

Volume 2, Issue 2

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New NACS Website Launched!



NACS is pleased to announce that the redesign of the NACS website is completed and the website is now live! The new website has a clean and modern look with a dynamic new home page to display the seven research areas in the program. The website features a search function for faculty research interests and methods. A big thanks to all who worked on the new design, especially Pam Komarek, Emerald Brooks, and Katie Sacksteder. We would also like to express our gratitude to Marie Gates-Liden, Laura Ours, and other OACS staff in the College of BSOS who were responsible for the design and implementation of this project.

Please check out our website at www.nacs.umd.edu

Our new homepage!

Pam Receives Outstanding Staff Award

NACS assistant director Pam Komarek has received the 2015 Outstanding Staff Award from the College of Behavioral and Social Sciences. This award recognizes employees whose efforts have been extraordinary and who provide invaluable daily support to students, faculty, and administrators. Congratulations!

Semester Research Training Award

NACS students have the opportunity to apply for the new NACS Semester Research Training Award. The award will provide funds to a NACS student who wishes to visit another lab for a semester in order to acquire new expertise in technology or methodology that is not available in the home laboratory, but is critical for the student's development as a researcher and scientist. The award will be granted on a competitive basis and provides a stipend of (\$10,000) as well as additional funds (up to \$2,000) for transportation and lodging expenses.

The selected host lab can be within the US or in a foreign country. Students can apply for this award even if they don't plan to spend a full semester in the host lab as long as they will be able to master the new skill/technique during a shorter time period. To learn how to apply and to submit applications, please contact Katie Sacksteder (ksackste@umd.edu).

Student Grants Review Committee

This year the new Student Grants Review Committee (SGRC) was formed. Five students have volunteered to serve on the committee. The goal of the committee is to review NACS students' grant proposals prior to submission. Students who are interested must have their proposals as completed as possible and are strongly encouraged to have them reviewed by NACS Grant specialist Katie Sacksteder before submission to the SGRC. The committee will review submissions for the NIH National Research Service Award (NRSA) and the NSF Graduate Research Fellowship Program (GRFP). Proposals are accepted on a rolling basis. For more information or to have your grant proposal reviewed, please contact Krystyna Solarana (korzecho@umd.edu).

Student Representative Committee

Last year NACS created a Student Representative Committee (SRC). NACS Director Jens Herberholz and NACS students from each cohort (years 1-5 in the program) serve on the committee. The committee was established to provide a forum for students to express the concerns of the NACS student body to the NACS leadership, as well as to brainstorm ideas that will benefit the NACS community as a whole. The SRC has been instrumental in providing input on the QE proposal, student teaching, student training grants, the student grants review committee, and upcoming NACS events. Currently the SRC is helping the NACS leadership plan a new symposium event that will be held later this year.

Student Highlights

Recent Student Awards

Mehrnoosh Ahmadi, Soc. for Research in Child Development Award Dan Bryden, Best Poster at the Baltimore Chapter SfN Meeting Allyson Ettinger (Certificate student), NSF Graduate Research Fellowship Amritha Mallikarjun, NSF Proposal Honorable Mention Shikha Prashad, Sally J. Phillips Dissertation Fellowship Clare Sengupta, ARCS Foundation Scholarship

Recent Student Publications

(students and alumni in **bold** & *italics*; faculty in **bold**)

