

SATURDAY NOV II

NOV



SATURDAY

ABBREVIATION KEY

E: Elementary School

MS: Middle School

HS: High School

2Y: Two-Year College

4Y: Four-Year College

GA: General Audience

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ST. LOUIS
2017

7:30 AM – 8:45 AM**BioClub Breakfast**

Regency C • Meal Function (Tickets Required) • GA



The NABT BioClub continues to grow, and both current and future BioClub Advisors are invited to share favorite resources, and stories about their chapters. Join the club (BioClub that is)!

The BioClub Breakfast is made possible through the generous support of

CAROLINA
www.carolina.com

Missouri Biology Teachers Morning Coffee**Pegram**

Missouri teachers are invited to meet other local teachers for some coffee, camaraderie, and to learn more about NABT.

9:00 AM – 10:15 AM**INVITED SPEAKER
SCOTT WILLIAMSON SPEAKER SERIES****John Kelly**

➔ See page 10 for biography.

The Question of Variation

Regency A • Special Speaker • GA

Nearly all populations display genetic variation in behavior, morphology, physiology, and the susceptibility to disease. The question of why organisms vary is a classic one that resisted a comprehensive answer. However, advances in both quantitative and molecular biology now allow us to address the question of variation in an unprecedented way. In this talk, Dr. Kelly will discuss the processes that maintain genetic variation in nature with a particular focus on the model plant species *Mimulus guttatus*. This work illustrates how genetics, mathematics, and field biology can be combined to study these processes.

Dr. Kelly is the inaugural speaker in a new series established by Brad and Carol Williamson to honor their son Scott, a gifted biologist who loved the challenge of the big questions in biology but who balanced this passion with his devotion to his family.

9:00 AM – 10:15 AM**9:00 AM – 11:00 AM****NABT Biology Education Poster Session**

Midway • Poster Session (120 min) • HS, 2Y, 4Y, GA

This poster session will highlight research, practices, and programs in three distinct categories: general strategies for teaching biology, the scholarship of teaching and learning, and mentored student research. Posters presented by undergraduate and graduate students may be entered into two competitions.

➔ Complete listing starts on page 52

Coordinator: Troy Nash, Mercer University, Macon, GA

302 • Which Scientist's Work Saves 8 Million Lives a Year? Special NABT Screening of the Award-winning Documentary, Hilleman: A Perilous Quest to Save the World's Children

Grand B • Biotechnology • Symposium (75 min) • HS, 2Y, 4Y

Most haven't heard of him, but his work probably affected their lives. Join us to learn about this American hero. Meet the film director, get free classroom resources, and leave inspired!

Charlotte Moser, Vaccine Education Center at Children's Hospital of Philadelphia, Philadelphia, PA and Donald Mitchell, Medical History Pictures, Haverford, PA

301 • The Central Dogma of Genetic Medicine - A New Animated, Interactive Video, and Hands-on Activity to Teach CRISPR and Other Techniques, such as Gene Therapy and RNA Interference, Which Target the Flow of Genetic Information from DNA to RNA to Protein

Regency B • Biotechnology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Hear from experienced educators how to incorporate into your lesson plans exciting new classroom-made resources focused on the latest technologies used to treat genetic disease.

Ann Brokaw, Rocky River High School, Rocky River, OH; Kate Fisher, Oregon City High School, Oregon City, OR; and Laura Bonetta, HHMI, Chevy Chase, MD

9:00 AM – 3:00 PM**SPECIAL PROGRAMMING PRESENTED BY
OpenStax****All sessions in Midway Suites 1****9:00 AM – 10:00 AM****410 • Building an Online Science Kit with Carolina Biological and OpenStax**

General Biology • Demonstration (60 min) • 2Y, 4Y

Learn about building an online science kit with hands-on investigations for your students. Discover how your learning outcomes can be synced with individual investigations and specific sections of OpenStax texts, giving students a one-stop-shop for their text and kit that makes online science easier than ever.

Louis F. McIntyre, Sr, Rockingham Community College, Houston, TX

10:00 AM – 11:30 AM**411 • Help Us Shape the Future of Ed-Tech – OpenStax Tutor Beta Feedback Session**

General Biology • Demonstration (90 min) • 2Y, 4Y

OpenStax is conducting a feedback session on our new, low-cost courseware – we need your help to improve our tool and make more gains in student learning. Learn about our technology and get a free semester of OpenStax Tutor access for your students.

Kathi Fletcher, OpenStax, Houston, TX

1:30 PM – 3:00 PM**412 • Forge a New Frontier in Education with OpenStax Tutor Beta**

General Biology • Demonstration (90 min) • 2Y, 4Y

Discover how our new OpenStax Tutor Beta courseware uses our biology book to deliver quality content, spaced practice, and immediate feedback. Learn how we've designed our low-cost, research-based tool to shape the future of ed tech, then give feedback to help us improve!

Kathi Fletcher, OpenStax, Houston, TX

9:00 AM – 10:15 AM continued**NABT Committee Meeting:
Awards Committee and OBTA
Directors**Switchman Room • Committee
Meeting • GAJason Crean, Committee Chair, and
Mark Little, National OBTA Coordinator**9:00 AM – 11:00 AM****SPECIAL PROGRAMMING
PRESENTED BY
HudsonAlpha****88 • Touching Triton**Midway Suites 2 • General Biology •
Special Workshop (120 min) • HS, 2Y

HudsonAlpha's *Touching Triton* uses a game-like interface to challenge students to make medical packing decisions by analyzing risk for common complex disease. This session provides everything you need to get started using *Touching Triton* in your classroom.

Madelene Loftin and Adam Hott,
HudsonAlpha Institute for Biotechnology,
Huntsville, AL**9:00 AM – 10:15 AM continued****50 • Integrating Human
Rights Advocacy into Biology
Coursework**Midway Suites 5 • Ecology /
Environmental Science / Sustainability •
Paper (75 min) • HS, 2Y, 4Y

Scientists possess valuable knowledge for resolving human rights issues. This presentation describes a civic engagement project in which students consulted with human rights groups to resolve water quality issues.

Brian Shmaefsky, Lone Star College - Kingwood
and the American Association for the Advance-
ment of Science, Kingwood, TX**75 • Tissue Engineering -
Exploring Engineering Design
in Biology with Free DIY Guides
from Allen Distinguished
Educator Resources**Midway Suites 6 • General Biology •
Hands-on Workshop (75 min) • MS, HS

Come experience the Tissue Engineering unit from the Allen Distinguished Educators free DIY guides. Learn how to excite students about bio-engineering with inexpensive materials.

