66ᵗʰ Annual

April 26ᵗʰ, 2024

Hollins

Science Seminar
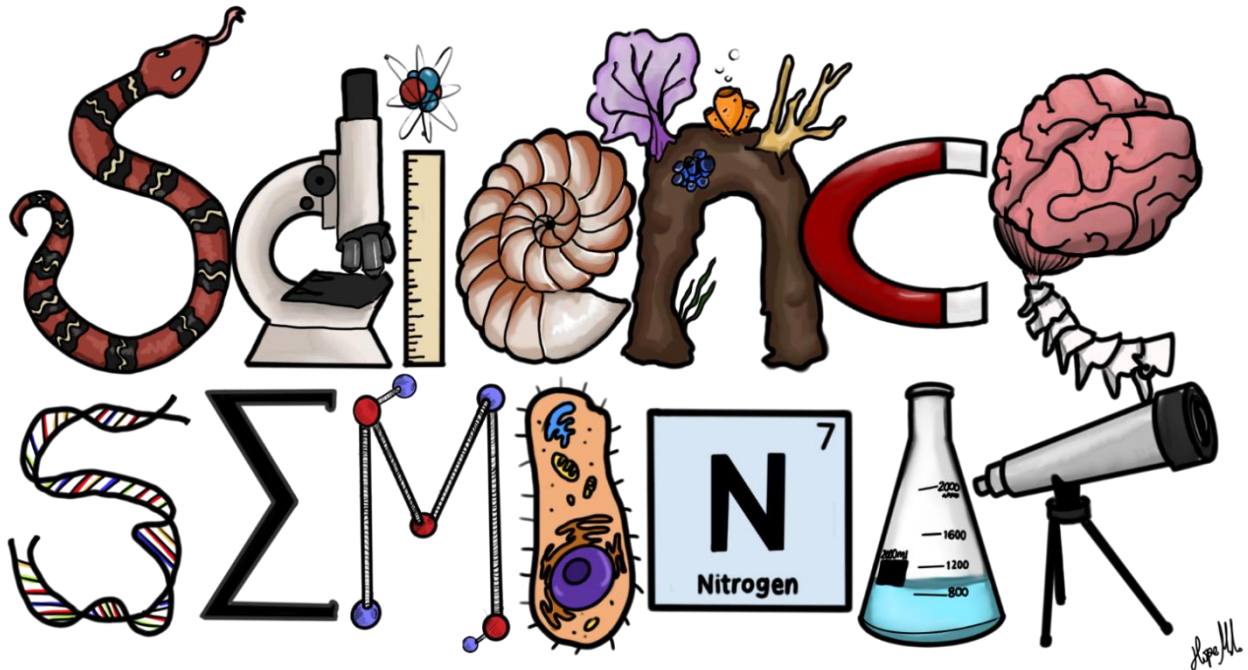
in conjunction with

4ᵗʰ annual

SPARC

**STUDENT PERFORMANCE &
ACADEMIC RESEARCH CONFERENCE**

"Science is based on experiment, on a willingness to challenge old dogma, on an openness to see the universe as it really is. Accordingly, science sometimes requires courage - at the very least the courage to question the conventional wisdom."
— **Carl Sagan**

We are delighted to invite you to join us for the 66th Annual Hollins Science Seminar Poster Session held in conjunction with the 4th annual SPARC conference.

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On March 14th, we had several science students give oral presentations on their senior theses. These presentations were followed that evening by a Keynote Address by Dr. Alex Capaldi, a mathematician from James Madison University.

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On the afternoon of April 26th, 27 posters reflecting the scientific and creative work of 35 students will be presented.

WEDNESDAY, March 14th

4:45 p.m.
Senior Research Presentations
VAC Auditorium

"The Study of Chemical compounds in the mainstream smoke of herbal cigarettes"
Lillian Burns and Caroline Russell, *Department of Chemistry*
(Under the direction of Dr. Son Hong Nguyen)

"*The southern expansion of Lyme Disease: examining pathogen dynamics in southwestern Virginia."*
Aliya Aguirre *Department of Biology*
(Under the direction of Dr. Elizabeth Gleim)

5:15 p.m.
Induction of Students to Sigma Xi

- Assi (Jacquelyne) Abe (C'24, B.A. in environmental studies & public health), nominated by Dr. Renee Godard & Dr. Kaila Thorn
- Aliya Aguirre (C'24, B.S. in biology, minor in chemistry), nominated by Dr. Liz Gleim
- Malaika Amin (C'25, B.S. in biology, B.A. in public health), nominated by Dr. Brian Reeves
- Ashree Bhatta (C'24, B.S. in chemistry, minor in data science), nominated by Dr. Son Nguyen
- Lillian Burns (C'25, B.S. in chemistry, minor in physics), nominated by Dr. Son Nguyen
- Zeina Ghanem (C'24, B.S. in psychology, minor in English), nominated by Dr. Bonnie Bowers
- Caroline Russell (C'25, B.S. in chemistry, minor in English and physics), nominated by Dr. Son Nguyen

Sigma Xi, the Scientific Research Honor Society, was founded in 1886 to "honor excellence in scientific research and encourage a sense of companionship and cooperation among researchers in all fields of science and engineering." Membership in Sigma Xi is "by invitation and is not limited by the possession of any specific degree." Candidates for Associate Membership must have "conducted independent investigation and written a report concerning their research…in a field of pure or applied science." Members of the Hollins Chapter of Sigma Xi have all conducted an independent research project in a setting that is outside of a course-embedded experience and were nominated for membership by a faculty member in Biology, Chemistry, Environmental Science or Studies, Mathematics, Physics, or Psychology

KEYNOTE ADDRESS
'Survival of the Friendliest' Necessitates 'Survival of the Sexiest' in the Evolution of Domestic Dogs
Dr. Alex Capaldi
James Madison University

Hollins 66th Annual Science Seminar

'Survival of the Friendliest' Necessitates 'Survival of the Sexiest' in the Evolution of Domestic Dogs

Presented by: **Dr. Alex Capaldi**

Where: **Babcock Auditorium**
When: **Thursday, March 14, 7:30pm**

Abstract:
Wolves are among the earliest known animals to be domesticated. However, the mechanism by which ancient wolves were domesticated into modern dogs is still unknown. The prevailing domestication hypothesis is that humans selectively bred the wolves that were more docile. However, there is a more recent hypothesis which states that wolves which were less hostile towards humans would essentially domesticate themselves by naturally selecting for tamer wolves, since that would allow for easier access to food near or in human settlements. The primary critique of the latter hypothesis is whether evolution by this natural selective pathway could have occurred in a sufficiently short time span. Simulating the process would help demonstrate if it was possible. Thus, we constructed an agent-based model of evolution of a single trait, a measure of human tolerance, in canines to test the plausibility of the natural selection process. We tested scenarios both with and without mate preference to provide a potential sexual selective force. We used fecundity and mortality rates from the literature for validation. Hartigan's Dip Test for Unimodality was used to measure if and when divergence of populations occurred. Our results indicate that the proto-domestication hypothesis is plausible within realistic time constraints with just natural and sexual selective forces.

Research Poster Session
FRIDAY April 26th
1:30-3:00

Dana Science Building, 2nd floor

Biology

The Southern Expansion of Lyme Disease:
Examining Pathogen Dynamics in Southwestern Virginia
Aliya Aguirre, Leemu Jackson, Elizabeth Gleim
Under the direction of Dr. Elizabeth Gleim

Lyme disease is the most common vector-borne pathogen in the United States, with an estimated 476,000 cases occurring annually. In the United States, Lyme disease is caused by *Borrelia burgdorferi* sensu stricto (s.s.) which is vectored by the tick, *Ixodes scapularis*. Historically, Lyme disease has not been common in Virginia. However, there has been an increase in Lyme disease cases in western Virginia for the past 15 years that is associated with a southern expansion of Lyme disease. This study is working to determine the prevalence and common strain types of *B. burgdorferi* s.s. in *I. scapularis* collected in southwestern Virginia. Two hundred and ninety-one *I. scapularis* nymphs and 99 *I. scapularis* adults were tested. In nymphs, pathogen prevalence was 3.8%, whereas, the adult pathogen prevalence was 36.4%. While the pathogen prevalence in nymphs is relatively low compared to other northeastern states, the adult pathogen prevalence is similar to the pathogen prevalence of other northeastern states. Overall, this likely indicates that Virginia is transitioning towards the pathogen establishing an endemic, sylvatic cycle. Work is currently underway to begin strain typing positive *B. burgdorferi* s.s samples.

