

**NINETY-EIGHTH ANNUAL MEETING  
of the  
ALABAMA ACADEMY OF SCIENCE, INC.**



**Meeting Jointly With**

**ALABAMA JUNIOR ACADEMY OF SCIENCE GORGAS  
SCHOLARSHIP COMPETITION**

**PROGRAM BOOK  
Virtual Program**

**March 18-19, 2021**



UNIVERSITY OF  
SOUTH ALABAMA

**Mobile, AL**

**[www.alabamaacademyofscience.org](http://www.alabamaacademyofscience.org)**

**<http://alabamajunioracademyofscience.org>**

**<http://alabamajunioracademyofscience.org/home/gorgas-scholarship-competition/>**

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99 <sup>th</sup> Annual Meeting (2022).....	Inside Back Cover



From the Local Arrangements Committee

Dear Colleagues in Science,

It is my pleasure to host the Annual Meeting of the Alabama Academy of Science for 2021. We were looking forward to seeing you in person at the University of South Alabama this spring, but COVID-19 had other plans. When we discussed the Annual Meeting, we knew that we could not completely cancel as we had last spring because of the importance of our mission of bringing together scientists, science educators, and students from high school through post-doctoral fellows in one, unique venue. The Alabama Academy of Science has a special place in the State, providing behind the scenes support for the State Science Fair System, the Science Olympiad, the Alabama Junior Academy of Science, and the Gorgas Scholarship Competition. This year, we are proud to be the primary host of the Alabama State Science Fair, also being held virtually, in partnership with Auburn University. We are also proud to have founded the Alabama Science Trail, accessible through our main website, [www.alabamaacademyofscience.org](http://www.alabamaacademyofscience.org), which provides a listing of many of the best science destinations for students, educators, and families in the State of Alabama.

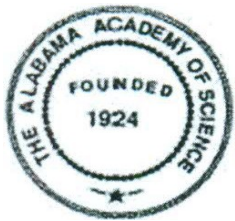
This year's meeting will be virtual, but is designed to be highly interactive and to provide an excellent venue for the dissemination of original scientific and creative work from all STEAM disciplines through the use of Zoom meeting presentations in small, discipline specific groups, virtual poster sessions using a 3D interactive poster hall, and a thought-provoking Keynote address, from Dr. Errol Crook, the 2021 Gardner Award-winning Director of the South Alabama Center for Healthy Communities; Professor and Abraham Mitchell Chair of Internal Medicine. Dr. Crook will be discussing his federally funded work on health disparities in the State of Alabama, a timely topic indeed.

We are especially pleased to be able to host the Alabama Junior Academy of Science, and the Gorgas Scholarship Competitions virtually this year, with outstanding finalists from across the State coming to compete for thousands of dollars in scholarships and the prestigious designation of AJAS and Gorgas Winner. Each year we help to launch the careers of young scientists in leading institutions both within the state and around the Nation, with our past winners going to such universities as Auburn, University of Alabama, Massachusetts Institute of Technology, and the University of Southern California. The hands on, in-depth learning that these students engage in is life changing and prepares our students for success in this world of rapid changes and big challenges. Please take the time to visit the Journal of the Alabama Academy of Sciences and catch up on cutting edge science from authors right here in Alabama, and for our professional and student members, please consider submitting your own original research, reviews, and editorials for our next issue!

I hope you enjoy your virtual experience, and we look forward to seeing you in person next year!

Jack Shelley-Tremblay  
Professor and Chair of Psychology  
University of South Alabama  
President-Elect, Alabama Academy of Sciences





## ALABAMA ACADEMY OF SCIENCE, INC

Fellow AAS Members and Esteemed Guests,

Welcome to the 98<sup>th</sup> meeting of the Alabama Academy of Science. As you know, the Alabama Academy of Science has a long history of bringing together educators, researchers, students, and the public at large. It has been my privilege to serve as the president of this prestigious organization this year.

It has been a trying year, not just for the Academy, not just for scientists, but for all people in Alabama not to mention the rest of the world. The challenges we have faced this year in the wake of a global pandemic have seemed, at times, insurmountable. You or someone you know may have faced financial hardships due to economic downturn or the loss of a job. Perhaps you or someone close to you contracted the coronavirus and battled through illness. Through all of the adversities of the past year, though, we have witnessed the perseverance of humankind. We have seen a marvel of science, teamwork, and determination in the development of multiple vaccines to fight this virus. We have witnessed educators go above and beyond their job-descriptions and comfort zones to develop and implement remote learning curriculums. We have seen businesses modify their practices to accommodate necessary safety measures in the best interests of their employees while still turning a profit. Through determination and ingenuity, we make the best of the situation we find ourselves in.

This is precisely the theme of this year's annual meeting! The Alabama Academy of Science has been holding meetings in person for nearly a century. However, this year that is not a feasible option, so an alternate option was devised. Through the guidance of our executive director, Dr. Larry Krannich, and the work of our executive committee, especially Dr. Jack Shelley-Tremblay, the meeting was seamlessly moved to a virtual format. While we may be disappointed that we will not be able to meet in person, this organization's history of bringing together educators, researchers, and students for the betterment of science will continue. We may even be able to reach people who could not otherwise travel to a meeting across the state!

I am looking forward to experiencing this year's annual meeting of the Alabama Academy of Science in a new and innovative way, and I hope to "meet" you there!

Sincerely,

Cameron Gren, Ph.D.  
President, Alabama Academy of Science

PRESIDENT • Cameron Gren  
Department of Chemistry and Industrial Hygiene • University of North Alabama  
Florence, AL 35632 • (256)765-6027  
Email: cgren@una.edu

## LOCAL ARRANGEMENTS COMMITTEE

The Academy expresses its appreciation to the University of South Alabama and John Shelley-Tremblay, Chair, Department of Psychology, the University of South Alabama for planning and hosting this 98<sup>th</sup> Annual Meeting. A special thanks goes to Dr. Karl Jahnke from the South Alabama Department of Art for designing the CANVAS for the Academy's first-ever virtual annual program. We also thank Dr. Raj Chaudry, Director of the South Alabama Innovation in Learning Center for his support, and Mr. Jason Smith and Mr. Wesley Woolverton for their technical expertise and invaluable contributions to making the meeting a success.

## GENERAL INFORMATION

- At least **one of the authors of a presented paper or poster must be a member** of the Academy.
- The **paper or poster presenter must be registered for the meeting.**
- Please follow these directions for logging into the 98<sup>th</sup> Annual program and accessing the CANVASs denoted in the program booklet. Where applicable, there will be specific Zoom links in CANVAS. The VIRTUAL CONFERENCE SITE is hosted in the CANVAS Learning Management System at the University of South Alabama.
  - You may now register for access to the virtual conference site:  
<https://jagsonline.instructure.com/enroll/J4BLFB>
  - This is the site where you will go to make and hear presentations.
  - You must register and PAY on the Academy of Sciences Page, and then register and upload your materials on the jagsonline instructure CANVAS site (above).
  - Follow specific Zoom links in CANVAS to program when indicated in CANVAS.
- Please be aware that the conference site is UNDER CONSTRUCTION but will be live beginning March 1st, 2021, to allow for uploading materials. Presenters who have not registered for the conference by March 17th may be blocked from the conference system.
- Where there is only a single poster presentation for a Section, that poster will be given as a 2-minute presentation after the Section's paper session. This applies to Section X.
- Where there is only a single paper presentation for a Section, that paper will be given as a 20-minute presentation/Q&A at the beginning of the Section's poster session. This applies to Section VIII.
- Section II, III, & IV programming has been combined to provide a critical mass of presenters.

## POSTER INFORMATION

Alabama Academy of Science Poster set-up begins March 1<sup>st</sup> with the submission of the digital poster materials. Each poster will be added to the CANVAS by the Local Arrangements Chair and available for presentation, viewing, and discussion at the times indicated in the program. Links to view posters and hear discussions are available in CANVAS. Each poster is allotted a **4' (horizontal) x 3' (vertical) format of display space** (the template default). Poster presentations may be viewed in the VIRTUAL EXHIBIT HALL throughout the conference. Still, poster presenters are assigned a specific time slot (see below and in the detailed section programs) to present and discuss their posters. Student presenters will also be judged by SECTION JUDGES and winners of poster competitions will be notified by Friday, March 19th, 2021. Awards will be distributed by US Mail.

Authors for the section posters should be present for discussions with viewers and competition judges designated in the respective section program and managed by the president. Please see the detailed program for assigned CANVAS and time. The template has been sent to accepted presenters and is also available on the Academy web site under Annual Meeting ➔ Poster Information.

**Gorgas Scholars Posters** are allotted **4' (horizontal) x 3' (vertical) format of display space**. Posters will be available for viewing in the **Sci-Mix from 5:00 – 6:20 PM on Thursday**, prior to the joint “banquet” program in the CANVAS indicated in the program. All registrants (AAS, AJAS, Gorgas, and school delegations) are invited to view posters at Sci-Mix.

### Poster Viewing Times

#### ***Thursday: See CANVAS Designations in Detailed Program***

<i>Biological Sciences, I</i> .....	10:20 AM – 12:20 PM; 1:00 PM – 3:00 PM
<i>Chemistry, II</i> .....	11:40 AM – 12:40 PM
<i>Physics and Mathematics III</i> .....	11:40 AM – 12:40 PM
<i>Engineering &amp; Computer Science, IV</i> .....	11:40 AM – 12:40 PM
<i>Social Sciences, V</i> .....	1:00 PM– 2:00 PM
<i>STEM Education, VII</i> .....	1:00 PM– 2:00 PM
<i>Environmental and Earth Sci., VIII</i> .....	2:30 PM– 3:30 PM
<i>Health Sciences, IX</i> .....	11:20 AM – 12:30 PM
<i>Bioethics and History &amp; Philosophy of Science</i> .....	4:10 PM– 4:30 PM
<i>Sci-Mix (Gorgas posters)</i> .....	5:00 PM – 6:20 PM

## SECTION BUSINESS MEETINGS

The following Sections will have Business Meetings at the indicated times on Thursday, March 18<sup>th</sup>, to elect Chairs and/or Vice-Chairs as denoted. See also Section programs for details.

