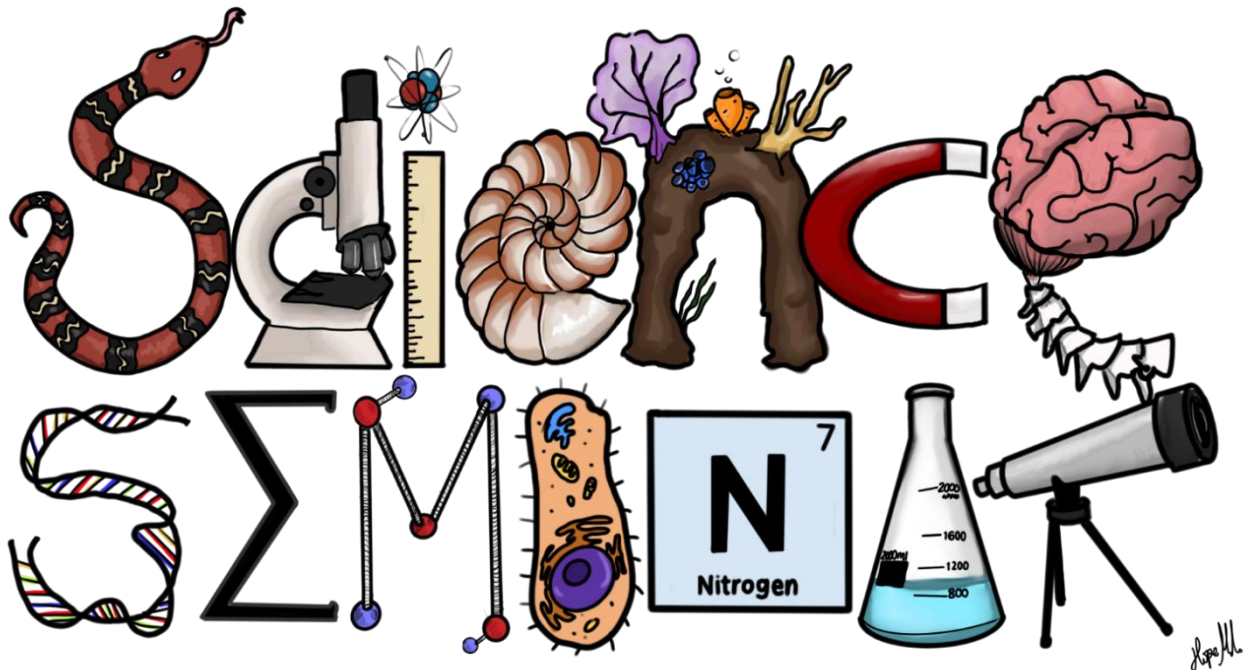


68th Annual

April 24th, 2026

Hollins



in conjunction with

6th annual

SPARC
STUDENT PERFORMANCE &
ACADEMIC RESEARCH CONFERENCE

*“What you do makes a difference,
and you have to decide what kind
of difference you want to make.”*

*— Jane Goodall
Primatologist and
UN Messenger of Peace*

We are delighted to invite you to join us for the 68th Annual Hollins Science Seminar Poster Session held in conjunction with the 6th annual SPARC conference.

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On March 18th, four research students gave oral presentations on their senior theses. These presentations were followed by a Keynote Address from Dr. Daniel Robb, a professor of physics from Roanoke College.

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On the afternoon of April 24th, 34 posters reflecting the scientific and creative work of 51 students will be presented.

WEDNESDAY, March 18th

4:45 p.m.

Student Research Presentations VAC Auditorium

“Optimizing the Distribution of Fruiting Agave on Bat-Friendly Tequila Plantations”

Lois Carpenter, Department of Mathematics

(Under the direction of Dr. Alex Capaldi, James Madison University)

“Gender Differences in Schizophrenia: A Comprehensive Literature Review”

Elizabeth Van Gieson, Department of Psychology

(Under the direction of Dr. Caroline Mann)

“Understanding Neural Avalanches and Entropy in Simulated Brain Networks”

Shania Braithwaite, Department of Physics

(Under the direction of Dr. Jacob Barfield)

“The Impacts of Wing-flashing by Northern Mockingbirds on Foraging, Parental Care, and Reproductive Success”

Anna Starman, Department of Biology

(Under the direction of Dr. Morgan Wilson)

5:15 p.m.

Induction of Students to Sigma Xi

Emily Christine Bryant '28

Lois Jean Carpenter '27

Karli Jae Craighead '26

Su Gursoy '28

Cassidy Fraser Henderson '27

Aerowyn Elisabeth Lacoma '27

Arwyn Sophia Elizabeth Orr Paulk '28

Adiah Joyce Saunders '26

Katherine (Katie) Marie Sheetz '27

Anna Reece Starman '26

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.

Hollins 68th Annual Science Seminar

Keynote Address

Circadian Clocks in Spiders

Presented by: **Dr. Daniel Robb**



Babcock Auditorium
Wednesday, March 18, 7:30pm

Daniel Robb is an associate professor of physics at Roanoke College just down the road from Hollins University. He studied at Williams College for his undergraduate degree and at the University of Texas at Austin for his graduate work. After two postdocs, he worked at Berry College in Georgia for four years, before starting at Roanoke College in 2012. He is interested in thermal and statistical physics as well as biophysics and enjoys word games and singing as hobbies.

Research Recognition Pins

In 2025, the science faculty at Hollins decided to award research recognition pins to all students presenting their research at Science Seminar. It was the wish of the faculty that students be recognized for their work and dedication to learning and uncovering new knowledge. Each year a different pin will be selected representing the work of research students in that academic year, with the hope that there may be some students that will collect four different pins in their time at Hollins.

2025 Student researchers in 2025 were presented with a mole pin and the following statement. *“Moles (family Talpidae) are subterranean creatures, whose lives underground play a vital, and often unseen role in the ecosystem – bringing oxygen and nutrients to root systems which support new sustaining growth above ground. And let’s not forget that the mole (6.022×10^{23}) is a fundamental unit, providing a meticulous accounting of the action of atoms and molecules in chemical reactions. We invite you to wear this mole with pride on your shirt and your graduation robe (when that time comes) to remind you of the meticulous, patient work you have done in your research endeavors and in recognition that such work helps new understanding and knowledge to the world.”*



2026



Student researchers in 2026 were invited to choose a pin from this selection with the accompanying statement. *“These pins were chosen because each highlights the significance of scientific research in a lighthearted way, and honors the contributions of our student researchers to discovery. Please choose the pin that speaks most clearly to you.”*



Research Poster
Session

FRIDAY April 24th

1:00-2:30

Dana Science
Building, 2nd floor

Biology/Environmental Science/Studies

Impact of Human Disturbance on Moth Populations in Ecuador

Gianna Jones, Abbie Miller, Esther Frederickson, Grace Glerum, Sabrina Gubbels-Wingo
Under the Direction of Dr. Renee Godard

Habitat disturbance in the temperate zone has been shown to negatively impact moth biodiversity and population size through a reduction in moth food resources and light pollution. Our study sought to understand how human activity impacts moth population numbers and diversity (# unique taxa) in the tropics. Specifically, we sampled moth population and diversity using light traps on two different nights in a disturbed habitat (Mera township, Ecuador) and on two nights at a nearby ecolodge situated in dense tropical forest. Significantly fewer moths were observed during trapping sessions in the township, and many fewer distinct taxa were noted when compared to samples from the tropical forest. Further, we found that the foggy conditions on our second day of sampling in the tropical forest increased the attractiveness of our trap but did not seem to have the same impact in the township samples. Our study revealed that habitat disturbance and ALAN is detrimental to moth biodiversity and population in the tropics and highlights the often-hidden impacts of human activity on the ecosystem.

Patterns of Moth Diversity in Relationship to Human Disturbance and Forest Type

Gianna Jones, Abbie Miller, Esther Frederickson, Grace Glerum, Sabrina Gubbels-Wingo
Under the Direction of Dr. Renee Godard

Moths play a vital role in the health of tropical ecosystems, acting as important pollinators and food resources for a variety of species. Unfortunately, human habitat disturbance has been associated with declines in moth populations and diversity. To explore the impacts of habitat disturbance on taxonomic diversity in the tropics, we sampled moth populations at two different locations in the Pastaza Province (Mera township and an undisturbed forest at Tamandua Ecolodge). Though small in population (<1000), Mera has light pollution, small-scale agriculture, and habitat loss, which were not present in the dense forest surrounding the ecolodge. We found higher population numbers and moth diversity (at the Family level) in samples from the tropical forest habitat when compared to the township samples. Surprisingly, similar samples in a temperate forest (Botetourt County, Va, USA) with little light pollution had the lowest family-level diversity and population number. This study highlights the importance of moths in tropical ecosystems and suggests that even modest levels of disturbance can have large impacts on moth biodiversity.

