PROGRAM IN NEUROSCIENCE & COGNITIVE SCIENCE

NACS Newsletter

Volume 9 **November 2024**

Fall 2024 Incoming Class

NACS welcomed fifteen new students in fall 2024. The students were asked to provide a few fun facts that most people don't know about them. Please read on to learn more *(continued on page 2)*.

Kanishka Balamurugan
Advisor: Jens Herberholz

Kanishka has grown to love cats over the years. She once firmly believed that cats were aliens trying to hypnotize humans and turn them into pets, but she has long outgrown that belief and now fawns over them.

Phoebe Cousens
Advisor: Anna Li

Phoebe loves reading, drawing, and hiking with her two-year-old Labrador, Ozzy.

Miguel Ezeiza-Ortega
Advisors: Jason Triplett & Ricardo Araneda

Miguel likes to go on runs while listening to true crime podcasts. He also has 15 tattoos.

Iris Liang
Advisor: Juan Angueyra

Iris loves whales and she has a cat named Latte.

Dani Matheny
Advisors: Colenso Speer & Ricardo Araneda

Dani spends most of her time outside of school/work climbing mountains or attending concerts, and she tries to run at least one 5K every year. Last year she went on her first international trip to Giant's Causeway in Ireland (pictured above).

Catherine Milligan
Advisor: Mike Dougherty

Catherine grew up on the eastern shore of Maryland. In her free time she enjoys relaxing with her kitten, Leo, and loves to craft and paint. She also used to sell her own jewelry at a local store in her hometown.

Hadley Mills
Advisor: Evan Hart

Hadley loves to rock climb, and she had a gecko for 13 years named Hocus Pocus.

Marissa Renee
Advisor: Melissa Caras

Marissa is licensed to sell baked goods in Georgia, has read 34 fiction books so far this year, and collects orange cat trinkets.

Fall 2024 Incoming Class

(continued from page 1).

Ibrahim Sartaj

Advisor: Ricardo Araneda

Ibrahim is currently planning a trip to the Skull Caverns. He really dislikes stainless steel pans, and prefers cast-iron instead. He's also on a never-ending quest to find the coziest café in the DMV.

Ciaran Stone

Advisors: Yasmeen Faroqi-Shah & Samira Anderson

Ciaran is a certified English as a foreign language teacher (EFL). He knows how to use chopsticks ambidextrously because of a highshool sword fighting accident. He also can read tarot cards.

Yukta Thyagaraj

Advisor: Caroline Charpentier

Yukta grew up in India and loves Indian street food (and garlic bread!). She also likes to draw and thrift. The one thing you should never ask Yukta is directions to places, as she can pretty much lose her way even to her own house!

Yi Wei

Advisors: Lauren Atlas & Luiz Pessoa

Yi is a cat lady with two lovely cats (her favorite cat is Jiao). She has all sorts of cat toys, and also taught her cats little tricks like shaking hands.

Isabel Wilder

Advisor: Tracy Riggins

Isabel has a 4 (almost 5) year old son named Jamie. She loves yoga and hiking, and makes kombucha at home.

Chaebin Yoo

Advisor: Caroline Charpentier

Chaebin enjoys both taking and appreciating photography. She recently started cooking (for survival!), but is beginning to find joy in it.

Luci Zepeda Rivera

Advisors: DJ Bolger & Samira Anderson

Luci shares a birthday with her 14-year-old cat, Flinga. She loves dancing to techno music and gardening, especially with succulents. Her favorite movie genre is horror.

Funding support for NACS from Colleges and BBI

In Spring 2023, NACS organized a Leadership Retreat – attended by college deans, associate deans, department chairs and NACS leadership. One recurring theme at the Retreat was that colleges should contribute to NACS proportionally to the number of participating students from those colleges as a sort of "participation support fee." In turn, this fee would support NACS's goal of growing its class size, supporting students more equitably, increasing diversity, and growing its computational curriculum. Matt Roesch submitted a funding proposal to all of the deans of the colleges who have faculty affiliated with NACS. Three colleges (ARHU, EDUC, and SPHL) and the BBI now contribute annually to NACS.

