remotely via ZOOM and is open to all RAS Members and guests. Our featured speaker for our 2nd Annual Samuel Ciorca Memorial Lecture is Dr. James Lamsdell, Associate Professor of Geology at West Virginia University. Dr. Lamsdell has published extensively on fossil arthropods including eurypterids and on evolutionary theory. There will also be a short talk by Dr. Derek Briggs, Professor of Earth & Planetary Sciences at Yale University and Curator at the Yale Peabody Museum of Natural History. He and his team have published on two newly identified fossils collected by Sam in the Silurian Bertie Group of upper New York State and Ontario. These were difficult to identify and Derek will review the process by which such problematical fossils are analyzed and classified. For

meeting details and login info see the March *FossilLetter* or contact Michael Grenier at paleo@frontiernet.net.

Mar. 6 Wed: Astronomy Board Meeting

7:00 p.m. – 9:00 p.m. ASRAS Members are welcome to attend. Contact: Anthony Golumbeck at semp@use.startmail.com.

Mar. 20 Wed: Herbarium

1:00 p.m.-4:00 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. 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.

Mar. 20 Wed: RAS Board Meeting

7:00 p.m. – 9:00 p.m. Warner Castle. For details, contact: Michael Grenier, mgrenier@frontiernet.net

Mar. 26 Tues: Mineral Section Virtual Meeting

7:15 p.m. Zoom only. Dr. Stephen Chamberlain will discuss the publication he and George Robinson published: *New York State, A Topographic Mineralogy*. GPS locations, photos and sketches of minerals from every county are listed in this compendium, which is available for free in 3 downloads by contacting mineral.hosta@gmail.com. Section members will receive details about this. Contact: Jutta Dudley, juttasd@aol.com.

Mar. 27 Wed: Astronomy Members Forum

7:30 p.m. Farash Center and Zoom. "Making Your Own Solar Funnel" by Mark Minarich. Contact: Anthony Golumbeck at semp@use.startmail.com.

Rochester Research in Review.

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

[Female lab mice behave very differently when placed outdoors. Cornell University.](#)

[Multiple city hubs, dispersed parks keep metro areas cooler. Cornell University.](#)

['Tiny tornadoes' around leaves spread deadly plant pathogens. Cornell University.](#)

[Wastewater surveillance is key tool in keeping schools open during public health emergencies, study reveals. Syracuse University.](#)

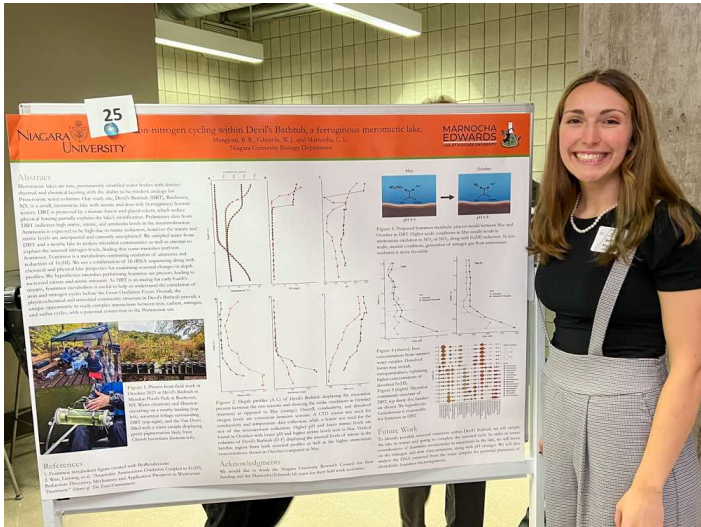
[Close encounters of the supermassive black hole kind. Syracuse University.](#)



The Crab Nebula, M1. Photo by Rick Albrecht, Feb 11, 2024.

Undergraduate Student Research Grant Awards

The following are a few abstracts from students receiving awards for the 2023-2024 year.