Kathryn Davis, Hood River Valley High School,
Hood River, OR

9:00 AM – 10:15 AM *continued*

85 • Teaching a High School Research Course

Midway Suites 7 • Nature of Science - Hands-on Workshop (75 min) • HS, 2Y, GA

We will discuss the research courses we teach at our schools that get students to think, write, and talk like scientists while engaging in authentic open-ended inquiry.

Paul Strode, Fairview High School, Boulder, CO and Ryan Reardon, Jefferson County International Baccalaureate, Irondale, AL

209 • Developing a Model for Negative Feedback Mechanisms of Thermoregulation

Midway Suites 8 • General Biology - Hands-on Workshop (75 min) • HS

Participants will engage in a three-dimensional lesson that illustrates how to teach students to construct conceptual models, using the negative feedback mechanisms of thermoregulation.

Susan Johnson and Stacy Allen, Southern Arkansas University STEM Center for K-12 Education, Magnolia, AR

298 • Making Student Thinking Visible to Improve Teaching and Learning

Midway Suites 9 • Instructional Strategies - Hands-on Workshop (75 min) • MS, HS, 2Y

Do you know what your students really understand about biology? Experience how intentional, research-based questioning strategies and video analysis can reveal student thinking and improve instructional practice.

Cindy J. Gay, BSCS, Colorado Springs, CO and Jamie Gay, Longmont High School, Longmont, CO

9:00 AM – 11:45 AM

SPECIAL PROGRAMMING PRESENTED BY Flinn Scientific

All sessions in Midway Suites 3

All sessions: Meg Griffith, Flinn Scientific, Inc., Batavia, IL

9:00 AM – 10:15 AM

326 • Flinn Favorite Biology Lab Activities and Games

General Biology • Hands-on Workshop (75 min) • MS, HS

Join us as we share labs, demos, and games! We focus on topics like evolution, genetics, biochemistry, and more. You're sure to find a favorite that works for you! Handouts provided!

10:30 AM – 11:45 AM

325 • Flipping AP Biology with FlinnPREP

AP Biology • Demonstration (75 min) • HS

Learn how FlinnPREP™, a supplemental digital curriculum, can ease your transition with video, images, and written content in a condensed form. Free teacher resources and door prizes will be distributed.

9:00 AM – 11:45 AM

SPECIAL PROGRAMMING PRESENTED BY Fisher Scientific

All sessions in Midway Suites 4

All sessions: Ellyn Daugherty, Fisher Science Education/GBiosciences, El Dorado Hills, CA and Colin Heath, G-Biosciences, St. Louis, MO

9:00 AM – 10:15 AM

355 • Biotech is STEM: Cheese-making and Scientific Methods

Biotechnology • Hands-on Workshop (75 min) • HS

Biotech labs and computer activities give relevance to science content and process. In this workshop, teachers conduct a cheese-making lab that's used to teach scientific methodologies and bioinformatics (molecular modeling).

10:30 AM – 11:45 AM

356 • Proteins are the Cash of Biotech - The rAmylase Project

Biotechnology • Hands-on Workshop (75 min) • HS

Proteins are usually colorless and always submicroscopic. How can scientists recognize and measure protein presence and activity? In this hands-on workshop, participants study amylase (enzyme) activity using protein indicator testing.

9:00 AM – 10:15 AM *continued***285 • How Do We Assess Students in a Three-Dimensional Classroom?****Midway Suites 10** • Science Practices • Hands-on Workshop (75 min) • MS, HS, 2Y, GA

Assessing NGSS performance expectations requires multiple, rigorous assessment opportunities that demonstrate student understanding of content, and their engagement with SEPs and CCCs. Come change one-dimensional assessments into two- or three-dimensional!

Jim Clark, San Lorenzo Unified School District, San Lorenzo, CA and Samantha Johnson, Arroyo High School, San Lorenzo, CA

127 • The Anthropocene Era - Using Data Analysis, Claims, Evidence, and Reasoning to Explore Human Impacts on Our Planet**Burlington Route** • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS

How does the carbon cycle affect earth's systems and ocean acidification? Join us for hands-on activities and free HHMI Biointeractive resources that will help your students explore these challenging topics.

Dana Grooms, Thousand Oaks High School, Thousand Oaks, CA and Beth Dixon, Western Sierra Collegiate Academy, Rocklin, CA

174 • Weaving Biotechnology Throughout Your Biology Curriculum**Illinois Central** • General Biology • Hands-on Workshop (75 min) • HS

Explore areas of basic biology curriculum, and demonstrate where and how you can integrate biotech in a way that is supportive of fundamental, biological concepts yet teaches basic biotechnology.

Leslie Prudhomme, Mass Insight Education, Boston, MA

163 • Contributing to *The American Biology Teacher*: A Hands-on Workshop**Jefferson/Knickerbocker** • General Biology • Hands-on Workshop (75 min) • GA

The editorial team of *The American Biology Teacher* will jointly present a workshop for those who would like to be authors and/or reviewers with a practice review and article development session.

William McComas, University of Arkansas, Fayetteville, AK

242 • Learning Biological Processes with Computational Thinking**Missouri Pacific** • Science Practices • Hands-on Workshop (75 min) • MS, HS

This presentation showcases a protein synthesis and computational thinking unit in the context of a socio-scientific issue about Alzheimer's disease and genetic testing. Attendees are encouraged to bring computers/tablets.

Amanda Peel, University of Missouri, Columbia, MO

138 • Biology Practices That Drive Thinking Forward**New York Central** • General Biology • Hands-on Workshop (75 min) • HS

Explore the use of interactive biology manipulatives and engaging kits that get students figuring out biological concepts, while enjoying learning. Emphasis will be on "designed to discover" high school activities.

Rebecca Brewer, Troy High School, Troy, MI

78 • The Evolution of a Mutual Mentoring Relationship**Wabash Cannonball** • Curriculum Development • Symposium (75 min) • HS, 2Y, 4Y

This presentation will discuss a 15-year professional, mutual-mentoring relationship between high school and university faculty members. Discussion on how to create these collegial relationships will be emphasized.

Barry Greenwald, St. Paul Public Schools, St. Paul, MN and Mark Decker, University of Minnesota, Minneapolis, MN

10:30 AM – 11:00 AM**31 • From Soil to Sun...Engaging At-Risk Students With Plants in an Introductory Biology Class!****Midway Suites 8** • Instructional Strategies • Hands-on Workshop (30 min) • MS, HS

A compilation of classroom strategies, labs, hands-on activities, technology, and media to enhance engagement and performance of at-risk students in the introductory-level biology classroom, with a focus on plants.