DEI Committee Information Sessions

The NACS Diversity, Equity, and Inclusion (DEI) Committee has sponsored a virtual Open House for prospective students since 2022. This year the DEI committee also started sponsoring a "How to Join a Lab" information session to help undergraduates seek out research experience. The DEI committee plans to offer both sessions every semester. DEI committee members include Ed Bernat (chair), Catherine Carr, Laura Castillo, Carlo Combista, Mine Muezzinoglu, Sarah Perry, Rachel Thompson, Isabel Wilder, Rose Ying, and Selin Zeytinoglu.

Welcome New NACS Faculty!

UMD Faculty:

Ramani Duraiswami, Professor and Associate Chair for Graduate Studies, Computer Science
Tim George, Assistant Research Scientist, ARLIS
Kelley Gunther, Assistant Research Scientist, ARLIS
Stacey LG Kane, Assistant Professor, Hearing and Speech Sciences
Huang (Frederick) Lin, Assistant Professor, Epidemiology and Biostatistics
Hyuk Oh, Assistant Research Professor, Kinesiology
Umberto Saetti, Assistant Professor, Aerospace Engineering

Adjunct Faculty:

Lauren Atlas, Senior Investigator and Chief, Section on Affective Neuroscience and Pain, NCCIH
Bevil Conway, Senior Investigator, Sensation, Cognition, and Action Section, NEI
Katie Hsiao, Assistant Professor, Dept. of Pediatrics, Children's National Hospital
Youssef Kousa, Principal Investigator, Centers for Genetic Medicine & Neuroscience Research, Children's National Hospital
Hendrikje Nienborg, Investigator, Visual Decision Making Section and Laboratory of Sensorimotor Research, NEI
Immanuel Samuel, Associate Scientific Director, War Related Illness and Injury Study Center, US Department of Veteran Affairs

Events

NACS Seminars Series
Fall 2024 and Spring 2025

NACS Faculty Meeting
December 13, 2024
May 9, 2025

NACS Student Meeting
December 13, 2024
May 9, 2025

NACS-Fest
February 13 & 14, 2025

NACS Retreat
August or September, 2025

Congratulations to Kristin, Jason, and Ellen!

NACS students Kristin Hoch and Jason Putnam were awarded CEBH T32 Fellowships, and Ellen Roche was awarded an NIH National Research Service Award (NRSA) Fellowship.


Kristin Hoch


Jason Putnam


Ellen Roche

Dr. Tracy Riggins is a Professor in the Department of Psychology.

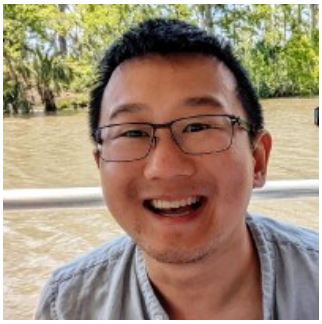
I began my research career as an undergraduate in a developmental psychology lab at UC San Diego. We studied sibling relationships and their impact on development. Although I enjoyed working with children, the topic was not compelling to me. So, for my next research experience, I volunteered in a cognitive electrophysiology lab where we recorded brain activity (EEG) in adults as they viewed various stimuli. I became fascinated by the brain. So, when it came time to apply for graduate school, I focused my applications on programs that would allow me to study brain development (using EEG) in children. I found a match at the Institute of Child Development at the University of Minnesota. I have been studying development of the brain in young children and how it impacts their behavior ever since. Over the course of two postdoctoral fellowships (at UC Davis and University of Maryland School of Medicine), I added MRI methods to my tool kit. When I joined the University of Maryland as an Assistant Professor, I narrowed the focus of my work to how developmental changes in the hippocampus relate to improvements in children's episodic memory performance. This work has established 1) accelerated rates of change in children's episodic memory abilities during early childhood, 2) associations between episodic memory performance and hippocampal volume, 3) age-related differences in functional connectivity between the hippocampus and cortical regions, and 4) how differences in hippocampal functional connectivity are related to episodic memory in early childhood. Although my goal was to highlight age-related changes, individual differences (i.e., differences between children of the same age) were readily apparent and often greater than those between children of different ages! As a result, in my lab's current research, we investigate factors that may give rise to variations between children, including: parenting, stress, exposure to various substances during prenatal development, and sleep. Many of these factors and new lines of study are driven by student's interests – I am fortunate to work with a strong, creative group!

