



NABT PROFESSIONAL DEVELOPMENT CONFERENCE

NOVEMBER 11–14, 2015
RHODE ISLAND CONVENTION CENTER
PROVIDENCE, RI

#NABT2015



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College Board framework lead Julianne Zedalis will present on the new AP® Biology framework and how to prepare your students for success on the AP® Biology exam, all with the help of a free open-source peer-reviewed textbook from Rice University's OpenStax College. Her contributions to the College Board include:

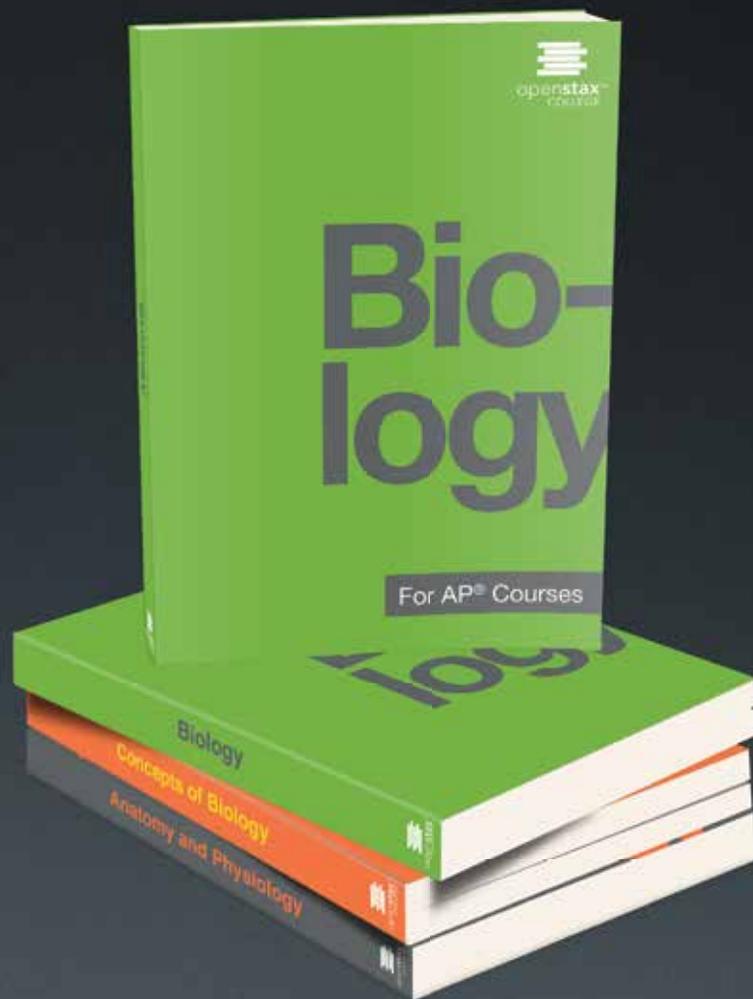
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- AP® Biology Redesign Translation Committee, 2007
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PROFESSIONAL DEVELOPMENT CONFERENCE

NOVEMBER 11-14, 2015

RHODE ISLAND CONVENTION CENTER, PROVIDENCE, RI

Welcome to Providence and the 2015 NABT Professional Development Conference! Along with the NABT Board of Directors, the Executive Director, committee members and countless volunteers, we are excited to have you join us here to share the NABT experience – one that continues to make NABT the “Leader in Life Science Education”.

I would like to thank all the leaders, committee members, and other volunteers who work tirelessly through the year serving NABT. Another huge thank you goes to the Professional Development Committee. This committee has been working all year to provide us with the best possible conference program with outstanding sessions, speakers and workshops! Sponsors and exhibitors are important and key partners making our conference possible. We especially want to thank them for their generous support. Award sponsors allow NABT to recognize the talents and contributions of our members. Thank you!

We invite you to join us for the **NABT Open Forum on Wednesday afternoon** from 1:00-4:00. Here, members of the Board of Directors, NABT executive director Jacki Reeves-Pepin, *The American Biology Teacher* editor Bill McComas and other NABT leaders are looking forward to meeting you and hearing your ideas and suggestions for making NABT even better! Let me invite all first-time attendees to the **First Timers’ Breakfast on Thursday morning** where you will have an opportunity to interact with NABT “mentors” who can answer all your conference and community questions. We hope that these new friends will become lasting NABT colleagues!

One of the highlights of the conference this year will be our **BELS Banquet** speaker, **Carl Zimmer**, the **2015 NABT Distinguished Service Award Winner**. As you know, Carl is an award-winning science journalist whose books, articles, essays and blog posts explore the frontiers of biology. And don’t miss the fun and exciting **HHMI Night at the Movies with Sean Carroll**. As always, every day during the conference nationally known speakers will bring us the latest information on topics from microbiology to evolution.

Don’t forget to share your experiences on NABT’s Facebook page and on Twitter using **#NABT2015**. We would love to see your pictures and videos covering conference events, sessions and people you have met in Providence.

While you are here take some time to explore the city that is 140 years older than our nation, with its great restaurants and numerous historic sites. We also look forward to seeing you next year in Denver, Colorado for another outstanding NABT Professional Development Conference!



Jane P. Ellis

Jane P. Ellis, NABT President 2015

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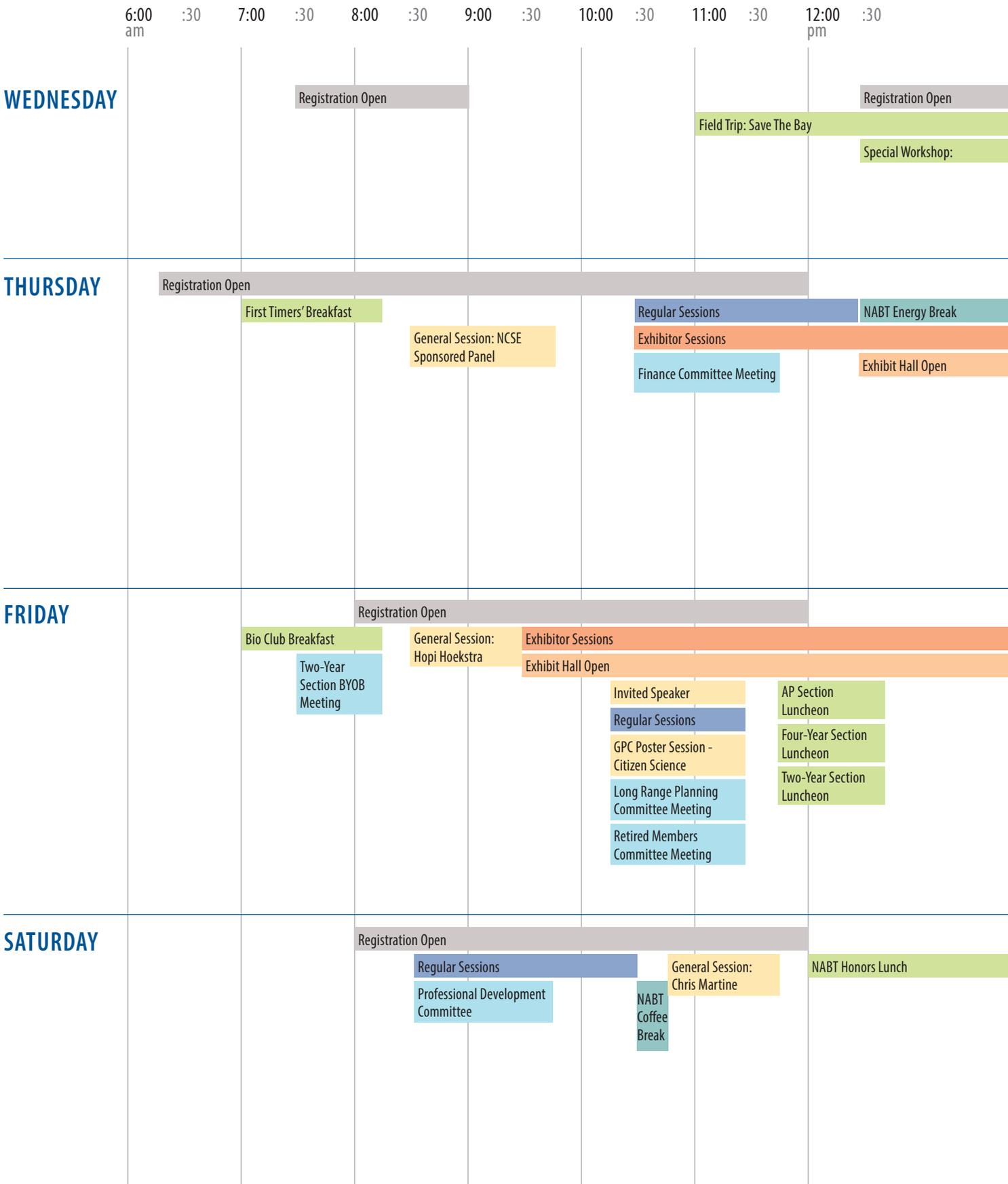
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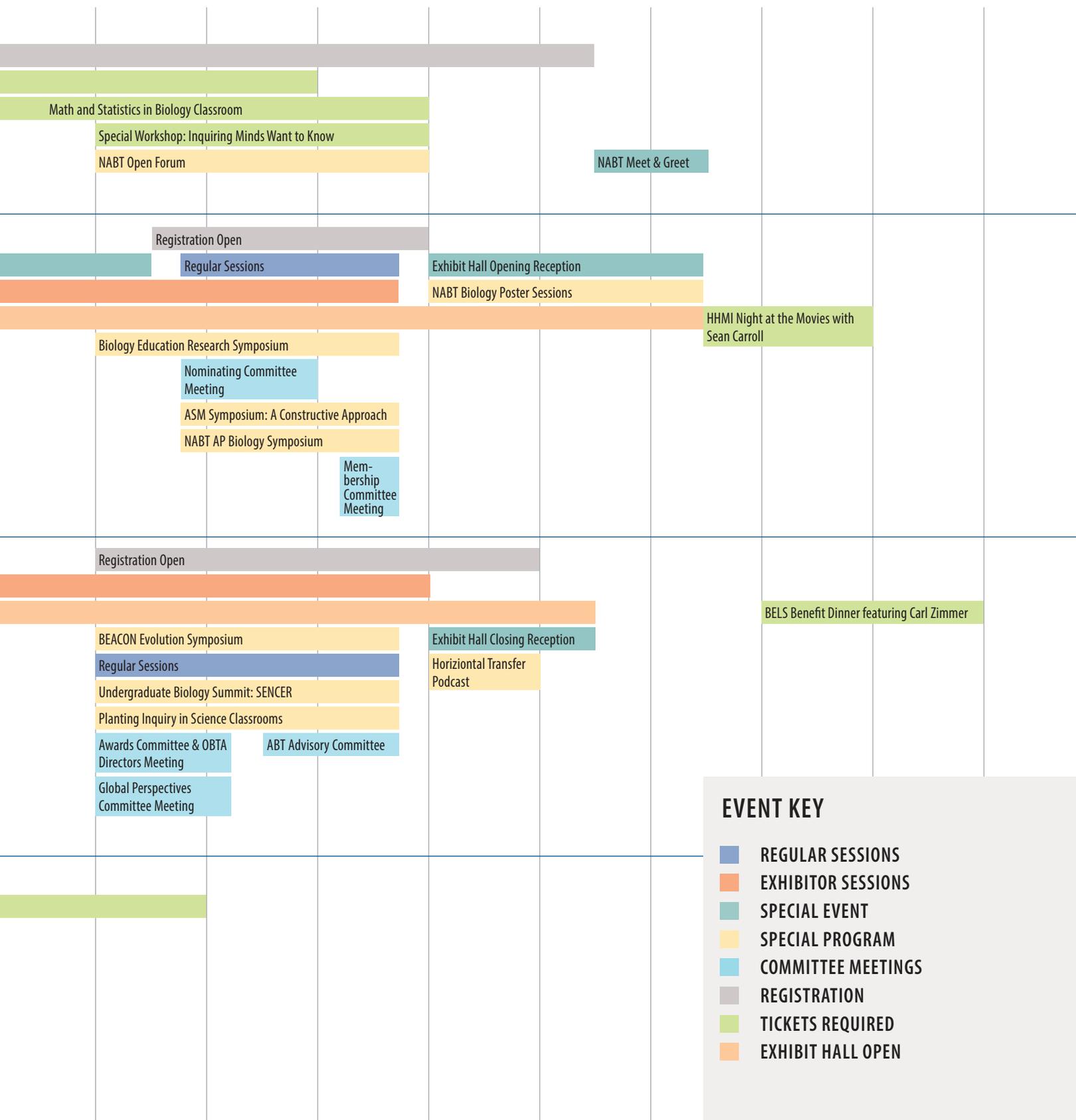
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SCHEDULE AT A GLANCE



1:00 :30 2:00 :30 3:00 :30 4:00 :30 5:00 :30 6:00 :30 7:00 :30 8:00 :30 9:00



EVENT KEY

- REGULAR SESSIONS
- EXHIBITOR SESSIONS
- SPECIAL EVENT
- SPECIAL PROGRAM
- COMMITTEE MEETINGS
- REGISTRATION
- TICKETS REQUIRED
- EXHIBIT HALL OPEN

FOR PERSONS WITH DISABILITIES

Careful thought is given when planning the NABT Conference to make it accessible to all persons. Should you require special services, please go to the registration area to contact an NABT representative. We will strive to meet your needs.

CERTIFICATE OF ATTENDANCE

See page 83.

REGISTRATION HOURS

The NABT registration desk is located on the 3rd floor of the Rhode Island Convention Center (RICC). It will be open during the following hours.

WEDNESDAY, NOVEMBER 11

7:30AM – 9:00AM
12:30PM – 5:30PM

THURSDAY, NOVEMBER 12

6:15AM – 7:00AM: First Timers' Registration
7:00AM – 12:00PM
1:30PM – 4:00PM

FRIDAY, NOVEMBER 13

8:00AM – 12:00PM
1:00PM – 5:00PM

SATURDAY, NOVEMBER 14

8:00AM – 12:00PM

FUTURE NABT CONFERENCE DATES & SITES

2016 PROFESSIONAL DEVELOPMENT CONFERENCE

November 3-6, 2016
Denver Sheraton - Downtown • Denver, CO



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E-mail: office@NABT.org
Website: www.NABT.org

Use #NABT2015 to Tweet from Providence!

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.

ABOUT THE PROFESSIONAL DEVELOPMENT CONFERENCE

All functions, meetings and exhibits will take place at Rhode Island Convention Center (RICC) or Omni Hotel. Please consult this guide and signage for room information.



SESSION SURVEY

Help us ensure you see great sessions at the NABT Conference. Use the QR code to link to the survey, or visit www.nabt.org/sessionsurvey15

VISITING THE EXHIBIT HALL

The NABT Exhibit Hall is your venue to interact with a variety of curriculum publishers, equipment manufacturers, software developers, non-profit partners, and other organization that have resources that can benefit you as a biology educator. Receptions, contests, poster sessions, and other special experiences will also be featured in the Exhibit Hall. **Registration badges are required for admission to the Exhibit Hall.**

Thursday, November 12 12:30pm – 6:30pm (Opening Reception 4:00pm – 6:30pm)
Friday, November 13 9:30am – 5:30pm (Closing Reception starts at 4:00pm)

WiFi

Thank you to our conference WiFi sponsor, Vernier. The log-in details for each venue are below:

RICC:	Omni:
SSID - NABT	SSID - Omni Meeting
Password - Vernier	Password - Vernier



TRANSPORTATION FOR FIELD TRIP

The NABT Conference will feature one program that will be offsite. Tickets are required to attend. Please visit the registration desk for more details.

Save the Bay Seal-Watch Cruise

WEDNESDAY, NOVEMBER 11

The shuttle for the field trip to the Save the Bay Seal-Watch Cruise will depart from the Omni lobby at 11:00am. Please be in the lobby of the Omni by that time. The shuttle will leave at 3:00pm to return to the Omni.

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THURSDAY, NOVEMBER 12

Panel Discussion: For session details, see page 25.



JACQUELYN L. GILL, Ph.D.

Assistant Professor, School of Biology & Ecology
Climate Change Institute
University of Maine, Orono, ME

Jacquelyn L. Gill holds a joint appointment in CCI and the School of Biology & Ecology. As a paleoecologist and biogeographer, she is interested in using the natural experiments of the past to inform conservation in the Anthropocene. Jacquelyn applies an interdisciplinary approach combining paleoenvironmental reconstructions from lake sediments, modern field ecology, and modeling. Research in the Gill Lab focuses on climate change, extinction, and biotic interactions through time, from species to communities to ecosystems. Jacquelyn received her B.A. from the College of the Atlantic and her M.S. and Ph.D. from the University of Wisconsin.



KENNETH R. MILLER, Ph.D.

Professor of Biology, Department of Molecular Biology, Cell Biology, & Biochemistry
Brown University, Providence, RI

Kenneth R. Miller is Professor of Biology at Brown University. He did his undergraduate work at Brown, and earned a Ph.D. in 1974 at the University of Colorado. His research work on cell membrane structure and function has produced more than 60 scientific papers and reviews in leading journals. Miller is coauthor, with Joseph S. Levine, of four different textbooks. In addition to six awards for teaching, Ken has received the Presidential Citation of the AIBS, Public Service Award of the ASCB and the NABT Distinguished Service Award. He has been honored by the AAAS for Advancing the Public Understanding of Science, and received the Gregor Mendel Medal from Villanova University. He has also received the Stephen Jay Gould Prize by the SSE, and the Laetare Medal from Notre Dame University. He is the author of *Finding Darwin's God (A Scientist's Search for Common Ground between God and Evolution)*, and *Only a Theory (Evolution and the Battle for America's Soul)*.



SETH MNOOKIN

Assistant Professor, Comparative Media Studies/Writing
Associate Director, The Graduate Program in Science Writing
Massachusetts Institute of Technology, Cambridge, MA

Seth Mnookin is the Co-Director of MIT's Graduate Program in Science Writing. His most recent book, *The Panic Virus: The True Story Behind the Vaccine-Autism Controversy*, won the National Association of Science Writers 2012 "Science in Society" Award and the New England chapter of the American Medical Writers Association's Will Solimene Award for Excellence. Seth is currently a member of the FDA's Expert Working Group on Medical Countermeasure Emergency Communication Strategies. Seth's essays and reporting have been featured in the annual *Best American Science and Nature Writing* anthologies, and his journalism has appeared in numerous publications. He graduated from Harvard College in 1994 with a degree in History and Science, and was a 2004 Joan Shorenstein Fellow at Harvard's Kennedy School of Government.

FRIDAY, NOVEMBER 13

HOP I E. HOEKSTRA, Ph.D.

