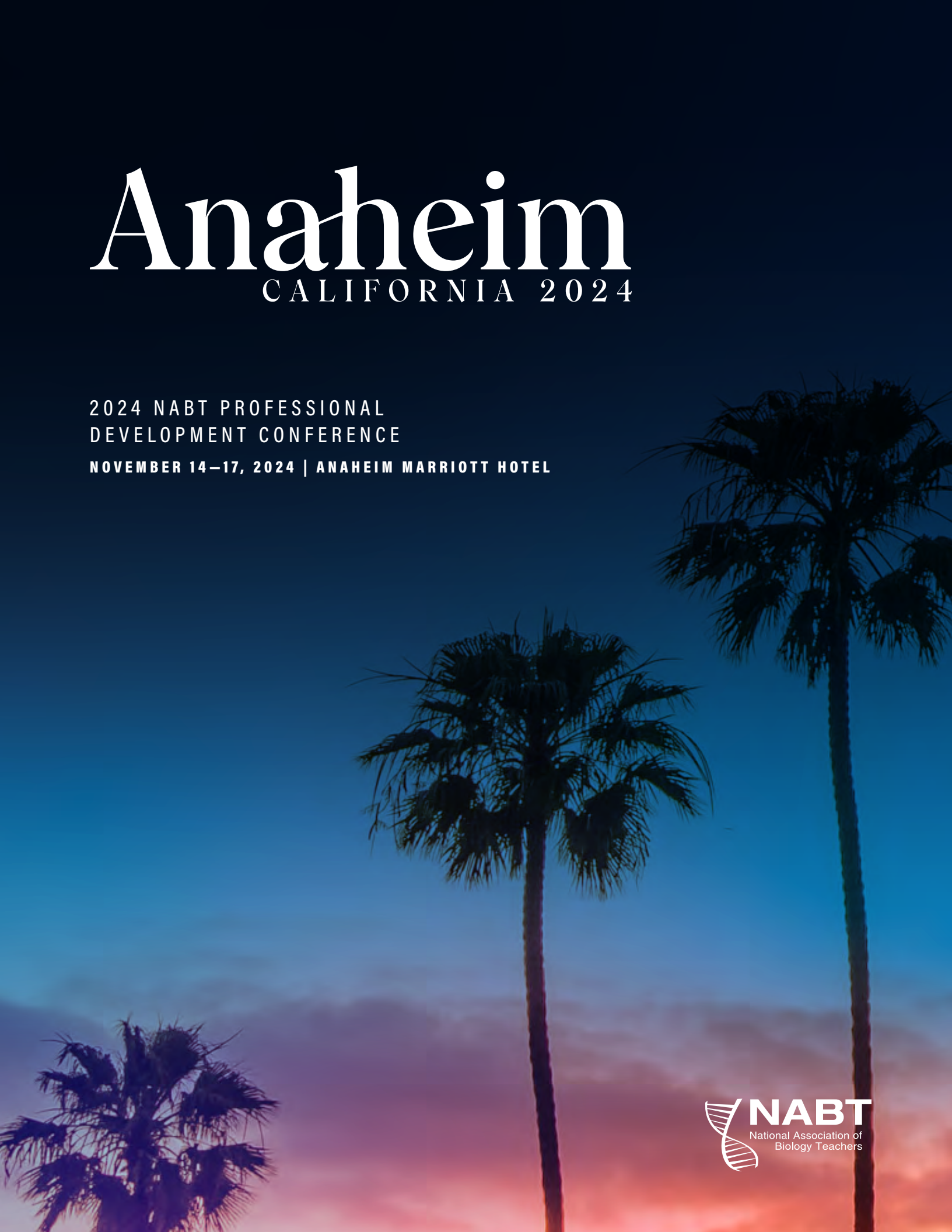
Anaheim
CALIFORNIA 2024

2024 NABT PROFESSIONAL
DEVELOPMENT CONFERENCE

NOVEMBER 14–17, 2024 | ANAHEIM MARRIOTT HOTEL



NABT
National Association of
Biology Teachers

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National Association of Biology Teachers

Anaheim
CALIFORNIA 2024

NABT PROFESSIONAL DEVELOPMENT CONFERENCE
NOVEMBER 14–17, 2024
ANAHEIM MARIOTT HOTEL
ANAHEIM, CALIFORNIA

A SPECIAL THANKS
to Our Generous 2024 Conference Sponsors & Exhibitors!

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Convention Map


SCOUT HER OUT
NABT President-Elect **Kirstin Milks**
has pledged to build community, promote science literacy,
spark joy in learning, and so much more!
FIND THE PRESIDENT in Anaheim and enter to win some great prizes
from NABT. The drawing will be on Friday, November 15th.
NABT
National Association of
Biology Teachers
Anaheim
CALIFORNIA 2024

From the President

Hello NABT Family, and WELCOME!

If you are like me, you are already brimming with excitement for the 2024 NABT Professional Development Conference! This is one of those events that I look forward to all year long, and when that fall term comes around, you know it is just around the corner! Each year, NABT brings familiar faces, new connections, innovations in teaching and learning, and many opportunities to grow my networks, practice, and outreach.

To our first timers, welcome to NABT, a place where you are valued, welcomed, and can grow, regardless of your experience in education. To our long-timers, welcome home, it is great to see you again!

NABT truly is an organization that is FOR teachers and led BY teachers, and I cannot wait for you to see what is in store for you this year here in Anaheim. I can't wait for you to see all the workshops, events, and sessions you can explore. If you're new to the NABT Conference, stop by the First Timer's Coffee Break (Friday, 7:30AM) and make sure you find your "home base" during our Networking Luncheons (Friday, 12:45PM). If you're looking to get more involved in NABT, I encourage you to learn more during our Committee Meetings (Saturday, 7:30AM)

In addition to networking, we have almost a hundred amazing presentations by members and sponsoring partners throughout each day of programming, including workshops by HHMI, Bio-Rad, 3D Molecular, miniPCR, and more. Join us to learn from groundbreaking speakers, including Janet Carlson from Stanford University and our 2024 Evolution Education Awardee Briana Pobiner from the Smithsonian Human Origins Program. And don't miss my friends, Biologist Alex Troutman and Anthropologist, Science Communicator and Comedian Natalia Reagan.

Lastly, thank you all for making this conference and this organization feel like home. To our members, section chairs, and the many committees that keep programs strong, the time and passion you put into NABT are invaluable. To our Board of Directors, your willingness to keep NABT on the leading edge for life science education. Finally, to our "fearless leader," Executive Director Jacki Reeves-Pepin, thank you, thank you, thank you.

Come and find me and say hello! We are glad you are here, welcome HOME to NABT. Cheers!

Amanda Townley, PhD
NABT President, 2024

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CONGRATULATIONS
to the Winners!

Join us in celebrating the winners of the 2024 Best of STEM Awards, recognizing excellence and innovation in teaching and learning resources, programs, and materials.

In addition to the companies and organizations receiving these prestigious awards, the real winners are our students, whose learning experiences and opportunities are genuinely enhanced by the remarkable work represented here.

- 267,000 STEM educators surveyed
- An expert panel of judges selected the finalists

Accelerate Learning Inc.: Kide Science powered by Accelerate Learning, *Best of STEM Hands-on Curricular Materials: Pre-K to Grade 2.*

Avantis Education, creators of ClassVR: ClassVR, *Trailblazer: Immersive Reality: (AR/VR).*

BioBrain: BioBrain - Biology (AP & IB DP), *Best of STEM for Biology.*

BioBuilder Educational Foundation: BioTechBuilder, *CTE Champion: STEM.*

Carolina Biological Supply Company: Carolina Lab Skills, *Best Freebies for STEM.* **How Do Polygenic Risk Scores Stack Up? (Kit),** *Best Resources for Analyzing and Interpreting Data.* **Taq Polymerase Production and Validation Kit,** *Trailblazer Award: Biotechnology.*

CloudLabs Learning: CloudLabs Science, *Best of STEM for Biology: Digital Labs.* **CloudLabs Science,** *Best of STEM for Chemistry.*

Code.org: Code.org's AI Teaching Assistant, *Best AI Assistant for Teaching and Learning.* **Code.org's Music Lab,** *Trailblazer: Inspiring Computational Thinking.*

CodeHS: CodeHS, *CTE Champions: IT & Coding: Code Creation & Engineering.*

CodeMonkey: CodeMonkey, *Best AI Curriculum for Teaching and Learning.*

CoderZ: CoderZ, *CTE Champions: IT & Coding: Real-World Learning.*

Drone Legends: Little Legends™, *Best of STEAM Curricular Materials: Pre-K to Grade 2.*

ExploreLearning: ExploreLearning Frax, *Bridging the Gap: Math Intervention Resources—Grades 3–5 Fractions.* **Gizmos STEM Cases,** *Trailblazer: Simulations for STEM.*

iCEV: iCEV Health Science Curriculum, *CTE Champions: Health Science.* **iCEV CTE Curriculum,** *CTE Champions: Comprehensive Curriculum.*

JASON Learning: STEM Ready: Seeking Sustainable Energy Solutions, *Best of STEM for Environmental Science.* **The JASON Learning Academy,** *Bridging the Gap: Professional Development.* **Building a Greater Digital Future,** *CTE Champion: STEM: Career Exploration.*

Killer Snails: WaterWays, *Trailblazer: Early Learning (Pre-K to 6).*

Learning Undefeated: Mobile eXploration Lab (MXLab), *Social Impact Award: Promoting Diversity & Equity Inclusion.*

LEGO® Education: LEGO® Education SPIKE™ Essential, *Best of STEM: Hands-on Learning.*

Makey Makey LLC: Makey Makey Expanded Platform (Makey Makey + Backpack Boards), *Best of STEM: Hands-on Learning: Grades 6–8.* **Makey Makey Expanded Platform (Makey Makey + Backpack Boards),** *Trailblazer: Middle School STEM—Grades 4–8.*

MIND Education: ST Math, *Bridging the Gap: Math Intervention Resources—Preschool to Grade 8.*

Realityworks: Educational Aquaponics System, *CTE Champion: STEM: Plant Science.*

SAE International: A World In Motion® (AWIM®), *Best Educator Support for Teaching & Learning.* **A World In Motion® (AWIM®) Preschool Exploration Series,** *Best of STEM Curricular Materials: Pre-K to Grade 2.*

Sphero, Inc.: Sphero BOLT+, *Best of STEM: Robotics.*

STEM Sports: STEM Sports® Curriculum, *Best of STEM for Culturally Relevant Teaching & Learning.*

Tutor.com and The Princeton Review: High-Dosage Tutoring, *Bridging the Gap: Math Intervention Resources.*

Visit the website for complete competition details.

bestofstemawards.com

Educators Pick Best of STEM Awards™ is a project of Catapult X, NSTA, NABT, and MCH Strategic Data. Winners are chosen by educators and certified by The Teich Group. Catapult X administers the program. For questions contact daylenelong@catapult-x.com.

ABOUT THE PROFESSIONAL DEVELOPMENT CONFERENCE

All functions, meetings, and exhibits will take place at the Anaheim Marriott unless otherwise noted. Please consult this guide and signage for room information.

FOR PERSONS WITH DISABILITIES

Careful consideration is made during the planning of the NABT Conference to make it accessible to all participants. Should you require special services, please go to the registration area to contact an NABT representative. We will strive to meet your needs.

NURSING ROOM

A quiet space has been set aside for you in the San Diego room on the lower level.

CERTIFICATE OF ATTENDANCE

See page 75

REGISTRATION HOURS

The NABT registration desk is located in the Platinum Registration foyer. It will be open during the following hours:

Thursday, November 14

7:00AM – 6:00PM

Friday, November 15

7:00AM – 6:00PM

Saturday, November 16

7:00AM – 6:00PM

Sunday, November 17

7:00AM – 10:30AM

FUTURE NABT CONFERENCE DATES & SITES

2025 Professional Development Conference
October 30–November 2, 2025
St. Louis Union Station Hotel
St. Louis, MO

2026 Professional Development Conference
October 29–November 1, 2026
Hyatt Regency Dallas
Dallas, TX

A limited NABT WiFi network is available.
NETWORK: NABT PASSWORD: NABT2024

ABOUT NABT

The National Association of Biology Teachers (NABT) is the leader in life science education.™ Our association is the largest national organization dedicated exclusively to supporting biology and life science educators. Our members—representing all grade levels—teach more than one million students each year!

Learn more by visiting www.NABT.org.

VISITING THE EXHIBIT HALL

The NABT Exhibit Hall is your venue to interact with a diverse group of curriculum designers, publishers, manufacturers, developers, nonprofit partners, and other providers with resources to support you as a biology educator. Receptions, contests, and other special experiences will also be featured in the Exhibit Hall.

Registration badges are required for admission to the Exhibit Hall.

Thursday, November 14	5:30PM – 7:30PM
Friday, November 15	8:00AM – 5:30PM (Closing Experience starts at 4:00PM)

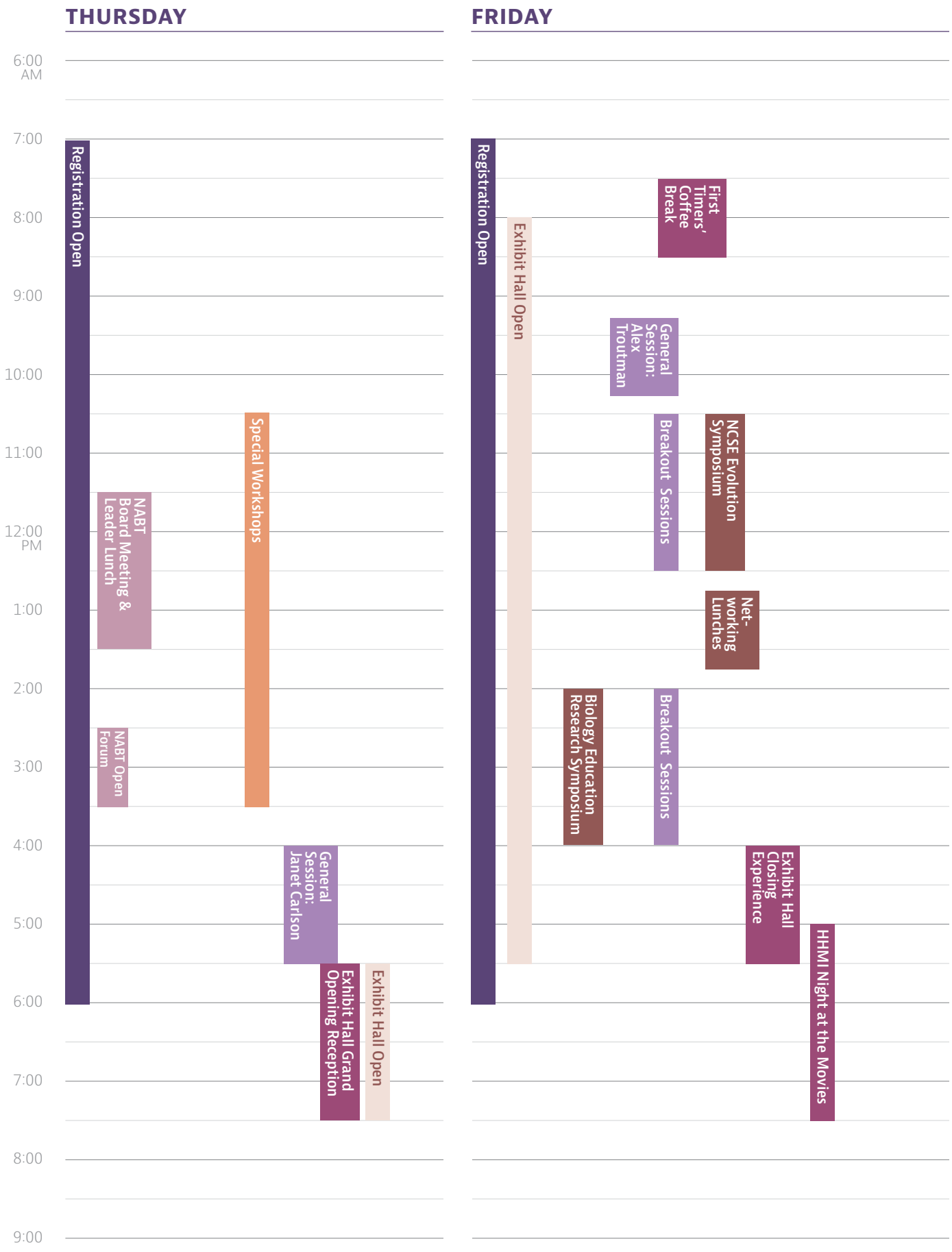
2024 NABT CONFERENCE APP

Download the Grupio App when you visit the App Store or Google Play. Search for NABT in the App to access the event!

PROVIDING SESSION FEEDBACK

All education sessions are reviewed by the NABT Professional Development Committee for acceptance. Help us ensure you see great sessions at the NABT Conference by sharing your comments at **bit.ly/NABT2024sessions**

PHONE: (888) 501-NABT
EMAIL: office@NABT.org
WEBSITE: www.NABT.org


THURSDAY
FRIDAY
6:00 AM
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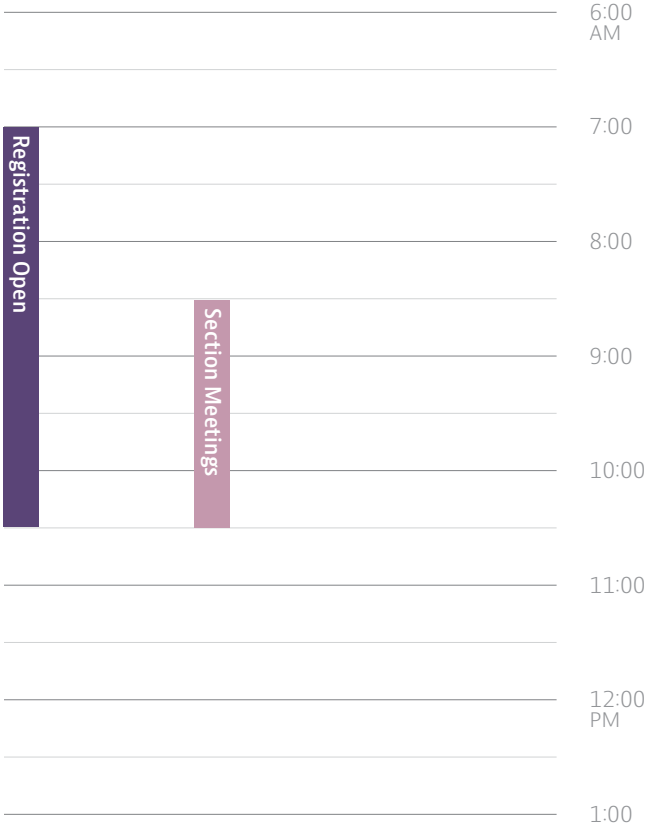
Registration Open
NABT Board Meeting & Leader Lunch
NABT Open Forum
Special Workshops
General Session: Janet Carlson
Exhibit Hall Grand Opening Reception
Exhibit Hall Open
Registration Open
Exhibit Hall Open
First Timers' Coffee Break
General Session: Alex Troutman
Breakout Sessions
NCSE Evolution Symposium
Net-working Lunches
Biology Education Research Symposium
Breakout Sessions
Exhibit Hall Closing Experience
HHMI Night at the Movies

SATURDAY

SUNDAY



EVENT KEY

- SESSIONS & SPEAKERS
- SPECIAL EVENT
- SPECIAL PROGRAM
- COMMITTEE MEETINGS
- REGISTRATION
- TICKETS REQUIRED
- EXHIBIT HALL OPEN

SPECIAL EVENTS
(TICKETS REQUIRED)

Saturday, November 16

NABT Honors Luncheon
Grand E, Onsite Ticket: $60

NABT is proud to recognize the 2024 NABT Award Recipients during this celebratory event. We will honor exceptional biology teachers from all levels, and everyone is welcome to join us to congratulate these remarkable professionals.

Saturday Night Closing Reception & Silent Disco
Platinum Patio, Onsite Ticket: $15

Get ready to dance the night away at NABT's first-ever Silent Disco! This unique event will feature food, fun, and friends catching up and getting down. Don't have boogie fever? You're still guaranteed to leave Anaheim with a smile.

SPECIAL WORKSHOPS (FREE)

THURSDAY, NOVEMBER 14

10:30AM–3:30PM

Cultivating Authentic Dialogue in College STEM Classrooms
Orange County Ballroom 3 & 4

We will showcase the IGELS "Consideration Tree," which provides a structure to help STEM instructors evaluate the risks and rewards of their topic choices. Participants will discuss ways to support trustful dialogue in the classroom, identify resources to cultivate a reflective and empathetic mindset, develop language to articulate the value and process of contemplative teaching to colleagues and campus leadership, and manage discomfort in the classroom in a productive way.

Sponsored by PROJECT IGELS

12:30PM–3:30PM

SCST Presents: Optimizing Instructional Strategies
Gold Key I & II

Join the Society for College Science Teaching (SCST) for this interactive symposium featuring multiple interdisciplinary presentations highlighting best practices and effective strategies for teaching science at the undergraduate level. Group discussions will also explore successful teaching strategies and barriers to implementation, as well as future opportunities and challenges in college science teaching.

Sponsored by SCST

20 in 20 and Beyond
Orange County Ballroom 1

Come try numerous 20-minute inquiry-based activities that are sure to engage and excite your students. You and your students will be glad you did!

12:30PM–3:30PM

Using Societal Challenges as Phenomena in Three-Dimensional Units to Develop Student Agency
Orange County Ballroom 2

Experience how BSCS's Anchored Inquiry Learning instructional model leverages complex, culturally relevant societal challenges as phenomena in three-dimensional teaching and learning to support all students' learning and development of agency!

Sponsored by BSCS SCIENCE LEARNING

NCSE Presents: Scientific Literacy in the Digital Age of Misinformation
Platinum Ballroom 1

Students are being exposed to more scientific misinformation and disinformation than ever before. Teaching them to identify sound science accurately can be challenging. Join NCSE as we offer practical tools and strategies to navigate an increasingly digital world.

Sponsored by NCSE National Center for Science Education

HHMI BioInteractive Storylines for Coherent Instruction
Platinum Ballroom 2

Storylines (coherent lesson sequences) anchored in engaging phenomena improve student engagement and understanding of overarching biological concepts. In this workshop, facilitators will model using phenomena to lead storyline-based instruction. Participants will experience components of a new, freely available storyline that explores the biology of the sickle cell trait. This storyline was designed with AP® Biology and undergraduate introductory courses in mind, but educators teaching general high school biology will also benefit from the experience.

Sponsored by hhmi BioInteractive

NABT NETWORKING EVENTS (FREE)

FRIDAY, NOVEMBER 15

7:30AM–8:30AM

NABT First Timers' Coffee Break

Grand Ballroom E

First-time conference attendees are invited to learn more about NABT, the 2024 Professional Development Conference, and connect with other "first timers." NABT leaders and former "first timers" will also be available to answer your questions and help you make the most of your time in Anaheim.

8:00AM–9:00AM

NABT BIPOC Practitioners' Affinity Meeting

Gold Key I & II

Network with fellow BIPOC practitioners to connect and build relationships! This event is open to any practitioner of any level who self-identifies as a Black, Indigenous, and/or person of color.

12:45PM–1:45PM

Everyone's conference registration includes a boxed lunch. Pick up your lunch outside the Grand Ballroom and join a section event, meet up with friends, or find a quiet spot to relax and recharge.

Tickets for your entrée selection were made with your registration.

AP® Biology Section Luncheon

Platinum Ballroom 5 & 6

Grab your lunch and meet other AP® Biology teachers in a friendly, informal setting to share insights, ask questions, and build community. You may even get to meet some of your favorite AP® colleagues in person. The luncheon includes a special presentation of the Kim Foglia AP® Biology Service Award.

Sponsored by minipcr bio®

Four-Year College and University Section Luncheon

Grand Ballroom E

Faculty, education researchers, graduate students, and anyone associated with four-year colleges and universities are invited to network with colleagues and learn about section programs and opportunities. There will also be a special presentation of the Four-Year College & University Section Awards.

Elementary and Middle-Level (K-8) Luncheon

Grand Ballroom G

Grab your lunch and meet up with other awesome K-8 teachers at this informal networking lunch designed to help you connect with colleagues.

High School Level Luncheon

Platinum Ballroom 5 & 6

If you teach funny freshmen, serious seniors, and everyone in between, you will want to grab your lunch, grab a seat, and connect with other high school biology teachers in this informal setting.

Sponsored by minipcr bio®

Two-Year College Section Luncheon

Grand Ballroom H–K

Join a supportive community of two-year college educators to share your strategies, your struggles, and your successes! The winners of the Two-Year College Biology Teaching Award and the Professor Chan Teaching Award will also be recognized.

SATURDAY, NOVEMBER 16

7:30AM–8:30AM

NABT BioClub Breakfast (Tickets Required)

Grand Ballroom E

Every year, the NABT BioClub supports students at K-12 schools, community colleges, and informal learning organizations throughout North America. Join us to share what your club is doing or learn how to start a BioClub chapter of your own!

Sponsored by CAROLINA® www.carolina.com

NABT's 2SLGBTQIA+ Practitioners' Affinity Meeting

Gold Key I & II

Connect with fellow (Two Spirit, Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual, plus) practitioners! This event is open to all levels who self-identify as 2SLGBTQIA+ (Please note: A does not stand for Ally/Aligned for this session).

