



INDIANA ACADEMY OF SCIENCE NEWSLETTER

Issue 179

May 2021

From the President



Dear Friends,

I am glad you are here. Thank you for your sustained commitment to science and your dedication to the Academy.

If you attended our 136th Annual Academy Meeting, I hope you will agree the event was a great success. Despite being unable to gather in person, we communed virtually to share scientific information, make new connections, and strengthen existing relationships. From the keynote addresses and research presentations to hot topic discussions and interactive workshops, the day was packed with exciting and meaningful content. I was particularly excited to see so much great work presented by our early-career scientists! Thank you to all who presented, attended, and engaged with other members! I offer my deepest gratitude to our Executive Director Dr. Delores Brown, our Meeting Planning Committee, and our Section Leadership for ensuring the success of this meeting.

Prior to the Annual Meeting, we held Academy Elections. Thank you to all who volunteered to serve the Academy and run for elected positions. Congratulations to those who were elected (see page 3). I look forward to the good work you will do. I hope those who were not elected this term will consider running again in the future and seek other ways to serve and remain involved with the Academy. I would like to thank our members for voting to amend Academy bylaws to establish a standing elected Diversity, Equity, and Inclusion Committee. This is essential to ensuring the Academy sustainably promotes diversity, equity, and inclusion among our membership and the broader scientific community.

It has been my honor and privilege to serve as President of the Indiana Academy of Science. I am proud of the work the Academy has done to address the most pressing issues of this moment (scientific or otherwise): the coronavirus pandemic and inequity in society (including STEM). While there have been positive developments on both fronts, our work has only just begun, especially in the realm of equity. We must remain vigilant in working toward an Academy and society in which all individuals feel like they are valued, can contribute, and belong. My term as president ends on May 31. I am delighted to pass the gavel to Dr. Paul Doss, Professor of Geology at the University of Southern Indiana. The Academy is in very good hands.

If you have not already, please get vaccinated when you can! My best,

Eric (VJ) Rubenstein, Ph.D.

INSIDE...

From the Executive Director	2	Metallic Nanoparticles & Aquatic Plants.....	10
Election Results	3	Indiana Geological & Water Survey News.....	10
Academy Council Members & Bylaws Change	4	Entomology/Zoology Section News.....	11
Recent IAS Award Winners	4	Mosquito Creek BioBlitz Announcement	11
Sr. Research & Community Grant Recipients.....	5	IAS Awards Reminders	11
Indy Zoo Global Conservation Grants Winners	6	Job Announcements	12
Remembering Ron Richards	7	<i>Fish and Wildlife News</i>	12
Help Map Brood X: Cicada Safari App	8	Science With a Twist	12
Plant Photographic Scavenger Hunt	9	Upcoming Newsletter Deadlines.....	12

From the Executive Director



Hello Academy Members,

Thank you to those of you who attended the *136th Annual Academy Meeting* the end of March 2021. Two-hundred Academy members and friends joined us for a full day of science—at its best! Though certainly a different format than what we've been used to, the virtual annual academy meeting gave us the chance to come together once again and learn from one another. The Indiana Academy of Science prides itself in furthering our mission of promoting scientific research, diffusing scientific information, improving education in the sciences, and encouraging communication and cooperation among scientists. With the *136th Annual Academy Meeting*, we did just that!

When I first came to the Academy as the Executive Director (now 10 years ago), I recall being told that I was expected to also register as a member of the Academy. Though I wondered why that was needed, I did not see the harm, so I gladly accepted the directive. Little did I know at that time that I would be happy with the value received from being a member of the Indiana Academy of Science. Membership in the Academy is indeed a privilege. As member and past Academy Secretary Dr. Jessi Haeft so eloquently states in her video remarks that are now part of our Academy Story video recording (found on the Academy Website, the Indiana Academy of Science provides opportunities for wherever you find yourself in your career and life—senior scientist in corporate or academic science, a junior scientist, a science educator, a science student, or as past president Dr. Jim Curry reminded me years ago, simply a *science enthusiast*. For me, as an administrator with my research interest in change and transformation in higher education and my understanding of the importance of science to who we are and how we live, the Academy membership relationships I've built over the years in combination with opportunities made available to me resulting from those relationships have been valuable beyond words.