Investigator, Howard Hughes Medical Institute
 Alexander Agassiz Professor, Department of Organismic & Evolutionary Biology and
 Department of Molecular & Cellular Biology
 Curator of Mammals, Museum of Comparative Zoology
 Harvard University, Cambridge, MA

Hopi E. Hoekstra is the Alexander Agassiz Professor of Zoology and the Curator of Mammals in the Museum of Comparative Zoology at Harvard University. Her research focuses on uncovering the genetic basis of morphological and behavioral traits that affect fitness of individuals in the wild. She received her BA from UC Berkeley and her Ph.D. from the University of Washington. In 2013, she was named a Howard Hughes Investigator. She has

received Young Investigator awards from the American Society of Naturalists and the Beckman Foundation, and most recently, the Lounsbery Medal from the National Academy of Sciences. She gave the 2013 Commencement speech at UC Berkeley's Integrative Biology Department and has been profiled in *The New York Times*. Hopi also teaches in Harvard's introductory Life Science course *Genetics, Genomics and Evolution* to approximately 500 freshmen each



year, and has been awarded the Fannie Cox Prize and a Harvard College Professorship for teaching excellence.

For session details, see page 45.

SATURDAY, NOVEMBER 14

**CHRISTOPHER T. MARTINE, Ph.D.**

David Burpee Professor of Plant Genetics and Research, Biology Department,
 Curator, Manning Herbarium
 Bucknell University, Lewisburg, PA

Christopher T. Martine is the David Burpee Chair in Plant Genetics and Research in the Department of Biology at Bucknell University (Lewisburg, PA), where he also serves as Director of the Wayne E. Manning Herbarium. Chris earned both his B.S. and Master's degrees at Rutgers University before attending the University of Connecticut to pursue his Ph.D. in Botany.

Chris has dedicated much of his professional life to teaching, including stints in K-12 science education positions. His passion for university-level instruction has been recognized with the Charles Edwin Bessey Teaching Award from the BSA, the SUNY Chancellor's Award for Teaching Excellence, and the 2014 Innovations in Plant Systemat-

ics Education Prize from the ASPT. His public outreach efforts include a science-based blog for the *Huffington Post* and his YouTube video series, "Plants are Cool, Too!"

An active botanical scholar with interests in plant ecology, evolution, and reproductive biology, Chris has published numerous papers and two books – and his recent research trips to Australia and Peru have led to the discovery of 7 new species. He currently leads a research lab group at Bucknell and three recent graduates from his lab started their Ph.D.s in Botany this fall.

For session details, see page 63.

FRIDAY, NOVEMBER 13



DONALD C. JACKSON, PH.D.
 Professor Emeritus of Medical Science,
 Adjunct Professor of Molecular Pharmacology,
 Physiology and Biotechnology
 Brown University, Providence, RI

Donald C. Jackson is Professor Emeritus and Adjunct Professor at Brown University where he has been on the faculty of Physiology since 1973. He received his Ph.D. at the University of Pennsylvania where he studied temperature regulation and did post-doctoral work with Knut Schmidt-Nielsen at Duke University on aspects of comparative physiology. His research has concerned respiratory and acid-base responses and adaptations of animals, primarily reptiles and amphibians, to temperature change and extreme environments. A major focus of his work has been on how animals such as freshwater turtles can survive for long

periods without oxygen. This work led to the recent publication of his book, *Life in a Shell: A Physiologist's View of a Turtle*. Dr. Jackson continues to teach Animal Physiology at Brown and at the University of New Orleans.

For session details, see page 47.

Sponsored by



FEATURED SPEAKER



Photo Credit: Ben Stechschulte

CARL ZIMMER
 Author
 Instructor, Yale University
 New Haven, CT

NABT is proud to feature science author **Carl Zimmer** during a special dinner benefitting the *NABT Biology Educator Leadership Scholarship (BELS)*, where he will be awarded the **2015 NABT Distinguished Service Award**.

Carl Zimmer is the author of a dozen books, including *Parasite Rex* and *The Tangled Bank: An Introduction to Evolution*. After earning a B.A. in English at Yale, Zimmer joined the staff of *Discover*. There he served as a senior editor from 1994 to 1999. Since then he has written features for a wide range of magazines including *National Geographic*, *Scientific American*, and *The Atlantic*. In 2004, Carl began contributing stories to *The New York Times*, and in 2013 he began writing "Matter," a weekly column about science. Carl's journalism has earned prizes from the National Academy of Sciences and the American Association for the Advancement of Science.

In 2004, Carl launched one of the first science blogs, The Loom, which is now hosted by *National Geographic*. He also appears frequently on *RadioLab*. Since 2009, Carl has been a lecturer at Yale, where he teaches science writing.

For event details, see page 59.

The BELS program is Sponsored by 

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 Texas Association of Biology Teachers (**TABT**)
 Virginia Association of Biology Teachers (**VABT**)

BIOCLUB STUDENT AWARDS

Alec Demith

Tiffin Columbian High School, Tiffin, OH

Matthew Pancake

Vincennes University, Vincennes, IN

Outstanding student members of a NABT BioClub are eligible for this textbook scholarship with one student from each BioClub high school chapter and one student from each community college chapter being named. The student must be a graduating senior who has been accepted to a two- or four-year college/university.

Sponsored by Carolina Biological Supply Company

BIOLOGY EDUCATOR LEADERSHIP SCHOLARSHIP (BELS)

Ethan Ake

The Agnes Irwin School, Rosemont, PA

The Biology Educator Leadership Scholarship (BELS) program was established to encourage and support 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 and PASCO Scientific

DISTINGUISHED SERVICE AWARD

Carl Zimmer

Yale University, New Haven, CT

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 his or her research, writing, and teaching.

Sponsored by the National Association of Biology Teachers

ECOLOGY/ENVIRONMENTAL SCIENCE TEACHING AWARD

Kelly Mandy

Marist School, Atlanta, GA

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 his/her commitment to the environment into the community.

Sponsored by Vernier Software and Technology

EVOLUTION EDUCATION AWARD

Andrew J. Petto

University of Wisconsin – Milwaukee, Milwaukee, WI

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

Sponsored by BEACON and BSCS

FOUR-YEAR COLLEGE & UNIVERSITY SECTION BIOLOGY TEACHING AWARD

Kevin Drace

Mercer University, Macon, GA

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

Reneé Schwartz

Georgia State University, Atlanta, GA

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

Nancy Elwess

SUNY Plattsburgh, Plattsburgh, NY

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 ASHG and GSA

HONORARY MEMBERSHIP

Sharon Radford

The Paideia School, Atlanta, GA

The highest honor from the association, this award 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

THE KIM FOGLIA AP® BIOLOGY SERVICE AWARD

Sydney Bergman

School Without Walls High School, Washington DC

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 an AP® Biology teacher and member of that community.

Sponsored by the Neil A. Campbell Educational Trust and Pearson

OUTSTANDING BIOLOGY TEACHER AWARD (OBTA)

See the full OBTA listing for 2015 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

OUTSTANDING NEW BIOLOGY TEACHER ACHIEVEMENT AWARD

Camden Hanzlick-Burton

Olathe Northwest High School, Olathe, KS

This award recognizes outstanding teaching in grades 7-12 by a "new" biology/life science instructor within his/her 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 his/her career.

Sponsored by the Neil A. Campbell Educational Trust and Pearson

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

Curtis D. Coffman

Vincennes University, Vincennes, IN

This award is given to 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 his/her commitment into the community to promote biology education.

Sponsored by Sarah McBride and John Melville

THE RON MARDIGIAN BIOTECHNOLOGY TEACHING AWARD

Vyjayanti Joshi

Lake View High School, Chicago, IL

This award is given to 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

Stacey Kiser

Lane Community College, Eugene, OR

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



For over 50 years the National Association of Biology Teachers has been committed to recognizing outstanding biology teachers.

OBTA HONOREES 2015

REGION I

Aaron Mathieu

Acton-Boxborough Regional High School
Acton, MA

Valerie May

Woodstock Academy
Woodstock, CT

REGION II

Jamie Carpenter

Princess Anne High School
Virginia Beach, VA

Joan Hamer

Honeoye Falls-Lima HS
Honeoye Falls, NY

Katherine Heavers

West Windsor-Plainsboro HS South
West Windsor, NJ

Edwina Kinchington

Pittsburgh Science and Technology
Academy
Pittsburgh, PA

David Szaroleta

Salesianum High School
Wilmington, DE

REGION III

Lori Bing

Zionsville Community High School
Zionsville, IN

Andrea Brook

Lake Orion High School
Lake Orion, MI

Amy Inselberger

Adlai E. Stevenson High School
Lincolnshire, IL

Jeff Wirch

Kenosha Bradford High School
Kenosha, WI

REGION IV

Kay Bass

Harrisburg High School
Harrisburg, SD

Camden Hanzlick-Burton

Olathe Northwest High School
Olathe, KS

REGION V

Doreen Gallant Green

Hemingway High School
Hemingway, SC

Jessica Sandel

Jordan-Matthews High School
Graham, NC

Carolyn Thomas

Wildwood Middle School
Shenandoah Junction, WV

REGION VI

Katie Higgins

Patrick Taylor Science and Technology
Academy
River Ridge, LA

Trecia Neal

Fernbank Science Center
Atlanta, GA

Lorraine Perez

Russellville High School
Russellville, AL

Paula Phillips

Trinity Preparatory School
Winter Park, FL

REGION VII

Peggy Alexander

Owasso Mid-High School
Owasso, OK

Matt Wells

Cypress Lakes High School
Katy, TX

Casey Woods

Beebe High School
Beebe, AR

REGION VIII

Kimberly Popham

Belgrade High School
Belgrade, MT

Robin Walters

Sand Creek High School
Colorado Springs, CO

REGION IX

Thomas Artiss

The Harker School
Bonny Doon, CA

The Outstanding Biology Teacher Award is proudly sponsored by:

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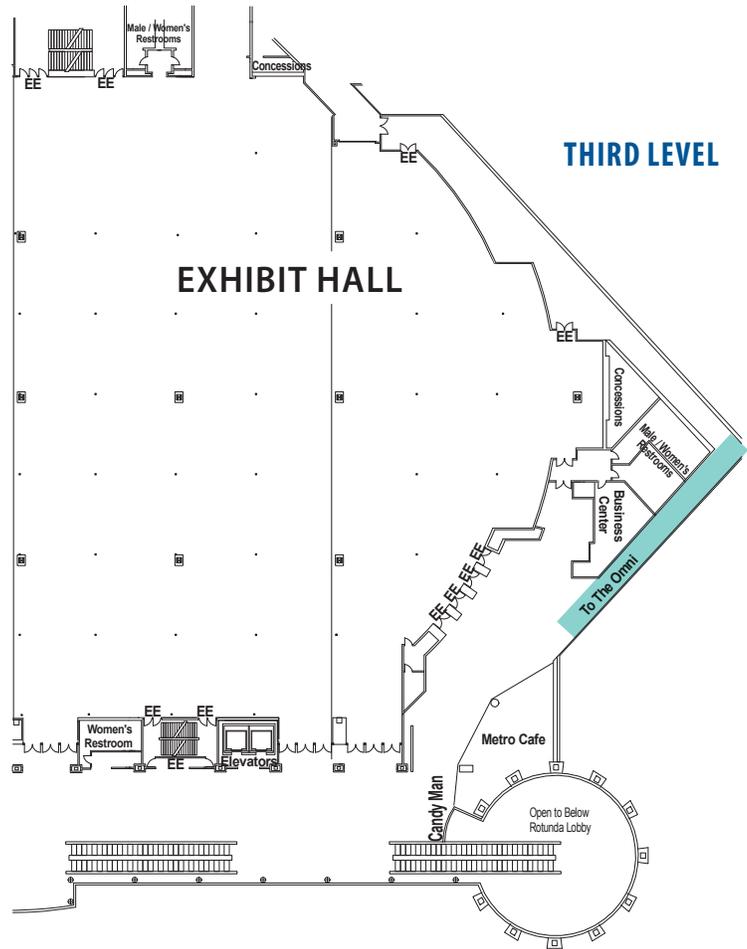
**THANK YOU
TO OUR OBTA DIRECTORS**

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

RHODE ISLAND CONVENTION CENTER (RICC)

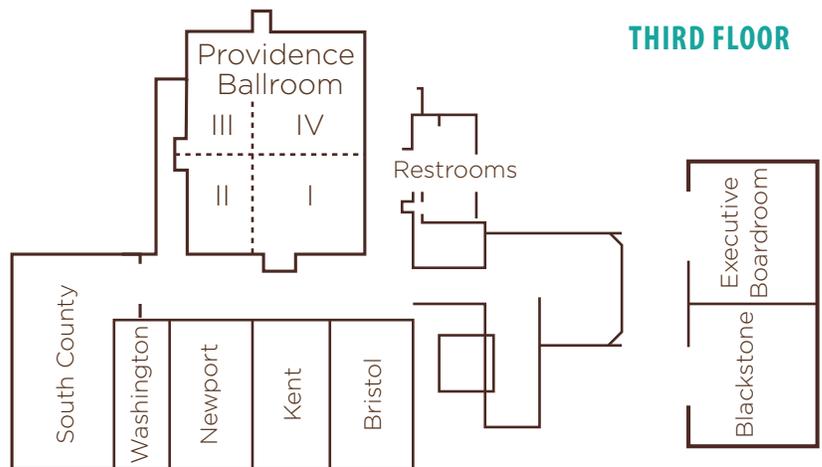
Room Name	Floor
550A/B	5th
551A/B	5th
552A/B	5th
553A/B	5th
554A/B	5th
555A/B	5th
557	5th
558A/B	5th
Ballroom A	5th
Ballroom B/C	5th
Ballroom D/E	5th
Connection to Omni	3rd
Exhibit Hall C+D	3rd
Registration	3rd
Rotunda*	3rd
West Lobby	1st

*There is a Rotunda room in the Omni as well, but it is not in use for our event

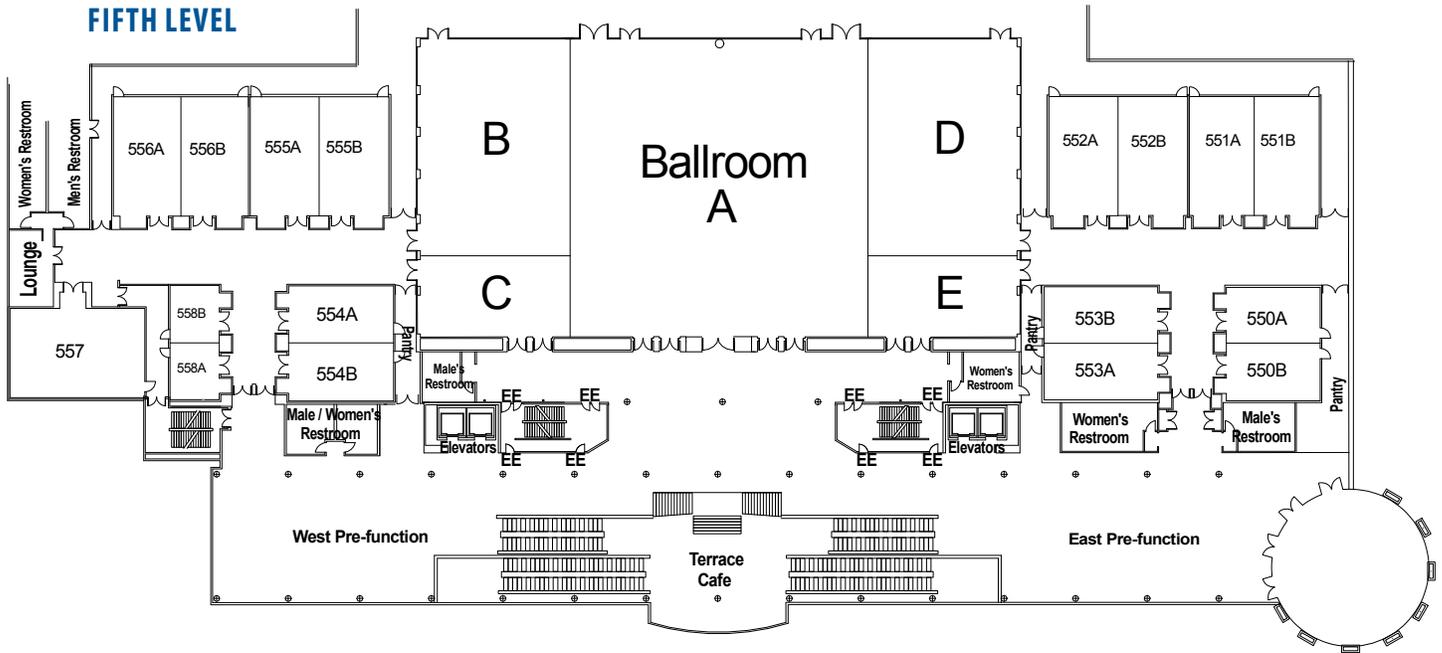


OMNI PROVIDENCE

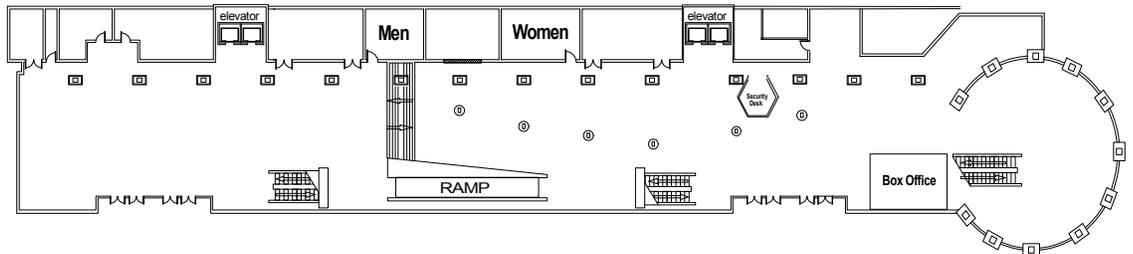
Room Name	Floor
Blackstone	3rd
Bristol	3rd
Connection to RICC	3rd
Executive Boardroom	3rd
Kent	3rd
Narragansett Ballroom	1st
Newport	3rd
South County	3rd
Stateside Suite	1st
Washington	3rd
Waterplace Ballroom I, II & III	2nd



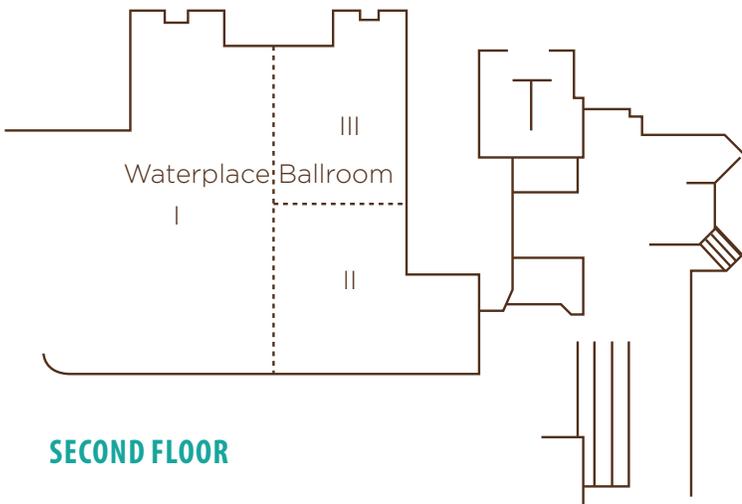
FIFTH LEVEL



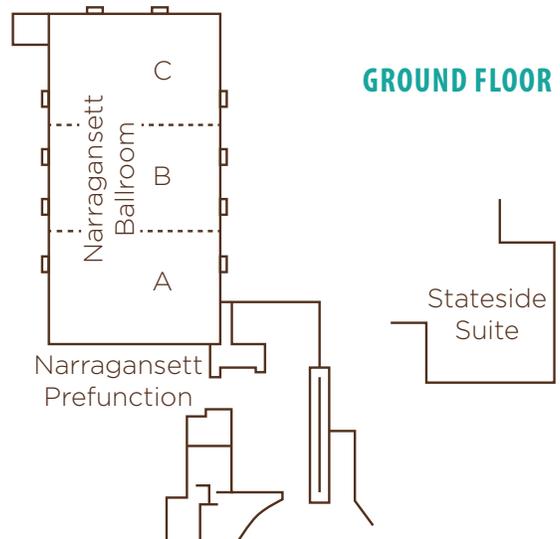
LOBBY LEVEL



SECOND FLOOR



GROUND FLOOR





SPECIAL WORKSHOPS

WEDNESDAY, NOVEMBER 11, 2015

Math & Statistics in the Biology Classroom

12:00PM – 4:30PM

AP Biology • HS • Free (Lunch included)

Presented by Satoshi Amagai, HHMI, Chevy Chase, MD and Paul Strode, Fairview High School, Boulder, CO

High school science standards, including AP Biology, IB Biology, NGSS, and the Common Core, encourage the use of mathematics and statistics in biology education. In this hands-on, half-day workshop, participants will learn key mathematical and statistical concepts and methods used in biological research, including the nature of data, distribution, sampling, and standard statistical tests. Participants will work independently and in small groups to practice analyzing real scientific data, and multiple workshop facilitators will be on-hand to answer questions. Learn how HHMI BioInteractive's free classroom-ready resources can help you implement math and statistics in your biology classroom.