BOARD OF DIRECTORS

President: **Amanda Townley**
President-Elect: **Kirstin Milks**
Past President: **Tara Jo Holmberg**
Secretary/Treasurer: **Jacqueline Washington**
Director-at-Large: **Kristy Daniel**
Director-at-Large: **Anneke Metz**
Director/Coordinator: **Lee Ferguson**
Director/Coordinator: **David Butler**

Executive Director: **Jaclyn Reeves-Pepin**

REGIONAL COORDINATORS

Region I (CT, ME, MA, NH, RI, VT): **Don Pinkerton**
Region II (DE, DC, MD, NJ, NY, PA, VA): **Nicole Veltre-Luton**
Region III (IL, IN, MI, OH, WI): **David Butler**
Region IV (IA, KS, MN, MO, NE, ND, SD): **Andrew Taylor**
Region V (KY, NC, SC, TN, WV): **Robin Bulleri**
Region VI (AL, FL, GA, LA, MS, PR): **Audra Brown Ward**
Region VII (AZ, AR, NM, OK, TX): **Lee Ferguson**
Region VIII (CO, ID, MT, NV, UT, WY): **Katrina Marcos**
Region IX (AK, CA, HI, OR, WA, Pacific Territories): **Beth Cates**
Region X (Canadian Provinces & Territories): **Martha Schissler**

SECTION CHAIRS

NABT BioClub: **Ashlie Gowitzka**
AP® Biology Section: **Mark Little**
Four-Year College & University Section: **Troy Nash**
Two-Year College Biology Section: **Cleo Rolle**

COMMITTEE CHAIRS

ABT Journal Advisory Committee: **William McComas**
Archival Committee: ***Vacant***
Awards Committee: **Kathy Van Hoeck**
Finance Committee: **Jacqueline Washington**
Honorary Membership Committee: **Kirstin Milks**
Informal Science Education Committee: **Jill Maroo**
Justice, Equity, Diversity, & Inclusion (JEDI): **Enya Granados & Maribel Gendreau**
Member Resources Committee: **Kirstin Milks & David Butler**
Nominating Committee: **Bob Melton**
Past President Advisory Council: **Kirstin Milks**
Professional Development Committee: ***Vacant***
Retired Member Committee: **Dennis Gathmann**

BOARD-APPOINTED REPRESENTITIVES

OBTA National Coordinator: **Mark Little**
Introductory Biology Task Force: **Anna Hiatt**
Social Media Task Force: **John M. Moore & Stacey Kiser**
Pre-Service Teacher Advisory Committee: **Julie Angle**

AFFILIATE MEMBERS

Biology Teachers Association of New Jersey **(BTANJ)**
Cleveland Regional Association of Biologists **(CRABS)**
Colorado Biology Teachers Association **(CBTA)**
Connecticut Association of Biology Teachers **(CTABT)**
Delaware Association of Biology Teachers **(DABT)**
Empire State Association of Two-Year College Biologists **(ESATYCB)**
Hong Kong Association of Biology Teachers **(HKABT)**
Illinois Association of Biology Teachers **(IABT)**
Illinois Association of Community College Biologists **(IACCB)**
Indiana Association of Biology Teachers **(IABT)**
Kansas Association of Biology Teachers **(KABT)**
Louisiana Association of Biology Teachers **(LABT)**
Massachusetts Association of Biology Teachers **(MABT)**
Michigan Association of Biology Teachers **(MABT)**
Mississippi Association of Biology Educators **(MSABE)**
Missouri Association of Biology Teachers **(MOBioTA)**
New York Biology Teachers Association **(NYBTA)**
South Carolina Association of Biology Teachers **(SCABT)**
Texas Association of Biology Teachers **(TABT)**
Tennessee Association of Biology Teachers **(TNABT)**
Virginia Association of Biology Teachers **(VABT)**

NABT Committee Meetings

Learn more about NABT Committees and the programs they support during their annual meeting on **Saturday, November 16th at 7:30AM in the Marquis Ballroom.**

ABT ADVISORY COMMITTEE

The ABT Advisory Committee helps ensure *The American Biology Teacher* publishes articles and highlights themes relevant to the teaching and learning of biology and life science at all levels.

William McComas, ABT Editor-in-Chief

AWARDS COMMITTEE

This committee coordinates the nomination and application process for the NABT Awards program. Committee members evaluate applications, select award recipients, and notify the honorees of their awards.

Kathy Van Hoeck, Committee Chair

INFORMAL SCIENCE COMMITTEE

This committee identifies programs, initiatives, and activities that highlight how informal and community science programs can support biology and life science instruction.

Jill Maroo, Committee Chair

JUSTICE, EQUITY, DIVERSITY, & INCLUSION (JEDI) COMMITTEE

The JEDI Committee helps develop programs and resources that address the needs of a diverse community of biology teachers and students to ensure NABT fosters an inclusive, diverse environment and builds belonging among members and groups.

Enya Granados and Maribel Gendreau, Committee Chairs

LONG RANGE PLANNING COMMITTEE

Working with the Board of Directors and other NABT leaders, the Long Range Planning Committee develops goals and objectives that align with NABT's Strategic Plan.

Steve Christenson, Committee Chair

MEMBER RESOURCES COMMITTEE

Review resources, services, incentives, and program recommendations to assist with membership development and outreach.

Kirstin Milks and David Butler, Committee Chairs

NOMINATING COMMITTEE

Working with NABT members, this committee recruits individuals to serve in leadership positions within the association, including identifying and evaluating candidates for NABT elections.

Bob Melton, Committee Chair

OBTA DIRECTORS & REGIONAL COORDINATORS

Help NABT recognize outstanding biology teachers in your state! This meeting will include updates on the NABT Outstanding Biology Teacher Award (OBTA).

PROFESSIONAL DEVELOPMENT COMMITTEE

This committee helps evaluate and implement NABT's professional development activities, including reviewing the great sessions submitted for the NABT Professional Development Conference.

Committee Chair to be Named

RETIRED MEMBERS COMMITTEE

"Post Classroom Professionals" are a key part of the NABT community and continue to volunteer, serve as mentors, and promote different initiatives. Learn more about staying involved.

Dennis Gathmann, Committee Chair

SOCIAL MEDIA COMMITTEE

Using social media outlets to broaden the NABT community and promote programs that support biology and life science teachers.

Stacey Kiser and John M. Moore, Task Force Chairs

BIOCLUB STUDENT AWARDS

Camden Cook
Western Piedmont Community College, Morganton, NC

Lea Kasmer
Greensburg Salem High School, Greensburg, NC

Outstanding student members of a NABT BioClub are eligible for this textbook scholarship, with one student from a BioClub high school chapter and one student from a community college chapter named each year.

Sponsored by Carolina Biological Supply Company

BIOLOGY EDUCATOR LEADERSHIP SCHOLARSHIP (BELS)

Michael Delmont
University at Buffalo, Buffalo, NY

The Biology Educator Leadership Scholarship (BELS) supports teachers who are furthering their education in the life sciences or science education. The award recipient is a practicing educator who has been accepted into a graduate program at a Masters or Doctoral level.

Sponsored by NABT Member Donations

DISTINGUISHED SERVICE AWARD

Not awarded in 2024.

Established in 1988 to commemorate the 50th anniversary of the NABT, the Distinguished Service Award is presented to a nationally recognized individual who has made major contributions to biology education through their research, writing, and teaching.

Sponsored by the National Association of Biology Teachers

ECOLOGY/ENVIRONMENTAL SCIENCE TEACHING AWARD

David Amidon
Onondaga Nation School, Nedrow, NY

This award recognizes a middle or high school teacher who has successfully developed and demonstrated an innovative approach in the teaching of ecology/environmental science and has carried their commitment to the environment into the community.

Sponsored by Vernier Software and Technology

EXCELLENCE IN ENCOURAGING JEDI AWARD

Cameron Simpkins
Fayetteville High School, Fayetteville, AR

The NABT Excellence in Encouraging Justice, Equity, Diversity, and Inclusion (JEDI) Award recognizes efforts to promote equity in life science education. The recipient/recipients demonstrate a passion and commitment for JEDI through their teaching and outreach while also identifying successful strategies that increase enthusiasm for biology.

Sponsored by the National Association of Biology Teachers

EVOLUTION EDUCATION AWARD

Briana Pobiner, PhD
Smithsonian Institution, Washington, DC

This award recognizes innovative classroom teachers and their efforts to promote the accurate understanding of biological evolution within the larger community.

Sponsored by BSCS Science Learning & NCSE

FOUR-YEAR COLLEGE & UNIVERSITY SECTION BIOLOGY TEACHING AWARD

Krista Lucas, PhD
Pepperdine University, Malibu, CA

This award recognizes creativity and innovation in undergraduate biology teaching, including curriculum design, teaching strategies, and laboratory utilization that have been implemented and demonstrated to be effective.

Sponsored by NABT's Four-Year College & University Section

FOUR-YEAR COLLEGE & UNIVERSITY SECTION RESEARCH IN BIOLOGY EDUCATION AWARD

Not awarded in 2024.

Recognizing innovation in research that furthers our understanding of undergraduate biology teaching, this award is given to an individual who displays creativity in scholarship and research in biology education.

Sponsored by NABT's Four-Year College & University Section

GENETICS EDUCATION AWARD

Abdalla Ibrahim Zanouny, PhD
University of Houston, Houston, TX

This award recognizes innovative, student-centered classroom instruction that promotes the understanding of genetics and its impact on inheritance, health, and biological research.

Sponsored by Genetics Society of America

HONORARY MEMBERSHIP

Mark Little
Broomfield High School (retired), Arvada, CO

Donald French, PhD
Oklahoma State University (emeritus), Stillwater, OK

The highest honor from the association, the Honorary Membership recognizes those individuals who have achieved distinction in teaching, research, or service in the biological sciences and designates them lifetime members of NABT.

Sponsored by the National Association of Biology Teachers

JENNIFER PFANNERSTILL TRAVEL AWARD

Yajaira Fuentes-Tauber, EdD
Rocky Mountain High School, Fort Collins, CO

Established to honor the memory of Jennifer Pfannerstill, this award is a need-based scholarship to support a teacher who has demonstrated a commitment to personal and professional development by helping that individual attend the NABT Conference for the first time.

Sponsored by NABT, BFW, and Donations

THE KIM FOGLIA AP® BIOLOGY SERVICE AWARD

Anne Gill
Cy-Fair High School, Cypress, TX

The Kim Foglia AP® Biology Service Award recognizes an AP® Biology teacher who displays a willingness to share materials, serves as a mentor to both students and professional colleagues, creates an innovative and student-centered classroom environment, and exemplifies a personal philosophy that encourages professional growth as a teacher and member of the AP® community.

Sponsored by the National Association of Biology Teachers

OUTSTANDING BIOLOGY TEACHER AWARD (OBTA)

See the full OBTA listing for 2024 Honorees

For over 50 years, the Outstanding Biology Teacher Award (OBTA) honors outstanding biology educators from grades 7-12 who are judged on their teaching ability and experience, cooperativeness in the school and community, creativity, inventiveness, initiative, and student-teacher relationships.

Sponsored by Carolina Biological Supply Company, with special consideration from Bio-Rad Laboratories, miniPCR, and Botanical Society of America

OUTSTANDING NEW BIOLOGY TEACHER ACHIEVEMENT AWARD

Robin Coffman
Whitko Jr./Sr. High School, Whitley, IN

This award recognizes outstanding teaching in grades 7-12 by a "new" biology/life science instructor within their first three years of teaching biology who has developed an original and outstanding program or technique while also making a contribution to the profession at the start of their career.

Sponsored by the National Association of Biology Teachers

PROF. CHAN TWO-YEAR COLLEGE AWARD FOR THE ENGAGED TEACHING OF BIOLOGY

Ranya Taqieddin, PhD
Saint Charles Community College, Saint Peters, MO

This award recognizes a two-year college faculty member who has successfully developed and demonstrated an innovative, hands-on approach in the teaching of biology and has carried their commitment into the community to promote biology education.

Sponsored by Sarah McBride and John Melville

THE RON MARDIGIAN BIOTECHNOLOGY TEACHING AWARD

Bob Kuhn
FCS Innovation Academy, Alpharetta, GA

This award recognizes a secondary school teacher or undergraduate college biology instructor who demonstrates outstanding and creative teaching of biotechnology by incorporating active laboratory work in the classroom.

Sponsored by Bio-Rad Laboratories

TWO-YEAR COLLEGE BIOLOGY TEACHING AWARD

Cheston Saunders
Piedmont Community College, Roxboro, NC

This award recognizes a two-year college biology educator who employs new and creative techniques to demonstrate excellence in teaching and scholarship through publications, teaching strategies, curriculum design, or laboratory utilization.

Sponsored by NABT's Two-Year College Section and Cell Zone, Inc.

OBTA OUTSTANDING

Outstanding Biology Teacher Award

For over 60 years, the National Association of Biology Teachers has been committed to recognizing outstanding biology teachers.

THE OUTSTANDING BIOLOGY TEACHER AWARD IS PROUDLY SPONSORED BY:

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Other consideration provided by Bio-Rad Laboratories, miniPCR, and Botanical Society of America.

THANK YOU TO OUR OBTA DIRECTORS

To our OBTA Directors, whose ongoing commitment to this program has helped NABT present the award to thousands of outstanding teachers.

NABT
National Association of Biology Teachers

OBTA HONOREES 2024

REGION I

Lindsey L'Ecuyer, EdD
Andover High School
Andover, MA

Matthew Custer
Lebanon High School
Lebanon, NH

REGION II

Sarah Avery
Baltimore Polytechnic Institute
Baltimore, MD

Jennifer Alvarado
Cinnaminson High School
Cinnaminson, NJ

REGION III

Susan Remshak
Grayslake North High School
Grayslake, IL

Angelia Floyd
Bloomington High School South
Bloomington, IN

Patricia Richardson
Forest Hills Central High School
Grand Rapids, MI

Jennifer Sunderman Broo
Mariemont High School
Cincinnati, OH

REGION IV

Julie Schwarting
Lawrence Free State High School
Lawrence, KS

Erin Schmidt
Totino-Grace High School
Fridley, MN

Karen Moffat, EdD
Festus High School
Festus, MO

REGION V

Erica Sypole
South Brunswick High School
Southport, NC

Rachel Lytle
Brentwood High School
Brentwood, TN

REGION VI

Chenein Compton
Oxford High School
Oxford, AL

Crystal McDowell
Greenbrier High School
Evans, GA

Kenneth Hackman
Madison Central High School
Madison, MS

REGION VII

Jentry Yard
Dr. Camille Casteel High School
Queen Creek, AZ

Mark Travis
Greenwood High School
Greenwood, AR

Christopher Speck
Madison Middle School
Albuquerque, NM

Jennifer Hofeld
Harrah High School
Harrah, OK

Vanilla Macias-Rodriguez
Providence Catholic School
San Antonio, TX

REGION VIII

Yajaira Fuentes-Tauber, EdD
Rocky Mountain High School
Fort Collins, CO

Felicia King
Gallatin High School
Bozeman, MT

REGION IX

Karen Broad
Western Sierra Collegiate Academy
Rocklin, CA

Rama Devagupta, PhD
Southridge High School
Kennewick, WA

PAST PRESIDENTS & CONFERENCE LOCATIONS

2023 Tara Jo Holmberg, Baltimore, MD
2022 Chris Monsour, Indianapolis, IN
2021 Julie Angle, Atlanta, GA
2020 Sharon Gusky, Online Conference
2019 Sherry Annee, Chicago, IL
2018 Elizabeth Cowles, San Diego, CA
2017 Susan Finazzo, St. Louis, MO
2016 Bob Melton, Denver, CO
2015 Jane Ellis, Providence, RI
2014 Stacey Kiser, Cleveland, OH
2013 Mark Little, Atlanta, GA
2012 Donald French, Dallas, TX
2011 Dan Ward, Anaheim, CA
2010 Bunny Jaskot, Minneapolis, MN
2009 John M. Moore, Denver, CO
2008 Todd Carter, Memphis, TN
2007 Pat Waller, Atlanta, GA
2006 Toby Horn, Albuquerque, NM
2005 Rebecca E. Ross, Milwaukee, WI
2004 Betsy Ott, Chicago, IL
2003 Catherine W. Ueckert, Portland, OR
2002 Brad Williamson, Cincinnati, OH
2001 Ann S. Lumsden, Montreal, QC, Canada
2000 Phil McCrea, Orlando, FL
1999 Richard D. Storey, Ft. Worth, TX
1998 ViviannLee Ward, Reno, NV
1997 Alan McCormack, Minneapolis, MN
1996 Elizabeth Carvellas, Charlotte, NC
1995 Gordon E. Uno, Phoenix, AZ
1994 Barbara Schulz, St. Louis, MO
1993 Ivo E. Lindauer, Boston, MA
1992 Alton L. Biggs, Denver, CO
1991 Joseph D. McInerney, Nashville, TN
1990 Nancy V. Ridenour, Houston, TX
1989 John Penick, San Diego, CA
1988 Jane Abbott, Chicago, IL
1987 Donald S. Emmeluth, Cincinnati, OH
1986 George S. Zahrobsky, Baltimore, MD
1985 Thomas R. Mertens, Orlando, FL
1984 Marjorie King, Purdue Univ., IN
1983 Jane Butler Kahle, Philadelphia, PA
1982 Jerry Resnick, Detroit, MI
1981 Edward J. Kormondy, Las Vegas, NV
1980 Stanley D. Roth, Boston, MA
1979 Manert Kennedy, New Orleans, LA
1978 Glen E. Peterson, Chicago, IL
1977 Jack L. Carter, Anaheim, CA
1976 Haven Kolb, Denver, CO
1975 Thomas J. Cleaver, Portland, OR
1974 Barbara K. Hopper, New York, NY
1973 Addison E. Lee, St. Louis, MO
1972 Claude A. Welch, San Francisco, CA
1971 H. Bentley Glass, Chicago, IL
1970 Robert E. Yager, Denver, CO
1969 Burton E. Voss, Philadelphia, PA
1968 Jack Fishleder, Anaheim, CA
1967 William V. Mayer, New York, NY w/AAAS
1966 Arnold B. Grobman, Washington, DC w/AAAS
1965 L. S. McClung, U of CA, Berkeley w/AAAS
1964 Ted F. Andrews, Boulder, CO w/AIBS
1963 Philip R. Fordyce, U of MA, Amherst, MA w/AIBS
1962 Muriel Beuschlein, Corvallis, OR w/AIBS
1961 Paul V. Webster, Denver, CO w/AAAS
1960 Howard E. Weaver, New York, NY w/AAAS
1959 Paul Klinge, Chicago, IL w/AAAS
1958 Irene Hollenbeck, Washington, DC w/AAAS
1957 John Breukelman, Indianapolis, IN w/AAAS
1956 John P. Harrold, New York, NY w/AAAS
1955 Bro. H. Charles Severin, Atlanta, GA w/AAAS
1954 Arthur J. Baker, Berkeley, CA w/AAAS
1953 Leo F. Hadsall, Boston, MA w/AAAS
1952 Harvey E. Stork, St. Louis, MO w/AAAS
1951 Richard L. Weaver, Philadelphia, PA w/AAAS
1950 Betty L. Wheeler, Cleveland, OH w/AAAS
1949 Ruth A. Dodge, New York, NY w/AAAS
1948 Howard A. Michaud, Washington, DC w/AAAS
1947 E. Laurence Palmer, Chicago, IL w/AAAS
1946 Prevo L. Whitaker, Boston, MA w/AAAS
1945 Helen Trowbridge, St. Louis, MO w/AAAS
1944 Merle A. Russell, No Meeting
1943 Merle A. Russell, No Meeting
1942 Homer A. Stephens, No Meeting
1941 George W. Jeffers, Dallas, TX w/AAAS
1940 Malcolm D. Campbell, Philadelphia, PA w/AAAS
1939 Myrl C. Lichtenwalter, Columbus, OH w/AAAS
1938 First Formal Meeting*, Richmond, VA w/ AAAS

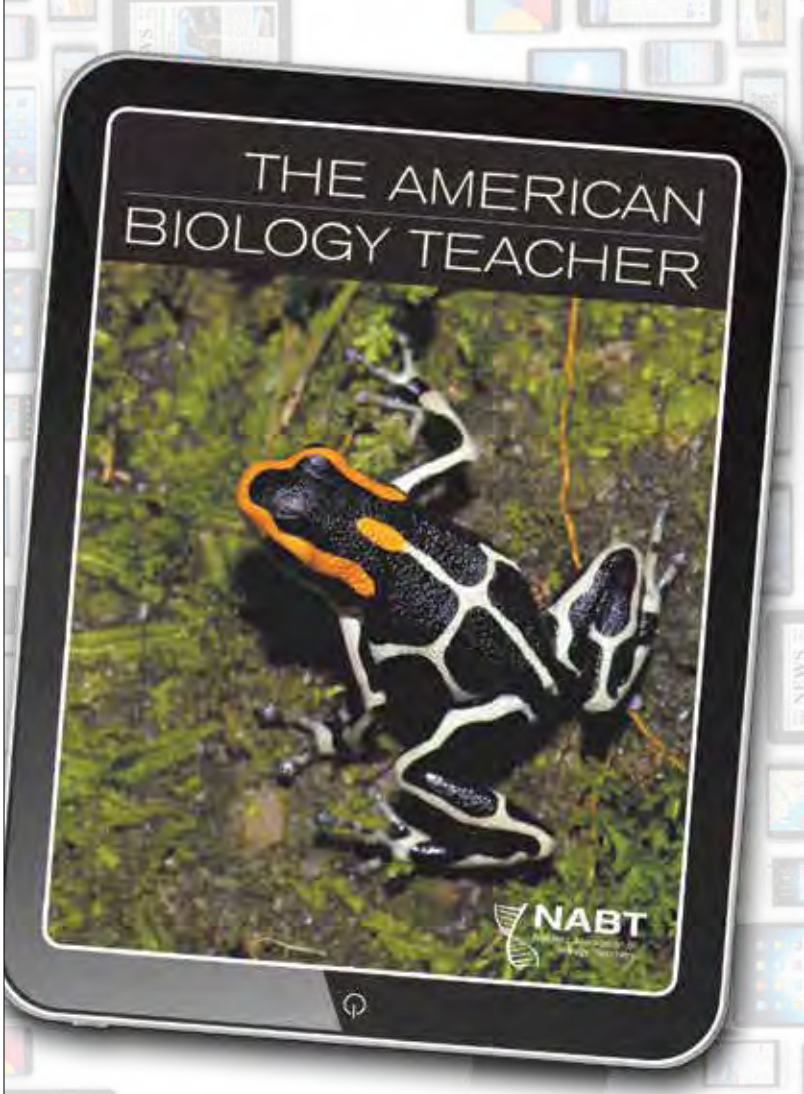
* NABT established on July 1, 1938 in New York City, NY

HONORARY MEMBERS

2023 William F. McComas
2022 John A. Jungck
2021 Patsye Peebles
2020 Bob Melton
2019 Dennis Gathmann
2018 Michael Sipes
2017 John M. Moore
2016 Margaret (Betsy) Ott
2015 Sharon Radford
2014 Jay Labov
2013 Todd Carter
2012 Maura Flannery
2011 Louisa Stark
2010 Patricia Waller, Brad Williamson
2009 *NOT AWARDED*
2008 Donald Cronkite
2007 William H. Leonard
2006 Terry Hufford
2005 Randy Moore, Eugenie Scott
2004 John Penick
2003 Donald Emmeluth
2002 Leonard Blessing
2001 Gordon E. Uno
2000 Elizabeth Carvellas
1999 *NOT AWARDED*
1998 Ivo Lindauer
1997 Sam Rhine
1996 Kenneth S. House
1995 Joseph D. Novak
1994 Nancy V. Ridenour, Alton L. Biggs
1993 George S. Zahrobsky
1992 Jon R. Hendrix
1991 Robert E. Yager
1990 Jane Butler Kahle
1989 Joseph D. McInerney
1988 Thomas Mertens, Marjorie King
1987 Floyd Nordland
1986 Donald S. Dean
1985 Stanley Weinberg
1984 Jack Carter, Samuel Postlethwait
1983 Manert Kennedy
1982 Harold "Sandy" Wiper, Jerry P. Lightner
1981 Sophie Wolfe
1980 Sister M. Gabrielle, Ted F. Andrews, Sister Marian Catherine McGrann
1979 Ingrith Olsen
1978 John A. Moore
1977 Addison E. Lee
1976 Paul DeHart Hurd
1975 Garrett Hardin, Stanley E. Williamson
1974 H. Seymour Fowler
1973 William V. Mayer
1972 Chester A. Lawson, Paul E. Klinge, Robert L. Gantert
1971 *NOT AWARDED*
1970 *NOT AWARDED*
1969 Arnold B. Grobman
1968 *NOT AWARDED*
1967 *NOT AWARDED*
1966 *NOT AWARDED*
1965 John Breukelman, H. Bentley Glass, George W. Beadle, Paul B. Sears, Brother H. Charles Severin
1964 E. Laurence Palmer, Hermann J. Muller, Roger Tory Peterson, Oscar Riddle, Helen Irene Battle