<i>Biological Sciences, I [Chair and Vice-Chair]</i> .....	<i>10:10 AM</i>
<i>Physics and Mathematics III [Vice-Chair]</i> .....	<i>12:40 PM</i>
<i>Engineering &amp; Computer Science, IV [Vice-Chair]</i> .....	<i>12:40 PM</i>
<i>Social Sciences, V [Vice-Chair]</i> .....	<i>12:00 PM</i>
<i>STEM Education, VII [Vice-Chair]</i> .....	<i>2:00 PM</i>
<i>Environmental and Earth Sci., VIII [Chair and Vice-Chair]</i> .....	<i>2:20 PM</i>
<i>Bioethics and History &amp; Philosophy of Science [Vice-Chair]</i> .....	<i>4:00 PM</i>

**PROGRAM OF THE ALABAMA ACADEMY OF SCIENCE  
March 18-19, 2021**

**ALABAMA ACADEMY OF SCIENCE  
Thursday, March 18, 2021**

**8:00 AM – Noon: Academy of Science Program Paper Sessions** (Zoom lobby link available on the CANVAS conference web site)

8:30 AM	Biological Sciences I (Section I) .....	Zoom Room 1
9:00 AM	Physics and Mathematics (Section III) .....	Zoom Room 2
9:00 AM	Engineering and Computer Science (Section IV).....	Zoom Room 3
9:00 AM	Social Sciences I (Section V) .....	Zoom Room 4
8:50 AM	STEM Education (Section VII) .....	Zoom Room 5
9:00 AM	Health Sciences (Section IX) .....	Zoom Room 6

**10:00 AM – 4:30 PM AAS Posters** (Virtual exhibit hall available from the CANVAS conference web site)

10:00 AM – 4:30 PM Poster Viewing (All Sections)..... See CANVAS address in Program

Authors present:

10:20 AM – 12:20 PM.....	Biological Sciences (Section I)
11:20 AM – 12:30 PM.....	Health Sciences (Section IX)
11:40 AM – 12:40 PM.....	Chemistry (Section II)
11:40 AM – 12:40 PM.....	Physics and Mathematics (Section III)
11:40 AM – 12:40 PM.....	Engineering and Computer Science (Section IV)
1:00 PM – 3:00 PM .....	Biological Sciences (Section I)
1:00 PM– 2:00 PM .....	Social Sciences (Section V)
1:00 PM– 2:00 PM .....	STEM Education (Section VII)
2:30 PM– 3:30 PM .....	Environmental and Earth Science (Section VIII)
4:10PM– 4:30 PM .....	Bioethics and History & Philosophy of Science (Section X)

**1:00 – 5:00 PM: Academy of Science Program Paper Sessions**

1:00 PM	Bioethics & History & Philosophy of Science (Section X) .....	Zoom Room 1
2:00 PM	Anthropology (Section VI).....	Zoom Room 2

**5:00 – 6:20 PM** Sci-Mix/Viewing by all of Gorgas Scholars’ Posters..... CANVAS

**6:30 PM** Joint AJAS/AAS “Banquet” Program .....

Keynote speaker: Dr. Errol D. Crook, Director of the Center for Healthy Communities, University of South Alabama: *From Bench to Community, Understanding Health Disparities Before, During and After COVID-19*

Presided by: Dr. Cameron Gren, President, AAS  
Avery Pyles and Hailey Holbert, Co-Presidents, AJAS



**ALABAMA JUNIOR ACADEMY OF SCIENCE**

**March 18-19 2021**

**CANVAS**

**Thursday, March 18, 2021**

12:30 -1:00 PM	Joint AAS/AJAS Business.....	CANVAS
2:00 – 6:00 PM	Registration.....	CANVAS
4:00 PM	AJAS Orientation .....	CANVAS
5:00 – 6:20 PM	“Sci-Mix”: Viewing by all of Gorgas Scholars’ Posters .....	CANVAS
6:30 PM	Joint AJAS/AAS “Banquet” Program .....	CANVAS

Keynote speaker: Dr. Errol D. Crook, Director of the Center for Healthy Communities, University of South Alabama: *From Bench to Community, Understanding Health Disparities Before, During and After COVID-19*

Presided by: Dr. Cameron Gren, President, AAS  
Avery Pyles and Hailey Holbert, Co-Presidents, AJAS

**ALABAMA JUNIOR ACADEMY OF SCIENCE**  
**Friday, March 19, 2021**

7:30 AM	Judges/Students Check In.....	CANVAS
8:00 AM	Welcome.....	CANVAS
8:05 AM	Software Orientation.....	CANVAS
8:15 AM	Program Orientation AJAS Students.....	CANVAS
8:15 AM	Program Orientation Judges .....	CANVAS
8:50 AM – 1:30 PM	Paper Competition	
8:50 AM	Session 1, Physical Science .....	CANVAS
8:50 AM	Session 1, Medicine and Health, Behavioral, and Social Sciences .....	CANVAS
10:00 AM	Session 2, Life Sciences .....	CANVAS
11:10 AM	Session 3, Engineering, Mathematics and Computer Science.....	CANVAS
12:20 PM	Session 4, Environmental Science, Earth Science, and Space Science	CANVAS
BREAK	Return at 2:00 PM for AJAS Finals	
2:00 PM	AJAS Paper Competition Finals.....	CANVAS
3:40 – 4:00 PM	AJAS Judges meeting .....	CANVAS
4:00 PM	AJAS Winners Announcement.....	CANVAS

**GORGAS SCHOLARSHIP COMPETITION**

**March 18-19, 2021**

**CANVAS**

**Thursday, March 18, 2020**

4:00 – 5:00 PM	Gorgas Check in .....	CANVAS
4:30 - 5:00 PM	Gorgas Orientation .....	CANVAS
5:00 – 6:20 PM	“Sci-Mix”: Viewing by all of Gorgas Scholars’ Posters .....	CANVAS
	See CANVAS for link to viewing and discussion	
6:30 PM	Joint AJAS/AAS “Banquet” .....	CANVAS

Keynote speaker: Dr. Errol D. Crook, Director of the Center for Healthy Communities, University of South Alabama: *From Bench to Community, Understanding Health Disparities Before, During and After COVID-19*

Presided by: Dr. Cameron Gren, President, AAS  
Avery Pyles and Hailey Holbert, Co-Presidents, AJAS

# GORGAS SCHOLARSHIP COMPETITION

University of South Alabama

Friday, March 19, 2021

7:30 AM	Judges & Students Check in.....	CANVAS
8:00 AM	Welcome.....	CANVAS
8:05 M	Software Orientation.....	CANVAS
8:15 AM	Program Orientation for Students.....	CANVAS
8:15 AM	Gorgas Judges Orientation.....	CANVAS
10:00 AM – 12:40 PM	Individual Interviews with Judges.....	CANVAS
12:30 PM	Gorgas Judges Break	
1:00 PM	Gorgas Judges Executive Session.....	CANVAS
4:00 PM	Winners Announced .....	CANVAS

The Alabama Science Scholar Talent Search and Gorgas Scholarship Competition are supported and administered by the Alabama Academy of Science, Inc.

The Gorgas Scholarship Competition website,  
<http://alabamajunioracademyofscience.org/home/gorgas-scholarship-competition/>,  
contains detailed information on the annual competition and awards available to winners and finalists.

**Joint Paper Session**  
**SECTION I – BIOLOGICAL SCIENCES**  
**SECTION VII: STEM EDUCATION**  
**CANVAS:**  
**Thursday Morning, 8:30 AM – 9:50 AM**

**Brad Bennett and Jeff Morris, Presiding**

**Biological Sciences Paper**

1. 8:30 **\*\*u** Detection of Large Cat Species in Central Belize Using Camera Trap Technology. *Anjolaoluwa Lawani*, Talladega College; Andrew Coleman, Talladega College.

**STEM Education Papers**

1. 8:50 **\*\*u** Podcast as an Engagement Tool in the Classroom and Beyond. *Derek Dang*, Emily Stephens, Parbhoo Karishma, Sahar Moughnyeh, Ryleigh Fleming, Sarah Adkins-Jablonsky, and Samiksha Raut, University of Alabama at Birmingham.
2. 9:10 Genetics Course-Based Undergraduate Research Experience (CURE) Exploring Disease Utilizing Bioinformatics & Nematodes in Hybrid Learning. *Ashley Turner*, Jacksonville State University; Natalie Forte, Jacksonville State University; Anil Challa, University of Alabama at Birmingham; Katelyn Cooper, Arizona State University.
3. 9:30 **\*\*g** Fostering Online Student Engagement with Effective Technological Tools. *Bre Minniefield* and Samiksha Raut, University of Alabama at Birmingham.
4. 9:50 **\*\*g** Why Does Our Work Matter? Connecting Microbiology Laboratory Curricula to North Birmingham Stakeholders. *Sarah Adkins-Jablonsky*, University of Alabama at Birmingham; Qutia Roberts, University of Alabama at Birmingham; Brad Bennett, Samford University; Rob Akscyn, Jeff Morris, University of Alabama at Birmingham. (2020).

10:10 BUSINESS MEETING [Election of Chair and Vice-Chair for Biological Sciences Section]

**\*\*u** or **\*\*g** Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.

## SECTION I – BIOLOGICAL SCIENCES

Thursday Morning & Afternoon

CANVAS:

Authors Present: Sessions 1 & 2: 10:20 AM – 12:20 PM Viewing and Judging

Sessions 3 & 4: 1:00 PM – 3:00 PM Viewing and Judging

Brad Bennett, Presiding

## SECTION I – BIOLOGICAL SCIENCES

Posters

Session 1: 10:20 – 11:20 am

2. \*\*u Genetic and Evolutionary Conservation Analysis in *C. elegans* to Examine the Functional Conservation of Human Genes and Decipher Variants of Uncertain Significance. *Amira Carter*, Trinity Elston, Alexis Petty, Alan Holderfield, Tanner Vandever, Natalie Forte, and Ashley Turner, Jacksonville State University.
3. \*\*g Evaluating the Impacts of Wild Pigs on Water Quality and Wetland Ecosystem Health in Alabama. *Elizabeth Bradley* and Graeme Lockaby, Auburn University.
4. \*\*u Intraindividual Sequence Variation in pre-rRNA cistrons of the Ectoparasitic plant *Cuscuta*. *Megan Elliott*, David A. Johnson, and Megan K. Elliott, Samford University.
5. \*\*g Evaluating the Role of SOX10 in Innate Immune Gene Regulation. *Alex Dawson*, University of Alabama at Birmingham; Melissa Harris.
6. \*\*g Effects of Sublethal Methylmercury Exposure on Songbird Hippocampal Neuroanatomy. *Cara Brittain*, Auburn University; Daniel Cristol, College of William and Mary; Haruka Wada, Auburn University.
7. \*\*u Abundance of Jaguar (*Panthera onca*) Prey Species in Central Belize. *Rekenia Cole* and Andrew Coleman, Talladega College.

Session 2: 11:20 am – 12:20 pm

8. \*\*u An Analysis of Fecundity Density for Black Crappie (*Pomoxis nigromaculatus*) at Lake Purdy, Birmingham, Alabama. *Jacqueline Hintz*, Anthony Overton, and Kaitlynn Wade, Samford University.
9. \*\*u An Analysis of Fecundity Age and Length Relationship for Black Crappie (*Pomoxis nigromaculatus*) at Lake Purdy, Birmingham, Alabama. *Kathryn Jones*, Kaitlynn Wade, Jacqueline Hintz, and Anthony Overton, Samford University.
10. \*\*u Effects of Pumpkin Seed and Flesh Diets on Testicular Superoxide Dismutase 2 Expression. *Jaylon Vaughn*, Chastity Braford, and Olga Bolden-Tiller, Tuskegee University.
11. \*\*u Prevalence of Scute Abnormalities in Olive Ridley Sea Turtle (*Lepidochelys olivacea*) Hatchlings. *Amber Ellington* and Andrew Coleman, Talladega College.
12. \*\*g Detecting *Toxoplasma gondii* in the giant African snail (*Lissachatina fulica*) in Oahu, Hawaii. *Olivia Stogner*, Auburn University; Kenneth A. Hayes, Bishop Museum; and Christopher A. Lepczyk and Sarah Zohdy, Auburn University.

13. \*\*u Expenditures on Invasive Species Management Across the United States. *Allison Foster*, Christopher A. Lepczyk, and Jean E. Fante-Lepczyk, Auburn University; and Daniel Rubinoff, University of Hawaii.

