



69th Annual Meeting
October 17th- 18th, 2025
Hosted by



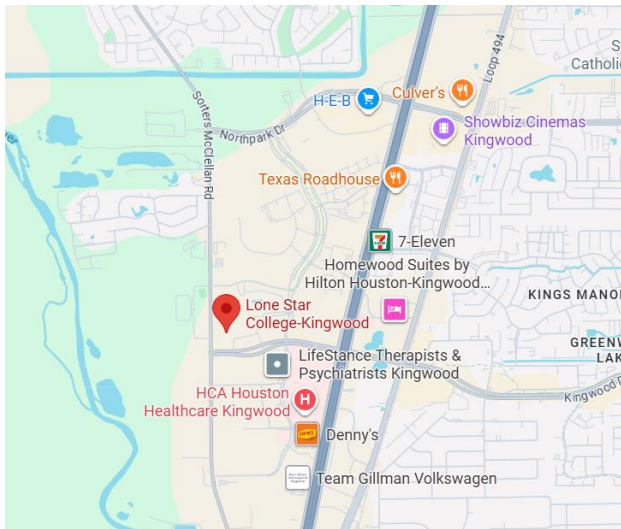
Lone Star College – Kingwood
Kingwood, TX

The conference will take place in:
Lone Star College – Kingwood Student Conference Center
20000 Kingwood Drive, Kingwood, TX 77339
<https://www.lonestar.edu/kingwood.htm>



Driving Directions

If you are traveling on **I-69 / US-59** in the Houston/Kingwood area the exit for Kingwood Drive is Exit 152 on I-69 / US-59. The college is on the West side of the Highway. The Student Conference Center (SCC) building is on the South end of the campus.

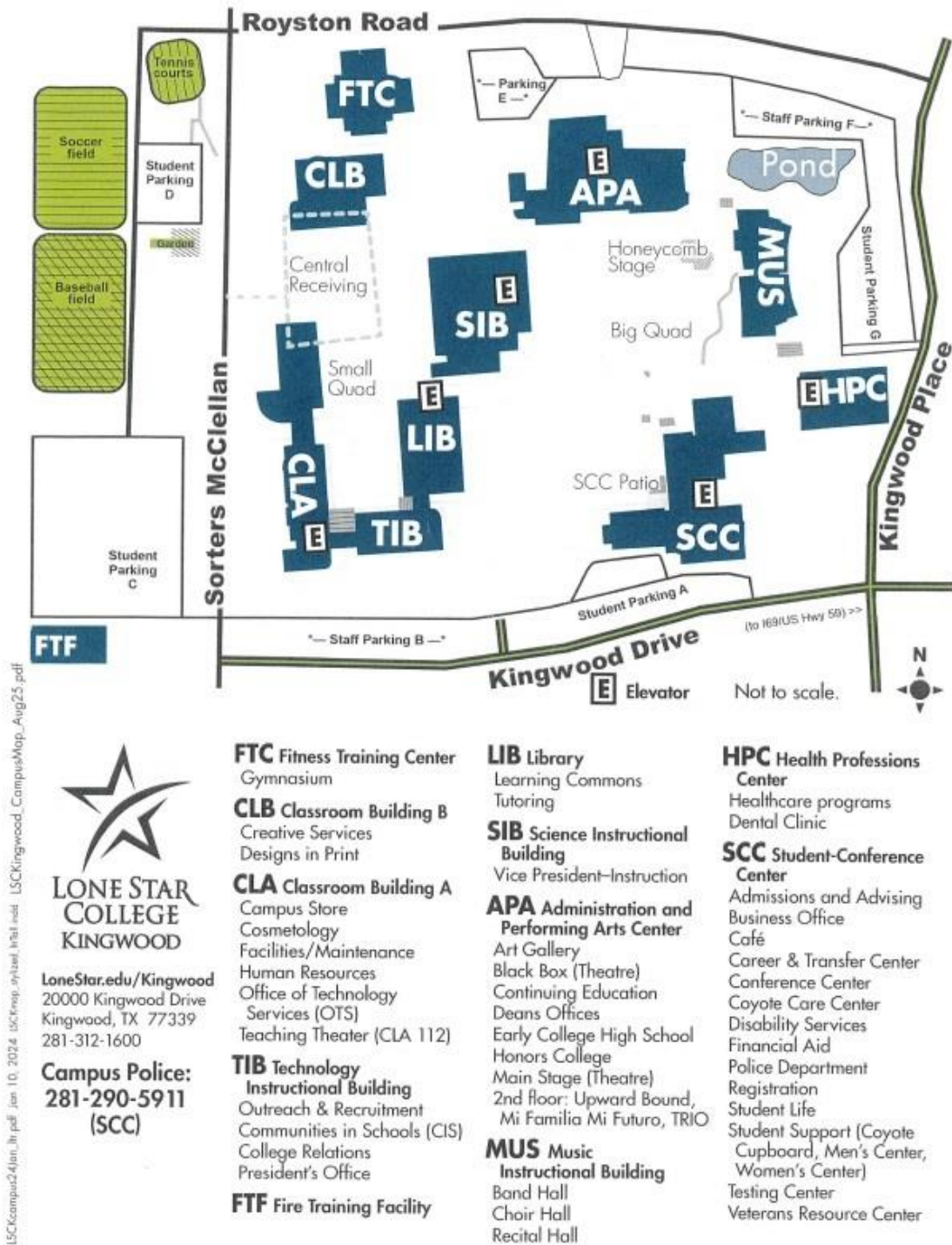


Lone Star College – Kingwood is about 12 miles from George Bush Houston Intercontinental Airport (IAH).



IAH website: <https://www.fly2houston.com/iah/>

Campus Map



Parking: All campus parking is free in student parking spots (do not park in Staff/Faculty parking spaces). Each lot has accessibility parking. Parking lots A, B, and C are closest to the SCC and SIB buildings. All sessions and functions take place in the SCC and SIB Buildings.