NABT DISTINGUISHED SERVICE AWARD RECIPIENTS

2023 Lee Berger, Explorer in Residence at National Geographic, Johannesburg, South Africa
2022 Michael Osterholm, CIDRAP, University of Minnesota, Minneapolis, MN
2021 Jeff Corwin, Marshfield, MA
2020 *NOT AWARDED*
2019 Bonnie Bassler, Princeton University, Princeton, NJ
2018 Ed Yong, The Atlantic, Washington, DC
2017 May Berenbaum, University of Illinois Urbana-Champaign, Urbana, IL
2016 Temple Grandin, Colorado State University, Fort Collins, CO
2015 Carl Zimmer, Yale University, New Haven, CT
2014 The Lacks Family (descendents of Henrietta Lacks), Baltimore, MD
2013 Rita R. Colwell, University of Maryland College Park and Johns Hopkins University Bloomberg School of Public Health, College Park, MD
2012 Michael Pollan, UC Berkeley Graduate School of Journalism, Berkeley, CA
2011 Neil Shubin, University of Chicago, Chicago, IL
2010 Richard Dawkins, The Richard Dawkins Foundation for Reason and Science, Falcon, CO
2009 Mario Capecchi, University of Utah, Salt Lake City, UT
2008 Ken Miller, Brown University, Providence, RI
2007 Sean Carroll, University of Wisconsin-Madison Madison, WI
2006 Shirley Malcom, AAAS, Washington, DC
2005 James A. Thompson, University of Wisconsin-Madison, Madison, WI; and Nina Leopold Bradley, Aldo Leopold Foundation, Baraboo, WI
2004 Barbara Bancroft, RN, CPP Associates, Inc., Chicago, IL
2003 Roberta Pagon, MD, Children's Hospital & Regional Medical Center, Seattle, WA
2002 Thomas E. Lovejoy, The H. John Heinz III Center for Science, Economics and the Environment, Washington, DC
2001 E.O. Wilson, Harvard University, Cambridge, MA
2000 Roger and Deborah Fouts, Chimpanzee and Human Communication Institute, Ellensburg, WA
1999 Jack Horner, Museum of the Rockies, Bozeman, MT
1998 Leroy Hood, University of Washington, Seattle, WA
1997 Neal Lane, National Science Foundation, Washington, DC; and Donald Kennedy, Stanford University, Palo Alto, CA
1996 Francis Collins, National Institutes of Health, Bethesda, MD
1995 Carl Djerassi, Stanford University, Palo Alto, CA
1994 Bruce Alberts, National Academy of Sciences, Washington, DC
1993 Nancy S. Wexler, College of Physicians and Surgeons of Columbia University, New York State Psychiatric Institute, New York, NY
1992 Paul R. Ehrlich, Stanford University, Palo Alto, CA
1991 Stephen Jay Gould, Harvard University, Cambridge, MA
1990 Peter Raven, Missouri Botanical Garden, St. Louis, MO
1989 Stanley Cohen, Stanford University, Palo Alto, CA
1988 Lynn Margulis, University of Massachusetts, Boston, MA; and James D. Watson, Cold Spring Laboratory, Cold Spring Harbor, NY



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NABT
National Association of Biology Teachers

Thursday
November 14

GENERAL SESSION SPEAKER

Janet Carlson, PhD
Associate Professor, Emerita
Center to Support Excellence in Teaching (CSET)
Stanford University, Stanford, CA

Janet Carlson, PhD, is an Associate Professor (Research) Emerita at Stanford University's Center to Support Excellence in Teaching (CSET). Her work focuses on the bridge between research and practice, and she has supported a diverse portfolio of research, design, and development activities that improve instruction and develop leading educators who emphasize equity in the classroom and positively impact the learning of all students. Janet's interest in bringing research into practice began when she was a classroom teacher. After earning a BA in Environmental Biology from Carleton College, she taught high school biology and middle school life science teacher and joined NABT. She quickly realized that the mix of curriculum, assessments, and teaching practices she used affected the learning outcomes of her students. Her curiosity about what was more and less effective —and why—led her back to graduate school and further study. She went on to earn an MA in Curriculum and Instruction from Kansas State University and a PhD in Science Education from the University of Colorado. In between and after earning those degrees, she spent 20 years at BSCS (now BSCS Science Learning), where she served as the Executive Director. She then moved to CSET at Stanford, where she has been based for over a decade.

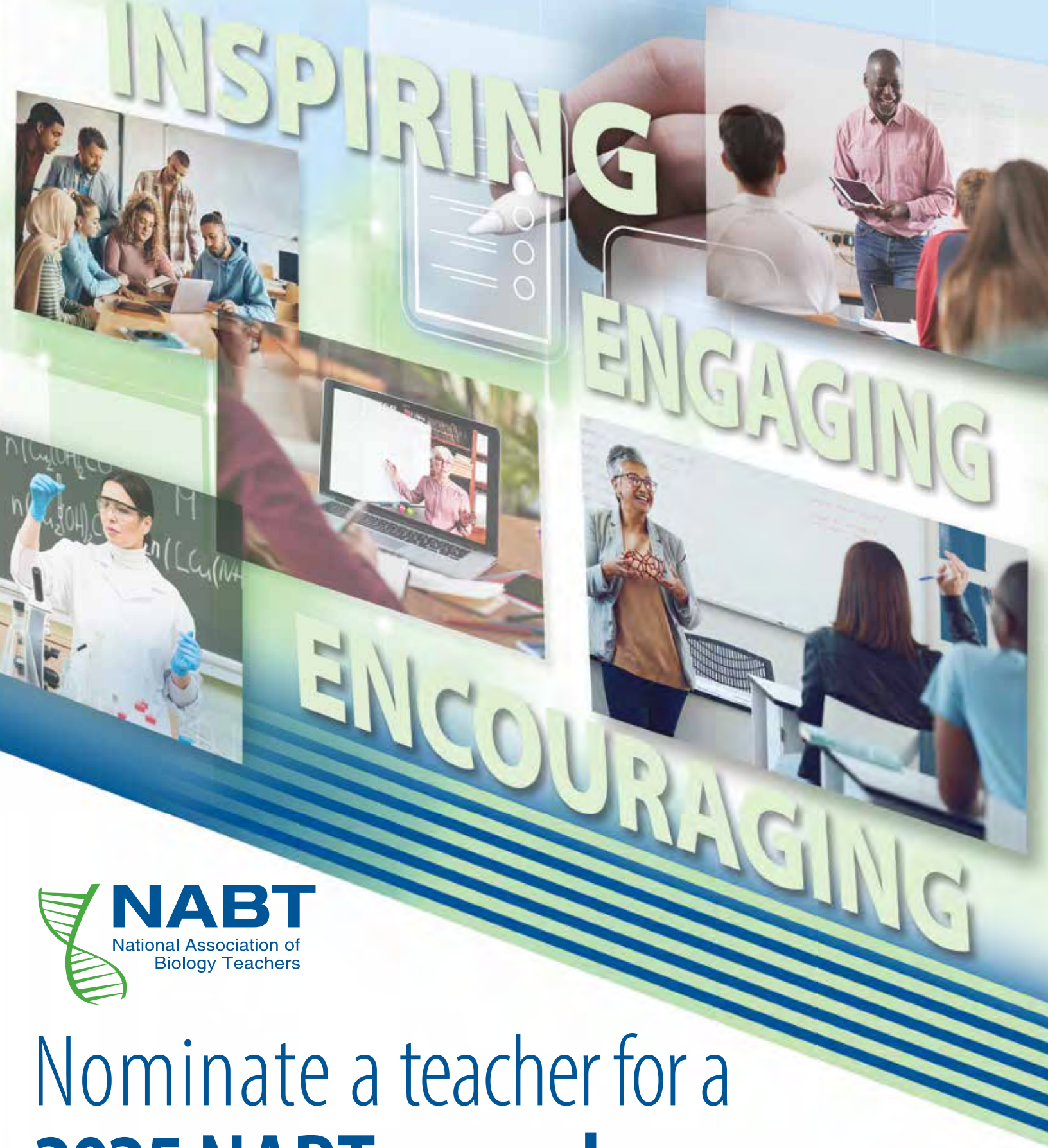
Friday
November 15

GENERAL SESSION SPEAKER

Alex Troutman, MS
Outdoors Enthusiast, Wildlife Biologist and Science Educator
Austell, GA

Alex Troutman is a wildlife biologists and co-organizer of several *Black in X* weeks, including *Black Birders Week*, *Black Mammologists Week*, and *Black in Marine Science Week*. This movement encourages diversity in nature, the celebration of Black individual scientists, awareness of Black nature enthusiasts, and diversity in STEAM fields. He understands what it is like to grow up without "wildlife role models" who looked like you, and dedicates his time to fulfilling that representation for future generations of Black or POCs (people of color) scientists.

Alex earned both his Bachelor of Science and Masters degree in Biology from Georgia Southern University, and endeavors to promote a similar passion for biology by leading groups on nature hikes and through public speaking engagements.



NABT
National Association of Biology Teachers

Nominate a teacher for a **2025 NABT award.**

Submit your nomination online before March 15th

https://nabt.org/Awards-NABT-Award-Nomination-Form

Saturday November 16

INVITED SPEAKER

Briana Pobiner, PhD
Human Origins Program
Smithsonian National Museum of Natural History, Washington, DC

Briana Pobiner, PhD, is a paleoanthropologist and museum educator whose science research centers on the evolution of Early Stone Age human diets (with a focus on meat-eating) and whose education research centers on the teaching and learning of human evolution in high school biology classrooms. Since joining the Smithsonian in 2005 to help put together the Hall of Human Origins, in addition to continuing her active field, laboratory, and experimental research programs, she has led the Human Origins Program's education and outreach efforts. Briana is also an Associate Research Professor of Anthropology in the Center for the Advanced Study of Human Paleobiology at George Washington University. Briana has a BA from Bryn Mawr College, where she created her own major called Evolutionary Studies, and an M. and PhD in Anthropology from Rutgers University. She is the recipient of the 2021 American Association of Biological Anthropologists and Leakey Foundation *Communication and Outreach Award* in Honor of Camilla Smith, a 2021 National Center for Science Education Friend of Darwin awardee, and the 2024 recipient of the *Evolution Education Award* from the National Association of Biology Teachers.

Saturday November 16

INVITED SPEAKER

Natalia Reagan, MA
Anthropologist, Primatologist, Actor, Producer, Writer, Host and Comedian
Los Angeles, CA

Natalia Reagan is an anthropologist, primatologist, comedian, host, producer, podcaster, professor, writer, frequent animal expert, and monkey chasing weirdo. Her training was in a four-field approach to anthropology and she often examines topics through a bio-cultural lens. Natalia is a comedy writer and correspondent, and has been featured on numerous shows and podcasts, including Neil deGrasse Tyson's *StarTalk, the Thrillist's Daily Hit, History's Unbelievable, UnXplained & UnXplained Now*, Scientific American's *Science Quickly*, Travel Channel's *Paranormal Caught on Camera*, and Spike TV's *10 Million Dollar Bigfoot Bounty*. Natalia was also a writer and host for Discovery's DNews, Seeker, and TestTube, as well as an animal expert on Nat Geo Wild's *Everything You Didn't Know about Animals*. Before becoming a scientist, Natalia was an actress and comedian, and it took getting hit by her own 1994 Ford Ranger on the shoulder of the 101 freeway for her to go back to school to become an anthropologist. After getting her Masters, Natalia began producing science comedy videos in her garage. Natalia's passion includes combining science and comedy to help democratize science and spread science literacy while inducing spit takes!

2024 NABT EVOLUTION SYMPOSIUM

Friday, November 15, 2024 | 10:30 am – 12:30 pm | Platinum Ballroom 3/4

NCSE National Center for Science Education

Mammal Madness

A Lioness Walks Into an Orca: How Stories Enhance Science Education

Katie Hinde, *Arizona State University*

Katie Hinde, award-winning scholar and founder of March Mammal Madness, discusses how human minds are adapted for sharing stories about nature, which underlies the success of MMM.

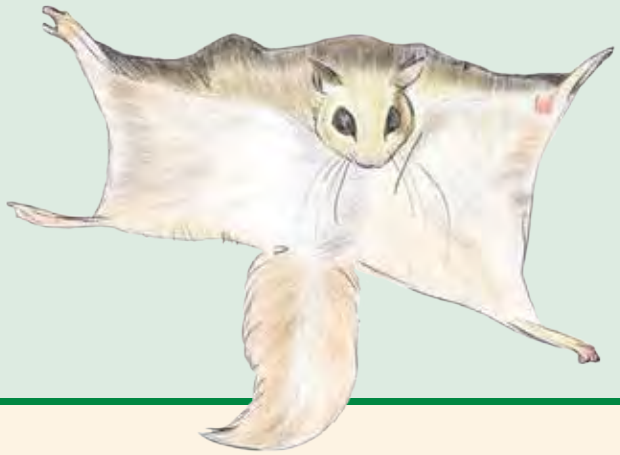
A March Mammal Madness Extravaganza!

NCSE TEACHER WORKSHOP:

Mystery Mammal Madness: Curious Cases of Convergence

Blake Touchet, **Jeff Grant**, *NCSE*

Help students overcome common misconceptions about evolution through a convergent evolution storyline. We'll share effective classroom strategies and distribute NCSE-developed resources.



Join us for a FREE, online version of "Mammal Madness" on Darwin Day, February 12, 2025.

Celebrate Charles Darwin's birthday as Katie Hinde and NCSE staff reprise their NABT presentation.

PLUS: 2025 March Mammal Madness surprises are in store for attendees!

Join the NCSEteach email list and stay tuned for details on how to register for the event.

Thursday

SESSSION KEY:

ELEM - Elementary
MS - Middle, Junior High
HS - High School
2Y - 2-year College
4Y - 4-year College & University

10:30AM–3:30PM

1675-105516 Cultivating Authentic Dialogue in College STEM Classrooms

Orange County Ballroom 3 & 4 • JEDI / Inclusive Teaching Practices • Special Workshop (Full Day) • 2Y, 4Y

We will showcase the IGELS "Consideration Tree," which provides a structure to help STEM instructors evaluate the risks and rewards of their topic choices. Participants will discuss ways to support trustful dialogue in the classroom, identify resources to cultivate a reflective and empathetic mindset, develop language to articulate the value and process of contemplative teaching to colleagues and campus leadership, and manage discomfort in the classroom in a productive way.

Bryan Dewsbury, Florida International University, Miami, FL; Dayna Defeo, University of Alaska-Anchorage, Anchorage, AK; Gabriela Hamerlinck, University of Florida, Gainesville, FL; Elizabeth Harrison, Kennesaw State University, Kennesaw, GA; Heather Rissler, North Iowa Area Community College, Mason City, IA; Davida Smyth, Texas A&M University-San Antonio, San Antonio, TX; Gordon Uno, University of Oklahoma, Norman, OK

11:30AM–1:30PM

NABT Board of Directors Meeting & Leader Lunch

Platinum Ballroom 4 • Committee Meeting (2 hours) • Invitation Only

12:30PM–3:30PM

1675-108045 SCST Presents: Optimizing Instructional Strategies

Gold Key I & II • Instructional Strategies • Special Symposium (3 hours) • 2Y, 4Y

Join the Society for College Science Teaching (SCST) for this interactive symposium featuring multiple interdisciplinary presentations highlighting best practices and effective strategies for teaching science at the undergraduate level. Group discussions will also explore successful teaching strategies and barriers to implementation, as well as future opportunities and challenges in college science teaching.

Kennedy Conroy and Thayne Sweeten, Utah State University, Logan, UT; Jason R. Wiles, Syracuse University, Syracuse, NY; Derrick A. Nero, University of Nebraska-Omaha, Omaha, NE; Tarren J. Shaw, University of Oklahoma, Norman, OK; Renee M. Clary and Athena Owen Nagel, Mississippi State University, Mississippi State, MS

12:30PM–3:30PM CONT.

1675-106290 *20 in 20* and Beyond

Orange County Ballroom 1 • General Biology • Special Workshop (3 hours) • ML, HS, GA

Come try numerous 20-minute inquiry-based activities that are sure to engage and excite your students. You and your students will be glad you did!

Whitney Crispen Hagins, MassBioEd (retired), Bolton, MA

1675-106377 Using Societal Challenges as Phenomena in Three-Dimensional Units to Develop Student Agency

Orange County Ballroom 2 • Instructional Strategies • Special Workshop (3 hours) • ML, HS, 2Y

Experience how BSCS's Anchored Inquiry Learning instructional model leverages complex, culturally relevant societal challenges as phenomena in three-dimensional teaching and learning to support all students' learning and development of agency!

Cindy Gay, BSCS Science Learning, Steamboat Springs, CO

1675-108475 NCSE Presents: Scientific Literacy in the Digital Age of Misinformation

Platinum Ballroom 1 • Science Practices • Special Workshop (3 hours) • HS, 2Y, GA

Students are being exposed to more scientific misinformation and disinformation than ever before. Teaching them to identify sound science accurately can be challenging. Join NCSE as we offer practical tools and strategies to navigate an increasingly digital world.

Wendy Johnson and Blake Touchet, National Center for Science Education, Oakland, CA

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12:30PM–3:30PM CONT.

1675-106258 HHMI BioInteractive Storylines for Coherent Instruction

Platinum Ballroom 2 • Curriculum Development • Special Workshop (3 hours) • HS, 2Y, 4Y

Storylines (coherent lesson sequences) anchored in engaging phenomena improve student engagement and understanding of overarching biological concepts. In this workshop, facilitators will model using phenomena to lead storyline-based instruction. Participants will experience components of a new, freely available storyline that explores the biology of the sickle cell trait. This storyline was designed with AP® Biology and undergraduate introductory courses in mind, but educators teaching general high school biology will also benefit from the experience.

Britt Murcko Czupryna, Niles West High School, Niles, IL; Michele Koehler, Riverside-Brookfield High School, Brookfield, IL; Kathy van Hoeck, York Community High School (retired), Marion, IA; Jason Crean, HHMI BioInteractive, Chevy Chase, MD

2:30PM–3:30PM

NABT Open Forum

Platinum Ballroom 4 • Committee Meeting • GA

The NABT Board of Directors and Executive Director will lead this interactive discussion on the association's state. Updates on current and future initiatives will also be shared. Everyone is invited to learn more about our operations, provide feedback on the programs we support, and get more involved with NABT.

4:00PM–5:30PM

Janet Carlson

See biography on page 16

Building Bridges: Connecting Research with Practice for Highly Effective Teaching

Platinum Ballroom 5 & 6 • Special Speaker • GA

Current education research highlights ways to provide effective, high-quality learning experiences for both students and instructors. Yet, we still need to bridge the gap between what the research tells us to do and what we actually do. In this interactive session, participants will review several research areas related to effective teaching. You'll consider key ideas about how people learn, the knowledge and skills of highly effective teachers, and how to deepen your classroom practice to enhance student learning. Dr. Carlson will then introduce a model that illustrates the relationship between what you know and what you do as a teacher and how that relates to more equitable learning experiences for your students. By the end of this session, you'll have reflected on the complexity of teaching, learned strategies on how to use research findings to refine your effectiveness with students of any age, and depart with ideas on how to lead from your classroom to encourage others.

5:30PM–6:00PM

NABT Four-Year College & University Executive Committee Meeting

Elite Ballroom • Committee Meeting • 4Y

5:30PM–7:30PM

Exhibit Hall Grand Opening Reception

Marquis Ballroom • Special Event • GA

Get ready for an unforgettable experience in Anaheim! Join us for the grand opening of the 2024 NABT Exhibit Hall, where our amazing sponsors and partners will showcase the latest innovations in life science education. From beloved classics to new favorites, you are sure to find something to elevate your teaching and engage your students!

6:00PM–7:00PM

NABT Past President's Advisory Council Meeting & Reception

Presidential Suite • Invitation Only

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Biotechnology tools & classroom activities

Win a biotech pack worth **over $2,500** for your class!

Workshops in Platinum Ballroom 1

Friday, November 15

8:00 – 9:00 AM	Accessible protein expression and purification for classroom settings
10:30 – 11:45 AM	Hands-on activities to bring CRISPR/Cas to your class
12:00 – 12:30 PM	Bacterial transformation made easy with True Blue
2:00 – 3:15 PM	Genotype to Phenotype. A hands-on PTC Taster Lab
3:30 – 4:00 PM	Tools and activities to implement genetics research in advanced high school or undergraduate biology courses

Thermal cyclers

Electrophoresis

Molecular viewer

Friday

SESSSION KEY:

ELEM - Elementary
MS - Middle, Junior High
HS - High School
2Y - 2-year College
4Y - 4-year College & University

7:30AM–8:30AM

NABT First Timers' Coffee Break

Grand Ballroom E • Special Event (60 min) • GA

First-time conference attendees are invited to learn more about NABT, the 2024 Professional Development Conference, and connect with other "first timers." NABT leaders and former "first timers" will also be available to answer your questions and help you make the most of your time in Anaheim.

8:00AM–9:00AM

NABT BIPOC Practitioners' Affinity Meeting

Gold Key I & II • JEDI / Inclusive Teaching Practices • Special Event (60 min) • GA

Network with fellow BIPOC practitioners to connect and build relationships! This event is open to any practitioner of any level who self-identifies as a Black, Indigenous, and/or person of color.

8:00AM–9:00AM CONT.

SPECIAL PROGRAMMING PRESENTED BY BIO-RAD

1675-109132 Determination of Biological Sex with the Bradford Assay: A Forensic Approach

Grand Ballroom C & D • Biotechnology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Discover forensic biotech in our workshop. Perform Bradford Assay for gender ID from fingerprints and delve into biochemical analysis with practical skills.

Damon Tighe, Bio-Rad Laboratories, Hercules, CA

SPECIAL PROGRAMMING PRESENTED BY MINIPCR

1675-109548 Accessible Protein Expression and Purification for Classroom Settings

Platinum Ballroom 1 • Biotechnology • Hands-on Workshop (60 min) • HS, 2Y, 4Y

Hands-on protein expression and purification in a classroom-friendly format! Express a mixture of fluorescent proteins using cell-free protein technology, then separate them using affinity purification. Magnetic purification means no columns!

Ally Huang, miniPCR bio, Cambridge, MA

9:15AM–10:15AM

PLENARY SPEAKER

Alex Troutman

See biography on page 17

A Journey Through the Nature Doorway and How Representation Matters for You, Them, and Me

Platinum Ballroom 5 & 6 • Special Speaker (60 min) • GA

Nature serves as a gateway, sparking curiosity and igniting passions for science, biology, and careers in the natural resources and STEAM fields. As we guide others through this 'doorway,' it's essential to provide representation that reflects diverse backgrounds, showcasing individuals who not only look like them, but also share similar life experiences.

By providing and embodying this representation, we can demonstrate to the individuals we hope to reach, and others, that BIPOC individuals can achieve success, often against the "odds." This intentionality ensures an inclusive and inspiring journey into the wonders of the natural world.

10:30AM–12:30PM

NABT EVOLUTION SYMPOSIUM PRESENTED BY NCSE

Mammal Madness

Platinum Ballroom 3 & 4 • Evolution • Special Session (120 min) • GA

A Lioness Walks into an Orca: How Stories Enhance Science Education

Human minds are adapted for story-telling and story-listening, especially about animals and nature. Research from STEM education, evolutionary social science, cultural anthropology, and social psychology demonstrate that stories and illustrations improve learning. These elements have been embedded in education for tens of thousands of years and, in part, underlie March Mammal Madness (MMM).

MMM is a simulated tournament of empirically informed, yet hypothetical, encounters between animal "combatants." Tournament outcomes are revealed by weaving published scholarly science into story arcs, following combatant characters across a series of encounters through numerous ecosystems. Each March, facts and findings are transformed into dramatic reveals and unexpected plot twists as teachers and students learn the fate of their chosen victor. Reaching hundreds of thousands of players worldwide annually, March Mammal Madness demonstrates that dispersing science is most sustainable when good-natured competition is combined with ancestral adaptations for community and storytelling.

Katie Hinde, Arizona State University, Tempe, AZ

Mystery Mammal Madness: Curious Cases of Convergence

This session will provide classroom strategies that challenge students' preconceived notions about evolutionary fitness. Often, students believe fitness is about being bigger, faster, or stronger and that evolution is progressing towards an ultimate outcome. However, by using convergent evolution as an example, students understand that fitness is more about how well an organism is suited to its environment and that there is no predetermined goal. In this storyline introduction, teachers will receive materials to help students evaluate how two completely different groups of organisms can develop the same adaptations.

Blake Touchet, Wendy Johnson, and Jeff Grant, National Center for Science Education, Oakland, CA

Join us at the Anaheim Marriott Hotel
Friday, November 15, 2024 — Grand Ballroom C&D

Come on over to **booth #204** to learn what's new and get free teaching goodies!

8:00–9:15 AM
Determination of Biological Sex with the Bradford Assay: A Forensic Approach
Discover forensic biotech by performing a Bradford Assay for gender identification from fingerprints and delve into biochemical analysis with practical skills.

10:30–11:45 AM
Hands-On CRISPR Gene Editing
Experience CRISPR-Cas9 gene editing experiments designed for your students' learning. In this hands-on workshop, edit a chromosomal gene, with essential experimental controls, using the same cut-and-repair technology used in medicinal and agricultural applications.

12:00–12:30 PM
Pollen Fingerprinting: Uncovering Nature's Role in Forensics
Discover the intriguing world of forensic botany and learn to teach the science of pollen analysis in this interactive workshop.

2:00–3:15 PM
Ozempic/Semaglutide Science: Mastering Diabetes and Weight Loss
Discover how Ozempic (semaglutide) addresses both diabetes and weight loss. Gain insights into the drug's impact on blood sugar control and appetite suppression with interactive ELISA simulations.

