PROGRAM IN NEUROSCIENCE & COGNITIVE SCIENCE

NACS Newsletter

Volume 8 **November 2023**

Fall 2023 Incoming Class

NACS welcomed six new students in Fall 2023. The students were asked to provide a few fun facts that most people don't know about them. Please read on to learn more.

Kristin Hoch

Advisor: Rochelle Newman

Kristin grew up in Colorado and loves hiking, Nordic skiing, and backpacking. She also enjoys reading and writing science fiction and fantasy.

Lizzie Kerman

Advisor: Rodolphe Gentili

Lizzie loves to stay active by doing CrossFit. She knits in her free time and loves house plants.

Chloe Matheson

Advisor: Anna Li

Chloe likes to paint and draw in her free time. She also likes to periodically DJ for her cat Tofu, and aspires to get into music production this year.

Sarah Perry

Advisor: Matt Roesch

Sarah loves to read and write and is especially obsessed with the Titanic and most sea-related things. She also has a cat named Magnus.

Geoff Short

Advisors: Rodolphe Gentili & James Reggia

Geoff loves board games (especially difficult ones) and often plays at least a few each month on a virtual tabletop. Geoff and his wife Caroline are parents to their 5-year-old son Desmond and a Schnoodle named Jasmine.

Xiaoyu Yang

Advisor: Ellen Lau

Xiaoyu has a few unique talents: she can write Chinese characters on a grain of rice, and she can swivel her elbow pit to face her nails.

What's New in NACS?

Student Writing Group

NACS implemented a Writing Group for NACS students in the Fall 2023 semester at the suggestion of students on the Student Representative Committee. The Writing Group meets once each month in the Cole Conference Room. A NACS student facilitates the session and NACS provides snacks and coffee.

Recruitment Efforts

NACS increased outreach events this year in an effort to increase the size and diversity of our applicant pool. We had an in-person and virtual grad fair at NIH this summer (attended by Matt Roesch and NACS student Paul LaFosse), and a virtual outreach event in September hosted by the NACS DEI committee. We also had our own booth (attended by Matt and Paul) at the Society for Neuroscience's annual conference in Washington, DC.

In addition, NACS sent NACS faculty Ricardo Araneda and NACS student Norma Peña-Flores to the SACNAS conference (Society for Advancement of Chicanos/Hispanics and Native Americans in Science) in Portland, Oregon, and we sent NACS faculty Ed Bernat and NACS student Katherine Pizano to ABRCMS (Annual Biomedical Research Conference for Minoritized Scientists) in Phoenix, Arizona.

NACS Faculty Mentor of the Year Award

Rachel Romeo is the second recipient of the NACS Faculty Mentor of the Year Award. She was nominated by several HDQM and NACS students including Ellen Roche, Victoria Alexander, Gavkhar Abdurokhmonova, Ben Rickles, Junaid Merchant, Ellie Taylor, and S. Alexa McDorman.

The following is a quote from the letter of nomination: "There are so many ways Rachel encourages me and this comes up in our everyday encounters. I think the biggest piece of her encouragement is (at least for me) implicit – just the unassuming, accessible, very open and kind person she is just by default…she is the role model of a successful and kind scientist, who despite her standing in the field will always find time to chat about what's of interest to me or help if I need a piece of advice."

Events

NACS Seminar Series
Fall 2023 & Spring 2024

NACS Faculty Meeting
May 10, 2024

NACS Student Meeting
December 8, 2023 and
May 10, 2024

NACS Town Hall
January 26, 2024

NACS-Fest
February 15 & 16, 2024

NACS Research Day
April 26, 2024

Welcome new NACS Faculty!