Ovarian cancer metastasis:
The role of ULK1 in downstream signaling in mitochondrial plasticity
Malaika Amin[1], Isabelle Lewis[2], Nazia Bano[2], Dr. Eva Schmelz[2]
[1] Hollins University, Roanoke, VA
[2] Virginia Tech, Blacksburg, VA

Ovarian cancer is the deadliest gynecological cancer in women, reported as the fifth leading cause of cancer related deaths in women. With a survival rate of less than 30%, it is a genetically and histologically heterogenous disease and the most aggressive serous ovarian cancer is now thought to originate in the epithelial cells of the fallopian tubes. Ovarian cells exfoliate from their primary tumors and are disseminated throughout peritoneal cavity. Previous studies from our lab show that cancer progression and hypoxic conditions promote reversible changes in mitochondrial morphology in mouse cells and human cell lines that provide the capacity to adapt to the changing tumor microenvironment. Mitochondrial plasticity and mitophagy have been linked as critical events for the survival of disseminating metastases. Ulk1 is a kinase crucial for the activation of autophagy in cells upon exposure to cellular stress like nutrient deprivation or hypoxia. In this study we use mouse models of ovarian cancer progression that represent benign (MOSE-E,) cells, slow-developing (MOSE-L) and fast-developing disease (MOSE-LTICv) to study the impact of mitophagy on cancer cell survival. We aim to generate ULK1 defective ovarian and fallopian tube cell lines to discriminate between the impact of loss of function of ULK1 in cancer cells vs whole body for in vitro and in vivo studies.

Biology

Solids or Prints? *Gallus gallus domesticus* **Hens Learn Color Association**
Faster Than Pattern Association
Anna Kryder
Under the direction of Dr. Renee Godard

The cognitive abilities of domestic chickens (*Gallus gallus domesticus*) is an area of research that has become increasingly prevalent in recent years as the considerable cognitive abilities of avians as a whole are becoming more widely recognized, and associative learning is a simple test of cognitive abilities widely utilized in research. Color and pattern are two stimuli easily recognizable & readily learned by domestic chickens, but associative learning of these stimuli have primarily been studied in chicks, not adult birds. In order to evaluate the relative difficulty of learning these stimuli types in domestic chickens, a series of trials were utilized to measure the rate at which hens learned to associate a positive stimulus with a food reward: one set of trials using solid colors as stimuli & one set using patterns. Trials of increasing difficulty were administered for each stimuli type, with each trial type having unique graduation criteria, and the rate of learning was measured by the amount of attempts a subject underwent before reaching said criteria. My results found that the rate of learning in the experimental subjects was significantly faster when learning to associate a food reward with color stimuli than pattern, and that color association seemed to stay constant after shaping, while pattern association waned (the learning speed in the more complex pattern trial was significantly slower than the less complex trial).

Determining prevalence of *Cytauxzoon felis* **in lone star ticks**
collected in southwestern Virginia
Abigail Bishop, Elizabeth Gleim
Under the direction of Dr. Elizabeth Gleim

Cytauxzoon felis is a hemoprotozoal, piroplasmid parasite that is vectored by the *Amblyomma americanum* (lone star) tick. *Cytauxzoon felis* is the causative agent of cytauxzoonosis in felids. In particular, because cytauxzoonosis has an approximately 40% mortality rate in domestic cats, it is considered a pathogen of veterinary relevance. *Cytauxzoon felis* primarily occurs in southern, south-central, and the mid-Atlantic United States. However, there is limited knowledge regarding the prevalence of *C. felis* in Virginia with most prior studies focusing on testing felids, not ticks. In this study, *Amblyomma americanum* adult ticks collected from various sites in southwestern Virginia are being tested for *C. felis*. To do this, DNA extractions are currently being performed and will be followed by a nested polymerase chain reaction (PCR) that targets the internal transcribed spacer 1 (ITS-1) region of *C. felis*. To date, DNA extractions have been completed on six *A. americanum* adults and *C. felis* testing is underway.

Biology

Evaluating and Identifying Environmentally Sensitive Roadside Vegetation Management Strategies in the Atherton Tablelands in Far North Queensland, Australia

Catherine Bussani[1], Shannon Doner[2], Grace Robinson[3], Rebecca Toomey[4], Sigrid Heise-Pavlov[5]
[1] Hollins University – Roanoke, VA, USA
[2] Drake University – Des Moines, IA, USA
[3] Connecticut College – New London, CT, USA
[4] Hamilton College – Clinton, NY, USA
[5] Center for Rainforest Studies, School for Field Studies – Yungaburra, QLD, Australia

The Atherton Tablelands in the Wet Tropics of Australia is one of the most biodiverse areas in the country. In response to the high biodiversity of this area, the Tablelands Regional Council (TRC) has put forth several policies and strategies to protect this area's rich and unique natural assets and mitigate the climate crisis. TRC is creating a Vegetation Management Plan, including a Roadside Vegetation Management (RVM) policy. This project evaluated the current roadside vegetation management practices of TRC, in light of TRC's commitments to climate risk management, to aid in developing the RVM policy. This was done by reviewing literature, conducting informal conversations with community members, TRC workers and council members, as well as visiting several locations being impacted by current vegetation management practices. While visiting these locations, we observed the damage done to vegetation and photographed the damage. The evaluation results identified roadside locations where the current practices are likely to have adverse environmental impacts. Based on an extensive literature review on the economic and ecological aspects of roadside vegetation management practices, it is recommended that grassy vegetation be replaced with native, low growing shrubs or planting a tree alley to shade out current vegetation. Implementing these practices would enable TRC to reach its goals regarding climate change risk responses, emission reductions, and biodiversity protection. These alternatives were selected due to their economic viability and alignment with TRC's existing policies and goals. It is recommended that a future case study area be used to test the economic and environmental benefits of the proposed alternative RVM practices.

Biology

**The effects of potassium on electric stability and firing rates in
monolayer and isolated cell cultures.**

Lisa Okolo[1], Alec Beck[2], Dr. Steven Poelzing[2]
[1]Hollins University, Roanoke, VA USA
[2]Fralin Biomedical Research Institute, Roanoke, VA

Potassium ions play a crucial role in regulating cardiac electrophysiology, influencing action potential duration and propagation within the myocardium. Mathematical models suggest that cyclic extracellular potassium dynamics are integral to the initiation, entrainment, and synchronization of cellular clusters (Poelzing S. et al ,2021). However, it remains uncertain whether potassium sensitivity alone is adequate to fully comprehend the intricate dynamics of arrhythmia initiation and propagation within the myocardium. In monolayer cells, potassium (K+) and firing rates exhibit an indirect proportionality, whereas in isolated cells, K+ and firing rates demonstrate a direct proportionality This research utilizes *Gallus gallus* embryonic atrial tissues to analyze firing rates and electrical stability in monolayer and isolated cells by potassium solution manipulation and optical mapping. Our findings showed that firing rates are inversely proportional to potassium concentration in both monolayer cultures and isolated cells. Furthermore, higher potassium concentrations enhance electrical stability in isolated cultures while decreasing it in monolayer cultures. These results underscore the importance of considering cellular environment and organization when investigating the effects of potassium on cardiac electrophysiology, potentially informing the development of more precise therapeutic interventions for arrhythmias.