Biology/Environmental Science/Studies

The Impacts of Wing-flashing by Northern Mockingbirds on foraging, Parental Care, and Reproductive Success

Anna Starman, Hayley Ponn

Under the Direction of Dr. Morgan Wilson

Foraging efficiency may be enhanced by flashing patches of white wing and tail feathers and has been documented in several avian species. Northern Mockingbirds (*Mimus polyglottos*, NOMO) exhibit this “wing-flashing” (WF) behavior while foraging, during displays, and in response to predators. In NOMOs, WF has been hypothesized to increase foraging success, but previous findings are inconclusive. To further investigate the biological role(s) of WF behavior in NOMOs, the ventral surface of white primary feathers of male NOMOs were artificially darkened and the foraging and provisioning rates of undarkened (control) males and their mates were compared. While foraging, undarkened males performed significantly more prey strikes than darkened males; however, when foraging without WF, prey strike success did not differ between darkened and undarkened males. There was no clear effect of darkening on the provisioning rate of males. Body condition (mass/tarsus³) of experimental nestlings was similar to control nestlings, but experimental nestlings had significantly lower mass and had shorter tarsus lengths compared to control nestlings. Additionally, experimental nestlings fledged significantly later than control nestlings. These findings suggest that artificial darkening of white wing patches of NOMO males may negatively impact the quality of parental care, contributing to lower mass, shorter tarsus, and a longer time to fledge for nestlings.

Foraging Load Size and Activity in Leaf-cutter Ants in Rural and Urban Ecuador

Natalie Tollison and Anna Starman

Under the Direction of Dr. Dr. Renee Godard

Leaf cutter ants are important ecosystem engineers in Neotropical forests, moving a significant amount of nutrients from the forest canopy to the soil. We were interested in understanding how time (day vs. night), weather, and level of human disturbance would impact foraging activity in leaf-cutter ants (*Atta* spp.). To investigate, we sampled activity levels and leaf size along leaf-cutter ant trails in Mera (urban, N=17) and Tamandua (forest, N=27). During the daytime, ants in Mera carried significantly more leaves that were larger in size as well as more total items than did ants in Tamandua. Factors such as the level of anthropocentric disturbance and different surface gradients between urban and rural sites may have impacted the load size carried by leaf-cutter ants. Smoother surface gradients provided by sidewalks may allow for higher load sizes than more complex gradient trails in Tamandua. In Tamandua, average leaf size at night was significantly larger than average leaf size during the day. Understanding factors that impact such a critical group of organisms can provide insight on processes that might sustain tropical forest biomes and biodiversity.

Biology/Environmental Science/Studies

Biodiversity and Diet Patterns: Environmental Impacts on Ecuadorian Birds

Holly Hylton, Fin Bolt, Gracyn Herbst
Under the Direction of Dr. Renee Godard

The current biodiversity crisis is of great concern, particularly to bird species in temperate and tropical areas. We examined avian biodiversity patterns in Ecuador, one of the most bird-biodiverse countries in the world (1650+ species). In January 2026, birds were surveyed (visual and auditory) for 30 minutes on consecutive days in 4 different locations that differed in the degree of human development. As expected, species richness was much higher in undisturbed locations than disturbed locations. In addition, our comparison of dietary patterns between sites showed a much higher proportion of frugivorous and insectivorous species in areas with less human disturbance which is suggestive that these important resources decline with human alteration of habitat. Further, in areas with high levels of frugivory, more “gulper” than “masher” species were detected, which potentially bodes well for seed dispersal, a critical forest ecosystem service. Given the limitations of time and resources, we only noted the presence of species, not population number. We hope that future surveys at these sites will allow us to detect changes in species composition in relationship to future development and climate change.

Patterns & Partners: Ecological Distribution & Space-Use Habits of *Adinobates claudiae* with *Heliconia* spp. in Tropical Rainforests

Mia Benjamin, Moa Lilja, Jenna Parker, & Larson Selvig
Under the Direction of Dr. Daniel Medina, School for Field Studies, Panama.
Coordinated by Dr. Mary Jane Carmichael

Understanding of how small-scale disturbances, such as tree-fall gaps, affect the dynamics between tropical vegetation and the distribution of amphibians, remains a knowledge gap that is key to conservation efforts. Disturbed secondary forests are recognized as sufficient habitats for *Adinobates claudiae* (Claudia’s Poison Frog) to reproduce and distribute offspring to phytotelmata. Several species of neotropical frogs in Central America, including *A. claudiae*, use phytotelmata in heliconia, bromeliads, and dieffenbachias to deposit their tadpoles (Poelman et. al., 2008). Thus, monitoring the distribution of *A. claudiae* in their potential reproductive sites may be influential in predicting the trajectory of ecosystem health and how species might be affected by human disturbances, pathogens, and climate change. Continued research on amphibian species distribution, such as the Smithsonian’s work on endemic species in Panama, is becoming crucial as anthropogenic disturbances easily persuade amphibian populations (Nilipour, L. 2019).

Biology/Environmental Science/Studies

Cuticular strengthening across *Drosophila* species: a conserved mechanism to protect against parasitoid wasps?

Karli Craighead

Under the Direction of Dr. Shaun Davis

The correct recognition and response to environmental threats is critical for organismal survival. In nature, parasitoid wasps pose a significant threat to vinegar flies (*Drosophila* spp.). Female parasitoid wasps oviposit their eggs into fly hosts, and once the offspring hatches, the developing wasp eventually consumes the fly from the inside out. Flies have evolved numerous immunological and behavioral mechanisms to protect themselves, but the study of their possible physiological defense mechanisms have remained largely unexplored. In this study, I assayed various fly hosts for their ability to enhance their cuticle for protection against a wasp attack. A low-cost penetrometer assay was developed to determine the force required to pierce the fly cuticle with a fine metal pin, which mimics the wasp ovipositor. *D. melanogaster* and closely related species showed a trend of enhancing their cuticle stiffness when exposed to wasps. Additionally, flies had a trend of higher survival when given advanced warning of an imminent wasp attack. These data suggest the possibility of a third defensive mechanism flies use to protect themselves, particularly at a vulnerable stage of their life cycle.

A Comparison of TNF- α Expression by Cyanidin-3-O-Lathyroside and Dexamethasone: A Proposed Study

Lillian McDowell, Gabrielle Hedrick

Under the Direction of Dr. Mary Jane Carmichael and Dr. Daniel Derringer

Both during and after cancer treatment, chronic inflammation becomes an issue due to systemic TNF- α production. When a suppressant is given to a patient to combat these issues, the entire NF- κ B response is shut down, leading to a lack of an immune system response. This research proposal puts forward a modification of a recent study on Cyanidin-3-O-lathyroside to see whether or not this substance can improve chronic inflammation treatments, specifically in cancer patients. This study will utilize an in vitro macrophage model using RAW 264.7 cells found in mice. The cells will be induced with Lipopolysaccharide and injected with Cyanidin-3-O-lathyroside. Changes in cytokine levels will be monitored post injection. With this research proposal, finding a minimum effective concentration of Cyanidin-3-O-lathyroside can help optimize doses that are essential to drug development. By studying this compound, we hope to have a better understanding of how these compounds can impact pharmacological research, and enhance drug discovery efforts in treatment of chronic inflammation.