Marianne Gudmundsson, Mary Ann Ericksen, Erin McBride, and Lisa Pavic, Glenbrook South High School, Glenview, IL

152 • Stratifying Biology Research in an Undergraduate Biology Program**Missouri Pacific** • Science Practices • Demonstration (30 min) • 2Y, 4Y

Current Research and Vision & Change recommend that a research experience increases retention in undergraduate sciences in both major and non-major classes. Explore the model Taylor University is using.

John Moore, Brian Dewar, and Jessica Vanderploeg, Taylor University, Upland, IN

307 - HHMI Biointeractive's "Scientists at Work" Video Series and Accompanying Resources Use Creative Storytelling and Active Learning Exercises to Foster Understanding of the Scientific Method - "What's in Your Pollen" and "Virus Hunters" will be Explored

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

With "Scientists at Work", students see diverse scientists "geek out" about their work. This session shows how to use this "hook" to teach hypothesis-driven inquiry to investigate current, real-world problems.

Dave Westenberg, Missouri University of Science and Technology, Rolla, MO; Holly Basta, Rocky Mountain College, Billings, MT; and Paul Beardsley, HHMI, Chevy Chase, MD

NABT Committee Meetings: Global Outreach and Citizen Science & Stewardship Committees (formerly Global Perspectives Committee)

Switchman Room • Committee Meeting • GA

Committee Chairs to be Selected

243 - Messy Data to Make Authentic Models for Stability and Change

Midway Suites 5 • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS

Real data is messy. Your students need to learn how to interpret it to make and analyze models. Models help students identify and explain stability, and change patterns.

Jim Clark, San Lorenzo Unified School District, San Lorenzo, CA

UNK

Sign up to win a science teaching kit and learn more about the University of Nebraska at Kearney's online MS in Biology program. Booth 10

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"This online master's in biology program was perfect for me. It opened up opportunities and also moved me on the pay scale."

Curtis Reese, MS in Biology, Graduate

Online Biology, MS

- ▶ University of Nebraska at Kearney
- Non-Thesis Online Option
- Master's of Science Program
- Low Student to Faculty Ratio
- ▶ online.nebraska.edu

NABT POSTER SESSION • 9:00 AM – 3:00 PM • Midway

Poster Session Manned: 9:00 AM – 11:00 AM • Poster Judging: 9:00 AM – 11:00 AM

BIOLOGY EDUCATION RESEARCH COMPETITION

1. Characterization of Students' Experimental Design Approaches in Traditional Laboratories versus Course-Based Undergraduate Research Experiences*

David Esparza, Haidar Ahmed, and Jeffrey Olimpo, The University of Texas at El Paso, El Paso, TX

2. Comparing Instructional Approaches Using the Tree of Life and Student Learning Outcomes

Edward Leone, Oklahoma State University, Stillwater, OK; Kristy Daniel, Texas State University, San Marcos, TX

3. Ecological Literacy, Urban Green Space, and Mobile Technology: Exploring the Impacts of an Arboretum Curriculum Designed for Undergraduate Biology Courses

Patrick Phoebus, Kim Sadler, and Michael Rutledge, Middle Tennessee State University, Murfreesboro, TN

4. Effective Instructional Design for Online Activities: Investigating the Role of Feedback in an Activity for Phylogenetics

David Ford, East Tennessee State University, Johnson City, TN; Anna Hiatt, University of Nebraska-Lincoln, Lincoln, NE

5. An Exploration of Socio-Scientific Reasoning Through Teaching About Genetically Modified Organisms

Hai Nguyen, Bethany Stone, and Troy Sadler, University of Missouri, Columbia, MO

6. Exploring Student Motivation and Engagement in Community College Introductory Science Classes Using the MUSIC® Model

Kerri Donohue and Gayle Buck, Indiana University, Bloomington, IN

7. Implementing a Comprehensive Action Research Workshop within an Upper-Division Scientific Teaching Course Improves Pre-Service Teachers' Knowledge of and Attitudes Toward Action Research Methodologies

David Esparza and Jeffrey Olimpo, The University of Texas at El Paso, El Paso, TX

8. Investigating Instructional Behaviors and Expectations of College Biology Instructors

Spenser Biehler and Pradeep Max Dass, Northern Arizona University, Flagstaff, AZ

9. An Investigation into How Students Perceive the Use of Social Media in the Science Classroom

Zachary Nolen and Kristy Daniel, Texas State University, San Marcos, TX

10. Measuring Changes in Student Content Knowledge, Reasoning, and Decision-Making About Modern Food Labels Using a Case Study Approach*

Enya Granados, Kaylee Wilburn, and Justin Pruneski, Heidelberg University, Tiffin, OH

11. Measuring the Effect of Invasive Species Education Curricula on Student Attitudes Toward Invasive Species

Kathryn Parsley, The University of Memphis, Memphis, TN; Tina Cade and Paula Williamson, Texas State University, San Marcos, TX; Florence Oxley, Austin Community College, Austin, TX

12. Overcoming Figure Phobia: A Graphical Approach to Reading a Scientific Paper

Adam Brown, Jocelyn Malamy, and Beatrice Fineschi, The University of Chicago, Chicago, IL

13. Preservice Teacher Engagement and Perceptions of Informal, Outdoor Learning Environments

Sara Salisbury and Kristy Daniel, Texas State University, San Marcos, TX

14. Student Understanding and Misconceptions of the Nature of Chromosomes Related to Genetic Material and Cell Division in an Introductory Biology Course at a Community College

Lauren Elliott and David Rudge, Western Michigan University, Kalamazoo, MI

15. Using Concept Maps to Monitor Knowledge Structure Changes in a Science Classroom

Leah Cook, Davenport University, Caledonia, MI; Brandy Skjold, Western Michigan University, Kalamazoo, MI

MENTORED UNDERGRADUATE RESEARCH

1. Assessing Red Fox (*Vulpes vulpes*) and Coyote (*Canis latrans*) Populations on Presque Isle State Park Using Remote Cameras

Tyler Chispen and Amy Burniston, Mercyhurst University, Erie, PA

2. Hatching Behavior of *H. glycines*

Aaron West, PRECS, Champaign, IL; Nathan Schroeder and Sit Thapa, The University of Illinois, Champaign, IL

3. Transgenerational Responses of Freshwater Snails to Fish Predators

Maggie Pearce, Scott Goepfner, Lynne Beaty, Julie Angle, and Barney Luttbeg, Oklahoma State University, Stillwater, OK