Important information

Hotel Locations

Extended Stay America - Kingwood

291 Kingwood Medical Dr, Kingwood, TX 77339

(281) 713-8989

0.8 mile walk from college on the same side of the highway

9-minute drive

Denny's restaurant nearby

Baymont by Wyndham - Kingwood

22601 US-59, Kingwood, TX 77339

(832) 412-4197

1.3 mile walk from college on the same side of the highway

8-minute drive

Denny's restaurant nearby

LaQuinta Inn & Suites – Kingwood, IAH Airport

22790 Hwy 59 N, Kingwood, TX 77339

(281) 359-6611

0.9 mile walk from college must cross the intersection under the highway

6-minute drive

Homewood Suites - Kingwood Parc-Airport Area

23320 US-59, Kingwood, TX 77339

(281) 358-5566

0.9 mile walk from college must cross the intersection under the highway

6-minute drive

Short walk to a strip mall with restaurants

Wi-Fi Access

Campus visitors can use Lone Star College Guest Wi-Fi to access the internet.

- Select Lone Star College Visitor from your device's Wi-Fi settings
- IT Service Desk help at 281.318.4357

Emergency Contacts

Lone Star College System Emergency

Response

281.290.5911

Harris and Montgomery County

Emergency Response

911

Lone Star College System Non-Emergency

Response

832.813.6800

City of Houston Non-Emergency Response

311

Lone Star College System Main Number

832.813.6500

Registry for Special Needs Emergency

Services 21

Thank You

Lone Star College – Kingwood

On behalf of the ACUBE 2025 Annual Meeting Local Arrangements Chair and Program Chair, I extend my deepest gratitude to the dedicated staff and administrators of Lone Star College - Kingwood. Your exceptional support, attention to detail, and warm hospitality played a crucial role in ensuring the success of this year's meeting. From coordinating venue logistics to providing on-site assistance, your team's professionalism and commitment created a welcoming and seamless experience for all participants. We are truly grateful for your partnership and the spirit of collaboration that helped make this event possible.

Thank You to 3D Molecular Designs

We extend our sincere gratitude to 3D Molecular Designs for their generous contribution of welcome packets featuring the 3D-printed, AR-enhanced Coronavirus Model. This innovative educational resource enriches our participants' learning experience by transforming complex scientific concepts into accessible and engaging tools. We deeply appreciate your support and commitment to advancing science education. <https://3dmoleculardesigns.com/>



Native Americans Attribution

For millennia this area was used and stewarded by the Akokisa who were recorded in historic documents as Orcoquiza/Arkokisa and variant spellings. The Akokisa maintained seasonal villages and traveled the waterways of Galveston Bay, the Trinity River and nearby creeks, including Spring Creek and the present Humble/Kingwood area, for fishing, hunting, and shelter; European contact, disease, and settlement led to the dramatic disruption and dispersal of their communities by the early 1800s. We honor their lives, histories, and enduring legacy on these lands. The Akokisa were an Atakapan-associated coastal people historically documented around Galveston Bay and along the lower Trinity and Sabine rivers. Historic sources describe multiple village groups in the greater Houston area in the 1700s, use of dugout canoes on creeks and bayous, and contact with French and Spanish traders and missionaries in the 18th century. By the 19th century many Akokisa communities had been reduced or absorbed as a result of disease, missionization, and settler expansion. Local historical markers and archaeological work identify Akokisa presence in Harris County near waterways that flow through today's Humble/Kingwood area.

Schedule at a Glance

Friday October 17 2025			
Time	Event		
11:00 am – 12:30 pm	Registration – SCC Lobby		
12:30 pm - 1:20 pm	Welcome Session – SCC 104-106		
1:30 pm – 4:45 pm	Strand 1 Sessions - SIB		Strand 2 Sessions - SIB
4:00 pm – 4:45 pm	Trail Walk Meet - SIB hallway	Learning Garden Tour -SIB hallway	Mindfulness tables SCC 104-106
5:00 pm - 5:50 pm	Poster Session – SCC 104 - 106		
6:00 pm -6:50 pm	Dinner – SCC 108-109 Student Jazz Ensemble		
7:00 pm - 8:00 pm	Awards and Announcements - SCC 108 - 109		
8:30 pm -?	Moth Night SCC		
Saturday October 18 2025			
Time	Event		
8:00 am - 8:50 am	Student Mixer Breakfast - SCC 108-109		
9:00 am - 9:50 am	Opening Remarks 104-106		
10:00 am -11:00 am	Keynote Speaker - SCC 104-106		
11:10 am-11:50 am	Strand 3 Sessions - SIB		Strand 4 Sessions - SIB
12:00 pm – 12:50 pm	Lunch - SCC 108-109		
1:00 pm – 4.25 pm	Strand 3 Sessions - SIB		Strand 4 Sessions - SIB
4:40 pm – 5:00 pm	Conference Conclusion – SCC 104 - 106		



Our Mission

Members of ACUBE share ideas and address the unique challenges of balancing teaching, research, advising, administration, and service. We are a supporting and mentoring community that provides professional development opportunities to:

- Develop and recognize excellence in teaching
- Incubate new and innovative teaching ideas
- Involve student research in the biology curriculum
- Advise and mentor students in and out of the classroom
- Enhance scholarship through our national, peer-reviewed journal, *Bioscene*.

Governance

President, Ashley Driver, University of Scranton

Past President, Melissa Haswell, Delta College

President Elect, J.T. Cornelius, Indiana University School of Medicine

Executive Secretary of Finance, Greg Smith, Lakeland University

Executive Secretary, Nourin Amin, Ball State University

Membership Secretary, Gigi Makky, Marquette University

Website Editor, Tara Prestholdt, University of Portland

Historian Jason Wiles, Syracuse University

Social Media Chair, Takunda Maisva, Syracuse University

Editor of Bioscene, Robert Yost, Indiana University Purdue University

Steering Committee

Brooke Greiner, Medical College of Wisconsin

Celina Bellanceau, University of Tampa

Cassandra Korte, Lynn University

Luciana Caporaletti, Penn State Wilkes-Barre

Local Arrangements Chair and Program Chair Brian R. Shmaefsky, Lone Star College - Kingwood

Keynote Speaker
Dr. Elizabeth A. Norell
The University of Mississippi
Associate Director of Instructional Support



Biography

Dr. Elizabeth A. Norell is an educator, author, and advocate for inclusive and authentic teaching practices in higher education. She currently serves as the Associate Director of Instructional Support at the University of Mississippi's Center for Excellence in Teaching and Learning (CETL). In this position, she collaborates with faculty to design, execute, and publish Scholarship of Teaching and Learning (SoTL) projects, supports assessment activities, and serves as a liaison for social sciences and applied sciences departments.

