



Volume 5,  
Issue 4

April 2017

*What's going on in  
the North Carolina  
Academy of Science:*

- Annual Meeting Reflections
- Bryden and Derieux Award Winners
- Featured Scientist—Dr. Karthik Agorham
- Photos from the Annual Meeting

**Inside this issue:**

Meeting Reflections	1
Featured Scientist	2
News & Announcements	2
Photos	3
Bryden & Derieux Award Winners	4-6
Thank You to Sponsors	7

## Student Reflections on the NCAS Annual Meeting

*Report by: Dr. Karen Guzman, Campbell University*

Each spring, I look forward to the NCAS Annual Meeting with anticipation. The one and a half day event always provides a refreshing look at science as the meeting brings together a diverse group of scientists, both with respect to scientific field and time-frame within their career or education. The meeting is a great opportunity for both faculty and students to share and reflect on one of

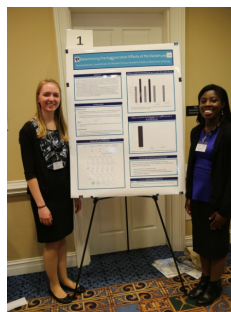
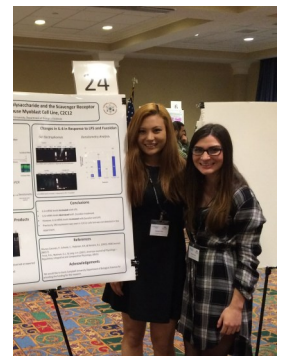


our passions: Science! In an age when we get wrapped up in our own little corner of science, the NCAS meeting encourages us to see science as a multifaceted endeavor. I especially appreciated the thought-provoking key note presentation by Dr. Karthik Agorham, the Featured Scientist in this issue of the newsletter, on the topic “*A spoonful of DNA, a handful of dirt, and a dash of reason: A simple recipe for successful, sustainable food production?*.”

For the April issue of the newsletter, we often use the cover story to hear from a meeting participant about their experience at the meeting. For this issue, I asked students from Campbell University to reflect on their experiences. Here is what they had to say:

"Being able to attend the NCAS conference was an amazing experience! The event allowed me to interact with fellow students about their research and explore other research ideas. This experience has definitely encouraged me pursue future research opportunities and network with other students."

*-Gloribel Vanegas*



"Through all of the presentations and interactions with other students, it was really neat to see the diverse, supportive community that is present between the different schools and science disciplines."

*-Micaela Robson*

"For me it was one of my favorite experiences this semester because Lyndsay and I were finally able to share the research we had been working so hard on and it felt like we really accomplished something. Being able to present and discuss our project with a variety of people who were all interested was a great feeling. I also enjoyed learning many things from other present-

ers and their research."

*-Hannah Jonas*

# Featured Scientist

Report by: *Dr. Jessica McCann, Duke University*

In this issue, we are featuring Dr. Karthik Aghoram, our keynote speaker at the NCAS annual meeting. His talk was titled “A spoonful of DNA, a handful of dirt, and a dash of reason: A simple recipe for successful, sustainable food production?” Dr. Aghoram gave a balanced, well-informed presentation of the challenges of sustainable food production, the controversy regarding various approaches to solve the problem, and the promise of using modern technologies in a sensible way. A lively question and answer period followed and left the audience with a foundation for continuing the discussion.



We asked Dr. Aghoram when it was that he first realized he wanted to be a scientist. “Like many kids growing up in urban India, I wanted to go to medical school after high school (that’s how the system works there) and become a doctor,” he said. Lucky for him, he had the benefit of being able to experience the system from the outside before jumping in with both feet. “My sister, who is 4 years older, started medical school and I got a close look at what it entails, then decided that it was not to my liking.” He loved science in school, so decided to enroll in a Bachelors program focused in Chemistry, Botany and Zoology. He then went on to complete a Master’s in Botany. But he says that even after several years of advanced science education, he only had a vague idea of what it meant to be a practicing scientist. All of his education thus far had been lecture based. “I had no idea how to do research,” he said.