3:30–4:00 PM
CRISPR: Now and Beyond
Designed for biology educators' professional development, this talk will delve into CRISPR's evolving landscape, highlighting breakthroughs such as precise gene therapy techniques, advanced delivery systems, and innovative agricultural applications.

There's more to learn! Register now at **Bio-Rad.com/ExplorerEvents** for our upcoming webinars.

Bio-Rad Explorer — Advancing Student Discovery

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24-0687 1024

10:30AM–11:45AM

1675-106278 Providing STEM Enrichment and Connections for the Underserved Population through Collaboration with Local Schools, Businesses, and Organizations

Gold Key I & II • JEDI / Inclusive Teaching Practices • Demonstration (75 min) • HS, 2Y, GA

The Nighthawk Collaborative STEM Connection (NCSC) includes an advisory board of community/business/educational partners that collaborate on existing STEM outreach efforts and are beginning to provide STEM research opportunities for underserved students.

Reggie Cobb, Nash Community College, Rocky Mount, NC

1675-105519 The LifeSkills Guide: A Tool for Faculty Teaching Undergraduate Life Science Courses

Grand Ballroom A & B • Instructional Strategies • Demonstration (75 min) • 2Y, 4Y

The IGELS project (Interactions in General Education Life Science courses) will solicit feedback on a new tool for identifying appropriate student outcomes, activities, and assessments for the general, non-majors life science course.

Gordon Uno, University of Oklahoma, Norman, OK; Sam Donovan, BioQUEST, Pittsburgh, PA; Melanie Lenahan, Raritan Valley Community College, Clinton, NJ; Karla Fuller, Gutmann Community College, New York, NY; Tamar Goulet, University of Mississippi, University MS; Gabriela Hammerlinck, University of Florida, Gainesville, FL; Elizabeth Harrison, Kennesaw State University, Kennesaw, GA; Heather Rissler, North Iowa Area Community College, Mason City, IA; Davida Smyth, Texas A&M University-San Antonio, San Antonio, TX; Bryan Dewsbury, Florida International University, Miami, FL

SPECIAL PROGRAMMING PRESENTED BY BIO-RAD

1675-109220 Do Real Hands-on CRISPR Gene Editing!

Grand Ballroom C & D • Biotechnology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Experience CRISPR-Cas9 gene editing experiments designed for your students' learning! In this hands-on workshop, edit a chromosomal gene with essential experimental controls using the same cut-and-repair technology used in medicinal and agricultural applications.

Damon Tighe, Bio-Rad Laboratories, Hercules, CA

SPECIAL PROGRAMMING PRESENTED BY HHMI

1675-108408 Beyond the Headlines: Constructing Models to Understand the Effects of Climate Change on Biodiversity

Grand Ballroom F • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Participants will explore phenomena to develop explanations of how the carbon cycle affects biodiversity at the ecosystem level. We'll explore BioInteractive resources that introduce students to diverse scientists, global impacts, and solutions to climate change.

Diana Siliezar-Shields, Barrington High School, Barrington, RI and Tanea Hibler, Rabun Gap-Nacoochee School, Rabun Gap, GA

SPECIAL PROGRAMMING PRESENTED BY CAROLINA

1675-107861 The Case of the Murdered Mayor–Solve a Forensic Case Using Multiple Lines of Evidence

Orange County Ballroom 1 • Biotechnology • Hands-on Workshop (75 min) • ML, HS, 2Y

Assume the role of a crime scene investigator solving a crime scenario. Students use fingerprinting, hair analysis, tire impressions, blood typing, forensic entomology, and a police log to identify a suspect from six alleged perpetrators.

Ryan Hainey, Carolina Biological Supply Company, Burlington, NC

SPECIAL PROGRAMMING PRESENTED BY BIOZONE

1675-108512 BIOZONE Showcase–New Biology Titles for AP®, IB, NGSS, APES, and Anatomy & Physiology

Orange County Ballroom 2 • General Biology • Demonstration (75 min) • HS

Explore the innovative methodologies used to deliver engaging programs for AP® Biology, APES, NGSS, IB Biology, Anatomy & Physiology, and Environmental Science. Attendees receive a free print copy, plus 90-day access to BIOZONE World.

Richard Allan, BIOZONE Corporation, Parker, CO

10:30AM–11:45AM CONT.

1675-106491 Health Hacking: Students Exploring Health Outcomes with Big Data

Orange County Ballroom 3 · Biotechnology · Demonstration (75 min) · ML, HS

Engage students in authentic health research using the "All of Us" research dataset. We will present curriculum we used to engage students in this robust dataset to investigate their own research questions about biomedicine.

Matthew Blank, Katherine Harris, and Jimmie Thomas, Baylor College of Medicine, Houston, TX

1675-106184 Dragons, CER, iNaturalist and More–Using the ABT for Classroom Lessons

Orange County Ballroom 4 · Instructional Strategies · Hands-on Workshop (75 min) · ML, HS

Learn how dragon traits and molecular data teach biology students how to use a cladogram model to interpret and test predictions. Learn how to use CER to improve student writing and literacy.

Mark Little (retired), Broomfield High School, Arvada, CO

SPECIAL PROGRAMMING PRESENTED BY MINIPCR

1675-109550 Hands-on Activities to Bring CRISPR/Cas to Your Class

Platinum Ballroom 1 · General Biology · Hands-on Workshop (75 min) · HS, 2Y, 4Y

See our suite of CRISPR/Cas activities. We have something for everyone with both in vitro and in vivo CRISPR/Cas labs and free resources such as paper modeling activities.

Ally Huang, miniPCR bio, Cambridge, MA

1675-106238 Too New for Textbooks: Stories of DNA Discovery from the Past Year

Platinum Ballroom 2 · Genetics · Demonstration (75 min) · ML, HS, 2Y

Want to learn about brand-new genetic discoveries? Hear about the impact of these discoveries and how they connect to curricula to bring cutting-edge science to life. Plus, get the new HudsonAlpha Guidebook!

Kelly East and Jennifer Hutchison, HudsonAlpha Institute for Biotechnology, Huntsville, AL

1675-105442 Using AI as a Tool for Differentiation

Platinum Ballroom 7 · Curriculum Development · Hands-on Workshop (75 min) · HS

Come learn how various free AI platforms can be used to help students grow in the classroom. This session will allow you time to explore and learn how this could help your practice!

Jessica Pritzker, Glenbrook South High School, Glenview, IL

1675-106357 Aligned and Updated Project-Based Learning for AP® Environmental Science

Platinum Ballroom 8 · AP® Environmental Science · Demonstration (75 min) · HS, 2Y, 4Y

Learn about the benefits of a Project-Based Learning approach and how it can increase engagement for diverse learners using the newly updated AP® Environmental Science curriculum from consultants on behalf of the College Board.

Lisa Pavic, Glenbrook South High School, Glenview, IL; Erika Erickson, Gilmer County Schools, Gilmer, GA

SPECIAL PROGRAMMING PRESENTED BY 10K SCIENCE

1675-110784 Exploring Authentic Data in VR, from a CRISPR Treatment for Sickle Cell to an Invasive Species Wreaking Havoc on Agriculture

Platinum Ballroom 10 · Science Practices · Demonstration (75 min) · HS, 4Y

Bring authentic science data into your classroom: explore the CRISPR mechanic and how it can be used to treat sickle cell disease, or explore bacterial genetics through an agricultural-environmental scenario.

Laura Lynn Gonzalez and Elizabeth Cook, 10k Science, Oakland, CA, and Tanya Buxton, Menlo School, Atherton, CA

12:00PM–12:30PM

1675-106439 Cultivating Cultural Connections: Family Problem-Based Learning and Plants with Cultural Significance for Latiné Families

Gold Key I & II · Botany & Plant Biology · Demonstration (30 min) · ELEM, ML

This presentation briefly describes the "Our Plot of Sunshine" curriculum, developed and used with 5th and 6th grade Latina girls and their parents, emphasizing edible plants with significance for Latiné cultures (e.g. purslane, marigolds).

Margarita Jimenez-Silva and Caitlyn Ishaq, University of California, Davis, Davis, CA; Peter Rillero, Arizona State University, Phoenix, AZ; Kim Rillero, Urban Farming Education, Phoenix, AZ

12:00PM–12:30PM CONT.

1675-106551 Engaging Introductory Undergraduate Biology Students' Engagement in Metacognition Using the BioMet Learning Modules

Grand Ballroom A & B • Instructional Strategies • Paper (30 min) • 2Y, 4Y, GA

This session will focus on findings from a study that explored how metacognition developed among undergraduate biology students and how the use of Biology Metacognition Learning Modules supported students in developing and engaging in metacognition.

Jaime L. Sabel, University of Memphis, Memphis, TN

SPECIAL PROGRAMMING PRESENTED BY BIO-RAD

1675-109222 Pollen Fingerprinting: Uncovering Nature's Role in Forensics

Grand Ballroom C & D • General Biology • Demonstration (30 min) • HS, 2Y, 4Y

Discover the intriguing world of forensic botany and learn to teach the science of pollen analysis in this interactive workshop using the ZOE Fluorescent Cell Imager.

Damon Tighe, Bio-Rad Laboratories, Hercules, CA

SPECIAL PROGRAMMING PRESENTED BY HHMI

1675-108514 Going Local: Using HHMI BioInteractive Resources to Teach Biodiversity Survey Methods and Solutions

Grand Ballroom F • Ecology / Environmental Science / Sustainability • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Discover ways to engage your students in biodiversity studies in local ecosystems with HHMI BioInteractive resources. Join us as we discuss surveying biodiversity in a variety of ecosystems to formulate solutions to ecological threats.

Jeannie Long, Tennessee Wesleyan University, Athens, TN

SPECIAL PROGRAMMING PRESENTED BY CAROLINA

1675-107859 Teaching Photosynthesis and Cellular Respiration with Algae Beads

Orange County Ballroom 1 • General Biology • Hands-on Workshop (30 min) • ML, HS, 2Y

Participants will make and use sodium alginate and Chlorella to make algae beads. They will learn how the beads can be used to teach photosynthesis and cellular respiration.

Crystal Risko, Carolina Biological Supply Company, Burlington, NC

SPECIAL PROGRAMMING PRESENTED BY VERNIER

1675-111223 Introduction to Spectroscopy

Orange County Ballroom 2 • General Biology • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Come see how easy it is to analyze plant pigment spectra, chlorophyll content in olive oil and to even investigate algae pigments. Learn how to create standard curves and analyze enzymatic activity. Spectroscopy is easy and exciting for your students using the Go Direct SpectroVis Plus Spectrophotometer and our free Spectral Analysis app, available for computers, Chromebooks and mobile devices.

John Melville, Vernier Science Education, Beaverton, OR

1675-105904 Student Perceptions of Transfer of Knowledge for Quantitative Reasoning in Undergraduate Biology Labs

Orange County Ballroom 3 • Instructional Strategies • Paper (30 min) • 2Y, 4Y, GA

Undergraduate biology students were asked to share their perspectives on how they transfer quantitative knowledge into their lab experiences. Student responses were analyzed for themes, including barriers and supports in the three domains of transfer.

Joelle Prate and Jeremy Hsu, Chapman University, Orange, CA

1675-106504 JEDI Session Writing Workshop

Orange County Ballroom 4 • Instructional Strategies • Hands-on Workshop (30 min) • ML, HS, GA

Are you interested in presenting at an NABT Conference? Join members of the JEDI Committee to workshop your NABT session proposal ideas and prepare to submit for the 2025 Conference in St. Louis.

Maribel Gendreau, Hampton Roads Academy, Yorktown, VA and Enya Granados, Clarke Central High School, Athens, GA

NABT BioClub

CHAPTERS

Abington Heights High School, Clarks Summit, PA
Aiken County Career and Technology Center, Warrenville, SC
Arcadia High School, Phoenix, AZ
Archbishop Curley High School, Baltimore, MD
Arroyo High School, San Lorenzo, CA
Athens High School, Troy, MI
Athens High School, Athens, IL
The Barstow School, Kansas City, MO
Bethlehem High School, Bardstown, KY
Bishop Garcia Diego High School, Santa Barbara, CA
Bloomington High School South, Bloomington, IN
Brentwood Academy, Brentwood, TN
Cabarrus Kannapolis Early College High School, Concord, NC
Canadian Valley Technical Center, OK
Caney Valley High School, Ramona, OK
Cardinal Gibbons High School, Raleigh, NC
Carrboro High School, Carrboro, NC
Castle Park High School, Chula Vista, CA
Central Carolina Technical College, Sumter, SC
Central Falls High School, Central Falls, RI
Central Magnet School, Murfreesboro, TN
Chelan High School, Chelan, WA
Chester High School, Chester, PA
Clayton High School, Clayton, MO
Colonia High School, Colonia, NJ
Coronado High School, Colorado Springs, CO
Cuyohoga Community College, Macedonia, OH
Darnell-Cookman School of the Medical Arts, Jacksonville, FL
DeVry Advantage Academy, Chicago, IL
Divine Savior Holy Angels High School, Milwaukee, WI
Dora R-III School, Dora, MO
Dougherty Valley High School, San Ramon, CA
El Centro College, Dallas, TX
Emergence Academy, Springfield, MA
Emmett High School, Emmett, ID
Fairhaven High School, Fairhaven, MA
Florence Freshman Center, Florence, AL
Florida SouthWestern State College, Naples, FL
Freedom High School, Freedom, WI
Frontier Regional School, S Deerfield, MA
Georgia State University Perimeter College, Decatur, GA
Gillette College, Gillette, WY
Grafton High School, Grafton, WI
Grandville High School, Grandville, MI
Greater Lowell Technical High School, Tyngsborough, MA
Greater New Bedford Regional Vocational Technical High School, New Bedford, MA
Greensburg Salem High School, Greensburg, PA
Hampton Roads Academy, Newport News, VA
Harmony School in Innovation, Katy, TX
Hillsboro High School, Hillsboro, OR
Hilltop High School, Chula Vista, CA
Holt High School, Holt, MI
The Independent School, Wichita, KS
Julia R Masterman School, Philadelphia, PA
Kenmore West High School, Buffalo, NY
Kent County High School, Worton, MD
Kettle Run High School, Nokesville, VA
Lake Metroparks, Concord, OH
Lexington High School, Mansfield, OH
Louisiana School for Math, Science and the Arts, Natchitoches, LA
Martin Luther College, New Ulm, MN
Mary Persons High School, Forsyth, GA
Marysville High School, Marysville, KS
McDowell Intermediate High School, Erie, PA
Metropolitan Community College, Omaha, NE
Midland Park High School, Midland Park, NJ
Mid Michigan College, Harrison, MI
Minnetonka High School, Minnetonka, MN
Morganton, NC West Mifflin Area High School, West Mifflin, PA
Moscow High School, Moscow, ID
Mount Abraham Union High School, Bristol, VT
Nassau Community College, Garden City, NY
Northampton Area High School, Northampton, PA
Northwest Mississippi Community College, Oxford, MS
Olivet Nazarene University, Bourbonnais, IL
Palm Tree School, Fairfax, VA
Perkins High School, Sandusky, OH
Pike High School Freshman Center, Indianapolis, IN
Pikeview High School, Princeton, WV
Pinecrest High School, Southern Pines, NC
Putnam City High School, Oklahoma City, OK
Riverside City College, Riverside, CA
Riverside High School, Leesburg, VA
Saint Ignatius High School, Cleveland, OH
Seabury Hall, Makawao, HI
Seneca East High School, Attica, OH
Sherando High School, Winchester, VA
Sibley East Middle and High School, Arlington, MN
Skyline High School, Sammamish, WA
Snow College, Ephraim, UT
Southeast Community College, Lincoln, NE
South Central Jr Sr High School, Elizabeth, IN
South Garner High School, Garner, NC
Southern Wells High School, Poneto, IN
St. Andrew's Episcopal School, Potomac, MD
St. Clair High School, St. Clair, MI
State Library of PA, Lykens, PA
Stillwater High School, Stillwater, OK
Stouffville District Secondary School, Whitchurch-Stouffville, ON, Canada
The Summit County Day School, Cincinnati, OH
Sunlake High School, Land O'Lakes, FL
Taylor University, Upland, IN
Tiffin Columbian High School, Tiffin, OH
Troy High School, Troy, MI
Unionville High School, Kennett Square, PA
University Christian High School, Hickory, NC
Ursuline Academy, Dedham, MA
Vincennes University, Vincennes, IN
Visitation Academy - Saint Louis, St. Louis, MO
Walters State Community College, Rutledge, TN
Westdale Secondary School, Hamilton, Ontario
Western Piedmont Community College, Morganton, NC
West Mifflin Area High School, West Mifflin, PA
Wheeling Park High School, Wheeling, WV
Worthington Christian High School, Worthington, OH

The mission of the NABT BioClub is to recruit, support, nurture, and promote students who have an interest in biological sciences for personal reasons, academic preparation, the betterment of society, and possible career opportunities by providing guidance, resources, and activities to meet these goals.

Look for the BioClub logo to indicate recommended articles for NABT BioClub members. If you are interested in forming a chapter of the NABT BioClub, contact NABT at office@nabt.org.

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15th Annual Biology Education Research Symposium

2:00PM – 4:00PM
Platinum Ballroom 8

The symposium is coordinated by the NABT Four-Year College & University Section's Research Committee.

Proceedings will be posted online at NABT.org

Bridging the Gap: Sex and Reproduction Education in the College Biology Classroom

Katherine Bates and Kimberly Dickman, United States Air Force Academy, Colorado Springs, CO

In the United States, sexual assault rates and sexually transmitted infections remain higher in college students compared to other sectors of the population. The 2021 Youth Behavioral Risk Survey by the Center for Disease Control and Prevention found at least eight percent of high school students have experienced forced sex they did not want, with prevalence greatly increasing as people enter college.

Comprehensive sex education can reduce rates of sexual activity and STIs. Many comprehensive sex education courses also focus on healthy relationships, consent, and recognizing sexual assault and can serve as a primary prevention tool for sex and dating. While sex education is often limited in public high school, colleges and universities present a unique opportunity to reach a wide audience with disparate sex education backgrounds. Sex educators can serve society better by teaching comprehensive sex education to increase protective factors for young adults.

Here, we present an analysis of the literature concerning the topics and mechanisms young adults want in comprehensive sex education. Additionally, we will discuss a college-level biology course we designed to follow best practices in comprehensive sex education and its effectiveness and reception among college students.

Exploring Outcomes from Participating in an Outdoor Science Activity

Carolyn Jess and Kristy Daniel, Texas State University, San Marcos, TX

Today's youth often lack opportunities to participate in science practices outdoors. The purpose of this study was to capture fifth-grade student responses to an outdoor science activity booklet about pollination to discover what outcomes the students received from the activity. The booklet contained four post-activity questions to find what each student found most enjoyable, important, helpful, and what aspects made the participants feel most like a scientist. Student responses were organized into categories and emergent themes to reveal that students most enjoyed taking part in outdoor science practices. Participants reported that science practices were the most influential elements of the outdoor science activities. Science practices were also most responsible for students to feel like scientists and led many students to enjoy the activities. Science content was most important and helpful and the hands-on data collection and analysis aspects of the activities were impactful. Finally, being outside fostered enjoyment of the science activities. Short outdoor activities can promote children's scientific interest and identity development. Using what we learned through deductively coding student responses, we can implement tools children found beneficial into future science activities to ensure participants experience enjoyment, learning, and feeling like a scientist.

Investigating Student Attitudinal Outcomes of a First-Year, Two-Semester Biology Course-based Undergraduate Research Experience (CURE)

Emma Throneburg, Natalie Christian, Connor Morozumi, Mikus Abolins-Abols, Jeffery Masters, and Rachel Pigg, University of Louisville, Louisville, KY

Participation in research experiences can improve undergraduate student attitudinal outcomes and retention, yet many barriers exist that prevent broad student participation in traditional research experiences. Implementing Course-based Undergraduate Research Experiences (CUREs) can reduce these barriers. Furthermore, CUREs incorporated into introductory courses reach students early in their academic career. In this study, we implemented a two-semester CURE within an introductory biology laboratory sequence. Using attitudinal surveys, we monitored students' scientific self-efficacy, science identity, and science community values. Additionally, we investigated how student attitudes might vary across demographic groups.

We found that student attitudinal gains occurred primarily after the first semester of the CURE, with scientific self-efficacy and science identity both increasing substantially. These gains were sustained after the second semester, which is noteworthy given the difficult new concepts covered (i.e., data analysis and scientific writing). Science community values remained high at all time points, suggesting that students' science values formed before college. Throughout CURE participation, scientific self-efficacy, science identity, and science community values varied only slightly or not at all between the demographic groups we investigated. This study demonstrates the effectiveness of a two-semester introductory biology CURE to improve and sustain student attitudes in science.

Discourse and Argumentation Promotes Learning During Collaborative Group Exams

S. Katherine Cooper, Jillian Arzoumanian, Michelle Osovitz, and Jeffrey Grim, University of Tampa, Tampa, FL; Suann Yang, SUNY Geneseo, Geneseo, NY

Collaborative Group Exams (CGEs) represent a specific implementation of student-centered learning aimed at transforming high-stakes assessments into collaborative learning experiences. Our current study focuses on student feedback to elucidate if sociocultural engagement underpins the performance gains seen with CGEs. We hypothesize that discourse and argumentation amongst peers are the causal mechanisms. Data from 834 students across 31 sections of biology courses at general education, introductory, and upper-level biology courses at a PUI were analyzed using a mixed-methods approach. Quantitative findings indicate that 74.6% of students reported CGEs consistently enhanced their learning experience. Qualitative analysis identified three primary themes in student responses: 1) discipline-specific content acquisition, 2) learning through peer discussion, and 3) development of soft skills. The findings show that discourse and argumentation during CGEs play a pivotal role in their effectiveness by promoting deliberative and disputative argumentation, therefore aligning with sociocultural learning theories. Thus, CGEs can be used to incorporate discourse and argumentation in STEM curricula, which in turn promotes deeper understanding and knowledge retention.

Defining Acceptance of Evolution: A Delphi Study

Taya Misheva and Jason Wiles, Syracuse University, Syracuse, NY and Sara Brownell, Arizona State University, Tempe, AZ

Evolution is firmly recognized as a core concept of biology, yet studies have found that biology students often do not accept evolution. As such, much of evolution education research aims to identify the causes of evolution rejection and to develop instructional strategies for increasing acceptance. This research relies upon surveys intended to measure evolution acceptance. Survey validity is an essential component of research quality, and a thorough definition of the construct of interest is critical for survey development and validity assessment. Thus, the purpose of this study was to develop a detailed, consensus-based definition of what constitutes "full acceptance of evolution" within the context of undergraduate biology education. We employed the Delphi method, in which a panel of experts was iteratively surveyed to establish a definition of evolution acceptance. As expert panelists reached a consensus definition, we found that (a) all agreed that evolution acceptance can be compatible with religious belief, and (b) "full acceptance" requires knowledge of certain aspects of evolution, including the shared ancestry of all life and existence of extensive supporting evidence for evolution. This definition provides a foundation for establishing a survey that more accurately assesses students' awareness of and assent with key aspects of evolution.

12:00PM–12:30PM CONT.

SPECIAL PROGRAMMING PRESENTED BY MINIPCR

1675-109539 Bacterial Transformation Made Easy with True Blue

Platinum Ballroom 1 • AP® Biology • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Easy-to-implement genetic engineering and bacterial transformation activity. Rehydrate bacteria and transform without starter cultures! The protocol requires less than 45 minutes of class time and only requires ice and a pipette.

Alex Dainis, miniPCR bio, Cambridge, MA

1675-106366 Free Short Science Films that Engage Students, Promote Learning, and Support Inclusive Teaching Practices in the STEM Classroom

Platinum Ballroom 2 • Technology in the Classroom • Demonstration (30 min) • HS, 2Y, 4Y

In this session, you will learn about free short science films and related resources from Science Communication Lab that engage students, promote conceptual understanding, expand definitions of scientists, and illuminate the nature of science.

Shannon Behrman, Science Communication Lab, Berkeley, CA

1675-106316 Students' Use of and Attitudes Toward AI Use to Support Experimentation in an Introductory Biology Laboratory

Platinum Ballroom 7 • Technology in the Classroom • Paper (30 min) • 2Y, 4Y, GA

How do student use AI to support their lab work? What do students think about its use? We present qualitative and quantitative survey data from a large, introductory biology CURE lab to provide answers.

Donald French, Moria Harmon, and Aimee Elquist, Oklahoma State University, Stillwater, OK

1675-106558 Supporting Student Investigation without Losing the Plot: Practical Tips for Organizing and Supporting Semester-Length Projects

Platinum Ballroom 8 • Instructional Strategies • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Long-term, independent investigations can be a source of rich science learning for students...and a challenge for instructors and students to manage. Come see strategies to make projects manageable and rewarding.

Julie Minbiole, Columbia College Chicago, Oak Park, IL and Stephen Traphagen, Oak Park and River Forest High School, Oak Park, IL

1675-106394 Integrating Sustainability: Teaching Biology with the UN Sustainable Development Goals

Platinum Ballroom 9 • Ecology / Environmental Science / Sustainability • Demonstration (30 min) • HS, 2Y, 4Y

This session aims to equip educators with strategies to integrate UN Sustainable Development Goals into diverse teaching settings, offering tools for alignment, administrative support, and collaboration among instructors for enhanced sustainability education.