UMD Faculty:
Juan Angueyra, Assistant Professor of Biology
Caroline Charpentier, Assistant Professor of Psychology and BBI
Evan Hart, Assistant Professor of Psychology
Eric Hoover, Assistant Professor of Hearing and Speech Sciences
Danielle Powell, Assistant Professor of Hearing and Speech Sciences
Weizhan Xie (Zane), Assistant Professor of Psychology and BBI

Adjunct Faculty:
Michael Caiola, Staff Fellow at FDA: Office of Science and Engineering Laboratories
Tobias Merson, Staff Scientist at NIMH: Oligodendroglial Interactions Group
Michael "Mish" Shoykhet, Principal Investigator, Children's National Research Institute
Achim Werner, Stadtman Investigator at NIDCR: Stem Cell Biochemistry Unit
Steffen Wolff, Assistant Professor of Pharmacology at UMD School of Medicine

Congratulations to James and Rose!

NACS students James Baldassano and Rose Ying were awarded NIH National Research Service Award (NRSA) Fellowships.

Photo by Brian W. Jones

Juan Angueyra (he/him) is a latinx Assistant Professor at the Department of Biology and the Brain and Behavior Institute. Juan earned his M.D. degree from the Universidad Nacional de Colombia and his Ph.D. degree in Physiology and Biophysics from the University of Washington, and he did his postdoctoral training at the National Eye Institute.

My scientific career has unfolded at the intersection of photoreceptor research with other interesting fields. My first contributions in science — with Dr. Enrico Nasi and Dr. Maria Gomez — were at the intersection of phototransduction and evolution, exploring the intracellular cascade of light detection in photoreceptors of ancient species: scallop and amphioxus. As a graduate student — with Dr. Fred Rieke - I explored the intersection of phototransduction and neural computations. My work in primate cone photoreceptors, investigated how inefficiencies in the phototransduction cascade propagate through visual circuits and limit visual behaviors (like light detection or color discrimination). I also investigated how light adaptation in photoreceptors acts as a dynamic process that is critical for the encoding of information during the exploration of natural scenes. As a postdoctoral fellow — with Dr. Wei Li and Dr. Katie Kindt — I decided to combine transcriptomics and retinal development to establish a versatile screening platform in zebrafish, which enabled the discovery of novel factors involved in the generation of photoreceptor subtypes. As an independent researcher at UMD, our lab's research continues to focus on how retinal cells make fate decisions during development, eventually leading to the formation of circuits that encode visual information. Our lab is deeply committed to train the next generation of responsible and diverse scientists. We weave our expertise on genomics, imaging, electrophysiology, and visual behavior to answer scientific questions under a holistic lens.

Images of dissociated photoreceptors from species Juan has studied.

What advice would you give to students who are starting out in the NACS program?

As humans, PIs are fallible and imperfect; build meaningful relationships that you can rely on when the time comes. Graduate school is challenging and the most successful students are those that create multidimensional networks of support.

Dr. Amanda Chicoli (NACS PhD 2016) is a lecturer in the Department of Psychology at UMD.

Tell us about your current position and how you think the training experience in the NACS program helped you prepare for it.

Since 2019, I have been a lecturer in the Psychology Department at the University of Maryland, College Park. I was one of the first hires to support the undergraduate neuroscience major that launched fall 2020. In addition to my role as an instructor, I also currently serve on the Psychology Executive Committee and the Neuroscience Undergraduate Committee, and as a research coordinator for the major and a faculty advisor for the neuroscience minor. I have been extremely fortunate to work with colleagues in developing educational materials for teaching programming languages to our psychology students and to be able to mentor students on research projects. My research interests broadly lie in studying social behavior and decision making. More specifically, my dissertation work investigated what individual and public information groups of fish (giant danio) use when making the decision to escape a predation threat. For this work, I used computational modeling and behavioral experiments which led to three first-authored publications. My postdoctoral research was at the Carnegie Institution for Science on the Johns Hopkins campus. There I studied a habenular to interpeduncular nucleus pathway hypothesized to be involved in chronic stress (including social stress and defeat) using a variety of genetic, cellular and molecular, and imaging techniques in zebrafish.