Dr. Norell's academic journey includes a Ph.D. in political science from the University of Texas at Dallas, as well as master's degrees in journalism from the University of Arkansas and library science from Texas Woman's University. Over the past two decades, she has taught a diverse array of subjects, including composition, journalism, new media, political science, and statistics, at various institutions, including a tenure-track position at Chattanooga State Community College.

Keynote Address:

Authenticity and Transformational Teaching

In December 2024, Dr. Norell published her first book, "The Present Professor: Authenticity and Transformational Teaching", through the University of Oklahoma Press. The book explores how educators can foster meaningful student relationships by embracing authenticity and presence in the classroom, offering strategies to improve mental clarity and teaching effectiveness. Dr. Norell will be discussing how to practice the philosophy of her book in this session.

Dinner Music Entertainment in the SCC



Recital Hall – Music Building

The music department at Lone Star College - kingwood offers a dynamic and supportive environment for students pursuing their passion for music. With dedicated faculty, state-of-the-art facilities, and a variety of performance opportunities, the department provides a strong foundation in music theory, performance, and education. Students can develop their skills through ensembles, private instruction, and academic coursework, preparing them for transfer to four-year programs or careers in the music industry.

The music department at Lone Star College – Kingwood has earned recognition for its outstanding student performances, faculty expertise, and strong community engagement. Students and ensembles from the program have received top ratings at regional and state competitions, and many graduates successfully transfer to prestigious university music programs. The department regularly hosts concerts, festivals, and collaborative events that showcase student talent and enrich the local arts community. Faculty members are accomplished performers and educators who bring professional experience to the classroom, helping students achieve high levels of artistic and academic excellence.

The music department at Lone Star College–Kingwood hosts a variety of concerts each year that highlight the talents of students, faculty, and guest artists. Examples include:

- Student Recitals – Solo and small ensemble performances that showcase developing musicians.
- Choral Concerts – Featuring campus choirs performing classical, contemporary, and multicultural works.
- Instrumental Ensemble Performances – Concert band and chamber groups presenting a range of styles from traditional to modern.
- Jazz and Popular Music Nights – High-energy events spotlighting jazz combos and modern music ensembles.
- Faculty and Guest Artist Concerts – Professional performances that provide students and the community with rich cultural experiences.

These concerts are open to the public and help build a strong connection between the college and the surrounding community.

Field Experiences

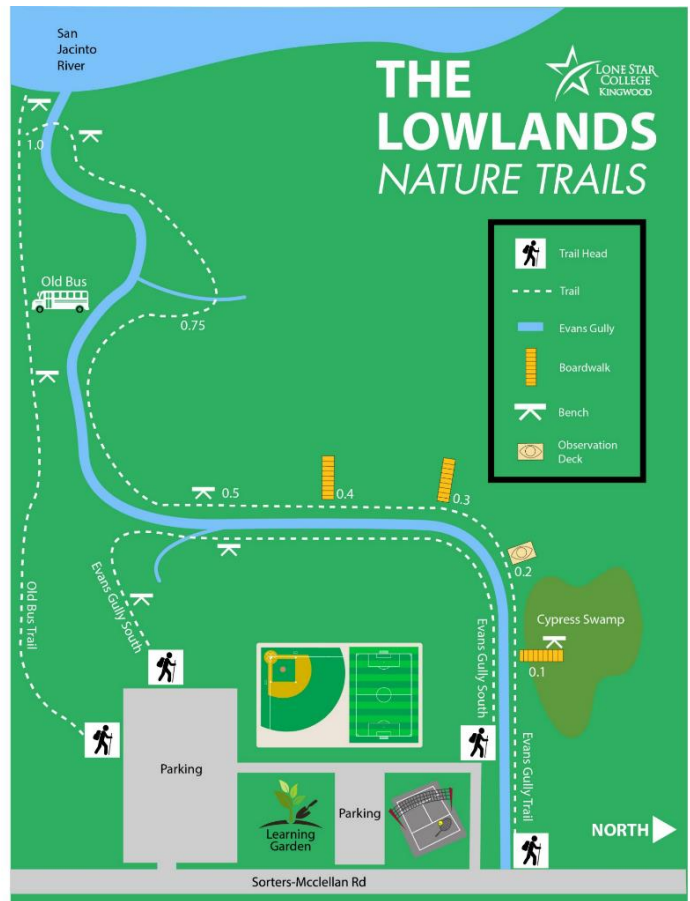
Trail Tour, Brian Shmaefsky SIB 212 Hallway

The Lone Star College - Kingwood Lowlands Nature Trail is a scenic nature trail open to the public since November 2013. It winds through a river-bottom forest ecosystem on college property, following along Evans Gully and stretching toward the San Jacinto River.

Key features include:

- Over 2.5 miles of accessible granite walking trail.
- Three approximately 200-foot accessible boardwalks and an observation deck, allowing access over wetland areas and dense understory without disturbing sensitive habitat.
- Lush vegetation, including willow oak, cypress wetlands, mixed hardwoods like sweetgums and oaks, understory shrubs like yaupon and sassafras, plus vines and wetland-plants like palmetto.

Wildlife is abundant: many bird species (residents and migratory), butterflies, even occasional deer or fox sightings.



Learning Garden Tour (Lillian Hulett) SIB 212 Hallway

The Lone Star College - Kingwood Learning Garden is located on the Kingwood campus of Lone Star College, the Learning Garden is a space where students, faculty, and community members come together to learn, grow, and give back. Featuring multiple sponsor plots, the garden hosts a variety of plants—from vegetables and herbs to pollinator-friendly flowers—and serves as a living classroom for sustainable practices. It offers hands-on learning for special programs like Project Connection, lets local groups adopt beds, and acts as a hub for stewardship, environmental education, and community connection.