My message to all of you is to take advantage of the wonderful opportunity you have to know each other as members of the Indiana Academy of Science. As a member, you have access to the full on-line membership directory (through the Website *Member Center*) both in your specific area of interest as well as the other many areas of science the Academy represents. The Indiana Academy of Science is one of the oldest scientific professional membership organizations in the United States, and the only multidisciplinary scientific organization in the state of Indiana. The benefits to introducing yourself and cultivating a relationship online are immense.

Stay well everyone.

— Delores G. Brown, Ph.D., Executive Director

Editor's Note: *Dr. Brown recently was elected to be one of the newest Fellows of the Academy, in recognition of her accomplishment as an Academy member. See pages 4 & 11 for more information about Fellows.*

ELECTION RESULTS



**President-Elect
Marc Milne**



**Council Secretary
Michelle Marincel
Payne**



**Member at Large
Jennifer Kowalski**



**Senior Research Grants Committee
Irene Reizman**



**Foundation Committee Chair
Tom Dolan**



2021-22 Academy Council

President

Paul Doss

Member-at-Large

Azeem Ahmad

President-Elect

Marc Milne

Member-at-Large

Jennifer Kowalski

Secretary

Michelle Marincel Payne

Parliamentarian

Edward Frazier

Treasurer

Michael Finkler

Executive Director

Delores Brown

Immediate Past President

Eric (VJ) Rubensetin

Research Grants Committee Chair

JD Mendez

Foundation Committee Chair

Tom Dolan

Change to Bylaws

Prior to the Annual Meeting, the membership voted to approve an amendment to Article VIII, Section 3 (Elected Standing Committees) as follows:

3. Diversity, Equity, and Inclusion (DEI) Committee. The DEI Committee shall consist of five members elected for rotating three-year terms, plus a Council Member-at-Large as an ex-officio member, but without vote. The committee shall design, implement and oversee efforts to promote diversity, equity, and inclusion in the Academy, and in the Indiana scientific Community. The committee shall report regularly to the Council.

Award Winners Recognized at the 136th Annual Meeting

Distinguished Scholar Award

Don Ruch

Fellows

Delores Brown

Ellen Jacquart

Mark Jordan

JD Mendez

Darrell Schulze

Distinguished Service Award

Patty Zeck

IAS SPRING 2021 GRANT RECIPIENTS

Senior Research Grants

Lead Investigator	Title	Institution
Barrett, Katherine Lee	Aquatic Macroinvertebrate Carbon and Nitrogen Stable Isotope Ratios as a Fingerprint of Land Use Impacts in the St. Joseph River Basin	Holy Cross College
Bernstein, Douglas	Investigating Hrd1's role in protein folding in the human fungal pathogen <i>C. albicans</i>	Ball State
Dawadi, Mahesh	Performance Enhancement of Dye Sensitized Solar Cells	Earlham
Dennis, Tyler	Soil Micro-Arthropod Analysis to Compare Reclaimed Mining Sites	Indiana State
Jones, Laura	Effects of non-breeding habitat quality and long-distance dispersal on Cerulean Warbler (<i>Setophaga cerulea</i>) reproductive success	Ball State
Mudica, Kathym	Indiana river otter metal body burden as an indicator of food web cycling of metals	Indiana State
Muse, Danielle	Becoming un-Frizzled: Critical Investigations in Wnt Signaling and Multi-Drug Chemoresistance in Breast Cancer	Indiana State
Rathfon, Summer	Gene flow and relatedness among Indiana's relict eastern hemlock (<i>Tsuga canadensis</i>) populations	Purdue
Sample, Richard	Examining how Regional Differences in Soil Nutrient Concentrations impacts White-tailed Deer Browsing Selection of Hardwood Stump Sprouts in Indiana Forests	Purdue
Shrestha, Namita	Impact of Combined Sewer Systems on Wabash River	Rose-Hulman
Simpson, Mathew	Effects of Raw and Aged Microfibers on Growth of Aquatic Plants	Ball State
Spears, Benjamin	Mutagenic Analysis of putative post-translatimel modifcaiton sites in the <i>Arabidopsis thaliana</i> transription factor TCP8	Butler

