



## President's Message

The Undergraduate Student Research Grant Review Committee recently selected six students to receive research grants from the Rochester Academy of Science based on the quality of research and presentation. Along with the Fall Scientific Paper Session, this is an important program for us in encouraging the scientists of the future currently in school.

Committee members reviewed and graded these, consulted with each other, and presented a consensus on the awards. Thank you to chairman William Hallahan and members Helen Haller, Tim Tatakis, and Emily Ledgerwood for their diligence in completing this.

Each September, Dr. Hallahan sends our Request for Proposals to the sciences faculty at the colleges and

universities throughout Upstate NY. The money awarded comes principally from three endowments: the Katherine H. Jensen Memorial Research Grant Fund, the Thomas F. & Annie A. and Grace Murray Memorial Research Grant Funds, and the Student Grants Endowment Fund. The first article on winning submissions begins in this issue.

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## Publication Opportunity

If you have an original research project in the natural sciences that you would like considered for publication in the Proceedings of the Rochester Academy of Science, you are invited to submit it by May 1st. A publication date in the Fall of 2020 is our goal. For information please contact our Publications Committee Chair, Past

President Jutta Dudley, 385-2368, [juttasd@aol.com](mailto:juttasd@aol.com).

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## Nominations for RAS Board of Directors

*Reminder:* If you wish to run for a position on the Board of Directors, submit a petition signed by ten endorsing members to Secretary Helen Haller by February 1. Include a brief sketch of your qualifications and desire to serve. See last month's issue for more details. If you would like to discuss this, please call or write Tony Golumbeck (315)789-4374, [semp.golum@gmail.com](mailto:semp.golum@gmail.com).

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## Announcement of the 2019-2020 Undergraduate Student Research Grant Awards

This year, we had 15 proposals, requesting a total of \$7,426. Our mission was to award only significant grants rather than small, partial awards. The RAS Grants Committee awarded a total of \$2736.77 for six research projects.

**First place: Erica Delles, Rochester Institute of Technology.** *Physiological Condition in Relation to Molecular Sex of Thrushes During Migration Stopover.* Award: \$500 plus \$50 to the student. Sponsor: Susan Smith Pagano, Ph.D.

**Christian DiBiase, SUNY Oswego.** *Survey of Artemisinin Content in Species of Artemisia Native to Western North America.* Award: \$486.77. Sponsor: Kamal Mohamed, Ph.D.

**Cassandra Robataille, Hartwick College.** *Interleukin- $\beta$ -induced Loss of Endothelial Barrier Function and the Role of Orexin-A.* Award: \$500. Sponsor: Joshua Garrett, Ph.D.

**Alexandra Haley, Canisius College.** *Comparative Primate Microbiome.* Award: \$350. Sponsor: Susan Margulis, Ph.D. and David Haeusser, Ph.D.

**Jack Polentes, Hobart & William Smith Colleges.** *Investigating triggers for ecological succession at Zurich Bog, NY during the Holocene.* Award: \$300 from RAS Grants Fund + \$200 from RAS Life Sciences section. Sponsor: Tara Curtin, Ph.D.

**Joseph Karboski, St. John Fisher College.** *Investigation of a Compound to Potentiate Topoisomerase Activity.* Award: \$350. Sponsors: Jonelle Mattiaccio, Ph.D. and Jonathan Millen, Ph.D.

## 2019-2020 Undergraduate Student Research Grant Awardee:

Christian DiBiase, SUNY Oswego.  
*Survey of Artemisinin Content in Species of Artemisia Native to Western North America.* Sponsor: Kamal Mohamed, Ph.D.



Christian DiBiase, SUNY Oswego

Malaria is one of the most widespread infectious diseases throughout the world having been responsible for a reported 219 million cases in 2017. It is a vector-borne disease caused by *Plasmodium* parasites, and currently the most effective treatments for uncomplicated variations of the disease are artemisinin-combination therapies (ACTs). Artemisinin (ASN) is a sesquiterpene lactone sourced from plants of the genus *Artemisia*, and despite recent advancements in the synthesis of ASN, plant sourced ASN remains the most reliable and fruitful supply of the compound. *A. annua* has long been the most cultivated plant for collecting ASN, however recent studies have indicated ASN presence in other species of *Artemisia*. Much research has been done on species native to Asia, Africa, and the Middle East, however the ASN content of species native to the western region of North America have remained relatively unstudied despite recent reports of anti-parasitic activity and

ASN content in species native to the region. Thus, the aim of the present investigation is to survey and quantify ASN content in five species of *Artemisia* native to western North America using organic extraction methods and HPLC-DAD analysis. ASN concentration will be compared both across the species studied and amongst the plant parts within each species. Knowledge of the ASN content in these species could provide insight into potentially significant alternative biosynthetic sources of ASN, which could be utilized in future production of ACTs.