Moth Night Program

Stuart Marcus – Texas Master Naturalist

The Houston area is home to a remarkable diversity of moth species, from small, delicate leaf miners to large silk moths. These nocturnal pollinators play an essential role in supporting native plants, feeding bats and birds, and contributing to the overall health of our environment.

As we explore the night, light stations and bait traps will be used to attract and observe different species up close. You will discover the subtle beauty, surprising variety, and ecological importance of these nighttime fliers and learn how moths can reveal a lot about the health of local habitats. Examples of moths commonly found in the Houston area:



Large Moths (at least 2.5" wingspan)

Name	Description	Larval Food Source
Luna	Pale green with long tails	sweet gum
Polyphemus	Golden-yellow with large eyespots	oaks
Cecropia	Brown with red patches and white bands	maples, plums
Io	Yellow with large eyespots	privet

Small and Medium Moths

Name	Description	Larval Food Source
Leopard	White with black spots, the caterpillar is the well-known woolly bear	plaintain
Hummingbird	Resembles a small hummingbird and feeds on flowers during the day	honeysuckle
Sphinx	Large family with cryptic coloration, caterpillars include green hornworms	wide variety including pentas and tomatoes



Stuart Marcus retired in 2019 from his position with the U. S. Fish and Wildlife Service as manager of the Trinity River National Wildlife Refuge in Eastern Texas. He worked for the FWS for more than 40 years, and spent another year with the U. S. Forest Service in North Carolina. Marcus is a Florida native and a 1977 graduate of the University of Florida. After college, he briefly worked with his dad before entering the field of wildlife refuge management. He started his career in 1978, first working for the Forest Service in North Carolina and then working for four different refuges in Florida. In 1994, he

landed the position of refuge manager for the newly established Trinity River National Wildlife Refuge. He is now an active member of Texas Master Naturalists accumulating nearly 5000 volunteer hours, primarily on moth photography. (Photograph courtesy of Texas Highways Magazine)

69th Annual ACUBE Meeting Program

Time		Friday October 17 2025	
11:00 am – 12:30 pm	Registration – SCC Lobby		
12:30 pm - 1:20 pm	Welcome Session – SCC 104-106		
	Strand 1		Strand 2
1:30 pm – 1: 50 pm	Design Strategies to Increase Meaningful Engagement in Online Discussions – Heather Scherr SIB 114	1:30 pm - 3:00 pm	Survival in a Changing World: Visualizing Evolution with HHMI BioInteractive and Anole Lizards - Jonelle Orridge & Nilo Marin SIB 118
2:00 pm – 2:40 pm	Discovering BacTalk™ — Bringing Bacterial Communication to Life in the Classroom – Leigh Brown SIB 122		
2:45 pm – 3:25 pm	Building Ethical Foundations: A Workshop Model for Teaching RCR in Undergraduate Summer Research Program -Khadijah (Gigi) Makky SIB 114		
3:30 pm – 3:50 pm	Peer-Led Team Learning: A Broad Participatory Engagement Activity Toward Expanding Participation in STEM for All - Takunda Maisva & Jason R. Wiles SIB 122	3:20 pm – 3:50	From Overwhelmed to Organized: Teaching First-year Biomedical Sciences Majors How to Manage their Time - Laurieann Klockow SIB 118
Concurrent			
4:00 pm – 4:45 pm	Trail Walk Meet SIB hallway SIB 112	Learning Garden Tour -SIB hallway SIB 112	Mindfulness tables -SCC 104-106
5:00 pm - 5:50 pm	Poster Session – SCC 104 - 106		
6:00 pm - 6:50 pm	Dinner – SCC 108-109 Student Jazz Ensemble		
7:00 pm - 8:00 pm	Awards and Announcements - SCC 108-109		
8:00 pm	Moth Night – Stuart Marcus SCC lobby		

Time	Saturday October 18 2025	
8:00 am - 8:50 am	Student Mixer Breakfast - SCC 108-109	
9:00 am - 9:50 am	Opening Remarks SCC 104-106 Break Time	
10:00 am - 11:00 am	Keynote Speaker - SCC 104-106	
	Strand 3	Strand 4
11:10 am- 11:50 am	Student Panel Problem- Based Learning Perceptions SIB 118	Implementing Undergraduate Research Opportunities through the HHMI SEA-PHAGES Program: Cultivating Scientific Thinking and Faculty Development - Kissaou Tchedre SIB 122
12:00 pm – 12:50 pm	Lunch - SCC 108-109	
	Strand 3	Strand 4
1:00 pm – 2:30 pm	3D Biology Lessons for a Sustainable Future - Kim Grider SIB 118	Equations with Life: Mathematical Modeling for Biology Faculty - Kristine Squillace Stenlu, Anita Schuchardt SIB 122
2-35 pm – 2:55 pm	Breaking Barriers, Not Just Ice: Designing Community-Building Activities for Online Biology Students – Nourin Amin SIB 114	Caution ahead: finding ways to prepare students for challenging coursework in biology - Ashley Driver SIB 112
3:15 pm – 3:55 pm	Enhancing Student Engagement in the Biomedical Sciences through Digital Problem-Based Learning - Hosam Abdelhady SIB118	Houston Zoo Booth - SCC Mindfulness tables – SCC 104 - 106
4:05 pm – 4:25 pm	Watching the Summer Tick Away: How the Prevalence of B. Burgdorferi Helped Salvage Student Research Experience - Andrew Karls SIB 114	Sustainability as a Living Laboratory: Faculty– Student Partnerships that Scale Learning Beyond the Classroom – Sarah Morgan SIB-122
4:40 pm – 5:00 pm	Conference Conclusion - SCC	

ABSTRACTS BY CATEGORY

90-minute Workshop Presentations and Special Sessions

3D Biology Lessons for a Sustainable Future

Kim Grider, Hargrave High School; Population Education

Biology and AP Biology courses include units on Ecology – taking a big picture approach to interactions within ecosystems. Environmental Science courses go in more depth on human ecology topics. Our species has an outsized influence on environmental changes. This includes using natural resources which can alter ecosystems such as forests and marine areas, introducing invasive species and pollution, and bringing about changes in climate. The global population has doubled in the past 50 years to 8.2 billion, contributing to significant changes in terrestrial and marine ecosystems. As our population continues to grow, so does the demand for natural resources, affecting fragile ecosystems and habitats.