Sponsored by 

Inquiring Minds Want to Know: How to get your students to ask good questions that lead to great scientific investigations

1:00PM – 4:00PM

General Biology • MS, HS • Free

Presented by Jim Clark and Samantha Johnson, Arroyo High School/San Lorenzo USD, San Lorenzo, CA

Remember the scene from Ferris Bueller, when the teacher asks, "anyone, anyone"? Don't be that guy! This short course will focus on the SEP's of asking questions and planning and carrying out investigations. Attendees will design a lab to test their question, sharing lab protocols and results with fellow participants. We will then discuss how this data connects to other SEPs. All participants will leave with ready-made material they can utilize in their classes as soon as they get home.



MEAL EVENTS

THURSDAY, NOVEMBER 12, 2015

First Timers' Breakfast

7:00AM - 8:15AM

Free (Tickets are required)

NABT Conference *first timers* are invited to learn more about NABT and the Professional Development Conference over a complimentary breakfast. Each table will have an NABT leader available to answer your questions and help you make the most of your time in Providence.

The NABT First Timers' Breakfast is made possible through the generous support of



FRIDAY, NOVEMBER 13, 2015

BioClub Breakfast

7:00AM - 8:15AM

Free (Tickets are required)

The NABT BioClub keeps adding new clubs from middle schools to community colleges throughout the United States and Canada. Both *current* and *future* BioClub Advisors are invited to share resources, feedback and stories about their chapters. Join the club (BioClub that is)!

Sponsored by  www.carolina.com

FRIDAY, NOVEMBER 13, 2015

Four-Year Section Luncheon

\$ 11:45AM – 12:45PM

\$8 onsite

Join faculty, education researchers, graduate students, and others who make four-year colleges and universities their professional home. Network with colleagues and friends (and make new ones) at this event. The lunch will include a special presentation of the Four-College and University Section Awards. Winners of the Student Poster and Student Travel awards will also be recognized.

FRIDAY, NOVEMBER 13, 2015

Two-Year Section Luncheon

\$ 11:45AM – 12:45PM

\$8 onsite

Students at two-year colleges are only as diverse as their instructors. Share your challenges, epiphanies, and best practices with other two-year and community college educators who "get it." The winner of the Two-Year College Biology Teaching and Prof. Chan Teaching Award will also be announced.

Sponsored by  

FRIDAY, NOVEMBER 13, 2015

AP Biology Section Luncheon

\$ 11:45AM – 12:45PM

\$8 onsite

You have the big ideas and enduring understandings covered. But what about the science practices and the labs? And that exam? Meet other AP Biology teachers in a friendly informal setting to share questions and insight. You may even finally get to meet some of your favorite fellow AP teachers in person.

Sponsored by 



SPECIAL EVENTS

THURSDAY, NOVEMBER 12, 2015
HHMI Night at the Movies with Sean Carroll
 6:30PM - 8:00PM
 Free (Tickets are required)



HHMI BioInteractive (www.biointeractive.org) and NABT are pleased to host the 5th Annual *HHMI Night at the Movies with Sean Carroll*. Join Dr. Carroll for the premiere of the new short film *The Biology of Skin Color*, a highly engaging case study in recent human evolution, focusing on the interaction between biology and the environment. This free red-carpet event will begin at 6:30pm with a reception including free food and drink.

FRIDAY, NOVEMBER 13, 2015
\$ BELS Benefit Dinner featuring Carl Zimmer
 7:00PM - 9:00PM • \$90 (Tickets are required)



NABT is proud to honor Carl Zimmer with the 2015 Distinguished Service Award during a special dinner benefitting the NABT Biology Educator Leadership Scholarship (BELS). Reporting from the frontiers of biology, Zimmer is an award-winning journalist whose articles, essays, books, and blog posts have become required reading for the biology education community. Zimmer will be the guest of honor and featured speaker at the BELS Banquet, where he will talk about his experiences as a science writer and offer commentary on what is currently exciting him in biology research today. Questions from the audience are encouraged.

Join us as we honor Carl Zimmer for his contributions to biology education through his writing and teaching. Tickets to the BELS Banquet include a private cocktail reception, dinner, presentation and book signing.

The BELS Program is made possible with the generous support of NABT members and



SATURDAY, NOVEMBER 14, 2015
\$ NABT Honors Luncheon
 12:00PM – 2:00PM • \$60 (Tickets are required)

The grand finale of the NABT Conference, this celebration honors exceptional biology teachers. Join us as we recognize the accomplishments and professional contributions of all of the 2015 NABT Award recipients, including the Outstanding Biology Teacher Award (OBTA) honorees. Everyone is welcome to attend!



FIELD TRIP



WEDNESDAY, NOVEMBER 11, 2015
Save The Bay Seal-Watch Cruise

\$ 11:00AM - 3:00PM
\$50 (Transportation and tour provided)

SOLD OUT

As the temperature drops and winter descends, harbor seals follow schools of herring and migrate to their winter home in Narragansett Bay.

Join experts from *Save The Bay* (www.savebay.org) to learn about these fascinating marine mammals as you observe them in their natural habitat. Guides will discuss seal migration patterns, adaptations, food webs and laws to keep marine mammals safe. This special 2-hour tour also includes views and narration about some of Rhode Island's historic lighthouses.

Save The Bay will provide binoculars, but be sure to dress warm as it can be chilly on the water - the boats are sheltered from the wind and weather but they are not heated! The tour departs from the Omni Providence promptly at 11:00am. Your arrival at the *Save The Bay* dock in Newport includes training from the guides prior to departure. All attendees should be back on land and at the Omni by 3:00pm!

PAST PRESIDENTS & CONFERENCE LOCATIONS

- 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. Bently 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, D.C. w/AAAS
1965 — L. S. McClung, U of CA, Berkley 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 City, NY w/AAAS
1959 — Paul Klinge, Chicago, IL w/AAAS
1958 — Irene Hollenbeck, Washington, D.C. w/AAAS
1957 — John Breukelman, Indianapolis, IN w/AAAS
1956 — John P. Harrold, New York City, 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 City, NY w/AAAS
1948 — Howard A. Michaud, Washington, D.C. 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
* birth of NABT occurred on July 1, 1938 in New York City, NY

HONORARY MEMBERS

- 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

- 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, Ph.D., 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, D.C.
2005 — James A. Thompson, V.M.D., University of Wisconsin—Madison, Madison, WI; and Nina Leopold Bradley, Aldo Leopold Foundation, Baraboo, WI
2004 — Barbara Bancroft, RN, MSN, PNP, CPP Associates, Inc., Chicago, IL
2003 — Roberta Pagon, M.D., 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, D.C.
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 — Dr. Leroy Hood, University of Washington, Seattle, WA
1997 — Neal Lane, Director, National Science Foundation, Washington, D.C.; and Donald Kennedy, Stanford University, Palo Alto, CA
1996 — Dr. Francis Collins, National Institutes of Health, Bethesda, MD
1995 — Carl Djerassi, Stanford University, Palo Alto, CA
1994 — Bruce Alberts, National Academy of Sciences, Washington, D.C.
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 PRESIDENT-ELECT

Bob Melton is GEARING UP

to lead NABT in 2016.



Try to catch up
with him at the
NABT Conference
in Providence!

When you meet the
next NABT President,
you can also win
some great prizes from

PASCO[®]

The drawing will be
Friday, November 13th
in the Exhibit Hall.



ABBREVIATION KEY
E: Elementary School
MS: Middle School
HS: High School
2Y: Two-Year College
4Y: Four-Year College
GA: General Audience
AP® is a registered trademark.

WEDNESDAY NOVEMBER 11



8:30AM – 4:30PM

Touching Triton Workshop

551B • Genetics • Invitation Only Workshop • HS, 2Y, 4Y

BSCS / NABT AP® Biology Leadership Academy Cohort III

552A • AP Biology • Invitation Only Workshop • HS

QUBES Workshops (InTeGrate & Quantitative Biology in Introductory Biology)

553B • Invitation Only Workshop • 2Y, 4Y

10:30AM – 12:30PM

NABT Board of Directors Meeting

Newport • Committee Meeting • GA

11:00AM – 3:00PM

Save The Bay Seal – Watch Cruise

RICC Lobby • Field Trip (Tickets Required) • GA

Join experts from Save The Bay (www.savebay.org) to learn about these fascinating marine mammals as you observe them in their natural habitat. Guides will discuss seal migration patterns, adaptations, food webs and laws to keep marine mammals safe. This special 2-hour tour also includes views and narration about some of Rhode Island's historic lighthouses.

Buses will depart the Omni at 11:00am.

12:30PM – 4:00PM

#950 Math and Statistics in the Biology Classroom

Providence II & III • AP Biology • Special Workshop (Tickets Required) • HS

In this hands-on, half-day workshop, participants will learn key mathematical and statistical concepts and methods used in biological research, including the nature of data, distribution, sampling and standard statistical tests. Participants will practice analyzing real scientific data and learn how HHMI BioInteractive's free classroom-ready resources (www.hhmi.org/biointeractive) can help you implement math and statistics in your biology classroom.

Satoshi Amagai, HHMI, Chevy Chase, MD and Paul Strode, Fairview High School, Boulder, CO

1:00PM – 4:00PM

#816 Inquiring Minds Want to Know: How to Get your Students to Ask Good Questions that Lead to Great Scientific Investigations

551A • General Biology / Special Workshop (Tickets Required) • MS, HS

Remember the scene from Ferris Bueller, when the teacher asks, "anyone, anyone"? Don't be that guy! This short course will focus on the SEP's of asking questions and planning and carrying out investigations. Participants will leave with goody bags!

Jim Clark and Samantha Johnson, Arroyo High School/San Lorenzo USD, San Lorenzo, CA

NABT Open Forum

South Country • Special Program • GA

NABT is an association led by our members for our members. Engage with leaders and fellow members in this interactive format that highlights the "state of the association," NABT programs, and new initiatives. Make NABT stronger by sharing your ideas, your feedback and your leadership.

4:30PM – 5:30PM

NABT / BSCS AP Biology Academy Reception

552A • Invitation Only

Sponsored by **CAROLINA®**
www.carolina.com

5:30PM – 6:30PM

NABT Meet & Greet

Rotunda • Special Program (Conference Badge Required) • GA

Join other NABT attendees to connect and conspire at this informal reception. This is a great place to meet old friends and make new ones as you learn more about Providence and make plans to explore the city.

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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THURSDAY NOVEMBER 12



7:00AM – 8:15AM**NABT First Timers' Breakfast**

Ballroom D & E • Meal Function • Tickets Required • GA

NABT Conference first timers are invited to learn more about NABT and the Professional Development Conference over a complimentary breakfast. Each table will have an NABT leader available to answer your questions and help you make the most of your time in Providence.

The NABT First Timers' Breakfast is made possible through the generous support of

**8:30AM – 9:45AM****GENERAL SESSION SPEAKERS****Jacquelyn L. Gill, Kenneth R. Miller, and Seth Mnookin**

See page 8 for full biographies of the speakers.

Eye of the Storm: Teachers, Science & Societal Controversy

Ballroom A • Special Speaker • General Audience

Sometimes established scientific findings run smack into deeply held religious or political views, leading to societal debate. Such debate inevitably spills over into the classroom, and science teachers find themselves in the position of having to mediate misunderstandings and misconceptions. Topics like evolution have recently been joined by climate change, vaccination and GMO-food safety, where scientific consensus is similarly at odds with sincere value judgments.

While it's easy to say that teachers should just "stick to the science", these thorny topics require teachers be aware of, and comfortable addressing, the non-scientific preconceptions that students bring with them to class. The ability to think scientifically is a powerful skill and addressing these controversies effectively offers an opportunity to help students understand the nature of science – what counts as evidence, how scientific disagreements are resolved, and why debate in science is so different from political and other kinds of debate.

In this session, three experts in scientifically established, but societally controversial topics – evolution, climate change, and vaccine safety – will present how they navigate these choppy waters.



The panel is presented by The National Center for Science Education in partnership with NABT.

#ES1 Bio-Rad Session: Eat+Learn. 3D Learning aligned to NGSS (Breakfast provided)

553B • General Biology • Hands-on Workshop • HS, 2Y, 4Y, GA

See full description on next page.

10:30AM – 11:45AM**#755 NCSE Presents: Dealing with Doubt & Denial in the Classroom**

550A & 550B • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • MS, HS

In this hands-on workshop we will address how to comfortably teach socially and politically controversial scientific topics in the classroom, creating

teachable moments out of tense interactions and de-escalating challenges when they arise.

Minda Berbeco and Stephanie Keep, National Center for Science Education (NCSE), Oakland, CA

#773 Having Fun With Symbiosis!

551A • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • MS, HS, 2Y

In this workshop, participants will be part of a lesson strand for teaching ecological interactions in a way that engages students in several ways and allows for some natural creativity. Topics will include mutualism, commensalism, and five more.

Thomas Hinckley, Landmark College, Putney, VT

#876 Primate and Hominin Phylogeny Construction Using Skulls – Students Using Past Generations to Learn the Next Generation Science Standards!

552A • Evolution • Hands-on Workshop (75 min) • MS, HS, 2Y

Observe and measure skulls to create phylogenetic trees and the evolution of primates and hominins. Michigan teachers with support from the MSU Museum and BEACON will share hands-on & virtual labs that guide students through the dimensions of NGSS.

Heather Peterson and William Hodges, Holt High School, Holt, MI and Fred Hingst, DeWitt High School, DeWitt, MI

#780 Little Critters – Big Ideas: An Ecology Unit Based on Stream Macroinvertebrates

552B • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • MS

Macroinvertebrates can be used to teach big ideas in ecology. We will present one lesson from a unit developed to extend students' experiences at a stream field trip into the Ecology classroom. Insight into student learning will be shared.

Alan Berkowitz, Cary Institute of Ecosystem Studies, Millbrook, NY

7:00AM – 3:45PM

#ES1 Special Programming Presented by Bio-Rad Laboratories

All sessions are in Room 553B

7:00AM – 8:15AM

Eat+Learn. 3D Learning Aligned to NGSS (Breakfast provided)

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

Engage in an interactive NGSS-aligned 3D learning experience. This includes practical measures and insights for encouraging 3D learning and assessment in your classroom while focusing on understanding the mechanism underlying chromatography.

Nicole Shea, Bio-Rad Laboratories, Hercules, CA

10:30AM – 11:45AM

Photosynthesis(PS) + Cell Respiration(CR) with Algae Beads

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

Bring inquiry into a PS and CR lab (Big Idea 2: Labs 5, 6). Use algae beads to examine light intensity and color effects on PS while studying CR in the dark. See the clear connection of the consumption and release of CO₂ that occurs during PS and CR.

Sherri Andrews, Bio-Rad Laboratories, Hercules, CA

12:00PM – 1:15PM

Lunch and Learn with Bio-Rad! The GMO Debate Rages On! (Lunch provided)

Bioethics • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Do you feel that GMs create Frankenfoods or do they help produce safe food to feed the growing population? Learn more about GMOs, how to test for the presence of GM content in foods, join a debate and learn how to bring this experience to your class.

Sherri Andrews, Bio-Rad Laboratories, Hercules, CA

1:45PM – 3:00PM

Easily Integrate Inquiry with Glowing Bacteria - Big Idea 3

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

Learn new ways to advance inquiry in the classroom – by integrating real-world scientific practices that will encourage your students to direct their own scientific investigation. This is so much more than your typical transformation lab!

Sherri Andrews, Bio-Rad Laboratories, Hercules, CA

3:15PM – 3:45PM

The Lionfish Project

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

Lionfish have greatly impacted biodiversity in coral ecosystems from North Carolina and beyond. Learn about a project utilizing DNA barcoding to engage students in collecting and analyzing data about the lionfish diet at sites in the US and Caribbean.

Sherri Andrews, Bio-Rad Laboratories, Hercules, CA

10:30AM – 11:45AM *continued***#786 The Exposome: Making Chemical Exposures Relevant to Biology Instruction**

555A • AP Biology • Demonstration (75 min) • HS, 2Y, 4Y

Conduct a graphing/data interpretation activity that introduces the concept of the exposome while reinforcing learning about DNA damage and repair and cancer formation in response to exposure to cancer causing chemicals such as vinyl chloride.

Dana Haine, UNC-Chapel Hill Superfund Research Program, Chapel Hill, NC

#740 Data-based Inquiry in the Classroom Using Authentic Research Data from the Dryad Digital Repository

555B • Curriculum Development • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Looking for real datasets to use in the classroom? DryadLab has what you are looking for! Appropriate for introductory to advanced quantitative skill development – come learn how to use these materials in your classroom!