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

1. Work hard (and play hard). Graduate school is similar to other things in life, you get out what you put in. Put in the time and you will learn an enormous amount. But don't forget to take breaks and enjoy life as well.

2. Don't compare your academic journey with others'. You can observe what other students in your cohort and lab do, what they accomplish, but set your own goals, blaze your own trail.

3. Be kind. Be kind to yourself, be kind to other students, be kind to staff, be kind to faculty. Kindness matters and will not only increase your feelings of connectedness but decrease stress and make your graduate school experience a positive one (regardless of your scientific findings)!



Dr. Rui Hu (NACS PhD 2020) is a Scientist at BioMarin Pharmaceutical.

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

I am currently a Scientist at BioMarin Pharmaceutical in the neuroscience department, where I serve as a functional lead in preclinical drug discovery efforts focused on rare, genetic, neurodevelopmental disorders. My work encompasses various experimental techniques, including multiple modes of electrophysiology and high-content calcium live-imaging in human stem cell-derived neuron models from different disease backgrounds. I have led drug discovery efforts, including a biologic therapeutic discovery project targeting an ion channel, and have worked with a wide range of therapeutic modalities, including peptides, small molecules, mAbs, oligonucleotides, and AAVs. While my role includes screening and validating therapeutic compounds in our in vitro models, my team and I also address fundamental research questions such as elucidating the relationship between genotype and phenotype in various rare genetic disorders, and exploring how therapeutic interventions impact the relationship between RNA, protein, and physiological function.

In addition to my scientific work at BioMarin, I have served as a neurophysiology and ion channel subject matter expert on diligence committees for evaluating potential business opportunities related to asset licensing or acquisition from smaller biotechs. I also provide mentorship to master's students, and manage external academic and industry collaborations.

Outside of BioMarin, I received a Visiting Research Scientist appointment with Dr. Richard Smith's laboratory at Northwestern University's Feinberg School of Medicine, where I work with Rich's team on physiology and behavioral data analytics for pre-natal neurodevelopmental channelopathies.

Prior to joining BioMarin, I was a postdoctoral fellow with Dr. Beth Stevens at Boston Children's Hospital, where I investigated the role of a complement cascade inhibitor, CSMD1, in neuronal function.

My training in the NACS program was instrumental in preparing me for my current role. I cannot overstate my gratitude towards Dr. Ricardo Araneda, whose mentorship provided me with a deep understanding of neurophysiology and pharmacology that I now apply to complex drug discovery projects. My time in his lab encouraged my passion for basic science, fostered my independence as a scientist, and expanded my professional network through experiences such as teaching in the Marine Biology Laboratory's Neurobiology Course.

I am also thankful to my thesis committee members: Dr. Quentin Gaudry, who kick-started my learning to program for data analysis and for being a great lab neighbor; Dr. Jens Herberholz, who emphasized the importance of diverse model organisms in understanding nervous system function and taught me that electrophysiology and beer go really well together; and Kate Macleod and Matt Roesch for their personal and scientific guidance.

While my PhD was in olfaction, my experience training with Dr. Ricardo Araneda combined with the basic curriculum from the NACS program enhanced my ability to adapt to new fields of research, not limited to my postdoctoral work and my current work. In addition, the interdisciplinary nature of the NACS program helped develop my ability to communicate complex ideas to broader audiences, a crucial skill in my post-PhD roles.