Mammalian Trophic Diversity in Tropical and Temperate Regions

Amy Brookshire, Kaelin Shirley, Ella Wilds
Under the direction of Dr. Renee Godard

Tropical and temperate forests can differ in physical structure as well as species diversity. These differences in structure and composition can impact the structural composition of animal food webs. Using remote camera traps, compared animal activity patterns in relationship to trophic levels in temperate forests in Virginia those found in tropical rainforests in the Pastaza Province, Ecuador. To evaluate animal activity, camera trap data from three trail cameras placed in a mature, second-growth temperate forest in Botetourt County, Va. (August-January 2024) was compared to animal activity in two tropical forests (2 cameras in a primary forest and 2 in a secondary forest) in the Pastaza Province (October 2023 to January 2024). Our analysis showed much higher animal activity rates in the temperate zones (2.266 captures/camera day) compared to tropical forest (0.108 captures/camera a day). A total of eleven species were captured in both locations with two species dominating the temperate zone (white-tailed deer accounted for over 65% of all captures, and grey squirrels for over 23%). The dominance of this large herbivore in the temperate zone suggests that these forests may be impacted strongly by one species, while the tropical forests appear to have a balance of species in different trophic levels.

Chemistry

Synthesis and Characterization of Fullerene-Functionalized Metal Chalcogenide Nanosheets

Malaika Amin and Olivia A. Cogswell
Under the direction of Dr. Brian J. Reeves

Bulk heterojunction solar cells composed of fullerene electron acceptors and polymer electron donors are the current leaders in the field of flexible and transparent solar cells. The solubility of these components enables low-cost production of thin, transparent films but renders low efficiency. Metal chalcogenide nanosheets, such as CdS, CdSe, ZnS, and ZnSe represent potential solutions to the problem. Although these materials are difficult to process because of their low solubility, it is hypothesized that chemically bonding fullerenes to CdX (X= S, Se) and ZnX nanosheets will improve nanosheet stability and solubility while maintaining flexibility and transparency. This would allow them to be used as a new electron transport material to make efficient, flexible, and transparent solar cells. The synthesis and preliminary characterization of N-boc protected nanosheets as precursors to CdX and ZnX fullerene-functionalized nanosheets is presented here.

Synthesis of Perfluoroalkyl Phenanthroline Ligands for use in Cu(I) Complexes

Dionne Torres
Under the direction of Dr. Brian J. Reeves

Ruthenium (Ru(II)) polypyridyl complexes have attracted interest in the last decade due to their outstanding photophysical properties. The versatility of Ru(II) polypyridyl complexes has been demonstrated by their use in dye sensitized solar cells, light emitting diodes, light-emitting electrochemical cells, as well as catalytic systems. Unfortunately, the high cost of ruthenium complexes poses a significant barrier in their widespread adoption despite their valuable properties. Recently, copper (Cu(I)) polypyridyl complexes have gained attention as a low-cost alternative to the well-studied Ru(II) polypyridyl complexes. Recent experiments have revealed that the Cu(I) MLCT excited states undergoes a pseudo-Jahn-Teller distortion resulting in an exposed metal center enabling solvent coordination that shortens the excited-state lifetime. The diminished emission lifetime and quantum yield of Cu(I) polypyridine MLCT excited states compared to their Ru(II) counterparts limit their use in systems that require prolonged luminescence or quantum efficiency. This study serves to explore the synthesis and use of perfluoroalkyl phenanthroline ligands as an avenue to lessening the degree of pseudo-Jahn-teller distortion and extending the excited state lifetimes for Cu(I) polypyridyl complexes.

Chemistry

Investigation of chitosan based materials for cosmetics applications
Leia Hernandez
Under the direction of Dr. Brian J. Reeves

This project confronts the issue of daily plastic (polyethylene) usage in rinse-off cleansing cosmetics by investigating the use of a biodegradable biopolymer chitosan as a key replacement ingredient. Chitin is sourced from crab and shrimp shells, and deacetylated chitin is known as chitosan. Several chitosan films and emulsions were prepared to determine the difference in properties between polyol plasticizers. A balm cleanser base was prepared to incorporate varying concentrations of chitosan and chitosan solution. These samples were analyzed using a microscope to detect any noticeable changes in appearance after the addition of chitosan to the formula. Infrared spectroscopy indicated the presence of chitosan and other functional groups in the films. The next step will be to test the cleansing power of each sample. If chitosan can increase cleansing effectiveness and be a suitable replacement for polyethylene, it can be brought up to companies who still use polyethylene in their formulas. Thus, eliminating a source of microplastic pollution from the cosmetics industry.

Synthesis and Characterization of Compounds of Dirhenium
Katherine Babineau, Adia Belle, Abigail Soto
Under the direction of Dr. Daniel R. Derringer

Three diphosphines, $Ph_2PCH(H)PPh_2$ (dppm), $Ph_2PCH(Me)PPh_2$ (dppmMe) and $Ph_2PCH(CN)PPh_2$ (dppmCN), were prepared using literature procedures. The compounds were characterized by H-1 NMR and IR spectroscopy. Then, in separate studies, two of the phosphines, dppmMe and dppmCN, were combined with a dirhenium compound, $Re_2(O_2CCH_3)_2Cl_4(OH_2)_2$, and refluxed in EtOH for 1 h. The formation of three different diphosphine-containing dirhenium spieces resulted: $Re_2(O_2CCH_3)Cl_4(dppmCN)_2$, $Re_2(O_2CCH_3)Cl_4(dppmMe)_2$, $Re_2Cl_4(dppmMe)_2$. These products were characterized by cyclic voltammetry and single-crystal X-ray crystallography.

Environmental Studies/Science

MaxEnt Model of Belted Kingfisher Nests Along the Tennessee River Gorge Largely Determined by Soil Type

Lang Beeland[1] and Nyssa Hunt[2]
[1]Hollins University, Roanoke, VA
[2]IGT Lab, University of Tennessee at Chattanooga

The Belted Kingfisher, *Megaceryle alcyon*, is a species of bird in the order Coraciiformes known for having burrow-style nests on the borders of rivers, creeks, and lakes. Using data from the Tennessee River Gorge Trust collected via in-person scouting, we mapped documented Belted Kingfisher nesting sites and tested them against a collection of variables, including NCLD 2019 land cover data, bioclimatic factors from WorldClim, and soil type. This was done using ArcGIS, a web mapping service from ESRI. We found based on a series of significance tests that BEKI prefer to nest along bodies of water that are bordered by sandy clay soil. This map suggests various sites that are ripe for further investigation by the Tennessee River Gorge Trust, within their surveyed land we found hot spots for possible BEKI activity on Elder Mountain, and in Falling Water Nature Preserve, all within the city of Chattanooga, TN.

Human Settlement Impacts on Bird Diversity in Ecuador

Lang Beeland and Finn Webster
Under the direction of Dr. Renee Godard

Though only the size of Colorado, Ecuador ranks fifth in the world for avian diversity, supporting more than a thousand species of bird. We explored the impacts of human settlement on avian diversity by conducting repeated 30 minute surveys of bird diversity in four different locations (suburban, peri-urban, rural cluster, uninhabited). Human settlement characteristics were determined using satellite imagery along with data from the Global Human Settlement Layer. We found that overall bird diversity and the number of novel species between observations decreased with increasing human settlement. Human population growth and the expansion of extractive practices are likely to impact bird diversity and populations in the future.

Mathematics/Statistics/Data Science

Your Algorithm is Rigged! Unrigging ICE's Risk Classification Assessment Tool
Joselinne Piedras-Sarabia
Under the direction of Dr. Molly Lynch

In today's rapidly advancing technological landscape, the reliance on algorithms for decision-making has become increasingly prominent. The U.S. Immigration and Customs Enforcement (ICE) employs the Risk Classification Assessment Tool (RCAT) to determine the fate of immigrants, including whether they should be released on bond, detained in ICE facilities, or referred to a supervising officer for further consideration. However, concerns have been raised regarding the fairness and transparency of the RCAT algorithm, particularly after it was revealed that ICE manipulated the algorithm in 2017, resulting in significant changes to immigration detention and release decisions. This project aims to address this issue by modifying the current RCAT algorithm while upholding principles of algorithmic fairness. This project holds significance in shedding light on the intersection of technology, ethics, and immigration policy, highlighting the need for transparency and accountability in algorithmic systems that have profound implications for thousands of lives. Through our research, we strive to contribute to the ongoing discourse on algorithmic fairness and its role in shaping immigration policies and practices.