Kristin Jenkins, BioQUEST Curriculum Consortium, Madison, WI and Samantha Swauger, DryadLab, Chapel Hill, NC

#767 Teaching DNA Replication in Context: From Mutations to Errors to Cancer

556A • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • HS, 2Y

This workshop will demonstrate how the teaching of DNA replication can be enhanced by relating it to a molecular story of replication errors, redundant DNA repair systems and cancer – in such a way that students practice their critical thinking skills.

Diane Munzenmaier and Margaret Franzen, MSOE CBM, Milwaukee, WI

#920 Next Generation Digital Curriculum

556B • Instructional Strategies & Technologies • Partner Presentations (75 min) • GA

In this session, we will share our current thinking about digital curriculum and ask participants to share your own thoughts concerning digital curriculum features and characteristics.

Brooke Bourdélát-Parks, BSCS, Colorado Springs, CO

#777 Students Reading Real Science: Tools for Success

557 • Instructional Strategies & Technologies • Demonstration (75 min) • HS, 2Y, 4Y

Introduce primary literature and professional scientific research to students using “Science in the Classroom” (<http://scienceintheclassroom.org>). Use C.R.E.A.T.E. strategies (<http://teachcreate.org>) to design activities and assessments.

Melissa McCartney, AAAS Education and Human Resources, Washington, D.C.; Sally Hoskins, The City College of New York, New York, NY; Sherri Story, King’s Fork High School, Suffolk, VA; Kathy Kresge and Sharon Lee-Bond, Northampton Community College, Bethlehem, PA

#910 Mapping Genes to Traits using SNPs

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

Analyzing SNP data from genome-wide association studies (GWAS) is increasingly important in the biological sciences. Explore free activities and materials to help you bring gene mapping and statistical analysis into your introductory biology course.

Melissa Csikari, Germanna Community College, Stafford, VA; Elinor Karlsson, University of Massachusetts Medical School, Boston, MA; Megan Stine, HHMI BioInteractive, Chevy Chase, MD

10:30AM – 3:45PM

#ES2 Special Programming Presented by Carolina Biological Supply Company

All sessions are in Room 553A

10:30AM – 11:45AM

Getting to the Root of Artificial Selection with Wisconsin Fast Plants®

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

In this highly interactive session, we will explore the range of selection experiments made possible by using Wisconsin Fast Plants to teach core evolution and ecology concepts. Come learn about effective experimental designs and their implementation.

Hedi Baxter Lauffer, Wisconsin Fast Plants, Madison, WI

12:00PM – 12:30PM

30 Minutes to New: AP Biology New Products Primer

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

Looking for unique resources to enrich your students’ AP Biology experience? Join us for an overview of Carolina Biological’s exclusive supplementary products and ideas about how to integrate them into your curriculum.

Sarah Bottorff, Carolina Biological Supply Company, Burlington, NC

1:45PM – 3:00PM

They Come in Pairs: Using Socks to Identify and Address Student Misconceptions about Chromosomes

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

Understanding meiosis and chromosome behavior has always been a challenge. What if it were as easy as folding laundry? This workshop will help you identify and address student misconceptions using ChromoSocks. In partnership with HudsonAlpha.

Jennifer Carden, Carolina Biological Supply Company, Burlington, NC

3:15PM – 3:45PM

Renovating Science Courses for Distance Learning

General Biology • Hands-on Workshop (30 min) • 2Y, 4Y

Distance learning hands-on lab activities achieve essential learning outcomes for online courses. This inquiry-based model emphasizes using legitimate lab materials, acquiring critical lab skills and actively engaging students in their own learning.

Shannon McGurk, Carolina Biological Supply Company, Elon, NC

10:30AM – 3:45PM

#ES3 Special Programming Presented by Macmillan New Ventures

All sessions in Room 554A

10:30AM – 11:45AM

Redesigning Biology Courses with Lab Simulation Technology

Instructional Strategies & Technologies • Demonstration (75 min) • HS, 2Y, 4Y
Faculty across the country are rethinking their general education biology courses and labs. Course redesigns with technology as the centerpiece are the most cost-effective and outcome-driven approach.

Matthew Nelson, Late Nite Labs, New York, NY

1:45PM – 3:00PM

Empowering Educators and Engaging Students

General Biology • Demonstration (75 min) • 2Y, 4Y
Sapling Learning is an instructional online homework system combining passionately crafted content, targeted feedback, and a personal relationship with a dedicated Tech TA. Come to learn how we engage students and empower educators like you.

Hannah Robus, Sapling Learning, Austin, TX

3:15PM – 3:45PM

Custom Digital Solutions for the Biology Lab

General Biology • Demonstration (30 min) • 4Y
Learn about Hayden-McNeil's custom services that go well beyond the printed lab manual. Demonstrations will include pre-lab and post-lab online resources, full online course solutions, and digital interactives that support your printed manual.

Katy Trionfi, Hayden-McNeil Publishing, Plymouth, MI

10:30AM – 11:45AM *continued*

#877 Traditional Labs Transformed for NGSS Science Practices

Washington • Science Practices • Hands-on Workshop (75 min) • MS, HS, 2Y
Science practices are necessary so traditional labs need to be transformed. We will share labs and activities that are now inquiry focused requiring data analysis and explanations. We will also share how we use our lab notebooks. Come try it with us!

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

#ES25 Enhance Critical Thinking with Interactive Case Studies

Newport Room • General Biology • Hands-on Workshop (75 min) • MS, HS, 2Y, 4Y, GA
Hear from fellow teachers how these cases engage students in critical thinking and problem solving, and then experience a case on your device. Developed in partnership with teachers, the cases are proven to increase learning in NIH and NSF research.

Tom Robertson, Cogent Education, Athens, GA

NABT Committee Meeting: Finance Committee

Blackstone • Committee (75 min) • GA

Harry McDonald, NABT Secretary / Treasurer, Olathe, KS

10:30AM – 12:30PM

#761 Answering the Call for Life Science Transformation

Providence Ballroom I & IV • Curriculum Development • Hands-on Workshop (120 min) • 2Y, 4Y

Participants will use the PULSE Snapshot Rubrics to gauge their department's progress toward Vision and Change and PULSE resources to develop a plan to better align their department with the Vision and Change recommendations.

Sharon Gusky and Tara Jo Holmberg, Northwestern Connecticut Community College, Winsted, CT; Thomas Jack, Dartmouth College, Hanover, NH; Gina Sembrebon, Bay Path University, Longmeadow, MA; Patrice Boily, Western Connecticut State University, Danbury, CT; Barbara Nicholson, Central Connecticut State University, New Britain, CT; Dustin Vale-Cruz, Springfield College, Springfield, MA

#886 Exploring the Floating Disk Photosynthesis Technique in an AP Biology and NGSS Context

Providence Ballroom II & III • AP Biology • Hands-on Workshop (120 min) • HS

Join us as we explore and troubleshoot photosynthesis using the Floating Leaf Disk assay featured in the *AP Biology Lab Manual*. The session will go from design, to data collecting, to analysis, to scientific argumentation.

Brad Williamson, University of Kansas, Lawrence, KS and Camden Hanzlick-Burton, Olathe Northwest High School, Olathe, KS

12:00PM – 12:30PM

#801 Relationship between Instructional Strategies and Student Focus in a Flipped, Introductory Biology Classroom

550A & 550B • Instructional Strategies & Technologies • Paper (30 min) • HS, 2Y, 4Y

Which active learning strategies maintain student focus in a flipped, introductory biology classroom? Based on quantitative observations of student behavior, we will report on optimal activity length for questioning, class discussion, and group work.

Cara Stephens, Donald French, and Michael Moore, Oklahoma State University, Stillwater, OK

#887 Teaching Fundamental Concepts of Neuroscience for Meaningful Learning: Lessons Learned from Teachers in the Field

551A • Neuroscience • Hands-on Workshop (30 min) • HS, 2Y, 4Y

We have created a suite of interactive case studies that addresses the most difficult to teach neuroscience concepts. Join us to discuss findings from a study of eight brilliant science teachers and over 400 students to see what we learned.

Sophia Jeong and Georgia Hodges, University of Georgia, Athens, GA; Holly Amerman, Rome City High School, Rome, GA; Anna Scott and Richard Patterson, The Athens Academy, Athens, GA

#781 The Tree Room: A New Tool for Teaching Evolutionary Relationships

552A • Evolution • Demonstration (30 min) • HS, 2Y, 4Y

Berkeley's landmark *Understanding Evolution* website just got even better with *The Tree Room*. This freely available companion site brings evolutionary relationships to life for students and teachers with interactives, vetted lessons, and more.

Anastasia Thanukos, University of California Berkeley, Berkeley, CA; Teresa MacDonald, University of Kansas, Lawrence, KS; David Heiser, Yale Peabody Museum of Natural History, New Haven, CT; Chris Willems, Metropolitan Business Academy, New Haven, CT

#872 The Power of Data in River Ecology

552B • Ecology / Environmental Science / Sustainability • Demonstration (30 min) • HS

Students use the powerful *National Geological Survey* database to answer questions about water quality. After collecting their own data, students look for patterns and trends and make predictions about DO, nitrates, temp, and precipitation among others.

Kate Henson, Miss Porter's School, Farmington, CT

#855 Meeting the NGSS with Blended Learning by Teaching and Assessing Genetically Modified Crops

555A • Biotechnology • Paper (30 min) • HS, 2Y, 4Y

GMO crops provide a context for NGSS blended learning and assessment. We illustrate how to blend practices, disciplinary core content, and crosscutting concepts with this complex issue.

Shannon Burcks and Marcelle Siegel, University of Missouri, Columbia, MO

#892 Making the Flip with Genes

555B • General Biology • Demonstration (30 min) • HS, 2Y, 4Y

The genes concepts were flipped for non-biology students in an integrated lab lecture undergraduate course. The design incorporated script writing for original videos and construction of web lessons. Internet resources were also used.

Kathy Gallucci, Elon University, Elon, NC

#905 Using a Computer Game to Teach Scientific Argumentation

556A • Instructional Strategies & Technologies • Paper (30 min) • HS

We will present a case study of how a teacher used a computer game to support students' construction of scientific arguments and how different levels of scaffolding available through student sheets may impact the quality of students' arguments.

Chandana Jasti, Robert Wallon, Hillary Lauren, and Barbara Hug, University of Illinois, Champaign, IL

#858 Recycling and Building Rigorous AP Biology Questions

556B • AP Biology • Demonstration (30 min) • HS

This seminar will focus on creating challenging and rigorous AP biology questions. Focus will be on deconstructing multiple choice into short answer questions, visual data questioning and peer analysis of deconstructed free response with whiteboards.

Bob Kuhn, Centennial High School, Roswell, GA

10:30AM – 3:45PM

#ES4 Special Programming Presented by OpenStax College Rice University Inc

All sessions in Room 554B

10:30AM – 11:30AM

Capturing Student Interest with Digital Interactivity

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

This session covers Sapling Learning's interactive, open-ended, and inquiry-based digital resources. These resources, coupled with OpenStax College's Biology, are a low-cost online homework and textbook solution.

Todd Pearson, Sapling Learning & OpenStax College, Houston, TX

12:00PM – 12:30PM

AP Biology: CONQUER THE FRAMEWORK!

AP Biology • Demonstration (30 min) • HS

College Board framework lead Julianne Zedalis presents on the new AP Biology framework and how to prepare your students for success on the AP Biology exam, all with the help of a free, peer-reviewed textbook by Rice University's OpenStax College.

Julie Zedalis, OpenStax College, Houston, TX

1:45PM – 2:45PM

Wiley's Affordable Solutions to Learning Challenges

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

Through a partnership between Wiley and OpenStax College, BIO Principles and BIO Concepts with WileyPLUS Learning Space is a next-generation adaptive learning, etext and course stream, with key resources all in one place and at an affordable price.

Clay Stone, Wiley & OpenStax College, Houston, TX

3:15PM – 3:45PM

OpenStax College's Biology – Enhanced!

General Biology • Hands-on Workshop (30 min) • 2Y, 4Y

SimBio has partnered with OpenStax College to offer a complete set of introductory Biology chapters you can mix and match with SimBio's popular virtual labs. Free evaluation software will be provided to workshop participants.

Ellie Steinberg, SimBio & OpenStax College, Houston, TX

12:00PM – 12:30PM *continued***#857 Biology Best Bets XVI: Teacher to Teacher**

557 • General Biology • Demonstration (30 min) • HS

Biology Best Bets is back after a 4-year hiatus. Explore our latest collection of biology learning experiences in context – student prior knowledge, logistics, cost, assessments, & extensions. Adapt them for your needs!

Suzanne Black, Inglemoor High School, Kenmore, WA; Nancy Monson, West Linn High School, West Linn, OR; Jennifer Lockwood, Newbury Park High School, Newbury Park, CA

#875 Teaching The Big Ideas by Investigating Mitochondrial Genetics

Washington • AP Biology • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Mitochondrial genetics are complex, however looking at the connections between point mutations in mitochondrial DNA, proteins of the electron transport chain, and human health and disease is a powerful way to teach students essential content.

Ryan Reardon, Jefferson County International Baccalaureate School (JCIB), Birmingham, AL

NABT Committee Meeting: Archival Committee

Blackstone • Committee (30 min) • GA

Carrie Boyce, University of Southern Mississippi, Hattiesburg, MS and Jill Maroo, University of Southern Iowa, Waterloo, IA

NABT BIOLOGY EDUCATION RESEARCH SYMPOSIUM

1:00PM – 3:45PM • SOUTH COUNTRY

SCHEDULED PRESENTATIONS:

Exploring Third-Grade Students' Model-based Explanations about Plant Processes

Laura Zangori, University of Missouri-Columbia and Cory Forbes, University of Nebraska-Lincoln, Lincoln, NE

To develop understanding about plant growth and development, a fundamental concept throughout elementary curriculum, elementary students should engage in knowledge-building about plant processes through scientific practice (NGSS Lead States, 2013). Scientific modeling, a core scientific practice, is underemphasized in elementary science learning environments and little past research has explored the ways in which early learners' engage in discipline-specific modeling practices. Scientific modeling provides an opportunity for students to construct models that make "hidden" processes, such as seed origin, explicit and visible. Students then use their models to scientifically reason about how and why plant processes work and propose model-based explanations. Here we report on a design-based study to investigate the ways in which 3rd-grade students' ($n = 73$) constructed models and generated model-based explanations about plant structure/function and plant life cycles. Results indicate that elementary students considered hidden elements and generated mechanism-based explanations about both plant processes. However, findings from this study highlight the range of ideas evident in students' understanding about seed origination and how and why plant structures function to support the plant. Implications from this research include suggestions for model-centered plant curriculum in elementary science learning environments to support 3rd-grade students in conceptualizing hidden plant processes.

The Effects of Introducing E-texts and E-materials in 100 and 200-level Biology Courses on Teaching Pedagogy

Rebecca Garrison, Kerrie McDaniel, and Jerry Daday, Western Kentucky University, Bowling Green, KY

A new generation has entered higher education that learns differently from generations before. To meet the changing needs of this generation, a Biology Department at a four year university introduced e-textbooks and e-materials in the fall of 2013 to most low-level classes. An unforeseen product of this shift was a change in the way that some faculty taught and assessed their classes. This study examines the changes in pedagogical techniques among professors of 100- and 200-level biology classes due to introduction of new e-text and e-materials. Syllabi were collected from these classes pre- and post-implementation and common characteristics were inductively coded and statistically analyzed to identify changes in pedagogy. Interviews were conducted of faculty teaching these classes. It was found that biology professors increased their average number of homework assignments by 23%. There was also a 289% increase in the number of courses that offered homework assignments as a means of assessment, indicating a shift from traditional summative assessments to more formative assessments after the implementation of the e-materials. This work provides insight into simple strategies that affect pedagogy in higher education STEM disciplines.

Case Studies in Teaching Evolution: The Intersection of Dilemmas in Practice

Rachel Fisher, University of Arizona, Tucson, AZ

Despite recent science education reform documents citing evolution as a core concept to be taught in grades K-12, research shows problems with how it is currently taught. Evolution is often avoided, teachers minimize its importance within biology, infuse misconceptions, and/or interject non-scientific ideologies into lessons. My research focused on how teachers in two geographically and culturally distinct school districts in the southwestern U.S. negotiate dilemmas during an evolution unit. One school district was rural and had a large population of Mormon students, while the other district was urban, with a large majority of Mexican/Mexican-American students. Using a case study approach, I observed three biology teachers during their evolution lessons, interviewed them throughout the unit, co-planned lessons with them, and collected artifacts from this unit, including anonymous student work. Findings showed teachers' backgrounds and comfort levels with evolution, in addition to the community context, affected how they negotiated pedagogical, conceptual, political, and cultural dilemmas. This study's findings will inform in-service and pre-service teachers' future practice and professional development tools to aid with their teaching – this may include methods to negotiate some of the political (e.g. state standards) or cultural (e.g. religious resistance) issues inherent to teaching evolution.

Pre-service Teachers' Engagement with Life Science Concepts within Structured Formative Assessment Assignments

Jamie L. Sabel and Cory Forbes, University of Nebraska-Lincoln, Lincoln, NE, and Laura Zangori, University of Missouri-Columbia, Columbia, MO

Undergraduate students preparing to become elementary teachers (i.e., pre-service teachers) often have limited science subject matter knowledge. In order to effectively engage students in scientific practices and connect students' ideas about science to appropriate instructional strategies, teachers should learn disciplinary concepts and how to apply their content knowledge to elementary classroom environments with proven instructional practices, such as formative assessment. However, the use of formative assessment practices is not widespread in part because teachers may not understand formative assessment or have enough science content knowledge to effectively engage in the practice. To address this concern, we developed an innovative course for elementary pre-service teachers built upon two pillars—life science content and formative assessment. As a part of the course, pre-service teachers engaged in formative assessment assignments that provided structure to engage them in each step of the formative assessment process and to support them in considering their own and elementary students' life science understanding. Here, we will present results of an embedded mixed methods study designed to evaluate how engaging in these assignments provided opportunities for pre-service teachers to gain content knowledge and the ability to productively engage in formative assessment for science.

The Role of Sense-making in Undergraduate Modeling Activities

Andrea M.-K. Bierema, Jon R. Stoltzfus and Christina V. Schwarz, Michigan State University, East Lansing, MI

Recent national calls for improving science education (e.g., Vision and Change, AAAS, 2011) emphasize the need to focus on core disciplinary concepts and incorporate scientific practices during instruction. To address this need, we introduced modeling activities to the curriculum of two undergraduate, large-enrollment, introductory biology courses. During these activities, students work in groups of three to create scientific models of biological phenomena. To assess how these activities engage students in sense-making, we analyzed group discussion and students' concurrent diagrammatic modeling recorded on digital tablets and interviewed a subset of the participants. We found evidence that students were engaged in the activity and worked to make sense of the phenomena. However, we also found that students tend to agree with one another without argument, which suggests engagement in everyday discussion norms that do not necessarily foster explicit scientific thinking. Therefore, these group modeling activities may foster understanding of core concepts, but need further modification, such as asking students to develop written explanations of the phenomenon before working on the model in a group. This might lead to improvement in scientific thinking. In conclusion, we found that these modeling activities in large enrollment classrooms helped foster sense-making of biological phenomena.

