



NEWSLETTER

NEW JERSEY ACADEMY OF SCIENCE



Volume 44, 1

Winter 2019

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From the President

Dear NJAS Members and Friends

The NJ Academy of Science is a non-profit organization whose mission is to preserve and promote the advancement of STEM-related fields within the NJ scientific community. The organization is 100% funded by its membership dues, publications, fundraisers, and private donations. It is our hope that our NJAS members and friends continue to contribute to our mission. Thank you to all of you who have renewed your membership for 2019 and will continue to renew it for 2020.

This year's 64th NJAS Annual Meeting took place on May 18, 2019 at Kean University. We had a great turnout, with over 100 participants at our Annual Meeting. Our keynote speaker was Dr. Daniela Shebits, who gave a talk on the Zika virus and its [potential] public health effects in the United States. In addition, a remarkable and stimulating diversity of scientific topics were discussed at the Junior and Senior Academy presentations. The day culminated with the Awards Ceremony, which acknowledged the winners of the junior academy, senior academy and the grant-in-Aid awardees.

We are proud to announce that the NJ Academy of Science selected new executive officers in the Fall of 2019. The open executive officer positions were filled by NJAS members and faculty members from Montclair State University, William Paterson University, Kean University, Rutgers University, Fairleigh Dickinson University, Raritan Valley Community College, Bard HS Early College, AT&T-Labs Advanced Technologies, Brookdale Community College, Fort Lee HS, High Technology HS, Biotechnology HS, and Bergen County academies. This is an impressive team that represents various academic and private institutions in the state of New Jersey - which is of utmost importance for the growth and diversification of our organization. As a team, we are working vigorously to expand on the Academy's activities for the future, and request that NJAS members participate and help us advertise and promote these activities. More information will be in the Newsletters.

Next year's 65th NJAS Annual Meeting will take place on May 2, 2020 at Kean University. The meeting theme topic will be "Cybersecurity and Privacy". The Keynote Speakers will be **Mr. Jonathan Gonzales-Quintero**, AT&T Lead Member of Technical Staff/Security Technology & Architecture and **Professor Mike Qaissaunee**, Dept. Chair - Engineering Technology and Director of Brookdale Community College Cyber Center. Recently, the NJAS executive board has developed collaborations with Rutgers Post-Doctoral Affairs office and NJ STEM Pathways network to help host the NJAS seminar series starting 2020. There will be four themes throughout the year, if you are interested in serving as a guest speaker, please contact us at njacademyofscience@gmail.com.

Additionally, with a new editorial staff, we are encouraging more participation in submissions of manuscripts to our peer-reviewed journal *The Bulletin*. We promise faster turnaround times and better communications with researchers. Help our Bulletin become the vehicle for research communications within New Jersey and beyond. For any questions regarding submissions of manuscripts please email questions to NJAS.publications@gmail.com.

Lastly, Let's reflect on Henry Ford's statement that "Coming together is a beginning. Keeping together is progress. Working together is success." We will continue to strive by these inspirational words in order to further advance the mission of the NJAS in the years to come. We thank you for your time and are looking forward to an exciting 2020!

Season's greetings and a Happy New Year



Maria Agapito, PhD - President
NJ Academy of Science

New Executive Board Members

President	Maria Agapito, Ph.D.	Past President	Eric Iannacone, Ph.D.
Vice President	Dan Nicholas Celenti, Ph.D.	Treasurer	Nan Perigo, MS
Secretary	TBA	Chairperson of the Science Program	James T. Arnone, PhD
Editor of the Newsletter	Julian P. Keenan, Ph.D.	Bulletin Co-Editors	Kendall Martin, Ph.D. Julian P. Keenan, Ph.D. Joseph Spagna, Ph.D.
Director of the Junior Academy	Brittany West, MS	Assistant Director: of the Junior Academy	Rebecca Lyddon, Ph.D.
Program Development Coordinator	TBA	Social Media President Editor	Mr. Joshua Egwuonwu
Social Media VP Editors Ms. Natalie Radu Mr. Kush Chaudhari Ms. Erica Choe			

MARK YOUR CALENDARS

The 65th NJ Academy of Science (NJAS) Annual Meeting will be held **May 2, 2020**. The meeting will take place at Kean University. The meeting theme topic will be “Cybersecurity and Privacy”. The Keynote Speakers will be **Mr. Jonathan Gonzales-Quintero**, AT&T Lead Member of Technical Staff/Security Technology & Architecture and **Professor Mike Qaissaune**, Dept. Chair - Engineering Technology and Director of Brookdale Community College Cyber Center.

PLEASE SAVE THE DATE.

Plan on attending, submitting to and supporting the 65th NJAS Annual Conference. The NJAS goals for this year are to sponsor a vendor show at the Annual meeting, released our scientific publications (*Bulletin* and Newsletter) and enhance NJAS network by facilitating scientific and professional development seminars.

The 64th NJ Academy of Science (NJAS) Annual Meeting Keynote Speaker Profile



Daniela Shebitz, Ph.D.