Biology/Environmental Science/Studies

Neurocircuitry in flies: Sight of parasitoid wasps triggers reduced oviposition rates

Katie Sheetz

Under the Direction of Dr. Shaun Davis

Organismal survival requires the correct recognition of environmental threats and alteration of behavioral traits. Parasitoid wasps represent a major threat to flies (*Drosophila melanogaster*) because they inject a single egg inside the body of fly larvae or pupae. Once hatched, the wasp larva eventually eats the fly from the inside out. Though not directly targeted, adult flies recognize this threat and respond by reducing their egg laying rates, presumably to protect their offspring. I performed co-housing experiments in which flies were housed with parasitoid wasps for 24 hours, or kept separate from any wasps, and recorded the number of eggs laid. First, I verified that the oviposition reduction response was induced by wasp exposure. Previous work suggests that flies respond only to the presence of wasps that attack fly larvae and not to those that attack fly pupae, and that wasp movement is the specific sensory cue. Therefore, I recorded and analyzed the locomotion of multiple parasitoid wasp species to characterize the visual stimuli. The larval parasitoids walk slower than pupal parasitoids, suggesting that an upper limit exists in which flies can detect wasp movement. In the fly brain, roughly one third of all neurons are devoted to processing visual stimuli. I hypothesize that there is a distinct visual pathway that is responsive to wasp movement, but its identity remains unknown. A small cluster of visual projection neurons, called lobula columnar 11 (LC11), connect the optic lobes to the central brain and are involved in wasp detection to trigger behavioral changes. To fully characterize the visual pathway, I used a whole-brain connectome dataset to identify candidate neurons positioned upstream of LC11. The GAL4/UAS system was used to target and inhibit medulla neuron (Mi1) functions. Early work, while unable to draw any significant conclusions, does suggest that silencing Mi1 neurons prevents flies from being able to respond to wasps. The long-term goal of this project is to identify the neuronal pathways throughout the fly nervous system that detect and trigger behavioral changes when exposed to dangerous situations.

Biology/Environmental Science/Studies

An Analysis of the Phytochemical Properties and Antimicrobial Activity of *Aloe barbadensis* on *Staphylococcus aureus*, *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa*

Emily Bryant, Arwyn Paulk, Sofia Yanez-Velasquez

Under the Direction of Dr. Mary Jane Carmichael, Dr. Daniel R. Derringer,
& Dr. Molly Weselcouch

The purpose of this study was to investigate the antimicrobial properties of different parts of the aloe plant. Specifically, we examined how aloe gel, latex, and leaves affected the growth of pathogens: *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*. We analyzed the chemical composition of each aloe component using high performance liquid chromatography. Using a disk diffusion assay, the gel, latex, and rind extracts, along with control and standard solutions were tested for their antibacterial efficacy against three ESKAPE pathogens : *S. aureus*, *K. pneumoniae*, and *P. aeruginosa*. The aloe components showed no inhibition of bacterial growth, while the antibiotics used as positive controls were effective. These findings suggest that further investigation of the aloe components is warranted.

The Indoor Mycobiome: Air Quality, Ventilation, and the Potential for Exposure to Fungal Pathogens

Arwyn Paulk

Under the Direction of Dr. Mary Jane Carmichael

Indoor air quality plays a crucial role in human health, specifically within built environments such as college campuses where individuals spend extended periods of time indoors. This study investigates the indoor mycobiome of Hollins University, focusing on how ventilation, moisture, and environmental conditions influence fungal presence and possible exposure. Using surface and air sampling, environmental measurements (temperature, humidity, CO₂), and student surveys, we assess the distribution of fungi across campus spaces and student perceptions of the role of fungi in the environment. This study aims to better understand air quality, fungal exposure, and wellbeing in campus environments.

Biology/Environmental Science/Studies

Bacterial Diversity on Frequently Touched Campus Surfaces: A Proposed Study

Mia Canales Villatoro, Georgette-Charlene Donkoh

Under the Direction of Dr. Mary Jane Carmichael and Dr. Daniel Derringer

Frequently touched surfaces in shared environments can act as reservoirs for diverse bacterial communities, allowing for the transfer of microorganisms between individuals. While many studies have focused on large public and healthcare settings, fewer have examined bacterial diversity on smaller college campuses. This project is designed as a pilot study to examine bacterial diversity on frequently touched surfaces at Hollins University, including door handles, faucets, elevator buttons, and light switches. Using culture-based methods, samples will be collected through sterile swabbing, incubated, and analyzed by counting colony-forming units (CFUs) and observing colony morphology. This study will not identify specific bacterial species but will instead focus on quantifying colony abundance and documenting visible differences in colony characteristics to assess relative diversity. The primary objectives are to compare bacterial communities across surfaces and determine which locations exhibit the greatest bacterial diversity. The results will provide baseline data on bacterial presence in a small campus environment and may help guide future research, improve sanitation efforts, and encourage better hygiene practices among the campus community.

Chemistry

Synthesis and Characterization of Heteroleptic Copper(I) and Silver(I) Complexes with Fluorinated Bipyridine and Phenanthroline Ligands

Emily Bryant, Su Gursoy, Cassidy Henderson

Under the Direction of Dr. Brian Reeves

Organic light emitting diodes (OLED) have shown significant promise as cost effective alternatives to their inorganic counterparts. Within the OLED field, there is currently an effort to replace iridium(III) sensitizers with cheaper and more earth abundant copper(I) and silver(I) alternatives. One issue that needs to be overcome is the pseudo Jahn-Teller distortion in copper(I) complexes, a major quenching pathway. In homoleptic complexes, it has been shown that sterically bulky ligands can be utilized to control Jahn-Teller distortion, resulting in longer emission lifetimes and higher quantum yields. This work aims to use Heteroleptic copper(I) and silver(I) complexes that contain strongly electron-withdrawing and sterically bulky trifluoromethyl groups as a way to tune the fluorescence of the complexes. Preliminary characterization of these compounds was completed with mass spectrometry and single crystal X-ray crystallography (SC-XRD). Heteroleptic structures for several compounds have been confirmed with SC-XRD, while others are still in progress. Additionally, the absorbance and fluorescence properties of the compounds were studied as films and in dichloromethane Solutions.

Synthesis and analysis of precursors to fullerene-functionalized metal chalcogenide nanosheets

Olivia "Ari" Cogswell

Under the Direction of Dr. Brian 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. 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, resulting in a new electron transport material for solar cells. The synthesis of amine and N-boc protected nanosheets as precursors to CdX and ZnX fullerene-functionalized nanosheets is presented here. Preliminary characterization has included FT-IR, UV-visible, fluorescence spectroscopy, scanning electron microscopy, and powder X-ray diffraction. Additionally, their capacity to act as electron acceptors has been shown through fluorescence quenching.

Mathematics/Statistics/Computer Science

Describing SET using an Affine Space

Soledad Ruggiero

Under the Direction of Dr. Tim Magee

This paper will explore the popular card game SET in the lens of Affine spaces, specifically the four-dimensional affine space over the three element field. Once this one-to-one correspondence is created between the deck of cards and the points within this Affine Space, we can identify sets as triples of collinear points. Using this geometric structure, we are able to find the maximum cards needed to find a collectible set.

Understanding the Golden Ratio by using the Fibonacci Sequence and Binet's Formula

Kennedy Cooper

Under the Direction of Dr. Tim Magee

In this paper, I will be explaining the connections between Golden Ratio, the Fibonacci Sequence, and Binet's Formula. Using the quadratic formula and the limit theorem to prove how $\frac{1+\sqrt{5}}{2}$ is not only the Golden Ratio but also the limit of ratio of consecutive terms of the Fibonacci sequence.

Portfolio Optimization: An Operations Research Approach

Allie Boudreaux

Under the Direction of Dr. Giancarlo Schrementi

This thesis applies operations research methods to financial portfolio optimization using rigorous models derived from convex optimization and linear programming. Three models are developed and compared: Minimum Variance, Maximum Sharpe Ratio (Charnes--Cooper transformation), and CVaR Minimization (Rockafellar--Uryasev LP). Each model is implemented in Python using CVXPY and validated against equal-weight and risk-parity benchmarks via `\textbf{walk-forward backtesting}`. A `\textbf{six-week live trading simulation}` on the Alpaca Markets paper trading API tests whether theoretical allocations can be faithfully executed in practice. Central finding: Formal optimization offers measurable advantages over naive diversification under backtesting conditions, while the live trading window reveals meaningful divergence between theoretical allocations and execution.