Iron-nitrogen Cycling Through a Seasonal Cycle Within Devil's Bathtub, a Ferruginous Meromictic Lake.

by Bethany Mangioni, Niagara University

Abstract:

Meromictic lakes are rare, permanently stratified water bodies with distinct thermal and chemical layering that can be used as modern analogs for Proterozoic water columns. Our study site, Devil's Bathtub (DBT), Rochester, NY, is a small, meromictic lake with anoxic and ferruginous (iron-rich) bottom waters. DBT is protected by a mature forest on glacial eskers surrounding the lake, which reduces physical forcing and which partially explains the lake's permanent stratification. Preliminary data from DBT indicates high nitrite, nitrate, and ammonia levels in the monimolimnion, the bottom, unmixed layer. We expected ammonia to be high due to nitrate / nitrite reduction; however, the very high nitrate and nitrite levels are unexpected and currently unexplained. Recent sampling of microbial communities at DBT and a nearby lake indicate the unusual nitrogen dynamics may be explained by microbes performing feammox. Feammox is a metabolism combining oxidation of ammonia and reduction of Fe(III). We propose to use a combination of 16S rRNA sequencing along with chemical and physical lake properties for examining seasonal changes in depth profiles. We hypothesize microbes performing feammox cause the increased nitrate and nitrite and our primary objective is to discover what microorganisms are using this specific metabolic process, and if there is consistency throughout all seasons. As DBT is an analog for early Earth's oceans, feammox metabolism is useful to help us understand the correlation of iron and nitrogen cycles before the Great Oxidation Event. These objectives will be completed through seasonal sampling across a complete year, then DNA extractions and 16s rRNA sequencing will follow for molecular sequencing and analysis. The physicochemical and microbial community structure within Devil's Bathtub provide a unique opportunity to study complex interactions between iron, carbon, nitrogen, and sulfur cycles, with a potential connection to the Proterozoic era.



Paternity as a Driver of Post-Fledging Brood Division and Male Parental Behavior in the Socially Monogamous Black Throated Blue Warbler

by Brian Hofstetter, Cornell University.

Abstract:

Females typically have high assurance of their relatedness to young in their nests, whereas males' paternity is uncertain because birds often engage in extra-pair copulations with individuals outside of their social pair bonds. Studies have shown that males can adjust their level of parental care according to their relatedness to their brood, but results are mixed. However, these studies typically are unable to examine differences in parental effort directed towards specific nestlings in the brood. Once nestlings fledge, females and males divide the brood, which provides a unique opportunity to examine differential parental investment according to genetic relatedness during the post fledging period – an understudied but critical life stage. I hypothesize that brood division is based on paternity and that males adjust their post-fledging parental care according to their 'paternity uncertainty'. I propose to examine how paternity influences brood division and male post-fledging parental behavior in the socially monogamous black-throated blue warbler at the Hubbard Brook Experimental Forest, NH. From May-Aug 2024, I will attach a radio-transmitter to one randomly assigned nestling per brood on day 8 of the nestling stage and track each fledging

from fledging to independence using a receiver and Yagi 3-element antenna to augment data collected from 2022-2023. I will quantify male parental effort once at the nest on day 7 of the nestling stage using 2-hr videorecordings and after fledging during 30-min observation periods each day fledglings are tracked. I will obtain blood samples from social parents, candidate male sires, and nestlings, extract DNA, and use ddRAD-sequencing for SNP discovery and genotyping for parentage analysis. I will examine whether (1) males selectively provision and defend related fledglings, (2) male provisioning rates and time spent near fledglings is positively associated with the proportion of related offspring in a brood, and (3) the relationship between male parental effort and parentage is stronger for older males relative to younger males. Determining the influence of parentage on brood division and male post fledging parental behavior is important for understanding the evolution of avian reproductive strategies and life history trade offs.



Eastern Bluebird (*Sialia sialis*). Photo by Tim Tatakis, April 2, 2022.

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.

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.