- * Baese-Berk, M., *Heffner, C.C.*, Dilley, L.C., Pitt, M.A., Morrill, T., & McAuley, J.D. (2014). Longterm temporal tracking of speech rate affects spoken-word recognition. Psychological Science, 25: 1546-1553.
- * Bissonette, G.B., Bryden, D.W., and Roesch, M.R. (2014) You won't regret reading this, Nat Neurosci 17, 892-893.
- * Choi J-M, *S. Padmala* and L. Pessoa. (in press). Counteracting effect of threat on reward enhancements during working memory. Cognition and Emotion.
- * Bryden, D.W., and Roesch, M.R. (2015) Executive Control Signals in Orbitofrontal Cortex during Response Inhibition, J Neurosci 35, 3903-3914.
- * Burton AC, Nakamura K, Roesch MR. From ventral-medial to dorsal-lateral striatum: neural correlates of reward-guided decision-making. Neurobiology of learning and memory. 2015;117:51-9. Epub 2014/05/27. doi: 10.1016/j.nlm.2014.05.003. PubMed PMID: 24858182; PubMed Central PMCID: PMC4240773.
- * David B.T. McMahon, Adam P. Jones, Igor V. Bondar, David A. Leopold, Face-selective neurons maintain consistent visual responses across months PNAS 2014 111 (22) 8251-8256; published ahead of print May 5, 2014, doi:10.1073/pnas.1318331111
- * Falk, B., Jakobsen, L., Surlykke, A., & Moss, C.F. (2014). Bats coordinate sonar and flight behavior as they forage in open and cluttered environments. The Journal of Experimental Biology, 217(24), 4356–4364. http://doi.org/10.1242/jeb.114132
- * Logan D, Ivanenko YP, Kiemel T, Cappellini G, Sylos-Labini F, Lacquaniti F and Jeka JJ. (2014) Function dictates the phase dependence of vision during human walking. Journal of Neurophysiology. 112:165-180.
- * Logan D, Kiemel T and Jeka JJ. (2014) Asymmetric sensory reweighting in human upright stance. PLOS ONE. 9:e100418.
- * Morrill, T.H., Baese-Berk, M., *Heffner, C.C.,* & Dilley, L.C. (accepted for publication). The interaction of syntactic cues and timing information in spoken word recognition. Psychonomic Bulletin and Review.
- * Tidwell, J.W., Dougherty, M.R., Chrabaszcz, J.S., Thomas, R.P., & Mendoza, J.L. (2014). What counts as evidence for working memory training? Problems with correlated gains and dichoto-mization. Psychonomic bulletin & review, 21(3), 620-628.
- Venezia A.C., Guth L.M., Spangenburg E.E., Roth S.M. (2015). Lifelong Parental Voluntary Wheel Running Increases Offspring Hippocampal Pgc-1α mRNA Expression But Not Mitochondrial Content or Bdnf Expression. Neuroreport. In Press.
- * Venezia A.C., Roth S.M. (2015). Recent Research in the Genetics of Exercise Training Adaptation. Medicine and Sport Science - 'Genetics and Sports', 2nd revised and extended edition. In Press
- * Yokoyama T*, S. Padmala* and L. Pessoa. (in press). Reward learning and negative emotion during rapid attentional competition. Frontiers in Psychology.

Sarah Blankenship, Soc. for Research in Child Development Award Amanda Chicoli, Ann G. Wylie Dissertation Fellowship Ruilong Hu, NSF Graduate Research Fellowship Srikanth Padmala, NSF Graduate Research Fellowship Alex Presacco, HESP Earlene Elkins Fellowship Award Andrew Venezia, NRSA F31 Pre-Doctoral Research Fellowship

Congratulations 2014 Graduates!

Nuria AbdulSaber, Ph.D. Advisors: Allen Braun and Bill Idsardi

Mohit Chadha, Ph.D. Advisor: Cindy Moss

Jong Moon Choi, Ph.D. Advisor: Luis Pessoa

Yu Gu, Ph.D. Advisor: Betsy Quinlan

Alice Jackson, Ph.D. Advisor: DJ Bolger

David Logan, Ph.D. Advisor: John Jeka

Susan Teubner-Rhodes, Ph.D. Advisor: Michael Dougherty

> **Sara Therrien**, Ph.D. Advisors: Catherine Carr and Art Popper

NACS Student Seminars

NACS student seminars were held this semester on Thursdays in the Bioscience Research Building. Seventeen student speakers presented their research. Information on dates and times for next fall will be announced soon.



In the Spotlight



Aminah Sheikh is a 4th year NACS student working in Patrick Kanold's lab. Last year Aminah was awarded an International Graduate Research Fellowship from the Graduate School. In summer 2014 she traveled to Germany where she conducted research for two months in the lab of Dr. Heiko Luhmann at the Institute of Physiology & Pathophysiology, Focus Program Translational Neurosciences (FTN), Johannes-Gutenberg University, Mainz.

Aminah's research focuses on the mechanisms of abnormal brain developmental disorders. For example, premature white-matter brain injury results in interruption of normal maturation and consequently increases risk of developing cerebral palsy and epilepsy in infants. She has found that using a rodent stroke model, hypoxia-ischemia (HI), one can induce selective injury to developing neurons in the subcortical white matter region of the brain, the subplate neurons. Lesion studies, including her own (Tolner* Sheikh* et al., 2012), have shown that subplate neurons are necessary for proper development of the cerebral cortex. While it is clear that subplate neurons play a major role in the maturation of developing brain circuitry, she is currently investigating the mechanism by which subplate damage leads to altered development, which has yet to be explained. A common medical disorder, fetal nuchal cord disorder, occurs during pregnancy when the umbilical cord of the fetus is wrapped fully around the neck. Subsequently, the twisting of the umbilical cord reduces oxygen (hypoxia) and blood flow (ischemia) to the infant. From studying the anatomical and physiological changes after Hypoxia-Ischemia, she hopes to identify targets for treatment (e.g. shrinkage in brain size), to help prevent long-term brain damage and cognitive impairment.