Misunderstanding of the Hypothesis in Biology

Paul Strode, Fairview High School, Boulder, CO

Helping students understand and generate appropriate hypotheses and test their subsequent predictions in science in general and biology in particular should be at the core of teaching the nature of science. However, there is much confusion among students and teachers about the difference between hypotheses and predictions. Here I present evidence of the problem and describe steps scientists actually follow when employing scientific reasoning strategies. This is followed by a proposed solution for helping students effectively explore this important aspect of the nature of science.

SPECIAL GUEST PRESENTER:

René Schwartz, Georgia State University, Atlanta, GA

Recipient of the 2015 NABT Four-Year Section Research in Biology Education Award

12:30PM – 1:30PM

NABT Energy Break

Exhibit Hall • Special Program (60 min) • GA
You took in some sessions, now you can take a break. Stop by for a snack and a sneak peek of what the Exhibit Hall has to offer.



1:00PM – 3:45PM

NABT Biology Education Research Symposium

South Country • Special Program • Symposium (165 min) • GA
NABT is proud to present the 7th Annual Biology Education Research Symposium. Presentations were accepted through a double-blind review process that was open to biology instructors and researchers at all levels.

Full abstracts are available on page 31 and proceedings will be posted at www.NABT.org.

1:45PM – 3:00PM

#866 Top 10: Genetics and Biotechnology Discoveries 2015

550A & 550B • General Biology • Biotechnology (75 min) • MS, HS, GA
The 2014 *Biotechnology Guidebook* contains current research findings in brief vignettes that are seamless additions into your content area course or for a personal update on your genetics and biotechnology content. This free resource is available for download on the HudsonAlpha website: www.hudsonalpha.org

Neil Lamb, HudsonAlpha institute for Biotechnology, Huntsville, AL

#765 Engaging in Close Reading of a Text – How to Meet the CCSS while Teaching NGSS Content & Skills

551A • Science Practices • Hands-on Workshop (75 min) • MS, HS
NGSS & CCSS keeping you awake? Help your students meet the standards. Learn strategies for integrating CCSS-Literacy standards with the NGSS Science and Engineering Practices of evaluating information and engaging in argument from evidence.

Lesley Shapiro, Classical High School, Providence, RI and Audrey Armstrong, St. Rocco School, Johnston, RI

#792 Chewing on Change – Exploring the Evolution of Horses in Response to Climate Change

552A • Evolution • Hands-on Workshop (75 min) • MS, HS, 2Y
This four-lesson curriculum investigates the evolution of the horse in response to climate change using authentic paleontology methods to study fossilized horse teeth. Attendees will preview the lessons and receive free curriculum materials.

Jennifer Broo, St. Ursula Academy, Cincinnati, OH; Jessica Mahoney, Edgewater High School, Orlando, FL; Sean Moran, University of Florida, Gainesville, FL

#846 Smithsonian’s Teaching Evolution through Human Examples (TEtHE): Cultural and Religious Sensitivity (CRS) Teaching Strategies Resource

552B • Evolution • Hands-on Workshop (75 min) • HS, 4Y, GA
The CRS resource and the instructional approach it adopts will be described. Session participants will have an opportunity to explore an example exercise from each of the two classroom activities presented in the resource.

Connie Bertka, Science and Society Resources, LLC, Potomac, MD and Briana Pobiner, Smithsonian Institution, National Museum of Natural History, Washington, D.C.

#770 MIT BLOSSOMS Video Lessons: A Teaching Resource to Support NGSS

555A • Instructional Strategies & Technologies • Partner Presentations (75 min) • MS, HS
Session introduces MIT BLOSSOMS, featuring biology lessons aligned with NGSS. These lessons, developed by university-HS educators, are designed to encourage active student learning. Session will announce contest for NABT biology teachers.

Richard Larson and Elizabeth Murray, Massachusetts Institute of Technology, Cambridge, MA

#914 Transform Those Cookbook Labs

555B • Curriculum Development • Hands-on Workshop (75 min) • HS, 2Y
Learn to transform “cookbook” labs into ones that 1) actively engage students in developing hypotheses and methods and exploring concepts; 2) address a wide variety of learning styles and cultures; and 3) effectively integrate Internet resources.

Margaret Shain-Stieben, American Physiological Society, Bethesda, AL

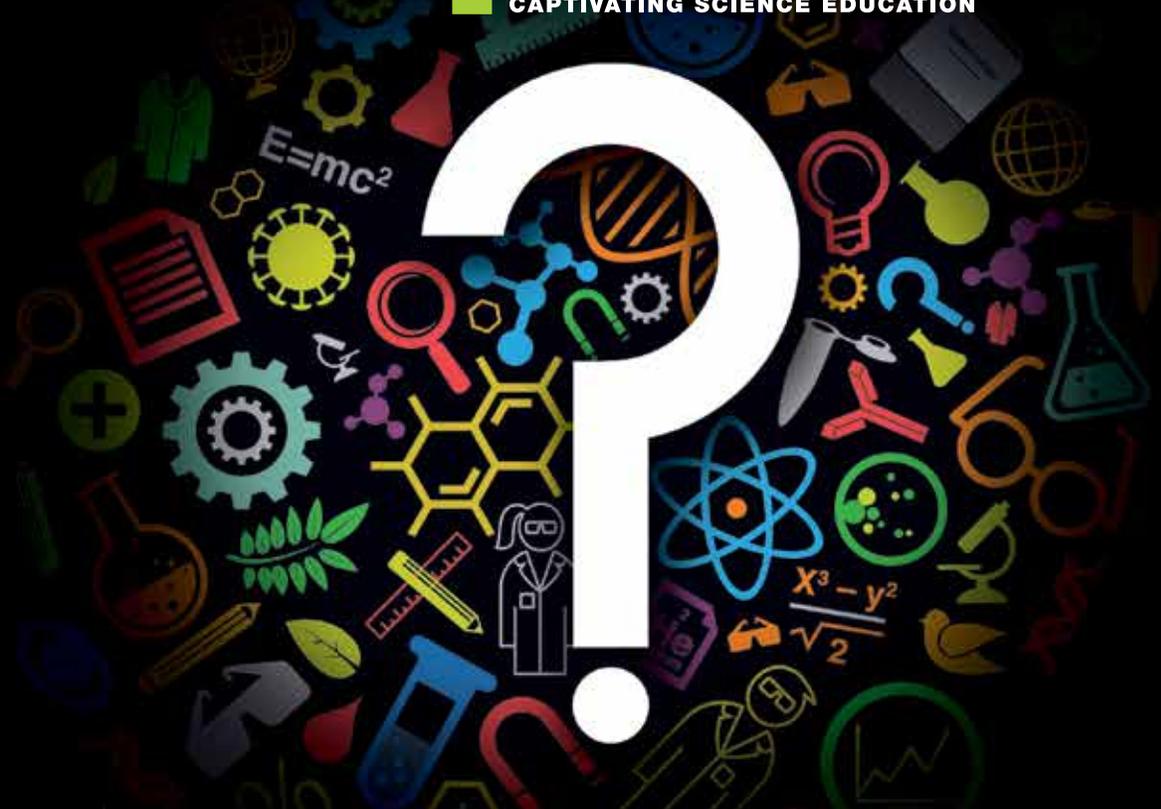
#862 Don’t Just Punt It...Punnett! An Interactive Model for Helping Students Understand What the Punnett Square Really Represents

556A • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • MS, HS, GA
Learn about a set of NGSS-aligned lessons and an interactive demonstration to teach middle school students genetics. Participate in an analysis of video from our lessons, developed as part of our videocase-based professional learning community.

Paul Beardsley, Cal Poly Pomona, Pomona, CA; Julie Allender, Elizabeth Mercado, and Mary Timassy-Nelson, Ontario Montclair School District, Ontario, CA

Biotechnology Explorer™

CAPTIVATING SCIENCE EDUCATION



NABT Providence Workshop Schedule

Join us in room 553B for these great free workshops.

Thursday, November 12

Visit Us at Booth #401

Take fun pictures with your friends at our photobooth during the opening reception!

- | | |
|----------------|---|
| 7:00–8:30 AM | Eat and Learn. 3-D Learning Aligned to NGSS (breakfast provided) — engage in an interactive NGSS-aligned 3-D learning experience. This includes practical measures and insights for encouraging 3-D learning and assessment in your classroom while focusing on understanding the mechanism underlying chromatography. |
| 10:30–11:45 AM | Photosynthesis (PS) + Cell Respiration (CR) with Algae Beads — bring inquiry into a PS and CR lab (Big Idea 2: Labs 5, 6). Use algae beads to examine light intensity and color effects on PS while studying CR in the dark. See the clear connection of the consumption and release of CO ₂ that occurs during PS and CR. |
| 12:00–1:15 PM | Lunch and Learn with Bio-Rad! The GMO Debate Rages On! (lunch provided) — do you think that GMOs are Frankenfoods or do they help produce safe food to feed the growing population? Learn more about GMOs and how to test for the presence of genetically modified content in foods. Join a debate and learn how to bring this experience to your class. |
| 1:45–3:00 PM | Easily Integrate Inquiry with Glowing Bacteria (Big Idea 3) — learn new ways to advance inquiry in the classroom — by integrating real-world scientific practices that will encourage your students to direct their own scientific investigations. This is so much more than your typical transformation lab! |
| 3:15–3:45 PM | The Lionfish Project — lionfish have greatly impacted biodiversity in coral ecosystems of North Carolina and beyond. Learn about a project utilizing DNA barcoding to engage students in collecting and analyzing data about the lionfish diet at sites in the U.S. and Caribbean. |



Visit us on the Web at explorer.bio-rad.com
Call toll free at 1-800-424-6723;
outside the U.S., contact your local sales office.

BIO-RAD

1:45PM – 3:00PM *continued*

#856 Socratic Seminars in Science: From Texts to Data

556B • General Biology • Hands-on Workshop (75 min) • MS, HS, 2Y

Learn how to use this group discussion strategy, in which students work together to achieve deeper understanding of a text, graph, or reading. Participate in an actual seminar which focuses on analyzing and interpreting scientific data.

Maureen Munn and Joan Griswold, University of Washington, Seattle, WA

#841 Marine Science Mania VII

557 • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • MS, HS

Marine Science Mania will share best practices, labs and activities used to engage, excite and instill passion in students for Marine Science. Will discuss 1 to 1 instructional devices and their role in the classroom. Will include giveaways and CDs with materials.

Tom Froats, Prospect High School, Mount Prospect, IL

#909 Teach Inquiry-Based Ecology with a Citizen Science Trail Camera Project

Ballroom B • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS

HHMI BioInteractive presents a new online citizen science platform where students identify animals in trail camera images to help scientists in Gorongosa National Park. Workshop participants will do hands-on activities using trail camera photos.

Amanda Briody, Frederick Douglass High School, Baltimore, MD; Kim Parfitt, Central High School, Cheyenne, WY; Bridget Conneely, HHMI BioInteractive, Chevy Chase, MD

1:45PM – 3:45PM

ASM Presents: A Constructive Approach to Biology

Providence Ballroom I & IV • Microbiology & Cell Biology • Symposium (120 min) • HS, 2Y, 4Y

The classical mode of studying and teaching Biology uses deconstructive methods to tease apart the operation of living systems. An alternative approach relies on assembling functional biological systems from individual parts. This session will present both current academic research and innovative modes of teaching the biological sciences through this constructive framework of Synthetic Biology.

Kristala L. J. Prather and Natalie Kuldell, Massachusetts Institute of Technology, Cambridge, MA

NABT AP Biology Symposium: Using Data to Tell a Biological Story – A Focus on AP Biology Science Practice 2

Providence Ballroom II & III • AP Biology • Symposium (120 min) • HS

The revision of the AP Biology course and exam addressed an increasing need for students in AP Biology to have a strong foundation in quantitative approaches to data analysis. In this session, participants will be provided with tools for the practical application of statistics in the AP Biology classroom. Participants will also be provided with activities for manipulating data, performing statistical analyses and constructing graphical representations of data specific to the AP Biology Course and Exam in short, medium, and long blocks of class time. Participants will be encouraged to share their challenges and best practices on how to incorporate quantitative skills in the classroom.

Jennifer Pfannerstill, North Shore Country Day School, Winnetka, IL

#ES26 Revolutionizing Biotechnology in Real-Time

Newport Room • Biotechnology • Hands-on Workshop (75 min) • MS, HS, 2Y, 4Y

Do an electrophoresis experiment in 30 minutes. The revolutionary MiniOne Electrophoresis System features a safe 42V low voltage power supply, non-UV illuminator and uses non-hazardous reagents. Have results on your phone by the end of class.

Richard Chan, The MiniOne Electrophoresis, San Diego, CA

NABT Committee Meeting: Nominating Committee

Blackstone • Committee (75 min) • GA

Betsy Ott, Tyler Community College, Tyler, TX

3:15PM – 3:45PM

#772 The Microbiome of a High School: Student Population = 1250, Microbial Population = ?

550A & 550B • General Biology • Paper (30 min) • HS, 2Y, 4Y

Join us as we share the findings from a student-driven study of the microbiome. Environmental swabs were collected with the help of researchers from HudsonAlpha. Learn how students uncovered microbial populations in this cross curricular project.

Dasi Price, HudsonAlpha Institute for Biotechnology, Huntsville, AL

#754 How Prepared are First-Year College Students to Learn about Cellular Respiration in Introductory Biology?

551A • General Biology • Paper (30 min) • 2Y, 4Y, GA

Come listen to our progress in creating the chemistry in cellular respiration CI, and the factors that affect incoming student preparation on cellular respiration. Our results will help attendees plan their approaches to teaching this topic.

Jay Forshee II, Chelsea Fortenberry, and Donald French, Oklahoma State University, Stillwater, OK

#865 Zoo Genetics: Newly Updated and Designed Classroom Activities

552A • General Biology • Demonstration (30 min) • MS, HS, 2Y

Using real world storylines and data from the field, Zoo Genetics exposes students to problem solving and sense making in authentic and

interesting ways. This presentation highlights the benefits of a partnership between teacher and scientist.

Jason Crean, Lyons Township High School & St. Xavier University, Chicago, IL, and Kathy Van Hoeck, York Community High School, Elmhurst, IL

#724 Integration of Science and Literacy

552B • Instructional Strategies & Technologies • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Do you find your students struggling with vocabulary, reading textbooks and taking notes in your classroom? This NSF-funded project incorporates literacy strategies into the science content in an introductory biology course at a community college.

Marirose Ethington, Genesee Community College, Batavia, NY

#725 Integrating Ecology in an Undergraduate Botany Course

555A • Plant Biology • Paper (30 min) • 2Y, 4Y, GA

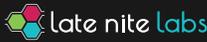
Learn about the redesign, implementation, and results of a botany course for upper undergraduate biology majors in which core botanical concepts were taught within ecological principles using primary literature, modeling tasks, and group discussion.

Laura Zangori, University of Missouri - Columbia, Columbia, MO and Jason Koontz, Augustana College, Rock Island, IL

IGNITE YOUR STUDENTS' CURIOUS MINDS

Transform your biology courses with innovative solutions from Macmillan New Ventures (MNV)! As part of MNV, Hayden-McNeil, Sapling Learning, and Late Nite Labs offer customized lab manuals, digital lab simulations, online homework solutions, and lab prep questions with personalized feedback. Stop by booths 300, 301, and 303 to learn more.

Join us for demo sessions: **RICC Room 554A - Thursday, November 12**



10:30am-11:45am
Redesigning Biology Courses with Lab Simulation Technology



1:45pm-3:00pm
Empowering Educators and Engaging Students



3:15pm-3:45pm
Custom Digital Solutions for the Biology Lab



STUDENT POSTER COMPETITION Scholarship of Teaching and Learning

1. Assessment of the Peer-Assisted Learning Resource Center for Introductory Biology Students at Presbyterian College

Michael Harris, Troy Nash, and Suann Yang, Presbyterian College, Clinton, SC

2. Creating an Authentic Research Experience in a General Biology Lab: Publishing in the Journal of Introductory Biology Investigations

Jay Lance Forshee II and Donald P. French, Oklahoma State University, Stillwater, OK

3. The Effect of Embryonic Exposure to Predation Risk on the Growth and Anti-predator Behavior of *Physa acuta*

Cassandra A. Dowds, Lynne E. Beaty, and Barney Luttbeg, Oklahoma State University, Stillwater, OK

4. The Engaged Undergraduate: A Conceptual Model

Marisa DeCollibus and Bryan Dewsbury, University of Rhode Island, Kingston, RI

5. Implementing In-Class Group Activities in a Non-Majors' Biology Class to Enhance Learning and Develop Positive Attitudes toward Biology

Trenton Pennington and Sandhya Baviskar, University of Arkansas, Fort Smith, AR

6. Influence of Peer-Led Team Learning on Recruitment and Retention in STEM

Jeremy D. Sloane, Julia J. Snyder, and Jason R. Wiles, Syracuse University, Syracuse, NY

7. Interpreting Models of Evolution – The Case of Phylogenetic Trees

Inga Ubben and Annette Upmeier zu Belzen, Humboldt-Universität, Berlin, Germany; Kristy Daniel, Texas State University, San Marcos, TX; and Sandra Nitz, Universität Koblenz-Landau, Mainz, Germany

8. Is Active Student Participation in the Flipped Biology Classroom an Accurate Predictor of Performance?

Michael E. Moore, Donald P. French, and Robert Evan Davis, Oklahoma State University, Stillwater, OK

9. Predictive Model For Student Success and Affect in an Introductory Biology Course

Danika Korpacz and Bryan Dewsbury, University of Rhode Island, Kingston, RI

10. Relationship between Instructional Strategies and Student Focus in a Flipped, Introductory-Biology Classroom

Cara Stephens, Michael E. Moore, and Donald P. French, Oklahoma State University, Stillwater, OK

11. The Role of Curiosity Practices in Classroom Discourse

Wendy R. Johnson and Charles W. Anderson, Michigan State University, East Lansing, MI

STUDENT POSTER COMPETITION Mentored Undergraduate Research

12. 5-HTTLPR Gene

Juan Ruiz, SUNY Plattsburgh, Plattsburgh, NY

13. A Comparative Survey of Soil Invertebrate Diversity in Correlation with Soil Pollution

Liana Van Nostrand, Soledad Tejada, Rhys Manley, Ariadne Speliotis, Sam Willner, and Marah Birnbaum, Bard High School Early College, New York, NY

14. Diadema Dilemma: Coral and Algal Coverage as Related to *Diadema antillarum* Density

Abigail Treadwell, New England College, Henniker, NH; Tom Frazer, University of Florida, Gainesville, FL; and Kristi Foster, Central Caribbean Marine Institute, Princeton, NJ