Emily G. Weigel, Georgia Institute of Technology, Atlanta, GA

SPECIAL PROGRAMMING PRESENTED BY 10K SCIENCE

1675-110785 Engaging Students in Immersive VR Experiences Using Real-World Research and AI

Platinum Ballroom 10 • Technology in the Classroom; • Demonstration (30 min) • MS, HS, 4Y

Is VR here for good this time? Join us and hear from an educator using interactive VR to effectively communicate challenging STEM subjects, and learn how learning can be tracked in VR using AI.

Laura Lynn Gonzalez and Elizabeth Clark, 10k Science, Oakland, CA, and Tanya Buxton, Menlo School, Atherton, CA

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12:45PM–1:45PM

NABT Lunch Break

Your conference registration includes a boxed lunch, which you can pick up outside the Grand Ballroom before joining a section event, meeting with friends, or finding a quiet spot to relax and recharge.

Tickets for your entrée selection were made with your registration. Please present your lunch ticket to staff to pick up your boxed lunch.

AP® Biology Section Luncheon

Platinum Ballroom 5 & 6 • AP® Biology • Meal Functions (60 min) • HS

Grab your lunch and meet other AP® Biology teachers in a friendly, informal setting to share insights, ask questions, and build community. You may even get to meet some of your favorite AP® colleagues in person. The luncheon includes a special presentation of the Kim Foglia AP® Biology Service Award.

Sponsored by minipcr bio®

Four-Year College & University Section Luncheon

Grand Ballroom E • General Biology • Meal Functions (60 min) • 4Y

Faculty, education researchers, graduate students, and anyone associated with four-year colleges and universities are invited to network with colleagues and learn about section programs and opportunities. There will also be a special presentation of the Four-Year College & University Section Awards.

Elementary and Middle-Level (K-8) Luncheon

Grand Ballroom G • General Biology • Meal Functions (60 min) • ELEM, MS

Grab your lunch and meet up with other awesome K-8 teachers at this informal networking lunch designed to help you connect with colleagues.

High School Level Luncheon

Platinum Ballroom 5 & 6 • General Biology • Meal Functions (60 min) • HS

If you teach funny freshmen, serious seniors, and everyone in between, you will want to grab your lunch, grab a seat, and connect with other high school biology teachers in this informal setting.

Sponsored by minipcr bio®

Two-Year College Section Luncheon

Grand Ballroom H - K • General Biology • Meal Functions (60 min) • 2Y

Join a supportive community of two-year college educators to share your strategies, your struggles, and your successes! The winners of the Two-Year College Biology Teaching Award and the Professor Chan Teaching Award will also be recognized.

2:00PM–4:00PM

15th Annual Biology Education Research Symposium

Platinum Ballroom 8 • Instructional Strategies • Symposium (2 hours) • 2Y, 4Y, GA

NABT is proud to present the 15th Annual Biology Education Research Symposium. Presentations were expected through a double-blind review process open to biology instructors and education researchers at all levels. The symposium format is traditional 15-minute presentations of papers by individuals or co-authors, followed by Q&A.

See page 32 for the full listing.

2:00PM–3:15PM

1675-106174 What Does Science Have to do with Race and Racism? A Curricular Approach to Anti-Racist Science Teaching

Gold Key I & II • JEDI / Inclusive Teaching Practices • Hands-on Workshop (75 min) • ML, HS, 2Y

What is race? During this session, we will introduce a curriculum for biology educators that explores how racism, the construct of race, the history of science, and human genetic variation intersect.

Jeanne Chowning and Hanako Osuga, Fred Hutch Cancer Center, Seattle, WA; Jason Foster, Evanston Township High School, Evanston, IL

2:00PM–3:15PM CONT.

1675-105854 Connecting with Your Community Through the Classroom: A SENCER Workshop

Grand Ballroom A & B • Instructional Strategies • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Attendees will be introduced to the SENCER philosophy. Participants will align their program and course outcomes to the SENCER ideals, and we will provide a framework in which to modify or "sencerize" their course.

Virginia McHugh-Kurtz, Harper College, Palatine, IL; Heather R. Pelzel, University of Wisconsin-Whitewater, Whitewater, WI; Rachel Bergstrom, Beloit College, Beloit, WI

SPECIAL PROGRAMMING PRESENTED BY BIO-RAD

1675-109231 Ozempic and Semaglutide Science: Mastering Diabetes and Weight Loss

Grand Ballroom C & D • AP® Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Join our workshop to explore Ozempic's dual action on diabetes and weight loss. Learn about semaglutide's role in blood sugar and appetite regulation through hands-on ELISA simulations.

Damon Tighe, Bio-Rad Laboratories, Hercules, CA

SPECIAL PROGRAMMING PRESENTED BY HHMI

1675-108515 Heads or Tails? Modeling Cellular Signaling in Planarians with HHMI BioInteractive's Model Builder Tool

Grand Ballroom F • Science Practices • Hands-on Workshop (75 min) • HS, 2Y, 4Y

We'll explore BioInteractive's Model Builder tool to make sense of the underlying cell signaling that governs planarian regeneration. Participants will learn how to scaffold student models to enable self-assessment and promote rich discussion.

Amit Morris, Upper Canada College, Toronto, ON, Canada and Kasey Joy Christopher, Duquesne University, Pittsburgh, PA

SPECIAL PROGRAMMING PRESENTED BY EDVOTEK

1675-108200 Introducing Your Students to CRISPR with Sickle Cell Gene Editing

Orange County Ballroom 1 • Biotechnology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Explore Nobel Prize-winning CRISPR in our electrophoresis workshop! This powerful biotechnology breakthrough is making dramatic changes to human health RIGHT NOW. Dive into CRISPR biology with quick experiments modeling a cure for sickle cell anemia.

Danielle Snowflack, Edvotek, Washington, DC

SPECIAL PROGRAMMING PRESENTED BY BFW PUBLISHERS

1675-108471 Bedford, Freeman & Worth Grounded in Evolution: A Classroom Activity on the Evolutionary History of Flightless Birds

Orange County Ballroom 2 • AP® Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Biology educator James Morris shares an activity in which participants will build evolutionary trees and use them to test hypotheses about the evolutionary relationships and history of flightless birds, such as ostriches, kiwis, and cassowaries.

James Morris, Brandeis University, Waltham, MA

1675-106042 The American Association of Immunologists Presents: AAI Teachers Research Program–Immunology Lessons for the Classroom

Orange County Ballroom 3 • Microbiology & Cell Biology • Hands-on Workshop (75 min) • HS

Learn how to bring the excitement of immunology research to students in the classroom with units presented by teachers from the American Association of Immunologists Summer Research Program for Teachers.

Mike Criscitiello, Texas A&M University, College Station, TX

1675-109096 Writing for the ABT

Orange County Ballroom 4 • Instructional Strategies • Hands-on Workshop (75 min) • HS, GA

Join the editorial team of *The American Biology Teacher* for this interactive session designed to encourage and support prospective authors. Turn your idea for an article into an action plan.

William McComas, ABT Editor-in-Chief, University of Arkansas, Fayetteville, AR

2:00PM–3:15PM CONT.

SPECIAL PROGRAMMING PRESENTED BY MINIPCR

1675-109560 Genotype to Phenotype: A Hands-on PTC Taster Lab with Companion Digital Curriculum!

Platinum Ballroom 1 • AP® Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

PTC tasting is a classic way to link genotype and phenotype. Use PCR and gel electrophoresis to determine if students have taster or non-taster alleles.

Alex Dainis, miniPCR bio, Cambridge, MA

1675-106368 From CRISPR to 23 and Me: Ethics and Possibilities in an Age of New Genetics

Platinum Ballroom 2 • Biotechnology • Hands-on Workshop (75 min) • HS

Techniques like CRISPR, mitochondrial transfer, and mRNA therapeutics have expanded possibilities for genetic manipulation. Together, we will explore how these techniques can energize the curriculum and challenge students to consider their social and ethical implications.

Kenneth R. Miller, Brown University, Rehoboth, MA

SPECIAL PROGRAMMING PRESENTED BY WISCONSIN FASTPLANTS

1675-108637 Practical Strategies for Embedding Student-Centered Plant Research in Undergraduate Courses

Platinum Ballroom 7 • Instructional Strategies • Hands-on Workshop (75 min) • 2Y, GA

Be inspired! Learn effective strategies and resources for integrating student-centered, place-based plant research into courses. Inspire students to pursue careers and academics in plant science, contributing to local and global science and agricultural challenges.

Hedi Lauffer and Dan Lauffer, Wisconsin Fast Plants, Larkspur, CO

1675-108732 The College Board Presents: They Didn't Write What They Thought They Said

Platinum Ballroom 9 • AP® Biology • Demonstration (75 min) • HS, 2Y, 4Y

Why do students struggle to write about the science they know? We will explore how teachers can improve students' writing by helping students transfer their verbal responses to written, improving students' ability to write science.

Catherine Walsh, The College Board, Alachua, FL and Chikezie O. Madu, White Station High School/University of Memphis, Memphis, TN

SPECIAL PROGRAMMING PRESENTED BY NCSE

1675-106223 Sustainable Climate Solutions

Platinum Ballroom 3 & 4 • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • ML, HS, 2Y

The climate crisis is undeniably causing anxiety among young people. Engage with NCSE's free NGSS-aligned mini-storyline, which focuses on evidence-based solutions, and gain the confidence to implement these activities in your classroom.

Wendy Johnson and Blake Touchet, National Center for Science Education, Oakland, CA

3:30PM–4:00PM

1675-106511 Shaping the Future: Using Interdisciplinary Collaboration to Advance Quantitative Biology Education at Community Colleges

Grand Ballroom A & B • General Biology • Hands-on Workshop (30 min) • HS, 2Y, 4Y

The Quantitative Biology at Community Colleges (QB@CC) network will be showcased as a model for building interdisciplinary communities of practice. Participants will engage in collaborative activities that strategize network building.

Melanie K Lenahan, Raritan Valley Community College, Clinton, NJ; Jennifer Adler, Maysville Community & Technical College, Maysville, KY; Heather Zimbler-DeLorenzo, Georgia State University, Atlanta, GA; Sheela Vemu, Waubonsee Community College, Sugar Grove, IL; Vedham Karpakakunjaram, Montgomery College, Rockville, MD; Adronisha Frazier, Northshore Technical Community College, Lacombe, LA

SPECIAL PROGRAMMING PRESENTED BY BIO-RAD

1675-109232 CRISPR–Now and Beyond

Grand Ballroom C & D • Biotechnology • Paper (30 min) • HS, 2Y, 4Y

Delve into CRISPR's evolving landscape in our talk, highlighting breakthroughs like precise gene therapy techniques, advanced delivery systems, and innovative agricultural applications designed for biology educators' professional development.

Damon Tighe, Bio-Rad Laboratories, Hercules, CA.

3:30PM–4:00PM CONT.

SPECIAL PROGRAMMING PRESENTED BY HHMI

1675-108516 Sharing Classroom-Ready Materials in the HHMI BioInteractive Educator Resource Library

Grand Ballroom F • Curriculum Development • Hands-on Workshop (30 min) • GA

Did you know BioInteractive's Online Community features an Educator Resource Library with classroom-ready, member-generated materials? Join us as we discuss how to use and contribute to this repository of activities connected to BioInteractive resources.

Kristine Grayson, University of Richmond, Richmond, VA

SPECIAL PROGRAMMING PRESENTED BY ALGAE RESEARCH SUPPLY

1675-109642 Algae Beads and Brainy Brinys (Algae Culture and Brine Shrimp Experiment Kit)

Orange County Ballroom 1 • AP® Biology • Hands-on Workshop (75 min) • ML, HS, 4Y

We will play with algae beads for photosynthesis and respiration and with Brainy Brinys, a kit to grow algae and feed it to brine shrimp while quantifying everything!

Matthew Huber and Daphne Warren, Algae Research and Supply, Inc., Carlsbad, CA

SPECIAL PROGRAMMING PRESENTED BY BFW PUBLISHERS

1675-108474 Bedford, Freeman & Worth Get AP® Biology and AP® Environmental Science Ready with BFW Publishers

Orange County Ballroom 2 • AP® Biology • Demonstration (30 min) • HS

Discover the impact of BFW Publishers' AP® Science programs, "Biology for the AP® Course" and "Environmental Science for the AP® Course." Explore innovative teaching methods, student features, CED alignment, AP® practice, skills, and a teacher's program.

Thomas Menna, BFW Publishers, Hamilton, NJ

1675-109777 Using Scientific Legacy to Inspire Learning

Orange County Ballroom 3 • Nature of Science • Demonstration (30 min) • ML, HS, GA

Student engagement is important for learning. We'll share resources to help! Watch our new seven-minute, animated historical film and get ideas for engaging students in science through history and language arts.

Charlotte A. Moser, Vaccine Education Center/ Children's Hospital of Philadelphia, Philadelphia, PA and Donald R. Mitchell, Vaccine Makers Project, VEC at CHOP, Philadelphia, PA

SPECIAL PROGRAMMING PRESENTED BY MINIPCR

1675-109552 miniPCR Presents: Tools and Activities to Implement Genetics Research in Advanced High School or Undergraduate Biology Course

Platinum Ballroom 1 • General Biology • Demonstration (30 min) • HS, 2Y, 4Y

Explore robust experiments with simple implementation that can be expanded into authentic research questions relevant to advanced high school or undergraduate biology coursework.

Ally Huang, miniPCR bio, Cambridge, MA

1675-107865 Enhancing Understanding of Evolution by Promoting Metacognitive Awareness and Self-Regulation of Intuitive Thinking

Platinum Ballroom 2 • Evolution • Hands-on Workshop (30 min) • HS, 2Y, 4Y

The participants will learn about and try innovative approaches to enhancing students' understanding of evolution. Explicitly addressing students' unscientific intuitive ideas has proven to be highly successful in this regard, and learning materials will be presented. This session is a special presentation by the 2024 Huxley Award Winner.

Tim Hartelt, University of Kassel, Kassel, Germany

3:30PM–4:00PM CONT.

SPECIAL PROGRAMMING PRESENTED BY NCSE

1675-108466 NCSE Climate Change Story Shorts

Platinum Ballroom 3 & 4 • Ecology / Environmental Science / Sustainability • Hands-on Workshop (30 min) • ML, HS, GA

NCSE has developed NGSS-aligned lessons to teach about climate change. Teachers will be introduced to our Story Shorts–mini-storylines that can be completed in five class periods or expanded through optional Side Quest activities.

Wendy Johnson and Blake Touchet, National Center for Science Education, Oakland, CA

1675-106479 Growing Knowledge: Harnessing Hydroponics & Aquaponics for Hands-on Learning in the Classroom

Platinum Ballroom 7 • AP® Environmental Science • Demonstration (30 min) • ML, HS, 2Y

Dive into hydroponics and aquaponics for hands-on learning! Explore curriculum connections, skill development, and community integration. Discover low-cost setups for diverse classrooms and leave ready to inspire curiosity, creativity, and sustainability in your school.

Kelsey Kaiser and Michelle Zhang, Oak Park & River Forest High School, Oak Park, IL

1675-106535 The CURE for High School Labs

Platinum Ballroom 9 • AP® Biology • Hands-on Workshop (30 min) • HS

Come join your fellow AP® and IB Bio teachers to dream and design the possibilities for science that extends past the 47 minutes of a single-period day following the CURE Model (Curricular Undergraduate Research Experiences) of college courses.

Brenda Campbell Royal, Central Magnet School, Murfreesboro, TN

SPECIAL PROGRAMMING PRESENTED BY ANATOMAGE

1675-109719 Adapting Traditional Science Labs to Modern Interactive Simulations with the Science Table by Anatomage

Platinum Ballroom 10 • General Biology • Demonstration (30 min) • HS, 2Y, 4Y

The Science Table displays biology experiments with realistic-quality visuals on an interactive seven-foot-long touchscreen table. The workshop will focus on incorporating these experiments into middle school, high school, and college-level classrooms.

Zach Bryant, Anatomage, Inc., Santa Clara, CA

4:00PM–5:00PM

1675-110737 Student Poster Practice Session

Platinum Ballroom 8 • Instructional Strategies • Demonstration (60 min) • HS, 2Y, 4Y

Join other student poster presenters (and their mentors) for some informal practice to help you prepare for the NABT Biology Education Poster Session.

Michael Moore and Rachel Pigg, NABT Biology Education Poster Session Coordinators

4:00PM–5:30PM

Exhibit Hall Closing Experience

Marquis Ballroom • Special Event • GA

It's last call in the NABT Exhibit Hall. It's also your last chance to visit booths, talk to exhibitors, and get those freebies for the classroom. This special reception will include special guests, giveaways, and the grand prize drawing for the "Find the President" Contest.

5:00PM–7:00PM

HHMI Night at the Movies

Platinum Ballroom 5 & 6 • Special Event • GA

Join HHMI Tangled Bank Studios for a sneak peek of their upcoming film *WILD HOPE: MISSION IMPOSSIBLE*, which tells the inspiring story of how a late-career epiphany led Stanford University biochemist Pat Brown to abandon his academic career and commit himself to fighting global warming and biodiversity collapse, starting with a surprising product—an impossibly delicious plant-based hamburger. Through groundbreaking science and unwavering commitment, Pat's mission transformed the culinary landscape—and provided real hope for a more sustainable and ethical food system.

Following the screening, hear from Pat himself during an audience Q&A and get the inside scoop on what he sees as the next big solution in the fight against climate change. Learn more about the Wild Hope movement at Wildhope.tv.

Popcorn, drinks, and an assortment of snacks will be available for your movie experience.

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SESSSION KEY:

ELEM - Elementary
MS - Middle, Junior High
HS - High School
2Y - 2-year College
4Y - 4-year College & University

NABT BIOLOGY EDUCATION POSTER SESSION • 8:00AM–10:00AM • Marquis Ballroom

BIOLOGY EDUCATION RESEARCH COMPETITION – GRADUATE STUDENTS

1. **Can Non-Religious Instructors Reduce Perceived Conflict Between Religion and Evolution? A Randomized Controlled Study**
   Rahmi Aini, M. Elizabeth Barnes, Casey Epting, & Alexa Summersill, Middle Tennessee State University, Murfreesboro, TN; Baylee Edwards, Arizona State University, Tempe, AZ
2. **The Impacts of Science Communication Instruction on Introductory Undergraduate Biology Students' Ability to Communicate about Culturally Controversial Science Topics**
   Kate Coscia, M. Elizabeth Barnes, Donye Asberry, Casey Epting, & Alexa Summersill, Middle Tennessee State University, Murfreesboro, TN
3. **Measuring and Exploring the Cultural Wealth and Experiences of First-Year Latin* Biology Students at a Large Hispanic-Serving Institution**
   Alexander Eden & Bryan Dewsbury, Florida International University, Miami, FL
4. **The Effect of Struggle on Student Mindset in a CURE**
   Claire Freimark, Ana Garcia Vedrenne, Kevin Garcia, & Celia Faiola, University of California Irvine, Irvine, CA
5. **Enhancing Learning Outcomes: Specifications Grading in Parasitology**
   Kevin Garcia & Ana Garcia Vedrenne, University of California Irvine, Irvine, CA
6. **The Role of Job Advertisements in Building Diverse Faculty in STEM: A Semi-Automated Analysis with Large Language Module ChatGPT**
   Hannah Kam & Stanley Lo, University of California San Diego, La Jolla, CA; Erik Arevalo, Allen Hancock College, Santa Maria, CA; Mike Wilton, University of California Santa Barbara, Santa Barbara, CA
7. **Instructor-Perceived Benefits and Costs of Inviting Students to Answer Questions Voluntarily in Large Science Courses**
   Erika Nadile, Katelyn Cooper, Makena Winton, Tasneem Mohammad, Sara Brownell, & James Collins, Arizona State University, Tempe, AZ
8. **Exploring Undergraduate Students' Interpretations of Biological Sense-Making with Equations Using Eye Movements**
   Mallika Saha & Kristy Daniel, Texas State University, San Marcos, TX; Anita Schuchardt, University of Minnesota, Minneapolis, MN
9. **Exploring Biology Graduate Students' Awareness, Utilization, and Perceptions of ChatGPT: A Mixed Methods Analysis**
   Shifath Bin Syed & Joshua Reid, Texas Tech University, Lubbock, TX
10. **What a Rubber Ducky Can Teach Us about Doing Science**
    Jill Zipperer & Kristy Daniel, Texas State University, San Marcos, TX

BIOLOGY EDUCATION RESEARCH COMPETITION – UNDERGRADUATE & HIGH SCHOOL STUDENTS

11. **Perceptions of Evolution and Evolution Education among Undergraduate Muslim Biology Students in the United States**
    Khadijah Alnassari, M. Elizabeth Barnes, Rahmi Aini, Zaynab Alnassari, Ahmed Alnassari, & Fatimah Alnassari, Middle Tennessee State University, Murfreesboro, TN
12. **The Impact of Identity on Undergraduate Students' Science Communication about Culturally Controversial Science Topics**
    Donye Asberry, M. Elizabeth Barnes, Kate Coscia, Casey Epting, & Alexa Summersill, Middle Tennessee State University, Murfreesboro, TN
13. **Faculty-Mentored Research Enhances Self-Efficacy, Effort Control, and Teacher Immediacy: Key Indicators of Student Success and Retention**
    Nellie Bowman Hernandez, Sadie Jensen, Ashley Stone, & Heather Wilson-Ashworth, Utah Valley University, Orem, UT
14. **Exploring the Role of Linguistic Capital in Asian American Students within STEM**
    Tammy Bui, Jeremy Hsu, & Jessie Tsai, Chapman University, Orange, CA; Desiree Forsythe, Santa Clara University, Santa Clara, CA; Andy Trinh & Stanley Lo, University of California San Diego, La Jolla, CA; Lillian Lee & Rou-Jia Sung, Carleton College, Northfield, MN
15. **Leveraging AI to Enhance Learning in a Biochemistry Classroom**
    Addie Colclasure, Emily Hamilton, & John Cogan, The Ohio State University, Columbus, OH
16. **Factors Shaping Students' Study Strategies in an Introductory Biology Class at an Open-Enrollment University**
    Makaylee Dahms & Jeremy Hsu, Chapman University, Orange, CA
17. **Analysis of the Impact of a Computational Chemistry Intervention on Undergraduate Biology Students' Understanding of Enzyme Structure and Function**
    Keeley Farmer & Nathan DeYonker, University of Memphis, Memphis, TN; Jamie Sabel, The Ohio State University, Columbus, OH
18. **Determining the Accuracy of ChatGPT 4.0 in Introductory Biology Courses Using Bloom's Taxonomy**
    Nicholas Girolamo, Joshua Reid, Lauren Linnebur, & Shifath Bin Syed, Texas Tech University, Lubbock, TX

NABT BIOLOGY EDUCATION POSTER SESSION • 8:00AM–10:00AM • Marquis Ballroom

19. **Christian Undergraduate Biology Students' Climate Change Beliefs and Communication**
    Jadyn Hayes, M. Elizabeth Barnes, & Erin Rowland-Schaefer, Middle Tennessee State University, Murfreesboro, TN
20. **What Do Students Think of STEM Course Office Hours at a Two-Year College?**
    Grace Holick & Jeremy Hsu, Chapman University, Orange, CA; Meredith Dorner, Irvine Valley College, Irvine, CA
21. **Exploring the Effects of Student Mindset on Study Strategies**
    Molly Niswender & Jeremy Hsu, Chapman University, Orange, CA
22. **Enzyme Explorers**
    Leslie Sanchez, Ashley Mattison, & Amelia Paquin, Oklahoma State University, Stillwater, OK
23. **Exploring the Influence of Counter-Stereotypical Scientist Biographies on STEM Motivation, Interest, and Identity**
    Ashley Stone, Heather Wilson-Ashworth, Emily Heider, Sadie Jensen, Nellie Bowman Hernandez, & Micah Ross, Utah Valley University, Orem, UT

MENTORED STUDENT RESEARCH COMPETITION – UNDERGRADUATE & HIGH SCHOOL STUDENTS

24. **Pathonix: Enhancing Histopathological Ovarian Cancer Detection with an Explainable and Efficient Ensemble Learning Framework**
    Vishnu Mukku, Avon High School, Avon, CT; Ramachandran Kasu, University of Idaho, Moscow, ID
25. **Redesigning Recycling: The Impact of Bin Design and Placement on Campus Recycling Behavior**
    Katie Buc, Aimee Thomas, & Mark Tobler, Loyola University New Orleans, New Orleans, LA
26. **Transcriptome and Metabolome Analysis Reveals the Effect of Drought on Borago officinalis**
    Borey Kong & Hagop Atamian, Chapman University, Orange, CA
27. **Chia as a Potential Replacement for Water-Demanding Alfalfa**
    Sophie Pel, Hagop Atamian, Kevin Nguyen, Lilian Senger, & Nana Pepra-Ameyaw, Chapman University, Orange, CA; Evelyn Wu, Brown University, Providence, RI
28. **Assessing Flora and Fauna on Loyola University Campus by GIS Analysis**
    Elizabeth Redemann & Aimee Thomas, Loyola University New Orleans, New Orleans, LA

GENERAL (NON-COMPETITION) CATEGORY

29. **Moving the Needle: Improving Graduate Teaching Assistants Conceptions of Teaching**
    Rocksher Annur, Anisha Navlekar, Lisa Limeri, & Joshua Reid, Texas Tech University, Lubbock, TX
30. **The Utility of Pre/Post-Course Surveys: Tracking Learning Gains and Targeting Improvement**
    Jenny Archibald, University of Kansas, Lawrence, KS
31. **Immunology for Non-Immunologists: COVID-19 Diagnosis Role Play Activity**
    Holly Basta, Rocky Mountain College, Billings, MT; Sean Coleman, Wartburg College, Waverly, IO; Archana Lal, Labette Community College, Parsons, KS; Sumali Pandey, Minnesota State University Moorhead, Moorhead, MN; Iglika Pavlova, Michigan State University, East Lansing, MI; Aparna Shah, Virginia Tech, Blacksburg, VA
32. **Assessing Pseudoscientific Anti-LGBTQ Bias in Students and Designing Effective Curricular Interventions**
    Charlie Blake, STEM Center at Southern Illinois University, Edwardsville, IL
33. **C.U.R.E.ing Biofilms: A Multi-Week Investigative Research Experience for Microbiology Students**
    Lisa Bowers & Daae Ransom, St. Olaf College, Northfield, MN
34. **Connecting Children to Nature: Assessing the Impact of Nature Journaling, Children's Literature, and Time Outdoors**
    Ashley Campbell & Crystal Hughes, West Texas A&M University, Canyon, TX
35. **Designing Modeling Kits for a Teacher Professional Development Workshop on GLP-1 Agonist Drugs**
    Amber Cesare & Kathleen Hill, Penn State Center of Science and the Schools, University Park, PA; Boal Amie, The Pennsylvania State University, University Park, PA; Ira Ropson, Penn State College of Medicine, Hershey, PA; Mark Hoelzer & Heather Ryan, 3D Molecular Designs, Milwaukee, WI

NABT BIOLOGY EDUCATION POSTER SESSION • 8:00AM–10:00AM • Marquis Ballroom

GENERAL (NON-COMPETITION) CATEGORY CONT.