Community Grant

Organization	Title	Amount
Health & Science Innovations	Young Innovators Quest Program	\$1000

Indianapolis Zoo Awards Global Conservation Grants: \$350,000 allocated to support saving species worldwide

The Indianapolis Zoo has awarded several conservation projects for its 2021 Conservation Grant Program totaling nearly \$350,000. These organizations are making an authentic difference in saving species worldwide and will continue their success with this support from the Zoo. As wild things and wild places face increasing challenges, the Zoo's support is essential and will assist in the conservation of species under severe threat of extinction, including African elephants, great apes, and the recovery efforts for critically endangered Orinoco crocodiles, one of the species featured in the Zoo's upcoming exhibit Alligators & Crocodiles: The Fight to Survive presented by Central Indiana Honda Dealers. The Zoo also continues to respond and support animal crises that are unexpected, such as the rescue effort for Texas sea turtles impacted by the recent winter storm. "We are proud to support these proven conservation projects that protect nature and preserve species and habitats, both internationally and right here at home in Indiana, for future generations," said Bill Street, Senior Vice President of Conservation, Life Sciences and Education. "Conservation efforts worldwide have been greatly impacted by the pandemic, so we are especially grateful to be able to fulfill our mission and commit this level of support in 2021 and beyond." Grants are given based on science and research, measurable impact and projects that incorporate logical behavior change in areas where conflicts between people and wildlife exist. The Zoo has provided more than \$1 million in support to conservation efforts in the past three years.



Crawfish Frog, from www.in.gov

2021 Conservation Initiatives:

- APPC —Panamerican Conservation Association (sloths)
- Cheetah Conservation Fund (cheetahs)
- Goulougo Triangle Ape Project (African great apes)
- Indiana Department of Natural Resources (crawfish frogs)
- International Elephant Foundation (elephants)
- IUCN Species Survival Commission (endangered species)
- Macaw Recovery Network (scarlet and great green macaws)
- Mara Elephant Project (African elephants)
- Sumatran Orangutan Conservation Program (Sumatran orangutans)
- Tanzania Conservation and Research Project (African elephants)
- Venezuelan Crocodile Specialist Group (Orinoco crocodiles)
- Wildlife Conservation Society (lions)
- World Parrot Trust (blue-throated macaws)

About the Indianapolis Zoo

The Indianapolis Zoo protects nature and inspires people to care for our world. Located in White River State Park downtown, the Indianapolis Zoo is accredited by the Association of Zoos and Aquariums and the American Alliance of Museums as a zoo, aquarium and botanical garden. Visit IndianapolisZoo.com

Remembering Ron Richards



Photo from indianamuseum.org

In late March, we were saddened to learn of the passing of Ron Richards, a loyal friend of the Academy who gave so very much of his time and expertise to our work, exhibiting his Mastodon remains at our Annual Meetings, making himself available to speak about his Museum work whenever we asked, and serving the Academy leadership as a Member-at-Large Council Member in 2011 and 2012. Ron was one of the first people I met after taking my position with the Academy; the new Academy office was being prepared inside of the State Museum at the time. As the senior research curator of paleobiology for the Museum, Ron made my transition to my new position in a new state a lot smoother, making sure I was introduced to those whom he felt I needed to know and making himself available to answer all of my many questions. He was indeed a humble and gentle man. He will be missed.