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

ROCHESTER ACADEMY OF SCIENCE CONTACTS

		(585) home//cell
Michael Grenier	President	671-8738
Jeff Gutterman	Vice President	392-8299//748-2272
Helen D. Haller	Secretary	387-9570
Tim Tatakis	Treasurer	497-7038
Jutta Dudley	Past President	385-2368
Michael Richmond	Director '24	586-7432
Dan Krisher	Director '24	698-3147
Tony Golumbeck	Director '25	(315) 789-4374
Open	Director '25	
Karen Wolf	Director '26	670-9709
Douglas Kostyk	Director '26	943-3419
Alex Smith	Anthropology	750-3329
David Bishop	Astronomy	455-5715
Lawrence Hirsch	Life Sciences	512-5672
Tim Tatakis and Steven Daniel	Herbarium	497-7038
Dan Krisher	Fossil	698-3147
Stephen Busschaert	Mineral	351-7633
Robert Crumrine	Bulletin Editor	813-4157
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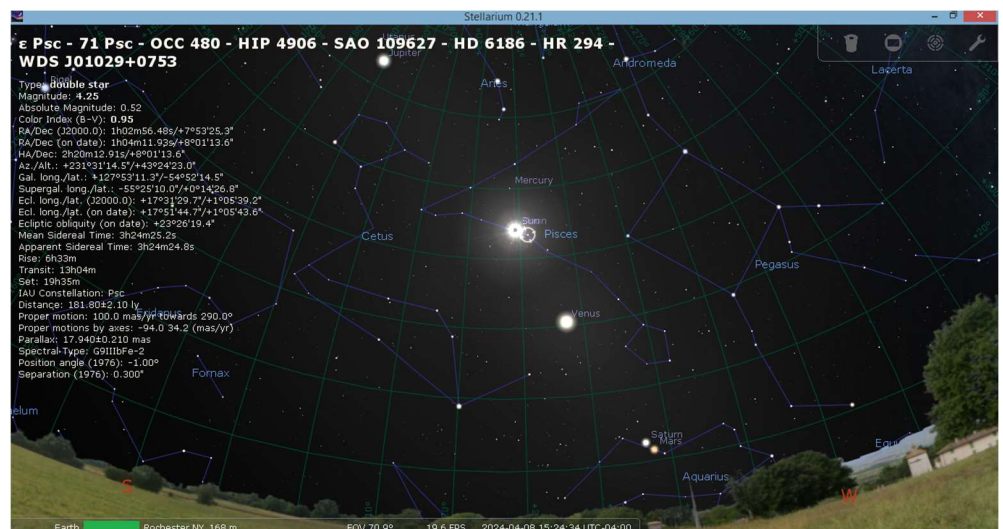
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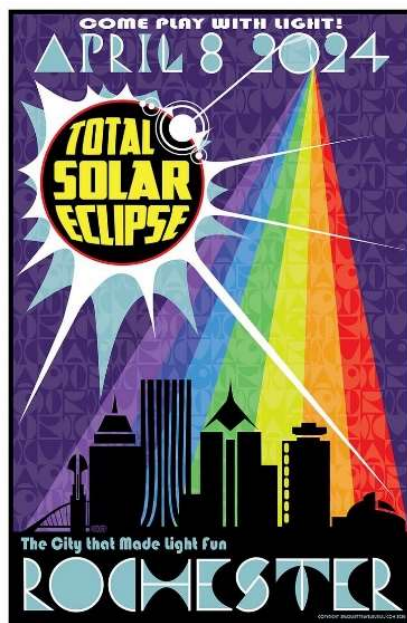
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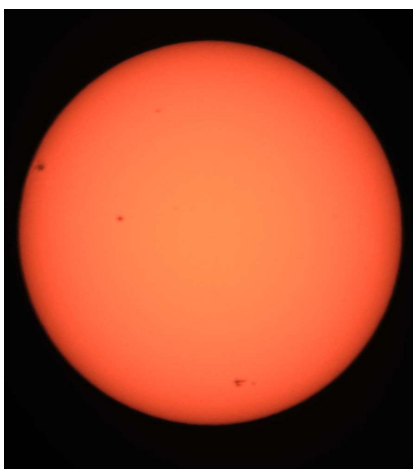
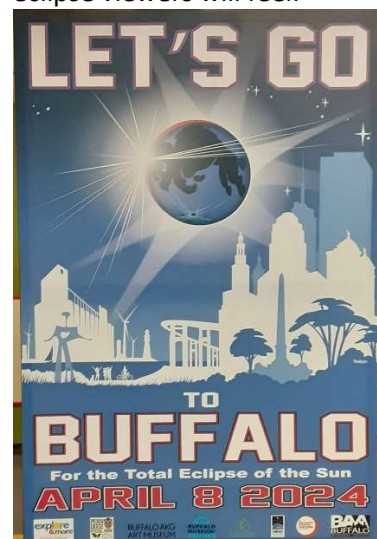
Center Roc the Eclipse Festival: Note that the RMSC and their festival on East Avenue is also on the D&C list. See <https://rmsc.org/roc-the-eclipse-festival/> for details. Events include over 30 Rochester exhibitors and organizations with hands-on activities (including ASRAS), Solar telescope viewing, Planetarium shows (included with admission), live stage concert entertainment including the ROC City Ballet, The Isotopes, and comedy groups. Entertaining speakers including Dr. Phil Plait (the 'Bad Astronomer') on astronomy and science education and Cate Larsen (the 'Groovy Geologist'). There will be food trucks, the Giant Eclipse Glasses, and more activities inside the museum.