Psychology

Working Memory in College Students with and Without Neurodevelopmental Disorders
Riley Eller
Under the direction of Dr. Bonnie Bowers

Working memory is a limited capacity system capable of storing and manipulating information. It is involved in complex cognitive processes including reasoning, comprehension, and types of learning. Deficits in working memory are typical in neurodevelopmental disorders such as ADHD/ADD, autism spectrum disorder, and learning disabilities- but there is limited research on differences in working memory among the different disorders. College students were given three working memory tasks including visuospatial test, digit span test, and word recall along with the Working Memory Questionnaire (WMQ; Azouvi et al., 2012), a self-questionnaire testing different aspects of working memory. There were trends finding working memory deficits within the tasks, particularly in the visuospatial task, in those with neurodevelopmental disorders. Those with neurodevelopmental disorder were found to have higher overall scores on the WMQ compared to those without, indicating higher deficits.

COVID-19 Impact: Mental Wellbeing, Health Consciousness, Global and Self Interconnectedness, and its Racial Social Effects
Zeina Ghanem
Under the direction of Dr. Bonnie Bowers

The Coronavirus pandemic has affected individuals' lifestyles, behaviors, health, and perspectives as separate entities and as a collective whole. This study aimed to understand participant's (N = 118) experiences of how the COVID-19 pandemic affected these factors. Key findings revealed positive correlations and Cronbach alphas > .80 in mental wellbeing, health consciousness, global and self interconnectedness, and racial/social effects measures. Additionally, there was a significant difference in the Racial Social Effect measure. Individuals belonging to a minority race/ethnicity had a higher mean value compared to those of a nonminority race/ethnicity; t (106) = -5.11, p < .001. The findings prompt further research into the relationships and effects of the COVID-19 pandemic on these factors.

Psychology

The Effect of Background Colors and Associations on Perceived Attractiveness, Help-Seeking, and Helping Behavior
Zeina Ghanem
Under the direction of Dr. Bonnie Bowers

The objective of this study is to understand how background colors influence an individual's perception of another person's interpersonal attractiveness, along with how these factors affect an individual's social support giving and seeking behavior for each presented image. Participants (N = 278) consented to take a 10-minute online survey. The background colors used were red and blue with varied saturation levels (light, medium, and dark) and a white control background. Key findings revealed a strong positive correlation between Interpersonal Attraction and Social Support Seeking for all background colors and saturation lightness levels, $r(268) = .611$, $p < .001$. The findings prompt further research into the effects of background colors on these measures.

Interpersonal Relationships, Stigma, Knowledge, and Perceptions of Alzheimer's Disease
Keegan Clark
Under the direction of Dr. Bonnie Bowers

There has been a rise in cases of Alzheimer's Disease over the years (Alzheimer's & dementia), yet little research into the stigmatic perception of those with Alzheimer's Disease. Previous research investigated the relationships among knowledge, assumed knowledge, the stigma of Alzheimer's Disease, and relational closeness to individuals with Alzheimer's Disease among middle to older adults, however, there is limited research on younger adults. A pilot study with college-aged student participants was conducted utilizing Alzheimer's Disease and Ageing Perception Scale (ADAPS), Attitudes Toward People with Dementia Scale, a confidence scale, and the Relational Closeness Scale. This study found non-significant correlations among these variables, but a larger sample size was needed. A follow-up study was conducted with younger (18-29) and older (30+) adults following the same methodology.

Psychology

Competitive Stress During Consolidation on False Memory Formation
Madison Brousseau
Under the direction of Dr. Alex Wooten

The purpose of this study was to investigate the relationship between stress induced during competition and its impact on false memory formation. Twenty-eight undergraduate participants completed a mathematical task (under low, moderate, and high competition conditions) during the filler task part (i.e., consolidation phase) of the DRM paradigm. The DRM paradigm assesses whether a false memory has been formed through the use of word lists and was tested using yes/no recognition accuracy. We found that participants did not show a difference in false memory formation between competition levels. These findings indicate that a stronger competitive manipulation may be needed to better understand its effects on false memories. As this cross-section between competitive stress and false memory is still new in the literature, more research is needed to better understand the relationship between these variables, especially as stress and false memory overall have shown conflicting findings in past research.

The Influence of Deadline and Distraction on Children's Task Performance
Willow Seymour, Olivia Perrine, and Hildana Abebe
Under the direction of Dr. Seunghee Han

A child's capability is tied to the environment in which they learn. No child will learn in a vacuum; their environment becomes as much a part of their experience as the curriculum. Previous studies have found that classrooms with excess visual displays may draw eye movement away from the task (Hanley et al., 2017). Children also require external reminders in activities involving internal time regulation to generate the same level of accuracy (Mäntylä et al., 2007). How do we gauge just how much distraction can affect performance? Are we able to negate the effect of distraction by informing the child of an oncoming deadline? This observational study of ten children aged 7 - 12 years old introduced a visual/auditory distraction, as well as a deadline to a puzzle task, which revealed information about children's cognitive processing and self-restraint in distracting environments. We formed three hypotheses of the interactive effects between deadline and distraction on children's performance: Children under the deadline condition will be able to complete a task better than they were able to with no deadline (A), children with the distraction condition will experience a decrease in the percentage of task completion (B), and children under both the deadline and distraction condition will perform the task better than those under the sole distraction condition, but worse than under the sole deadline condition (C). Out of these Hypotheses, we found sufficient evidence to support A, but mixed results on B. Hypothesis C has some support, but more research must be completed to establish statistical significance.

Psychology

Birth Order and Children's Compliance Tendencies
Olivia Olson and Anna Young
Under the direction of Dr. Seunghee Han

Birth order is considered an integral part of children's personality development. When looking at birth order, the eldest and only children tend to be affected more by others' expectations (Prime et al., 2017). This leads to the hypothesis that the eldest and only children will be affected by compliance tendencies more often as well. However, there is limited research investigating this topic, especially with early elementary-age children. The present study examines the relation between birth order and compliance in early elementary-age children (first to third grade). This research offers a significance to future research in examining six to nine year old's compliance tendencies within the lens of birth order. As a pilot study, 8-12 children will be recruited. Children's behaviors will be observed while they are doing the Clean-up Toys Task in the lab (Kochanska & Kim, 2013). Parents and children will also be interviewed to know their personality and compliance at home.

Race and Screen Time in Children
Zoe Raba
Under the direction of Dr. Seunghee Han

In light of the shifting of social activities to electronic devices in reaction to Covid-19, there are still a number of other factors that can contribute to the increase of screen time in young children. Factors such as lack of green spaces, safe environments, as well as environmental racism can all play a role in the shifting of recreational time away from outdoor play to electronic device usage. The objective of this research is to examine the level of significance of the relation between a child's race and the amount of time they spend on an electronic device (phone, tablet, gaming console, streaming services, etc.), and whether the relation varies by their home environment (e.g., urban or rural, neighborhood). The significance of this research is to add to our understanding of contemporary children's lives with electronic devices by examining why or how their race and physical environmental factors may exhibit influence on them. This project will allow researchers to examine factors contributing to the amount of time children spend on electronic devices, investigating what relations race and home environment may have in impacting screen time.

Physics

Revolutionizing Uterine Fibroid Care: Modern Minimally Invasive Treatments
Achin Tamang and Tara Schmidt
Under the direction of Dr. Brian Gentry

Uterine fibroids are the most common benign tumors that grow in the muscle tissue of the uterus. There are seven types of fibroids, with three major ones, categorized by where they form: intramural (within the wall), submucosal (in the uterine cavity), and sub serosal (outside the uterus). The Dual Wavelength Diode Laser System (DWLS) and transcervical radiofrequency ablation (TRA) demonstrate recent advancements made in uterine treatment technology. DWLS reduces the size of fibroids with better results than prior laser treatments like CO_2 and Nd-YAG lasers. An ex-vivo study evaluating DWLS achieved a substantial 46.6% reduction in fibroid volume across all types (D'Alterio et al., 2021). TRA utilizes radiofrequency energy to safely shrink myomas. Findings from SAGE, a registry focused on the long-term effects of TRA, demonstrated favorable outcomes from 160 women in the preliminary results. These minimally invasive approaches offer a compelling alternative to more invasive procedures due to their enhanced safety, precision, and shorter recovery times, signifying notable progress in uterine fibroid treatment.