15. Effects of Global System for Mobile Communication (GSM) Radiation on *Paramecia tetraurelia*

Samuele Weekes, SUNY Plattsburgh, Plattsburgh, NY

16. Functional Analysis β -hemoglobin gene in *Paramecium tetraurelia*

Feysel Shifa, SUNY Plattsburgh, Plattsburgh, NY

17. Methylenetetrahydrofolate Reductase Gene C677T Polymorphisms

Daniel Salatto, SUNY Plattsburgh, Plattsburgh, NY

18. Occurrence of Foodborne Pathogens in Grazed and Non-Grazed Native Pecan Orchards

Kacera Yoes, Alix Orr-Yates, and Li Maria Ma, Oklahoma State University, Stillwater, OK

19. Translating Research on Luminescence of GRAS Probes into Educational Tools in Photophysics

Alexia A. Ciarfella, Joseph M. Zuccaro, Maria G. Corradini, and Richard D. Ludescher, Rutgers, The State University of New Jersey, New Brunswick, NJ

20. Using DNA Barcoding to Survey Biodiversity in the East River

Alberta Devor, Lena Zinner, and Ayse Aydemir, Bard High School Early College, New York, NY

Non-Competition Posters

21. Automated Analysis of Constructed Responses: Exploring Students' Ideas about the Processes of Genetic Information Flow in their Own Words

Andrea M.-K. Bierema, Michigan State University, East Lansing, MI

22. Cloning and Sequencing of the GAPC-2 Gene in Cilantro (*Coriandrum sativum*)

Idit Hazan, Brandi Sigmon, Sean Giza, and Mohamed Al-Hussein, Grand View University, Des Moines, IA

23. Cloning of the GAPC gene in *Abutilon theophrasti* (velvetleaf)

Idit Hazan, Brandi Sigmon, Elizabeth Kras, and Alyssa Douglas, Grand View University, Des Moines, IA

24. Community Engagement and STEM Outreach through the "Summer Science Fun" Program

Holly A. Little, Saginaw Valley State University, University Center, MI

25. Comparative Respiratory Systems in Terrestrial Arthropods: A Laboratory Exercise in Animal Physiology

Sara Tallarovic, Karly Brightwell, and Caitlin Schlagal, University of the Incarnate Word, San Antonio, TX

26. Creation and Modification of a Scientific Method Lab for an Online Non-majors Introductory Biology Course

Kristin Lenertz-Kersey, South Dakota State University, Brookings, SD

27. Developing Shared Vision: Community Change and Course Redesign in an Interdisciplinary Faculty Learning Community

Emily M. Walter and Ulrike Muller, California State University, Fresno, CA

28. The Development and Implementation of a Basic Physics Course with Life Science Applications

Jean DeSaix, Laurie E. McNeil, Alice D. Churukian, Duane L. Deardorff, and David P. Smith, University of North Carolina, Chapel Hill, NC

29. Evolutionary Perceptions across the Disciplines within a Religious Centered State

Alyssa Chrystine Brown, William H. Heyborne, and Emily Dean, Southern Utah University, Cedar City, UT

30. Greater Impacts of Summer Field Research in Central America

LaRoy Brandt, Truman State University, Kirksville, MO

31. HabitatNet: Connecting Community, Education, & Ecosystems through Biodiversity Field Research Projects

Daniel Bisaccio, Brown University, Providence, RI

32. An Historical Study of Teaching Biology to Science-Illiterate Students in Eighteenth-Century France

Trudy L. Witt, Germanna Community College, Fredericksburg, VA

33. How Can You Teach Biology Online? Designing Laboratory Courses for Online Learning Environments

Mary Mawn, SUNY Empire State College, Saratoga Springs, NY

34. How Early in Introductory Biology Courses Can Students Be Identified Who Are at Risk of Failing?

Randal Streck, Post University, Waterbury, CT

35. How Naturalists Use Mobile Technology to Support Participation during a Nature Hike

Aubin St.Clair, University of Southern Mississippi, Hattiesburg, MS; Kristy L. Daniel, Texas State University, San Marcos, TX; and Aimée K. Thomas, Loyola University, New Orleans, LA

36. An Inquiry-based Activity using Cancer Staging to Teach Students about Tissue Layers

Kurt Lucin and Alyssa Anderson, Eastern Connecticut State University, Willimantic, CT

37. Insights from Student-Driven Enrichment Activities

Clark Gedney, Isidore Julien, Purdue University, West Lafayette, IN; Katlin Hahm, University of Michigan, Ann Arbor, MI; Kaitlyn E. Gilland, Purdue University, West Lafayette, IN; and Melanie Johnston, Johns Hopkins University, Baltimore, MD

38. Introducing a Multi-component Mammalian Brain Anatomy and Histology Laboratory Associated with an Inquiry-based *Drosophila* Huntington's Disease Module

Lindsay Mehrmanesh, Kene Piasta, and Melissa S. Kosinski-Collins, Brandeis University, Waltham, MA

39. Let Them See Light!

Nancy Elwess, SUNY Plattsburgh, Plattsburgh, NY

40. Life Sciences Freshman Research Scholars: Integrating First-Year Students into the Research Community

John Stewart, Amy Martindale, Coral Rewasiewicz, and Donald French, Oklahoma State University, Stillwater, OK

41. Make it & Solve it! : 3D Modeling & Printing Based Problem Solving Activity with Bio-mimicry

Seung-Hyuk Kwon, Yong-Ju Kwon, Jeung-Tae Eom, Young-Ji Lee, and Jae-Young Oh, Korea National University of Education, Cheongju, North Chungcheong, South Korea

42. Natural Selection Verification Program using 3D Printing

Jeung-Tae Eom, Yong-Ju Kwon, Seung-Hyeok Kwon, Jae-Yeong Oh, and Young-Ji Lee, Korea National University of Education, Cheongju, North Chungcheong, South Korea

43. A New General-Education Science Course at Wesley College

William Kroen, Wesley College, Dover, DE

NON-COMPETITION POSTERS *continued*

44. Non-Visual Laboratory Activities for Biology

Deborah M. Fiore, Bridgewater State University, Bridgewater, MA

45. Novel GAPDH Gene Sequenced from *Mentha arvensis* (mint)

Idit Hazan, Brandi Sigmon, Anai Perez, Ryan Starkman, and Haris Variz, Grand View University, Des Moines, IA

46. OUTSIDE Naturalist Development Workshop: Identities of Participants and their Relation to Volunteer Motives

Jennifer A. Mraz, University of Southern Mississippi, Hattiesburg, MS; Kristy L. Daniel, Texas State University, San Marcos, TX; and Aimée K. Thomas, Loyola University, New Orleans, LA

47. Phylogenetic Word Associations

Carrie Boyce, University of the Virgin Islands, USVI, and Kristy L. Daniel, Texas State University, San Marcos, TX

48. Plant-Centered Bioinformatics Lessons Engage High School Students in Authentic Science Practices

Andrea Cobb, Thomas Jefferson High School for Science and Technology, Alexandria, VA; Margot Goldberg, Pittsburgh Milliones 6-12 School, Pittsburgh, PA; Jason Miller and Christopher Town, J. Craig Venter Institute, Rockville, MD

49. QUBES: Building a Community to Promote Undergraduate Quantitative Biology Education

Alison Hale and Sam Donovan, University of Pittsburgh, Pittsburgh, PA, and Arietta Fleming-Davies, Radford University, Radford, VA

50. Re-Designing Principles of Genetics to Address the Vision and Change Recommendations

John M. Moore, Taylor University, Upland, IN

51. Ready to Burst! Exploring the Effects of Lysozyme on Gram-Positive and -Negative Bacteria

Ricki Burnett, Jessica Habashi, and Grant Wilson, Utah State University, Brigham City, UT

52. Role of Reflexivity on Students' Outcomes in a College Science Laboratory Course

Chandrani Mishra, The University of Southern Mississippi, Hattiesburg, MS; Kristy L. Daniel, Texas State University, San Marcos, TX; and Kari L. Clase, Purdue University, West Lafayette, IN

53. Students, Students, Students. All We Ever Hear about Are the Students!

Meshagae Hunte-Brown, Drexel University, Philadelphia, PA

54. Teaching the Genome Generation: Teacher Professional Development in Genomics Instruction for Rural and Urban High Schools

Charles Wray, Michael McKernan, and Kelly LaRue, The Jackson Laboratory, Mount Desert Island, ME and Dana Waring, Harvard Medical School, Cambridge, MA

55. The Thermic Effect of Food in Scorpions: a Laboratory Exercise in Animal Physiology

Sara Tallarovic, Karly Brightwell, Caitlin Schlagal, University of the Incarnate Word, San Antonio, TX

56. The Use of Student-Led Supplemental Instruction (SI) to Enhance Learning in First-year Biology Courses

Kerry Cheesman, Kimberly Heym, and Bruce Epps, Capital University, Columbus, OH

57. Using a Trade Book to Show How Change Influences Society

Sandra Latourelle and Karen Case, SUNY Plattsburgh, Plattsburgh, NY

58. Using an Evidence-based Argumentation Skill Progression to Improve Teacher Practice and Increase Student Learning in the (AP) Science Classroom

Malcolm S. Pringle, E M Kennedy Academy, Boston, MA; Gregory Banks, Urban Science Academy, Boston, MA; Sarah Mayper and Marisa Suescun, Evidence-Based Argumentation Initiative – Boston Debate League, Boston, MA

59. Using Mainstream General Audience Science Books to Help Increase Nutrition-Related Learning Outcomes in an Anatomy and Physiology Nursing Course

Todd M. Linscott, Black Hawk College, Moline, IL

3:15PM – 3:45PM *continued*
#880 Using Case Studies with Elementary Students to Learn the Body Systems

555B • Curriculum Development • Hands-on Workshop (30 min) • ES

During this session, researchers will share findings from an elementary STEM camp where students, grades 3-5, explored 3-D interactive case studies that address diabetes and obesity. We will explore the game as well as curricular supports created.

Georgia Hodges, University of Georgia, Athens, GA

#827 eBio: How the Use of ePortfolios Improved Assessment and Engagement in Non-majors Biology

556A • Instructional Strategies & Technologies • Paper (30 min) • 2Y, 4Y

This session showcases how intentional use of ePortfolio in a non-majors biology course

provides an efficient instructional model built on the use of technology that increases student engagement, persistence and success for students in the course.

Karla Fuller, Guttman Community College (CUNY), New York, NY

#883 Learning Reinforcement Activities - One Way We Updated an Already Inquiry-based Course

556B • Science Practices • Paper (30 min) • 2Y, 4Y

This presentation will summarize how we organized our new combined introductory biology courses using Vision and Change as a conceptual framework. We will outline the significant change we made in how we assess students and provide specific examples.

Connie Russell Heimann, Amaris Guardiola, and Russell Wilke, Angelo State University, San Angelo, TX

#733 Learning about Biodiversity

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

Try out classroom activities for students to learn about biodiversity and human effects. Activities include wildlife history, climate data and biomes, an invasive species board game and bird island. Participants will receive full instructions.

Linda Sigismondi, University of Rio Grande, Rio Grande, OH

NABT Committee Meeting: Global Perspectives Committee

Blackstone • Committee (75 min) • GA

Jacqueline McLaughlin, Penn State Lehigh Valley, Center Valley, PA



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4:00PM – 6:30PM

NABT Poster Sessions

Exhibit Hall • Special Program • Poster Session • GA

NABT posters highlight research, programs and techniques in three different categories: general strategies to teach biology, scholarship of teaching and learning, and mentored undergraduate research.

Complete poster information is available on page 36.

Exhibit Hall Opening Reception

Exhibit Hall • Special Program • GA

You are the guest of honor at this special opening reception of the 2015 NABT Exhibit Hall. Showcasing the NABT sponsor and exhibitor Community, the exhibit hall is the place to enhance your teaching and explore the latest and greatest in tools, technologies, programs, and resources. Join us for complimentary appetizers and beverages. All attendees are invited to observe the poster sessions and to enjoy the special experiences provided by our sponsors.

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6:30PM – 8:00PM

HHMI Night at the Movies with Sean Carroll

Ballroom A • Special Event (Tickets Required) • GA

Join Dr. Sean Carroll and special guest Dr. Zalfa Abdel-Malek for the 5th Annual *HHMI Night at the Movies* and the premiere of the new short film "The Biology of Skin Color", a highly engaging case study in recent human evolution, focusing on the interaction between biology and the environment. This FREE red-carpet event will begin with a reception including pizzas, beer, wine and popcorn. Don't miss your chance to attend this exclusive preview.

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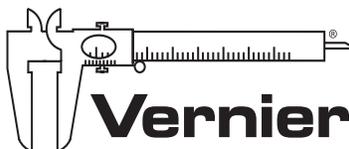
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FRIDAY, NOVEMBER 13
RICC Room 553A

9:30 – 10:00 am	Imaging and Microscopy with Vernier
10:15 – 11:30 am	Biology with Vernier
1:00 – 2:15 pm	Environmental Science with Vernier
2:30 – 3:45 pm	Human Physiology with Vernier





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to the many **VOLUNTEERS**
who worked so hard to make the
2015 Conference a success.

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BioClub



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Alcott High School for the Humanities, Chicago, IL
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Colonia High School, Colonia, NJ
Convent of the Sacred Heart, New York, NY
Cuyahoga Community College, Parma, OH
Durant High School, Plant City, FL
Edgewater High School, Orlando, FL
El Centro College, Dallas, TX
Fayetteville High School, Fayetteville, AR
Florida SouthWestern State College, Naples, FL
Frankford High School, Philadelphia, PA
Freedom High School, Freedom, WI

George Mason High School, Falls Church, VA
Grafton High School, Grafton, WI
Grand View University, De Moines, IA
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Hidden Valley High School, Roanoke, VA
Incarnate Word Academy, Houston, TX
International School of Minnesota, Eden Prairie, MN
Iowa City West High, Iowa City, IA
John Overton High School, Nashville, TN
KC Distance Learning, Bloomsburg, PA
Lake Metro Parks, Concord, OH
Lincoln High School, Esko, MN
Marysville High School, Marysville, KS
Midland Park High School, Midland Park, NJ
MLK Magnet High School, Nashville, TN
Mount Saint Mary Academy, Watchung, NJ
Nashville State Community College, Nashville, TN
Nassau Community College, Garden City, NY
Naugatuck Valley Community College, Waterbury, CT
Newport High School, Bellevue, WA
North Pitt High School, Bethel, NC
Parkland Magnet Middle School, Rockville, MD
Philip O. Berry Academy of Technology High School, Charlotte, NC

Pikeview High School, Princeton, WV
Rickover Naval Academy, Chicago, IL
Riverside City College, Riverside, CA
Ronald Reagan College Prep School, Milwaukee, WI
Salem High School, Salem, IN
Saltsburg High School, Saltsburg, PA
Skyline High School, Sammamish, WA
Southern Vermont College, Bennington, VT
Southern Wells High School, Poneto, IN
St. Clair High School, St. Clair, MI
Steamboat Springs High School, Steamboat Springs, CO
The Summit County Day School, Cincinnati, OH
Sycamore High School, Cincinnati, OH
T. Wingate Andrews HS Center for Sci & Tech, High Point, NC
The Barstow School, Kansas City, MO
Tiffin Columbian High School, Tiffin, OH
Tower Hill School, Wilmington, DE
Unionville High School, Kennett Square, PA
Vincennes University, Vincennes, IN
Visitation Academy - Saint Louis, St. Louis, MO
West Island College, Calgary, AB
West Mifflin Area High School, West Mifflin, PA
Western Sierra Collegiate Academy, Rocklin, CA
Whiting High School, Laramie, WY
Windsor High School, Windsor, CO
Wise County Alternative Education Center, Wise, VA
Woodrow Wilson High School, Portsmouth, VA
Woodstock High School, Woodstock, IL
York Community High School, Elmhurst, IL

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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FRIDAY
NOVEMBER 13

ABBREVIATION KEY
E: Elementary School
MS: Middle School
HS: High School
2Y: Two-Year College
4Y: Four-Year College
GA: General Audience
AP® is a registered trademark.

7:00AM – 8:15AM NABT BioClub Breakfast

Ballroom D • Meal Function
(Tickets Required) • GA

The NABT BioClub keeps adding new clubs from middle schools to community colleges throughout the United States and Canada. Both current and future BioClub Advisors are invited to share resources, feedback and stories about their chapters. Join the club (BioClub that is)!

The BioClub Breakfast is made possible through the generous support of

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7:30AM – 8:15AM Two-Year Section Bring Your Own Breakfast (BYOB) Meeting

Narragansett Ballroom C • Committee Meeting (45 min) • 2Y

Get your breakfast to-go and head to this meeting with the Two-Year College Section. Discuss programs and opportunities that support teachers at this level. All two-year, junior, and community college instructors are invited to attend.

Sharon Lee-Bond, Northampton Community College, Bethlehem, PA

8:30AM – 9:30AM

GENERAL SESSION SPEAKER

Hopi E. Hoekstra

See page 9 for biography.

Digging for Genes that Affect Behavior

Ballroom A • Special Speaker • General Audience

Understanding which genes affect important behaviors, and how they work in the brain, remains a major challenge in biology. To address this goal, Dr. Hoekstra and her team are capitalizing on natural variation in behavior within and between species of deer mice (genus *Peromyscus*). In this talk, Dr. Hoekstra will focus on an innate behavior – burrowing, which produces an intriguing and complex animal architecture – to explore the genetics and neurobiology of behavioral evolution. She will then reflect on how studying natural variation in mice can shed light onto the genetics of human behavior.

9:30AM – 11:30AM AP Biology Academy Debrief

Ballroom D • Invitation Only

10:15AM – 11:30AM #921 How To Use Tree Thinking To Teach Plant Diversity and Evolution

550A & 550B • Evolution • Hands-on Workshop (75 min) • MS, HS, 2Y, 4Y

This workshop presents Huxley Award-winning activities for using phylogenetic tree thinking to teach plant evolution and diversity to students from middle school to college levels.

This session is a special presentation by the recipient of the 2015 Huxley Award presented by the Society for the Study of Evolution (SSE).

Phil Gibson, University of Oklahoma, Norman, OK

#840 Introducing IBIS: Integrating Biology with Inquiry Skills

551A • General Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Join us for an overview of our inquiry-based, mixed major introductory biology curriculum, and a sampling of lecture and lab investigations. We will also share learning objectives and assessments, and ways to promote an inquiry-learning environment.

Suann Yang, Troy Nash, Rachel Pigg, Presbyterian College, Clinton, SC and Tarren Shaw, University of Oklahoma, Norman, OK

#809 Genetics, Ethics, and Murder!

552A • General Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

How are modern DNA profiles generated? Are new collection, storage, and searching norms okay? Explore modern DNA forensic analysis by cracking a fictional double homicide and examining ethical issues raised by real court cases.