**Session 3: 1:00 – 2:00 pm**

14. \*\*u Apolipoprotein E Mimetics Preferentially Target Phosphatidylserine Potentially Decreasing Apoptosis. *Zaurayze Rehman*; James Boyett; Samantha Giordano-Mooga; GM Anantharamaiah; Paul Wolkowitz; CR White, University of Alabama at Birmingham.
15. \*\*g Fungal Volatile Organic Compounds can mediate between Bark Beetles and Ophiostomatoid Fungi. *Sylvester Menanyih*; Lori Eckhardt, Auburn University.
16. \*\*g Evaluation of Kemp's Ridley Sea Turtle Clutch Frequency using Ultrasound Technology. *Robby Brannum*; Thane Wibbels; Ken Marion, University of Alabama at Birmingham.
17. \*\*g Histological Analysis of Sex Ratios in Kemp's Ridley Sea Turtles. *Katie Presz*, Thane Wibbels, and Ken Marion, University of Alabama at Birmingham.
18. \*\*g Evaluations of Stable Isotope Signatures in Diamondback Terrapins. *Forrest Collins*, Thane Wibbels, and Ken Marion, University of Alabama at Birmingham.
19. \*\*g Loblolly Pine and Brown-spot Needle Blight: An Emerging Relationship Threatens Timber Industry. *Debit Datta*, Scott Enebak, Jeffrey Coleman, and Lori Eckhardt, Auburn University.

**Session 4: 2:00 – 3:00 pm**

20. \*\*g Analysis of the Human Variant Lys859Arg in Cullin-4B (Cul4b). *Travis Mitchell*; Brittanee West; Eric Johnson, Alabama College of Osteopathic Medicine.
21. \*\*g In silico and in vitro Experiments Analyzing Novel Human Variants of the GALT Gene Yield Contradictory Results. *Travis Mitchell*; Eric Johnson, Alabama College of Osteopathic Medicine.
22. \*\*g The Gut Microbiota in Naturally Occurring and Laboratory Aquaculture *Lytechinus variegatus* Revealed Differences in the Community Composition, Taxonomic Co-occurrence Network, and Predicted Functions. *George Green*, Joseph Hakim, Jiung-Wen Chen, Casey Morrow, Stephen Watts, and Asim Bej, University of Alabama at Birmingham.
23. \*\*g Nutritional Combinatorial Impact on the Gut Microbiota and Plasma Short-chain Fatty Acids Levels in the Prevention of Mammary Cancer in Her2/neu Estrogen Receptor-negative Transgenic Mice. *Manvi Sharma*, Manvi Sharma, Itika Arora, Matthew Stoll, University of Alabama at Birmingham; Yuanyuan Li, University of Missouri, Columbia; and Shizhao Li and Trygve Tollefsbol, University of Alabama at Birmingham.
24. \*\*g Regulation of Mg<sup>2+</sup>-Dependent Phosphatidic Acid Phosphatase Enzymes in the Yeast *Yarrowia lipolytica*. *Sagar Pasham* and Stylianos Fakas, Alabama A&M University.
25. Identification and Expression of NAD<sup>+</sup> Synthesis Salvage Pathway Enzymes in *Lactobacillus*. *Silvia Kinnebrew*, Bryce Pierce, *Brad Bennett*, Samford University. (2020)

26. \*\*g Uncovering the Dirt on North Birmingham. *Sarah Adkins-Jablonsky*, Anuradha Goswami, Qutia Roberts, Robert Aksycn, Sam Gregory, Kathryn Aler, Alex Dawson and Jeff Morris, University of Alabama at Birmingham; and Brad Bennett, Samford University (2020).

\*\*u or \*\*g Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.



**Joint Paper Session**  
**SECTION II – CHEMISTRY**  
**SECTION III – PHYSICS AND MATHEMATICS**  
**SECTION IV – ENGINEERING AND COMPUTER SCIENCE**

**CANVAS:**  
**Thursday Morning, 9:00 AM– 11:40 AM**  
**Wen Yan and Ravi Gollapalli, Presiding**

SECTION II – CHEMISTRY SESSION

SECTION III – PHYSICS AND MATHEMATICS SESSION:

1. 9:00       \*\*u Constructing an Optical Tweezers. *Charles Harville*; D. Brian Thompson, University of North Alabama.
2. 9:20       \*\*u Measurements and Simulations of a Gauss Gun Projectile's Kinetic Energy. *Hannah Miller*; D. Brian Thompson, University of North Alabama.
3. 9:40       Mathematical Scheme for Ranking the Great Wicketkeepers and Wicketkeeper-Batsmen in Test Cricket. *Arjun Tan*, Alabama A&M University.
4. 10:00      Mathematical Scheme for Ranking the Great All-Rounders of Cricket History. *Arjun Tan*, Alabama A&M University.
5. 10:20      Analysis and Interpretation of the USA-193 Satellite Fragmentation in Orbit. *Arjun Tan*, Alabama A&M University.

SECTION IV – ENGINEERING AND COMPUTER SCIENCE SESSION:

1. 10:40      Connected Vehicles Cloud Computing (CVCC) Applications, Challenges and Communications Model. *Anthony Winchester*, Birmingham-Southern College.
2. 11:00      \*\*u A Novel Technique to Increase the Sensitivity of SPR-based Biosensors. *Jeremy Reid*, Tingyi Wei, Cameron Gren, and Ravi Gollapalli, University of North Alabama
3. 11:20      Surface Engineering of Bio-materials Using Cold Plasma Processing. *Vinoy Thomas*, University of Alabama at Birmingham. (2020)

\*\*u or \*\*g Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.

**Joint Poster Sessions**  
**SECTION II – CHEMISTRY**  
**SECTION III – PHYSICS AND MATHEMATICS**  
**SECTION IV – ENGINEERING AND COMPUTER SCIENCE**

**CANVAS:**

**Authors Present: 11:40 AM – 12:40 PM; Viewing and Judging**  
**Donna Perygin, Wen Yan and Ravi Gollapalli, Presiding**

SECTION II – CHEMISTRY

1. \*\*u Maleimide Homoepibatidine Derivatives. *Kaylee Rawlins* and Stephen Slauson, Jacksonville State University

SECTION III – PHYSICS AND MATHEMATICS

6. \*\*u Phonon Thermal Conduction At Low Temperatures. *Delya Sligh*; Prakash Sharma, Tuskegee University.
7. Nanostructure Evolution and Void Surface Reconstruction in Nanovoid Rich Locally Hydrogenated Amorphous Material. *Durga Paudel*, Alabama A&M University; Parthpratim Biswas, The University of Southern Mississippi, Alabama School of Mathematics and Science.
8. \*\*u Absorption and Laser-Induced Fluorescence Studies of Chlorophyll. *Clay Thompson*, Archana Sharma, and Akshaya Kumar, Tuskegee University

SECTION IV – ENGINEERING AND COMPUTER SCIENCE

4. \*\*u Comparing Two Prototype Designs On The Effectiveness Of Gas Separation In Spatial Atomic Layer Deposition. *Vivek Kumar*, Dongqing Pan, Tingyi Wei, John Lucius, Griffin Tull, and Puneet Paul, University of North Alabama.

12:40 PM BUSINESS MEETING [Election of a Vice-Chair for Section III]

BUSINESS MEETING [Election of a Vice-Chair for Section IV]

\*\*u or \*\*g Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.

**SECTION V – SOCIAL SCIENCES**  
**Paper Session**  
**Thursday Morning 9:00 AM – 11:40 AM**  
**CANVAS:**  
**Susan D. Herring, Presiding**

1. 9:00 Aging Veterans in the State of Alabama. David Albright, University of Alabama; Justin McDaniel, Southern Illinois University; and *Zainab Suntai*, Kirsten Laha-Walsh, and Candi Williams, Alabama AARP, University of Alabama.
  2. 9:20 \*\*u Learning Experiences that Enhance Learning Proficiency in Higher Education. *Dana Wilchcombe*, Oakwood University.
  3. 9:40 Churchill and the “Ungentlemanly” War. *Susan Herring* and Bryan Kennedy, Athens State University.
  4. 10:00 \*\*u An Examination of Punctuating Events and the Future of Nursing: Policies, Pandemics, and Beyond. Courtney Haun and *Ethan Haydel*, Samford University.
  5. 10:20 Managing Contracts: DOD Approach. *Charles Roberts*, Bryan Kennedy, Athens State University. (2020)
  6. 10:40 An Ethical Dilemma, or Different Perspectives. *Thomas Pieplow*, Bryan Kennedy, Susan D. Herring, Athens State University. (2020)
  7. 11:00 The Development of a Competitive-Advantage Model for Online Education in a Small State University. *Michael Essary*, Athens State University. (2020)
  8. 11:20 Contracting in the Presence of Insurance: The Case of Bioenergy Crop Production. *Mohit Anand*, Miles College; Ruiqing Miao, Auburn University; Madhu Khanna, University of Illinois at Urbana-Champaign. (2020)
  9. 11:40 Continuous Supply Chain Improvement Using Artificial Intelligence. *Cynthia R. Lovelace* and Samantha Montgomery, Athens State University.
- Noon BUSINESS MEETING [Election of a Vice-Chair for the Section]

\*\*u or \*\*g Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.

**SECTION V – SOCIAL SCIENCES**

**Poster Session**

**Thursday Afternoon**

**CANVAS:**

**Authors Present: 1:00 - 2:00 PM; Viewing and Judging**

**Susan D. Herring, Presiding**

10. \*\*u Cyber Dating Aggression Amongst Adolescents. *Carmen Brown* and *Krista Mehari*, University of South Alabama.
11. \*\*g Combat Veterans With Polytrauma and Traumatic Brain Injury: Exploring Variables Affecting Access to Social Work Outpatient Services. *Kirsten Laha-Walsh*, University of Alabama; *David Albright*, University of Alabama; *Bruce Thyer*, Florida State University; *Kelli Godfrey*, University of Alabama; *Raymond Waller*.
12. \*\*g The Indirect Relation of Parenting to Relationship Satisfaction through Attachment in Emerging Adults. *Damion Whittington* and *Silje Lindstad*, University of South Alabama.

\*\*u or \*\*g Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.

**SECTION VI – ANTHROPOLOGY**

**Paper Session**

**Thursday Afternoon 2:00 – 4:40 PM**

**CANVAS:**

**Jason Heaton, Presiding**

1. 2:00 Calculating Torsion Values in Common Skeletal Elements: Creating an Accessible Method. *Jason Heaton*, Birmingham-Southern College; Andrew Brock, Augusta University; and Mark Rupright, Birmingham-Southern College.
2. 2:20 The Role of Religion in Primate Conservation: Muslim Perceptions of Barbary Macaques in the Rif Mountains, Morocco. *Sherrie Alexander*, University of Alabama at Birmingham.

**SECTION VII: STEM EDUCATION**  
**Joint Session with SECTION I: BIOLOGICAL SCIENCES**  
**Paper Session**

**Thursday Morning 8:30 – 10:10 AM**

*CANVAS*

**Brad Bennett and Jeffrey Morris, Presiding**

**Biological Sciences Paper**

1. 8:30 **\*\*u** Detection of Large Cat Species in Central Belize Using Camera Trap Technology. *Anjolaoluwa Lawani*, Talladega College; Andrew Coleman, Talladega College.

**STEM Education Papers**

1. 8:50 **\*\*u** Podcast as an Engagement Tool in the Classroom and Beyond. *Derek Dang*, Emily Stephens, Parbhoo Karishma, Sahar Moughnyeh, Ryleigh Fleming, Sarah Adkins-Jablonsky, and Samiksha Raut, University of Alabama at Birmingham.
2. 9:10 Genetics Course-Based Undergraduate Research Experience (CURE) Exploring Disease Utilizing Bioinformatics & Nematodes in Hybrid Learning. *Ashley Turner*, Jacksonville State University; Natalie Forte, Jacksonville State University; Anil Challa, University of Alabama at Birmingham; Katelyn Cooper, Arizona State University.
3. 9:30 **\*\*g** Fostering Online Student Engagement with Effective Technological Tools. *Bre' Minniefield* and Samiksha Raut, University of Alabama at Birmingham.
4. 9:50 **\*\*g** Why Does Our Work Matter? Connecting Microbiology Laboratory Curricula to North Birmingham Stakeholders. *Sarah Adkins-Jablonsky*, University of Alabama at Birmingham; Qutia Roberts, University of Alabama at Birmingham; Brad Bennett, Samford University; Rob Akscyn, Jeff Morris, University of Alabama at Birmingham. (2020).