Advancements in ALS Diagnosis and Prognosis
Prabina Waiba Tamang and Reeya Thapa
Under the direction of Dr. Brian Gentry

Amyotrophic Lateral Sclerosis (ALS) is a severe neurodegenerative disease affecting motor neurons, leading to progressive muscle weakness, paralysis, and eventual death, with an average life expectancy of 2-5 years post-diagnosis. Currently, ALS affects approximately 30,000 Americans, with an estimated 450,000 to 600,000 individuals globally living with this condition, resulting in approximately 12 cases per 100,000 individuals worldwide. Despite its severity, ALS remains challenging to definitively diagnose, often resulting in delayed intervention and limited treatment options that primarily aim to manage symptoms rather than halting or reversing disease progression. Moreover, these treatments are typically invasive and provide only modest effectiveness. Recent studies have highlighted the effectiveness of NfL, a protein found in nerve cells, as a diagnostic biomarker for ALS, showing elevated levels in cerebrospinal fluid and blood samples of ALS patients compared to healthy controls. This biomarker aids in early and precise prognosis, complementing metabolic approaches for treatment. Metabolic approaches, such as small molecule drugs and gene therapies, show promise in delivering targeted treatment to ALS-affected tissues by using nanoparticles in the brain and spinal cord. Early preclinical studies show promising results, suggesting motor function improvements and extended survival in ALS animal models following metabolic interventions. Therefore, using NfL as a diagnostic biomarker for early detection of ALS, along with nanoparticle-based metabolic treatments, offers significant potential for improving patient outcomes by enabling early intervention and targeted therapeutic delivery to ALS-affected tissues, potentially enhancing treatment effectiveness and extending survival rates.

SPARC

Supporting Creative Community: Internal Leadership and Interpersonal Trust
Emily Bauer, Theatre Department
Under the direction of Dr. Wendy-Marie Martin

The art of theatre is built on teamwork, on collaboration, on interpersonal relationships. Problems in these relationships can damage both the individuals involved and the theatrical project they are collaborating on. This honors thesis examines the interpersonal dynamics that exist in theatre spaces, the different approaches to them that exist, and the ways in which they can deteriorate. Using the dual lens of Jack Gibb's Trust Level Theory and the Five Principles of Organizational Leadership, this project proposes attitudes and practices that may aid in creating more ethical, communicative and trusting theatre environments. The practical component of this research proposes a hypothetical theatre company built with sustainable interpersonal dynamics at its heart.

Cultivating a Disabled Embodied Dramaturgy
Aves Lewis, Theatre Department
Under the direction of Dr. Wendy-Marie Martin

My work is attempting to fill the gap of research in disability performance studies that exists specifically in using techniques such as embodied dramaturgy, which focuses on the bodymind of the performer in order to have authentic and grounded performance. By applying three embodied dramaturgies as interventions to the cast of my original play *CORPS (a canniballet in two acts)* as well as implementing aspects of disabled dramaturgy to the entire process, I am looking to study the effects of this overall framework on both disabled and nondisabled actors' self-efficacy and satisfaction with the dramaturgies with scales of measurement, and feelings on overall artistic experience in one-on-one interviews. As I continue this research, I want to eventually be able to publish a book of practices as part of a larger Disabled Embodied Dramaturgy framework that can be applied to creative projects and benefit disabled and nondisabled performers by not only providing accommodation but also supporting and inspiring them creatively.

SPARC

Do CO₂ emissions reflect recent changes in consumption patterns? A case study
Charlotte Rose, Department of Economics
Under the direction of Dr. Pablo Hernandez

Carbon dioxide (CO_2) emissions are characterized as major inhabitants of the EU proposal to become the world's first carbon-neutral continent by the year 2050. This project examines the capabilities of consumption as a factor of GDP to further account for coinciding cyclical trends and their eventual collapse. The agglomerations of the natural logs for necessary proxies were determined to ultimately compare to carbon dioxide totals measured in units of kilotons (kt). The utilization of the Environmental Impact Population Affluence Technology (IPAT) equation allows the eventual comparisons to be taken following appropriate markers of such equation and model. The case study consists of examining a sample of member countries of the EU-27 with a cross-country analysis spanning from 2008-20. These countries include Belgium (BEL), Germany (DEU), Denmark (DNK), France (FRA), Hungary (HUN), Italy (ITA), Netherlands (NLD), and Spain (ESP). The proposed hypothesis sustains that CO2 emissions will be explained by IPAT technology while controlling for externalities such as geographical propensities and population densities.

Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less.
- Marie Curie

Student

Biographies

2024

Listed by subject area

Biology

Aliya Aguirre, class of 2024, is a biology major with a minor in chemistry. Over the years at Hollins, Aliya has developed a love for cellular and molecular biology, specifically in wildlife and zoonotic pathogens. Upon graduation, Aliya plans to take a gap year before she applies to Ph.D. programs that can allow her to specialize in infectious disease. While at Hollins, she has been a part of the chemistry journal club as well as the Hollins Repertory Dance Company.

Abigail Bishop, class of 2025, is majoring in Biology (B.S.) on the pre-veterinary track and minoring in chemistry and psychology. While at Hollins they have been involved in various clubs and organizations such as the Hollins Activity Board, Mae Jemison specialty house, the Chemistry Journal Club, and the Pre-Medical/Veterinary Society. After Hollins, they are planning on pursuing a doctorate in veterinary medicine and dedicating their time to animal rescue.

Biology

Amy Katherine Brookshire, class of 2024, is majoring in Biology (B.S.) with a concentration in pre-veterinary medicine and minoring in Psychology. During her time at Hollins under the guidance of her advisor, Elizabeth Gleim, she has dedicated her summers and J-terms to internship experiences with veterinarians, as well as participating in the Hollins study abroad program for STEM majors, allowing her to have an enriched experience in Ecuador. She engaged in many science seminars and alumni relations conferences that have given her the opportunity for work experiences. Following graduation, Amy will be applying to graduate schools to continue her education in veterinary medicine and large animal practice.

Catherine "Cat" Bussani, class of 2024, is majoring in Biology (B.S.) and double minoring in Chemistry and History, with plans to work in wildlife conservation and animal management. During her time at Hollins, she has studied abroad in the Australian rainforest in Spring 2023, as well as studied predator behavior, such as wolves, bears, and coyotes in Minnesota during J-Term 2023. Since her freshmen year, she has been on the Hollins soccer team and was named a 2023 College Sports Communicators Academic All-District Team Member as well as being named VaSID Academic All-State Team. Following graduation, Cat plans to take a gap year to work at the Disney College Program and gain experience working with wildlife before pursuing graduate school in Zoo, Aquarium, and Animal Shelter Management.

Biology

Anna Kryder, class of 2025, is majoring in Biology (B.S.) and Studio Arts (B.A.). Under the guidance and encouragement of their professor Dr. Renee Godard they conducted behavioral research on their flock of chickens in the spring of 2023, as independent research for the Animal Behavior Laboratory course. They focused on investigating the visual learning speed of domestic chickens by using food association, building off the work of others in this field of study. They have a passion for ornithology, behavioral science, oil painting, and chickens. They are planning on attending graduate school after graduating next spring.

Lisa Achieng Okolo, class of 2024, is charting her course towards a future in medicine with a major in Biology and a premed track. Hailing from Nairobi, Kenya, she brings a rich diversity of experiences and perspectives to her academic and extracurricular pursuits. Dedicated to serving her community, Lisa has made her mark at Hollins by serving as a Quantitative Reasoning Tutor and an International Student Peer Mentor. She has also been involved in the Collegiate Habitat for Humanity project and is an active member of the Pre-med society and Chemistry journal club. Under the esteemed mentorship of Dr. Steven Poelzing at the Fralin Biomedical Research Institute, Lisa has seized the opportunity to delve into Biomedical Research in Cardiology, specifically Cardiac electrophysiology. With her sights set on a future in Cardiothoracic medicine, Lisa is poised to embark on the next phase of her journey after Hollins: Medical school.