Dana Waring, Harvard Medical School, Boston, MA and Katherine Lontok, American Society of Human Genetics, Bethesda, MD

#757 Let's Get Helical: Exploring DNA Structure and Function with Physical Models

552B • General Biology • Hands-on Workshop (75 min) • MS, HS, 4Y

DNA is both a structure and a source of information. Explore both features with interactive DNA models and a paper bioinformatics exercise focusing on the beta subunit of hemoglobin, including the point mutation that leads to sickle cell disease.

Margaret Franzen and Diane Munzenmaier, MSOE, Milwaukee, WI

10:15AM – 11:30AM *continued*
**#ES19 Accelerate Learning:
 Demystifying Biology NGSS with
 STEMscopes**

554A • General Biology • Hands-on Workshop
 (75 min) • MS, HS

Use the 5E with us as we investigate a Biology lesson in STEMscopes. This engaging, hands-on investigation will model collaboration techniques, vocabulary integration, facilitating questions, and formative assessments for student achievement gains.

Terry Talley, Accelerate Learning – STEMscopes,
 Houston, TX

**#ES20 miniPCR PTC Taster Lab: from
 Genotype to Phenotype**

554B • Genetics • Hands-on Workshop
 (75 min) • MS, HS, 2Y, 4Y, GA

Explore the molecular genetics of sensory perception. DNA changes in taste receptor genes can alter our ability to taste. Take a cheek swab, use PCR and gel electrophoresis to study your own taste receptor genes. See how taste is encoded in your DNA!

Sebastian Kraves, miniPCR, Cambridge, MA

**#716 A True and Proven Successful
 Pre AP and AP Curriculum Ladder
 from Middle School to AP**

555A • Curriculum Development • Demonstration
 (75 min) • MS, HS, GA

Is your school or feeder system looking for a proven successful, easy to implement, teacher- and student-friendly free set of science curriculums? If so, then this is your session. Come see what A+ College Ready in Alabama has developed.

Robert Summers, A+ College Ready, Birmingham, AL

**#720 Incorporating the National
 Climate Assessment into your
 Biology Curriculum using NGSS**

555B • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS, 2Y, 4Y

An acidifying ocean? Plants flowering earlier? We'll be discussing the many opportunities to

incorporate the impacts of climate change on organisms into the biology classroom using the new National Climate Assessment and aligning with NGSS.

Minda Berbeco, National Center for Science Education, Oakland, CA and Dana Haine, UNC Institute for the Environment, Chapel Hill, NC

**#874 Do You See What I See? –
 Making Student Thinking Visible**

556A • General Biology • Hands-on Workshop
 (75 min) • MS, HS

Come see modeling in action! Participants will engage in several modeling activities. All participants will leave with a “grab bag”, lesson plans, and strategies that can be implemented in your classroom as soon as you return from the conference.

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

**#879 The Alignment of
 Undergraduate Courses,
 Curriculum, and Assessment
 of Learning and Teaching with
 Recommendations of Vision &
 Change**

556B • Curriculum Development • Hands-on Workshop (75 min) • 2Y, 4Y

Participants will examine strategies for heightening alignment of courses, curricula, and assessment with the life sciences' core concepts and competencies, as elaborated in Vision & Change. PULSE resources to assist in this process will be shared.

Sharon Gusky, Northwestern Connecticut Community College, Winsted, CT; Taylor Allen, Oberlin College, Oberlin, OH; Richard Cardullo, University of California Riverside, Riverside, CA; Karen Klyczek, University of Wisconsin – River Falls, River Falls, WI; David Marcey, California Lutheran University, Thousand Oaks, CA; Dustin Vale-Cruz, Springfield College, Springfield, MA

**#860 Round Holes and Square Pegs
 2.0: How Do Traditional Biology
 Activities Fit into the NGSS?**

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

Join us as we explore evaluating traditional biology activities in light of the NGSS. We'll cover modifying existing activities to support the NGSS. At what point do you say, this doesn't fit – I need a new peg?

Jennifer Carden and Dasi Price, HudsonAlpha Institute for Biotechnology, Huntsville, AL

**#913 Human Evolution in Living
 Color**

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

Explore free resources on human evolution, including hands-on activities, videos, and interactives. Learn about the traits that distinguish us from our primate relatives and more recent adaptations, like skin color, that vary among human populations.

David Knuffke, Deer Park High School, Deer Park, NY; Helen Snodgrass, YES Prep Public Schools, Houston, TX; Laura Bonetta, HHMI BioInteractive, Chevy Chase, MD

**#813 Smithsonian's Teaching
 Evolution through Human Examples
 (TEtHE) Project: Four Free AP
 Biology Curriculum Units Based on
 Human Evolution Case Studies**

Providence Ballroom I & IV • AP Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Four free curriculum units to teach evolution in AP Biology will be described: *Adaptation to Altitude*, *Evolution of Human Skin Color*, *What Does It Mean to be Human?*, and *Malaria*. Participants will engage in two of the activities in the units.

Paul Beardsley, Cal Poly Pomona, Pomona, CA and Briana Pobiner, Smithsonian Institution, Washington, D.C.

10:15AM – 11:30AM

INVITED SPEAKER**Donald C. Jackson**

See page 10 for biography.

Living Without Oxygen: Lessons from Animal Physiology

South Country • Special Speaker • GA

Inadequate oxygen is a major clinical issue for humans largely because of the low tolerance of our heart and central nervous system to this condition. In striking contrast to our vulnerability to even brief periods of hypoxia is the ability of certain animals to survive for weeks or months at low temperature with little or no oxygen. The premier examples of this exceptional tolerance are freshwater turtles, such as the painted turtle, and the crucian carp, a close relative of the goldfish. Both species can maintain viable body fluid homeostasis for long periods under anaerobic conditions, but with strikingly different metabolic strategies. This talk will compare these strategies that concern dealing with anaerobic metabolic end-products, conserving metabolic substrates, and protecting the heart and brain from irreversible damage.

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10:15AM – 11:30AM

NABT GPC Poster Session: Citizen Science – Teaching Conservation

Exhibit Hall • Special Program • Poster Session • GA

The 3rd Annual GPC Poster Session will include the work of select programs that are organizing citizen science studies and teachers who utilize citizen science projects in the classroom.

See page 51 for a full listing of posters.

#864 Tiny Bubbles, Popcorn and More: Modeling Population Demographics

Providence Ballroom II & III • AP Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Ecology is all about energy and relationships. In this encore workshop, participants will actively model concepts of logistic and exponential growth, carrying capacity, survivorship curves and Batsian mimicry.

Pam Close, D. H. Hickman High School, Columbia, MO;
Jessica Williams, Grand View University, Des Moines, IA;
Lee Ferguson, Allen High School, Plano, TX

#925 Graduate Student CV Review, Networking and Mentoring Workshop

Washington • Special Program • Hands-on Workshop (75 min) • GA

The NABT Graduate Student Committee presents opportunities for students to interact one-on-one with expert faculty mentors to review their CV's, network, and explore different mentoring approaches.

#ES40 Increasing Environmental Behaviors Using SeaWorld myActions

Newport • Instructional Strategies & Technologies • Demonstration (75 min) • E, MS, HS

Learn how SeaWorld has combined natural history, environmental science and biology with an interactive social media platform to create myActions, a free tool for educators that encourages increases in student behaviors that benefit the environment.

Bill Street, SeaWorld Parks and Entertainment,
Orlando, FL

NABT Committee Meeting: Long Range Planning Committee

Executive Boardroom • Committee (75 min) • GA

Todd Carter, Seward County Community College,
Liberal, KS

NABT Committee Meeting: Retired Members

Blackstone • Committee (75 min) • GA

Dennis Gathmann, Retired, Mattoon, IL

11:45AM – 12:45PM

AP Biology Section Luncheon

Narragansett Ballroom A • Meal Function (Tickets Required) • HS, 4Y

You have the big ideas and enduring understandings covered. But what about the science practices and the labs? And that exam? Meet other AP Biology teachers in a friendly informal setting to share questions and insight. You may even finally get to meet some of your favorite fellow AP teachers in person.

Sponsored by

PEARSON

Four-Year Section Luncheon

Narragansett Ballroom B • Meal Function (Tickets Required) • 4Y

Join faculty, education researchers, graduate students, and others who make four-year colleges and universities their professional home. Network with colleagues and friends (and make new ones) at this event. The lunch will include a special presentation of the Four-Year College and University Section Awards. Winners of the Student Poster and Student Travel awards will also be recognized.

9:30AM – 3:45PM

#ES18 Special Programming Presented by Vernier Software & Technology

All sessions are in Room 553A

9:30AM – 10:00AM

Imaging and Microscopy with Vernier

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

In this demonstration, learn to use our USB Digital Microscope and the Celestron Digital Microscope Imager, a drop-in digital microscope camera, with the new Camera App on LabQuest® 2, with Chromebooks™, and with Logger Pro software on computers.

Mike Collins, Vernier Software & Technology, Beaverton, OR

10:15AM – 11:30AM

Biology with Vernier

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

In this hands-on workshop, you will conduct experiments such as Enzyme Action and Spectra of Plant Pigments from our popular biology lab books. Use our SpectroVis Plus spectrophotometer and learn about our new wireless products.

Mike Collins, Vernier Software & Technology, Beaverton, OR

1:00PM – 2:15PM

Environmental Science with Vernier

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

Learn how to use Vernier technology to study environmental science. Water quality, renewable energy, mapping field data, and other topics from our lab books will be performed using LabQuest® 2 and our Go Wireless products in this hands-on workshop.

Colleen McDaniel, Vernier Software & Technology, Beaverton, OR

2:30PM – 3:45PM

Human Physiology with Vernier

Anatomy & Physiology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

In this hands-on workshop, you will conduct activities from our Human Physiology with Vernier lab book. Use a variety of our sensors including our EKG Sensor, Spirometer and our new Go Wireless® Heart Rate. EMGs and GSR will also be demonstrated.

John Melville, Vernier Software & Technology, Beaverton, OR

11:45AM – 12:45PM *continued*

Two-Year Section Luncheon

Narragansett Ballroom C • Meal Function (Tickets Required) • 2Y

Students at two-year colleges are only as diverse as their instructors. Share your challenges, epiphanies, and best practices with other two-year and community college educators who “get it.” The winner of the Two-Year College Biology Teaching and Prof. Chan Teaching Award will also be announced.

Sponsored by



1:00PM – 2:15PM

#916 Biosafety in the Classroom

551A • Microbiology & Cell Biology • Hands-on Workshop (74 min) • GA

This lively and interactive presentation (targeted for high school or undergraduate instructors) addresses best practices for biosafety when working with microbes in the lab or sampling from natural communities. Examples and alternatives for different techniques will be presented.

Ruth Gyure, Western Connecticut State University, Danbury, CT

#802 RB, CF, and BMI: Finding the Genetic Basis of Diseases and Traits

552A • Biotechnology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Twin studies combined with genomics can reveal the causes of rare diseases and the genetic and environmental contributions to common traits such as diabetes and BMI. Teach these concepts using a lesson from the American Society of Human Genetics.

Michael Dougherty, American Society of Human Genetics (ASHG), Bethesda, MD

ASM PRESENTS

A Constructive Approach to Biology

Kristala L. J. Prather and Natalie Kuldell
Massachusetts Institute of Technology

Thursday, November 12, 1:45 PM - 3:45 PM

Location: Providence Ballroom I & IV

Learn more about synthetic biology and the BioBuilder curriculum for teaching synthetic biology in your classroom.

Lab Safety

Ruth Gyure
Western Connecticut State University

Friday, November 13, 1:00 PM - 2:15 PM

Location: Room 551A

Learn more about best practices in biosafety when working with microbes in the lab through a lively and interactive presentation.

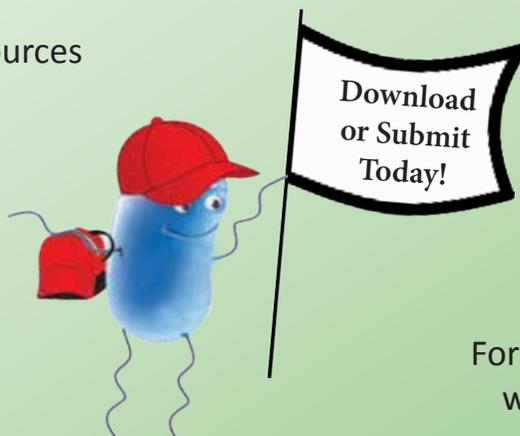
Visit ASM at Booth #516 to Learn about K-12 Outreach Activities!

Peer-reviewed collection of K-12 activities that include:

- teacher and student handouts
- practical tips to complete the activity
- preparation and learning times
- materials needed and sources to obtain them
- safety requirements
- Ideas for assessment



**AMERICAN
SOCIETY FOR
MICROBIOLOGY**



**Latest
Activity!**

*Putting
Disinfectants
to the Test*

For more information visit:
www.asm.org/educators

9:45AM – 4:00PM

#ES21 Special Programming Presented by Pearson**All sessions are in Room 553B**

9:45AM – 10:15AM, 12:45PM – 2:15PM, 3:45PM – 4:00PM

Pearson “Genius Bar” One-to-One Customer Support

General Biology • Hands-on Workshop • HS, 2Y, 4Y

Stop by RICC Room 553B for one-to-one training and support with MasteringBiology, ExamView, and other Pearson technology products. Learning Technology Specialists will be available to assist you!

Lauren Harp, Pearson, San Francisco, CA

10:15AM – 11:30AM

Teaching Evolution and Climate Change

General Biology • Symposium (75 min) • MS, HS

Teaching Evolution and Climate Change in a Climate of Science Denial: Even with NGSS, the Battles Continue.

Ken Miller and Joe Levine, Pearson, Boston, MA

11:30AM – 11:45AM

Miller & Levine Biology Book Signing

General Biology • Symposium (75 min) • HS

Join Pearson Biology authors Ken Miller & Joe Levine for a meet and greet, and receive a complimentary Teachers' Edition signed by both of the authors!

Ken Miller and Joe Levine, Pearson, Boston, MA

2:30PM – 3:45PM

MasteringBiology “Sneak Preview” & User Feedback Session

General Biology • Demonstration (75 min) • HS, 2Y, 4Y

Whether you are new to MasteringBiology or a long-time user of Pearson's widely-used online assessment and tutorial program, this session offers something for everyone! Join us for a “sneak preview” of new assignment options and share your feedback.

Joshua Frost, Pearson, San Francisco, CA

1:00PM – 2:15PM *continued***#850 Structured Academic Controversy: A Discussion Strategy for Complex Socio-Scientific Issues**

552B • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • MS, HS, 2Y

This structured discussion technique promotes student engagement and respectful dialogue while exploring the topic of the role of government in implementing school policies that address obesity and nutrition. A background in bioethics is included.

Joan Griswold and Maureen Munn, University of Washington, Seattle, WA

#ES27 Flinn Favorite Biology Lab Activities and Games

554A • General Biology • Demonstration (75 min) • MS, HS

Students learn faster and better when involved in fun, hands-on activities that create learning opportunities. Join Flinn as we share biology-based inquiry labs, demonstrations and games you can use to motivate your students.

Meg Griffith, Flinn Scientific, Batavia, IL

#ES24 Biotechnologies: Protein Assays in STEM Education

554B • Biotechnology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

How can scientists know they have a protein, know it is active and determine how much protein they have? Using G-Biosciences kits, participants will conduct three assays to show the presence and relative activity of a protein enzyme, amylase.

Simon Holdaway, G-Biosciences, St. Louis, MO

NABT GLOBAL PERSPECTIVES COMMITTEE'S 3rd ANNUAL 2015 POSTER SESSION AND WORKSHOP

"Citizen Science – Teaching Conservation"

FRIDAY, NOVEMBER 13

Poster Session

Exhibit Hall

10:15AM – 11:30AM

Posters will include both the work of select programs that are organizing citizen science studies and teachers who utilize citizen science projects in the classroom.

Poster Presentations

Using Citizen Science Data to Investigate Marine Biodiversity

LaRoy Brandt, Truman State University, Kirksville, MO

Monarch Watch: Education, Conservation, and Research

Ann Ryan and Jim Lovett, University of Kansas, Lawrence, KS

Tipitini Biodiversity Station: Weaving Together a Tapestry of Conservation, Education, and Research

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

Determining the Willingness to Pay for Ecosystem Service Restoration in a Degraded Coastal Watershed: A Ninth Grade Citizen Science Investigation

Kristina Nicosia, et. al., West-Windsor Plainsboro North High School, Plainsboro, NJ

Driven to Discover with Citizen Science

Robert Blair, Karen Oberhauser, Andrea Lorek Strauss and Nathan Meyer, University of Minnesota, St. Paul, MN

Excellence in the Field: Conservation and Scientific Literacy

Micah Sewell and Simon Buzzard, Ecology Project International, Missoula, MT

The Power of Long-term Observation: Using Long-term Participation in Phenology Monitoring to Teach Observation and Perseverance

LoriAnne Barnett, University of Arizona, Tucson, AZ

Season Spotter: Keep an Eye on Changing Seasons

Margaret C. Kosmala, Harvard University Herbaria & Libraries, Cambridge, MA

Using Citizen Science to Monitor Ecosystem Responses to Habitat Restoration

Chelle King, Museum Volunteers for the Environment (MUVE) at the Patricia and Phillip Frost Museum of Science, Miami, FL

What's in your backyard? Citizen Science Camera Trapping as a Lens to Study Mammal Diversity in Classrooms

Stephanie Schuttler, North Carolina Museum of Natural Sciences, Raleigh, NC

Using *Nature's Notebook* to Examine Organismal Interactions in an Undergraduate Ecology Curriculum

Karen Kackley, Eileen Grodziak, and Pamela Borowski, Penn State University Lehigh Valley, Center Valley, PA

Citizen Science at the Cornell Lab of Ornithology

Emma Greig, Cornell Lab of Ornithology, Ithaca, NY

SATURDAY, NOVEMBER 14

Workshop

Room: 557

8:30AM – 10:30AM

Presenters:

Emma Greig, Project Leader of Project Feeder Watch, Cornell Lab of Ornithology, Ithaca, NY
www.feederwatch.org

Chelle King, Exhibit Developer/MUVE Coordinator, Museum Volunteers for the Environment (MUVE) at the Patricia and Phillip Frost Museum of Science, Miami, FL
www.miamisci.org/muve

Robert Blair, Professor of Fisheries, Wildlife and Conservation Biology, University of Minnesota, St. Paul, MN

Moderator:

Jacqueline McLaughlin, The Pennsylvania State University – Lehigh Valley, *Global Perspectives Committee Chair*

1:00PM – 2:15PM *continued*
**#747 Building a Case for NGSS and
 CCSS Connections: Environmental
 Education Leading the Way**

555A • Ecology / Environmental Science /
 Sustainability • Demonstration (75 min) •
 E, MS, HS

We will share case studies and other sources for best practices connecting school yards, school gardens and the resources the schools use to classroom lessons. Learn to use place-based education to move your K-12 classroom to the next level.