Mathematics/Statistics/Computer Science

Optimizing the Spatial Distribution of Fruiting Agave on Bat-Friendly Tequila Plantations

Lois Carpenter

Under the Direction of Dr. Alex Capaldi, James Madison University

Coordinated by Dr. Molly Weselcouch

Bat-friendly tequila plantations aim to feed pollinating bats like the Mexican Long-nosed Bat (*Leptonycteris nivalis*) by allowing a portion of their crop to flower at the expense of the final harvest size. We seek to determine if the spatial distribution of flowering agave has any impact on the number of bats a plantation could support, so that farmers interested in preserving nectarivorous bats could do so more efficiently. We created an agent-based model, a type of computer simulation, to study the interaction of *L. nivalis* bats and *Agave tequilana*. The model is informed by phenology and empirical parameters from the literature such as energetics. We compared four different spatial arrangements of flowering agave and determined spatial distribution does impact bat populations, with the most efficient arrangements yielding population estimates consistent with conservationist predictions, validating our model. Finally, the emergent bat carrying capacity of a plantation is directly proportional to the amount of flowering agave meaning that farmers need not worry about diminishing returns from their conservation efforts.

Arrow's Impossibility Theorem and American Idol

Free Fries

Under the Direction of Dr. Molly Weselcouch

This paper explores both the mathematical foundations and real-world applications of voting theory by examining the proof of Arrow's Impossibility Theorem and its relevance to modern systems such as American Idol. The first part of this study provides a detailed explanation of Arrow's Theorem, including the formal definitions of key fairness criteria: Non-dictatorship, Pareto efficiency, Independence of Irrelevant Alternatives (IIA), and unrestricted domain. Building on this, I then apply these concepts to the voting structure used in American Idol, which primarily follows a plurality voting system. By analyzing how audience voting determines winners, the study investigates whether the system satisfies Arrow's fairness criteria and identifies the ways in which it falls short, particularly through violations of independence of irrelevant alternatives.

Physics

Understanding Neural Avalanches and Entropy in Simulated Brain Networks

Shania Braithwaite

Under the Direction of Dr. Jacob Barfield

Cortical neurons fire in cascades called neural avalanches, which follow scale-free patterns typical of systems at a critical point balanced between order and randomness. Using computer simulations, we compare two models of criticality in brain-like networks. The traditional model shows clear patterns only when large groups of neurons are observed. A newer model by Jones et al. (2023) reveals similar structure even in small subsets. To test whether this newer model also supports efficient information flow, we analyzed Shannon entropy across the network. Our results show that entropy peaks near a critical point, supporting the idea that information capacity is maximized at criticality, even in the newer model.

Psychology

How vegetarians are affected by their dietary choices: Cognitive dissonance and plant-based diets

Victoria Alvarado

Under the Direction of Dr. Mary Jane Carmichael and Dr. Daniel Derringer

Using animals (clothes, entertainment, ingredients, services) but stating caring, respecting and loving them is a contradiction that often causes cognitive dissonance. Vegetarians and omnivores who claim caring about non-human animals are a little different from each other since vegetarians abstain from consuming certain (non-human) animals/animal byproducts. However, ultimately vegetarians still behave in a contradictory way not very different from omnivores, are they aware of this? Do they experience cognitive dissonance?

Effectiveness of Target Training Snakes for Easier Snake Enclosure Transfer

Kimberly Zavala, Madalyn Likens, Brianna Oakley

Under the Direction of Dr. Bonnie Bowers

This study examined if snakes can learn to associate a visual target stimulus with food, similar to target training-training methods already used successfully in other reptiles. Although turtles, alligators, and lizards have shown strong learning abilities in previous research, snakes remain understudied in this area. To address this gap, captive kingsnakes (*Lampropeitis elapsoides* and KINGSLEY) and corn snakes (*Pantherophis guttatus*) housed in the Hollins University lab were trained using a green target sphere paired with food rewards. Across multiple training stages, snakes were exposed to repeated pairings of the target and a prey item (*Mus musculus*), followed by trials in which the target was presented alone to test if they would orient toward, approach, make contact with, or follow it. Each snake completed a series of structured trials that gradually increased in difficulty, beginning with simple target food pairings and progressing to target following, exiting the enclosure, and moving between designated stations. Feeding latency, approach behavior, and accuracy of target directed responses were recorded throughout the procedure; behaviors such as tongue flicks, tail rattles, and contact with the stimulus. Preliminary observations suggest that both species showed measurable changes in behavior across sessions, including faster orientation toward the target and more consistent following behavior, indicating that they were forming an association between the stimulus and the food reward. Overall, the findings support the idea that snakes are capable of basic conditioning and can learn to respond to consistent visual cues. These results contribute to the limited research on snake learning and suggest that target based training may help reduce stress and improve husbandry practices in captive settings.

Psychology

Conch Gone? Examining Cultural Preservation through Bahamian Culinary Menus

Adiah Saunders

Under the Direction of Dr. Bonnie Bowers

This study examined how Bahamian cuisine is represented on restaurant menus in Nassau, New Providence amid a dominating tourism industry. Using a stratified random sample of 30 restaurants, 1,155 menu items were coded for cultural origin, cultural language use, promotional features, as well as pricing. The results show that international dishes appear more frequently, regardless of the target audience. However, the proportion of Bahamian dishes did not differ between tourism-oriented and local-oriented restaurants. Cultural language was also strikingly higher for Bahamian items, and their pricing was equivalent to that of the international dishes. Furthermore, Bahamian dishes received slightly more promotional emphasis, which suggests cultural integration rather than commodification. These findings indicate that despite the tourism industry's influence, Bahamian cuisine remains a priority and is protected in both language and presentation, reflecting ongoing efforts toward cultural preservation within a highly globalized food market.

Hang-Hop-Hug: Effects of a Brief Sensorimotor Activity in the Classroom on Emotional State and Balance Among 6-8 Year Olds

Hannah Mae Schmidt, Sadie Henshaw

Under the Direction of Dr. Caroline Mann

The current study examines the impact of a brief body movement exercise on children's emotional state, focus, and motor balance. Previous research demonstrates that physical activity, even in short bursts, can improve selective attention and positively influence emotional regulation (Ma et al., 2014; Tse, 2020). Our study focuses on a kinetic exercise called Hang-Hop-Hug- which lasts about four minutes and can be performed in the classroom without equipment. First and second grade students (N = 18) were randomly assigned to either the intervention group (N = 9) or the control group (N = 9). Both groups completed a balance pre-test, an emotional state scale before and after every session, and a focus assessment on Fridays. The intervention group performed Hang-Hop-Hug on Monday, Wednesday, Friday for 3 weeks. We compared this intervention with a placebo seated activity (drawing) and examined the two groups on variables of motor balance, mood, and focus after the 3-week period. We hope to analyze preliminary data prior to the SPARC Poster Session.

Psychology

Music, Love, and a Little Bit of Sweat

Mila Reynolds-Saint

Under the Direction of Dr. Seung-Hee Han

Music is a strong stimulus with the power to elicit emotional and neurobiological responses. The present study examined whether music influences an individual's perceived passionate love toward their romantic partners. The eligibility criteria required participants to be currently in a romantic relationship. Participants first completed the Passionate Love Scale (PLS; Hatfield & Sprecher, 1986; $\alpha=.91$) and then attended an in-person laboratory session five to seven days later. Participants were randomly assigned to a group. In the control group, participants viewed a photograph of their romantic partner while completing the PLS. In the experimental group, participants viewed a photograph of their partner while listening to Flight of the Bumblebee. Physiological response was measured via Galvanic Skin Response (GSR). Data from 19 participants (Mage= 24.9 yrs, SD= 6.4 yrs; 68.4% women; 42.1% heterosexual; 78.9% never married) were analyzed by using the SPSS program. Results from independent T-tests indicated that music was a significant stimulus for increasing physiological arousal; music group (MGSR= 28.28, SDGSR=12.49) and non-music group (MGSR= 16.86, SDGSR=6.13), $t(17)=2.37$, $p = .03$. There was no significant difference in PLS scores between the music and non-music groups ($t(17)=.61$, $p=.55$). Linear regression analyses revealed that the GSR marginally significantly predicted the PLS for the music group ($\beta=-.45$, $P=.08$), but not for the non-music group ($\beta =.55$, $P=.49$). These findings provide implications that music could aid in potential therapies and overall mental well-being for couples. Further implications will be discussed.