4. Using Herbarium Specimens to Study Plant Phenology in Southern Appalachia

Liane Ventura and Amy Boyd, Warren Wilson College, Asheville, NC

5. The *Wolbachia* Infection Frequency of Insects in Central West Virginia

Maren Wentzel and Sara Sawyer, Glenville State College, Glenville, WV

* Undergraduate students

GENERAL (NON-COMPETITION) CATEGORY**1. Active Learning, Anxiety, and Alienation: Potential Impacts on Student Persistence and Success**

Ben England, The University of Tennessee, Knoxville, TN; Jennifer Brigati, Maryville College, Maryville, TN; Elisabeth Schussler, The University of Tennessee, Knoxville, TN

2. A Classroom Activity Simulation Population-level Evolution by Hand

Travis Hagey, Alexa Warwick, and Louise Mead, Michigan State University, East Lansing, MI

3. Development and Implementation of Zero-Cost Version of General Biology for Non-Majors

Vedham Karpakakunjaram, Aubrey Smith, and Virginia Crichton, Montgomery College, Rockville, MD

4. Do Students Engaged in a Curriculum that Stresses Critical Thinking Change Their Approach to Learning?

Anneke Metz, Southern Illinois University, Carbondale, IL

5. Does Behavioral Response to a Novel Environment Vary in Parental Species and Hybrids?

Caitlin Cobbs, Oklahoma State University, Stillwater, OK

6. Effectiveness of Different Assessment Strategies in Non-Majors Introductory Biology

Lindsay Chaney, Snow College, Ephraim, UT

7. The Effects of Case-Based Instruction on Undergraduate Biology Students' Understanding of the Nature of Science

Amy Burniston, Mercyhurst University, Erie, PA

8. Faculty Professional Development in Quantitative Biology Promotes Scholarly Teaching

Gabriela Hamerlinck, BioQUEST Curriculum Consortium, Madison, WI; Kevin Kidder, Sandra LoRe, and Pamela Bishop, The University of Tennessee, Knoxville, TN; Kristin Jenkins, BioQUEST Curriculum Consortium, Boyds, MD; Samuel Donovan, University of Pittsburgh, Pittsburgh, PA

9. A Game of Selection: Exploring Galápagos Colonization

Kerry Cheesman, Alan Stam, and Nancy Swails, Capital University, Columbus, OH

10. Genetics Course Augmentation with Technology (GCAT): A Framework for Enhancing Active Learning in STEM Using Mobile Devices

Joseph Ross, California State University at Fresno, Fresno, CA

11. The Genomics Education Partnership and G-OnRamp: Expanding Opportunities for Undergraduate Research in Genomics

Sarah Elgin, Washington University in St. Louis, St. Louis, MO; Diane Sklensky, Lane College, Jackson, TN; Yating Liu, Washington University in St. Louis, St. Louis, MO; Luke Sargent, Oregon Health and Science University, Portland, OR; Wilson Leung, Washington University in St. Louis, St. Louis, MO; Jeremy Goecks, Oregon Health and Science University, Portland, OR

12. Group Exams: A Way to Stimulate Teamwork in a Large Enrollment Class

Ana Medrano and Ann Cheek, University of Houston, Houston, TX

13. Integrating Concepts in Biology: A Data Driven Approach to Introductory/AP Biology

Elizabeth Forrester, Baylor School, Chattanooga, TN; A. Malcolm Campbell, Laurie J. Heyer, and Christopher Paradise, Davidson College, Davidson, NC

14. An Interactive E-Text: Advantages for the Student and for the Instructor

Kimberly Gonzalez, Middlesex Community College, Bedford, MA; Thomas Shea, University of Massachusetts at Lowell, Lowell, MA

15. Pathways and Subways: Using Analogies and Guided Inquiry to Introduce Metabolic Pathways

Kerry Hull, Bishop's University, Sherbrooke, Quebec, Canada; Murray Jensen, The University of Minnesota, Minneapolis, MN; Patricia Marx, Bishop's University, Sherbrooke, Quebec, Canada

16. Philosophies and Practices of Inquiry: A Comparative Case Study of Dual-Enrollment Physics and Physiology Courses

Murray Jensen, Laura Seithers, and Elizabeth Greene, The University of Minnesota, Minneapolis, MN; Kerry Hull, Bishop's University, Sherbrooke, Quebec, Canada

17. PRECS: A Collaborative Model for Undergraduate Research with Community College Students

C. Britt Carlson, Parkland College, Champaign, IL; Nathan Schroeder, University of Illinois, Urbana-Champaign, Urbana, IL

18. Promoting Success with Critical Thinking and Metacognition in the Science Classroom for First-Year Students Utilizing Supplemental Instruction

Sheela Vemu, Waubensee Community College, Sugar Grove, IL; Lindsey Carter, Butler Community College, El Dorado, KS; Jessica Moreno, Janel Venegas, and Maria Aguilar, Waubensee Community College, Sugar Grove, IL

19. Students' Perceptions about Conservation and Environmental Knowledge After Participating in Ecological Restoration Projects

Kim Sadler, Penny Carroll, and Angelique Troelstrup, Middle Tennessee State University, Murfreesboro, TN

➔ continued on next page

NABT POSTER SESSION

GENERAL (NON-COMPETITION) CATEGORY, CONTINUED

20. Take a Shot: Integrating Math with the Life Sciences Using Simple Epidemiological Calculations to Examine How Immunization Programs Protect Populations

Darrell Ray, University of Tennessee-Martin, Martin, TN

21. Use of Scaffolds to Support Self-Regulated Learning and Metacognition in Undergraduate Biology Students

Jaime Sabel, The University of Memphis, Memphis, TN

22. Using Food as a Tool for Understanding

Andrea Huntoon, Fox Valley Technical College, Appleton, WI

23. Using Graphing Materials to Improve Undergraduate Biology Students' Graph Choice, Construction, and Interpretation in an Upper-Division Animal Behavior Lecture Course

Emily Weigel and Aakanksha Angra, Georgia Institute of Technology, Atlanta, GA

24. Using Human Examples to Teach Evolution in AP Biology Classrooms Increases Understanding and Decreases Misconceptions

Briana Pobiner, Smithsonian Institution, Washington, D.C.; William Watson, Diocese of Camden Catholic Schools, Camden, NJ; Paul Beardsley, California State Polytechnic University, Pomona, CA; Constance Bertka, Science and Society Resources LLC, Potomac, MD

25. Validity and Reliability of the Chemistry in Cellular Respiration Concept Inventory

Lance Forshee, Southern Utah University, Cedar City, UT; Donald French, Oklahoma State University, Stillwater, OK

10:30 AM – 11:45 AM *continued*

188 • The Fascinating and Controversial Science of CRISPR: Structured-inquiry Lab Activity

Midway Suites 6 • Biotechnology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

This lab activity introduces students to genome editing using CRISPR technology. Students design, model, and simulate a CRISPR-Cas9 complex targeting a particular gene of interest.