Traveling Eclipse Art Exhibit:

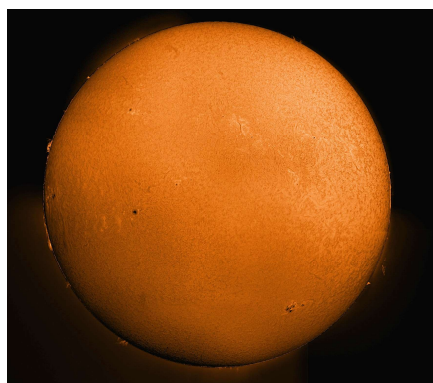


My favorite is his international poster which captures the feeling of pure joy—rapture even—that many eclipse viewers will feel.

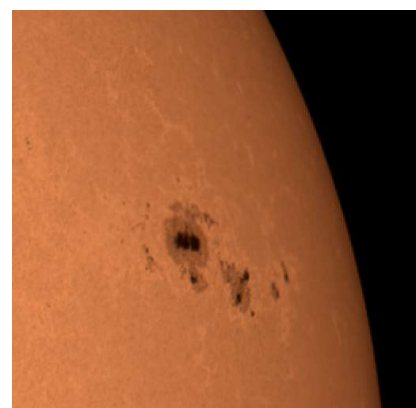
In November, I touted the traveling eclipse poster art exhibit, *The Art of the Eclipse: Works by Tyler Nordgren*. It has just finished its exhibition at the SUNY Brockport Tower Fine Arts Gallery & Rainbow Gallery on February 25th and will now be at the Rochester Museum and Science Center through to eclipse day, April 8th. I recommend seeing this 30-poster exhibit, consisting of eclipse posters from 2017 and 2024, as well as Dr. Nordgren's New York Parks series. I visited the exhibit when it was at the Webster Parks & Recreation building in December. Rochester, of course, has two posters by Tyler.



Solar disc in white light. Photo by Seth Zebrak, Feb 4, 2024.



Solar disc, Hydrogen Alpha light. Photo by Doug Kostyk Feb 5, 2024.



Solar disc in white light, closeup. Photo by Kevin Lyons, Feb 14, 2024.

Events for March 2024

Mar. 1 Fri: Astronomy Members Meeting

7:30 p.m. – 9:30 p.m. RIT, Carlson Building, room 1125. Dr. Michael Richmond of RIT will speak about Strömgen Spheres. Contact: Anthony Golumbeck at semp@use.startmail.com.