Intentional Personality Constructs of the Dead (IPCD): Perceived Benefits and Creepiness of AI Communication with the Deceased

Allie Mitchem

Under the Direction of Dr. Richard Michalski

Recent technological advancements are discovering new ways for people to use AI to communicate with deceased loved ones. Many companies have created the stepping stones for this new AI industry to emerge. Discourse has emerged about the potential for either helping or harming those who are grieving but no current studies have examined the direct opinion of the general public and their acceptance of this specific AI technology. This study aims to explore this new concept and bridge the gap in current research by examining self-reported characteristics that make people interested in or averse to the use of IPCDs for those who are grieving.

Psychology

Evaluative Feedback's Effect on Intellectual Self-Perception in Individuals with Trait Narcissism Following Task Performance

Camden Staton, Elizabeth Van Gieson, Prabina Tamang, Sasha Wyszynski
Under the Direction of Dr. Bonnie Bowers

The main purpose of this study is to investigate the effect of trait narcissism within an academic context, specifically relating to receiving feedback. Current research has primarily focused on narcissism in relation to social approval rather than evaluative feedback concerning task performance (Chen et al, 2024). Additionally, most research concerning trait narcissism has been conducted on cisgender, heterosexual men, highlighting a gap within the popular literature (Matsuo & DeSouza, 2016). Therefore, this study aims to further our understanding of how trait narcissism can impact academic performance and self-perception, particularly in female participants who have been largely understudied in the current literature. The data for this study was collected using a qualtrics survey through Hollins University. All participants were above the age of 18 and currently enrolled as undergraduate students at Hollins University. After participants completed two subjective tasks, they were randomly assigned one of three predetermined feedback conditions, those being positive ("you performed significantly above average"), neutral ("you performed average"), and negative ("you performed significantly below average"). After receiving feedback, participants then answered the Narcissitic Personality Inventory 13 (NPI-13), a modified version of the Latitudes of Self-Description Questionnaire (LSDQ), as well as our Externalizing Belief scale. Our hypotheses were (1) high levels of trait narcissism will result in higher self-perception in the negative feedback condition, (2) high levels of trait narcissism will result in higher self-perception across all conditions, and (3) high levels of trait narcissism will result in greater externalizing beliefs.

Psychology

Race, SES, and Sense of School Belonging: A Multilevel Analysis of Racial Disparities in Academic Achievement

Bhumika Rai

Under the Direction of Dr. Alex Wooten

“Achievement Gap” has been a highly discussed topic in U.S. socio-political debate as well as in education policy and research. The racial disparity in educational outcomes has primarily been studied with a deficit-based framework that blames the individual instead of the systemic and structural factors that produce them (Shukla et al., 2022; Strunk, 2024). Grounded in Critical Race Theory informed framework, the present study examines the racial disparity in academic achievement and sense of school belonging among U.S. secondary school students. The current study analyzes the U.S. 2018 Programme for International Student Assessment dataset to examine how mathematics, reading and science scores as well as sense of school belonging vary across different racial groups in the United States. The study analyzed the U.S. sample consisting of 4819 students across 164 schools using two-level (school and student) multilevel regression models and found that Socioeconomic Status (SES) was a strong predictor of achievement across all subjects and however the racial disparities remained despite significantly improving the model fit. On the other hand, sense of school belonging had a weak association with achievement and did not significantly improve model fit for all three subjects. While this study uses a nationally representative sample and a multilevel modeling approach to estimate within-school and between-school variation in achievement, the cross-sectional design limits the study in making causal inferences on how school belonging and SES shapes achievement over time.

Self- Silencing & Psychological Distress in Women’s Same-Gender Relationships

Arden Kiely

Under the Direction of Dr. Bonnie Bowers

Interpersonal processes are a known predictor of mental health; however, less is known about how this functions in women’s same-gender romantic relationships. This study examines whether self-silencing mediates the association between unmitigated communion and symptoms of anxiety and depression. Participants aged 18 and older who have been involved in a romantic relationship with a women will complete an online survey using validated measures of interpersonal tendencies and assessments for anxiety and depression. It is hypothesized that greater unmitigated communion will positively correlate with self-silencing as well as greater symptoms of anxiety and depression. The findings of this study may deepen our understanding of how relationship patterns impact mental health in queer populations and inform therapeutic approaches that promote healthy boundaries.

Psychology

Education on Early Menstruation and Self-Esteem

Olivia Olson

Under the Direction of Dr. Seung-Hee Han

Previous research has found that girls are experiencing precocious puberty and menstruating earlier than previous generations due to socioeconomic and environmental factors (Hillard, 2002). Precocious puberty can often be met with lower levels of self-esteem (Brock & Rowse, 2016) which can be due to continued levels of low education on menstruation (Long & Haver, 2022). To examine the relation early menstruation and menstrual education have on self-esteem, a research survey was created. This survey included the Global Self-Esteem Scale (Rosenberg, 1965) and Body Esteem survey (Mendelson & Mendelson, 2001), with responses from 207 participants. Although we found no statistically significant association between the first menstruation age and self-esteem levels, results show that 45% of participants first menstruate “early” or before the age of 11 and that 55% of participants rate their education level on menstruation from school in particular as very low to low. Changes can be made to menstrual education taught at school in a way that media or conversations with family members cannot as easily. Our findings suggest that menstruation education should be improved to meet the needs of children by considering the increasing earlier age of first menstruation.

Marijuana Use, Perceived Social Connection and Bonding Experience in Emerging Adulthood

Aerowyn LaComa

Under the Direction of Dr. Bonnie Bowers

With state specific marijuana legalization, use among emerging adults (18-29 years) has increased. This study aimed at investigating the relationship between marijuana use (MU), perceived social connection (PSCM) and bonding experiences (BEM). Participants (N = 52, M = 21.77, SD = 2.05) completed surveys assess frequency, social connection and bonding. Result showed marijuana use was positive associated with perceived social connection ($r = .359, p = .010$) and bonding experience ($r = .442, p = .001$). Daily users reported higher social connection and bonding than monthly users, suggesting possible identification with cannabis culture. These finding indicate that marijuana use may enhance social and bonding experiences in emerging adulthood, although further research is needed to determine whether these effects reflect genuine connection or if the psychoactive effects of marijuana are contributing to the perceived sense of connection and bonding.

Psychology

Gender Differences in Schizophrenia: A Comprehensive Review

Elizabeth Van Gieson

Under the direction of Dr. Caroline Mann

This review synthesizes research on gender differences in schizophrenia across age of onset, symptom presentation, course of illness, biological mechanisms, substance use, and social functioning. Evidence suggests that men experience earlier onset, worse premorbid functioning, more severe negative symptoms, and poorer social functioning. Women displayed later and bimodal onset patterns, stronger affective symptoms, and better social functioning, with their less severe course of illness associated with estrogen's neuroprotective effects. These gender differences contribute to distinct clinical trajectories and treatment needs. This paper argues for the development of gender-specific interventions, including estrogen-based pharmacological interventions for women, and targeted behavioral therapies for men focusing on social skills, substance use, and treatment adherence. Integrating gender-specific considerations in treatment is essential for improving long-term outcomes and creating effective care.

SPARC

Childbirth in Latin: A Woman's Perspective

Penelope Lutz

Under the Direction of Dr. Katelin McCullough

On the surface, the act of childbirth in Roman antiquity was viewed as a fulfillment of duty. The goal of marriage was the production of children, encouraged by marriage at a young age to best take advantage of female fertile periods. The ultimate achievement in a woman's life was becoming a mother. Ancient sources that mention childbirth are rare, especially outside of a medical context. Although some ancient physicians and medical authors wrote about childbirth and obstetrics, their focus was less on the actual care of women and more on the vitality of the infant. With such high rates of infant mortality, midwives, physicians, and parents prioritized the conditions in which the child was beget, borne, and raised. In addition to interpreting what textual evidence we have of childbirth in antiquity, this project will go a step further to investigate this lacunae about the social position of women, particularly in the state of pregnancy and motherhood. This lack of legitimate information about women, the active laborer in childbirth, reveals the dehumanization and obsolescence implicit in the female role. The aim of this project is to identify the limited mentions of childbirth we can find in Latin literature and dissect what vocabulary exists in those situations. This project looks at both medical texts and non-medical texts.

Information About Habitat for Humanity

Alecia Jenkins, Crystal Moore, Samragyi Karki, and Veronica Feeney

Under the Direction of Wendy-Marie Martin and Brenda Hale

Habitat for Humanity is a non-profit Christian housing organization founded in 1976 in Americus Georgia. Their mission is to bring people together to build homes, communities, and hope. Thriving communities where everyone has the opportunity to live in a sustainable and affordable home. Habitat for Humanity engages over two million volunteers every year. Every contribution helps a family get one step closer to a home. The Collegiate Challenge allows students to spend Spring break working together on a Habitat builds.