While Aminah was working in the Luhmann lab she gained experience learning a physiology recording technique and received one-on-one mentoring. She also expanded her professional neuroscience connections and got a broader perspective of how labs operate and interact with one another across the world. Aminah looks forward to future successful international collaborations.

After she earns her Ph.D., Aminah plans to go to medical school with hopes of pursuing a career in either Pediatric Neurology or Otorhinolaryngology (ENT) as a Physician Scientist. She hopes to integrate the research skills she has learned, as well as the inquisitive research mind set she has developed in order to improve neurological treatments in a clinical setting. Aminah says, "From volunteering in clinics, I noticed that it is difficult for scientists and physicians to understand each other's points of view, and thus the transfer of ideas undergoes some strain. Ultimately, I plan to lead a cohesive research lab at a research hospital involving physicians and scientists who will be able to get hands- on patient experience to drive the research for scientists to investigate the specifics underlying the mechanisms of cortical plasticity in neurological disorders."



Alex Presacco is a 3rd year NACS student, working in the lab of Samira Anderson. Last year he was chosen as one of three University of Maryland students to attend the Universitas 21 "Graduate Research Conference: Celebrating Ageing Research" at the University of Auckland in New Zealand. Universitas 21 (U21) is a global network of 27 research universities around the world.

Older adults frequently complain that they can hear what they have been told, but cannot understand the meaning, particularly in noisy conditions. These difficulties in understanding speech cannot be only related to reduced audibility, otherwise the use of hearing aids would solve the problem. Age-related deficits in auditory temporal processing could be the main cause of the communication problems experienced by older adults. The focus of Alex's research is to investigate how aging affects neural processing in the auditory system at the midbrain and cortical level by using non-invasive neuroimaging techniques such as Electroencephalography (EEG) and Magnetoencephalography (MEG).

The communication difficulties experienced by older adults have a significant social impact on them, as several studies have shown strong correlations among hearing loss and depression and cognitive impairment. Alex believes this is why it is so important to improve our understanding of how auditory temporal processing are affected by aging. Being able to identify age-related biomarkers in the auditory system could help audiologists assist older adults, in that they would be able to devise training techniques that could improve their understanding of speech in noise.

By attending the U21 conference, Alex was able to meet students that he would not usually interact with at conferences in the U.S. (i.e. students from Australian and Asian Universities), and this experience helped him expand his knowledge of age-related problems. According to Alex, "as a Ph.D. student, your scope of research is limited to the area that you are investigating and you usually attend conferences only focused on your topic, so the U21 conference was a unique opportunity to learn more about different research in the aging fields."

Alex's goal is to pursue a research career in an academic setting. He plans to work with Cochlear Implant (CI) recipients for his postdoctoral training. Recently he has been offered the opportunity to work on a CI project at the University of Washington, Seattle, beginning in summer 2016. Alex says, "This would be an ideal fit for me, as it would combine my desire to work on a clinical oriented project where I could apply the auditory neuroscience technical skills learned during my Ph.D. at the University of Maryland."

In the Spotlight



Dr. Lisa Taneyhill is an associate professor in the Department of Animal and Avian Sciences. She was awarded a grant from the National Institute of Dental and Craniofacial Research at the NIH. The Taneyhill lab studies the neural crest formation in the avian (chicken) embryo to better understand overall animal growth and development.