David Wollert, Chattanooga State Community College, Chattanooga, TN

56 • Project-Based Learning in the NGSS Biology Classroom

Midway Suites 7 • General Biology • Hands-on Workshop (75 min) • MS, HS

A hands-on workshop to aid teachers in generating ideas, planning, and implementing a project-based unit in line with the *Next Generation Science Standards*.

Camden Hanzlick-Burton, Summit Sierra High School, Seattle, WA; Kelly Kluthe, Olathe West High School, Olathe, KS; and Andrew Davis, Lawrence Free State, Lawrence, KS

20 • Experimenting with Summative Assessment in an Exam-Free Undergraduate Biology Course

Midway Suites 9 • Instructional Strategies • Hands-on Workshop (75 min) • HS, 2Y, 4Y

I will share the successes and challenges I experienced while implementing an exam-free non-majors undergraduate biology course. Participants will experiment with creating their own exam-free summative assessments.

Karla Fuller, Guttman Community College, New York, NY

86 • A Vision of Proficiency-based Grading: Using Videos to Assess Student Understanding as they Develop and Use Models to Illustrate Biological Systems

Midway Suites 10 • Science Practices • Hands-on Workshop (75 min) • MS, HS, 2Y

What does it mean to “Use a model to illustrate” the flow of energy and matter? Discover the power of teaching and learning through model-building and listening to student explanations.

Roxane Johnson De Lear, Mill River Union High School, North Clarendon, VT

256 • Explore the Connections Between Ecosystems, Climate Change, and Human Interactions with Hands-on Modeling Activities from an NGSS-aligned High School Biology Unit Focused on Understanding the Underlying Ecosystem Biology of a Vector-borne Disease

Burlington Route • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Track a mysterious disease using scientists' data on how Lyme disease spreads through ecosystem communities. Investigate the role that ecosystem dynamics have on increasing the occurrence of vector-borne disease.

Barbara Hug and Tanya Josek, University of Illinois, Champaign, IL; Natasha Capell, Tuscola High School, Tuscola, IL; and Becky Fuller, University of Illinois, Urbana, IL

282 • Our Real BFF 2.0

Illinois Central • General Biology • Hands-on Workshop (75 min) • MS, HS, 2Y

This session will highlight free, web-based activities, developed under NIH collaboration, on the use of dogs as model organisms for the study of classical and molecular genetics/genomics, evolution, and disease.

Cheryl Hach, Kalamazoo Area Mathematics and Science Center, Kalamazoo, MI and Roberta Cramer, Michigan Science Teachers Association, Grand Haven, MI

273 • Zika Virus, Drug Discovery, and Student Projects in Bioinformatics

Jefferson/Knickerbocker • Biotechnology • Demonstration (75 min) • HS, 2Y, 4Y, GA

Can we repurpose existing drugs to treat new viruses? Learn how students can apply bioinformatics tools like BLAST and

"Molecule World" to address real-world problems and make discoveries.

Sandra Porter, Austin Community College, Seattle, WA

136 • MODEL Like a Scientist: Develop, Adapt, Test, and Apply Agent-Based Models in AP Biology - Meeting the Challenge of Incorporating Models into your Everyday Curriculum.

New York Central • AP Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Netlogo is a free modeling tool to deeply probe Biology's "big ideas." We'll explore how models help students think like scientists and do science. Bring your computers with Netlogo downloaded. <https://ccl.northwestern.edu/netlogo/>

Brad Williamson, University of Kansas (retired), Lawrence, KS

NABT Honors Luncheon

Regency C • Special Event (Tickets Required) • GA

Join us as we recognize the 2017 NABT Award recipients, including the Outstanding Biology Teacher Award (OBTA) honorees. This celebration honors exceptional biology teaching, and everyone is welcome as we applaud these remarkable individuals.

Bio-Rad Escape Room Experience



Midway • Special Event (Tickets Required) • GA

Solve the mystery to break out of Bio-Rad's lab skills escape room for high school and college life science. Workshop space is limited.

Get tickets at the Bio-Rad booth (Booth 22) on Thursday evening or Friday.



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1:30 PM – 3:30 PM**SPECIAL PROGRAMMING PRESENTED BY
HudsonAlpha Institute for Biotechnology****All sessions in Midway Suites 3****1:30 PM – 2:45 PM****323 • Big Data: Large-Scale Genomics Projects**

General Biology • Demonstration (75 min) • HS

The Human Genome Project provided a reference sequence for humans. Since the completion of the HGP, other large scale projects are answering the remaining questions, reshaping thinking about DNA changes.

Madelene Loftin, Neil Lamb, and Jennifer Carden, HudsonAlpha Institute for Biotechnology, Huntsville, AL

3:00 PM – 3:30 PM**324 • Investigating Common Complex Disease with Touching Triton**

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

Through the storyline of long-term space flight, students learn about the complexity of risk for common disease such as diabetes and colon cancer in this web-based serious game from HudsonAlpha.

Madelene Loftin and Dasi Price, HudsonAlpha Institute for Biotechnology, Huntsville, AL

11:45AM – 1:15 PM**NABT Energy Break**

Midway • Special Program • GA

Take a break to enjoy a snack, grab a drink, network with fellow attendees, and be sure to spend time checking out the student posters.

Sponsored by

MONSANTO

**1:30 PM – 3:30 PM****INTRO BIO TASK FORCE****318 • Intro Bio Symposium**

Grand A • Instructional Strategies • Symposium (120 min)

This symposium will present evidence-based approaches to implementing science practices into the introductory course. Participants will then work together to help develop appropriate learning progressions for teaching core introductory biology themes.

Presented by the NABT Introductory Biology Task Force

1:30 PM – 3:30 PM**NABT Undergraduate Biology Summit: Faculty Development in an Age of Evidence**

Grand B • Instructional Strategies • Symposium (120 min) • HS, 2Y, 4Y

This year's symposium will highlight projects that are currently undergoing scalable (group-level) and transferrable faculty development at the institutional, college, departmental, or working group levels. Presenters will share evidence-based efforts to promote faculty development along with practical deliverables for session attendees.

➔ See page 58 for featured presentations.