But it was during his Master’s work that Dr. Aghoram settled on a research focus, even if he didn’t know it yet. “I did a paper for a plant physiology class. I was assigned stomatal physiology - and I was captivated.” Stomata are responsible for regulating gas exchange in plants. When they are open during the day, they can gather the carbon dioxide required for photosynthesis – but open stomata allow water vapor to escape from plants. He realized there was potential to manipulate plant stomata development to help promote drought tolerance. “That was 24 years ago, and I am still fascinated by this field,” Dr. Aghoram said. “Now, I can share my passion with students in the classroom and the laboratory.”

Dr. Aghoram has a great reputation for mentoring undergrad research – he currently has 11 students conducting research in his lab - so we asked him for tips on designing research projects for undergrads. He told us that, “the main goal is to design projects that motivate students to pursue research, and train them in basic lab skills, marketable techniques, experimental design, and critical analysis of data.” His secret to managing so many students is to recruit students as sophomores, then train those recruits as lab leaders. “Otherwise, you will become the technical bottleneck” in the lab, Dr. Aghoram said.

While his enthusiasm for science and science teaching was obvious throughout our conversation, we were reminded again and again that Dr. Aghoram is an advocate for the strong role that science can have in policy making and improving lives. “I am very passionate about my role as a science communicator,” he said. He is also a strong advocate for applying science-based approaches to sustainable agriculture. “My motto: Less land. More

Applications for the 2017-2018 **Yarbrough Grants** are now open with a deadline of **May 1<sup>st</sup>, 2017**. These grants fund undergraduate research either in the 2017-2018 school year or the summer of 2017. All materials and questions should be sent to Dr. Eric Butler

Check out the **NC Science Festival** events going on across the state of North Carolina and celebrate your love for science! More information is available at:  
<http://www.ncsciencefestival.org/>  
Events are going on from April 7-23



# Bryden Awards

Report By Dr. Lei Zhang, Winston-Salem State University

Congratulations to **Halley Shah** at UNC-Greensboro for winning a 2017 Bryden Grant! The project is overseen by Professor Zhenquan Jia and is entitled “*Molecular Studies of Air Pollutant benzo(a)pyrene-1,6-guinone-Induced Endothelial Dysfunction: Implications in Chemical Atherogenesis.*”

The following proposals received honorable mentions:

**Radminla Petric UNC-Greensboro** (Advisor: Dr. Martina Kacounis-Rueppell) for the project entitled “*Effects of Broadband Anthropogenic Noise on Deer Mouse (Peromyscus maniculatus) Behavior.*”

**Kevin Parker, UNC Greensboro** (Advisor: Dr. Matina Kalconuis-Ruppell) for the project entitled “*Species-specific Temperature Thresholds for Bat Activity and Winter Occupancy Probability*”

# CANCAS Derieux Award Winners

Report by: Dr. Daniel Stovall, NC Wesleyan College and Beth Overman, Methodist University

**Congratulations to the 2017 Annual Meeting’s Poster Winners!**

Category	Award	Name	Institution	Title
Molecular Biology & Microbiology	3 <sup>rd</sup> Place	Ereny Gerges	UNC-Pembroke	Cadmium from cigarette smoke increases the risk and severity of lower respiratory tract infection by decreasing the immune response of alveolar macrophages
	2 <sup>nd</sup> Place	Rebecca Ulrich	High Point University	Small molecule modulation of virulence behaviors in <i>Staphylococcus epidermidis</i>
	1 <sup>st</sup> Place	Michele Johnson	High Point University	Capsaicin induces metabolic gene expression in myotubes
Botany & Zoology	3 <sup>rd</sup> Place	David Watts	NC State University	Who’s that? Can nocturnal aye-ayes ( <i>Daubentonia madagascariensis</i> ) determine who is talking?
	3 <sup>rd</sup> Place	Sherese Mann	NC A&T University	Improving Alzheimer’s literacy in STEM college students through service learning
	2 <sup>nd</sup> Place	Elizabeth Reardon	High Point University	Phylogeographic analysis of mitogenomes of five tropical Asian birds
	2 <sup>nd</sup> Place	Sarah Forget	High Point University	Effects of seasonal frond angles on leaf temperature and associated ecophysiology of the evergreen fern, <i>Polystichum acrostichoides</i>
	1 <sup>st</sup> Place	Trina Phan	Nash Community College	Using mtDNA to accurately describe diversity within the Northern Dusky Salamander species complex