Executive Director and Associate Professor School of Environmental and Sustainability Sciences, Kean University

Dr. Daniela Shebitz is an ethnobotanist, plant ecologist and restoration ecologist whose research focuses on evaluating the effects of land management on plant diversity in a wide range of locations from the Pine Barrens of New Jersey to the savannas of the Pacific Northwest and rainforests of Costa Rica. Daniela is currently the Executive Director and Associate Professor in Kean University's School of Environmental and

Sustainability Sciences where she weaves research and experiential learning into courses for students majoring in Environmental Biology, Environmental Science, and Sustainability. She holds a Ph.D. in Ecosystem Science from the University of Washington, Seattle (2006) and a Masters Degree in Environmental and Forest Biology from the SUNY College of Environmental Science and Forestry (Syracuse, NY). Daniela serves on the board of the Society of Ethnobiology, the New Jersey Higher Education Partnership for Sustainability (NJHEPS) and the Hanson Park Conservancy. She is the mother of two boys and loves to spend her time hiking, traveling, eating great food, and exploring with her family (including her dog, Rosie).

SUBMIT TO THE *BULLETIN* OF THE NJ ACADEMY OF SCIENCES

Please consider submitting your findings to the prestigious NJAS official journal. Peer reviewed and indexed in PubMed, this journal is the perfect location for your research. We are currently on a twice-yearly publication schedule, which consists of a spring issue and a fall issue.

Deadline for Spring 2020 issue is April 15th, 2020. For details:

Anyone having questions about the review and/or publication process should contact the editor at NJAS.publications@gmail.com

New Jersey Academy of Science: 64th Annual Meeting Winners

NJAS Senior Academy: Collegiate



First Place, Senior Academy: Marius Pelmus,
Seton Hall University
Topic: Photoactivity Restorations In Donor-Acceptor Phthalocyanine Photocatalysts



Second Place, Senior Academy: Can Ozger,
Ramapo College of New Jersey
Topic: Perturbation Of Working Memory, Rehearsal And Attention In College-Aged Adults Using High Density Event-Related Potentials (Derps)



Third Place, Senior Academy: Jane Breslin,
Seton Hall University
Topic: The Effect Of Microtubule-Associated Protein Tau On Polymerization Of Cancer Microtubules

NJAS Junior Academy: High School

Engineering Section:



First Place: Zachary Lyandres
Topic: Analysis of Orientation in Fluid-Confined Cylindrical Nanoporous Systems

Second Place: Suhani Balachandran

Topic: Comparing the Effectiveness of a Lab-Grade Shaker to a Student-Built Device

Third Place: Jeffrey Min

Topic: Building and Testing a Lego Polymerase Chain Reaction Thermal Cycler

Physics Section:



First Place: Oreoluwa Alao
Topic: The Effect of a Container's Surface Area-to-Volume Ratio on Cavitation Activity

Second Place: Kosei

Dohi

Topic: Simulating High Energy Physics Events with Conditional Variational Autoencoders



Third Place: Khushi Sabuwala
Topic: The Effect of Pyrolytic Graphite Stabilizing Distant on the Diamagnetic Levitation Strength of Neodymium Iron Boron.

Math & Computer Science Section:



First Place: Arya Tschand
Topic: Effectiveness of Artificial Intelligence Software (Dynamic Linear Regression) Implementation Into an Autonomous Micro-Irrigation System on Agriculture Health.

Second Place: Selena

Liu

Topic: Using Machine Learning to Detect Whether a Mole is Cancerous



Third Place: Thomas Makin

Topic: An Analysis of the Differences in Electronic Device Geolocation Accuracy Using Network Ping vs.

Global Positioning System

Health & Medicine:

First Place: Lauren

Aslami

Topic: The Effect of Carbonic Anhydrase Inhibition on Mast Cell Development



Second Place: Lucas Goldman:

Topic: Targeted A2AR Therapy for Osteoarthritis

Third Place: Alex Vardy

Topic: Comparing Gait Patterns Between Healthy and Parkinsonian Rats

Cell & Molecular Biology Section:



First Place: Jonas Simmons
Topic: Effect of Tumor Presence on the Immune Response in *C. elegans* Against *Serratia marcescens*

Second Place: Shreya Gupta
Topic: The Anthelmintic Effect of Natural Compounds on Adult and Dauer *C. elegans* Longevity



Third Place: Raehash Shah
Topic: The Effects of T cells and Streptolysin on Repair Mechanisms in the Heart

Chemistry & Biochemistry Section:

First Place: Deepak Gopalakrishnan
Topic: Exploring the Effect of Stereoisomeric Identity on the Insulin Receptor Binding Affinity of Chaetochromin



Second Place: Isabelle Kang
Topic: Forming Gel Carbon Nanotube Nanocomposites for Catalytic Scaffolded Frameworks

Third Place: Erica Choe

Topic: The Effect of Human Hepcidin and *Pseudosciaena crocea* Hepcidin on the inhibition of *Staphylococcus epidermidis* biofilm formation