36. Perceptions of Conflict Between Religion and Evolution Are Higher among Atheist Undergraduate Biology Students than Christian Biology Students

Kate Coscia, Rahmi Aini, Chloe Bowen, & M. Elizabeth Barnes, Middle Tennessee State University, Murfreesboro, TN; Baylee Edwards & Sara Brownell, Arizona State University, Tempe, AZ

37. A Focus on Reading and Writing in General Biology Class

Emral Devany, Kingsborough Community College CUNY, Brooklyn, NY

38. Collaborative Interrogation and Meaning-Making from the Primary Literature (CIMMPL)

Daniel Dries, Chapman University, Orange, CA

39. Exam Retakes Result in Modest Increase in STEM Retention in an Introductory Biology Course

Melinda Fowler, Mills College at Northeastern University, Oakland, CA

40. Gamifying Genetics for High School and Undergraduate Students via Plant GIFTS (Genetics In Farming Technology and Science)

Erin Friedman, University of Lynchburg, Lynchburg, VA; Mindy Findlater, University of California Merced, Merced, CA

41. Incorporating Technology Supported, Cooperative Learning into Large Enrollment CUREs

Ana Garcia Vedrenne, University of California Irvine, Irvine, CA

42. BCEENET: Inclusive CUREs Using Digitized Natural History Collections Data as a Gateway to the Scientific Research Community

Kristen Genet, Anoka-Ramsey Community College, Coon Rapids, MN; Janice Krumm, Widener University, Chester, PA; Carly Jordan & Cecily Bronson, The George Washington University, Washington, DC; Kathryn Weglarz, Westfield State University, Westfield, MA; Matt Johnson, Texas Tech University, Lubbock, TX

43. Embedded Research in Action: Western Painted Turtle Population and Growth Dynamics in a Shallow Suburban Lake (2013–2023)

Kristen Genet, Anoka-Ramsey Community College, Coon Rapids, MN

44. Out of Sight, Out of Mind: The Diminished Impact of Vision and Change on Undergraduate General Education Life Science Courses

Tamar Goulet, University of Mississippi, University, MS; Heather Rissler, North Iowa Area Community College, Mason City, IA; Gabriela Hamerlinck, University of Florida, Gainesville, FL; Dayna DeFeo, University of Alaska–Anchorage, Anchorage, AK; Gordon Uno, University of Oklahoma, Norman, OK

45. Evolving the Culture of Biology: Developing New Strategies and Resources for Teaching Assistant—Teaching Professional Development (TA-TPD)

Stephanie Gutzler, Georgia State University, Atlanta, GA; Kaleb Heinrich, University of Alabama, Tuscaloosa, AL; Adam Chouinard, Oregon State University, Corvallis, OR; Star Lee, University of California Irvine, Irvine, CA; Mitra Asgari, University of Missouri, Columbia, MO; Diyala Shihadih & Erin Shortlidge, Portland State University, Portland, OR

46. Students' Learning with AI in Biology Education

Tim Hartelt, University of Kassel, Kassel, Germany; Helena Aptyka, University of Cologne, Cologne, Germany

47. Virtual Reality Bodies: Incorporating VR Technology into Human Anatomy and Human Biology Courses as an Optional Study Tool

Caleb Hoffman, Kameron Monson, Jennifer Mraz-Craig, & Sarah Brock, Southern Utah University, Cedar City, UT

48. Incorporating Experiential, Student-Centered Learning into the Core Liberal Arts Curriculum: Example Modules and Outcomes from Plant Biology with Interdisciplinary Approaches to Active Learning

Ryan Huish, The University of Virginia's College at Wise, Wise, VA

49. Feature Counter-Stereotypical Scientists in Curricula with the Biologists and Graph Interpretation (BioGraphI) Project

Manjushri Kishore, Heartland Community College, Normal, IL; Christin Monroe, Landmark College, Putney, VT; Min Zhong, University of Texas at Austin, Austin, TX; Rachel M. Pigg, University of Louisville, Louisville, KY; Suann Yang, State University of New York Geneseo, Geneseo, NY

50. A Study on the Current Status of Inquiry Activities in Basic Biology Classes in Japanese High Schools: A Questionnaire Survey for Teachers

Naoko Kosaka & Kenji Matsubara, Japan Society for the Promotion of Science & National Institute for Educational Policy Research, Tokyo, Japan

51. The Impact of Quantitative Reasoning Modules on General Education Outcomes in Introductory Biology

Jennifer Laing & Christine DeStefano, Community College of Baltimore County, Baltimore, MD

NABT BIOLOGY EDUCATION POSTER SESSION • 8:00AM–10:00AM • Marquis Ballroom

52. **Supporting Community College STEM Students Through a Network of Research Experiences**
Kelly Livernoche & Seth Miller, Anne Arundel Community College, Arnold, MD

53. **Conceptions of Organismal Organization in Experts and Novices**
Tina Marcroft, Texas State University, San Marcos, TX; Stanley Lo & Regis Komperda, University of California San Diego, La Jolla, CA

54. **Bringing the Ocean to Ohio**
Amy McElhinney, University of Mount Union, Alliance, OH

55. **Exploring How STEM Education Researchers Define Inclusion: A Scoping Review**
Michael Moore, University of Arkansas at Little Rock, Little Rock, AR; Richard Harvey, St. Louis University, St. Louis, MO; Erin Carrillo, Virginia Commonwealth University, Richmond, VA; Alexander Eden, Florida International University, Miami, FL; Chelsey Nardi, Empirical Education Inc., Berkeley, CA

56. **Leveraging Faculty Desire for Improved Teaching Assessment to Spark Interest in University-Wide Teaching Reform**
Michael Moore, Lundon Pinneo, Stephanie Feola, & Mark Baillie, University of Arkansas at Little Rock, Little Rock, AR

57. **Is Oxford Nanopore Sequencing Educator Friendly?**
Barbara Murdoch, Eastern Connecticut State University, Willimantic, CT

58. **Learning about our Local Biodiversity Through Play: The Impact of Educational Card Game on Student Engagement**
Hilton Oyamaguchi, Grant Brugger, Rebecca Dalton, Elizabeth Figiel, Glenda Garcia, Erin McCarthy, Robert Sabatino, Anna Sanverdine, & David Contosta, Chestnut Hill College, Philadelphia, PA

59. **Unlocking Engagement: Enhancing Non-Majors Biology Through Digital Escape Rooms and Interactive Games**
Christine Patrum, Georgia State University Perimeter College, Decatur, GA

60. **The Look Again Quilt: Creative Approaches to Biology Education**
Melanie Peffer, University of Colorado, Boulder, CO

61. **The BioQUEST Curriculum Consortium: A Community of Educators Supporting Evolution and Revolution in STEM Education**
Sarah Prescott, BioQUEST, Raymond, NH; Deborah Rook, BioQUEST, Vienna, VA; Drew LaMar, BioQUEST, Williamsburg, VA; Sam Donovan, BioQUEST, Pittsburgh, PA

62. **Leveraging Exam Wrappers to Boost Metacognitive Growth**
Paulette Reneau, Georgia State University Perimeter College, Dunwoody, GA

63. **Improving Access to Computational and Data-Centric Teaching and Learning Resources for Biology Education: The Open Education Ecosystem Research Coordination Network**
Deborah Rook, BioQUEST, Vienna, VA; Drew LaMar, BioQUEST, Williamsburg, VA; Sarah Prescott, BioQUEST, Raymond, NH; Sam Donovan, BioQUEST, Pittsburgh, PA

64. **Developing Instruments to Evaluate and Improve Undergraduate Interpersonal Science Communication about Culturally Controversial Science Topics**
Erin Rowland-Schaefer, Kate Coscia, Donye Asberry, & M. Elizabeth Barnes, Middle Tennessee State University, Murfreesboro, TN

65. **The Pollinator Path: A Living Lab on an Urban Campus**
Doreen Schroeder & Catherine Grant, University of St. Thomas, St. Paul, MN

66. **The Value of Communicating Communal Goal Affordances: How Teacher Behaviors Can Communicate Safety in STEM Education**
Heather Stigge & Nassiba Adjerid, College of Saint Mary, Omaha, NE; Abigail Folberg, University of Nebraska Omaha, Omaha, NE

67. **Cell Aggregation Laboratory Activity for Teaching Cell-Cell Adhesion Using Synthetic Biology**
Daryn Stover, Ethan Howley, Adriana Cimetta, & Ingmar Riedel-Kruse, The University of Arizona, Tucson, AZ

68. **Nexus Institute for Quantitative Biology (NIQB): An Inter-Institutional and Interdisciplinary Consortium Building Curricula that Support Growth of Quantitative Reasoning Skills in Students Taking Introductory Biology I (Cells & Molecules)**
K. Rebecca Thomas, Evdokia Kastanos, & Vedham Karpakakunjaram, Montgomery College, Rockville, MD

69. **Enhancing Inclusivity: Adapting College-Level Introductory Biology Lab for Visually Impaired Students**
Benjamin Weibell, Julie Takacs, & Nancy Weibell, Anne Arundel Community College, Arnold, MD

70. **Supporting Implementation of Evidence-Based Instructional Practices by Community College Biology Faculty**
Rebecca Westphal, Cape Cod Community College, West Barnstable, MA; Parks Collins, Mitchell Community College, Statesville, NC

71. **A Writing-Enriched CURE for First-Year Students: Exploring Authentic Research and Preparing for Careers**
Min Zhong, University of Texas at Austin, Austin, TX; Scott Bowling & Rachel Whitman Rotch, Auburn University, Auburn, AL

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JOIN OUR WORKSHOP ON FRIDAY, NOVEMBER 19

Introduction to Spectroscopy

ROOM: OC Ballroom 2 • **TIME:** 12:00–12:30 p.m.

Join us for an interactive hands-on workshop designed to help you make spectroscopy simple and exciting for your students!

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7:30AM–8:30AM

NABT BioClub Breakfast

Grand Ballroom E • Special Event (Tickets Required) (60 min) • GA

Every year, the NABT BioClub supports students at K-12 schools, community colleges, and informal learning organizations throughout North America. Join us to share what your club is doing or learn how to start a BioClub chapter of your own!

Sponsored by CAROLINA® www.carolina.com

NABT's 2SLGBTQIA+ Practitioners' Affinity Meeting

Gold Key I & II • JEDI / Inclusive Teaching Practices • Special Event (60 min)• GA

Connect with fellow (Two Spirit, Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual, plus) practitioners! This event is open to educators at all levels who self-identify as 2SLGBTQIA+ (Please note: A does not stand for Ally/ Aligned for this session).

7:30AM–8:45AM

NABT Committee Meetings

Marquis Ballroom • Committee Meeting (75 min) • GA

Learn more about different volunteer opportunities from NABT committee chairs and regional coordinators. There are lots of ways to get involved—and help develop—programs that support you as a leader in life science education.

See page 11 for details about the different NABT Committees.

8:00AM–10:00AM

NABT Biology Education Poster Session & Coffee Break

Marquis Ballroom • General Biology • Special Symposium (120 min) • 2Y, 4Y, GA

The NABT Poster Session highlights best practices, programs, and research in three distinct categories: general strategies for teaching biology, the scholarship of teaching, and mentored student research. Student presenters are eligible for two competitions, and winners will be announced before the general session closing speaker.

See full listing on page 42

9:00AM–11:00AM

2024 AP® Life Science Symposium

Platinum Ballroom 2 • Instructional Strategies • Symposium (2 hours) • HS

Join other AP® life science teachers (Biology & APES) to discuss emerging trends impacting the advanced placement course. Discussions will highlight using storylines to teach AP® new testing modalities, and updates to the 2024-2025 AP® Biology exam. Don't miss this opportunity to learn and network with your fellow AP® teachers.

Britt Murcko Czupryna, Niles West High School, Niles, IL; Lee Ferguson, The Episcopal School of Dallas, Dallas, TX; and Catherine Walsh, The College Board, Alachua, FL

9:00AM–10:15AM

INVITED SPEAKER

Briana Pobiner

See biography on page 19

Teaching Human Evolution: Obstacles and Opportunities

Platinum Ballroom 3 & 4 •
Evolution • Special Speaker (75 min) • 2Y, 4Y, GA

Levels of acceptance of evolution in the United States, especially human evolution, are relatively low. Yet there is intense interest in understanding our origins and evolution, and learning about evolution in humans can be a "hook" to generate interest in evolution more broadly. This talk will review approaches that support positive dialogue and engagement on this topic, even in areas where there is some resistance to learning about evolution, and provide data from two projects that developed teaching materials for use in high school biology classrooms incorporating these approaches.

1675-106427 NABT Justice, Equity, Diversity, & Inclusion (JEDI) Networking Session

Gold Key I & II • JEDI / Inclusive Teaching Practices • Hands-on Workshop (75 min) • GA

Network with other practitioners who are passionate about justice, equity, diversity, and inclusion. This event is open to everyone, all identities and levels are welcome!

Enya Granados, Clarke Central High School, Athens, GA and Maribel Gendreau, Hampton Roads Academy, Newport News, VA

1675-106262 Empowering Change in Biology Pedagogy and Student Perception

Grand Ballroom A & B • Curriculum Development • Hands-on Workshop (75 min) • 2Y

Inspired by the "Exploring Academic Unit Change in Two-Year Colleges" project, participants in this workshop will acquire tools and practical ideas to engage in team-based, department-wide change projects.

Heather Zimbler-DeLorenzo and Christine Patrum, Georgia State University Perimeter College, Decatur, GA; Tara Jo Holmberg, Northwestern Connecticut Community College, Winstead, CT

1675-106387 Analyzing Data to Explore Environmental Justice in Local Community Contexts

Grand Ballroom C & D • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS

How can we engage students in analyzing graphical and map-based data to explore environmental justice in our local communities? Come to this session to learn about data sources and scaffolds to support this work.

Brianna Balke, Brown University and Blackstone Academy, Providence, RI

SPECIAL PROGRAMMING PRESENTED BY HHMI

1675-108517 Addressing Misconceptions about Patterns of Human Phenotypic and Genetic Diversity Using HHMI BioInteractive Resources

Grand Ballroom F • Genetics • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Explore two new lesson sequences from BioInteractive that guide students to address common misconceptions by analyzing authentic data to build a strong conceptual understanding of human phenotypic and genetic diversity.

Paul Beardsley, Cal Poly Pomona, Pomona, CA and Holly Basta, Rocky Mountain College, Billings, MT

1675-106286 GMO CER, OMG! Teach Decision-Making Skills and Close the Gap Between CP and Honors Biology Students

Orange County Ballroom 1 • General Biology • Hands-on Workshop (75 min) • HS

Participants will use activities that help students decide whether and how we should genetically modify corn. Materials can be integrated into genetics, evolution, and/or ecology units in both CP and Honors Biology.

Lindsey L'Ecuyer, Andover High School, Andover, MA

1675-106176 Exploring the Wonders of Evolution: Hands-on Activities Unveiled

Orange County Ballroom 2 • Evolution • Hands-on Workshop (75 min) • HS, GA

Join us as we dive into "Exploring the Wonders of Evolution: Hands-on Activities Unveiled," where teachers guide students through exciting, NGSS-aligned activities to appreciate evolution's fascinating journey through interactive, educational experiences.

Mary Ann M. Palencia, La Vista High School, Fullerton, CA

9:00AM–10:15AM CONT.

1675-106156 DataVersify: Humanizing and Diversifying Scientist Role Models in Data Literacy Instruction

Orange County Ballroom 3 • Instructional Strategies • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Strategies and resources to use scientist profiles alongside data literacy instruction will be discussed. Results from our efficacy study, examining how inclusion of diverse scientist role models during instruction affected student attitudes, will be shared.

Melissa K. Kjelvik, Michigan State University, Valdez, AK

1675-106280 Jellyfish Research: Building a High School Research Program

Orange County Ballroom 4 • Science Practices • Hands-on Workshop (75 min) • HS, GA

Learn about our high school's co-curricular jellyfish research program and complete a hands-on activity measuring pulse rates in moon jelly ephyra!

David Herman, Laura Kaufman, and Kate Tucci-Share, Flintridge Preparatory School, La Cañada Flintridge, CA

SPECIAL PROGRAMMING PRESENTED BY 3D MOLECULAR

1675-109620 Modeling mRNA—Life after Transcription

Platinum Ballroom 1 • AP® Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Engage in a hands-on approach to transcription and mRNA modification, taking your Flow of Genetic information kit to the next level for AP® Bio, including exon splicing, GTP cap, and poly-A tail.

Alice Scheele, 3D Molecular Designs/Patrick Henry High School, Ashland, VA

1675-106172 Bringing Trees to the Forefront of Evolution Education

Platinum Ballroom 8 • Evolution • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Learn how to use low-cost materials to effectively teach biology students how to use a cladogram model to interpret and test predictions of evolutionary relationships.

Kristy L. Daniel, Texas State University, San Marcos, TX and Mark Little (retired), Broomfield High School, Arvada, CO

1675-106080 Descriptive Statistics Crash Course

Platinum Ballroom 9 • Science Practices • Hands-on Workshop (75 min) • HS, GA

Learn what's "behind the curtain" of calculating and interpreting statistics like variance, SEM, and 95% confidence intervals. Use your new confidence and understanding to help your students with theirs!

Paul Strode, Annabelle Merg, Dylan Muzny, and Thomas Oviatt, Fairview High School, Boulder, CO

1675-105521 Searching for "Catalysts" for the IGELS Project

Platinum Ballroom 10 • Instructional Strategies • Symposium (75 min) • 2Y, 4Y, GA

The NSF-funded project "Interactions in General Education Life Sciences courses (IGELS)" introduces a new model of faculty professional development. We're seeking fellow "catalysts," undergraduate instructors who can help support future IGELS initiatives. Learn more at this networking session.

Gordon Uno, University of Oklahoma, Norman, OK; Bryan Dewsbury, Florida International University, Miami, FL; Sam Donovan, BioQUEST, Pittsburgh, PA; Karla Fuller, Gutmann Community College, New York, NY; Tamar Goulet, University of Mississippi, University, MS; Gabriela Hammerlinck, University of Florida, Gainesville, FL; Elizabeth Harrison, Kennesaw State University, Kennesaw, GA; Melanie Lenahan, Raritan Valley Community College, Clinton, NJ; Heather Rissler, North Iowa Area Community College, Mason City, IA; Davida Smyth, Texas A&M University-San Antonio, San Antonio, TX

10:30AM–11:00AM

1675-106426 Developing Course-Based Research Experiences in Your Courses

Grand Ballroom A & B • Instructional Strategies • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Authentic research experiences help students learn content. Incorporating research projects as units, modules, or whole-course experiences is daunting. Learn from our successes and mistakes as we help you develop research experiences for your course.

Carrie Jo Bucklin and Jennifer Idema, Texas State University, San Marcos, TX; Roger Gold, Southern Utah University, Cedar City, UT

10:30AM–11:00AM CONT.

1675-109950 Using Science in the News to Build Science Identity and Scientific Literacy in Non-STEM Majors

Grand Ballroom C & D • Instructional Strategies • Demonstration (30 min) • 2Y, 4Y, GA

We all see the headline "A new study says..." frequently. This session will highlight a project and presentation developed for non-STEM majors' classes to build their science identity and scientific literacy by leveraging popular media they encounter frequently.

Krista Lucas, Pepperdine University, Malibu, CA

SPECIAL PROGRAMMING PRESENTED BY HHMI

1675-108518 Better Understanding Our Breathing Biosphere Using an Interactive Graphing Tool

Grand Ballroom F • Ecology / Environmental Science / Sustainability • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Engage your students with a responsive model that illustrates the relationship between atmospheric gasses, cellular processes, and human activity. With this BioInteractive resource, students analyze real data to examine what affects atmospheric carbon dioxide levels.

Bernice Brythorne, Monticello High School, Charlottesville, VA

1675-106554 The LEGO DNA Sequencer

Orange County Ballroom 1 • Instructional Strategies • Demonstration (30 min) • ML, HS, GA

DNA sequencing revolutionizes education by enabling real-time DNA analysis in classrooms, supporting hands-on learning in genetics, biodiversity, and personalized medicine. We will demonstrate how DNA sequencing works using the LEGO sequencer.

Cristina Fernandez, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY

1675-109688 Are You Looking for Paid Opportunities to be a Teacher Leader and Presenter?

Orange County Ballroom 2 • Instructional Strategies • Demonstration (30 min) • ML, HS, GA

Join us to learn more about paid opportunities to lead workshops offering free lessons, webinars, and cash scholarships. Learn about our three projects: ScienceSaves, The Teacher Institute for Evolutionary Science, and GenerationSkeptics. Information: https://centerforinquiry.org/education-department/

David Amidon, Teacher Institute for Evolutionary Science, Syracuse, NY

1675-106385 AI and Paper Summaries: A Brief Lesson

Orange County Ballroom 3 • Instructional Strategies • Hands-on Workshop (30 min) • 2Y, 4Y

This session will demonstrate how to help students understand that AI summaries of articles are not always the best. An AI comparison assignment will be shared, and you are welcome to share your own examples as well.

Stacey Kiser, Lane Community College, Eugene, OR

1675-106407 The St. Jude Virtual Journal Club: Engaging Students in the Scientific Process Through Primary Literature

Orange County Ballroom 4 • Nature of Science • Paper (30 min) • HS

Participants will learn about a virtual journal club that encourages interaction between students, teachers, and scientists through reading and interpreting research papers. Asynchronous resources are being developed to support integration into high school curricula.

Shelby Montague, Lausanne Collegiate School, Memphis, TN

SPECIAL PROGRAMMING PRESENTED BY 3D MOLECULAR

1675-108948 Modeling Enzymes: From Basics to Bacterial Resistance

Platinum Ballroom 1 • AP® Biology • Demonstration (30 min) • HS, 2Y, 4Y

Engage in hands-on exploration of enzyme structure and function using tactile, physical models. First explore fundamental concepts and then apply them to the specifics of bacterial cell wall synthesis, antibiotics, and antibiotic resistance mechanisms.

Keri Shingleton, 3D Molecular Designs, Tulsa, OK

1675-108733 The College Board Presents: AP® Biology Course Updates

Platinum Ballroom 2 • AP® Biology • Demonstration (30 min) • HS, 2Y, 4Y

In this session, we will present the crosswalk of course changes expected to launch for the 2025–2026 school year.

Catherine Walsh, The College Board, Alachua, FL

1675-105908 The Students' Prairie: Creating Your Own Land Lab

Platinum Ballroom 7 • Ecology / Environmental Science / Sustainability • Demonstration (30 min) • HS

High school students in Aurora, IL, have created and grown their own 12-acre tallgrass prairie ecosystem since 2001. Learn how to adapt this quarter-century program for your school and create your own land lab.

Carl Armstrong, Waubonsie Valley High School, Plano, IL

10:30AM–11:00AM CONT.

1675-106395 Using Authentic Data Figures to Teach Predator-Prey Interactions and Other Topics in Ecology

Platinum Ballroom 8 • Ecology / Environmental Science / Sustainability • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Learn about an open educational resource to teach predator-prey interactions and other ecological topics! These modules also teach graph interpretation skills. You'll explore and adapt one of our lessons for your own course. Laptops recommended.

Suann Yang, SUNY Geneseo, Geneseo, NY and Jeremy Hsu, Chapman University, Orange, CA

1675-106364 Using Yogurt Fermentation as a Tool for Hands-on Investigation of Microbiology Anywhere

Platinum Ballroom 9 • Microbiology & Cell Biology • Paper (30 min) • HS, 4Y, GA

We have developed a group research project-based activity designed to introduce students to concepts of microbiology and scientific thinking. The activity doesn't require any special equipment and can be completed anywhere.