My time in the NACS program was truly amazing and significantly impacted my career; I am back at UMD because of how much I enjoyed my time here in graduate school! As a graduate student, I worked in Dr. Derek Paley's Collective Dynamics and Control laboratory in the Aerospace Engineering Department. I also collaborated with Dr. Arthur Popper in Biology and had the opportunity to form collaborations on and off campus. The interdisciplinary training of the NACS program provided a strong foundation of knowledge across neuroscience disciplines. This has helped me not only in my research, where I have used a wide variety of neuroscience methods to address questions of interest, but also in my teaching where I am able to help students connect ideas across disciplines. Moreover, while in the NACS program, there were numerous opportunities to build a broad skill set and explore my interests. I founded and led the NACS Outreach Committee, founded a graduate teaching lunch series, served as the student representative on the Executive Committee, was a graduate teaching assistant for a laboratory course, and organized several Women in Engineering events. I was able to travel internationally to present at conferences and attended the prestigious Neural Circuits and Behavior course at Woods Hole. These experiences were crucial in learning how to work with individuals across interdisciplinary and international teams, provided my first experiences as a teacher and mentor, and allowed me to gain insight into how to organize and run a program – all skills I use in my current career. Most importantly, everyone I encountered across campus was collaborative and friendly. Pam Komarek deserves a special acknowledgment here. She was the first to answer my questions before I applied to the NACS program and continues to help me send out communications and borrow equipment 14 years later. The collaborative and collegial experience I had during my graduate training has significantly informed the approach I take to teaching and mentorship now. I try to create meaningful connections with students and provide opportunities for students to learn and authentically connect with each other. I encourage students to have agency in their own educational experiences, as I appreciated how the NACS program incorporated graduate student feedback.

In the Spotlight: NACS Alumni

Dr. Matthew Miller (NACS PhD 2012) is an Assistant Director and Professor at Auburn University.

Tell us about your current position and how you think the training experience in the NACS program helped you prepare for it.

I am the Assistant Director and a Professor in the School of Kinesiology at Auburn University, where I also direct the Performance and Exercise Psychophysiology (PEP Lab) and serve as Graduate Program Officer. I also hold a courtesy joint appointment in the Department of Psychological Sciences, where NACS alumna Dr. Susan Teubner-Rhodes is an assistant professor! For my primary line of research, I investigate how the conditions under which individuals practice motor skills affect the learning of those skills. To this end, I attempt to discover the mechanisms by which certain practice conditions enhance motor learning, and I often use electroencephalography (EEG) to examine the mechanisms. For my secondary line of research, I investigate the neurocognitive processes underlying individuals' physical activity behavior. To this end, I use EEG to examine individuals' reactions to depictions of physical activity (e.g., images of people exercising) and actual physical activity (e.g., having to stand, rather than sit, to retrieve an object). Through both lines of research, I have had the pleasure of mentoring undergraduate and graduate students, including eight who have completed their doctoral degrees under my supervision. Three of these students are now tenure-track faculty at universities, where they are disseminating knowledge that can be traced back to NACS! Besides the teaching I do in the PEP Lab, I perform classroom instruction by teaching graduate courses in motor learning and performance as well as sport psychology. Beyond research and teaching, I am involved in administration and service. In my role as Assistant Director, I assist in the following: creating policies to promote diversity, equity, and inclusion; faculty and staff evaluations; personnel and resource management; budgeting; academic program development and evaluation; and forming on- and off-campus partnerships. In my role as Graduate Program Officer, I have established graduate student admission criteria, created a graduate student handbook, and I work with a graduate student advisory council to enhance the graduate student experience. Finally, my institutional service outside the School of Kinesiology includes membership on the College of Education's Governance Committee and the Advocates and Allies program, a subgroup of the Commission for Gender Equity.