Biology

Kaelin Shirley, class of 2025, is majoring in Biology (B.A.). During her time at Hollins, she has been a varsity member of the Hollins Equestrian Team and a Resident Assistant. For J-Term 2024, Shirley and other Hollins students traveled to Ecuador with Professor Renee Godard to explore the country's culture and offerings of biodiversity. While in Ecuador, Shirley assisted in research concerning mammal behavior in tropical rainforest using camera trap data at WASKA headquarters and the SUMAK research station in conjunction with camera trap data collected in Roanoke, VA for comparison with temperate forest mammal behavior. Shirley hopes to enter into the healthcare field following graduation from Hollins University in 2025.

"If we knew what it was we were doing, it would not be called research, would it?"
— Albert Einstein

Chemistry

Malaika Amin, class of 2025, is a Biology (B.S.) and Public Health (B.A.) double major, on pre-med track. During her time at Hollins, she has enjoyed working with various clubs and organizations like the Hollins Activity Board and the Pre-med/vet society. Malaika is an active advocate for women's rights, health, and social justice. She spoke at the 2022 Girls Lead Act briefing event for the rights of adolescent women and at Leading EDJ (Equity, Diversity, and Justice) conference 2023 and 2024, on stressors and mental health challenges faced by BIPOC and international students. She is currently working with the Translational Biology, Medicine, and Health program at Virginia Tech in their Ovarian cancer lab as a research assistant, since fall 2023. She is also the current class of 2025 President and will be serving Hollins community in this capacity for the next academic year as well.

Katherine (Katy) Babineau, class of 2024, is a senior chemistry major (B.S.) with a minor in physics. Upon graduation, she will pursue a Masters of Healthcare Administration program at the University of Lynchburg. Upon receiving her master's degree, she plans to apply to medical school, where she hopes to specialize in emergency medicine. While at Hollins, she has been the treasurer of the Public Health Outreach Club, the Young Adult Book Club, and the internal chair of the Hollins Repertory Dance Company. She has also been a member of the chemistry club since it began her sophomore year.

Chemistry

Adia Belle, class of 2024, is a Chemistry major (B.S.) with a minor in Physics. During her time at Hollins, she has been heavily involved in the Department of Student Activities and Orientation. In her senior year, she researched dirhenium compounds and synthesized phosphine ligands with acid/base chemistry. Due to her research over the past year, she is interested in the research and development of HPLC. After graduation, Adia will pursue a career in sustainable waste management.

Olivia "Ari" Cogswell, class of 2026, is a chemistry major with a biochemistry concentration, drawn to the field by its patterns, versatility, and potential to incite positive change. In their time at Hollins, they've served as a Student Success Leader (SSL) and Quantitative Reasoning Tutor. They were the recipient of the ACS, Division of Analytical Chemistry, Undergraduate Award in Analytical Chemistry in 2023. As a self-proclaimed dilletante, she enjoys writing poetry, learning guitar, and other creative pursuits that bring balance to her time spent in the lab.

Leia Hernandez, class of 2024, is majoring in Chemistry with a minor in Physics. She is a Chemistry Club officer, class cabinet senator, and ETP mentor. Additionally, she is a member of Omicron Delta Kappa Honor Society and Alpha Psi Omega National Theatre Honor Society. Following graduation, Leia plans to pursue a Master of Science in Cosmetic Science.

Chemistry

Abigail Soto, class of 2024, is majoring in Chemistry with a concentration in Biochemistry (B.S.), alongside a minor in Music at Hollins University. Engaged in campus life, she contributes to the music department's performances and holds leadership roles in organizations like Unión de Estudiantes Latinos, Roll With It, and the Spanish specialty house. During her senior year, Abigail conducted research in inorganic chemistry, synthesizing dirhenium compounds and their respective phosphine ligands. Following graduation, she aims to start a career in neurophysiological monitoring and analysis.

Dionne Monique Sakisat Torres, class of 2024, is majoring in Chemistry (B.S.) with a concentration in biochemistry and minoring in Biology. During her time at Hollins, she has been a member of the Chemistry Journal Club and Premed Society as well as the co-president for the Students for Environmental Action club. Under the guidance and encouragement of her professors Son Nguyen and Brian Gentry, Torres dedicated the summer of 2023 to the Student Research Internship Program (SRIP) at the University of Virginia where her internship was funded by the American Society for Pharmacology and Experimental Therapeutics (ASPET). She engaged in biomedical research and attended seminars regarding pharmaceutical research organized by ASPET. Following graduation, Dionne will be attending the University of Florida College of Pharmacy where she plans to continue her education and become a pharmacist.

Environmental Science/Studies

Lang Beeland, class of 2024, is majoring in Environmental Science (B.S.). During his time at Hollins, he has found a love for ornithology under the direction of Dr. Morgan Wilson and Dr. Renee Godard. He has traveled abroad in Ecuador (January 2024) while participating in avian research. He held an internship with the University of Tennessee at Chattanooga with the IGTLab under the direction of Dr. Charlie Mix and Nyssa Hunt, working with the Tennessee River Gorge Trust in order to further their avian nesting research using ArcGIS. Following graduation, Beeland hopes to continue to pursue ornithology and ecological research back in his hometown of Chattanooga, TN.

Finn Webster, class of 2024, is an environmental studies and studio art double major from Franklin, Tennessee. His time at Hollins has led him to express an interest in local landscapes and all that they hold, with particular affinity for ornithology and entomology. He has presented at SPARC with student research regarding renewable energy integration at Hollins. Under the tutelage of Renee Godard, he has traveled to Ecuador to study and observe biodiversity and hopes to continue to travel and gather knowledge about the world around him. During his summers, he works out at Ghost Ranch in New Mexico and enjoys hiking in his free time.

Environmental Science/Studies

Ella Wilds, class of 2025, is double majoring in Environmental Science (B.S.) and Film (B.A.). During her time at Hollins, she has been part of the Student Government Association as the Vice President of the class of 2025 for one year and was appointed to be Athletic Chair for the 2024-2025 academic year. She also competes with the track and field team, throwing discus, hammer, javelin, and shot put and is a member of the Honor, Conduct, and Appeals Board. Ella was part of the January 2024 trip to Ecuador and worked with a group of students to analyze trail camera data from Virginia and Ecuador to find patterns in mammalian biodiversity.

"Wonder is the seed of knowledge"
— Francis Bacon

Mathematics/Statistics/Data Science

Joselinne Piedras-Sarabia, class of 2024, is a Mathematics (B.S.) major with a concentration in Data Science. She transferred to Hollins University after graduating from San Jacinto College with an Associates of Arts in Behavioral and Social Sciences. Before Hollins University, Joselinne served as Programming intern for two years at the Houston Police Department. Afterwards, she served as a Finance Data Analyst intern under the Finance department of Harris County Precinct One for nine months. Following graduation, Joselinne will work as a data analyst in Texas while crafting a portfolio for Creative Writing M.F.A programs.

"What you learn from a life in science is the vastness of our ignorance."

– David Eagleman

Psychology

Hildana Abebe, class of 2025, is majoring in Clinical Psychology. During her time at Hollins, she has been inducted into Omicron Delta Kappa (leadership) and Psi Chi (psychology) honor societies. She has been an international student mentor and has been a member of Cognition lab overseen by Dr. Wooten as well as Child development lab overseen by Dr. Han. After graduation, she plans on attending graduate school and studying Applied Behavioral Analysis to help children with developmental disabilities.