Dr. Taneyhill received her B.A. in Chemistry/Biochemistry from McDaniel College, where she chemically characterized anti-cancer compounds as part of her undergraduate research training at the National Cancer Institute in Frederick, MD. It was her mentors at McDaniel, Drs. Marilyn and Rick Smith, who piqued her interest in science, particularly carry out research to address human disease. She received her M.A. and Ph.D. in Molecular Biology from Princeton University, working with Dr. Arnold Levine to elucidate molecular mechanisms underlying Wnt-induced mammary tumor formation using cultured cells. It was Arnie's enthusiasm for science, along with his faith and confidence in her scientific abilities, which propelled Dr. Taneyhill to pursue postdoctoral studies with Dr. Marianne Bronner at Caltech. Here Dr. Taneyhill took advantage of her graduate training in molecular biology to adapt several assays to the developing chick embryo to shed light on how immotile neural crest cell precursors become migratory through an epithelial-to-mesenchymal transition (EMT). Under Marianne's guidance, Dr. Taneyhill discovered a passion for development, and in particular, the formation of the neural crest, a multipotent cell population that gives rise to various derivatives, including the peripheral nervous system, craniofacial skeleton, skin pigment cells, and portions of the heart.

Dr. Taneyhill came to the University of Maryland in October 2007, and her lab is currently exploring how cellular junctions, or the glue that keeps cells together, are dismantled to generate migratory cell types during EMT, and later re-assembled to allow multiple cell types to interact to create new tissues and organs. To address these questions, Dr. Taneyhill utilizes both chick neural crest and placode cells, which are initially stationary but later become migratory through modulation of cell junction components and adhesion. This research is significant and will impact society by enhancing our understanding of the molecular mechanisms underlying the generation of migratory cells, a process co-opted during human diseases such as cancer, and the intercellular interactions required to create more complex structures in an embryo or adult organism. Understanding how multiple cell types communicate and interact to generate a new tissue or organ is the focus of the NIH grant Dr. Taneyhill has recently received. This grant will advance the laboratory's research by informing future translational studies involving in vivo tissue/organ repair and/or ex ovo organ culture and development, with the ultimate goal of developing new treatments for affected individuals.



Dr. Dan Butts is an assistant professor in the Department of Biology. He was awarded an Early Career award from the National Science Foundation studying the impact of large-scale brain activity on sensory processing. His lab is the NeuroTheory Lab, which develops new computational approaches to understand neuronal processing of vision and audition.

Dr. Butts received his B.A. in physics and mathematics from Oberlin College. After working a year abroad in Copenhagen, he went to graduate school at UC Berkeley in physics to study condensed matter theory (often referred as "systems physics"). He was drawn to Berkeley because his doctoral advisor, Dan Rokhsar, was planning on using approaches from this field to study what seemed like more interesting problems in Biology. As Dr. Butts became involved in an initial project with a nearby lab, studying how early neural activity in retina guides brain development, he fell in love with neuroscience and based his dissertation around development in the visual pathway, even as his advisor moved into genomics. Knowing very little Biology at the time, Dr. Butts hoped to be able to contribute with approaches derived from his training æ a physicist. However he was highly influenced by the director of the collaborating lab, Dr. Carla Shatz, who believed that experimental neuroscience training was a prerequisite to being a good theorist. She invited him to join her lab as she moved to Harvard Medical School, in order to experimentally test theoretical predictions Dr. Butts made in graduate school. The postdoc training under Dr. Shatz was essential for his future research at the interface of experimental and theoretical neuroscience.

Dr. Butts' passion became to understand how the brain processes sensory information: how neural circuits are able to transform the concrete physical stimuli detected by primary sensory receptors to the "abstract" understanding, such as knowing the objects that comprise the visual scene or the meaning of the words we hear. After establishing himself studying these problems in positions at Harvard University and Weill Cornell Medical College, he joined the faculty at University of Maryland in 2009. His lab combines new computational methods with tailored experiments in collaboration with a number of neurophysiology labs. Projects focus on understanding how natural stimuli (such as those that potentially have abstract meaning) are processed through successive computations across visual and auditory areas. These studies typically involve complex stimuli, as well as the study of their processing in relevant behavioral contexts, necessitating the use of sophisticated analytical tools in combination with carefully designed experiments. Dr. Butts recently received an Early Career Award from NSF to use such approaches to gain insight into how sensory processing is shaped by perceptual and behavioral events. His long-term goal is to use the resulting links between observable neural activity and perception and behavior to understand how information processing goes wrong in cases of mental illness and brain damage, and thus how it might be treated.

Faculty Awards and Achievements

Samira Anderson, assistant professor in Hearing and Speech Sciences, received a Hearing Health Foundation Grant for her work in "Neural adaptation in hearing aid users."

Gregory Ball, professor in Psychology and dean of the College of Behavioral and Social Sciences, was named a 2014 Fellow by the American Association for the Advancement of Science.