The NACS program was very helpful in preparing me for my current position. My home department was Kinesiology, and Dr. Brad Hatfield was my mentor. Besides providing me with content knowledge and helping me improve my writing skills, Dr. Hatfield demonstrated how to be a good unit leader. He became Chair of the Department of Kinesiology in my second year in NACS, and I became acutely aware of how patient and levelheaded he was with faculty and staff, just like he was with the students in his lab; I like to think that I have brought these attributes to my roles at Auburn University. NACS also allowed me to establish an advisory committee that consisted of experts in each aspect of my dissertation research, which employed EEG to investigate the neural basis of the positive association between team cohesion and motor performance. My committee was comprised of NACS faculty Drs. Rodolphe Gentili (Kinesiology), Tracy Riggins (Psychology), and Bill Idsardi (Linguistics; dean's representative), as well as Kinesiology faculty, Dr. Seppo Iso-Ahola. This group of experts showcases the value of NACS's interdepartmental and interdisciplinary program. NACS also permitted me to add an outstanding faculty member from George Mason University, Dr. Craig McDonald (Psychology), which shows how NACS's location in the DC metropolitan area can be leveraged. Crucially, NACS also helped prepare me for the future by exposing me to researchers outside of the DC metropolitan area. Specifically, the NACS weekly seminars were fabulous opportunities to learn about research from a multitude of neuroscience research areas from investigators all over North America. Notably, I found the student meetings with the investigators to be invaluable experiences that have prepared me for my current position. Finally, I would be remiss if I did not mention Pam Komarek, Assistant Director of NACS. Pam helped arrange all the NACS events and assisted me along my journey through the NACS program. NACS's excellence is due to its staff as well as its faculty!

Recent Student Publications

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

Akitake, B., Douglas, H. M., ***LaFosse, P. K.***, Beiran, M., Deveau, C. E., O'Rawe, J., Li, A. J., Ryan, L. N., Duffy, S. P., Zhou, Z., Deng, Y., Rajan, K., & **Histed, M. H.** (2023). Amplified cortical neural responses as animals learn to use novel activity patterns. *Current Biology*, 33(11), 2163–2174.e4.

Asghari, M., Peña, M., Ruiz, M., Johnson, H., ***Ehsani, H.***, & Toosizadeh, N. (2023). A computational musculoskeletal arm model for assessing muscle dysfunction in chronic obstructive pulmonary disease. *Medical & Biological Engineering & Computing*, 10.1007/s11517-023-02823-0.

Chad-Friedman, E., ***Jordan, L. S.***, Chad-Friedman, S., Lemay, E., Olino, T., Klein, D. N., & **Dougherty, L. R.** (2023). Parent and Child Depressive Symptoms and Authoritarian Parenting: Reciprocal Relations from Early Childhood Through Adolescence. *Clinical Psychological Science,* 0(0).

Dogra, S., ***Putnam, J.***, & Conn, P. J. (2022). Metabotropic glutamate receptor 3 as a potential therapeutic target for psychiatric and neurological disorders. *Pharmacology, Biochemistry, and Behavior*, 221, 173493.

Han, D. and **Carr, C.E.** (2023). Central projections of auditory nerve fibers in the Western ratsnake (Pantherophis obsoletus). *Journal of Comparative Neurology,* 531(12), 1261–1273.

Kim, H. C., Kaplan, C. M., Islam, S., Anderson, A. S., Piper, M. E., Bradford, D. E., Curtin, J. J., DeYoung, K. A., Smith, J. F., Fox, A. S., & **Shackman, A. J.** (2023). Acute nicotine abstinence amplifies subjective withdrawal symptoms and threat-evoked fear and anxiety, but not extended amygdala reactivity. *PLOS ONE*, 18(7), e0288544.

Kommula, Y., **Purcell, J. J.**, ***Callow, D. D.***, Won, J., Pena, G. S., & **Smith, J. C.** (2023). Emotional processing and positive affect after acute exercise in healthy older adults. *Psychophysiology*, 00, e14357.

LaFosse, P. K., Zhou, Z., ***Friedman, N. G.***, Deng, Y., Li, A. J., Akitake, B., & **Histed, M. H.** (2023). Bicistronic Expression of a High-Performance Calcium Indicator and Opsin for All-Optical Stimulation and Imaging at Cellular Resolution. *eNeuro*, 10(3), ENEURO.0378-22.2023.

Mahon, C. E., Hendershot, B. D., ***Gaskins, C.,*** **Hatfield, B. D**., ***Shaw, E. P.***, & **Gentili, R. J.** (2023). A mental workload and biomechanical assessment during split-belt locomotor adaptation with and without optic flow. *Experimental Brain Research*, 241(7), 1945–1958.