Dr. Shikha Prashad (NACS PhD 2015) is an Assistant Professor at the University of Texas at Arlington.

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

My experience as a Ph.D. student in the NACS program has been instrumental in shaping my career. I am an Assistant Professor in the Department of Kinesiology and Director of the Cognitive Motor Neuroscience Lab at the University of Texas at Arlington (UTA). Before moving to UTA, I was an Assistant Professor of Kinesiology at Washington State University in Pullman, WA.

My connection with NACS began when I was selected to join the program's undergraduate summer research experience (which I believe has sadly been discontinued) while I was an undergraduate student at Bryn Mawr College. I worked with Dr. Jose Contreras-Vidal on a project that investigated micrographia in patients with Parkinson's disease. This experience sparked my interest in graduate school, the NACS program in particular, and shaped my research interest in understanding neural and motor impairment in Parkinson's disease. I carried this interest with me to my dissertation where I studied the effect of aging and Parkinson's disease on cortical activity (measured through EEG) and motor learning. During my Postdoctoral Fellowship at the University of Texas at Dallas, I expanded my research skills and knowledge of cognitive neuroscience. I worked on projects that examined the effect of cannabis use on brain structure and function using functional MRI and EEG. These projects provided a solid foundation for my current research on the neurocognitive basis of human movement across the lifespan, in health and in the context of movement and substance use disorders. In addition to my research, I teach undergraduate and graduate courses in the area of motor learning and control.

NACS is inherently an interdisciplinary program and fosters collaboration across different disciplines. This allowed me to assemble a diverse dissertation committee (consisting of Drs. Jane Clark, Brad Hatfield, Rodolphe Gentili, DJ Bolger, and Jeff Harring) who enhanced my research and learning through their expertise and distinct perspectives. The weekly seminars were also a reflection of this interdisciplinary focus as they provided an opportunity to engage with experts in different fields within neuroscience and gave us many examples of how to engage the audience during research presentations. I also appreciated the flexibility in the curriculum that allowed me to gain foundational knowledge in neuroscience and take classes relevant to my research interests. I took advantage of this flexibility by taking several classes in computer programming and statistics that taught me tools and skills I continue to utilize for my research.

Throughout my time in the NACS program, I was lucky to be mentored by my committee who are experts in the field and provided guidance and feedback on my research. More importantly, they were incredibly supportive and cared about my wellbeing. My Ph.D. advisor, Dr. Jane Clark, was pivotal in helping me achieve my goals. She is encouraging and kind, has a wealth of knowledge and wisdom, is an amazing teacher and mentor, advocates for students, and is fun to be around! I continue to rely on my mentors for advice as I navigate my career in academia, and they are as generous with their time and advice as they were when I was a student. In addition to the faculty, Pam Komarek is very supportive of students and helped me navigate all kinds of tricky situations. The program's strong focus on the student experience was evident throughout my time at NACS and beyond. NACS gave me the training and knowledge essential for my career and lifelong friends and mentors who continue to support my personal and academic endeavors. It was the perfect program for me!

Recent Student Publications

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

Alderman, P. J., Saxon, D., Torrijos-Saiz, L. I., Sharief, M., Page, C. E., Baroudi, J. K., Biagiotti, S. W., ***Butyrkin, V. A.***, Melamed, A., Kuo, C. T., Vicini, S., García-Verdugo, J. M., Herranz-Pérez, V., **Corbin, J. G.**, & Sorrells, S. F. (2024). Delayed maturation and migration of excitatory neurons in the juvenile mouse paralaminar amygdala. *Neuron*, *112*(4), 574–592.e10.

Callow, D. D., ***Kommula, Y.***, Stark, C. E. L., & **Smith, J. C.** (2023). Acute cycling exercise and hippocampal subfield function and microstructure in healthy older adults. *Hippocampus*, *33*(10), 1123–1138.