Ecology Section



First Place: Danielle Berger
Topic: Effect of Temperature on Early Life History of Summer Flounder (*Paralichthys dentatus*)

Second Place: James Alexander Mueller-Lewis
Topic: Determination of Polycyclic Aromatic Hydrocarbons in Aquatic Organisms



Third Place: Will Chi and Jonathan Tenenbaum
Topic: Assessing the Filtration Efficacy of Free-Floating Aquatic Plants and

Identifying Self-Purification Potential Through DNA Barcoding

Botany Section:

First Place: Claudia Zhang
Topic: The Production of Cellulose Acetate and Starch-Based Bioplastics from Duckweed

Second Place: Arsh Singhal
 Topic: The Effect of Hydroponic Farming vs. Traditional Soil Systems on the Biomass of Lettuce Plants (*Lactuca sativa*)



Third Place: Dylan Cornejo
 Topic: The Use of a Paper-Based Growing Medium in a Hydroponic Drip Irrigation System

Psychology & Animal Behavior Section:

First Place: Edward Kim
 Topic: Examining the Evolutionary Adaptations to Extreme Environments Through Analysis of Prey Capture Performance in *Astyanax mexicanus* Larvae



Second Place: Mia Ladolcetta
 Topic: The Effect of Differently Tempoed Music on Task Performance



Third Place: Eileen Liang
 Topic: Testing the Productivity of Different Brainstorming Methods

2019 Grants in Aid Winners



Left: First Place
 Tiffany Fang



Right: Second Place
 Dylan Cornejo



Left: Third Place
 Kelly Qiang

GRANTS IN AID APPLICATION DEADLINES

NJAS wishes to announce the 2020 Grant-in-Aid (GIA) Program. This is a competitive award to fund high school student research Projects.

GIA Applications must be submitted by Monday December 23rd, 2019.

NJ high school students grades 9-12 may apply for a grant award of up to \$150 by submitting a research proposal on a science or math project they will perform in the 2019-20 academic year. Grant winners must present their research results at the NJ Academy of Science Annual Meeting to be held this Spring, May 2, 2020. To request an application for the GIA Program, contact: Ms. **Brittany West**, NJAS GIA Program Coordinator, via email at: bblackman86@gmail.com.

NJAS is also seeking GIA reviewers, please contact Ms. West for your interest in serving as NJAS Grant reviewer (BS, MS, or Ph.D. required).

64th NJ Academy Science Annual Meeting Judges

Thank you for your Time and Support

Dr. Anumeha Muthal.	Ms. Ariel Valverde
Dr. Laura Lorentzen	Dr. Tiffany Morris
Ms. Nancy Farlow	Dr. Roberta Batorsky
Ms. Danisha Moodie	Dr. Barbara Heard
Dr. Kendall Martin	Dr. James Arnone
Dr. Michael Lea	Dr. Sofya Borinskaya
Dr. Jing Gao	Mr. David Gamarra

NEWS



NJ Academy of Science joined the NJ STEM Pathways Network Meeting on December 6, 2019.

ENVISIONING TOMORROW'S EARTH

The 2020 AJAS/NAAS/AAAS Conference will take place February 12-16 at the Washington State Convention Center in Seattle, WA.

AJAS is America's only honor research society for high school scientists. Each Affiliated state's Academy of Science selects the premier middle and high school researchers from their state to be lifetime fellows in AJAS (Junior Academy).

Each year, AJAS hosts a conference to honor these students and to induct them as fellows into AJAS. The conference is always held in conjunction with the American Association for the Advancement of Science's (AAAS) Annual Meeting.

The NJAS Senior academy members who travel to Seattle for the AAAS Annual Meeting are encouraged to visit the students at the AJAS Poster Session and to attend the AJAS Oral Presentations.

The following Junior Academy students will serve as **NJ Academy of science delegates** at the 2020 AJAS/NAAS conference:

Ms. Claudia Zhang
Ms. Erica Choe
Ms. Lauren Aslami
Mr. Deepak Gopalakrishnan
Ms. Oreoluwa Alao
Mr. Arya Tschand

The NJAS executive board would like to extend their deepest gratitude to the parents and chaperones (Mr. Roche and Ms. Babbin) for assisting our Junior Academy members to attend the AJAS/NAAS conference.

Letters to the NJAS Newsletter Editor

We encourage a diversity of voices and views in our letters. Letters may include a review of a book, opinions about a movie in relation to science, ask a scientific question to the NJAS community, submit a piece of art in relation to science (may serve as the front page picture), opinions to current science news or issues, or can refer to an article that has appeared within the last two issues of the NJAS newsletter.

Letters should preferably be 150 to 175 words and must include the writer's address and phone number (only the name will be published). A piece of Art may be submitted electronically in a JPEG format. Letters or art pieces should be exclusive to the NJAS "Newsletter."

To send a Letter or Art to the Editor: email letter/art to NJASNewsletter@gmail.com, must include email subject as "Letter/Art to the NJAS Newsletter Editor."