**\*\*u or \*\*g** Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.

## SECTION VII: STEM EDUCATION

### Poster Session

Thursday Afternoon

CANVAS

Authors Present. 1:00 – 2:00 PM, Viewing and Judging

Jeffrey Morris, Presiding

5. \*\*u Can Biology Coursework Teach Research, Teamwork, and Communication Skills? *Jenna Bae*, Julie Jung, Ryan Lauterbach, Brittney Comans, Paul Milazzo, and Samantha Giordano-Mooga, University of Alabama at Birmingham.
6. \*\*u Breaking the Barriers of Traditional Service Learning in a Pandemic with E-ServiceLearning: Impacts of a COVID-19 Module in a Non-Majors Biology Course. *Ryleigh Fleming*, University of Alabama at Birmingham; Sarah Adkins-Jablonsky, University of Alabama at Birmingham; Marco Esteban, California Dougherty Valley High School; Diana Bucio, University of Alabama at Birmingham; Jeffrey Morris, University of Alabama at Birmingham; Samiksha Raut, University of Alabama at Birmingham.
7. Fermentation Fun: A Straightforward Active Learning Exercise That Blends Food Science, Microbiology, Molecular Biology, and Bioinformatics. *Brad Bennett*, Silvia Kinnebrew, Samford University; and Shannon Carden, Magic City Ferments. (2020)
8. Career Development Enhances Transfer Student Success. *Betsy Dobbins* and Rita Malia Fincher, Samford University. (2020).

2:00 PM BUSINESS MEETING [Election of a Vice-Chair for the Section]

\*\*u or \*\*g Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.

**SECTION VIII – ENVIRONMENTAL AND EARTH SCIENCES**

**Paper Session**

**Thursday Afternoon, 2:00 – 2:20 pm**

**CANVAS**

**Vinoy Thomas and Jeffrey Morris, Presiding**

1. \*\*g Alabama Cities Growth Projections and Patterns for 2040. *Megha Shrestha* and Chandana Mitra, Auburn University.

2:20 BUSINESS MEETING [Election of a Chair and Vice-Chair for the Section]

**SECTION VIII -- ENVIRONMENTAL AND EARTH SCIENCE**

**Poster Session**

**Thursday Afternoon, 2:30 – 3:30 pm**

**CANVAS**

**Authors Present: 2:30 PM– 3:30 PM, Viewing and Judging**

**Vinoy Thomas and Jeffrey Morris, Presiding**

2. \*\*g Applying Machine Learning Technique using Google Earth Engine to Access Landcover and Land-Use Change of Trivandrum, A Coastal City in India. *Sukanya Dasgupta* and Chandana Mitra, Auburn University; and Udaysankar Nair and Christopher Phillips, University of Alabama in Huntsville.
3. \*\*g *Solenopsis invicta* Affects the Distribution of Carrion Beetles in a Large Urban Park. *Evan Wigley*, Kyle Waldrop, Jonathan Reaves, and Grant Gentry, Samford University.
4. \*\*g Uncovering Novel Spatial Relationships Between Honey Bee Health, *Varroa destructor*, *Nosema* species, and Environmental Conditions. *Stephen Todd*, Geoffrey Williams, and Stephanie Rogers, Auburn University.

\*\*u or \*\*g Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.



**SECTION IX: HEALTH SCIENCES**  
**Paper Session**  
**Thursday Morning, 9:00 AM – 11:20 AM**  
**CANVAS**  
**Donna Cleveland, Presiding**

1. 9:00      **\*\*g** The Complex Interplay between Sleep, Physical Health, Mental Health, Cognitive Health, and COVID-19. *Garrett Talley*; John Shelley-Tremblay, University of South Alabama.
2. 9:20      Cadaveric Dissection in the Education of Health Science Clinical Students. *Mark Caulkins*, Nick Washmuth, Brad Cantley, and Kathleen Caulkins, Samford University.
3. 9:40      **\*\*u** Exercise and the Other Guys; The Secret to a More Efficient Health Care System. *Ivy Wilson*, Samford University.
4. 10:00     **\*\*u** Outcomes of a Virtual Young Teen Asthma and Wellness Camp Conducted by an Interdisciplinary Team. *Sean Shelley-Tremblay*, University of Alabama, and Ellen Buckner, Samford University.
5. 10:20     **\*\*u** The Comparative Effectiveness of Medical Treatments for Endometriosis: A Systematic Review. *Erin Huttula* and Katie Gibbs, Birmingham-Southern College.
6. 10:40     Breast Cancer Diagnostic Technologies: Today and Tomorrow. *Donna Cleveland*, University of South Alabama. (2020)
7. 11:00     The Rett-Syndrome MECP2 Allele In Mice Does Not Appear To Increase The Nuclear Or Mitochondrial Gene Mutation Rate. *Mary-Catherine Mitchell*, Hannah Olive, Katherine Wilson, Coleman Reeves, David Johnson, Samford University. (2020)

**\*\*u or \*\*g** Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.

## SECTION IX: HEALTH SCIENCES

### Poster Session

### Thursday Morning

### CANVAS:

**Authors Present: 11:20 AM - 12:30 PM for Viewing and Judging**

**Donna Cleveland, Presiding**

8. Anatomic Variants in Student Cadaveric Dissection. *Mark Caulkins*, Samford University; Nick Washmuth, Brad Cantley, Kelly Atkins, Paul Harrelson, John Hurt, Wes Johnson, and Katelynn Corder-Grier, Samford University.
9. **\*\*g** Gas Station Pharmacies: A Case Report of Tianeptine Use in Rural Alabama. *Abby Cook* and Ian Powell-Castilla, Alabama College of Osteopathic Medicine.
10. **\*\*g** Rural Reproductive Health: An Analysis of Education and Access for Young Alabama Women. *Abby Cook*, Alabama College of Osteopathic Medicine.
11. **\*\*g** Maternal Adverse Childhood Experiences (ACES) and Their Effect on Her Offspring: A Review. *Audrey Gunn* and Kasey Chelemedos, Alabama College of Osteopathic Medicine.
12. Caring for Our Caregivers: The Implementation of a Peer Support Program for Second Victims in Healthcare. *Donna Copeland*, Ashleigh Bowman, and Amy Davis, University of South Alabama.
13. Virtual Dissection: Alternative to Cadaveric Dissection for a Pregnant Nurse Anesthesia Student. *Nick Washmuth*, Terri Cahoon, Katrina Tuggle, and Ronald Hunsinger, Samford University.

**\*\*u or \*\*g** Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.

**SECTION X. BIOETHICS AND HISTORY & PHILOSOPHY OF SCIENCE**

**Paper Session**

**Thursday Afternoon, 1:00 PM – 4:00 PM**

**CANVAS:**

**Brian LaHaie, Presiding**

1. 1:00      **\*\*u** HP Printer. *Jenna Webb* and Clark Lundell, Auburn University.
2. 1:20      The Value Of Intellectual Property In Innovative Product Development. *Joyce Thomas*, Auburn University.
3. 1:40      Design For All? Members Only Need Apply. *Benjamin Bush* and Katherine Chastain, Auburn University.
4. 2:00      Perceptual Boundaries Based on Role and Social Context: A Collaboration between Prison Students and University Students. *David Smith*, Auburn University.
5. 2:20      The Importance of In-Person Learning in Product Design Education. *Shu-Wen Tzeng*, Auburn University; Clark Lundell, Auburn University.
6. 2:40      **\*\*u** The Apple Watch as it Communicates with the Brain. *Rachel Ney* and Clark Lundell, Auburn University.
7. 3:00      **\*\*u** Jumper Cables as an Engineered Product. *Katherine Rush* and Clark Lundell, Auburn University.
8. 3:20      Is There A Universal Ethic For How To Treat The Earth? *James Bradley*, Auburn University.
9. 3:40      PET: Polyethylene Terephthalate – The Ubiquitous 500 ml Water Bottle. *Clark Lundell*, Auburn University. (2020)
- 4:00      BUSINESS MEETING [Election of a Vice-Chair for the Section]

**\*\*u or \*\*g** Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.

**SECTION X. BIOETHICS AND HISTORY & PHILOSOPHY OF SCIENCE**

**Poster Session**

**Thursday Afternoon, 4:10 – 4:30 PM**

**CANVAS**

**Authors Present 4:10 – 4:30 pm, viewing and judging**

**Brian LaHaie, Presiding**

10. Ethical Issues Involving Healthcare During the COVID-19 Pandemic. *Shuntele Burns*, Alabama State University.

**\*\*u or \*\*g** Denotes presentation entered in student competition as an undergraduate or graduate student, respectively.

**ALABAMA JUNIOR ACADEMY OF SCIENCE**  
**Mark Jones, State Director**

**Engineering/Mathematics**

1. \*Benjamin Davis, Development of Low-Cost Consumer Grade Autonomous Robots for Disaster Response and Relief, *Auburn High School*, Auburn
2. \*Akshat Yaparla, Evolution of a Flow Field over a Dynamically Pitching Wing, *Alabama School of Fine Arts*, Birmingham
3. \*Chase Burbank, Scope of Awareness, *Wetumpka High School*, Wetumpka
4. Manav Patel, Coronified Sports, *Wetumpka High School*, Wetumpka
5. Javon Jennings, Using Virtual Machines to Contain Cyber Attacks, *Homeschool*, Huntsville
6. Ashraf Mansour, Development of an Electric Wheelchair with a Wireless Electroencephalography-Based Control System, *Auburn High School*, Auburn
7. Asher Owens, The Water Skipper, *Wetumpka High school*, Wetumpka
8. *Naeim Mahjouri*, Harvesting Energy from Everyday Movements by Developing a Two-Dimensional MXene-Based Triboelectric Nanogenerator, *Auburn High School*, Auburn
9. Ahnaf Hossain, COVID-19 Monitoring Through Twitter Analysis, *Auburn High School*, Auburn

**Environmental**

1. \*Hailey Holbert, Sanitation is Key, *Wetumpka High School*, Wetumpka
2. \*Alan Estrada, Evolve Our Fuel, *Wetumpka High School*, Wetumpka
3. \*Avery Pyles, Light as Air: A Study of How Ultraviolet Light Air Purity, *Wetumpka High School*, Wetumpka
4. *Jordan Jennings*, A Comparison Study of Different Species of Bamboo to Common Woods Used in Building, *Homeschool*, Huntsville
5. *Greta Beumer*, Designing a Handbag Line from Recycled Polyethylene Terephthalate (PET), *Wetumpka High School*, Wetumpka

**Life Scienc**

1. *Hannah Grissett*, How Molarity of Sucrose Solutions Affects Osmosis in Celery, *Fairhope High School*, Fairhope
2. *Shivani Babu*, Effects of High-Fat Diet on Phosphoprotein Enriched in Astrocytes-15kD (PEA-15) mRNA and Protein Concentration in the Cerebrum of Mice, *Auburn High School*, Auburn
3. *Bailey Worrell*, Right Vs. Left, *Wetumpka High School*, Wetumpka
4. *Allen Wright*, One Degree Closer to Identifying COVID-19, *Wetumpka High School*, Wetumpka
5. *Pierce Robinson*, The Effects of Water Quality on *Opsariichthys uncirostris*, *Wetumpka High School*, Wetumpka