Choi, S. B., ***Vatan, T.***, Alexander, T. A., Zhang, C., Mitchell, S. M., **Speer, C. M.**, & Nemes, P. (2023). Microanalytical Mass Spectrometry with Super-Resolution Microscopy Reveals a Proteome Transition During Development of the Brain's Circadian Pacemaker. *Analytical chemistry*, *95* (41), 15208–15216.

Dziura, S. L., Hosangadi, A., ***Shariq, D.***, ***Merchant, J. S.***, & **Redcay, E.** (2023). Partner similarity and social cognitive traits predict social interaction success among strangers. *Social Cognitive and Affective Neuroscience, 18*(1), nsad045.

Dziura, S. L., ***McNaughton, K. A.***, Giacobbe, E., Yarger, H. A., Hickey, A. C., ***Shariq, D.***, & **Redcay, E**. (2023). Neural sensitivity to social reward predicts links between social behavior and loneliness in youth during the COVID-19 pandemic. *Developmental Psychobiology, 65*(6), e22413.

Grogans, S. E., Hur, J., Barstead, M. G., Anderson, A. S., Islam, S., ***Kim, H. C.***, Kuhn, M., Tillman, R. M., Fox, A. S., Smith, J. F., DeYoung, K. A., & **Shackman, A. J.** (2024). Neuroticism/negative emotionality is associated with increased reactivity to uncertain threat in the bed nucleus of the stria terminalis, not the amygdala. *Journal of neuroscience*, e1868232024.

Jayashankar, J., ***Packy, A. L.***, Teymourlouei, A., Shaver, A. A., Katz, G. E., **Reggia, J. A.**, Purtilo, J., & **Gentili, R. J.** (2024). Assessment of a Novel Virtual Environment for Examining Cognitive-Motor Processes During Execution of Action Sequences in a Human-Robot Teaming Context. *Lecture Notes in Computer Science*, 147–166.

Kommula, Y., ***Callow, D. D.***, **Purcell, J. J.**, & **Smith, J. C.** (2024). Acute Exercise Improves Large-Scale Brain Network Segregation in Healthy Older Adults. *Brain connectivity, 10.1089/brain.2024.0003.*

O'Rawe, J. F., Zhou, Z., Li, A. J., ***LaFosse, P. K.***, Goldbach, H. C., & **Histed, M. H.** (2023). Excitation creates a distributed pattern of cortical suppression due to varied recurrent input. *Neuron*, *111* (24), 4086–4101.e5.

Packy, A. L., ***Jayashankar, J.***, Teymourlouei, A., Stone, J., **Oh, H.**, Katz, G. E., **Reggia, J. A.**, **Gentili, R. J.** (2024). Neurocognitive Assessment Under Various Human-Robot Teaming Environments. *46th Annual International Conference of the IEEE Engineering in Medicine & Biology Society*.

Smith, J.C., ***Callow, D. D.***, Pena, G. S., ***Kommula, Y.***, Arnold-Nedimala, N., Won, J., & Nielson, K. A. (2024). Exercise and Protection from Age-Related Cognitive Decline. *Current topics in behavioral neurosciences, 10.1007/7854_2024_501.*

Congratulations PhD Graduates!

Spring 2024

Felix Bartsch
Advisor: Dan Butts

Christopher Gaskins
Advisor: Rodolphe Gentili

Daniela Vazquez
Advisor: Matt Roesch

Summer 2024

Lauren Salig
Advisors: Bob Slevc & Jared Novick

Kathryn McNaughton
Advisor: Elizabeth Redcay

James Baldassano
Advisors: Katrina MacLeod & Catherine Carr

Tawen Ho
Advisor: Jens Herberholz

David Han
Advisor: Catherine Carr

Fall 2024

Anna Tinnemore
Advisors: Sandra Gordon-Salant & Matthew Goupell

Xie, Z., Gaskins, C. R., ***Tinnemore, A. R.***, Shader, M. J., **Gordon-Salant, S.**, **Anderson, S.**, & **Goupell, M. J.** (2024). Spectral degradation and carrier sentences increase age-related temporal processing deficits in a cue-specific manner. *Journal of the Acoustical Society of America*, *155*(6), 3983–3994.