SPARC

The Relationship between Economic Productivity and Air Pollution Levels in India (1991 - 2021)

Kanchan Shrestha

Under the Direction of Dr. Felicitas Adu-Acheampong

India's rapid economic growth has been associated with significant environmental degradation, especially air pollution, which poses an alarming risk to the health of Indian Population. While existing literature has explored the link between economic growth, environmental degradation, and their health and economic outcomes, fewer studies are focused on how particulate matter (PM2.5) emissions, one of the most harmful air pollutants are influenced by growing economic activities. This research employs multivariable regression analysis to analyze the relationship between key economic variables: GDP, industrialization, energy consumption, and urbanization, and PM2.5 concentration levels in India from 1991 to 2021. This study aims to determine whether the economic growth has played a role in India's harmful air pollution levels in the span of the past three decades. The findings will provide insights into the trade-offs between development activities and environmental sustainability in fast-paced developing economies. It also informs policy-makers to focus on sustainable strategies that preserves the environment while supporting the country's economic productivity by identifying the contribution of specific economic sectors to air pollution.

The Power of Home Ownership

Jessy Herrera, Ny'Ree Holland, Madison Freideman, Andrea Gomez Munza

Under the Direction of Wendy-Marie Martin and Brenda Hale

Owning a home isn't just about having a place to call your own. Homeownership is when someone and/or family owns a home. Owning a home contributes to the overall wellbeing of individuals. It helps foster a sense of belonging that shapes the world around us. Owning a home can provide stability for your family, roots in your community, and a place to truly call your own. There are many factors that contribute to someone not being able to own a home which include financial barriers, race, education, and employment. By bridging those gaps, homeownership becomes more accessible and improves wellbeing.

*“Science and everyday life cannot
and should not be separated.”*

— Rosalind Franklin
*Chemist and
DNA Pioneer*



Student Biographies 2026

**Listed alphabetically
by last name**



Maria Victoria Alvarado Urgiles is a first-year psychology major (B.S.) minoring in philosophy with a concentration in ethics. Currently considering double majoring in Biology and/or to add a creative writing or Spanish minor. Originally from Guayaquil, Ecuador she got to the United States of America as a high school first-year. With a niche interest yet to discover she is interested on exploring the developmental, cognitive, forensic and animal fields in psychology. Exploring the community and personal interest in Hollins she is currently a member of La Casa, UEL, Mae Jemison, Philosophy Club, Community Garden and The Spinsters holding cabinet positions for some of them.

Mia Benjamin ('26) is double majoring in Environmental Science (B.S.) and Biology (B.A.). During her time at Hollins, she has been an active member of the Sandusky Volunteer Service House, a trip leader for the Hollins Outdoor Program, and a co-captain for the rock climbing team. In the Spring of 2025, she traveled to Bocas del Toro, Panama, where she studied tropical island biodiversity. Additionally in 2025, she interned with the Mill Mountain Zoo's animal department, where she is now a zookeeper. Mia plans to continue a career in animal welfare and conservation after graduating.





Fin Bolt ('27), is majoring in Biology (B.S) with a double minor in Environmental Studies and Psychology. After graduation, they plan on becoming a paramedic and pursuing wildlife rehabilitation; they completed an internship in 2025 with The Wildlife Center of Virginia to get an introduction to the world of wildlife rehabilitation. In January 2026, they joined the group of students studying abroad in Ecuador and primarily studied bird biodiversity. Fin is an active member of the Hollins community, playing on the Hollins varsity volleyball team, acting as secretary for the Student-Athlete Advisory Committee (SAAC), and are an honorary member of the Mae Jemison STEM specialty house.

Allie Boudreaux ('26), is majoring in Mathematics (B.A.) with a minor in Data Science. She is from Breaux Bridge, Louisiana. During her time at Hollins, she had the opportunity to study various portfolio optimization methods in Python, which she subsequently utilized in her honors thesis research. She is excited to present her topic to others.





Shania Braithwaite is a Biology major with a minor in Data Science, with interests in biotechnology and computational biology. Her academic and research experiences have focused on data analysis, laboratory work, and computational approaches to understanding biological systems, along with coursework in programming. These experiences have strengthened her interest in integrating biological and computational methods to address complex scientific questions. She has been admitted to a PhD program in Bioinformatics and Computational Biology and plans to pursue further studies in this field.

Emily Bryant is a sophomore majoring in Chemistry with a concentration in biochemistry. She is passionate about exploring the intersection of chemistry and human health, particularly in relation to drug research and development. At Hollins, she is actively developing her research experience and technical skills through projects focused on the antimicrobial activity of bioactive phenols, as well as materials chemistry, including work with silver and copper-based OLED systems. In the future, she plans to attend medical school and pursue a career as a physician with an interest in pharmaceutical research.





Mia Canales Villatoro ('29), is pursuing a Bachelor of Science in Biology with a minor in Psychology. She is a first-generation Hispanic woman from El Salvador who is passionate about empowering women's voices, particularly in male-dominated fields. Mia developed an interest in neuroscience during high school and is especially interested in biology and cognitive neuroscience. At Hollins, she is a member of the Pre-Med/Vet Science Club and is focused on continuing her academic and professional development in the sciences. She plans to attend medical school and continue working toward becoming a physician following her undergraduate studies.

Lois Carpenter is a Junior Math Major at Hollins University. She loves math modeling and computer programming. She is very excited to share her research on agave arrangements and their impacts on bat population!





Olivia "Ari" Cogswell ('26), is a chemistry major with a biochemistry concentration, with minors in creative writing and mathematics. They're drawn to the sciences by their patterns, versatility, and potential to incite positive change. In their time at Hollins, they've served as a Quantitative Reasoning Tutor and officer in multiple student organizations. They were the recipient of the ACS, Division of Analytical Chemistry, Undergraduate Award in Analytical Chemistry in 2023 as well as the Ella Faith Mode student research award in 2025. As a student with varied interests, she enjoys cross-genre writing, singing in the Hollins choir, and other creative pursuits that bring balance to her time spent in the lab.

Kennedy Cooper ('26), is a double major in Art History and Math. She worked with Dr. Tim Magee to further understand the math behind the Golden Ratio, something that she discovered in art (while studying abroad in Florence, Italy). Her career interest is to be an actuary and to also work as a financial manager for a gallery. She interned at Reynolds Gallery where she was able to combine math and art history daily.





Karli Craighead ('26), is a Biology (B.A.) and Environmental Science (B.S.) double major at Hollins University. Under the guidance of professor Shaun Davis, Karli has conducted research focusing on the physiological defensive mechanisms of fruit flies in response to parasitoid wasp attack. Karli has recently been inducted into Sigma Xi, the scientific research honor society. Following graduation, she will be seeking further research opportunities and hopes to continue her education pursuing a PhD in Entomology.

Georgette-Charlene Donkoh ('29), is an Environmental Science (B.S.) and Public Health (B.A.) double major. She is originally from Cape Coast, Ghana, and has been living in Virginia since 2014. At Hollins, she is a member of S.H.A.R.E., the campus community service organization, and the Hollins Activity Board, where she serves on the Traditions Committee. Her presentation is a proposed pilot research project examining bacterial diversity on frequently touched surfaces across Hollins University using culture-based methods. Her academic interests focus on environmental health and disease prevention, and she plans to pursue a Master of Public Health after Hollins with the goal of becoming an epidemiologist.



Esther Frederickson ('28), is double majoring in Biology and Environmental Science. She has a passion for animals of all kinds, and is currently obsessed with finding all the millipedes in the Roanoke/Botetourt area. She spent her J-Term conducting research in Ecuador, with Dr. Renee Godard and other students. After graduation, she plans to pursue a career in wildlife conservation.



Free Fries ('26), is majoring in Mathematics (B.S.) with a concentration in Data Science. While at Hollins, she serves as the senator of the Mae Jemison specialty house and is an active member of the Hollins Chamber choir. Following graduation, she plans on pursuing a career as a data analyst, using her skills in math and data science to interpret complex datasets and support informed decision making.