## Medicine Health and Behavioral Science

1. \**Hannah Ashraf*, The Effect of Checkpoint Inhibition on modulating the Hypoxic Tumor Microenvironment, *The Altamont School*, Birmingham
2. \**Remy Cron*, The Effect of the Splice Mutation intron 1, bp 54, G > T in DOCK8 on DOCK8 Splicing, *Alabama School of Fine Arts*, Birmingham
3. *Ashwin Prabhakar*, 3D Imaging Based Implantable Scaffolds for Wound Healing, *Bob Jones High School*, Madison
4. *Julian Vilaridi and Connor Scheeren*, Unmask Your Potential, *Wetumpka High School*, Wetumpka

## Physical Science Earth and Space Science

1. \**Michael Fulmer*, Banked Turns Without Friction, *Wetumpka High School*, Wetumpka
2. *Juliana Boyett*, Investigating the effect of temperature on the pK<sub>a</sub> of acetic acid., *Fairhope Highschool*, Fairhope
3. *Luke Tessier*, The Study of Reinforced Cable Concrete, *Wetumpka High School*, Wetumpka
4. *Logan Hammack*, Structural Effectiveness to High Winds Produced by Tornados, *Wetumpka High School*, Wetumpka
5. *Makaila Jennings*, Using the Double Dip Transit Photometry Method to Identify Potential Habitable Planets, *Homeschool*, Huntsville
6. *Emma Seidel*, Precipitation Prediction with Machine Learning, *Alabama School of Fine Arts*, Birmingham

\* Denotes AJAS student who is also entered in the Gorgas Scholarship Competition

## GORGAS SCHOLARSHIP COMPETITION

### Sci-Mix Session

#### CANVAS:

**Ellen Buckner, Presiding**

Session 1: 5:00 – 5:40 pm

1. *Hannah Ashraf*, The Effect of Checkpoint Inhibition on modulating the Hypoxic Tumor Microenvironment, The Altamont School, [Teacher-sponsor: Katrina Dahlgren]
2. *Chase Burbank*, Scope of Awareness, Wetumpka High School, [Teacher-sponsor: Virginia Vilardi]
3. *Remy Cron*, The Effect of the Splice Mutation intron 1, bp 54, G > T in DOCK8 on DOCK8 Splicing, Alabama School of Fine Arts, [Teacher-sponsor: Rebecca Thrash]
4. *Benjamin Davis*, Development of Low-Cost Consumer Grade Autonomous Robots for Disaster Response and Relief, Auburn High School, [Teacher-sponsor: Jacque Middleton]
5. *Alan Estrada*, Evolve Our Fuel, Wetumpka High School, [Teacher-sponsor: Virginia Vilardi]
6. *Michael Fulmer*, Banked Turns Without Friction, Wetumpka High School, [Teacher-sponsor: Virginia Vilardi]

Session 2: 5:40 – 6:20 pm

7. *Alissa Hawthorne*, Can the flexibility [cm] of the long head of the bicep femoris, short head of the bicep femoris, semimembranosus and semitendinosus (the hamstring muscles) improve after running 190 meters on a rubber athletic outdoor track?, Murphy High School, [Teacher-sponsor: Rebecca Mullins]
8. *Hailey Holbert*, Sanitation is Key, Wetumpka High School, [Teacher-sponsor: Virginia Vilardi]
9. *Jaeyoung Lee*, Environmental Conservation: Calculation of Irregular Surface Area Utilizing the Monte Carlo Method and the Law of Large Numbers, Auburn High School, [Teacher-sponsor: Jacque Middleton]
10. *Avery Pyles*, Frequent Phone Calls: A Study of How Radiofrequency Energy Affects Eyesight, Wetumpka High School, [Teacher-sponsor: Virginia Vilardi]
11. *Cary Xiao*, MADSA: Musical Accuracy Development using Spectral Analysis, Alabama School Math Science, [Teacher-sponsor: Elisa Rambo]
12. *Akshat Yaparla*, Evolution of a Flow Field over a Dynamically Pitching Wing, Alabama School of Fine Arts, [Teacher-sponsor: Rebecca Thrash]

**\*\* Regeneron Science Talent Search Semi-Finalist**

Keynote Speaker 6:30 pm  
[see pg 10]

## **OBJECTIVES OF THE ALABAMA ACADEMY OF SCIENCE**

The objectives of the Academy are to:

- Promote the development of interest in scientific matters in the state,
- Provide means for publication of papers and abstracts,
- Provide opportunity for increased cooperation and fellowship among its members,
- Cooperate with other organizations having similar aims,
- Render public service in scientific matters,
- Promote the interest in and study of science by the youth of Alabama,
- Provide for and award scholarships to deserving youth of Alabama.

In fulfilling these objectives, the Academy is devoted to nearly all aspects of science and science education.

## **EDUCATIONAL ACTIVITIES OF THE ACADEMY**

The Academy sponsors

- Alabama Junior Academy of Science, a statewide organization of high school science clubs
- Junior Science and Humanities Symposium, an activity supported by the United States Army, U.S. Navy, U.S. Air Force, and the U.S. Coast Guard
- Five Regional Science Fairs at which high school students exhibit the results of their research or study projects. Regional Finalists compete in the Alabama State Science & Engineering Fair., which is hosted by the Academy. Winners go to the International Science and Engineering Fair (ISEF)
- Science Olympiads in which regional winners compete at the state level. Alabama winners go to the National Competition.
- Gorgas Scholarship Competition, which awards high education scholarship.
- Visiting Scientist Network in which volunteer members, upon invitation by a teacher, go to high schools to present talks, demonstrations, or workshops
- Travel grants to enable students to attend the annual meetings where they can present their research results in the Student Research Award Competition
- Research grants to enable students to carry out mentored research.

## 2021 REGIONAL SCIENCE FAIRS

- 1. Central Alabama Regional Science & Engineering Fair, [web](#), Virtual Fair**  
Video Presentations due February 18, 2021; Kevin Jarrett, coordinator  
The University of Alabama at Birmingham  
Community Outreach, 5th Fl., CHSB 19 933  
19th Street South  
Birmingham, AL 35294-2041
- 2. West Alabama Regional Science Fair, [web](#), No Fair in 2021**  
Roger Campbell, Ph.D. [rcampbell@uwa.edu](mailto:rcampbell@uwa.edu)  
Chairperson, Department of Physical Sciences The  
University of West Alabama  
Station 23  
Livingston, AL 35470  
(205) 652-3873
- 3. North Alabama Regional Science and Engineering Fair, [web](#) Virtual Fair  
March 23-25, 2021**  
GEARSEF Virtual Competition  
Jacob Kerstiens, coordinator  
[jacob.kerstiens@uah.edu](mailto:jacob.kerstiens@uah.edu)  
The University of Alabama in Huntsville College  
of Engineering  
Huntsville, AL 35899
- 4. Greater Eastern Alabama Regional Science and Engineering Fair, [web](#), Virtual Fair**  
Project Videos due February 26, 2021; Jr. Division Judges preview – **March 22**;  
Jr. Division Student Interviews – **March 23**; Sr. Division Judges preview – **March 30**;  
Sr. Division Student Interviews – **March 31**  
Janie Marino, GEARSEF Fair Coordinator  
[jgm0010@auburn.edu](mailto:jgm0010@auburn.edu)
- 5. Mobile Regional Science and Engineering Fair, [web](#), Virtual Fair**  
February 21 – 26, 202; [Engineering@southalabama.edu](mailto:Engineering@southalabama.edu)  
David T. Allison, Ph.D.  
[dallison@southalabama.edu](mailto:dallison@southalabama.edu)  
Department of Earth Sciences  
136 LSCB, 307 N. University Blvd.  
University of South Alabama Mobile, AL  
36688

### **Alabama Science & Engineering Fair, [web](#), Virtual Fair**

April 9th and 10th, 2021: Online Only Format

Hosted by the Alabama Academy of Science, with support from the University of South Alabama and Auburn University.



## 2021 INTERNATIONAL SCIENCE AND ENGINEERING FAIR

An activity of Regeneron Science Service, 1719 N Street, NW, Washington, DC 20036, (202) 785- 2255, FAX (202) 785-1243. <https://www.societyforscience.org/isef/>

The Regeneron 2021 ISEF will be held virtually, May 16-21, Judging will take place May 3-6 with a given category being judged on one day over three time periods.

For details visit <https://www.societyforscience.org/isef/2020-2/>

Virginia Vilardi, Regeneron/ISEF and State Coordinator, 1251 Coosa River Parkway, Wetumpka H.S., 36092, (334) 799-0104, [virginia.vilardi@elmoreco.com](mailto:virginia.vilardi@elmoreco.com); [vavilardi@gmail.com](mailto:vavilardi@gmail.com)



## ALABAMA SCIENCE OLYMPIAD 2021

The Alabama Science Olympiad site is at <http://www.alabamaso.org/>. Individuals can visit the [Tournaments](#) page for details. Due to the COVID-19 pandemic, most of the 2021 tournaments have been cancelled and expect to resume in 2022. The 2021 State and National Tournaments will be hosted virtually.

### State Tournaments

#### Auburn University

Division B and C State Olympiads  
Saturday, March 27<sup>th</sup>, hosted virtually  
Link to additional information:

<http://www.auburn.edu/cosam/departments/outreach/programs/Science%20Olympiad/>

### ASO State Policies can be found at:

- [Registration Information: http://www.alabamaso.org/registration.html.](http://www.alabamaso.org/registration.html)
- [Registration Form \(PDF\): http://www.alabamaso.org/registration.html.](http://www.alabamaso.org/registration.html)
- [Coaches Handbook and Policies: http://www.alabamaso.org/handbook.html.](http://www.alabamaso.org/handbook.html)
- [Division Descriptions: http://www.alabamaso.org/divisions.html.](http://www.alabamaso.org/divisions.html)
- [ASO News and Notes: http://www.alabamaso.org/index.html.](http://www.alabamaso.org/index.html)

### National Science Olympiad Tournament

The Science Olympiad National Tournament for Divisions B and C will be virtual during the week of May 17, 2021 and hosted by Arizona State University.

**State Director: Mary Lou Ewald**, Director of Science and Math Outreach, 131 SCC Building, Auburn University, Auburn, AL 36849 (334) 844-5745, [ewaldml@auburn.edu](mailto:ewaldml@auburn.edu).

Alabama Science Olympiad web page: <http://alabamaso.org/>.

National Science Olympiad web page: <http://soinc.org/about>.

## WILLIAM H. MASON SCIENCE TEACHER FELLOWSHIPS

The William H. Mason Science Teacher Fellowship Fund honors the late Dr. Mason's dedication and leadership in the Academy. Contributions may be made online on the Alabama Academy of Science website. Ronald Hunsinger serves as Chair of the Mason Science Teacher Fellowship Committee, [rnhunsin@samford.edu](mailto:rnhunsin@samford.edu). Downloadable applications and further information can be found on the Academy web site, [www.alabamaacademyofscience.org](http://www.alabamaacademyofscience.org).