In this inquiry-based, hands-on workshop, the presenter will facilitate activities with participants that address population ecology, carrying capacity in nature, the importance of biodiversity, and the impacts of the human footprint on ecosystem health. Activity formats include developing and using 3D models to explain ecological phenomena such as carrying capacity in nature, collecting and analyzing population data for different species, and working through a group challenge on sustainable resource management. The presenter will discuss how to implement these activities as part of broadening students' understanding of interdependent relationships in ecosystems.

Participants will come away with strategies for strengthening student skills in analyzing data, identifying patterns, and problem solving around real-world issues. They will also help students use mathematical representations to support explanations of carrying capacity in ecosystems, threats to biodiversity, and paths to sustainability. The presented activities are designed to encompass different learning styles for an inclusive classroom that seeks to engage all students. Participants will receive lesson plans (including assessment suggestions) and background materials, as well as links to digital resources.

Survival in a Changing World: Visualizing Evolution with HHMI BioInteractive and Anole Lizards

Jonelle Orridge, Nilo Marin, Broward College

What can anole lizards teach students about surviving and thriving in rapidly changing environments? Using a suite of HHMI BioInteractive resources, facilitators will demonstrate how real data and a model organism can support students in connecting important concepts such as natural selection, evolution, and the process of science. In the workshop, participants will use interactive modules, activities, and a new short film to analyze data, investigate the impact of current human environmental pressures on anole evolution, and discuss the implementation of these resources with other participants.

This hands-on activity will require participants to use their electronic devices, i.e., tablet or laptop.

Equations with Life: Mathematical Modeling for Biology Faculty

Kristine Squillace Stenlund, Anita Schuchardt, University of Minnesota

This workshop is designed to support biology faculty in exploring the use of mathematical modeling as a strategy for fostering deeper student understanding of the connections between mathematics and biological phenomena. While mathematics is often employed in science classrooms primarily for computation, data analysis, or representation, students frequently struggle to interpret how mathematical representations connect to underlying mechanisms and patterns in biology. This limitation can reduce their problem-solving capacity to memorize approaches rather than supporting transfer to novel contexts. Mathematical modeling has been identified as a promising instructional practice that can strengthen conceptual understanding and quantitative reasoning while promoting the integration

of mathematics and sciences. In particular, introductory level students are poised to benefit from such an approach early in their education transferring this fluency as they continue to learn.

During the workshop participants will engage in both experiential learning and pedagogical reflection. Participants will first engage in a modeling task from the perspective of students, collaboratively developing a mathematical equation to represent a selected biological phenomenon. Whole-group discussion will highlight similarities and differences across models, allowing participants to examine the strengths and limitations of different approaches and how these representations can reveal or obscure biological insights. Next participants will discuss the pedagogical implications of mathematical modeling. Participants will identify affordances and constraints associated with the practice, as well as instructional strategies that can encourage students to connect quantitative models with scientific explanations. Research-based findings on the role of modeling in supporting learning will be presented for further discussion. Finally, participants will discuss possible strategies from the workshop activities to incorporate into their own teaching contexts.

Through this experience, faculty will leave with a deeper understanding of mathematical modeling in biology instruction, concrete examples of classroom application, and strategies to promote student engagement in linking mathematics to biological phenomena.

20-minute Presentations

Building Cultures of Care: Fostering Belonging in the Science Laboratory

Brian Shmaefsky, Lone Star College – Kingwood

Scientific laboratories are not only spaces of discovery and innovation—they are also social environments where culture, relationships, and power dynamics deeply shape the experiences of students, researchers, and staff. This session explores the concept of the laboratory as a "community of care," where inclusive practices, mutual support, and a sense of belonging are integral to scientific success. Drawing on interdisciplinary perspectives and lived experiences, participants will examine how mentorship models, communication norms, leadership styles, and physical spaces impact emotional well-being, equity, and collaboration. Through case studies, facilitated discussions, and practical strategies, this session invites attendees to reimagine lab environments as inclusive ecosystems that value care as a core scientific ethic. Ideal for faculty, lab managers, graduate students, and institutional leaders, the session aims to inspire actionable change toward more compassionate and equitable scientific communities.

Peer-Led Team Learning: A Broad Participatory Engagement Activity Toward Expanding Participation in STEM for All

Takunda Maisva, Jeremy D. Sloane, Ryan D. P. Dunk, Julia J. Snyder, Christina I. Winterton, Kelly M. Schmid, Mariah C. Maxwell, & Jason R. Wiles, Syracuse University

Efforts toward broadening participation in STEM continue to be of great importance if the United States is to meet its need for an innovative STEM workforce. Peer-Led Team Learning (PLTL) is a collaborative, active learning pedagogical model that has been shown to support students through increased achievement and persistence in STEM. In this study, we examined both the short and long-term outcomes of PLTL participation in undergraduates enrolled in Introductory Biology at our institution over a five-year period. We investigated the association between PLTL participation and meeting the threshold for declaring a Biology major (earning a grade of C+ or better), graduation in general, and graduation in a STEM major. Outcomes were disaggregated by URM status, first generation college status, and student-reported sex identity (the only gender-related data collected institutionally). Results indicated that PLTL participation was associated with increased achievement across all groups. Disparities in performance between URM and non-URM students and between first-generation and continuing generation students were statistically significant in the non-PLTL groups of students, but not in the PLTL groups indicating that gaps were statistically closed. Regression models were used to assess PLTL as a predictor of course performance and final GPA. Participation in PLTL was associated with higher rates of STEM degree attainment for female-identifying students, non-URM students, continuing-generation students, and male students. Moreover, we observed higher baseline rates of achievement and graduation for all groups compared to earlier cohorts. These findings suggest that PLTL

remains an effective and inclusive active learning strategy that promotes student achievement in STEM, especially for gateway courses.