Madison Brousseau, class of 2025, is double-majoring in Psychology (B.A.) and Creative Writing. Since her time at Hollins, she has found an interest in exploring cognitive psychology, especially in the field of memory. She is currently the Research Statistics tutor, a Writing Center tutor, the coordinator for the Applied Memory and Cognition lab, co-captain for the rock climbing team, and a trip leader for the Hollins Outdoor Program. With her love for psychology and the outdoors, she hopes to conduct research in her future that may combine those passions. She intends to attend graduate school for cognitive psychology after graduation.

Psychology

Keegan Clark, class of 2024, is majoring in Spanish and Psychology (B.S.). During her time at Hollins, she has served as the Secretary and Co-President of the Pre-Medical/Veterinary Sciences Club, the Spanish Tutor, and has studied abroad in Spain and Ireland. Additionally, she is a member of the Sigma Delta Pi honor society, has been on the dean's list, and was the recipient of the CRC Press Chemistry Achievement Award in her first year at Hollins University. Keegan is passionate about neuroscience and studying neurodegenerative diseases, primarily Alzheimer's and Parkinson's Diseases. Following graduation, Keegan plans to work as a research technician in a neuroscience lab before pursuing a Ph.D. in neuroscience.

Riley Eller, class of 2024, is a psychology major (B.S.) and biology minor. Throughout her time at Hollins, Riley has been active in programs such as the riding team and being a SAAC representative throughout the 2021-22 school year, the Young Adult Book Club, and studied abroad in London in spring 2023. This past year she has conducted research examining working memory in neurodevelopmental disorders under the advisement of Dr. Bowers and has presented this research at places such as the Virginia Association for Psychological Sciences conference. After graduation, Riley is planning on a gap year to work with students with special needs and learning difficulties before going to grad school with hopes of studying special education.

Psychology

Zeina Ghanem, class of 2024, is majoring in Psychology (B.S) with a minor in English. She started engaging in research during her sophomore year and was published in the Undergraduate Research Awards at Hollins University. She studied abroad in Ireland at the University of Limerick for Fall semester of 2022 and became a global ambassador. She received membership to numerous academic honor societies and has engaged in many extracurriculars during her time at Hollins. After graduating, she hopes to attend graduate school and/or work in her field, with aspirations to potentially pursue clinical psychology.

Olivia Olson, class of 2026, is a Clinical Psychology Major (B.A.). She has been interested in the field of psychology since she was young and found her specific passion when she began to work with children. During her time at Hollins, she has been a member of the Child Development lab on campus, overseen by Dr. Han. In the Lab, she is currently working in connection with another student on research that focuses on birth order impact on children's compliance tendencies. Olivia has also been involved in student government as a class treasurer since coming to Hollins. After college, she hopes to work as a social worker before getting accepted into a graduate school program, all working towards becoming a child psychologist.

Psychology

Olivia Perrine, class of 2025, is majoring in Clinical Psychology (B.A.). During her time at Hollins University, she has nurtured her passion for psychology through her experiences in the Child Development Lab, her wonderful professors, and her inspiring peers. She is a HOPE Scholarship recipient and is currently working as a Behavior Technician at Attain ABA. Following graduation, she plans to pursue a Master's degree in Clinical Counseling and provide relief for children and adolescents who may be struggling with emotional or behavioral issues.

Zoe Raba, class of 2024, is double majoring in Psychology (B.A.) and Creative Writing (B.A). As a member of the Child Development Lab, they have been able to spend their time at Hollins conducting studies examining different factors that impact families and children on a local and nationwide scale. After graduation, they plan to continue their schooling in order to pursue more studies and work towards certification to be a licensed therapist.

Psychology

Willow Seymour, class of 2024, is double majoring in Psychology (B.A.) and Creative Writing. During their time at Hollins, they have been inducted into the Sigma Tau Delta (English and Literature), Psi Chi (Psychology), and Omicron Delta Kappa (Leadership) Honor Societies. They served as the 2023 - 2024 Head Editor of *Cargoes,* the longest standing literary magazine on campus. In 2023, they were the recipient of Best Graduate Poster by the Virginia Association for Psychological Science for their presentation of their research, *Familial economic stress and the socio-behavioral health of preschoolers.* The current research they are presenting was started as a Hollin's Summer Undergraduate Research Fellowship (SURF) project. After Hollins, they plan to take some time to work on the continuation of their Creative Writing Honors Thesis, a novel-length piece, before applying to graduate school.

Anna Young, class of 2024, is double majoring in Psychology (B.A.) and Business with a concentration in Finance. Her professor at her Early College Program ignited her interest in the psychology field and is the reason she is majoring in Psychology at Hollins. During her time at Hollins, she has been a member of Dr. Han's Child Development Lab and is conducting research with another student as well as being a member of Dr. Long's Investments club in the Business department. After graduation, she plans on joining the workforce in her hometown, before possibly applying for graduate school in the future.

Physics

Tara Schmidt, class of 2027, is an undeclared major. She has always had an interest in healthcare, especially for women. Although she's more interested in pursuing a career in insurance, she was greatly inspired by her aunt, a dedicated gynecologist. She enjoys playing saxophone, knitting, and spending time with her pets. After graduating from Hollins, she hopes to continue furthering her education in math and economics by attending graduate school.

Achin Tamang, class of 2027, is interested in Psychology and Public Health majors. She's an international student from Nepal. In the fall of 2023, she was awarded the Dean's List Honors, and she will soon start working as a chemistry tutor. Since childhood Achin has promoted health awareness. Now, she advocates for mental health. Besides studying, she enjoys dancing, hiking, drawing, and reading. After graduating from Hollins, she intends to attend graduate school in a health-related field.

Physics

Prabina Waiba Tamang, class of 2027, is a freshman at Hollins University with an intended double major in Chemistry (B.S.) and Psychology (B.S.). She is an international student from Nepal, currently serving as ISA (International Student Association) social media coordinator. After graduation, she plans to pursue a research career in Neuroscience.

Reeya Thapa, class of 2027, is currently pursuing a major in Psychology and a minor in Data Science. She is fascinated by the human brain and loves to dive into why it works the way it does. She is also interested in exploring how crime scenes work and solving mysteries.

SPARC

Emily Bauer, class of 2024, is majoring in Theatre (B.A.) and minoring in Music, with certificates in Piano Teaching and Musical Theatre Performance. Emily has participated in more than ten theatrical productions at Hollins as an actor, costumer, director and run crew member, and is a member of the Alpha Beta Epsilon chapter of Alpha Psi Omega, the National Theatre Honors Society. They have worked towards the culmination of their thesis over the past year under the advisement and encouragement of Wendy-Marie Martin, Suellen da Costa Coelho and Gwyneth Strope. After graduation, Emily will be returning home to help out on the family farm and prepare to apply for graduate studies in theatre.

Aves Lewis, class of 2024, is majoring in theatre with a minor in psychology. During their time at Hollins, they have been president of the Hollins Student Theatre Association, and a member of Alpha Psi Omega, Omicron Delta Kappa, and Psi Chi. Under the guidance of his professors Wendy-Marie Martin and Danielle Barre, Lewis has been pursuing an honor thesis in theatre with this research into disabled and embodied dramaturgies as well as producing their original play *CORPS (a canniballet in two acts)* in March 2024. Following graduation, Aves will be a reading teacher with the Institute of Reading Development and moving to Richmond, VA to continue researching and working in theatre.

SPARC

Charlotte Rose, class of 2024, is an International Business and Applied Economics (B.A.) double major on the Three-Year Accelerated Program. During her time at Hollins, she has served as the Vice President of the Hollins Investment Club since 2022 where she works to foster community conversations around personal finance, investment trading, and applicable economic policies. Charlotte has also served as the Student Success Leader under Dr. Pablo Hernandez, and she sits on the Library Student Advisory Board. She spent a semester abroad in Paris, France at American Business School (ABS) and Institute for the International Education of Students (IES) Abroad. Since her time abroad, Charlotte worked to share her experiences with peers as a presenter during the Leading EDJ (Equity, Diversity, and Justice) conference. Charlotte will be attending Emlyon Business School in Lyon, France to pursue a MSc in International Marketing & Business Development in the Fall of 2024.

"Science and everyday life cannot and should not be separated."