Fellowships have been awarded to these individuals for study at the indicated institutions:

1990 - 1991	Mrs. Amy Livengood Sumner, UAB
1991 - 1992	Mrs. Leella Holt, UNA
1992 - 1993	Mrs. Joni Justice Shanklee, Samford University
1993 - 1994	Jeffrey Baumbach, Auburn University
1994 - 1995	Not Awarded
1995 - 1996	Laura West Cochran, University of Montevallo
1996 - 1997	Tina Anne Beams, UA
1997 - 1998	Carole Collins Crabbe Clegg, UAB
1998 - 1999	Cynthia Ann Phillips, UNA
1999 - 2000	Ruth Borden, UAB
2000 - 2001	Amy K. Murphy, UAB, Karen L. Celestine, AL A&M
2001 - 2002	Jeannine Ott, Eubanks, Auburn University
2002 - 2003	Not Awarded
2003 - 2004	Kanessa Miller, Auburn University
2004 - 2005	Not Awarded
2005 - 2006	Mary Busbee, UAB, and Bethany Knox, UAB
2006 - 2007	Kelly Harbin, UAB
2007 - 2008	Michael Hallman, UA
2008 - 2009	Sherri Sanders Grosso, UNA
2009 - 2010	Not Awarded
2010 - 2011	Danielle Brooke Morlan, UWA
2011 - 2012	Cory Goble, University of Montevallo
2012 - 2013	Amber Foster, UA
2013 - 2014	Amy Bolding
2014 - 2015	Arpan Bosmia, UAB
2015 - 2016	Lacey McEwen, Samford
2016 - 2017	Tyler Rice, Auburn
2017 - 2018	Celia Dozier, Samford
2018 - 2019	Jacob Helf, Auburn
2019 - 2020	Joshua Evans, University of Montevallo

## WRIGHT A. GARDNER AWARDEES

Recipients are selected for their Outstanding Contributions to Science

- 1984 Robert P. Bauman, Physics, University of Alabama at Birmingham
- 1985 Nolan E. Richards, Research Scientist, Reynolds Metals Company, Sheffield
- 1986 S. T. Wu, Mechanical Engineering and Aeronautic Research, University of Alabama in Huntsville
- 1987 Herbert H. Winkler, Microbiology, University of South Alabama
- 1988 Richard W. Compans, Microbiology and Senior Scientist, University of Alabama at Birmingham
- 1990 Max Cooper, Medicine and Immunology, University of Alabama at Birmingham
- 1991 Dan Urry, Biochemistry, University of Alabama at Birmingham
- 1992 Gail Cassell, Microbiology, University of Alabama at Birmingham
- 1994 Frank Rose, Electrical Engineering, Space Power Institute, Auburn University
- 1996 Prakash Sharma, Physics, Tuskegee University
- 1997 Robert E. Pieroni, Internal and Family Medicine, University of Alabama, Tuscaloosa
- 1998 Thomas J. Wdowiak, Physics and Space Exploration, University of Alabama at Birmingham
- 1999 Samuel B. Barker, Physiology, and Dean Emeritus, University of Alabama at Birmingham
- 2000 George Crozier, Dauphin Island Sea Lab, Mobile
- 2001 James B. McClintock, Biology, University of Alabama at Birmingham
- 2002 Sara C. & Wayne H. Finley, University of Alabama at Birmingham Medical School
- 2003 Leven S. Hazlegrove, Samford University, Executive Director, Alabama Academy of Science
- 2004 William J. Barrett, Southern Research Institute, Retired, Birmingham
- 2005 Eugene Omasta, Professor Emeritus, Troy University.
- 2006 Dan Holliman, Professor Emeritus, Birmingham Southern College
- 2007 No award
- 2008 No award
- 2009 No award
- 2010 No award
- 2011 J. Michael Wyss, Director of COD, University of Alabama at Birmingham
- 2012 No award
- 2013 David B. Allison, Associate Dean for Science, School of Public Health, UAB, Birmingham.  
Ram Gupta, Chemical Engineering, Auburn University.
- 2014 Arnold Luterman, Ripps-Meisler Professor of Surgery, University of South Alabama
- 2015 Shaik Jeelani, Chair, Department of Materials Science & Engineering; Tuskegee University
- 2016 Pradeep Lall, John and Anne MacFarlane Endowed Professor, Department of Mechanical Engineering, Director, NSF-CAVE3 Electronic Research Center, Auburn University.
- 2017 E. O. Wilson, University Professor Emeritus, Harvard University.
- 2018 No Award
- 2019 David J. Wineland, Nobel Laureate in Physics, University of Oregon.
- 2020 Jody Singer, Director, NASA Marshall Space Center, Huntsville; Richard Myers, Director and President, HudsonAlpha Institute for Biotechnology, Huntsville.
- 2021 Errol D. Crook, Director of the Center for Healthy Communities, University of South Alabama

## FELLOWS OF THE ALABAMA ACADEMY OF SCIENCE

- 2007 Ellen Buckner (University of Alabama at Birmingham), Leven Hazlegrove (Samford University), Richard Hudiburg (University of North Alabama), Larry Krannich (University of Alabama at Birmingham), Eugene Omasta (Troy University), Prakash Sharma (Tuskegee University).
- 2008 Ram B. Gupta (Auburn University), Harry O. Holstein (Jacksonville State University), Adriane G. Ludwick (Tuskegee University), Ken Marion (University of Alabama at Birmingham), Michael B. Moeller (University of North Alabama)
- 2009 Stephen A. Watts (University of Alabama at Birmingham) and Jane Nall (State Director, Science Olympiad Program)
- 2010 George Cline (Jacksonville State University), David H. Nelson (University of South Alabama), and Virginia Vilardi (State Coordinator, Science Fairs, Wetumpka High School)
- 2011 James T. Bradley (Auburn University), Anne Cusic (University of Alabama at Birmingham), James B. McClintock (University of Alabama at Birmingham)
- 2012 Benjamin J. Bateman (Troy University) and Edward E. Thomas (Auburn University)
- 2013 Safaa H. Al-Hamdani (Jacksonville State University) and Catherine D. Shields (Jefferson County International Baccalaureate School)
- 2014 Brian Burnes (University of West Alabama), Ronald N. Hunsinger (Samford University), and Pradeep Lall (Auburn University)
- 2015 Mickie Powell (University of Alabama at Birmingham) and David Brian Thompson (University of North Alabama)
- 2016 No award
- 2017 No award
- 2018 Mark Jones (J. F. Drake Middle School) and Akshaya Kumar (Tuskegee University)
- 2019 Lawrence J. Davenport (Samford University) and Puneet Srivastava (Auburn University)
- 2020 Mel Blake (University of North Alabama) and Arjun Tan (Alabama A&M University)
- 2021 No award

## SECTION OFFICERS, 2020-2021

### Section I: Biological Sciences:

- Chair: (2021) Brad Bennett, Department of Biology, Samford University, Birmingham, AL 35229, (205) 726-2303, [bbennet1@samford.edu](mailto:bbennet1@samford.edu).
- Vice Chair: (2021) Mary Anne Garner, Department of Biology, Judson College, Marion, AL 36756, [mgarner@judson.edu](mailto:mgarner@judson.edu)

### Section II: Chemistry:

- Chair: (2022) Donna Perygin, Dept. of Chemistry and Geosciences, Jacksonville State Univ., Jacksonville, AL 36265, [dperygina@jsu.edu](mailto:dperygina@jsu.edu)
- Vice Chair: (2022) VACANT.

### Section III: Physics and Mathematics:

- Chair: (2021). Wen Yan, Dept. of Mathematics, Tuskegee University, Tuskegee, AL [wyan@tuskegee.edu](mailto:wyan@tuskegee.edu)
- Vice Chair: (2021) Matthew Edwards, Dept. of Physics, Alabama A&M University, Normal, AL 35762, [matthew.edwards@aamu.edu](mailto:matthew.edwards@aamu.edu)

### Section IV: Engineering and Computer Science:

- Chair: (2022), Ravi Gollapalli, Dept. of Engineering Technology, Univ. of North Alabama, Florence, AL 35632 (256)-765-4857, [rgollapalli@una.edu](mailto:rgollapalli@una.edu).
- Vice Chair: (2022) VACANT

### Section V: Social Sciences:

- Chair: (2022) Bryan Kennedy, Dept. of Management and Psychology, Athens State Univ., Athens, AL 35611, (256) 216-5363, [Bryan.Kennedy@athens.edu](mailto:Bryan.Kennedy@athens.edu)
- Vice Chair: (2022) VACANT

### Section VI: Anthropology:

- Chair: (2023) Jason Heaton, Department of Biology, Birmingham Southern College, Birmingham, AL 35254, (205) 226-7816, [jheaton@bsc.edu](mailto:jheaton@bsc.edu)
- Vice Chair: (2023) Sherrie Alexander, Department of Anthropology, University of Alabama at Birmingham, Birmingham, AL 35294, [sdalex@uab.edu](mailto:sdalex@uab.edu).

### Section VII: STEM Education:

- Chair: (2022) Jeffrey Morris, Dept. of Biology, University of Alabama at Birmingham, Birmingham, AL, [evolve@uab.edu](mailto:evolve@uab.edu).
- Vice Chair: VACANT

### Section VIII: Environmental and Earth Science:

- Chair: (2021) VACANT
- Vice Chair: (2021) VACANT

### Section IX: Health Sciences:

- Chair: (2022) Donna Cleveland, Dept. of Radiologic Science, University of South Alabama, Mobile, AL 36688, [jcleve1@bellsouth.net](mailto:jcleve1@bellsouth.net), [dccleveland@southalabama.edu](mailto:dccleveland@southalabama.edu)
- Vice Chair: (2022) Audrey Vasauskas, Dept. of Anatomical Sciences and Molecular Medicine, Alabama College of Osteopathic Medicine, 445 Health Sciences Blvd., Dothan AL 36303, [avasauskas@acom.edu](mailto:avasauskas@acom.edu).

### Section X: Bioethics and History and Philosophy of Science:

- Chair: (2022) Brian LaHaie, College of Environment and Design, Univ. of Georgia, Athens, GA 30-602 (706)-542-5125, [blahaie@uga.edu](mailto:blahaie@uga.edu).
- Vice Chair: (2022). VACANT

## ELECTED OFFICERS, 2020-2021

**President:** Cameron Gren, Dept of Chemistry and Industrial Hygiene, University of North Alabama, UNA Box 5049, Florence, AL 35632, (256) 765-5027, [cgren@una.edu](mailto:cgren@una.edu).

**President-Elect:** John Shelley-Tremblay, Department of Psychology, University of South Alabama, UCOM 1123, Mobile, AL 36688 (251) 460-6883, [jstremblay@southalabama.edu](mailto:jstremblay@southalabama.edu)

**Second Vice-President:** Vinoy Thomas, Department of Materials Science and Engineering, University of Alabama at Birmingham, (205) 975-4098, [vthomas@uab.edu](mailto:vthomas@uab.edu).

**Secretary:** Malia Fincher, Department of Biology, Samford, University, 900 Lakeshore Dr., Birmingham, AL 35229, (205) 726-2928 [rmfinche@samford.edu](mailto:rmfinche@samford.edu).

**Treasurer:** Bettina Riley, USA College of Nursing, 161 N. Section Street, Suite C, Fairhope, AL 36532, [briley@southalabama.edu](mailto:briley@southalabama.edu).

**Editor:** Brian Toone, Department of Computer Sci., Samford University, Birmingham, AL 35229 (205) 726-2960, [brtoone@samford.edu](mailto:brtoone@samford.edu).

**Coordinator of the Junior Academy:** Mark Jones, J. F. Drake Middle School, 655 Spencer Ave., Auburn, AL 36832, (334) 444-3099 [mtjones@auburnschools.org](mailto:mtjones@auburnschools.org).

**Associate Counselor to the Junior Academy:** Mary Williams, Altamont School, 4801 Altamont Rd., Birmingham, AL 35222, (205) 879-2006, [mawilliams@altamontschool.org](mailto:mawilliams@altamontschool.org).