Mar. 5 Tues: Fossil Members Meeting

7:00 p.m. **Note earlier than usual start time!** The meeting will be held remotely via ZOOM and is open to all RAS Members and guests. Our featured speaker for our 2nd Annual Samuel Ciorca Memorial Lecture is Dr. James Lamsdell, Associate Professor of Geology at West Virginia University. Dr. Lamsdell has published extensively on fossil arthropods including eurypterids and on evolutionary theory. There will also be a short talk by Dr. Derek Briggs, Professor of Earth & Planetary Sciences at Yale University and Curator at the Yale Peabody Museum of Natural History. He and his team have published on two newly identified fossils collected by Sam in the Silurian Bertie Group of upper New York State and Ontario. These were difficult to identify and Derek will review the process by which such problematical fossils are analyzed and classified. For

meeting details and login info see the March *FossilLetter* or contact Michael Grenier at paleo@frontiernet.net.

Mar. 6 Wed: Astronomy Board Meeting

7:00 p.m. – 9:00 p.m. ASRAS Members are welcome to attend. Contact: Anthony Golumbeck at semp@use.startmail.com.

Mar. 20 Wed: Herbarium

1:00 p.m.-4:00 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. 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.

Mar. 20 Wed: RAS Board Meeting

7:00 p.m. – 9:00 p.m. Warner Castle. For details, contact: Michael Grenier, mgrenier@frontiernet.net

Mar. 26 Tues: Mineral Section Virtual Meeting

7:15 p.m. Zoom only. Dr. Stephen Chamberlain will discuss the publication he and George Robinson published: *New York State, A Topographic Mineralogy*. GPS locations, photos and sketches of minerals from every county are listed in this compendium, which is available for free in 3 downloads by contacting mineral.hosta@gmail.com. Section members will receive details about this. Contact: Jutta Dudley, juttasd@aol.com.

Mar. 27 Wed: Astronomy Members Forum

7:30 p.m. Farash Center and Zoom. "Making Your Own Solar Funnel" by Mark Minarich. Contact: Anthony Golumbeck at semp@use.startmail.com.

Rochester Research in Review.

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

[Female lab mice behave very differently when placed outdoors. Cornell University.](#)

[Multiple city hubs, dispersed parks keep metro areas cooler. Cornell University.](#)

['Tiny tornadoes' around leaves spread deadly plant pathogens. Cornell University.](#)

[Wastewater surveillance is key tool in keeping schools open during public health emergencies, study reveals. Syracuse University.](#)

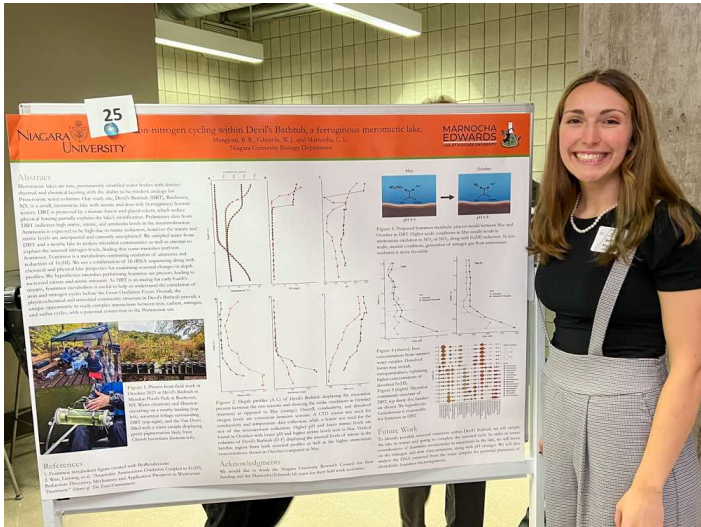
[Close encounters of the supermassive black hole kind. Syracuse University.](#)



The Crab Nebula, M1. Photo by Rick Albrecht, Feb 11, 2024.

Undergraduate Student Research Grant Awards

The following are a few abstracts from students receiving awards for the 2023-2024 year.