Contributed by Delores Brown

Help Map the 2021 Indiana Emergence of the Periodical Cicada Brood X with Cicada Safari

Submitted by Gene Kritsky



Cicada Safari 



Join Cicada Safari!



Periodical cicadas belonging to Brood X will emerge in parts of Indiana starting in May and singing into June. In 1885, Brood X emerged in every county of the state. However, clear-cutting forests for agriculture, roads, and power lines has fragmented our forests, and Brood X has been in decline in Indiana since 1919.

To assess the status of Brood X in Indiana, we are asking members of the Indiana Academy of Science to join a crowdsourcing campaign to map the 2021 emergence. This use of crowdsourcing for cicada research goes back to the 1840s, when Gideon B. Smith wrote newspaper articles asking readers to send him details of where they saw cicadas. In 1902, the USDA sent out 15,000 letters asking recipients for info on where cicadas emerged that year.

In recent years, entomologists have used voicemail messages, e-mails, and texts to document periodical cicada emergences, but the development of smartphone cameras with GPS data has provided a new and powerful tool for mapping efforts. Researchers who once relied on a handful of individuals can now collect data from thousands of citizen scientists, who can contribute by submitting photographs of cicadas with the free smartphone app Cicada Safari. Each photograph's metadata provides the date, time, longitude, and latitude for where and when the cicada was observed. The photograph adds to the value of the data, providing a visual confirmation that the submitted report was of a periodical cicada. Cicada Safari also accepts 10-second videos, and calls or chorusing in the audio can be identified to species.

Over 45,000 people have downloaded Cicada Safari, and the Indiana Academy of Science has partnered with several universities to help promote the app's use in mapping Brood X. It is available for iPhones from Apple's App Store and for Android phones from Google Play. Please help us generate the most detailed map of Brood X to date with Cicada Safari!



2021 Indiana Plant Photographic Scavenger Hunt

(Reprinted from Issue 178 of the Newsletter)

Paul Rothrock and Eric Knox, Indiana University Herbarium, Bloomington, IN

Calling all nature photographers!

The Consortium of Midwest Herbaria data portal <<https://midwestherbaria.org>> is one of a dozen linked portals uniting over 400 U.S. herbaria, which provide information about individual plant specimens and the species they represent. The underlying Symbiota platform also supports published descriptions (including Deam's 1940 *Flora of Indiana*), distribution maps, the online Golden Key species identification tool, and field photos of live plants that show the identifying characteristics.

The Indiana Academy of Science is co-sponsoring a statewide Photographic Scavenger Hunt during the 2021 growing season designed to complete the photo gallery of Indiana's plant species. Some species are found throughout Indiana, but most are restricted to certain parts of the state. It is this regionality that elicits a scavenger hunt format. Indiana has nine ecoregions, and the distribution information and flowering times have been used to create seasonally-based 'Hunting Lists' for each region, which can be downloaded at the Scavenger Hunt Website <<https://herbarium.bio.indiana.edu>>. The Hunt Website has a dropbox for submitting digital photos, along with the information of who, what, when, where needed to validate the photo-documentation of Indiana's flora by a network scientists and volunteer citizen-scientists alike. These photographs will also be incorporated into the Golden Key identification tool, which will enable almost everyone to identify almost all Indiana plant species. If you have questions about the Hunt contact <herbaria@indiana.edu>.

Spring has sprung, so pull on your boots, grab your camera, and let's make good use of every sunny day.

***Achyranthes japonica* (Miq.) Nakai** 🌱

Go To Encyclopedia of Life...

Family: Amaranthaceae

Japanese Chaff-Flower

[*Achyranthes bidentata* var. *japonica* Miq.]



FNA **Indiana Flora** Gleason & Cronquist Web Links

Indiana Coefficient of Conservatism: C = null, non-native

Wetland Indicator Status: N/A

Diagnostic Traits: leaves opposite, elliptic, to 13 cm; inflorescences include unbranched, many-flowered terminal spikes; flowers reflexed with age, their tepals fused at base, glabrous.