Tatiana V. Kuzmenko, Loyola Marymount University, Los Angeles, CA

11:15AM–12:30PM

1675-106533 Conservation Biology Curriculum & Instructional Practices: Applying a Framework for an Equitable Transformation

Gold Key I & II • JEDI / Inclusive Teaching Practices • Hands-on Workshop (75 min) • HS

Participants will consider a lesson's underlying principles, identify its location along a continuum from reproducing to transforming power, and engage in an environmental justice lesson exploring equitable solutions for conserving biodiversity.

Jocelyn Miller and Melissa Olson, E.O. Wilson Biodiversity Foundation, Durham, NC

11:15AM–12:30PM CONT.

1675-106073 Introduction to Trauma-Informed Pedagogy

Grand Ballroom A & B • Instructional Strategies • Hands-on Workshop (75 min) • GA

This workshop will provide an introduction to trauma-informed pedagogy strategies with short application activities. It emphasizes the importance and acknowledgement of faculty self-care and ends with a reflective discussion.

Melissa Haswell, Delta College, Midland, MI

1675-106367 Art of Making Digital Maps of Estuary Ecology Data

Grand Ballroom C & D • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS, 2Y

Explore why coastal wetlands are a tool in the fight against climate change. Analyze raw data collected by students monitoring marshes. Bring your laptop or other device to create your Google Map of estuary vegetation.

Jesse Wade Robinson, High Tech High, San Diego, CA

SPECIAL PROGRAMMING PRESENTED BY HHMI

1675-108519 Data-Rich Resources from HHMI BioInteractive to Engage Students in Asking Questions and Constructing Explanations

Grand Ballroom F • Science Practices • Hands-on Workshop (75 min) • HS, 2Y

Participants will explore how to use data to elicit testable questions and help students construct scientific explanations. These strategies can be applied to teach different content areas while engaging students in key science practices.

Jim Lane, Mahtomedi High School, Mahtomedi, MN and Deanna Digitale-Grider, Solorio Academy High School, Chicago, IL

1675-106449 Why Do Elephants Rarely Get Cancer? Exploring Genomic Evolutionary Adaptations and the Role of a Tumor Suppressor Gene

Orange County Ballroom 1 • Evolution • Hands-on Workshop (75 min) • HS, 2Y, GA

Explore the low incidence of cancer in elephants using evolutionary clues from different animals, electrophoresis results, genomic database exploration, model building, and applications to human cancer. Bring your laptop to this session.

Peggy O'Neill Skinner, The Bush School (retired) and Fred Hutchinson Cancer Center, Seattle, WA and Rebecca K. Brewer, Troy High School, Troy, MI

1675-105568 Enhancing Student Engagement and Concept Mastery: Leveraging Trade Books in a Spiraled Approach to Teaching Biology

Orange County Ballroom 2 • Instructional Strategies • Hands-on Workshop (75 min) • 2Y, 4Y

Are you struggling to engage students in biology while making conceptual and real-world connections? Here, we will describe spiral design and trade books, and you will collaborate to brainstorm ideas for your own courses.

Erin J. Friedman, Kim Geier, and Jamie L. Brooks, University of Lynchburg, Lynchburg, VA

1675-105965 Empowering Advocates: Using Scientific Literacy to Address Global Prenatal Care Barriers

Orange County Ballroom 3 • Instructional Strategies • Hands-on Workshop (75 min) • HS, 2Y, 4Y

In this interactive lesson, participants become health advocates, engaging in a scavenger hunt-style activity, where they analyze and interpret scientific research to propose effective solutions for barriers to global prenatal care access.

Ashley Burkart, Estrella Mountain Community College, Glendale, AZ

11:15AM–12:30PM CONT.

1675-106296 Teaching Biology Through Computational Modeling

Orange County Ballroom 4 • Science Practices • Hands-on Workshop (75 min) • HS

Join this session to get hands-on experience with an NGSS-aligned learning unit that teaches core biology content through computational modeling and computer programming. No computer programing experience needed.

Kristy Sundberg, McKinley Technology High School, Washington, DC

SPECIAL PROGRAMMING PRESENTED BY 3D MOLECULAR

1675-108450 Modeling Infection and Immunity

Platinum Ballroom 1 • General Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

This session introduces a summer course focused on the molecular mechanisms of virus infection and our innate and adaptive immune systems that have evolved to protect us. The course also addresses new vaccine platforms.

Tim Herman, 3D Molecular Designs, Milwaukee, WI

1675-106397 Using Fungi in Pop Culture to Engage Students with a Hands-on Activity Anchored in Real-World Research

Platinum Ballroom 2 • General Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

While it's not the *Last of Us*, Valley Fever is a potentially life-threatening fungal disease that is on the rise in today's changing climate. Come learn, lab, and see the real-world VF research.

Mary Haus, Chaffey Joint Union High School District, Ontario, CA and Heather Roberts-Gundrum, Alta Loma High School, Rancho Cucamonga, CA

1675-106542 Pandemics! How Changes in Human Ecology and Evolution Drive the Evolution of New Diseases

Platinum Ballroom 3 & 4 • Evolution • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Viruses like COVID and HIV that infect multiple species evolve across all members of their infectious ecosystem. The term "zoonosis" rarely appears in state standards, but describes most infectious diseases that challenge medicine and public health.

Joseph S. Levine, Savvas, Concord, MA

1675-106344 Using VR as an Educational Tool

Platinum Ballroom 8 • Technology in the Classroom • Hands-on Workshop (75 min) • ML, HS, GA

We will explore the multifaceted landscape of using virtual reality as a teaching tool, diving into its potential benefits and the challenges educators might encounter, and also experience the technology in practice.

Molly Dunn, CSU Spur, Denver, CO

1675-106548 Make Your Own Taq DNA Polymerase

Platinum Ballroom 9 • Biotechnology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Polymerase chain reaction (PCR) is used to mass-produce hundreds of important biological proteins. Extract and purify the key PCR enzyme Taq polymerase from recombinant bacteria and take it home with you!

Cristina Fernandez, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY

11:30AM–2:00PM

NABT Honors Luncheon

Grand E • Special Event (Tickets Required) • GA

NABT is proud to recognize the 2024 NABT Award Recipients during this celebratory event. We will honor exceptional biology teachers from all levels, and everyone is welcome to join us to congratulate these remarkable professionals.

2:00PM–3:15PM

1675-106378 Embedding Literacy Supports in 3D Units for Equitable Sensemaking and Learning

Gold Key I & II • Instructional Strategies • Hands-on Workshop (75 min) • ML, HS, 2Y

Embedding literacy supports for reading, writing, and academic discourse in 3D units promotes equitable sensemaking and science understanding! Learn how the BSCS Anchored Inquiry Learning instructional model leverages literacy supports throughout cycles of inquiry.

Cindy Gay, BSCS Science Learning, Steamboat Springs, CO

1675-106485 Promoting Student Growth and Engagement Through Competency-Based Feedback

Grand Ballroom A & B • Instructional Strategies • Hands-on Workshop (75 min) • HS, 2Y, 4Y

While content covered science courses is broad, the skills and practices used to engage with content stay the same. We will discuss how shifting to skill-based feedback supports student growth.

Faith Nelson and Stephen Traphagen, Oak Park and River Forest High School, Oak Park, IL

2:00PM–3:15PM CONT.

1675-106523 Mapping to Conserve Biodiversity Design Challenge

Grand Ballroom C & D • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS

Attendees will participate in a hands-on mapping design challenge centered on the grand global challenge of conserving Earth's biodiversity. The activity will engage learners in biodiversity conservation decisions that reflect efforts in science and policy.

Dennis Liu and Selim Tlili, E.O. Wilson Biodiversity Foundation, Durham, NC

SPECIAL PROGRAMMING PRESENTED BY HHMI

1675-108520 Using HHMI BioInteractive's Free Assessment Builder to Crowdsource Your Assessments for Learning

Grand Ballroom F • Instructional Strategies • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Assessment for learning is a powerful tool in our teaching toolkits, but writing high-quality items is time-consuming. Learn how BioInteractive's free, new Assessment Builder tool brings crowdsourced, vetted assessment items to your life science courses.

Valerie May, Woodstock Academy, Woodstock, CT and Rebecca Orr, Collin College, McKinney, TX

1675-106461 Chutes and Ladders: Identifying and Circumventing Barriers to Increase Student Engagement in Learning Activities

Orange County Ballroom 1 • Instructional Strategies • Hands-on Workshop (75 min) • GA

An interactive workshop to explore barriers to student participation in active learning, including obstructions on student mindsets and in activity design. We will share methods to identify obstacles and brainstorm strategies to address these concerns.

Bethany B. Stone, Sarah L. Bush, and Amanda Durbak, University of Missouri - Columbia, Columbia, MO

1675-106519 A Novel Case-Based Approach to Teaching Upper-Level Biology Majors

Orange County Ballroom 2 • Evolution • Hands-on Workshop (75 min) • 4Y

Using a case-based approach to teaching difficult biological concepts has proven effective in strengthening engagement, deepening understanding of challenging concepts, and honing written and oral communication skills for upper-level biology students.

Raelynn Deaton Haynes, Texas State University, Buda, TX

1675-106413 Exploring the Future: Harnessing AI for Science Education Tools

Orange County Ballroom 3 • Instructional Strategies • Hands-on Workshop (75 min) • HS. 2Y, GA

Harness the potential of generative AI in science education. The session showcases the benefits and some limitations of using AI to create classroom resources.

Christine Patrum, Georgia State University Perimeter College, Decatur, GA and Jewels Morgan, Georgia State University Perimeter College, Covington, GA

1675-106351 Teaching the Evolution of Complexity Using the Volvocine Algae Model System

Orange County Ballroom 4 • Evolution • Hands-on Workshop (75 min) • ML, HS, GA

This hands-on workshop will present how the volvocine algae model system can be applied to the teaching of the evolution of biological complexity at the K-12 level through the demonstration of a laboratory activity.

Joshua S. Hoskinson, Arizona State University, Mesa, AZ and Dinah R. Davison, Kansas State University, Manhattan, KS

SPECIAL PROGRAMMING PRESENTED BY 3D MOLECULAR

1675-108947 Protein Puzzles: Decoding Sickle Cell and CRISPR Solutions

Platinum Ballroom 1 • AP® Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Unravel sickle cell's molecular mysteries with hands-on, minds-on models. Fold beta-globin, applying amino acid properties and varying levels of protein structures. Compare typical and sickled variants to explore structure-function relationships. Dive into cutting-edge CRISPR therapies.

Keri Shingleton, 3D Molecular Designs, Tulsa, OK

1675-106343 Exploring Students' Knowledge Gaps—Using Data from the 2024 AP® Biology Exam to Inform Instructional Practices

Platinum Ballroom 2 • AP® Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Participants will utilize the College Board's "AP® Biology Chief Reader Report" from the 2024 exam to identify student misconceptions and knowledge gaps and then select instructional strategies to improve students' learning.

Ross Sappenfield, Vail Mountain School, Vail, CO and Rachel Lytle, Brentwood High School, Brentwood, TN

2:00PM–3:15PM CONT.

1675-106359 Learning Unity and Diversity in Alabama: A Cultural and Religious Sensitivity Resource and Curriculum Materials for Teaching Evolution in General High School Biology Classrooms

Platinum Ballroom 3 & 4 • Evolution • Hands-on Workshop (75 min) • ML, HS, GA

Learn to use a cultural and religious sensitivity resource and three curriculum units focused on teaching evolution using human and non-human case studies in general high school biology classrooms (field tested in Alabama).

Paul Beardsley, Cal Poly Pomona, Pomona, CA; Connie Bertka, Science and Society Resources, Potomac, MD; Briana Pobiner, Smithsonian Institution, Washington, DC

1675-106222 Regional Feedstocks: Are They the Answer to Achieving a Net Zero Future?

Platinum Ballroom 7 • Ecology / Environmental Science / Sustainability • Demonstration (75 min) • HS, 2Y, 4Y

Learn about the sustainability challenges facing the transportation industry and the potential of transportation biofuels, as well as impacts on greenhouse gas emissions.

Cait McGraw, Idaho National Laboratory, Idaho Falls, ID and Kelly Sturner, Argonne National Laboratory, Chicago, IL

1675-105812 Targeting Misinformation

Platinum Ballroom 8 • Science Practices • Hands-on Workshop (75 min) • GA

Anti-vaxxers, climate change naysayers, COVID myths, wonder diets, and greenwashing by industry—all challenge our students. Help them develop skills in assessing credibility and expertise and busting bogus scientific claims in the media.

Douglas Allchin, University of Minnesota, St. Paul, MN

1675-106503 Microbiomes for All

Platinum Ballroom 9 • Instructional Strategies • Hands-on Workshop (75 min) • ML, HS, GA

This session will introduce the Research Experiences in Microbiomes Network and the "Microbiomes for All" project and how it can be leveraged in the K-12 setting to expose students to STEM research.

Davida Smyth, Texas A&M University - San Antonio, San Antonio, TX and Theodore Muth, Brooklyn College, Brooklyn, NY

1675-107050 DIY Bioinformatics: Create a DNA Activity That Connects Genetic Analysis to Your Current Science Curricula

Platinum Ballroom 10 • AP® Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Bring your computer for a guided tour of the free NCBI website to locate, interpret, and download sequences. Small group discussions and handouts will help teachers craft a self-tailored activity, transferable to students.

Zack Bateson, National Agricultural Genotyping Center, Fargo, ND and Jane Hunt, EducationProjects.org, GrowNextGen.org, and NourishtheFuture.org, Dublin, OH

3:30PM–4:00PM

1675-105824 Cannabis and Society—Teaching Undergraduate Biology Through a Social Justice Lens

Gold Key I & II • Botany & Plant Biology • Demonstration (30 min) • 2Y, 4Y

Plants & Society, a non-major lab course, is a Social Justice Studies course at Harper College. The theme, Cannabis and Society, explores the botanical nature, history, environmental impact, public policy, and social dipartites of cannabis.

Virginia McHugh-Kurtz, William Rainey Harper College, Palatine, IL

3:30PM–4:00PM CONT.

1675-106539 Designing a Computational Tool for Media Literacy in Conservation Biology

Grand Ballroom C & D • Technology in the Classroom • Hands-on Workshop (30 min) • HS

Workshop attendees will participate in a computational design challenge focused on evaluating information sources. They will engage in a hands-on exercise to evaluate information sources and then apply these methods to design a computational tool.

Jocelyn Miller and Melissa Olson, E.O. Wilson Biodiversity Foundation, Durham, NC

SPECIAL PROGRAMMING PRESENTED BY HHMI

1675-108521 Beautiful Biology: A New HHMI Website Featuring Phenomenal Images for Student Engagement

Grand Ballroom F • General Biology • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Discover ways to engage students with images from the new HHMI Beautiful Biology website to build connections to content, ask probing questions, improve observational skills, and reinforce crosscutting concepts.

Ann Brokaw, Rocky River High School, Rocky River, OH

1675-106269 The Clover Project: Connecting Genetics, Ecology, and Plant Biology

Orange County Ballroom 1 • AP® Biology • Demonstration (30 min) • HS, 2Y

Unlock the secrets of cyanogenesis in clover! Participants will learn to implement this hands-on, inquiry-based lab that uses common lawn clover to investigate the connections between cell structure, genetics, evolution, ecology, and local climatic adaptation.

Carolyn "Beanie" Spangler and Kenneth Bateman, Wellesley High School, Wellesley, MA

3:30PM–4:00PM CONT.

1675-106239 Case Studies: The Key to Maintaining Inquiry-Based Learning on Assessments

Orange County Ballroom 2 · General Biology · Demonstration (30 min) · ML, HS, 2Y

Do you want to transform your tests to be inquiry-based and "cheat" proof? This workshop will teach you how to use scientific articles to create inquiry-based assessments and case studies.

Charaun Wills, The Potomac School, McLean, VA

1675-106458 Unlocking the Potential of AI in High School Biology: Strategies and Tools for Effective Integration

Orange County Ballroom 3 · Technology in the Classroom · Demonstration (30 min) · HS, 2Y, 4Y

This session presents strategies for integrating AI-powered adaptive learning in high school biology classrooms. Suitable for both experienced and beginner teachers, the session empowers educators to transform learning and prepare students for the future.

Kate Silber, Highland Park High School, Highland Park, IL

1675-106494 Comparing the Impact of Physical Model Construction and Digital Model Construction on Conceptual Understanding of Abstract STEM Concepts

Orange County Ballroom 4 · Instructional Strategies · Paper (30 min) · ML, HS, GA

This paper session examines results from a long-term research study comparing physical and digital model construction through different assessment strategies to measure conceptual understanding. Benefits and disadvantages of pedagogies and assessment tools will be discussed.

Salvatore G. Garofalo, Queens College, City University of New York, Queens, NY

1675-109288 "Dear Colleague:" Meet Your NSF Program Officers

Grand A & B · Instructional Strategies · Symposium (30 min) · GA

This session will highlight some of NSF's key programs while also giving participants advice on how to improve their chances of impressing Reviewer #2.

Gordon Uno, National Science Foundation, Alexandria, VA

SPECIAL PROGRAMMING PRESENTED BY 3D MOLECULAR

1675-108448 How Does Anthrax Kill You?

Platinum Ballroom 1 · Microbiology & Cell Biology · Hands-on Workshop (30 min) · HS, 2Y, 4Y

We will explore the molecular mechanism whereby the anthrax protective antigen heptamer binds to a virulence factor that unfolds as it passes through a 16-stranded beta-barrel that penetrates the membrane of the target cell.

Tim Herman, 3D Molecular Designs, Milwaukee, WI

1675-105479 What Do Students Think of When They Hear the Term "Evolution"? Exploring Students' Conceptions of Evolution in Introductory Biology Courses

Platinum Ballroom 3 & 4 · Evolution · Paper (30 min) · HS, 2Y, 4Y

We will discuss results from a research study examining how students define evolution at the beginning of undergraduate introductory biology courses and what this means for both high school and college biology instructors.

Jeremy Hsu, Chapman University, Orange, CA

1675-106256 Hexaconnection: Making Student Thinking Visible

Platinum Ballroom 9 · Instructional Strategies · Hands-on Workshop (30 min) · GA

Explore hexagonal thinking as a powerful student-to-student discussion strategy that promotes evidence-based collaboration to produce novel scientific explanations.

Vyjayanti Joshi, Haley Whelan, and Alyssa Martin, Lake View High School, Chicago, IL

3:30PM–4:00PM CONT.

1675-106243 Open Science in the Classroom: Explore Open Data Tools and Free Educational Resources from the Allen Institute

Platinum Ballroom 10 • General Biology · Demonstration (30 min) · HS, 2Y, 4Y

Join the Allen Institute as we demonstrate ways to guide students in using our cutting-edge open science datasets. Tour our curriculum library with free lessons incorporating our open data in neuroscience, cell biology, and immunology.

Alli Wiener and Kaitlyn Casimo, Allen Institute, Seattle, WA

4:15PM–4:30PM

Announcement of the 2024 Poster Winners

Platinum Ballroom 5 & 6 • Special Event · GA

NABT is pleased to announce the student winners of the Biology Education Research competitions and the Mentored Student Research competitions.

4:30PM–7:30PM

GENERAL SESSION

Natalia Reagan

See biography on page 19

Making Biology Humerus: The Life of a Scientist Comedian

Platinum Ballroom 5 & 6 • Special Speaker (60 min) · GA

Science—especially biology—is hilarious. From garish animal morphology, to elaborate mating rituals, to all things poop—the biological sciences are a comedy goldmine of endless content. But as educators, we are often taught to avoid wading into silly territory—that we have to remain serious so that we may be taken seriously. However, Natalia Reagan is a firm believer that humor is an invaluable teaching too. She has built a career combining her two passions—science and comedy- to create digestible science communication for the public and her classrooms! Though she may have an unfair advantage as a primatologist, as monkeys are a treasure trove of hilarity.

Some of Natalia's scicomm roles include hosting a Bigfoot TV show, writing comedy and hosting for Neil deGrasse Tyson, being a science expert on Nat Geo, Nat Geo Wild, History, & Travel Channel, writing and hosting for Discovery, podcasting for Scientific American, and creating her own science comedy content on YouTube, TikTok, and Instagram. Currently, she produces, writes, and hosts a science comedy variety show called *Survival of the Filthiest*. Essentially, her job is to make science accessible, fun, and memorable. Humor makes a lasting impact—and she have the receipts to prove it! Natalia will share her scicomm journey, from methodology, to soul-crushing failures, to happy successes so that you can be the best science communicator inside and outside your classroom!

6:00PM–8:00PM

Saturday Night Closing Reception and Silent Disco

Platinum Patio • Special Event (Tickets Required) · GA

Get ready to dance the night away at NABT's first-ever silent disco! This unique event will feature food, fun, and friends catching up and getting down. Don't have boogie fever? You're still guaranteed to leave Anaheim with a smile.

Sunday

8:30AM–10:30AM

Four-Year College & University Section Meeting

Platinum Ballroom 1 • Committee Meeting • 4Y, GA

Two-Year College Section Meeting

Platinum Ballroom 2 • Committee Meeting • 2Y, GA

Explore Our *Digital Modeling Hub!*

Combine Physical & Digital Learning Tools to Engage Students

*Our **Digital Modeling Hub** seamlessly integrates into your lessons, enriching existing curricula with its versatile toolkit:*

Augmented Reality Modules

Students *model science concepts beyond the limitations of physical models with interactive AR.*

Protein Exploratoriums

Students begin *protein visualization without learning Jmol coding.*

Interactables

Web-based *click, drag, and drop activities.*

Short Content Videos

Help learners *think more deeply about a molecular bioscience topic.*

Field Test Price $100 per Educator Includes Access for ALL Your Students!

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3d molecular designs

U.S. DEPARTMENT OF ENERGY
BIOENERGY RESEARCH AND EDUCATION BRIDGE PROGRAM

Attention High School, Technical and Community College, and University Educators!

Grow your science curriculum with FREE bioenergy classroom toolkits designed to increase student engagement and prepare the next-generation STEM workforce!

BIOENERGY 101

R&D
Research and development is the work directed toward the innovation, introduction, and improvement of products and processes.

Bioenergy
Energy produced from biomass and includes biofuels, bio-based products, and biopower.

Bioeconomy
A global transition to the sustainable use of renewable biomass resources in energy and products leading to economic, environmental, social, and national security benefits.

BRIDGING TODAY'S PROBLEM SOLVERS TO TOMORROW'S CLEAN ENERGY FUTURE

Stop by BRIDGES booth #411!

The U.S. Department of Energy's Bioenergy Technologies Office, in collaboration with Argonne National Laboratory and Idaho National Laboratory, is providing educators an opportunity to elevate their clean energy classroom experience with the **Bioenergy Research and Education Bridge Program** (BRIDGES). The case study-based education curriculum introduces educators to bioenergy national laboratory research that can be integrated into a classroom setting. **Bioenergy knowledge is not required!**

Student Impact

The BRIDGES case study-based education curriculum provides students an opportunity to develop and strengthen skills in:

- Problem solving
- Quantitative and/or qualitative analytics
- Decision making in complex situations
- Research and development dynamics comprehension
- Bioenergy concepts with equity and inclusion considerations

▶ NEXT STEPS

- **Request to participate** in BRIDGES Field Testing by sending an email to Bioenergy_Bridges@ee.doe.gov
- **Learn more about the BRIDGES toolkits by visiting** energy.gov/eere/bioenergy/bioenergy-research-and-education-bridge-program
- **Email** questions to bioenergy_bridges@ee.doe.gov

▶ **DOWNLOAD** the BRIDGES educator toolkit to learn how you can create an active, engaging, and personalized learning experience with bioenergy research and development scenarios covering sustainable aviation fuel (SAF), upcycling plastics, bioenergy feedstocks, and waste-to-energy research.

Bioenergy Research and Education BRIDGES
U.S. Department of Energy | Bioenergy Technologies Office

U.S. Department of ENERGY | Office of Energy Efficiency & Renewable Energy
Bioenergy Technologies Office
Argonne | INL Idaho National Laboratory | NABT

Notes

EXHIBIT HALL HOURS

THURSDAY
5:30PM–7:30PM
Exhibit Hall Opening Reception

FRIDAY
8:00AM–5:30PM
Exhibit Hours

4:00PM–5:00PM
Meet & Greet with NABT Leaders

4:00PM–5:30PM
Exhibit Hall Closing Reception

EXHIBITOR KEY

SPONSORSHIP TIERS

- Diamond
- Gold
- Silver
- Treasure Hunt Exhibitors

EXHIBIT HALL MAP KEY

- Sponsor Booths
- × Treasure Hunt Exhibitors

10k Science

Booth #400

10k.science

10k Science is a VR platform for immersive science education, featuring content from leading scientists and NGSS-alignment by the Lawrence Hall of Science. Audio-based AI Guides interact with students in real-time and provide teachers with insights on student learning through a web-based dashboard. A 2022 pilot study demonstrated significant increases in engagement and learning, highlighting the incredible potential for 10k Science to overcome the limitations of traditional media.

3D Molecular Designs

Booth #217

3dmoleculardesigns.com

Our collaborative kits and interactive models give words meaning by focusing on core ideas and intersecting concepts in biology, chemistry, physical, and life sciences. Engaging kits and dynamic models invite students to explore patterns, make predictions, and revise their explanations while grappling with complex science ideas. Teachers play key roles in the design, field testing, and activity development of all our kits and models so you can be sure learning is successful in your classroom. Kits support STEM, NGSS, IB, PLTW and can be incorporated in existing curriculum. Discover how to effectively bring modeling to your classroom and apply for our summer professional learning course, Modeling the Molecular World.