Each of the five species investigated in this study (*A. douglasiana*, *A. dracunculus*, *A. ludoviciana*, *A. tridentata*, *A. suskendorfii*) will be cultivated in a greenhouse with a controlled climate on the SUNY Oswego campus. Five plants from each species will be cultivated until flowering stage is reached, at which point the following plant parts will be harvested from three vigorous specimens of each species: flower, leaf, stem, and root. The flower's harvested will include the complete inflorescence. The leaves will include whole leaves with short stalks plucked from areas most exposed to greenhouse lighting. The stems will consist of the thin green branches



*Artemisia ludoviciana* (Wiki)  
aka White Sagebrush



*Artemisia dracunculus*  
(wiki)  
aka French Tarragon

connected to the leaves, and the roots will be comprised of parts near the root tips.

"I would like to thank the grants committee for choosing to fund my research, and the donors of Rochester Academy of Science for providing the contributions that will bring our work to fruition. I admire your generosity and support for the undergraduate scientific community, which has made endeavors such as ours possible."

— Christian DiBiase

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**Gateway for activation:** Malaria parasites ingest hemoglobin to produce heme from the host red blood cell using cytotomes. The interaction of heme in the parasite food vacuole with artemisinin (ASN) causes activation of the drug and parasite killing. PfKelch13-containing vesicles regulate the uptake of hemoglobin by *P. falciparum* and thereby affect the amount of ART activation through reduced heme availability.

**Photocredit:** Marapara, Cowman, p 22, *Science Magazine*, 3 January 2020.

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# Events for February 2020

For updates to events, check the Academy website, <http://www.rasny.org>, and Section websites.

## NOT MEETING IN FEBRUARY:

Anthropology Field Trip  
Astronomy Star Parties  
Life Sciences Field Trip

## 4 Thu: FOSSIL SECTION MEETING

7:30 – 9:00 p.m. Brighton Town Hall, Downstairs Meeting Room  
Section Member Michael Grenier will update us on what's new in the world of Dinosaurs. Contact: Dan Krisher  
DLKFossil@gmail.com or (585) 698.3147.

## 7 Fri: ASTRONOMY SECTION MEETING

7:30 p.m.–10:00 p.m. RIT Carlson Center for Imaging Science, CAR-1125. Lot F. First speaker Bob McGovern will give a short talk on the capabilities of the Farash Center. Main speaker: Dan Watson – Star-forming region NGC1333. Snacks available at 7:00 p.m. prior to meeting. Contact: Mark Minarich: (585) 257-6042.

## 9 Sun: ASTRONOMY PUBLIC OPEN HOUSE

12:00 p.m. - 4:00 p.m. (or later, if skies are clear). Marian and Max Farash Center for Observational Astronomy, 8355 County Road 14 Ionia, NY 14475. Sledding, weather permitting. For weather related cancellations or changes contact Mark Minarich: (585) 257-6042 or see [www.rochesterastronomy.org/calendar-of-events](http://www.rochesterastronomy.org/calendar-of-events).

## 12 Wed: ASTRONOMY BOARD MEETING

7:00 p.m. University of Rochester, Bausch & Lomb Hall, 2nd floor, room 203H. All ASRAS members are welcome. Contact Mark Minarich: (585) 257-6042.

## 15 Sat: LIFE SCIENCE HERBARIUM WORKSHOP

10 a.m. – 2 p.m. Basement Rochester Museum and Science Center (RMSC). No experience needed! You can either bring a lunch or plan to buy it at the RMSC Café. If you plan to attend, please send an RSVP to Elizabeth Pixley At RMSC go to the front desk to meet other participants. Contact: Elizabeth Pixley, herbarium curator: 334-0977 or [eypixley@gmail.com](mailto:eypixley@gmail.com).

## 18 Tues: MINERAL SECTION MEETING

7:00 p.m. Brighton Town Hall, downstairs meeting room. Speaker Don Lapham of the Buffalo Geological Society will present “Minerals of the Lockport Dolomite in Western NY and Southern Ontario”. Join us for an evening learning about the minerals in the bedrock below us, door prizes, and refreshments. Contact: Stephen Busschaert, (585) 351-7633.

## 19 Wed: RAS BOD MEETING

7:00 p.m. Brighton Town Hall, Stage Conference Room.



## 21 Fri: ASTRONOMY WINTER LECTURE SERIES

7:00 p.m.–10:00 p.m. RIT Carlson Center for Imaging Science, CAR-1125. Lot F. Member short talks including Frank Bov on the Observer's Handbook and David Jouppi on his software program. Volunteer speakers needed! Contact: Mark Minarich: (585) 257-6042.

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## ONGOING EVENTS

### STRASENBURGH OBSERVATORY

Operations of the Strasenburgh rooftop observatory will resume in April, but there may be last minute exceptions on warm, clear Saturday nights. Contact: Jim Seidewand (585) 703-9876.



Male Downy Woodpecker  
Photo Courtesy of Nick Lamendola, ASRAS

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Renew your RAS  
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for 2020!  
See January Bulletin  
for Membership Form.*

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**CHANGING ADDRESS?**

Temporary or Permanent?

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**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 e-mail [pres@rasny.org](mailto:pres@rasny.org).

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 July and September, by the Astronomy Section, Rochester Academy of Science. Submissions are due by the 10<sup>th</sup> of the month and may be emailed to: [editor@rasny.org](mailto:editor@rasny.org).

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

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