**Associate Counselor to the Junior Academy:** VACANT.

**Coordinator of State Science Fairs:** Virginia Vilardi, Wetumpka High School, 1251 Coosa River Parkway, Wetumpka, AL 36092 (334) 799-0104, (334) 514-1770 [virginia.vilardi@elmore.k12.al.us](mailto:virginia.vilardi@elmore.k12.al.us).

**Coordinator of State Science Olympiad:** Mary Lou Ewald, Director of Science and Math Outreach, 131 SCC Building, Auburn University, Auburn, AL 36849 (334) 844-5745, [ewaldml@auburn.edu](mailto:ewaldml@auburn.edu).

**AAAS Representative:** Stephen Watts, Department of Biology, University of Alabama at Birmingham, Birmingham, AL 35294–1170 (205) 934–2045, [sawatts@uab.edu](mailto:sawatts@uab.edu).

**Executive Director:** Larry Krannich, Department of Chemistry, University of Alabama at Birmingham, Birmingham, AL 35294 (205) 936-0823, [krannich@uab.edu](mailto:krannich@uab.edu).

**At Large Officers:** (Vacant)

**Graduate Student At Large Officers:** (Vacant)

### TRUSTEES:

- Ken Marion, Department of Biology, University of Alabama at Birmingham, Birmingham, AL 35294–1170, [kmarion@uab.edu](mailto:kmarion@uab.edu).
- Prakash Sharma, Department of Physics, Tuskegee University, Tuskegee, AL 36088 (334) 727-8998, [psharma@tuskegee.edu](mailto:psharma@tuskegee.edu).
- Matthew Edwards, Dept. of Physics, Chemistry, & Math, Alabama A&M University, Normal, AL 35762 (256) 372-8119, [Mathew.edwards@aamu.edu](mailto:Mathew.edwards@aamu.edu).
- David Nelson, Department of Biology, University of South Alabama, Mobile, AL 36688 (252) 460-6331, [dnelson@usouthal.edu](mailto:dnelson@usouthal.edu).
- Brian Burnes, Livingston, AL 35470 (205) 652-3442, [bburnes01@gmail.com](mailto:bburnes01@gmail.com).
- Richard Hudiburg, Department of Psychology, University of North Alabama Box 5187, Florence, AL 35632 (256) 765-4572, [rahudiburg@una.edu](mailto:rahudiburg@una.edu).

- Adriane Ludwick, Department of Chemistry, Tuskegee University, Tuskegee, AL 36088, [aludwick@tuskegee.edu](mailto:aludwick@tuskegee.edu).
- Brian Toone, Department of Computer Sci., Samford University, Birmingham, AL 35229 (205) 726-2960, [brtoone@samford.edu](mailto:brtoone@samford.edu).
- Ellen B. Buckner, Ida V. Moffett School of Nursing, (205) 726-2092, Samford University, (205) 726-2092 [ellen.buckner@samford.edu](mailto:ellen.buckner@samford.edu)
- Stephen Watts, Department of Biology, University of Alabama at Birmingham, Birmingham, AL 35294–1170 (205) 934–2045, [sawatts@uab.edu](mailto:sawatts@uab.edu).
- Anne Cusic, Department of Biology, University of Alabama at Birmingham, Birmingham, AL 35294–1170 (205) 934-9686, [mamcusic@gmail.com](mailto:mamcusic@gmail.com).
- Ron Hunsinger, Professor Emeritus, Samford University, Birmingham, AL 35229, (205) 540-6732 [rnhunsin@samford.edu](mailto:rnhunsin@samford.edu).



## APPOINTED COMMITTEES 2020-21

### Archives

- VACANT

### Auditing Senior Academy

- Budget and Finance Committee

### Auditing Junior Academy

- Budget and Finance Committee
- Mark Jones, J. F. Drake Middle School, 655 Spencer Ave., Auburn, AL 36832, (334) 444-3099 [mtjones@auburnschools.org](mailto:mtjones@auburnschools.org).

### Budget and Finance

- Trustee, Ken Marion, (Chair) 2020, Dept. of Biology, Univ. of Alabama at Birmingham, Birmingham, AL, 35294-1170, , [kmarion@uab.edu](mailto:kmarion@uab.edu)
- Trustee, Ellen Buckner, (2020) College of Health Sciences, School of Nursing, Samford University, Birmingham, AL, 35229, (205)726-2092(w); (205) 810-9877(c), [ebuckne2@samford.edu](mailto:ebuckne2@samford.edu); [ebbuckner@gmail.com](mailto:ebbuckner@gmail.com)
- First Vice-President, John Shelley-Tremblay, Department of Psychology, University of South Alabama, UCOM 1123, Mobile, AL 36688 (251) 460-6883, [jstremblay@southalabama.edu](mailto:jstremblay@southalabama.edu)
- Counselor to the Junior Academy, Mark Jones, (2020) J. F. Drake Middle School, 655 Spencer Avenue, Auburn, AL, 36832 , [mtjones@auburnschools.org](mailto:mtjones@auburnschools.org)
- President, Cameron Gren, Dept of Chemistry and Industrial Hygiene, University of North Alabama, UNA Box 5049, Florence, AL 35632, (256) 765-5027, [cgren@una.edu](mailto:cgren@una.edu)
- Treasurer, Bettina Riley, (2021) USA College of Nursing, 161 N. Section Street, Suite C, Fairhope, AL, 36532, (251) 517-5363, [briley@southalabama.edu](mailto:briley@southalabama.edu)
- Secretary, Melia Fincher, (2021) Department of Biology, Samford University, Birmingham, AL, 35229, (205) 726-2928, [rmfinche@samford.edu](mailto:rmfinche@samford.edu)
- Executive Director, Larry Krannich, Department of Chemistry, University of Alabama at Birmingham, Birmingham, AL 35294, [krannich@uab.edu](mailto:krannich@uab.edu)

### Editorial Board and Associate Journal Editors: (staggered 3-yr terms)

- John Shelley-Tremblay, (Acting Chair) (2022), Department of Psychology, University of South Alabama, UCOM 1123, (251) 460-6883 Mobile, AL 36688, [jstremblay@southalabama.edu](mailto:jstremblay@southalabama.edu)
- Jim Bradley, (2022) Department of Biology, Auburn University, Auburn, AL 36849, [bradljt@auburn.edu](mailto:bradljt@auburn.edu)
- Prakash Sharma, (2021) Department of Physics, Tuskegee University, Tuskegee, AL 36088, [psharma@tuskegee.edu](mailto:psharma@tuskegee.edu)
- Vacant

### Electronic Media: (3-yr terms)

- Diann Jordan, (2022) 915 South Jackson Street, Montgomery, AL 36101, [djordan@alasu.edu](mailto:djordan@alasu.edu)
- Richard Hudiburg, Associate Editor, (2022) Department of Psychology, University of North Alabama, Box 5187, Florence, AL 35632, [rahudiburg@una.edu](mailto:rahudiburg@una.edu)
- Brian Toone, (2021) Dept. of Computer Science, Samford Univ., Birmingham, AL, 35229, (205) 726-2960, [brtoone@samford.edu](mailto:brtoone@samford.edu)
- Jason L. Heaton, (2021) Dept of Biology, Birmingham Southern College, Birmingham, AL, [jheaton@bsc.edu](mailto:jheaton@bsc.edu)

### Emmett B. Carmichael Award: (staggered 2-yr terms)

- Richard Hudiburg, Chair, (2021) Department of Psychology, University of North Alabama, Box 5187, Florence, AL 35632, [rahudiburg@una.edu](mailto:rahudiburg@una.edu)
- David Nelson, (2022) Department of Biology, University of South Alabama, Mobile, AL 36688, [dnelson@usouthal.edu](mailto:dnelson@usouthal.edu)
- Brian Toone, (ex officio) Department of Computer Sci., Samford University, Birmingham, AL 35229 (205) 726-2960, [brtoone@samford.edu](mailto:brtoone@samford.edu).
- Larry Davenport, (2021) Department of Biological Sciences, Samford University, Birmingham, AL 35229, [ljdavenp@samford.edu](mailto:ljdavenp@samford.edu)

**Gorgas Scholarship Program: (staggered 3-yr terms)**

- Ellen Buckner, Co-chair, College of Health Sciences, School of Nursing, Samford University, Birmingham, AL 35229 (205) 910-9877 [ebbuckner@gmail.com](mailto:ebbuckner@gmail.com) & [ellen.buckner@samford.edu](mailto:ellen.buckner@samford.edu)
- Larry Krannich, Co-chair, Department of Chemistry, University of Alabama at Birmingham, Birmingham, AL 35294, [krannich@uab.edu](mailto:krannich@uab.edu)
- Elizabeth Dobbins, (2023) Department of Biology, Samford University, Birmingham, AL 35229, [egdobbin@samford.edu](mailto:egdobbin@samford.edu)
- David H. Nelson, (2023) Department of Biology, University of South Alabama, Mobile, AL 36688, [dnelson@southalabama.edu](mailto:dnelson@southalabama.edu)
- Prakash Sharma, (2022) Department of Physics, Tuskegee University, Tuskegee, AL 36088, [psharma@tuskegee.edu](mailto:psharma@tuskegee.edu).
- Andy Coleman, (2022) 512 Scenic Circle, Trussville, AL, 35173, [urbanturtleproject@gmail.com](mailto:urbanturtleproject@gmail.com); [atcoleman80@gmail.com](mailto:atcoleman80@gmail.com).
- VACANT
- Mitzi Adams (2022) 320 Sparkman Drive, Huntsville, AL, 35805, [mitzi.adams@nasa.gov](mailto:mitzi.adams@nasa.gov)

**Junior Academy:**

- Mark Jones, J. F. Drake Middle School, 655 Spencer Avenue, Auburn, AL 36832, [mtjones@auburnschools.org](mailto:mtjones@auburnschools.org)

**Junior Academy Regional Counselors:**

- Virginia Vilardi, Wetumpka High School, 1251 Coosa River Parkway, Wetumpka, AL 36092 (334) 799-0104, (334) 514-1770 [virginia.vilardi@elmore.k12.al.us](mailto:virginia.vilardi@elmore.k12.al.us).