Yarger, H. A., ***Shariq, D.***, Hickey, A. C., Giacobbe, E., Dziura, S. L., & **Redcay, E.** (2023). Examining Adolescents' Mental Health Before and During the COVID-19 Pandemic. *Merrill-Palmer Quarterly, 69*(1), 1-29.

Yu, X., Li, J., Zhu, H., Tian, X., & **Lau, E.** (2024). Electrophysiological hallmarks for event relations and event roles in working memory. *Frontiers in Neuroscience*, *17*, 1282869.

Awards and Accomplishments

Samira Anderson, Professor of Hearing and Speech Sciences, was promoted to the position of Chair in HESP this year.

Greg Ball, Professor of Psychology and Vice President of Research, was awarded the 2024 Donald S. Farner Medal for Excellence in Research in the Field of Avian Endocrinology.

Catherine Carr, Professor of Biology, was awarded the Mosaic Prize for her work on diversity and inclusion from the International Society for Neuroethology.

Caroline Charpentier, Assistant Professor of Psychology, received a 3-year R00 from NIMH: *Neuro-computational mechanisms of social learning and variation along psychiatric symptom dimensions and in autism*. Caroline also received the Open Science Impact Award from the UMD Department of Psychology.

Matt Goupell, Professor of Hearing and Speech Sciences, was awarded the 2023-2024 Distinguished Scholar-Teacher Award. Matt also received a 5-year grant from NIDCR: *Optimizing bilateral and single-sided deafness cochlear implants for functioning in complex auditory environments,* and a 2-year grant from NIDCR: *Effects of asymmetries on binaural-hearing abilities across the lifespan*.

Melanie Killen, Professor of Human Development and Quantitative Methodology, was named a Distinguished University Professor.

Rochelle Newman, Professor of Hearing and Speech Sciences, and co-PI **Matt Goupell**, Professor of Hearing and Speech Sciences, were awarded a 5-year training grant from NIDCR for UMD-REACH (Research Equity and Access in Communication and Hearing).

Luiz Pessoa, Professor of Psychology, was appointed interim director of the Brain and Behavior Institute (BBI).

Elizabeth Redcay was promoted to Professor of Psychology. She also received the 2024 Faculty Mentor of the Year Award.

Tracy Riggins, Professor of Psychology, received the 2024 Graduate Faculty Mentor of the Year Award. She also received the James McKeen Cattel Sabbatical Fellowship Award from the Association for Psychological Science.

Rachel Romeo, Assistant Professor of Human Development and Quantitative Methodology, received the Flux Society's 2024 Young Investigator Award.

Umberto Saetti, Assistant Professor of Aerospace Engineering, received the Dave Ward Memorial Lecture Award by the Aerospace Control and Guidance Systems Committee. He also received the Defense University Research Instrumentation Program award from the Office of Naval Research.

Alex Shackman was promoted to Professor of Psychology.

Shihab Shamma, Professor of Electrical and Computer Engineering, received the Defense University Research Instrumentation Program award from the Air Force Office of Scientific Research. **Ramani Duraiswami**, Professor of Computer Science, will also be collaborating on the project.

Carson Smith, Professor of Kinesiology, was awarded a grant from NIA: *Neural Mechanisms for Associations Between Fitness and Cognition in Aging.*

Steffen Wolff, Assistant Professor of Pharmacology at the UMD School of Medicine, was awarded a Seed Grant from the Brain Research Foundation: *When poems jumble tennis serves: Dissecting how learning systems interact.* He also received a R01 from NIMH: *A circuit mechanism for the interactions between distinct learning systems.*

Weizhen "Zane" Xie, Assistant Professor of Psychology, become a member of the Memory Disorders Research Society.

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!

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PROGRAM IN
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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)