Dan Butts, assistant professor in Biology, received a National Science Foundation Early Career Award for his research in "Network Modulation of Cortical Neuron Computation."

Nan Ratner, professor in Hearing and Speech Sciences, was named a 2014 Fellow by the American Association for the Advancement of Science. Dr. Ratner is also a 2014 honor award recipient of the American Speech Language and Hearing Association.

Naomi Feldman, assistant professor in Linguistics, was awarded an NSF grant for collaborative research "Cognitive models of the acquisition of vowels in context" with Micha Elsner at Ohio State University.

Mark Hallett, senior investigator at the National Institute of Neurological Disorders and Stroke, received at 2014 Lifetime Achievement Award from the American Association of Neuromuscular and Electrodiagnostic Medicine. He also received a Federal Laboratory Consortium for Technology Transfer (FLC) Mid-Atlantic Regional Award for Excellence in Technology Transfer, Deep Transcranial Magnetic Stimulation Coil, and Therapy System. This year he also became a honorary member of the Austrian Parkinson Society.

Derek Paley, associate professor in Aerospace Engineering, was awarded the A. James Clark School of Engineering E. Robert Kent Teaching Award for Junior Faculty in 2014.

Colin Phillips, professor in Linguistics and director of the Language Science Center, received an National Science Foundation Research Traineeship Program training grant (2015-2020). The project is called "Flexibility in language processes and technology: human and global scale." Dr. Phillips is PI on the grant. **Rochelle Newman**, chair of the Hearing and Speech Sciences Department and associate director of the Language Science Center, and **Bill Idsardi**, chair of the Linguistics Department, are co-PI's on the grant.

Patrick Kanold, associate professor in Biology, received a Brain Initiative Grant to develop new imaging technologies and data analysis techniques that will further our understanding of how large networks of neurons in the brain interact to process sensory information. **Tracy Riggins**, assistant professor in Psychology, is the PI on a grant called "Hippocampal-memory Network Development and Episodic Memory in Early Childhood." This grant is funded by the National Institute of Child Health and Human Development.

Matt Roesch, associate professor in Psychology, received an R21 grant for his research studying "Neural mechanism underlying social recognition of reward." This grant is funded by the National Institute of Mental Health.

Alex Shackman, assistant professor in Psychology, and Luis Pessoa, professor in Psychology, were awarded a Level II Dean's research initiative grant from BSOS for their collaborative research aimed at understanding the neural circuitry shared by anxiety, pain, and executive cognition.

Jonathan Simon, professor in Electrical and Computer Engineering and Biology, was awarded a grant from NIDCD for his research in "Auditory Scene Analysis and Temporal Cortical Computations." He also received a UMCP ADVANCE Program Interdisciplinary and Engaged Research Seed Grant for research on the "Effects of Aging on Speech-in-noise Processing in the Auditory Cortex and Midbrain." In addition, along with Eliot Hong at the University of Maryland Baltimore, Jonathan was awarded a UMCP-UMB seed grant called "Temporal Auditory Coding in Schizophrenia and Treatment Resistant Auditory Hallucination."

Bob Slevc, assistant professor in Psychology, and **Rochelle Newman**, chair of the Hearing and Speech Sciences Department, were awarded a grant from the Grammy Foundation for their collaborative research to investigate why musicians show advantages in secondlanguage learning as adults, particularly in learning the sound structure of new languages.

Lisa Taneyhill, associate professor in Animal and Avian Sciences, received a grant from NIDCR for her research "Neural crest and placode cell interactions during cranial gangliogenesis." She also received a Research Scholar Grant from the American Cancer Society for her research "Coordinated regulation of cadherins in the neural crest."



Volunteer for Outreach!



The NACS Outreach Committee is a student-led program to bring neuroscience and cognitive science into the community. By taking science to schools and other community venues, they are fostering a potential interest in science for future generations and enhancing their abilities to communicate science to a diverse audience.

If you are interested in participating, email outreachnacs@gmail.com .

Support NACS!

We would like to take this opportunity to remind you that you can donate to the NACS Program Gift Fund. The NACS Gift Fund is a very important source of funding for our program. We use the funds to pay for expenses that we cannot pay for using our state funds, such as appreciation gifts or awards and our recruitment event.

Donating is easy and simple. To donate go to our website and click on "Give to NACS."



PROGRAM IN NEUROSCIENCE & COGNITIVE SCIENCE NACS Seminars Cognitive Science Colloquia Language Science Day Maryland Day

NACS Facts!

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