**Local Arrangements at University of South Alabama**

- John Shelley-Tremblay, Department of Psychology, University of South Alabama, UCOM 1123, Mobile, AL 36688 (251) 460-6883, [jstremblay@southalabama.edu](mailto:jstremblay@southalabama.edu)

**Long Range Planning: (staggered 4-yr terms, committee elects chair)**

- Akshaya Kumar (2022) Department of Physics, Tuskegee University, Tuskegee, AL 36088, (334) 727-8968, [akumar@tuskegee.edu](mailto:akumar@tuskegee.edu).
- Puneet Srivastava (2023) 200 Corley Building, Biosystems Engineering, Auburn AL 36849, [srivapu@auburn.edu](mailto:srivapu@auburn.edu).
- Brian Toone, (ex officio) (2024) Department of Computer Sci., Samford University, Birmingham, AL 35229 (205) 726-2960, [brtoone@samford.edu](mailto:brtoone@samford.edu).
- John Shelley-Tremblay, (2023), Department of Psychology, University of South Alabama, UCOM 1123, (251) 460-6883 Mobile, AL 36688, [jstremblay@southalabama.edu](mailto:jstremblay@southalabama.edu)

**Mason Scholarship: (staggered 3-yr terms)**

- Ronald Hunsinger (Chair) (2023) 1070 Crest Rd., Leads, AL [rnhusin@samford.edu](mailto:rnhusin@samford.edu)
- Mickie Powell (2022) Department of Biology, University of Alabama at Birmingham, Birmingham, AL 35294 [mpowell@uab.edu](mailto:mpowell@uab.edu)

- Amanda Coffman, (2021) Department of Chemistry and Industrial Hygiene, University of North Alabama, School Florence, AL 35632, [alhofacker@una.edu](mailto:alhofacker@una.edu)
- R. Melvin Blake, (2023) Department of Physical and Earth Science, University of North Alabama, Florence, AL 35632, [rdblake@una.edu](mailto:rdblake@una.edu)

**Membership and Development:**

- Akshaya Kumar (Chair) Dept. of Physics, Tuskegee University, Tuskegee, AL 36088, (334) 727-8968, [akumar@tuskegee.edu](mailto:akumar@tuskegee.edu)
- Active Past Presidents
 

Adriane G. Ludwick .....	1989-90
Ken R. Marion .....	1991-92
Michael B. Moeller.....	1992-93
Prakash Sharma .....	1993-94
Eugene Omasta .....	1994-95
Ellen B. Buckner.....	1997-98
Richard Hudiburg .....	2000-01
Stephen A. Watts .....	2002-03
Anne M. Cusic.....	2003-04
Larry Davenport .....	2005-06
David Nelson .....	2006-07
George Cline.....	2007-08
D. Brian Thompson .....	2009-10
Brian Burnes .....	2010-11
Mickie Powell.....	2011-12
Ronald N. Hunsinger .....	2012-13
Emanuel Waddell .....	2013-14
John McCall.....	2014-15
Brian R. Toone .....	2015-16
Akshaya Kumar .....	2016-17
Ketia Shumaker .....	2017-18
Nixon Mewabi .....	2018
Drew Hataway .....	2018-2020

**Nominating:**

- Vinoy Thomas, Department of Materials Science and Engineering, University of Alabama at Birmingham, (205) 975-4098, [vthomas@uab.edu](mailto:vthomas@uab.edu), and all Section Chairs

**Place and Date of Meeting: (5 members, staggered 5-yr terms)**

- Rekha Lall (Chair) (2022) Auburn Primary Care, East Alabama Medical Center, 1719 Catherine Ct, Auburn, AL 36830, 334-826-7220, [rlall@eamc.org](mailto:rlall@eamc.org)
- Donna Perygin (2021) Department of Chemistry and Geosciences, Jacksonville State University, Jacksonville, AL 36265, [dperygina@jsu.edu](mailto:dperygina@jsu.edu).
- Larry Krannich, (2025) Department of Chemistry, University of Alabama at Birmingham, Birmingham, AL 35294, (205) 936-0823, [krannich@uab.edu](mailto:krannich@uab.edu)
- George Cline, (2022) Department of Biology, Jacksonville State University, Jacksonville, AL 36265, [gcline@jsu.edu](mailto:gcline@jsu.edu)
- Itza Soloman (2024), University of Mobile, 5735 College Parkway, Mobile, AL 36613, [sitza@umobile.edu](mailto:sitza@umobile.edu).

**Research: (5 members with staggered 5-yr terms)**

- Brian Burnes, Chair (2021) [bburnes01@gmail.com](mailto:bburnes01@gmail.com)

- Stephen Watts, (2022) Department of Biology, University of Alabama at Birmingham, Birmingham, AL 35294, [sawatts@uab.edu](mailto:sawatts@uab.edu)
- Afef Janen, (2021) Alabama A&M University, [afef.janen@gmail.com](mailto:afef.janen@gmail.com)
- Berneece Herbert, (2023) Department of Community and Regional Planning, Alabama A&M University, Normal, AL 35762 (256) 372-4988, [berneece.herbert@ammu.edu](mailto:berneece.herbert@ammu.edu)
- Vacant (2024)

#### **Resolutions:**

- Brian Burnes, Chair (2021) [bburnes01@gmail.com](mailto:bburnes01@gmail.com)

#### **Science, Public Policy, and Public Relations: (staggered 4-yr terms)**

- Scott Brande, co-Chair, (2021) Department of Geology, University of Alabama at Birmingham, Birmingham, AL 35294, [sbrande@uab.edu](mailto:sbrande@uab.edu)
- Brian Burnes, co-Chair (2021) [bburnes01@gmail.com](mailto:bburnes01@gmail.com)
- Ellen Buckner, (2022), College of Health Sciences, School of Nursing, Samford University, Birmingham, AL 35229 (205) 726-2092(w); (205) 810-9877(c), [ebuckne2@samford.edu](mailto:ebuckne2@samford.edu); [ebbuckner@gmail.com](mailto:ebbuckner@gmail.com).
- Gregory Buckley (2023) Dept. of Physical and Earth Science, University of North Alabama, Florence, AL 25632, [gbuckley@una.edu](mailto:gbuckley@una.edu).
- James Bradley, (2024) Department of Biological Sciences, Auburn University, Auburn, AL 36849, [bradljt@auburn.edu](mailto:bradljt@auburn.edu)
- Vacant (2023)

#### **Steering:**

- Immediate Past President, Drew Hataway, Dept. of Biology, Samford University, Birmingham, AL 35229, (205)-726-4190, [rahatawa@samford.edu](mailto:rahatawa@samford.edu).
- President, Cameron Gren, Dept. of Chemistry and Industrial Hygiene, University of North Alabama, UNA Box 5049, Florence, AL [cgren@una.edu](mailto:cgren@una.edu).
- Vice President, John (Jack) Shelley-Tremblay, (2020) Department of Psychology, University of South Alabama, UCOM 1123, (251) 460-6883 Mobile, AL 36688 , [jstremblay@southalabama.edu](mailto:jstremblay@southalabama.edu)
- Second Vice President, Vinoy Thomas, Department of Materials Science and Engineering, University of Alabama at Birmingham, (205) 975-4098, [vthomas@uab.edu](mailto:vthomas@uab.edu)
- Secretary, Bettina Riley, USA College of Nursing, 161 N. Section Street, Suite C, Fairhope, AL 36532, [briley@southalabama.edu](mailto:briley@southalabama.edu).
- Treasurer, Melia Fincher, Department of Biology, Samford University, 900 Lakeshore Dr., Birmingham, AL 35229, (205) 726-2928 [rmfinche@samford.edu](mailto:rmfinche@samford.edu)

#### **Wright A. Gardner Award: (4 members with staggered 2-yr terms)**

- Prakash Sharma, Chair, (2022) Department of Physics, Tuskegee University, Tuskegee, AL 36088, [psharma@tuskegee.edu](mailto:psharma@tuskegee.edu)
- Matthew Edwards, (2021) Dept. of Physics , Alabama A&M Univ., Normal, AL, 35762, (256) 372-8119 or (256) 372-8104, [matthew.edwards@aamu.edu](mailto:matthew.edwards@aamu.edu)
- Vacant (2022)
- Vacant (2020)

## PAST PRESIDENTS

<i>NAME</i>	<i>TERM</i>
Wright A. Gardner (2 terms).....	1924-26
Stewart J. Lloyd.....	1926-27
John R. Sampey.....	1927-28
Walter C. Jones.....	1928-29
Fred Allison.....	1929-30
Emmett B. Carmichael.....	1930-31
George J. Fertig.....	1931-32
J.F. Duggar.....	1932-33
J.L. Brakefield.....	1933-34
Russell S. Poor.....	1934-35
A.G. Overton.....	1935-36
Walter B. Jones.....	1936-37
Roger W. Allen.....	1937-38
P.H. Yancey.....	1938-39
George D. Palmer.....	1939-40
C.M. Farmer.....	1940-41
Paul D. Bales.....	1941-42
W.M. Mobley.....	1942-43
E.V. Jones.....	1943-44
J.T. McKenzie.....	1944-45
J.M. Robinson.....	1945-46
James L. Kassner.....	1946-47
John Xan.....	1947-48
Eugene D. Emigh.....	1948-49
C.A. Basore.....	1949-50
Harold E. Wilcox.....	1950-51
Henry Walker.....	1951-52
John A. Fincher.....	1952-53
Joseph F. Volker.....	1953-54
William T. Wilks.....	1954-55
Ralph Chermock.....	1955-56
J. Allen Tower.....	1956-57
Howard Carr.....	1957-58
Herbert A. McCullough.....	1958-59
Samuel B. Barker.....	1959-60
James R. Goetz.....	1960-61
Paul C. Bailey.....	1961-62
Louis J. Eisele.....	1962-63
E. Carl Sensenig.....	1963-64
William J. Barrett.....	1964-65
James F. Sulzby, Jr.....	1965-66
David L. DeJarnette.....	1966-67
H. Ellsworth Steele.....	1967-68
Ruric E. Wheeler.....	1968-69
Wilbur B. DeVall.....	1969-70
W.L. Furman.....	1970-71

G.O. Spencer.....	1971-72
Joseph C. Thomas.....	1972-73
Robert T. Gudauskas .....	1973-74
Reuben B. Boozer.....	1974-75
Thomas E. Denton .....	1975-76
Urban L. Diener .....	1976-77
James C. Wilkes.....	1977-78
William F. Arendale .....	1978-79
Jack H. Moore.....	1979-80
Geraldine M. Emerson.....	1980-81
Kenneth Ottis .....	1981-82
Charles M. Baugh.....	1982-83
Raymond E. Isbell .....	1983-84
John F. Pritchett.....	1984-85
Stanley T. Jones .....	1985-86
Philip G. Beasley .....	1986-87
H. Dean Moberly .....	1987-88
Richard L. Shoemaker .....	1988-89
Adriane G. Ludwick.....	1989-90
Michael E. Lisano.....	1990-91
Ken R. Marion .....	1991-92
Michael B. Moeller.....	1992-93
Prakash Sharma .....	1993-94
Eugene Omasta .....	1994-95
Dan C. Holliman.....	1995-96
Thomas S. Jandebeur.....	1996-97
Ellen B. Buckner.....	1997-98
Moore Asouzu .....	1998-99
Larry R. Boots .....	1999-00
Richard Hudiburg .....	2000-01
Roland Dute .....	2001-02
Stephen A. Watts .....	2002-03
Anne M. Cusic .....	2003-04
Ronald L. Jenkins .....	2004-05
Larry Davenport.....	2005-06
David Nelson .....	2006-07
George Cline .....	2007-08
Kenneth Roblee .....	2008-09
D. Brian Thompson .....	2009-10
Brian Burnes .....	2010-11
Mickie Powell.....	2011-12
Ronald N. Hunsinger.....	2012-13
Emanuel Waddell.....	2013-14
John McCall.....	2014-15
Brian R. Toone.....	2015-16
Akshaya Kumar.....	2016-17
Ketia Shumaker .....	2017-18
Nixon Mwebi .....	2018
Drew Hataway .....	2018-20
Cameron Gren.....	2020-21

## **HOSTS FOR FUTURE ALABAMA ACADEMY OF SCIENCE MEETINGS**

2022 – Athens State University  
2023 – College of Health Sciences, Samford University

The Local Arrangements Manual for planning Academy annual meeting can be found on the Academy website: [www.alabamaacademyofscience.org](http://www.alabamaacademyofscience.org).

**NINETY-NINTH ANNUAL MEETING**  
**of the**  
**ALABAMA ACADEMY OF SCIENCE, INC.**



**JOINT MEETING**  
**with the**  
**ALABAMA JUNIOR ACADEMY OF SCIENCE**  
**GORGAS COMPETITION AWARDS**



**Athens State University**  
**Athens, AL**