Coordinators: Grant Gardner, Middle Tennessee State University, Murfreesboro, TN and Emily Walter, California State University – Fresno, Fresno, CA

1:30 PM – 2:45 PM**NABT Committee Meeting: Professional Development and Conference Committees**

Switchman Room • Committee Meeting • GA

Kristina Nicosia and Ryan Lacson, Committee Chairs

308 • Using DNA Metabarcoding to Understand Niche Partitioning in the African Savanna

Regency B • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Scientists are using cutting-edge DNA metabarcoding technology to understand how species coexist on the African savanna through niche partitioning. Participants will explore classroom-ready HHMI BioInteractive resources in this hands-on workshop.

Scott Sowell, Darnell-Cookman Middle/High School, Jacksonville, FL; Katie Ward, Aragon High School, San Mateo, CA; and Bridget Conneely, HHMI, Chevy Chase, MD

1:30 PM – 2:45 PM *continued*

105 - DNA Barcoding - Independent Research in the Classroom

Midway Suites 2 • Ecology / Environmental Science / Sustainability • Demonstration (75 min) • HS, 2Y, 4Y

Engage students in student-driven research and course-based research experiences (CURES) by identifying organisms through unique DNA barcodes.

Bruce Nash, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY

112 - Biology Curriculum for a Crowded World

Midway Suites 5 • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • MS, HS

Participate in hands-on activities that apply math and science skills to tackle major

global challenges, including human population pressures, finite natural resources, and climate change.

Brian Shmaefsky, Lone Star College - Kingwood, Kingwood, TX

253 - BioBuilder - Bringing Science and Technology Problem-solving into the K-12 and Undergraduate Classroom

Midway Suites 6 • Biotechnology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Synthetic biology links biology, engineering, mathematics and computer science. This session will introduce sample BioBuilder activities and discuss BioBuilder programs to integrate synthetic biology into the curriculum.

Dave Westenberg, Missouri S&T, Rolla, MO

1:30 PM – 3:30 PM

SPECIAL PROGRAMMING PRESENTED BY Monsanto

331 - GMO, Pesticides, and Farming: A Hot Topic in the Media and Classroom - Monsanto Panel Discussion and Presentation

Midway Suites 4 • Biotechnology • Symposium (120 min) • HS, 2Y, 4Y, GA

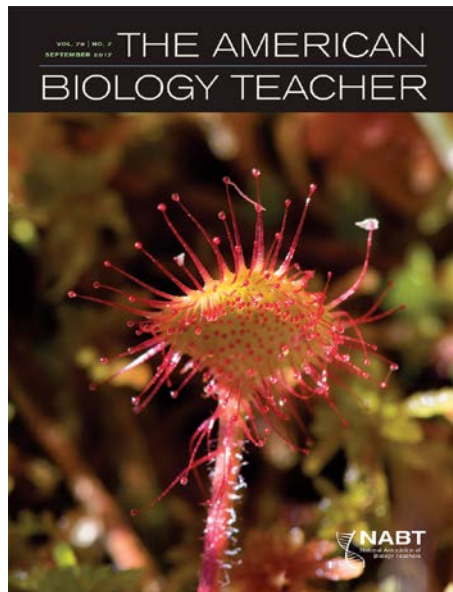
Scientists will discuss topics like GMOs and pesticides: what they are and aren't, how these innovations are tested, limitations/benefits of the technology, and where biotechnology is used outside of agriculture.

Valerie Bayes, Monsanto, St. Louis, MO



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NABT FOUR-YEAR COLLEGE AND UNIVERSITY SECTION UNDERGRADUATE BIOLOGY SUMMIT

Faculty Development in an Age of Evidence

Saturday, November 11

1:30 PM – 3:30 PM • Grand B

1:30 PM – 1:40 PM

Welcome and Introductions

Dr. Grant Gardner

Middle Tennessee State University, Murfreesboro, TN

Dr. Emily Walter

California State University - Fresno, Fresno, CA

Co-Chairs: Professional Development Summit Committee

1:40 PM – 2:10 PM

Keynote Address

Building on Disciplinary Norms: The Role of Mentoring in Faculty Development

Dr. Cynthia Brame

Vanderbilt University, Nashville, TN

Assistant Director of the Center for Teaching and Senior Lecturer of Biological Sciences

2:10 PM – 2:30 PM

Paper #1

Building a Culture of Diversity and Inclusion in Biology Education Research: The Formation of the iEMBER Network

Dr. Jana Marcette

Harris-Stowe University, St. Louis, MO

Dr. Michael Moore

Baylor University, Waco, TX

Dr. Rachel Tennial

University of Arkansas - Little Rock, Little Rock, AR

Dr. Erin Solomon

Washington University - St. Louis, St. Louis, MO

2:30 PM – 2:50 PM

Paper #2

Examining the Understanding of Inquiry-Based Learning and Teaching Among Undergraduate Teachers and Students

Dr. Maren Hudson

East Tennessee State University, Johnson City, TN

2:50 PM – 3:10 PM

Paper #3

Exploring Patterns in Teaching Practice and Organizational Barriers to Teaching Improvement

Dr. Emily Walter

California State University - Fresno, Fresno, CA

Ivan Ceballos-Madriral

California State University - Fresno, Fresno, CA

3:10 PM – 3:30 PM

Roundtable Discussion

137 • BPA Is Not OK! Using a BPA Assay Kit to Promote Student Understanding of Cell Signaling Through a Simple Modification of an AP Biology Lab Investigation

Midway Suites 7 • AP Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Bring inquiry to the forefront of your AP Biology class! Participants will measure the concentration of BPA and investigate the effect of BPA on the onion root tip cell cycle.

Adam Bergeron and Charles Collis, School District of Clayton, Clayton, MI

70 • Modern Ecology in the Classroom: Utilizing Current Ecological Research to Understand How Invasive Species Affect Biodiversity

Midway Suites 8 • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS, 2Y, 4Y

This session introduces a unit designed through an *NSF Research Experience for Teachers* fellowship utilizing modern ecological research and data analysis to address important concepts in ecology.

Jeanette Bosomworth, Beijing National Day School, Beijing, China

130 • So You Like to “Argue.” What Evidence Do You Have to Support Your Claim? Developing Argumentation Skills for the Biology Classroom

Midway Suites 9 • Instructional Strategies • Hands-on Workshop (75 min) • E, MS, HS

Attention preservice and novice biology teachers! Are you skilled at engaging in argumentation without arguing? Learn how to facilitate a biology classroom community that fosters evidence-based argumentation.

Julie Angle and Amy Olson, Oklahoma State University, Stillwater, OK

236 • Inquiry Without Insanity: Practical Approaches to Easily Add Inquiry-driven Labs in High School Biology

Midway Suites 10 • Instructional Strategies • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Want to support students in doing inquiry-driven work? Overwhelmed by constraints of time, materials, and logistics? Come see how to support student inquiry using labs you already know and like!