Breaking Barriers, Not Just Ice: Designing Community-Building Activities for Online Biology Students

Nouran Amin, Ball State University

Traditional icebreakers are a common feature in college classrooms, designed to encourage participation, ease anxiety, and build rapport. However, depending on how they are framed and implemented, they can sometimes lead to discomfort, disengagement, or missed opportunities for genuine connection. This presentation explores how reframing icebreakers as “community-building activities” can create more purposeful and meaningful opportunities for student interaction within the accelerated format of a five-week online biology course for non-majors. Drawing on student reflection data, the session highlights how creative and enjoyable activities are most effective when woven directly into the structure and content of the course. Participants will gain practical strategies for designing community-building activities that promote engagement, support student success, and tie participation back to disciplinary learning goals in online, asynchronous settings.

Design Strategies to Increase Meaningful Engagement in Online Discussions

Heather Scherr, Lone Star College – Kingwood

Asynchronous online discussions are often criticized for merely being a means to meet the teamwork requirement in an online course. These discussions may suffer from several issues: a lack of meaningful student interaction, insufficient accountability and participation, single due dates resulting in limited discussion time, and the use of completely AI-generated responses. To address these challenges, I have developed several discussion design strategies. Using consistent, thoughtfully constructed student groups and multi-part case studies can build community, potentially increasing accountability. Each discussion is broken down into 3 elements—initial posts, collaboration, and final answers—with progressive due dates, forcing sufficient discussion time. Instructions are organized in collapsible sections, allowing both detail and digestibility. Some posts require student videos to promote and demonstrate oral communication, increase accountability, and potentially reduce total reliance on AI. Finally, I employ LMS-automated notifications to prompt straggler participation. While my approaches employ specific tools, they are adaptable to other platforms.

Caution ahead: finding ways to prepare students for challenging coursework in biology

Ashley Driver, University of Scranton

The blank stares. The awkward silence. The panic. The seemingly simple question of “what happened?” and the oft-repeated response of “...I don’t know, I really tried.” A feeling of helplessness from both sides of the table can be felt as student and instructor meet after the first exam. It’s likely that we have all been there, and yet preventing this situation from recurring remains elusive. How can we get through to students earlier? What can be done differently? This session will focus on brainstorming approaches to improve student awareness and reflection early in a biology course. Participants should come prepared to discuss their own strategies and move forward towards potential solutions!

Watching the Summer Tick Away: How the Prevalence of B. Burgdorferi Helped Salvage Student Research Experience

Andrew Karls, Lakeland University

This past summer, I took on a research student for a 10-week HEK 293 cell-culture based project; unfortunately, our incubator failed in week three, requiring us to pivot. Given the cost of repairs and the money already invested, developing and executing a new project in a short timeframe felt daunting, until my dog picked up a deer tick, *I. scapularis*, on a walk. After a trip to the vet and a test for Lyme disease, I began to consider how the test itself was performed – in most cases, it’s simply done via PCR, where a gene specific to *B. burgdorferi* (the spirochete bacterium transmitted by *I. scapularis* and the causal agent for Lyme disease) is targeted for amplification. Although I hadn’t performed much PCR in my career, I knew we had a thermocycler on hand and the cost of a DNA extraction kit was modest. Soon, the idea of surveying ticks near campus began to emerge. In this presentation, I’ll explain how a quick shift led to a low-cost research project that engaged both the student and the community. I’ll discuss our

results, their implications, and how we expanded upon the original idea. Finally, I'll suggest ways in which what we did can be adapted for other undergraduate research experiences.

Sustainability as a Living Laboratory: Faculty–Student Partnerships that Scale Learning Beyond the Classroom

Sarah Morgan, Lone Star College- CyFair

How can sustainability initiatives on campus transform from classroom projects into lasting student leadership opportunities?

This session explores the power of faculty–student partnerships in scaling biology and environmental science learning beyond the classroom. Drawing on experiences at Lone Star College, we highlight one initiative: the annual Sustainability Day Summit. This serves as “living laboratories” where students connect scientific concepts to real-world challenges, develop leadership skills, and engage with community and industry partners.

Student officers from the Environmental & Sustainability Club will share their perspectives on co-leading these projects, reflecting on how faculty mentorship empowered them to apply biology knowledge, organize events, and build professional networks. Participants will leave with practical strategies to create similar bridges between coursework, student clubs, and campus sustainability projects. This session offers models, templates, and guiding questions to help attendees replicate and adapt these partnerships, turning their own campuses into fertile ground for student innovation and civic engagement.

40-minute Presentations

Implementing Undergraduate Research Opportunities through the HHMI SEA-PHAGES Program: Cultivating Scientific Thinking and Faculty Development

Kissaou Tchadre, Austin Community College

Enhancing Student Engagement in the Biomedical Sciences through Digital Problem-Based Learning.

Hosam Abdelhady, Sam Houston State University College of Osteopathic Medicine

This session will present how Problem-Based Learning (PBL) can transform digital biomedical education by fostering self-directed learning, critical thinking, and scientific problem-solving. At Sam Houston State University College of Osteopathic Medicine, we use PBL to immerse students in authentic patient cases rooted in biological and physiological concepts, encouraging them to actively seek, analyze, and apply information. This method bridges foundational biological knowledge with its clinical and societal applications, preparing students for complex, real-world challenges.

Discovering BacTalk™ — Bringing Bacterial Communication to Life in the Classroom

Leigh Brown, Bio-Rad Laboratories, Inc.

How can you get your students to see the invisible conversations happening between microbes? In this interactive 40-minute presentation, we'll introduce you to Bio-Rad's BacTalk™ Cell Signaling Kit, a hands-on lab experience that brings the cutting-edge science of quorum sensing into the undergraduate biology classroom.

Quorum sensing is the molecular language bacteria use to coordinate group behaviors, from bioluminescence to virulence. With BacTalk Cell Signaling Kit, students don't just read about it—they observe it directly by working with classroom safe *Vibrio campbellii* strains that glow only when their “neighbors” send the right chemical signal. The kit provides a rare opportunity for students to explore gene regulation and intercellular communication in living cells, while reinforcing core concepts in microbiology, molecular biology, and biotechnology.