– Rosalind Franklin

A 66 Year Legacy
Science Seminar Speakers
(1957-2024)

1957-58	Dr. Michael Scriven, Swarthmore College
1958-59	Dr. Michael Scriven
1959-60	Dr. Kirtley Mather, Professor Emeritus of Geology, Harvard University
1960-61	Dr. Kirtley Mather
1961-62	No information available
1962-63	Dr. Milton D. Soffer, Professor of Chemistry, Smith College
1963-64	Dr. Henry Margenau, Physics, Yale University
1964-65	Dr. Ernst Nagel, Philosophy of Science, Columbia University
1965-66	Dr. Neil Miller, Psychology, Yale University
1966-67	No science seminar
1967-68	Dr. Andrew de Rocco, Theoretical Physics, University of Maryland
1968-69	Dr. I. J. Goode, Statistics, VPI & SU
1969-70	Dr. Peter Trower, Physics, VPI & SU
1970-71	Dr. John Cairns, Biology, VPI & SU
1971-72	Dr. Henry W. Morgan, Physics, Oak Ridge National Laboratory
1972-73	Dr. James Dumont, Biology, Oak Ridge National Laboratory
1973-74	Dr. Robert E. Lyle, Chemistry, UNH (Visiting Prof. at UVA)
1974-75	Dr. Robert Giles, Wildlife and Forestry Dept., VPI & SU
1975-76	Dr. Derek A. Davenport, Professor of Chemistry, Purdue University
1976-77	Anne Maher Matthews, Hollins '68, Division of Public Health, U. Mass.
1977-78	Dr. Henry W. Morgan, Sr. Chemist, Oak Ridge National Laboratory
1978-79	Drs. Beatrice T. and R. Allen Gardner, Professors of Physiology, U. of Nevada
1979-80	Dr. Mary Beth Hatten, Hollins '72, Asst. Professor of Pharmacology, NYU Medical Center
1980-81	Dr. Alan Goren, Chemistry, VPI & SU
1981-82	Dr. Bolling Farmer, Hollins '70, Sr. Software Engineer, E-System, Dallas, TX
1982-83	Dr. Thomas Williams, Ocean View Veterinary Hospital, Pacific Grove, CA
1983-84	David E. Gushee, Chief, Environmental and Natural Resources Policy Division Congressional Research Service and Senior Specialist in Environmental Policy
1985-86	Dr. Dana Vardeman, Lab Supervisor, Stehlin Foundation for Cancer Research, Dr. R. Lowell Wine, Professor Emeritus, Statistics, Hollins University
1986-87	Dr. Michael Gazzaniga, Dept. of Neurology, NY Hospital, Cornell Medical Center, Southwestern
1987-88	Dr. Philip Tucker, Dept. of Microbiology, University of Texas Medical School
1988-89	Dr. Peter Anthony Cawood, Memorial University of Newfoundland "Continental Drift and the Development of the Appalachian Mountains"
1989-90	Dr. Neil Campbell, Biology, University of California at Riverside "Science Education in the 1990's: An Optimistic Forecast"

1990-91	Dr. Doris Schattschneider, Professor of Mathematics, Moravian College Visions of Symmetry: Mathematics in the Art of M.C. Escher"
1991-92	Dr. Derek A. Davenport, Professor of Chemistry, Purdue University "Early Vindication of the Rights of Woman Chemists"
1992-93	Dr. Mary Kay Hemmenway, Dept. of Astronomy, University of Texas-Austin "Results from the Hubble Space Telescope"
1993-94	Dr. Kennan Marsh, Hollins '78, Abbott Labs, Illinois
1994-95	Dr. Elizabeth Brownlee Kolmstetter, Hollins'85, Industrial Psychologist, FBI
1995-96	Dr. Jerry Mohrig, Dept. of Chemistry, Carleton College "Learning and Teaching: What's the Place for Undergraduate Research"
1996-97	Brenda Wilson, Science Editor, National Public Radio
1997-98	Dr. Muriel Lederman, Associate Professor of Biology, Virginia Tech
1998-99	Dr. Jean Chin, MD, Hollins'72, New York, NY "Health Issues of Importance to Young Women (especially STDs)" "Childbirth After Age 35" and "Breast Cancer and Genes"
1999-00	Robert Hansen, Professor Emeritus, Computer Science, Hollins University
2000-01	Dr. Mary D. Ellison, Hollins '76, Dir. of Research, United Network for Organ Sharing
2001-02	Dr. Arlan Mantz, Oakes Ames Professor of Physics, Connecticut College, New London, CT
2002-03	Col. Frank Borman, USAF, Retired "The American Space Program"
2003-04	Dr. David Bressoud, DeWitt Wallace Professor of Mathematics, Macalester College "Proofs and Confirmations: The Story of the Alternating Sign Matrix Conjecture"
2004-05	Dr. Kevin Shinpaugh, Director, Research and Cluster Computing, Virginia Tech "System X: Virginia Tech's SuperComputer"
2005-06	Dr. Bonnie Bowers, Associate Professor of Psychology Dr. Randy Flory, Professor of Psychology, "The Relative Effectiveness of Dim Green Light and Bright White Light for Treating Seasonal Affective Disorder," Dr. Erika Latty, Assistant Professor of Biology, "Comparisons of the Biological Communities in Old-Growth and Previously Logged Forests"
2006-07	Dr. Thomas A. Jenssen, Associate Professor, Department of Biological Sciences, V. Tech "Infanticide in curly-tailed lizards: Selection to avoid eating your young"
2007-08	Dr. Arthur M. Greene, Associate Research Scientist at Columbia University's International Research Institute for Climate and Society, Columbia University "Applied Climate Research at the IRI: Intersection of Climate and Society"
2008-09	Dr. David Mullins, Assistant Professor of Microbiology, Surgery and Human Immune Therapy, University of Virginia "Immune Therapy in the Treatment of Metastatic Melanoma"
2009-10	Dr. Larry Riddle, Professor of Mathematics, Agnes Scott College "Pioneering Women in Mathematics"
2010-11	Dr. Greg Morrisett, Professor of Computer Science, Harvard University, "RoboBees"
2011-12	Dr. David Harrison, Virginia Tech Behavioral Neuroscience Laboratory, "Emotion, the Angry, Hostile and Violent-Prone, A Functional Neural Systems Approach"
2012-13	Dr. Sue A. Tolin, Professor Emerita Virginia Tech, Viruses and Global Food Security"
2013-14	Dr. Kennan Marsh, Director of Experimental Sciences, AbbVie (Abbott Laboratories), "Neglected Tropical Disease Research: a new model for corporate citizenship"
2014-15	Dr. Per Carlson, Royal Institute of Technology, "Alfred Nobel and the Nobel Prizes"

2015-16	Dr. Linda Powers, Biomedical Engineering graduate faculty at the University of Arizona, "Sensors and Diagnostics for Microbial Health Hazards"
2016-17	Dr. Talitha Washington, tenured Associate Professor of Mathematics at Howard University "How Modeling Can Explain Our World"
2017-18	Dr. Michelle Ferebee, NASA Langley Research Center, "Women of NASA: Past, Present, and Future"
2018-19	Dr. Suzanne E. Dorsey, Assistant Secretary, Maryland Department of the Environment, "Touching Sea Turtles: Research collaboration and leadership in conservation"
2019-20	CANCELLED due to COVID-19.
2020-21	Dr. Susan Campbell, Assistant Professor of Animal and Poultry Sciences at Virginia Tech, "Mechanism of Seizure Development: Switching Roles and Gut Feelings"
2021-22	Dr. Holly Gaff, Professor of Biology at Old Dominion University, "Understanding ticks and tick-borne diseases through surveillance and modeling"
2022-23	Dr. Michael Olson, Professor of Social Psychology, University of Tennessee Knoxville "The Science of Bias: Implicit attitude change and impact."

"Science means constantly walking a tightrope between blind faith and curiosity; between expertise and creativity; between bias and openness; between experience and epiphany; between ambition and passion; and between arrogance and conviction – in short, between and old today and a new tomorrow."
— Henrich Rohrer