McNaughton, K. A. & Williamson, L.L. (2023). Effects of sex and pro-inflammatory cytokines on context discrimination memory. *Behavioral Brain Research*, 442, 114320.

McNaughton, K. A., Kirby, L.A., Warnell, K.R., ***Alkire, D***., ***Merchant, J***., ***Moraczewski, D.***, Yarger, H. A., Thurm, A., & **Redcay, E.** (2023). Social-interactive reward elicits similar neural response in autism and typical development and predicts future social experiences. Developmental Cognitive Neuroscience, 101197.

Salig, L. K., Kroff, J. R. V., **Slevc, L. R.**, & **Novick, J. M.** (2023). Linking frequency to bilingual switch costs during real-time sentence comprehension. *Bilingualism: Language and Cognition*, 1-16.

Wesner, E., ***Pavuluri, A.***, Norwood, E., Schmidt, B., & **Bernat, E**. (2023). Evaluating competing models of distress tolerance via structural equation modeling. *Journal of Psychiatric Research*, 162, 95–102.

Ying, R., Hamlette, L., Nikoobakht, L., Balaji, R., Miko, N., & **Caras, M. L.** (2023). Organization of orbitofrontal-auditory pathways in the Mongolian gerbil. *Journal of Comparative Neurology*, 00, 1– 23.

Yu, X., & **Lau, E**. (2023). The Binding Problem 2.0: beyond perceptual features. *Cognitive Science*, 47(2), e13244.

Congratulations PhD Graduates!

Spring 2023

Ben Rickles
Advisor: DJ Bolger

Summer 2023

Daniel Callow
Advisor: Carson Smith

Zach Maher
Advisors: Jan Edwards & Jared Novick

Fall 2023

Andrew Borrell
Advisor: Betsy Quinlan

Awards and Accomplishments

Ricardo Araneda, Professor of Biology, became the co-director of the Neurobiology course at the Marine Biological Laboratory in Woods Hole, MA, a world-renowned course that has been training graduate and postgraduate neuroscientists for over 50 years.

Greg Ball, Professor of Psychology and Vice President of Research, won the Daniel S. Lehrman Lifetime Achievement Award from the Society for Behavioral Neuroendocrinology, as well as the Elliot Coues Award for Research Achievement from the American Ornithological Society.

DJ Bolger, Associate Professor of Human Development and Quantitative Methodology, received the 2023 Distinguished Service Award from the Learning Disabilities Association of America. DJ also received an Institutional Grant from UMD's Grand Challenges Grants Program for the Maryland Initiative for Literacy and Equity, along with co-PIs **Colin Phillips**, **Rochelle Newman**, **Rachel Romeo**, and **Jared Novick.** Additionally, DJ and co-PI **Jeremy Purcell** received a NIH/NICHD R21 award to investigate the neural tuning of cortex to processing visual words.

Adam Brockett, Assistant Research Professor of Psychology, was awarded an Individual Project Grant from UMD's Grand Challenges Grants Program: *Establishing a Role for Psilocybin in Frontal Lobe Function.*

Shawn Burgess, Chief of Behavioral Neurogenetics Section at NICHD, joined the board of the Genetics Society of America (GSA). GSA is the professional membership organization for scientific researchers and educators in the field of genetics.

Melissa Caras, Assistant Professor of Biology, received a grant from NIH to study the contribution of non-sensory circuits to auditory perceptual learning. Her lab also recently published their first research paper in the Journal of Comparative Neurology. In addition, Melissa was also named the 2023 Schacht Lecturer in Auditory Science at the Kresge Hearing Research Institute.

Douglas Fields, NIH Emeritus Scientist, was awarded the Mensa Foundation Prize for his discovery of myelination plasticity.

Jens Herberholz was promoted to Professor of Psychology.