Stephen Traphagen, Rolling Meadows High School, Rolling Meadows, IL

295 • Sustainable Earth Education Speed Dating for Life Science Educators

Burlington Route • Ecology / Environmental Science / Sustainability • Symposium (75 min) • GA

This life-science sustainability focused “speed dating” event will feature educators and members of environmental and sustainability organizations sharing their best practices and resources for science-based

sustainability education. Prepare to participate in this FAST show-and-go session.

Teddie Phillipson-Mower, Indiana University Bloomington, Bloomington, IN

168 • What is Genome Editing? Tackling the Scientific and Ethical Questions in the Classroom

Frisco • Biotechnology • Symposium (75 min) • MS, HS, 2Y

Learn about the cutting-edge field of genome editing/CRISPR and lesson plans that explore potential applications for human health and de-extinction as well as the scientific and ethical questions.

Marnie Gelbart, Dana Waring, and Lauren Tomaselli, Personal Genetics Education Project/ Harvard Medical School, Boston, MA



1:30 PM – 2:45 PM *continued***157 • 30+ Activities to Engage At-Risk Students in Introductory Biology Classes****Illinois Central** • General Biology • Hands-on Workshop (75 min) • MS, HS

A compilation of 30+ classroom strategies, labs, hands-on activities, review strategies, technology, and media to enhance engagement and performance of at-risk students in the introductory-level biology classroom.

Marianne Gudmundsson, Lisa Pavic, Mary Ann Ericksen, and Erin McBride, Glenbrook South High School, Glenview, IL

95 • RGEODE: Mining Big Data in the Biology Classroom**Jefferson/Knickerbocker** • Biotechnology • Demonstration (75 min) • HS, 2Y

Prepare your students for the era of big data! We will demonstrate RGEODE, an activity that utilizes GEO expression data to reinforce genetics concepts and introduce students to R programming.

Alexis Norris, Johns Hopkins University, Baltimore, MD and Kelly Hoffman, Montgomery County Public Schools, Gaithersburg, MD

89 • Evolutionary Medicine: Medicine Without Evolution Is Like Engineering Without Physics**Missouri Pacific** • Anatomy & Physiology • Hands-on Workshop (75 min) • HS, 2Y

Evolutionary medicine or Darwinian medicine is the application of modern evolutionary theory to understanding health and disease. Integrate into your Physiology, Anatomy, Biology or AP Biology course.

Mark Friedman, International Society for Evolutionary Medicine and Public Health, Redondo Beach, CA and Robert Perlman, University of Chicago (emeritus), Chicago, IL

258 • Using Formative Assessments in the Classroom**New York Central** • General Biology • Hands-on Workshop (75 min) • HS

Participants will engage in formative assessment strategies that can be used the next class day. The presentation will focus on practicing strategies that increase student learning and engagement.

Diana Siliezar-Shields, Barrington High School, Barrington, RI

3:00 PM – 3:30 PM**NABT Committee Meeting: Member Resources Committee****Switchman Room** • Committee Meeting • GA

Sherry Annee, Committee Chair

312 • Introducing Undergraduates to Primary Literature using Science in the Classroom (SitC) and Paired HHMI BioInteractive Resources**Regency B** • General Biology • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Teaching students to understand primary literature can be challenging. Come learn about ready-to-use annotated research materials paired with BioInteractive multimedia and activities to help students analyze primary literature.

Kathryn Jones, Howard Community College, Columbia, MD, and Paul Beardsley, HHMI, Chevy Chase, MD

3:00 PM – 3:30 PM**SPECIAL PROGRAMMING PRESENTED BY PASCO Scientific****415 • Modeling Inquiry and Class Data Aggregation in the Modern Lab****Midway Suites 2** • Instructional Strategies • Hands-on Workshop (30 min) • HS

Create a class data set to discuss enzyme function and protein structure in just minutes. See how easy it can be to increase statistical rigor and inquiry using free software, a smartphone, a few consumables (and one sensor). Please download the PASCO SPARKvue app in advance.

Mike Blasberg, PASCO Scientific, Roseville, CA

255 • Incorporation of Creative Writing Techniques to Increase Engagement in Collegiate Molecular Science Curricula**Midway Suites 5** • Microbiology & Cell Biology • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Even the most dedicated student can become enmeshed in complex molecular mechanisms. To enhance student engagement with pathways, creative writing techniques can be useful.

Erin Sellner, Stephens College, Columbia, MO

131 • Socio-Scientific Issues Teaching and Learning**Midway Suites 6** • Instructional Strategies • Demonstration (30 min) • HS

This session highlights the Socio-Scientific Issues Teaching and Learning framework and its implementation in a secondary biology classroom, and in a professional development program for secondary biology and chemistry teachers.

Amanda Peel and Troy Sadler, University of Missouri, Columbia, MO

67 • Guppies in the Classroom - A Model Organism Used to Investigate Animal Behavior and Experimental Design Directed at Implementation of Statistics in the Biology Classroom

Midway Suites 7 • AP Biology • Hands-on Workshop (30 min) • HS

Our activity complements the units of the scientific process, evolution, and animal behavior emphasizing the use of statistics. You will observe guppy courtship and determine which traits females select.

David Ganey and Rick Hirst, Jefferson City High School, Jefferson City, MO

153 • Witnessing Respiration: A Bean is a Bean is a Bean??? Demonstration of a Quantitative, Low-cost, Low-tech Cellular Respiration Inquiry Protocol Alternative for Biology Students

Midway Suites 8 • General Biology • Hands-on Workshop (30 min) • MS, HS

Transform qualitative cellular respiration demonstrations into quantitative student investigations. This protocol for investigating differential cellular respiration in legumes is adaptable for middle school through AP level.

Pam Close and Jessica Platto, D. H. Hickman High School, Columbia, MO

72 • Assessing Laboratory Investigations Using BioBlitz Presentations

Midway Suites 9 • Instructional Strategies • Demonstration (30 min) • HS, 2Y, 4Y

This session will demonstrate the use of a 1-slide, 60-second "BioBlitz" presentation, followed by a peer-review session by the class, as a way to assess student labs.

Ryan Lacson, Galena High School, Galena, MO

210 • Using Published Research Data to do Biology: QUBES Examples, Strategies, and Resources

Midway Suites 10 • Instructional Strategies • Demonstration (30 min) • 2Y, 4Y

The Quantitative Undergraduate Biology Education and Synthesis (QUBES) Project has organized a diverse and flexible suite of resources to support faculty working with published research data in their classrooms.