Grace Glerum ('27), is a double major in Biology (BS) and Studio Art. During her time at Hollins, she has expanded her worldview through her majors, her participation on the soccer team, and as the 25-26 President of Carvin Global Village. Her passion for learning about the world around her, and expressing that through scientific and artistic means has revealed countless opportunities during her time here at Hollins. Whether that be here in the United States, or abroad in places such as Europe and South America, Grace is interested in further exploring ways that science and art can be combined in a professional manner, creating a harmony through an interdisciplinary foci.

Andrea Gomez Munza is pursuing a Bachelor of Arts in Studio Art at Hollins University. Over her years at Hollins, her works have been shown in Downtown Roanoke as well as at Hollins University. She explores ways to push a photograph to be more than its initial intention. She seeks to document her environment, and her Latino community!



Sabrina Gubbels-Wingo is an Environmental Studies and Political Science double-major. As a part of the Hollins 2026 research trip to Ecuador they explored their passion for insects by studying moths. In their free time they like to find weevils to fawn over and read.



Su Gursoy ('28), is majoring in Chemistry (with Biochemistry concentration) and Biology on pre-medicine track. During her time at Hollins, she has participated at NSF Artemis Research and Hollins SURF program. She was recipient of CRC Press Chemistry Achievement Award and Judith Gregory Smith Award as well as recipient of Outstanding Research Award at Ferrum College. Her passion for medical field started at a very young age, when she was in elementary school, and has deepened with each step of her educational journey. Further, she is a member of the Sigma Xi Scientific Research Honor Society here at Hollins and is excited to continue improve her laboratory skills while involving in research as well as enhance her knowledge in the medical field. After Hollins, she would like to continue her education at a medical school to become a physician.

Gabby Hedrick ('29), is a Biology major with a passion for healthcare and a goal to pursue a career in medicine. Her interest for healthcare sparked when she was 9 years old and has continued to grow through her academic and extracurricular experiences. She is an Artemis Scholar, and she had the opportunity to take the Research Design and Methods J-term course where she was able to work on a research proposal with Lillian McDowell. At Hollins, her passion for science has only grown, and she has built meaningful connections with peers and faculty who support her goals. She wants to grow her learning by taking internships and study abroad opportunities here at Hollins.



Cassidy Henderson ('27), is majoring in chemistry (B.S.) with a concentration in biochemistry and minoring in psychology and biology. While at Hollins, Cassidy is a member of the Sigma Xi honor society, a Hollins volleyball player, and president-elect for Hollins' Student-Athlete Advisory Committee. Her academic interests include pharmaceutical biochemistry, molecular biology, and human physiology. Cassidy recently completed an undergraduate research program with Fralin Biomedical Research Institute with a focus on neuroscience, and is excited to be continuing research with Hollins University this summer in inorganic chemistry. Cassidy plans to pursue an MD/PhD after graduation with the aspiration to complete research that will bring innovation to the medical field.

Sadie Henshaw ('28), is majoring in Biology (B.S.) and minoring in Mathematics on the Pre-Med track. During her time at Hollins, she has been an active member of the Riding Team and the tennis team, served as Student Conduct Chair, and worked as a campus tour guide and Reunion Student Worker. She is deeply passionate about working with women and children as a doctor, focusing on treating patients with compassion and respect. Next J-Term, she will be studying abroad in Greece, learning about the intersection of environmental science and culture. After Hollins, she plans to attend medical school to pursue a career as an OB-GYN.



Jessy Herrera is a sophomore at Hollins University pursuing a double major in International Studies and Business, along with a BLI certification on the pre-law track. During her time at Hollins, she has been committed to engaging with both academic and service oriented opportunities that broaden her understanding of global and local communities. For the second time, she participated in a Habitat for Humanity spring break service trip, where she worked alongside a dedicated community focused on building not only homes but also meaningful connections. This experience allowed her to develop practical skills while learning the importance of compassion, collaboration, and service to others. Through these experiences, she continues to cultivate a strong interest in community engagement and advocacy, which she hopes to carry forward into her future career.

Ny'Ree Holland is a senior pursuing a bachelor of science in Biology. Her minor is public health. She is interested in maternal health/ Women's health. On campus she's been involved in quite a few things such as the Hollins Activity Board, she's a resident assistant, pre-med/pre-vet club and so much more. After graduation she plans to pursue a master's degree in biomedical sciences and then eventually go to medical school.



Holly Hylton ('26), is majoring in Environmental Science (B.S.) from Buchanan, Virginia. During her time at Hollins, she has developed a passion for the outdoors, inspired by family road trips across the U.S. with the goal of visiting National Parks. For J-Term 2026 she traveled to Ecuador with several other students and Professor Renee Godard where she worked on bird biodiversity. Hylton hopes to continue her career path in conservation, fieldwork, and conservation management.

Alecia Jenkins is pursuing a communications degree (B.A) and a Batten Leadership Institute (BLI) certificate. Additionally, she is very active on campus, she is the Kpop+ club dance chair, a member of the Carvin House and Sandusky House, she is a part of HAB's formal committee and she is on the rock climbing team. Recently, during spring break she embarked on a service project with Habitat for Humanity along with her fellow Hollins peers. Together they built houses and sets for big donation events with Habitat for Humanity and another fellow college. Together they learned the importance of teamwork, construction skills, communication and much more. After college she plans on becoming an event planner and eventually pursuing more jobs in the entertainment/movie industry.





Gianna Jones is a biology major (B.S) hoping to pursue a career in species conservation post-grad. She spent her 2026 J-Term in Ecuador with Dr. Renee Godard and other students learning about the country and performing research on moth biodiversity. While at Hollins, she has served as a member of the Hollins Activity Board (HAB) and as a Hollins Community Connector (HCC).

Samragyi Karki ('26), is majoring in Applied Economics with a minor in Mathematics at Hollins University. During her time at Hollins, she has worked as a Resident Assistant and as the President of ACCENT club, helping foster inclusive community spaces on campus. Samragyi has also gained professional experience through internships with organizations such as the Nepal Economic Forum where she contributed to economic research, policy briefs, and social media outreach. After graduating in May 2026, she plans to go to grad school to continue exploring interdisciplinary interests and their impact on society.



Arden Kiely ('27), is a Psychology (B.S.) major with the ambition of becoming a clinical psychologist. She is actively involved on campus as a Resident Assistant, as the president of the pottery club, Mud Geeks, and as the SGA vice president. This year marks her second time presenting her work at the Science Seminar, SPARC, and VAPs. She is deeply passionate about exploring the intersection of biology, psychology, and human behavior. After graduation, Arden plans to attend a PhD program in clinical psychology and one day operating her own private practice.

Aerowyn LaComa ('26), is a Psychology major (B.S.) at Hollins University and a 2024 graduate of Virginia Western Community College. Through her internship at Blue Ridge Behavioral Healthcare and her work as a Crisis Text Line volunteer, she has developed a strong interest in crisis intervention and trauma-informed care. She is also involved in research related to substance use at the U.S. Department of Veterans Affairs and the Fralin Biomedical Research Institute Addiction Recovery and Research Lab. After graduation, she plans to pursue a Ph.D in Clinical Psychology with the goal of becoming a clinician and researcher focused on addiction in emerging adults, as well as crisis work, psychological assessments and diagnosis.



Madalyn Likens is a Psychology Major and Gender and Women's Study Major, History Minor

Penelope Lutz is a junior majoring in Classics and Public Health with a minor in History. She is interested in ancient medicine, specifically the fields of obstetrics, gynecology, and pediatrics.





Lillian McDowell ('29), is a biology major at Hollins University. With a passion for the medical field, she looks forward to furthering her knowledge of oncology research. This passion stems from seeing devastation in children and a desire to help. Upon graduating Hollins she plans to attend a medical graduate degree program and eventually set down roots and practice in the south.

Abbie Miller ('28), is sophomore majoring in Chemistry and minoring in Theatre. Their academic interests lie in applications of Chemistry in other branches of science. Her recent experience includes study abroad trip to Ecuador where they worked with a group of peers on research regarding moth biodiversity in the neo-tropics. When not in Dana, she has enjoyed being Treasurer for the Hollins Student Theatre Association (HSTA) and a work-study employee in the Theatre Department.



Allie Mitchem is a senior obtaining her Bachelor of Science in Psychology with a minor in Biology. She hopes to pursue a doctorate degree in counseling with a concentration in ecopsychology. She plans to create my own private practice and help people with their mental health.