Japanese Chaff Flower was first reported in Indiana in 2002 and now has spread throughout our Ohio Valley region. This invasive species favors partial shade and moist soil, making it an ideal floodplain weed.

imagine
your photos
here



Open Interactive Map

RESEARCH BRIEF: Potential Effects of Metallic Nanoparticles on Growth of Aquatic Plants

John Pichtel, PhD, Environment, Geology and Natural Resources, Ball State University

Ms. Parisa Ebrahimbabaie is a PhD candidate (and my advisee), who has been engaged in research examining the potential effects of metallic nanoparticles on growth of aquatic plants. There is concern that nanoparticles escape to the environment during manufacture, during routine use, and from sanitary sewer overflows. Regardless of source, it is expected that the majority of released ENPs eventually enter freshwater and marine environments.

Parisa has been growing both cattail (*Typha latifolia*) and sedge (*Carex comosa*) for extended periods in the presence of five different nanoparticles and assessing both uptake of nanoparticles and plant response. Preliminary results indicate that certain nanoparticles impart significant effects on chlorophyll production and activities of plant enzymes. The rates of nanoparticle uptake vary between the two plant species, and also between roots and shoots. The work is on-going.

In the past year Parisa has published two articles related to her research:

- Ebrahimbabaie, E., and J. Pichtel. 2021. Biotechnologies and nanotechnologies for remediation of chlorinated volatile organic compounds: Current perspectives. *Environmental Science and Pollution Research*. DOI: <https://doi.org/10.1007/s11356-020-11598-y>
- Ebrahimbabaie, P., W. Meeinkuirt, and J. Pichtel. 2020. Phytoremediation of engineered nanoparticles using aquatic plants: Mechanisms and practical feasibility. *Journal of Environmental Sciences* 93: 151–163.

NEWS FROM INDIANA GEOLOGICAL AND WATER SURVEY

Todd A. Thompson, Ph.D., Director and State Geologist

1. The Indiana Geological and Water Survey is making all of its over 2000 publications open-access. From February to December of 2020, more than 30,000 PDFs were downloaded. If a publication is yet available, request it from the IGWS Bookstore.
2. Researchers at the Indiana Geological Survey won the 2020 Esri International Cartographic Association (ICA)/International Map Industry Association (IMIA) Recognition of Excellence in *Cartography for the map Quaternary Geology of the Indiana Portion of the Elkhart 30x60-Minute Quadrangle* by José Luis Antinao, Robin F. Rupp, and Thomas Valachovics. The judges remarked that this map “is an exceptional example of design excellence that can be achieved for a geological map — one of the most complex map forms — through the subtle use of colors and exaggerated terrain.” They also praised the excellent use of visual hierarchy, which helps to draw attention to “the underlying causes of the geologic patterns, such as the influence of the ice front on quaternary deposits.”
3. Dr. Maria Mastalerz at the Indiana Geological and Water Survey received the Reinhardt Thiessen Medal. This medal recognizes persons who have made significant achievements and outstanding contributions in the fields of coal and organic petrology.

ENTOMOLOGY & ZOOLOGY SECTION NEWS

The Entomology & Zoology Section met on May 13. Eleven people attended from the University of Indianapolis, Indiana University Purdue University Columbus, and the Indianapolis Zoo. Victoria Gilles (IUPUC) shared a presentation about her work tracking global mayfly diversity, and Sergio Henriques (Global Center for Species Survival, Indianapolis Zoo) shared a presentation about "How To Protect 99% of All Animal Species." A robust discussion of global conservation efforts followed.