During this session, you'll step into the role of your students:

- Learn how the kit's three bacterial strains reveal the genetic “circuitry” of quorum sensing.
- See how simple classroom experiments make invisible chemical signals visible through bioluminescence.
- Explore how BacTalk can anchor discussions of antibiotic resistance, microbial ecology, and the evolution of cooperation.

We'll also highlight flexible teaching strategies for different course levels, from general biology to microbiology and molecular genetics. You'll leave with practical ideas for integrating BacTalk into your lab curriculum, connections to broader learning objectives, and a sense of how this engaging system can spark curiosity and deeper understanding. Come experience BacTalk for yourself—and imagine how it could transform your students' view of bacteria from simple pathogens to sophisticated communicators.

From Overwhelmed to Organized: Teaching First-year Biomedical Sciences Majors How to Manage Their Time

Laurieann Klockow, Marquette University

The transition from high school to college often leaves first-year students struggling with unstructured time, stress, ineffective study strategies and procrastination, challenges that are amplified in rigorous science majors. To address this, we taught a three-part interactive workshop that provides first-year biomedical sciences majors with a systematic approach to time management, aimed at reducing stress and establishing effective routines to support success in demanding science curricula.

While this workshop was implemented in the context of a semester-long BISC success course, it could be adapted for other contexts. It could be scaled as a one-time session, incorporated into advising or orientation programming, or shared informally through faculty office hours.

The workshop progresses from semester-level planning to weekly routines to daily action steps. Rather than focusing only on tools, students are guided to reframe their time as a student as equivalent to a full-time job, to recognize routines as stress reduction and to translate vague goals such as “study biology” into actions. By the end of the 3-part module, students leave with a sustainable habit of semester-level, weekly and daily planning.

Survey data at the end of the course indicated increases in self-reported confidence using time management strategies such as Master Calendars and digital calendar apps. The proportion of students describing themselves as “fairly” or “very confident” in their academic success also increased.

This presentation will share the workshop's materials and strategies, highlight lessons learned during its implementation, and review student feedback on its overall impact. By sharing these resources, we aim to help students transition from feeling overwhelmed to feeling organized and in control.

Building Ethical Foundations: A Workshop Model for Teaching RCR in Undergraduate Summer Research Program.

Khadijah (Gigi) Makky, Marquette University

Undergraduate research is considered one of the most impactful teaching practices. In addition to preparing students for careers in research, it provides experiential learning that helps them develop critical skills such as analytical thinking and attention to detail. Student involvement in research has been steadily increasing. According to the Council on Undergraduate Research, there are over 600 summer research programs for undergraduates in the United States, particularly in STEM fields. These programs are hosted by a wide range of institutions, including large research universities with federal funding, liberal arts colleges, and specialized institutes supported by various funding sources. Much of this involvement can lead to peer-reviewed publications.

As more undergraduates engage in research, it has become increasingly important to provide training in research ethics. Learning about the Responsible Conduct of Research (RCR) helps students understand how to conduct research honestly, responsibly, and ethically.

In our Biomedical Sciences department at a four-year Jesuit institution, we offer a summer research program that typically includes 25–35 students. These students spend the summer working on projects funded by federal grants (from the National Science Foundation (NSF) and the National Institutes of Health (NIH)) as well as internal grants. This 10-week research experience immerses students in hands-on research, culminating in a poster presentation of their projects at the end of the summer. Students also receive training in lab and chemical safety, animal handling, and attend a workshop on the Responsible Conduct of Research.

We designed the RCR workshop to be engaging and data-driven, helping students recognize its importance. To assess its effectiveness, we surveyed students before and after the workshop to evaluate their understanding of RCR-related issues. In this presentation, we share the original design of the workshop and the survey data, which highlight the value of offering such training at the beginning of a research program.

Poster presentations

Engaging Students in Exploring the Effects of Endocrine Disruptors Through Molecular Storytelling.

Brian R. Shmaefsky, Lone Star College – Kingwood

A water bottle that is BPA free, a shampoo that is parabens free - we see these labels on products we buy and in various multimedia. In collaboration with the Molecular CaseNet FMN, I have developed an engaging environmental toxicology lesson to deepen students' understanding of how this class of synthetic and natural chemicals interfere with and disrupt hormonal functions, hence the name Endocrine Disruptor Chemicals (EDCs). The lesson uses a molecular storytelling approach to illustrate the biological mechanisms and real-world consequences of endocrine disruption in molecular detail. This example focuses on how a specific EDC (called DDT) and how it interferes with the function of the estrogen receptor. Students will learn about the structure and function of estrogen receptors in biology. They will investigate the impact of DDT binding on endocrine function. By combining narrative techniques with scientific inquiry, the lesson engages students in critical thinking about environmental exposures, regulatory challenges, and public health implications.

Using a Herbarium Collection to Augment Research and Teaching

Camellia Moses- Okpodu, University of Wyoming

Leafy Spurge (*Euphorbia esula*), a resilient invasive species in the Rocky Mountain region, serves as the focal point of my research into plant epigenomics. By examining how gene expression in Leafy Spurge is regulated in response to environmental stimuli, this work reveals adaptive strategies that may be shared by other native and invasive species. These insights are critical for understanding plant responses to ecological pressures and for informing biodiversity conservation and invasive species management.

This research also explores the broader ecological interactions of Leafy Spurge, including its relationships with fungi, microbes, and herbivores. Epigenomic modifications can influence these interactions, shaping community dynamics and ecosystem resilience.

Importantly, this work demonstrates how herbarium collections can be leveraged to enhance both research and teaching. By integrating epigenomic data with historical specimens, we can track genetic and phenotypic changes over time, correlate them with environmental conditions, and inform conservation strategies. Herbarium records thus become powerful tools for understanding plant evolution, adaptation, and ecological function—while also serving as engaging, data-rich resources for student learning in genomics, ecology, and conservation biology.

Isolation, Identification, and Characterization of Antibiotic-producing Bacteria from Soil.