Sam Donovan, University of Pittsburgh, Pittsburgh, PA; Kristin Jenkins, BioQUEST, Boyds, MD; M. Drew LaMar, College of William and Mary, Williamsburg, VA; and Hayley Orndorf, QUBES, Pittsburgh, PA

281 • A Case for Introductory Ecology in Two- and Four-Year Colleges and Universities

Burlington Route • Ecology / Environmental Science / Sustainability • Paper (30 min) • 2Y, 4Y

Ecology and sustainability are important concepts for all students. Introducing these concepts through rigorous introductory courses can serve as a means of recruitment and can improve program retention.

Tara Holmberg, Northwestern Connecticut Community College, Winsted, CT

211 • Leaving the Textbook Behind: Creating a Dynamic and Relevant Classroom Experience

Frisco • General Biology • Hands-on Workshop (30 min) • MS, HS

Textbooks are expensive and static in a discipline that is extraordinarily fluid and dynamic. Come and learn how to use current events to drive the content of your course.

Lindsey Lohwater, St. Mark's School, Southborough, MA

167 • Card Sort Extravaganza! Activities for Visible Thinking and Formative Assessment!

Illinois Central • General Biology • Hands-on Workshop (30 min) • MS, HS

Join us as we share several different types of card sort activities that can be used to see the student's visual thinking. Lots of examples and handouts provided!

Kristy Butler and Patti Richardson, Forest Hills Central High School, Grand Rapids, MI


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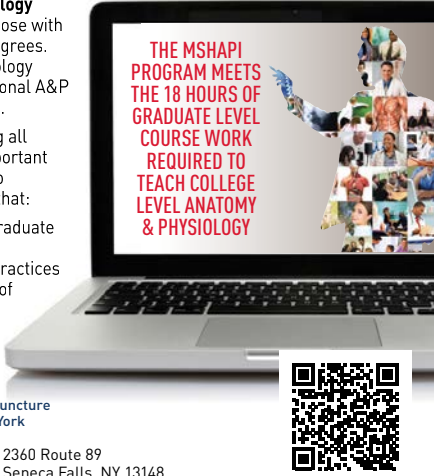
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4:00 PM – 5:00 PM**GENERAL SESSION SPEAKER****May Berenbaum**

➔ See page 9 for biography.

Science Fiction Films in the Classroom: Teaching Science Through Bad Examples

Grand Ballroom D, E, F • Special Speaker • GA

Because watching movies is an activity enthusiastically embraced by a large proportion of the public, movies provide a platform for engaging students based on their pre-existing interests. A 2016 RedBox study (Smith 2016) revealed that Americans watch on average a total of 5,040 movies throughout their lifetimes, with an average person watching 84 movies per year via a variety of platforms. That there is potential for movie-watching to have an impact on STEM learning is evidenced by the finding that 41% of respondents said a movie “changed the way they see the world”, and 10% said that a movie influenced their career choice.

Beyond the frequency with which Americans watch movies, the diversity of scientific subjects depicted in films provides almost limitless opportunities for sharing knowledge with interested and motivated students. Of the all-time top 25 movies based on cumulative domestic box office, 80% have explicit science content, encompassing but not limited to cybernetics, ecology, anthropology, glaciology, engineering, paleontology, genomics, physics, astrophysics, exobiology, and arachnology. Movies can be effective teaching tools because they emphasize narratives that engage learners and they present a simplified jargon-free (albeit often erroneous) interpretation of science. Once they are engaged, students can learn and remember concepts by contrasting the science reality with the movie version. Examples from 34 years of movies shown at the University of Illinois’ Insect Fear Film Festival will be provided as exemplars for building on Hollywood’s cinematic excesses for teaching science.

3:00 PM – 3:30 PM continued**321 • Giving (Grass)Roots to STEM: A Community-level Approach to Science Literacy and Advocacy with the Science Booster Clubs**

Missouri Pacific • Instructional Strategies • Demonstration (30 min) • MS, HS, GA

We will discuss NCSE’s Science Booster Clubs, how the booster club model supports local STEM education, and demonstrate two activities developed for teaching climate change and evolution to general audiences.

Laura Banker, University of Colorado-Denver, Denver, CO

39 • NABT Awards: Recognizing Excellence in Life Science Classrooms

New York Central • General Biology • Demonstration (30 min) • GA

NABT Awards Chair Dr. Jason Crean, along with Dr. Kristin Milks, Awards Coordinator of the Ron Mardigian Biotechnology Award, will present the numerous opportunities available for recognition in NABT.

Jason Crean, Lyons Township HS/Saint Xavier University, Western Springs, IL and Kristin Milks, Bloomington High School South, Bloomington, IN

3:00 PM – 3:30 PM continued**264 • How Does Participation in Course-embedded Undergraduate Research Experiences in Introductory Biology Courses Affect Students’ Motivation and Persistence in Life-science Majors?**

Wabash Cannonball • Instructional Strategies • Paper (30 min) • HS, 2Y, 4Y

Come learn what we can predict about student persistence in biology from measures of motivation and perception of research in biology, biochemistry, botany, chemistry, microbiology, and zoology CUREs.

Donald French, Lucy Bailey, John Stewart, Janette Steets, John Gustafson, and Wouter Hoff, Oklahoma State University, Stillwater, OK; and Michael Moore, Baylor University, Waco, TX

6:00 PM – 10:00 PM**Night at the City Museum**

Midway (Glass Doors to the right of Registration) • Special Event (Tickets Required)

Come play with us at the City Museum, a 600,000 square-foot “play house museum”, consisting of repurposed architectural and industrial objects that are housed in the former International Shoe Company. The City Museum features an eclectic mix of rooms, objects, a playground, and a lot of fun!

First shuttle departs the hotel at 5:45 PM. Shuttles run every 15 minutes then for the entirety of the event. Shuttle pick-up is off of the Midway exhibit hall space, just outside the large glass archway doors.

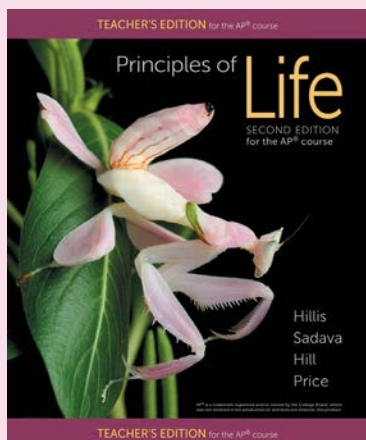
Last shuttle departs City Museum at 9:45 PM.



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