Sandra Gordon-Salant, Professor of Hearing and Speech Sciences, received the BSOS Dean's Medal, which is the highest honor the college can bestow. It is awarded to those with an outstanding record of sustained contributions to the campus. After over 42 years of teaching, research, and service, Sandy retired from UMD in Summer 2023.

Matthew Goupell, Professor of Hearing and Speech Sciences, received a 5-year R01, which is a continuation of a project on "Optimizing bilateral and single-sided-deafness cochlear implants for functioning in complex auditory environments."

Mark Histed, Chief of Neural Computation and Behavior Unit at NIMH, received the NIMH IRP Outstanding Mentor Award and the NIH Special Act Award for identifying the scientific computing needs and challenges IRP scientists face, promoting DEIA efforts of the IRP, and exceptional mentorship and support of trainees.

Anna Li, Assistant Professor of Psychology, received an Individual Project Grant from the Grand Challenges Grants Program: *Role of Mitochondria Dynamics in Opioid Addiction.*

N**an Ratner**, Professor of Hearing and Speech Sciences and NACS Graduate Director, received a grant from NIDCD to study predictors of recovery from late talking over early childhood.

Tracy Riggins was promoted to Professor of Psychology this year. She also received a 5-year grant from NHLB: *Longitudinal investigation of sleep, memory, and brain development across the nap transition.*

Rachel Romeo, Assistant Professor of Human Development and Quantitative Methodology, received the Early Career Contributions to Research Award from the Society for Research in Child Development. Rachel also received the Award for Early Career Contributions in Research from the American Speech-Language-Hearing Association.

Matt Roesch, Professor of Psychology and NACS Program Director, received a five-year grant from NIDA with **Anna Li** as co-I. This is the second renewal of his grant "Restoration and further assessment of the Actor-Critic and connected areas after cocaine self-administration."

Kenneth Rubin, Professor Emeritus of Human Development and Quantitative Methodology, will receive the 2024 APA Division 7 (Developmental Psychology) Award for Distinguished Contributions to Developmental Psychology.

Alexander Shackman, Associate Professor of Psychology, received a 5-year grant from NIAAA to study of anxiety-fueled alcohol misuse.

Shihab Shamma, Professor of Electrical and Computer Engineering, was awarded a 3-year grant from NSF: *The computational and neural basis of statistical learning during musical enculturation.*

Jonathan Simon, Professor of Electrical and Computer Engineering and Biology, was awarded a Seed Grant from BBI: *Toward a non-linguistic measure of auditory processing deficits in older and younger monolingual and bilingual adults*. Colleagues working on the team include NACS faculty **Samira Anderson** and postdoc affiliate **Mike Johns**. Jonathan also received a 5-year grant from NIA: D*igital Biomarkers for Vascular Cognitive Decline in Patients with Minor Stroke*.

Bob Slevc, Associate Professor of Psychology, and **Yasmeen Faroqi-Shah**, Professor of Hearing and Speech Sciences, received a 5-year grant to study the timing of the neural processes required for spoken language production and their disruption in agrammatic aphasia.

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, please contact NACS students Gloria Kim (hkim1230@umd.edu) or Deena Shariq (dshariq@umd.edu).

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."

Follow NACS on Twitter!

Follow NACS on Twitter to help stay connected. If you are on Twitter, give us a follow to keep up with the latest NACS news. Also, if you have had a paper recently accepted, received a grant, fellowship, or award, or just think something is really cool and want to share, tag us to let us know. We want to share as many of the achievements of our students and faculty as we can!

Follow us on Twitter
@umdnacs

PROGRAM IN NEUROSCIENCE & COGNITIVE SCIENCE

Neuroscience and Cognitive Science Program | T: 301-405-8910 | Email: NACS@umd.edu
0219 Cole Student Activities Building, University of Maryland, College Park, MD 20742

Contact Information
Director: Matthew Roesch, Ph.D. (mroesch@umd.edu) | Assistant Director: Pam Komarek (pkomarek@umd.edu)
Program Management Specialist: Claire Morse (cmorse@umd.edu)
Grants Development Specialist: Joo Yun Jun, Ph.D. (jyjun@umd.edu)