Crystal Robert O. Portillo, Brenna G. Ploof, Roxana X. Torres, Isabella E. Sulvaran, Anna K. Webster, Allie E. Seybert, Mohammad A. Alsaedi, Shima Chaudhary, Lone Star College – Kingwood

Soil ecosystems harbor diverse microbial communities, including antibiotic-producing bacteria that play key roles in microbial interactions and contribute to the dissemination of antibiotic resistance genes (ARGs). To address the widespread resistance to known antibiotics, the discovery of novel antibiotic producers is important. In this study, twenty soil samples were collected from various regions of Harris County, Texas, to isolate antibiotic-producing bacteria. The isolates were screened for antimicrobial activity against known ESKAPE-safe relative bacterial isolates. A total of 28 bacterial isolates were initially identified; however, only 12 maintained consistent antibiotic production after storage and were selected for further characterization. These isolates were identified using 16S rRNA gene amplification with universal primers (27F/1492R), followed by sequence analysis. The isolates were classified within

the genera *Bacillus*, *Pseudomonas*, *Priestia*, and *Rossellomorea*, indicating substantial genetic and potential functional diversity.

To evaluate the effectiveness of antibiotic production, a bioassay using *Caenorhabditis elegans* (*C. elegans*) was conducted. Three isolates were selected for this assay: AS2 (*Bacillus cereus*, GenBank: AB996598), MA15 (*Bacillus siamensis* strain TKM9, GenBank: ON564825.1), and BG4 (*Pseudomonas aeruginosa* strain DD3, GenBank: PP413726.1). Cell-free extracts (CFCs) were prepared by centrifuging 48-hour cultures grown in Luria-Bertani broth and collecting the supernatants. The motility of juvenile stage four and adult *C. elegans* was then monitored following exposure to the cell-free extracts to assess potential antimicrobial or toxic effects. CFC test results from isolates AS2 and MA15 significantly inhibited the motility of *C. elegans*. These results suggest a promising anthelmintic effect of the tested isolates.

A New Plastic Eater: Analysis of *C. Freundii* For its BioRemedial Effects on Polyurethane

Ivan Uribe, Lone Star, C+B21

This study investigates the impact of *Citrobacter freundii* on polyurethane with the aim to explore its capabilities for bio-remediation. Previous researchers have looked for plastic degrading organisms from sources such as fungi and soil. More recent scholarship has investigated plastic degrading microorganisms within insects, most promising the *Klebsiella oxytoca* in the yellow mealworm. Using the phylogenetic tree of *Klebsiella oxytoca*, *Citrobacter freundii* was selected as the optimal organism due to its close evolutionary relationship and economic viability. This study hypothesized that *Citrobacter freundii* is able to degrade polyurethane based on the fact that it is in the same genus as other plastic degrading microorganisms. To determine if *Citrobacter freundii* can break down polyurethane two methods were utilized: UV visible spectroscopy and colony counting. Bacterial cultures and broth grown using polyurethane modified media were utilized. These bacterial cultures in the test tubes grew as evidenced by increased optical density absorption over time. However, no visible colonies were found in the agar but upon further examination via microscopy there were some signs of bacteria present which means this test was inconclusive. The hypothesis of this study is somewhat supported as the data showed that *Citrobacter freundii* was able to utilize polyurethane as a carbon source as evidenced by the findings of the UV visible spectroscopy test. More time and resources are needed to study *Citrobacter freundii* but this organism shows great potential to be an alternative to dispose of plastic and is worth investigating further given the preliminary data.

The Mediterranean Diet and Premature Birth: The Interplay Between Proinflammatory Cytokines and 11 β -Hydroxysteroid Dehydrogenase 2

Madelyn Snow, Lone Star College- CyFair

With an aim to determine the mechanism by which the Mediterranean Diet (MD) decreases the risk of premature birth, this study examines the relationship between proinflammatory cytokines, 11 β -Hydroxysteroid Dehydrogenase 2 (11 β -HSD2), and cortisol. Adherence to the MD decreases both cortisol levels and the risk of premature birth, while high cortisol levels are linked to increased risk of premature birth. Increased levels of proinflammatory cytokines TNF- α , IL-1 β , and IL-6 inhibit 11 β -HSD2 activation, increasing fetal cortisol exposure and subsequently raising premature birth risk. The MD may lower increases in proinflammatory cytokines, therefore explaining how MD adherence lowers the risk of premature birth. A literature review was conducted to examine the correlation between the MD and proinflammatory cytokine levels. Flor-Aleman et al. found that TNF- α levels decreased at the 34th gestational week with higher MD adherence, while Ramon Estruch found that IL-6 levels decreased with MD adherence supplemented with mixed nuts and olive oil. Additionally, Koelman et al.'s systematic review of MD adherence revealed that TNF- α , IL-1 β , and IL-6 concentrations significantly decreased. Synthesis of these results suggests that the MD's ability to lower proinflammatory cytokines increases 11 β -HSD2 activation, thereby reducing fetal cortisol exposure and decreasing the risk of premature birth. Future research should analyze inflammatory cytokine concentrations in preterm births from mothers who did and did not follow the MD to test the validity of this conclusion.

Antioxidant - A Term Too Broad in the Context of Cancer

Anna Tamura, Lone Star College, CyFair

With an aim to clarify contradictions regarding the impact of antioxidants in cancer treatment, a systematic literature review was conducted examining how different antioxidants affect temozolomide (TMZ) therapy in glioblastoma. Antioxidants have been shown to induce resistance to treatment in many instances but enhance sensitivity in others. This research hypothesized that the impact correlates with the primary mechanism in action: scavenging reactive oxygen species (ROS) or modulating pathways. Three antioxidants were reviewed with a single, consistent impact on TMZ—glutathione, curcumin, and resveratrol—to identify their underlying mechanism. N-acetylcysteine (NAC)—an antioxidant that has shown both impacts of either resistance or enhancement—was analyzed as two separate antioxidants, based on impact, to highlight the primary role of mechanism in influencing the outcome of TMZ. As a result, a correlation was identified between ROS-scavengers with inducing resistance and pathway-modulators with enhancing sensitivity, confirming that antioxidants are not inherently contradictory but contextually dependent on mechanism in action. This research may extend to other cancers treated with similar oxidative stress-inducing therapies, suggesting a broader applicability of the mechanistic categorization. However, future research is needed to understand the factors that determine whether an antioxidant will act primarily as an ROS-scavenger or a pathway-modulator in order to effectively control outcomes to TMZ.