Iron-nitrogen Cycling Through a Seasonal Cycle Within Devil's Bathtub, a Ferruginous Meromictic Lake.

by Bethany Mangioni, Niagara University

Abstract:

Meromictic lakes are rare, permanently stratified water bodies with distinct thermal and chemical layering that can be used as modern analogs for Proterozoic water columns. Our study site, Devil's Bathtub (DBT), Rochester, NY, is a small, meromictic lake with anoxic and ferruginous (iron-rich) bottom waters. DBT is protected by a mature forest on glacial eskers surrounding the lake, which reduces physical forcing and which partially explains the lake's permanent stratification. Preliminary data from DBT indicates high nitrite, nitrate, and ammonia levels in the monimolimnion, the bottom, unmixed layer. We expected ammonia to be high due to nitrate / nitrite reduction; however, the very high nitrate and nitrite levels are unexpected and currently unexplained. Recent sampling of microbial communities at DBT and a nearby lake indicate the unusual nitrogen dynamics may be explained by microbes performing feammox. Feammox is a metabolism combining oxidation of ammonia and reduction of Fe(III). We propose to use a combination of 16S rRNA sequencing along with chemical and physical lake properties for examining seasonal changes in depth profiles. We hypothesize microbes performing feammox cause the increased nitrate and nitrite and our primary objective is to discover what microorganisms are using this specific metabolic process, and if there is consistency throughout all seasons. As DBT is an analog for early Earth's oceans, feammox metabolism is useful to help us understand the correlation of iron and nitrogen cycles before the Great Oxidation Event. These objectives will be completed through seasonal sampling across a complete year, then DNA extractions and 16s rRNA sequencing will follow for molecular sequencing and analysis. The physicochemical and microbial community structure within Devil's Bathtub provide a unique opportunity to study complex interactions between iron, carbon, nitrogen, and sulfur cycles, with a potential connection to the Proterozoic era.



Paternity as a Driver of Post-Fledging Brood Division and Male Parental Behavior in the Socially Monogamous Black Throated Blue Warbler

by Brian Hofstetter, Cornell University.

Abstract:

Females typically have high assurance of their relatedness to young in their nests, whereas males' paternity is uncertain because birds often engage in extra-pair copulations with individuals outside of their social pair bonds. Studies have shown that males can adjust their level of parental care according to their relatedness to their brood, but results are mixed. However, these studies typically are unable to examine differences in parental effort directed towards specific nestlings in the brood. Once nestlings fledge, females and males divide the brood, which provides a unique opportunity to examine differential parental investment according to genetic relatedness during the post fledging period – an understudied but critical life stage. I hypothesize that brood division is based on paternity and that males adjust their post-fledging parental care according to their 'paternity uncertainty'. I propose to examine how paternity influences brood division and male post-fledging parental behavior in the socially monogamous black-throated blue warbler at the Hubbard Brook Experimental Forest, NH. From May-Aug 2024, I will attach a radio-transmitter to one randomly assigned nestling per brood on day 8 of the nestling stage and track each fledging

from fledging to independence using a receiver and Yagi 3-element antenna to augment data collected from 2022-2023. I will quantify male parental effort once at the nest on day 7 of the nestling stage using 2-hr videorecordings and after fledging during 30-min observation periods each day fledglings are tracked. I will obtain blood samples from social parents, candidate male sires, and nestlings, extract DNA, and use ddRAD-sequencing for SNP discovery and genotyping for parentage analysis. I will examine whether (1) males selectively provision and defend related fledglings, (2) male provisioning rates and time spent near fledglings is positively associated with the proportion of related offspring in a brood, and (3) the relationship between male parental effort and parentage is stronger for older males relative to younger males. Determining the influence of parentage on brood division and male post fledging parental behavior is important for understanding the evolution of avian reproductive strategies and life history trade offs.



Eastern Bluebird (*Sialia sialis*). Photo by Tim Tatakis, April 2, 2022.

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.

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

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