## Thank You Judges & Moderators!

This year’s annual meeting boasted fantastic array of student presentations, including outstanding posters and oral presentations. Every year, volunteer judges with expertise in a variety of fields share of their time to provide valuable feedback to student presenters. These judges take their jobs very seriously, and deliberate carefully on award winners. Moderators create a professional environment for the oral presenters to showcase their hard work and results. Without these volunteers, the annual meeting would not be a success! Thank you

# CANCAS Derieux Award Winners

Report by: Dr. Daniel Stovall, NC Wesleyan College and Beth Overman, Methodist University

Physical Science, Biotechnology, Science Education, and Chemistry	3 <sup>rd</sup> Place	Spencer Winspear	Campbell University	Optimization of an electrophilic bromination of vanillin to be used as a pedagogical experiment
	3 <sup>rd</sup> Place	Jason Barbaretta	High Point University	A novel application of TEC-disulfide replacement showcased in the synthesis of SFTI-1
	2 <sup>nd</sup> Place	Emma James Barksdale	High Point University	Antibacterial assessment of cyclogossine A, A cyclic heptapeptide from <i>J. gossypifolia</i>
	1 <sup>st</sup> Place	Jennifer Marshall	High Point University	Extending the substrate scope of the Chan-Lam cross coupling reaction using photoredox catalysis
Molecular Genetics, Health Science, & Cell Biology	3 <sup>rd</sup> Place	Lonzie Hedgepeth	UNC Pembroke	Representation of protein-DNA binding dynamics via a Gal induction informed mathematical model
	2 <sup>nd</sup> Place	Cameron Dixon	St. Andrews University	Biochemical characterization of wasp venom
	1 <sup>st</sup> Place	Sarina Veale	NC A&T State University	Student learning gains in a health disparities research course

Ecology & Environmental Science	3 <sup>rd</sup> Place	Lauren Miller & Bea Balajonda	Elon University	Potential effects of habitat and host plant use on opportunity for hybridization between two insect species
	3 <sup>rd</sup> Place	Tyler Watson	East Carolina University	The fundulus diaphanus species complex: convergent evolution?
	2 <sup>nd</sup> Place	Aaron Wagoner	UNC Greensboro	Monitoring wildlife biodiversity at wetland restoration sites on the University of North Carolina Greensboro (UNCG) campus
	2 <sup>nd</sup> Place	Warren Grunvald	Elon University	Assessing morphological traits for evidence of in situ hybridization between two closely related insect species
	1 <sup>st</sup> Place	Micah Morgan	High Point University	Photo enzymatic repair effectiveness of Moina exposed to UV-B radiation

## CANCAS 2017–2018 Officers

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If you'd like to be involved in CANCAS, contact  
 Dr. Beth Overman  
 (boverman@methodist.edu) or  
 Dr. Daniel Stovall  
 (dstovall@ncwc.edu)!

# CANCAS Derieux Award Winners

Report by: Dr. Daniel Stovall, NC Wesleyan College and Beth Overman, Methodist University