Algae Research Supply

Booth #304

AlgaeResearchSupply.com

Algae Research and Supply is a group of geeks who believe that algae will be one of the tools used to remove CO2 from the atmosphere. Our mission is to get the cultures, equipment, and know-how to teachers and students so that they can wield algae as means to fight climate change.

Allen Institute

Booth #111

alleninstitute.org/education

The Allen Institute is a biomedical research nonprofit focused on accelerating foundational research, catalyzing bold ideas, and openly sharing our science to make a broad, transformational impact on the world. We provide free education resources and open data—developed with our scientists—to teach neuroscience, immunology, and cell biology. We offer resources for educators and students at the high school and college level to guide students through experiments using our cutting-edge resources, including data from real human brains and healthy human stem cells, without the need for specialized laboratory facilities. Our programs include virtual educator workshops and opportunities for educators and their students across the world, as well as in-person teacher academies, classroom visits, public events, and field trips at our headquarters in Seattle, Washington.

American Society of Human Genetics

Booth #403

ashg.org

ASHG is a global interdisciplinary community of thousands of researchers who investigate fundamental working of genes and genomic variation, and who translate new genetic knowledge to propel biomedical research, improve human health, and understand our common ancestral origins. We work to advance human genetics and genomics in science, health, and society through excellence in research, education, and advocacy.

American Society of Plant Biologists

Booth #302

aspb.org

The American Society of Plant Biologists promotes the growth and development of plant biology, encourages and publishes research in plant biology, and provides vital supports for plant scientists. The Society actively works to increase awareness of the significance of plants, support educators, and increase student interest in STEM by promoting scholarly teaching, active learning, effective mentoring, and evidence-based public engagement.

Amplyus (miniPCR)

Booth #203

minipcr.com

We make biology accessible. Whether you are a student, an experienced researcher, or a self-taught amateur, you need high-quality tools that are simple to use. Our biology and biotech equipment and lab activities have brought innovative molecular biology to classrooms and living rooms, forests and laboratories, and even to outer space! Our team of molecular biologists, engineers, designers, and educators is dedicated to the mission of making science accessible to everyone, everywhere.

Anatomage

Booth #101

anatomage.com

Anatomage is a medical company, driving innovation through advanced solutions in hospitals and educational institutions. Our digital cadaver table, the Anatomage Table, allows a hands-on approach to learning the human body through unique visualization options, dissection tools, and quiz mode features, making it a strong asset to any anatomy class.

Animalearn

Booth #312

thesciencebank.org

Animalearn works to enhance science education experiences by providing humane non-animal resources for K-12 classrooms and beyond. We offer dissection alternatives, expert information, and advocacy tools. Animalearn's one-of-a-kind loan program, The Science Bank, is home to hundreds of innovative animal-friendly humane science education products, including AR/VR technology and realistic models, that can be borrowed for FREE. Thank you for supporting humane life science education!

Beautiful Biology

Booth #100

beautifulbiology.org

Beautiful visuals of the invisible world of biology can inspire and educate students and the public. With this as our foundation, we have developed a new science outreach effort called Beautiful Biology, a visual-based journey into learning about living organisms and the rest of the biological world. Beautiful Biology will curate stunning visuals of the entire realm of living organisms that are invisible to the eye. These microscopic or macrophotography images and videos, along with accessible explanations of the biology underlying them, will be presented to the public, educators, and students through a free, interactive website and social media.

Bedford, Freeman & Worth High School Publishers

Booth #200

bfwpub.com

BFW Publishers is the leading provider of innovative AP® Science programs. With full CED alignment and integrated skills practice, our programs are designed to build the skills necessary for success on the AP® exam and in the course. Our AP® Biology program, Biology for the AP® Course, and our market-leading AP® Environmental Science program, Environmental Science for the AP® Course—like all of our programs—provide unmatched AP® specific features, teacher and student resources, online homework with targeted feedback, and much more. Additionally, we publish groundbreaking texts such as College Physics for the AP® Physics 1 & 2 Courses and Living By Chemistry (an inquiry-based chemistry program). With a reputation for excellence, BFW is proud to be part of the Macmillan Learning Family.

BioBrain

Booth #212

biobrain.com.au

BioBrain is an online platform that offers STEM learning resources for high school and college students, focusing on biology, chemistry and physics. BioBrain has been created by teachers to help students achieve the best learning outcomes possible, utilizing the latest technology available.

BioBrain's curriculum aligned learning materials are broken down into small bite-sized chunks, graded over three levels, to suit today's digital-native learners. Each subject features comprehensive learning materials with clear and detailed scientific diagrams. Short quizzes with a variety of question formats are used to assess understanding. The illustrated glossary helps students grasp the more difficult scientific concepts.

With both teacher and student interfaces, teachers can easily track their students' progress, while students receive instant feedback on quizzes and worked solutions to difficult questions.

BioBrain is available on all desktop and mobile devices, allowing students to learn at their own pace, anytime, and anywhere. The platform has been developed by teachers who understand the needs of their students, and have created a modern, easy-to-use interface that students love using.

BioBrain provides personalized learning, that can be tailored to the needs of the individual students or class.

Bioenergy Research and Education Bridge Program | U.S. Department of Energy

Booth #411

energy.gov/eere/bioenergy

Created by the U.S. Department of Energy's (DOE's) Bioenergy Technologies Office (BETO), in collaboration with Argonne National Laboratory and Idaho National Laboratory, BRIDGES is a bioenergy education curriculum that includes bioenergy case studies that can be taught in diverse settings, including high schools, technical and community colleges, and universities. BETO and its partners have developed four sets of student and instructor guides, each focused on topical, authentic case study scenarios in the bioenergy field. Each case study explores solutions for a more secure energy future using bioenergy technologies while addressing cultural responsiveness and issues surrounding diversity, equity, and inclusion (DEI). These case studies focus on sustainable aviation fuel, upcycling plastics, bioenergy feedstocks, and waste-to-energy potential.

BioLEAP

Booth #412

bioleap.org

BioLEAP is a humane education program dedicated to advancing learning in the biology classroom without harming animals. Program offerings include free NGSS-compliant curricular material, a digital catalog sourcing humane anatomy learning tools, and grants of up to $1,000 to help replace dissection in the classroom.

Bio-Rad Laboratories, Inc.

Booth #204

explorer.bio-rad.com

Bio-Rad provides a completely supported life science experience. Bio-Rad products are state of the art and take student learning objectives into account. Starting with the highest quality curriculum and reagents with guaranteed results, Bio-Rad provides peace of mind each time you spend your precious lab budget. We focus on providing teachers with the best resources possible so you can focus on what you do best—teach!

Biotility

Booth #210

biotility.research.ufl.edu

Biotility at the University of Florida offers pathways for individuals seeking to jumpstart or advance their career in the bioscience industries.

Our programs include industry short courses, bioscience educator professional development, and the Biotechnician Assistant Credentialing Exam (BACE)—a biotechnology industry-recognized credential that can be earned before students even graduate high school.

BIOZONE

Booth #207

biozone.com

BIOZONE has more than 30 years of experience in the development of engaging and effective resources for science teaching and learning.

Our resources are unlike any you've seen before and a departure from the traditional basal textbook paradigm. We take a "worktext" approach, combining the very best features of a traditional textbook with an interactive workbook. The resulting hybrid provides well-designed, compact lessons that engage students and provide a rigorous yet accessible program of work. Our expert writers bring science to life through the use of phenomena from engagement to assessment. We continually revise and improve our resources to ensure they remain current and relevant to your needs. Part of this process is engaging with you as teachers and valuing your feedback, and we are only ever a phone call or email away. By their innovative design, our resources encourage student interaction, using simple investigations and data analysis to engage students in the science around them.

Bone Clones

Booth #406

boneclones.com

Bone Clones, Inc.manufactures detailed, high-quality osteological reproductions of skeletal elements. In addition to producing specimens exhibiting trauma and pathology, we have an extensive range of skulls and skeletons providing age, sex, and ancestry differences. Our durable replicas obviate the need for a dedicated teaching collection of real human remains.

BrainFacts

Booth #317

brainfacts.org

BrainFacts is the the public information initiative of the Society for Neuroscience. We provide free resources to educators, budding neuroscientists, and the science-curious public.

Carolina Biological Supply Company

Booth #301

carolina.com

Carolina Biological Supply Company is a worldwide leader in science education, providing top-quality, innovative materials for educators. Carolina serves the K-16 market with everything needed to equip science laboratories and classrooms. Products, kits, NGSS lab solutions, and free teacher resources are available at carolina.com. Carolina™ Science catalog available upon request.

Clemson University

Booth #214

clemson.edu

The Department of Biological Sciences is proud to offer an online, non-thesis Master of Biological Sciences designed specifically for K-12 teachers. The curriculum consists of 30 credit hours of relevant, rigorous, and challenging graduate courses specifically designed to improve science-content knowledge. This program is fully in a distance-learning format.

CRISPRkit

Booth #401

crisprkit.org

Our solution tackles a key challenge in traditional CRISPR experiments: the necessity for live cell cultures. By leveraging a cell-free transcription-translation (TXTL) system, we have crafted an in vitro environment optimal for CRISPR gene editing and regulation experiments. With the TXTL system, one can complete an experiment by simply combining various CRISPR components in a tube, eliminating many steps typical of conventional experiments.

Another hurdle has been experimental readouts and analysis. Traditional CRISPR gene knockouts and knockdowns often require quantification using costly equipment found only in labs. Our solution? We employ chromoproteins that produce vivid pigments easily seen by the naked eye. Furthermore, we have developed a novel computational algorithm CRISPectra capable of analyzing smartphone-captured images of these results, removing the need for specialized equipment.

Our kits are approximately less than $5 each. We bypass the need for expensive lab equipment, making gene editing achievable anywhere, anytime.

Edvotek, Inc.

Booth #107

edvotek.com

Edvotek was the world's first company dedicated to demystifying biotechnology for students. In 1987, we envisioned how the emerging area of biotechnology could inspire students to choose a career in science. Today, Edvotek has expanded to become the world's leading supplier of safe, affordable, and easy-to-use biotechnology kits and equipment.

Engineering Tomorrow

Booth #410

engineeringtomorrow.org

Engineering Tomorrow is a non-profit STEM program. Guided by a diverse team of successful engineers, Engineering Tomorrow introduces high school students nationwide to various engineering fields and provides them with hands-on instruction, virtual labs, and mentorship. All our offerings are available to students, teachers, or schools at no cost. Many of our school partner teachers are math and science teachers and teachers in all CTE, STEM, and STEAM fields!!

Foundation for Biomedical Research

Booth #105

fbresearch.org

The Foundation for Biomedical Research (FBR) is America's most experienced, trusted, and effective nonprofit dedicated to improving human and animal health by promoting public understanding and support for biomedical research.

We believe that by illuminating the essential role animal research plays in changing health outcomes and defeating illnesses, we can help make lives even better.

Kendall Hunt Publishing Co.

Booth #306

k12.kendallhunt.com

Kendall Hunt has provided educational solutions in the higher education and K-12 marketplaces for close to 80 years. Our K-12 biology offerings include BSCS Biology: Understanding for Life, a full-year, high school level program; OpenSciEd High School includes biology units available that address the NGSS and empower students with a rigorous science education to prepare for success in college and STEM careers; and inquiryHub Biology engages students in ways to help them become proficient in all eight science and engineering practices. For more information on any of these biology programs or our full line of K-12 math, science, and gifted curriculum, visit k12.kendallhunt.com.

LA Promise Fund

Booth #104

amgenbiotechexperience.net/losangeles

Amgen Biotech Experience of Greater LA works to support biotechnology education in the Greater LA area. Our program is centered around ABE's engaging, hands-on biotechnology lab curriculum. Teachers receive free training on the curriculum, and once trained, we lend them the materials and provide the technical support they need to be able to implement our NGSS aligned curriculum in their own classrooms. All training and materials are free to all teachers.

LGS Microscopes

Booth #402

lgsmicroscopes.com

LGS offers microscopy products sales and service across the US.

Master of Science in Science Education (MSSE) Program

Booth #307

montana.edu/msse

Science Teaching - Graduate Studies Online and in the Field Interdisciplinary Graduate Studies in Science Education at Montana State University allows science educators of all backgrounds to gain knowledge and competence in the science disciplines of their choice. Online science and education courses are offered year-round, allowing students the flexibility to design an online curriculum that caters to their personal and professional interests.

During the summer, educators from all over the world have the opportunity to converge on Montana State's Bozeman campus to experience science through popular field and lab courses that utilize the state's diverse environment to teach scientific principles and provide models of field-based instruction. With an emphasis on science inquiry, Next Generation Science Standards (NGSS) and K-12 classroom-focused content, our courses are tailored to meet the needs of formal and informal science educators.

Microgen Laboratories

Booth #106

microgenlabs.com

The mission of Microgen is to become a leader in the development and manufacturing of novel diagnostic tests for public health applications. Currently, we are focused on the commercialization of infectious disease point-of-care diagnostics that are rapid, inexpensive, and simple to use.

MiniOne Systems

Booth #216

theminione.com

Game-changing MiniOne® Systems equipment and labs enable equal access to key biotech techniques for grades 7-12 and beyond. Whether used in the classroom lab or at home, our systems and inquiry-based lab kits save time and money and engage students with hands-on participation to answer real world questions.

National Human Genome Research Institute

Booth #215

genome.gov

The Education and Community Involvement Branch (ECIB) develops education and community involvement programs to engage a broad range of the public in understanding genomics and accompanying ethical, legal, and social issues.

Neurasium

Booth #413

neurasium.com

Neurasium is an online platform that engages and motivates high school students to self-study using gamified learning and AI. Built to lighten the workload for teachers, it offers AI-generated tutoring to reinforce understanding, leaderboards to encourage healthy competition, and personalized pacing for students. On top of this, Neurasium is also a cost saver, utilizing open-source textbooks from OpenStax to provide comprehensive, affordable content for Biology curricula.

Point Loma Nazarene University

Booth #405

pointloma.edu/graduate-studies/programs/general-biology-ms

Point Loma Nazarene University (PLNU) in San Diego, California offers a Master of Science degree in General Biology for working professionals. It is a particularly good fit for teachers, as it is excellent preparation for teaching AP® and honors biology for high school and also qualifies individuals to teach community college biology courses. The hybrid program includes online work with Zoom sessions in the fall and spring, and in-person lab courses for six weeks in the summer. Housing for students is available on our beautiful ocean-view campus.

Society for College Science Teaching

Booth #314

theSCST.org

Our mission is to improve college science teaching by facilitating interactions and relationships between faculty, pedagogical, and science education researchers; graduate students, science writers, and publishers; laboratory coordinators and developers; and other professional societies. SCST annually awards the Outstanding Undergraduate Science Teacher Award (OUSTA) and provides mini-grants for projects related to college science teaching. We welcome all scientific disciplines and modalities (traditional, online, informal).

GIVE THE GIFT OF COMMUNITY

Be the leader that empowers a fellow educator with an NABT membership.

Learn more at **NABT.org/Gifts-Logowear**

GIVE THE GIFT OF NABT
National Association of Biology Teachers

Graduate Studies in Science Education

- Online courses during the fall, spring & summer
- Summer field/lab courses
- Master's Degree, Graduate Certificates, and Professional Development
- Course options in all science disciplines
- Supports formal & non-traditional science educators
- Emphasizes NGSS
- Affordable, competitive tuition

MONTANA STATE UNIVERSITY | Master of Science in Science Education

Teach Kind

Booth #311

teachkind.org

TeachKindScience—PETA's humane education division—helps schools integrate compassion for animals into existing curricula through free lesson plans, presentations, and more. As former classroom teachers, we know that educators have the power to plant seeds of kindness and we want to make humane education easy! TeachKind also partners with school districts to replace outdated animal dissections with superior, trauma-free, cutting-edge learning tools and support educators nationwide. Check out TeachKind.org and start building empathy for all right now!

TeachDNA

Booth #315

TeachDNA.NET

TeachDNA makes fun, challenging, user-friendly, and instructive biomolecular models, and guides you through the layers of information contained therein. Product #1 is PlayDNA! with matching RNA Parts: a nucleic acid structure building toy that's realistically flexible and robust, bending and twisting like the real double helix. Cartoon nucleotides give a simplified view that appeals to learners of all ages and abilities. PlayDNA! and RNA Parts are available in long-lasting, storage-friendly kits from Carolina Biological Supply. More new three-dimensional biomolecular designs are on their way from TeachDNA.

The Jackson Laboratory

Booth #202

jax.org

The Jackson Laboratory (JAX) is an independent, nonprofit biomedical research institution which aims to discover precise genomic solutions for disease and empower biomedical researchers to improve human health. JAX Genomic Education develops NGSS-aligned lessons, activities, and hands-on laboratory protocols for teaching and learning about genetics and genomics.

Our Teaching the Genome Generation™ professional development program provides teachers with the content knowledge, teaching strategies, and resources needed to implement molecular genetics labs, bioinformatics activities, and bioethics lessons that effectively engage students.

Thermo Fisher Scientific

Booth #404

fishersci.com

The Fisher Scientific channel is your one-stop shop for a variety of global product and service brands, offering a comprehensive selection of laboratory equipment, chemicals, instruments, biological products, and consumable supplies. With an extensive list of exclusive alliances with major manufacturers and our own Fisherbrand™ line of products, we provide easy access to the items that are most in demand—all from one source.

Vaccine Education Center at Children's Hospital of Philadelphia

Booth #305

vaccinemakers.org

The Vaccine Makers Project (VMP) is the classroom-based program of the Vaccine Education Center at Children's Hospital of Philadelphia (VEC). Our team is committed to education about vaccine science via scientifically supported, historically accurate and emotionally compelling content. The VMP has free, school-based curricula to educate students about how the immune system works, how diseases develop and how vaccines work to prevent them. While the immediate goal is to provide educators with information and resources necessary to teach this scientific success story, the greater opportunity is to immunize the next generation of adults against scientific misinformation and disinformation while also equipping them with the skills necessary to critically evaluate the multitude of science-based topics central to how we live on and interact with this planet. Only when people understand and consider the scientific underpinnings of relevant topics can we expect that they'll be equipped to make informed and logical decisions.

Vernier Science Education

Booth #211

vernier.com

Vernier Science Education is committed to using our experience, knowledge, and passion to create the best and most reliable solutions for biology education. Our comprehensive solutions include hardware, software, content, assessment, professional development, and technical support. We are dedicated to partnering with biology educators and communities to build a STEM-literate society where students grow up to become knowledgeable citizens who can solve problems, fully contribute to their communities, and drive innovation.

W.W. Norton & Company

Booth #310

seagull.wwnorton.com/biology

Norton Biology brings together the best minds in biology teaching and research under one roof—from Sean Carroll to Bruce Alberts to Peter Parham. We provide superior visuals, up-to-date research, and active learning resources to help students see the world like biologists.

Wisconsin Fast Plants

Booth #102

www.fastplants.org

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Thank You

TO THE MANY VOLUNTEERS

WHO WORKED SO HARD TO MAKE THE 2024 CONFERENCE A SUCCESS!

NABT
National Association of Biology Teachers

Anaheim
CALIFORNIA 2024

NABT
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Ad Index

National Association of Biology Teachers

Certificate of Attendance

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NABT PROFESSIONAL DEVELOPMENT CONFERENCE

November 14–17, 2024
Anaheim, California

Amanda Townley, PhD
NABT President–2024

NABT
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NABT POLICY ON MEETING SAFETY & RESPONSIBILITY

NABT is committed to providing a safe, productive, and welcoming environment for all program participants and NABT staff. All participants, including, but not limited to, attendees, speakers, volunteers, exhibitors, NABT staff, service providers, and others are expected to abide by this Meeting Safety & Responsibility Policy.

This Policy applies to all NABT meeting-related events —both in-person and online—and includes those events sponsored by organizations other than NABT but held in conjunction with NABT events, in public or private facilities.

Personal Safety and Security

NABT works diligently to provide a safe and secure environment at its meetings and events by working with venue staff to make sure participants are safe. We ask that all attendees report any questionable or concerning activity to NABT staff so that they can take immediate action. No concern is too small, so if you see something, say something.

- Be aware of your surroundings at all times.
- Use the buddy system when walking to and from the event venue and networking event locations during early or late hours.
- Don't wear your meeting badge on the street. Take it off as soon as you leave the building/venue.
- Don't carry a lot of cash or credit cards. Leave in your hotel room safe.
- Don't leave personal property unattended anywhere, anytime.

If there is an emergency or if you need immediate assistance, do not delay in asking any NABT staff member or the on-site security personnel to help you.

Public Health & Safety

NABT understands that there is inherent risk in participating in any activity and we do our best to reduce those risks as much as possible. Due to the ongoing COVID-19 pandemic, NABT will adopt measures to mitigate risks based on available guidance from the World Health Organization, Centers for Disease Control, and other public health experts. We appreciate your full compliance with those protocols to help reduce viral transmission.

We also request that you monitor your own health status and forgo attending an NABT event if you suspect exposure or exhibit symptoms of transmissible illness.

Responsible Drinking

At NABT receptions, both alcoholic and non-alcoholic beverages are served. NABT expects participants at our events to drink responsibly. NABT and hotel staff have the right to deny service to participants for any reason and may require a participant to leave the event.

Unacceptable Behavior

- Harassment, intimidation, or discrimination in any form.
- Physical or verbal abuse of any attendee, speaker, volunteer, exhibitor, NABT staff member, service provider, or other meeting guest.
- Examples of unacceptable behavior include, but are not limited to, verbal comments related to gender, sexual orientation, disability, physical appearance, body size, race, religion, national origin, inappropriate use of nudity and/or sexual images in public spaces or in presentations, or threatening or stalking any attendee, speaker, volunteer, exhibitor, NABT staff member, service provider, or other meeting guest.
- Disruption of presentations at sessions, in the exhibit hall, or at other events organized by NABT at the meeting venue, hotels, or other NABT-contracted facilities.

NABT has zero tolerance for any form of discrimination or harassment by participants or our staff at our events. This includes but is not limited to sexual harassment or unwelcome conduct based on race, color, religion, sex (including pregnancy), gender identity, nationality, age, disability, or genetic information.

If you experience harassment or hear of any incidents of unacceptable behavior, please inform Jaclyn Reeves-Pepin, the NABT Executive Director at **jreevespepin@nabt.org** or **(888) 501-6228** so that appropriate action can be taken.

NABT reserves the right to take any action deemed necessary and appropriate, including immediate removal from the meeting without warning or refund, in response to any incident of unacceptable behavior, and NABT reserves the right to prohibit attendance at any future meeting.

By registering for an NABT event, you agree to comply with NABT's Meeting Safety & Responsibility Policy and will take full responsibility for your personal conduct.

Save the date

Oct 30-Nov 3, 2025

NABT 2025

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OCT 30-NOV 2, 2025

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Addendum for the 2024 NABT Conference Program

Corrected Description:

Friday, November 15 (8:00AM - 9:00AM)

1675-109132 Determination of Biological Sex with the Bradford Assay: A Forensic Approach

Discover forensic biotech in our workshop. Perform Bradford Assay for biological sex identification from fingerprints, and delve into biochemical analysis with practical skills.

Friday, November 15 (2:00PM - 4:00PM)

2024 will feature the *16th Annual Biology Education Research Symposium*.

Additions:

NABT Poster Session
Saturday, November 16 (8:00AM - 10:00AM)

7. The Development and Importance of Valid and Reliable Measures to Assess Student Learning

Amandeep Kaur, Kristy Daniel, Carrie Jo Bucklin, & Sunni Taylor, Texas State University, San Marcos, TX

33. Racially-Just Inclusive Open STEM Institute (RIOS): Promoting Innovative STEM Transformation through Collaborative Learning Opportunities and Education Research Mini-Grants

Kaitlin Bonner, St. John Fisher University, Rochester, NY; Carrie Diaz Eaton, Bates College, Lewiston, ME; Bryan Dewsbury, Florida International University, Miami, FL; Sam Donovan, BioQUEST, Pittsburg, PA

72. Behavior Changes in First-year STEM Students; Non-academic Factors Matter

Mehri Azizi and Bryan Dewsbury, Florida International University, Miami, FL

73. ORACLE: Operationalizing Research Around College Lab Experiences

Identifying the Learning Objectives of Biology Laboratories in the General Education Curriculum and Exploring Gaps Between Objectives and Practice

Sarah Gerken, Dayna DeFeo, Trang C. Chan, and Honor McElroy, University of Alaska Anchorage, Anchorage, AK

Exhibitor

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Cancellations

Saturday, November 16, 2024 (10:30AM - 11:00AM)

1675-109688 Are You Looking for Paid Opportunities to be a Teacher Leader and Presenter?

Poster Cancellations

Instructor-Perceived Benefits and Costs of Inviting Students to Answer Questions Voluntarily in Large Science Courses

Erika Nadile, Katelyn Cooper, Makena Winton, Tasneem Mohammad, Sara Brownell, & James Collins, Arizona State University, Tempe, AZ

C.U.R.E.ing Biofilms: A Multi-Week Investigative Research Experience for Microbiology Students

Lisa Bowers & Daae Ransom, St. Olaf College, Northfield, MN

The Pollinator Path: A Living Lab on an Urban Campus

Doreen Schroeder & Catherine Grant, University of St. Thomas, St. Paul, MN