MOSQUITO CREEK BIOBLITZ: June 19-20

The Indiana Academy of Science is holding its annual BioBlitz to discover biodiversity in our state on June 19th - 20th at Mosquito Creek, south of Corydon, IN. If you're an organismal biologist interested in participating, please sign up here: <https://forms.gle/YJmBh4epYLVPLsvN9>. There will be free food and free lodging! Just sign up for your lodging here: <https://forms.gle/EzkPdejKYwLdZQbZ6>.

IAS AWARDS REMINDERS

Award Nominations are accepted any time during the year, but are due by October 15th of each year for consideration for presentation at the Spring Academy Annual Meeting. Details & nomination forms available at < <https://www.indianaacademyofscience.org/awards-fellows>>.

Procedure for Nomination of Individuals for IAS Fellows

A Fellow is a member of the Academy (minimum of 5 years) who has demonstrated service to the Academy and to the advancement of science in Indiana; service to education in science; and achievements in scientific research. Nature of service to the Academy includes attending Indiana Academy of Science meetings, presenting papers at meetings, publishing in the Proceedings; serving as an officer, as a section or committee chair, as a committee member; playing a role in organizing Academy activities.

The Awards Committee of the Indiana Academy of Science accepts nominations any time of the year. Forms for Fellow may be found at <http://www.indianaacademyofscience.org/award-fellows>. Please keep in mind that Recommendations for Academy Fellows are put forth by Fellows of the Academy only. Recommended nominees must be current members of the Indiana Academy of Science. Please direct questions or send nominations to: awards@indianaacademyofscience.org.

Distinguished Scholar Award & Distinguished Service Award

The Distinguished Scholar Award of Indiana Academy of Science is bestowed upon individuals who have been recognized by the Academy as having an exceptional record of scholarship. Award recipients have been selected by the Council, and acknowledged through awards made at the annual Academy meeting. The Council may select and honor one Academy member each year for his or her outstanding scholarship.

The Distinguished Service Award of Indiana Academy of Science is bestowed upon individuals who have been recognized as having supported the Academy through service exceeding any normal expectation. Award recipients have been recognized by the Academy Council, and acknowledged through awards made at the annual Academy meeting. The Council may select and honor one Academy member each year for his or her outstanding service to The Academy.

JOB ANNOUNCEMENTS

Chemistry Lab Technician, Purdue Northwest

https://careers.purdue.edu/PNW/job/Hammond-Chemistry-Lab-Technician-IN-46320/730383400/?locale=en_US

Anatomy/Physiology Lecturer and Biology Lab Coordinator, Indiana U. Purdue U. Columbus

<https://indiana.peopleadmin.com/postings/10821>

FISH AND WILDLIFE NEWS

The Spring 2021 issue of Fish and Wildlife News is out! The current issue includes numerous feature stories about fish, fisheries, and the conservation of all wildlife. Access the current issue and subscribe to receive email alerts when new issues are posted by visiting the following web page

<https://www.fws.gov/home/fwn/index.html>

SCIENCE WITH A TWIST

The *Science With A Twist* link below showcases Dr. Nils *Johansen*, past president of the Indiana Academy of Science. Nils Johansen is an American geotechnical engineer, educator, consultant. Registered professional engineer, *Indiana, Alaska*. *Science With A Twist* is a community outreach initiative of the Indiana Academy of Science, in partnership with the Evansville Museum in Evansville Indiana. *Science With A Twist* has successfully provided monthly evening science talks in combination with good food, drink and networking for over 500 young professionals at the Bokeh Lounge in Evansville, Indiana over the past several years.

<https://www.facebook.com/evansvillemuseum/videos/142069467742458/>

UPCOMING NEWSLETTER DEADLINES

Send items to the Editor, Luke M. Jacobus, [lmjacobu @ iupuc.edu](mailto:lmjacobu@iupuc.edu)

- **Aug 15** for September 2021 (Issue 180)
- **Nov 15** for December 2021 (Issue 181)
- **Feb 1** for February 2022 (Issue 182)
- **April 15** for May 2022 (Issue 183)

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