## Congratulations to the 2017 Annual Meeting's Oral Talk Winners!

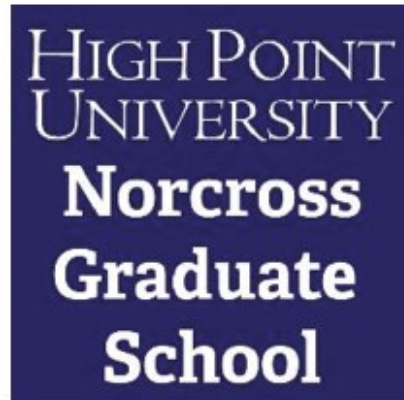
Category	Award	Name	Institution	Title
Microbiology	3 <sup>rd</sup> Place	Byron Hamilton	Guilford College	What's an old book good for? Testing an Ayurvedic cure for acne
	2 <sup>nd</sup> Place	Nathan Lee	Guilford College	The effect of a recombinant hydrolytic enzyme on hybrid biofilms of <i>Staphylococcus aureus</i> and <i>Candida albicans</i>
	1 <sup>st</sup> Place	Alyssa Hall	Lenoir-Rhyne University	The effect of carbon source and essential oil on the morphology and growth of <i>Aspergillus niger</i>
Genetics and Cellular & Developmental Biology	3 <sup>rd</sup> Place	Zack Zapatero	Davidson College	Deciding to be a helper: exploring the <i>in vitro</i> function of the Cd4 enhancer NCE
	2 <sup>nd</sup> Place	Abbi Stacherski	Lenoir-Rhyne University	Investigating the effects of gibberellic acid on cell growth in pumpkins ( <i>C. pepo</i> )
	2 <sup>nd</sup> Place	Cary Mundell	UNC Pembroke	Study of a positive lysosomal modulator for treating age related brain dysfunction
	1 <sup>st</sup> Place	Luke Lynch	Lenoir-Rhyne University	Exploiting synthetic lethal relationships with the SWI/SNF chromatin remodeling complex via miRNAs
Ecology & Behavioral Science	3 <sup>rd</sup> Place	Audrey Hoffman	Catawba College	VOC interference limits host detection of the parasitic plant <i>Cuscuta gronovii</i>
	2 <sup>nd</sup> Place	Zack Petrie	Warren Wilson College	Effect of powerlines on magnetoreception in <i>Notophthalmus viridescens</i>
	1 <sup>st</sup> Place	Gabrielle Resh	Elon University	Do mockingbirds normally copy their mimetic song directly from model species, or from other mockingbirds?
Zoology & Environmental Science	3 <sup>rd</sup> Place	Daniel Lough	Wake Forest University	Revisions of mammal and bird ranges in Manu National Park: results of a multiyear camera trapping study across a 3.2km elevation gradient
	2 <sup>nd</sup> Place	Emma Eskeland	Elon University	Examining two closely related species for evidence of selection against hybridization
	1 <sup>st</sup> Place	Dawson Nance	Elon University	Examining the effects of parasitism of female mate choice and copulation duration
Health Science, Biotechnology, & Engineering	3 <sup>rd</sup> Place	Taylor McKee	Lenoir-Rhyne University	The effects of tetracycline and erythromycin on mitochondria activity as demonstrated by regeneration rate in <i>Lumbriculus variegatus</i>
	3 <sup>rd</sup> Place	Emma Lightsey	Warren Wilson College	Detection of rabies antibodies in Wolf-Dog Hybrid Sera
	2 <sup>nd</sup> Place	Miguel Sanchez	Lenoir-Rhyne University	Collateral sensitivity: identification of <i>Burkholderia multivorans</i> bacterial mutants through PCR and gel electrophoresis
	1 <sup>st</sup> Place	Sarah Edmark	High Point University	Methylglyoxal sensitizes <i>Bacillus oleronius</i> to topical antibiotics

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The **objective** of the North Carolina Academy of Science is to *encourage the advancement of science within the state of North Carolina by promotion of scientific research and by the fostering of education in the sciences!* The North Carolina Academy of Science meets these objectives by...

- Publishing a peer reviewed scholarly journal, the *Journal of the North Carolina Academy of Science*.
- Fostering and encouraging student involvement in the sciences through support of the Collegiate (CANCAS) and Student Academies (NCSAS).
- Promoting interactions among scientists and students throughout North Carolina.
- Providing a forum for exchange of ideas for solving issues important to North Carolina.

The Academy members include individuals from academia, industry, government, and all others who support the objectives and goals of the Academy.

## North Carolina Academy of Science

### Our Mission

The North Carolina Academy of Science promotes public appreciation of science, science education, scientific research and a meaningful role for science in public policy.

### Our Goals:

#### Promote public appreciation of science

- Partnership with Science Centers
- Public Lecture Series
- Newsletter

#### Promote science education

- NCAS Webpage
- Academic Lecture Series
- NCAS Publications: Journal, Educational Publications
- Student Academy - Middle & High School

#### Promote scientific research

- Yarbrough and Bryden Research Grants
- CANCAS Undergraduate Research Workshop
- Presentation Opportunities at Annual Meetings

- Journal of the North Carolina Academy of Science

#### Promote science in public policy

- Symposia
- News Releases
- Position Statements
- Interactions with Public Officials