Bri Oakley is a Junior at Hollins. She is majoring in Psychology and minoring in Creative Writing. She plans to go to graduate school after graduating Hollins to study forensic psychology.



Olivia Olson ('26), is a Clinical Psychology Major (B.A) She is engaged in campus life as the SGA treasurer and as a lead resident assistant. Olivia began conducting research in the child development lab with Dr.Han during her sophomore year. This year marks her third time presenting her work at the Science Seminar and VAPs. Following graduation from Hollins, Olivia is attending Radford University for a MS in clinical mental health counseling. Her long-term goal is becoming a child psychologist and opening her own private practice.

Arwyn Paulk ('28), is an Environmental Science (B.S.) major from Gatlinburg, Tennessee. Arwyn's interest in Environmental Science stems from her grandfather's work as a ranger for the Great Smoky Mountains National Park Service. She is a member of Sigma Xi Honor Society and the Hollins University swim team. This summer, she will be working with a non-profit organization based in Newport, Tennessee, Clean Water Expected in East Tennessee (CWEET). In addition, she will be shadowing a member of Ripley's Aquarium of the Smokies to gain experience in the field of marine biology.





Hayley Ponn is a junior Environmental Science major from Warrenton, Virginia. She is on the soccer team and enjoys spending her time running, reading, and hanging out with friends. She is currently studying abroad in southern Chile with SFS! For her directed research, she is studying the flora and fauna of the Patagonian steppe with the goal of creating a trail audio guide for Pali Aike National Park which is located on the border of Chile and Argentina.

Bhumika Rai ('26), is a Psychology (B.S.) major with minors in Data Science and Film. With deep interests in applying psychology in social justice contexts, Bhumika has participated in various research opportunities during their undergraduate career. Bhumika started their research journey with a J-Term internship at American Institutes for Research as an Education Statistics Research Assistant Intern and was invited to return for the summer internship program. During summer 2024, Bhumika completed Hollins SURF program researching Cross-Race Effect in eyewitness identification under the supervision of Dr. Alex Wooten. Most recently, Bhumika was one of thirteen QUEST Scholars at the NYU Steinhardt Applied Psychology program, where they investigated the educational experiences of juveniles in detention. Post-graduation, Bhumika plans to gain further research experience prior to pursuing a graduate degree.





Mila Reynolds-Saint is a senior majoring in Psychology (B.S.) and minoring in international business. Their plans for after graduation are to get their master's degree in industrial psychology at Radford University.

Soledad Ruggiero ('26), is majoring in Math (B.S). She is from El Paso, Texas. While at Hollins, she has participated in the STEM specialty house Mae Jemison and served as Co-President of NEFA. She has also worked as a QL tutor since her sophomore year. Her research throughout her college career has focused on the card game SET and its applications across various disciplines of math.



Adiah Joyce Saunders ('26), is a pre-med Psychology (B.S.) major. Her first introduction to research was during her sophomore year, when she studied abroad in The Bahamas during J-term for her research. On the island of New Providence, she found a passion for exploring relations of residents with tourists. She is a recent Phi Beta Kappa and Sigma Xi Honor Society member and aims to continue research in the future. In her free time she enjoys a variety of extracurriculars, especially arts and crafts. In the future, she hopes to complete an M.D./Ph.D. program in order to continue to engage in psychological research as a licensed psychiatrist.



Hannah Mae Schmidt ('28), is majoring in Psychology with a Concentration in Clinical and Counseling Skills. At Hollins, she is an active member of the Hollins Riding Team, competing in the Novice division at the IHSA level. She is passionate about working with children and has spent the last 6 summers working as a counselor at YMCA Camp Cheerio, as well as working as a nanny during the school year. After graduation, she hopes to continue her studies in graduate school where she will learn to become a pediatric Occupational Therapist working in the school system. Her goal is to use therapeutic play to help children feel their best while doing the things they love both in and out of the classroom.



Katie Sheetz ('27), is a Biology (B.S.) major with a passion for the healthcare field and disability advocacy. She plans to attend medical school after graduating to become a chronic care physician, inspired by her lived experience. Katie is an active member of the Hollins community as the SGA Student Accessibility Chair, a role she established and will continue to hold next year. Beyond her advocacy on campus, she recently joined the State Council of Higher Education for Virginia's Disabilities Access to Higher Education Advisory Committee to advocate for students across Virginia. Katie hopes to emulate what it means to be a patient scientist, paving the way for patient-focused and research-informed care, while showing that her disability is not a defining quality but a motivator to create needed change.

Kanchan Shrestha ('27), is majoring in Applied Economics with minor in Mathematics. She is interested in researching about socio-economic issues in the developing countries, like wealth inequality and gender disparities in labor force participation. She currently serves as a Resident Assistant and Treasurer of APISA and International Students Association, where she is actively involved in fostering inclusive student experiences. During her time at Hollins, she has interned at the Economic Club of New York and Rappahannock Electric Cooperative, gaining exposure to the application of economic concepts in real-world problems. After graduation, she plans to pursue graduate studies in International and Development Economics.



Anna Starman is a 4th-year Environmental Science major at Hollins University. She is on the Hollins soccer and tennis team and enjoys painting and hiking in her free time. Post graduation, she plans to hike the Appalachian Trail before attending graduate school.



Prabina Waiba Tamang is an undergraduate psychology student at Hollins University. Her academic interests focus on mental health, emotional well-being, and counselling. She is particularly interested in understanding how psychological support can help individuals navigate challenges and improve their quality of life. After graduation, Prabina plans to pursue a master's degree in mental health counselling and eventually start her own private practice.

Natalie Tollison ('27), is a biology (B.S) and public health (B.A) double major. During J-term 2026, she studied abroad in Ecuador, and under the direction of Dr. Renee Godard performed research on leaf cutter ants. During her time at Hollins she has been a member of the Valley Chamber Orchestra and has served as a Student Success Leader (SSL) for transfer students. Following graduation she hopes to pursue a career in conservation biology and wildlife disease.



Kimberly Zavala is a senior majoring in Psychology with a minor in Public Health. Her future plans are to go to Physician Assistant school and become a pediatrician or work in Labor and Delivery (L&D).



Camden Staton (left) is a psychology student at Hollins University and a research assistant in the Applied Memory and Cognition Lab. She will begin a PhD in experimental psychology at East Texas A&M University in Fall 2026, joining the Carlson CriMe Lab to study eyewitness memory and decision-making.

Pralina Waiba Tamang (second from left, see bio on previous page)

Sasha Wyszynski (right) is an undergraduate student pursuing a B.S. in psychology and recently joined the Evolutionary Psychology Lab as a research assistant. Her academic interests include behavioral psychology, evolutionary psychology, psychology in law, and brain function. After graduating, she plans to pursue a PhD in psychology to become a psychological researcher. Outside academia, Sasha enjoys creating art, listening to music, and baking.

Elizabeth Van Gieson ('27, second from right) is an undergraduate student pursuing a B.A. in psychology with a clinical and counseling concentration and communications studies. She has been a research assistant in the Applied Memory and Cognition Lab since September 2024 and will be participating in the Virginia Tech NeuroSURF research program this upcoming summer. Additionally, she is a member of both Psi Chi and Omnicron Delta Kappa Honor Society. Her academic interests are focused on social cognition in psychiatric disorders, with a particular interest in schizophrenia spectrum disorders. She hopes to pursue a PhD in clinical psychology after her time at Hollins. Outside of academia, Elizabeth enjoys teaching colorguard, playing music, and spending time with her friends.

A 68 Year Legacy
Science Seminar Speakers
(1957-2025)

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."
2023-24	Dr. Alex Capaldi, Professor of Mathematics, James Madison University, "'Survival of the Friendliest' Necessitates 'Survival of the Sexiest' in the Evolution of Domestic Dogs"
2024-25	Dr. Brycelyn M. Boardman, Professor of Chemistry, James Madison University, "From Polyolefins to Biopolymers: A Research Journey Toward Sustainable Materials"
2025-26	Dr. Daniel Robb, Professor of Physics, Roanoke College, "Circadian Clocks in Spiders"

“Look up at the stars and not down at your feet. Try to make sense of what you see”

*— Stephen Hawking
Theoretical Physicist,
Cosmologist,
and Author*