Laurel Kohl and Elizabeth Cowles, Eastern Connecticut State University, Willimantic, CT

**#775 High Five: Five Ways to Make
 Teaching Biotechnology Easier and
 Faster**

555B • Biotechnology • Hands-on Workshop
 (75 min) • HS, 2Y, 4Y

Make biotechnology more hands-on and manageable. From reagent prep to running gels and PCR, you and your students will love these innovative ideas and solutions.

Whitney Hagins, Massachusetts Biotechnology Foundation, Cambridge, MA and Liss O'Connell, Diman Regional Vocational Technical High School, Fall River, MA

**#822 Improving Course Coherence,
 Assessment, and Student
 Engagement using Understanding
 by Design Planning**

556A • Curriculum Development • Hands-on
 Workshop (75 min) • 2Y, 4Y

Ever feel like your course goals and your exams don't quite match? Want to increase student engagement in your classes? Come see how a planning protocol from the K-12 world can improve your course and help your students access rigorous material.

Julie Minbiole, Columbia College, Chicago, IL and Stephen Traphagen, Rolling Meadows High School, Rolling Meadows, IL

1:00PM – 3:45PM

BEACON Evolution Symposium

Providence Ballroom I & IV • Special Program • Symposium (165 min) • GA

Join us for this talk featuring new research in evolutionary biology and a workshop on using authentic data from this new research in your classroom!

No Pain, Big Gain: Coevolution Between Bark Scorpion Pain-Inducing Neurotoxins and Grasshopper Mouse Pain Receptors

Bark scorpions produce venom that causes burning pain and hypersensitivity to touch. However, grasshopper mice prey on bark scorpions, grooming only briefly when stung. Come hear how grasshopper mice have solved the predator-pain problem by evolving structural modifications to their pain receptors that, paradoxically, convert toxin-induced pain into the sensation of analgesia.

Ashlee Rowe, Michigan State University, East Lansing, MI

Data Nugget Workshop: The Tale of Two Scorpions

Data Nuggets are hands-on activities designed to improve the scientific and quantitative skills of students by having them graph and interpret scientific data gathered by practicing scientists, with the added benefit of connecting students to interesting study systems, as yet unanswered questions, and the real people who are trying to solve nature's mysteries. This *Data Nugget* features observations of the anti-predator defenses of scorpions, and the behavior of grasshopper mice who prey on them, while providing all the materials necessary to bring these resources back to your classroom.

Matthew Rowe, Elizabeth Schultheis, and Melissa Kjelvik, Michigan State University, East Lansing, MI

See next page for a full listing of the featured presentations.

**#746 Some of the Above: Writing
 High Quality Standards-Based
 Multiple-Choice Questions**

556B • Instructional Strategies & Technologies •
 Hands-on Workshop (75 min) • MS, HS, GA

The challenge of developing multiple-choice assessments for the NGSS and AP Biology Framework are addressed by test developers from ETS. Techniques for writing good questions that clearly assess these standards will be shared.

Israel Solon, Nancy Olds, and Mitch Price, Education Testing Service, Princeton, NJ

**#889 Humans vs. Mosquitoes: A
 Deadly Serious Game at the Yale
 Peabody Museum**

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

A real-world disease transmission game used by the Red Cross teaches how climate change affects dengue fever expansion around the world. Explore this and other activities from a modular curriculum on emerging insect-borne diseases. SEPA-NIH funded.

Christine Lawlor-King, East Hartford Public Schools, East Hartford, CT



NABT 2015 EVOLUTION SYMPOSIUM

Emerging Research in Evolutionary Biology

Join us to hear about new research in evolutionary biology and a workshop on using authentic data in your classroom.

No Pain, Big Gain: Coevolution Between Bark Scorpion Pain-Inducing Neurotoxins and Grasshopper Mouse Pain Receptors

Dr. Ashlee Rowe

NEUROSCIENCE PROGRAM AND DEPARTMENT OF INTEGRATIVE BIOLOGY
MICHIGAN STATE UNIVERSITY

Pain serves an important adaptive function because it signals tissue damage. Some animals have capitalized on the pain pathway by evolving toxins that they use to deter predators. While pain may induce strong selection on predators, counter adaptation to evolve resistance to pain is likely constrained because of the cost associated with reduced response to tissue damage. Bark scorpions produce venom that causes burning pain and hypersensitivity to touch. However, grasshopper mice prey on bark scorpions, grooming only briefly when stung. Come hear how grasshopper mice have solved the predator-pain problem by evolving structural modifications to their pain receptors that, paradoxically, convert toxin-induced pain into the sensation of analgesia.



Data Nugget Workshop: A Tail of Two Scorpions

Dr. Matthew Rowe, Dr. Elizabeth Schultheis, and Melissa Kjellvik

DEPARTMENT OF INTEGRATIVE BIOLOGY AND
BEACON CENTER FOR THE STUDY OF EVOLUTION IN ACTION,
MICHIGAN STATE UNIVERSITY

Data Nuggets are hands-on activities designed to improve the scientific and quantitative skills of students by having them graph and interpret scientific data gathered by practicing scientists, with the added benefit of connecting students to interesting study systems, as yet unanswered questions, and the real people who are trying to solve nature's mysteries. We will present a Data Nugget that features data on the anti-predator defenses of scorpions, and the behavior of grasshopper mice who prey on these toxic prey and provide all materials necessary to bring these resources back to your classroom.



1:00PM – 2:15PM *continued* #911 Climate Change Effects on Marine Ecosystems

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

Discover free interactives, animations, and activities to teach the effects of global climate change on marine ecosystems. Be among the first to see our new interactive, and learn why some coral species may help preserve other coral reef ecosystems.

Ann Brokaw, Rocky River High School, Rocky River, OH; Bob Kuhn, Centennial High School, Roswell, GA; Sandra Blumenrath, HHMI BioInteractive, Chevy Chase, MD

#795 Help Your Students Succeed in AP Biology

Providence Ballroom II & III • AP Biology • Hands-on Workshop (75 min) • HS

Join two experienced AP teachers for a lively session designed to help students incorporate Science Practices and learn more biology. We'll use modeling, mathematics and inquiry techniques, and share hints for resources, assessments, and test prep.

Theresa Holtzclaw and Fred Holtzclaw, Webb School of Knoxville, Knoxville, TN

#ES41 Black & White: Guiding Students In Complex Science Issues

Newport • Global Education • Symposium (75 min) • E, MS, HS, 2Y, 4Y, GA

Instantaneous access to volumes of information has changed how students and teachers approach complex scientific issues. Using recent media stories regarding SeaWorld, this panel will discuss approaches to encouraging scientific debate and accuracy.

Bill Street, SeaWorld Parks and Entertainment, Orlando, FL

Join *The American Biology Teacher* Team: Writing and Reviewing for the ABT

Kent • Hands-on Workshop (75 min) • GA

The editors of *The American Biology Teacher* will discuss aspects of the journal from an introduction to the vision of the ABT to the preparation, submission, and review of manuscripts. Prospective authors are especially encouraged to bring ideas to this lively discussion designed to help focus an idea into a publishable manuscript.

William McComas, ABT Editor, University of Arkansas, Fayetteville, AR

NABT Committee Meeting: Awards Committee and OBTA Directors

Blackstone • Committee (75 min) • GA

Priya DasSarma, University of Maryland School of Medicine, Baltimore, MD and Mark Little, Broomfield High School, Broomfield, CO

#915 A How To For K-12 Outreach in an Undergraduate Setting

South Country • Science Practices • Hands-on Workshop (75 min) • 2Y, 4Y, GA

This session will be a primer for undergraduate educators on how to establish K-12 outreach programs for both personal and institutional benefit. Three programs will be discussed followed by a hands-on demo and a question and answer session.

Patricia Halpin, University of New Hampshire Manchester, Manchester, NH and Margaret Shain-Stieben, American Physiological Society (APS), Bethesda, MD

1:00PM – 3:45PM #812 Planting Inquiry in Science Classrooms

550A & 550B • Plant Biology • Hands-on Workshop (165 min) • HS, 2Y, 4Y

We share simple, effective techniques to help students develop skills ranging from generating questions based on observations of the usual and unusual to exploring alternative explanations. Leave with handouts and examples for use in your classroom.

Gordon Uno, University of Oklahoma, Norman, OK; Marshall Sundberg, Emporia State University, Emporia, KS; Catrina Adams, Botanical Society of America, St. Louis, MO

Undergraduate Biology Summit: SENCER – Connecting Biology Teaching to Community and Global Issues

Washington • Special Program • Symposium (165 min) • 2Y, 4Y

Join us for an interactive workshop to learn about Science Education for Civic Engagements and Responsibilities (SENCER). National SENCER program leaders will present ready-to-use resources for your classroom and lead round-table workshops to help you engage your students by integrating meaningful civic issues into biology.

See page 56 for more details.

2:30PM – 3:45PM #774 SMART (Students Modeling A Research Topic) Teams: Take Teaching Protein Structure And Function to the Next Level

551A • Science Practices • Hands-on Workshop (75 min) • HS

SMART Teams utilize physical 3D models to investigate current research topics in collaboration with a research mentor by using computer-based visualization and rapid prototyping. Learn more about how you can bring this to your school.

Kevin Crowthers, Worcester Academy, Worcester, MA and Diane Munzenmaier, Center for BioMolecular Modeling, MSOE, Milwaukee, WI

#788 Introduction to Epigenetics552A • General Biology • Demonstration
(75 min) • HS, 2Y, 4Y

Experience an activity that promotes student learning about epigenetics and the role of diet, lifestyle and the environment in influencing gene expression within an individual and in some cases across generations.

Dana Haine, UNC-Chapel Hill Superfund Research Program, Chapel Hill, NC

#819 Our Real BFF! Dogs as a Model Organism for Genetics, Evolution and Human Health552B • General Biology • Hands-on Workshop
(75 min) • MS, HS, 2Y

This session will show how our new understanding of dog genomics can be used to teach some of the big ideas in life science. NGSS-aligned activities will be presented.

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

#ES29 Advanced Inquiry Labs for AP Biology from Flinn Scientific

554A • AP Biology • Demonstration (75 min) • HS

Join Flinn Scientific as we model the inquiry process and demonstrate activities from our new guided-inquiry labs for AP Biology that integrates scientific inquiry and reasoning through a series of student-directed, inquiry-based investigations.

Meg Griffith, Flinn Scientific, Batavia, IL

#ES30 Biotechnologies: Restriction Digestion in STEM Education554B • Biotechnology • Hands-on Workshop
(75 min) • HS, 2Y, 4Y

New advances make it possible to perform restriction enzyme digestions and analysis in half the time. Participants will use G-Biosciences lab kits to perform fast restriction digestions and run 15 minute agarose gels to analyze the digestions.

Simon Holdaway, G-Biosciences, St. Louis, MO

Don't Miss These Pearson Events on Friday!

9:45–10:15 a.m. RICC Room 553B

“Genius Bar” One-to-one Customer Support for MasteringBiology™, ExamView®, and more

10:15–11:30 a.m. RICC Room 553B

Pearson authors Ken Miller and Joe Levine discuss “*Teaching Evolution and Climate Change in a Climate of Science Denial: Even with NGSS, the Battles Continue*”

11:30–11:45 a.m. RICC Room 553B

Book signing with Ken Miller and Joe Levine

12:45–2:15 p.m. RICC Room 553B

“Genius Bar” One-to-one Customer Support for MasteringBiology, ExamView, and more

1:00–2:15 p.m. Providence Ballroom II & III

Fred and Theresa Holtzclaw discuss ideas to “*Help Your Students Succeed in AP® Biology*”

2:30–3:45 p.m. RICC Room 553B

MasteringBiology Greatest Hits and New Releases: Join us for a preview of new assignment options in development, and share your feedback.

3:45–4:00 p.m. RICC Room 553B

“Genius Bar” One-to-one Customer Support for MasteringBiology, ExamView, and more

STOP BY BOOTH 506 to explore the new **Second Edition of *Campbell Biology in Focus***, browse through the Miller & Levine High School Biology program, discover new assignment options in MasteringBiology, and more.

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PEARSON

UNDERGRADUATE BIOLOGY SUMMIT

SENCER: Connecting Biology Teaching to Community and Global Issues

FRIDAY, NOVEMBER 13, 1:00PM – 3:45PM

Join us for an interactive workshop to learn about Science Education for Civic Engagements and Responsibilities (SENCER).

The SENCER Mission:

SENCER courses and programs strengthen student learning and interest in the sciences by connecting course topics to issues of critical local, national, and global importance.

- | | |
|-----------------|---|
| 1:00pm | <p>Welcome and Introduction
Eliza Reilly, Deputy Executive Director of Programs, SENCER, Washington, D.C.</p> |
| 1:15pm – 2:00pm | <p>Real-world Examples: SENCER Projects at Work in the Classroom
Presented by a panel of experts including:</p> <ul style="list-style-type: none"> • Danielle Kraus Tarka, SENCER Deputy Executive Director for Operations, Community Outreach, and Engagement, Washington, D.C. • Eliza Reilly, SENCER Deputy Executive Director for Programs, Washington, D.C. • Steve Christenson, Chair, NABT 4-Year Section, BYU–Idaho, Rexburg, ID • Ellen Faszewski, Co-Chair and Professor of Math and Science, Wheelock College, Boston, MA • Katharine York, Assistant Professor of Biology, Southern New Hampshire University, Hooksett, NH • Tara Mann, Director of Operations for the Dean of Arts & Sciences, Worcester Polytechnic Institute, Worcester, MA • Frederick Rogers, Chair of Natural Sciences, Franklin Pierce University, Rindge, NH • Kyle Trenshaw, STEM Education Postdoctoral Research Associate, Brown University, Providence, RI |
| 2:00pm – 3:00pm | <p>Round Table Breakouts
Work with SENCER staff and experienced NABT faculty to plan a SENCER project in your own classroom.</p> |
| 3:00pm – 3:15pm | <p>Table Reports</p> |
| 3:15pm – 3:45pm | <p>Panel Discussion and Wrap-Up by Summit Moderators</p> <ul style="list-style-type: none"> • Jacqueline McLaughlin, The Pennsylvania State University, Center Valley, PA • Anneke Metz, Southern Illinois University, Carbondale, IL |

2:30PM – 3:45PM *continued*
**#854 Electronic Biology Notebooks
 for Instilling STEM Skills**

555A • General Biology • Demonstration
 (75 min) • HS, 2Y, 4Y

A growing aspect of biology teaching is instilling science and technology career workforce skills. This presentation will demonstrate how student-made electronic notebooks using spreadsheet and document software teach students to be self-learners.

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

#776 20 in 20: The Next Chapter

555B • General Biology • Hands-on Workshop
 (75 min) • MS, HS

Make your Biology course more inquiry based and student centered! Here are new, exciting 20-minute activities to engage students in hands-on learning.

Whitney Hagins and Maggie Keeler, Massachusetts
 Biotechnology Foundation, Cambridge, MA, and Liss
 O'Connell, Diman Regional Technical High School,
 Fall River, MA

**#839 Engaging Students through
 Digital Assessment**

556A • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • MS, HS

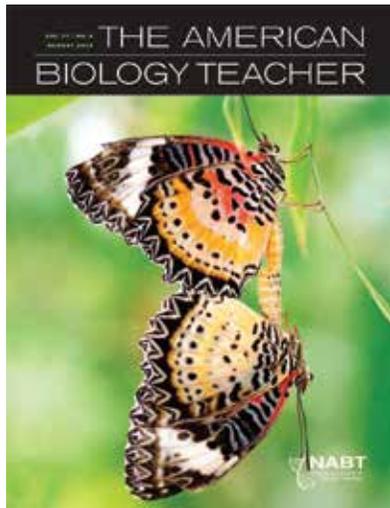
A dynamic and interactive session that will share a range of digital assessments that have proven successful. You will walk away with a variety of easy to implement digital tools that can be adapted for the specific needs of your students.

Caroline Milne, Sarah Danilkowicz, Vanessa Fenig,
 and Laura Turngren, Barrington High School,
 Barrington, IL



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Advancing Knowledge
 Driving Change



University of California Press is proud to publish the official journal of the National Association of Biology Teachers.

The American Biology Teacher is an award-winning, peer-refereed professional journal for K-16 biology teachers. Topics covered in the journal include modern biology content, teaching strategies for the classroom and laboratory, field activities, applications, professional development, social and ethical implications of biology and ways to incorporate such concerns into instructional programs, as well as reviews of books and classroom technology products.

ISSN: 0002-7685

eISSN: 1938-4211

Impact Factor: .260

Published: Monthly except June and July; combined Nov/Dec issue

abt.ucpress.edu

2:30PM – 3:45PM *continued***#730 Let's Talk About Your AP Story!**

556B • AP Biology • Hands-on Workshop (75 min) • HS, 2Y

Struggling with creating a connected, focused storyline for your AP biology students? Join AP biology teachers in rich conversation around considerations in developing a coherent curriculum sequence that deepens student understanding.

Robin Walters, Sand Creek High School, Colorado Springs, CO; Tamara Pennington, Windsor High School, Windsor, CO; Cindy Gay, Steamboat Springs High School, Steamboat Springs, CO

#756 Genes, Genomes and Personalized Medicine: An NIH-SEPA Project

557 • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • HS, 2Y

Explore new instructional tools that will take your students beyond understanding DNA as a double helix – to understanding bioinformatics and its importance in genomics and personalized medicine.

Diane Munzenmaier and Margaret Franzen, MSOE, Milwaukee, WI

#912 Coupling Multimedia Resources and Primary Literature in Introductory Biology

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

Discover engaging ways to teach biological core concepts away from the textbook by combining primary research articles with free multimedia resources from BioInteractive.org. We will focus on the evolutionary mechanisms leading to speciation.

Ellie Rice, Franklin and Marshall College, Lancaster, PA; Fred Wasserman, Boston University, Boston, MA; Sandra Blumenrath, HHMI BioInteractive, Chevy Chase, MD

#738 AAI Teachers Research Program – Immunology Lessons for the Classroom

Providence Ballroom II & III • AP Biology • Hands-on Workshop (75 min) • HS

Join our teacher researchers from the American Association of Immunologists (AAI) High School Teachers Summer Research Program as they share with you their research experiences and newly developed units which bring the excitement of immunology research to students in the classroom.

Gina Castellanos Ellsworth, Haverhill High School, Haverhill, MA; Antonio Gamboa, Pomona Unified School District, Pomona, CA; Aaron Mathieu, Acton – Boxborough Regional High School, Acton, MA; Sarah Peterson, Denver Public Schools, Denver CO; Jeremy M. Resmann, Soldan International Studies High School, St. Louis, MA; Gregory Shenk, CREC – Academy of Aerospace & Engineering, Hartford, CT; Patricia Weethee, Grove City High School, Grove City, OH; Michele Witkowski, Edison High School, Edison, NJ; Mary Litzinger, The American Association of Immunologists, Bethesda, MD; Clinton Mathias, Western New England University, Springfield, MO

NABT Committee Meeting: ABT Advisory Committee

Blackstone • Committee (75 min) • GA

William McComas, ABT Editor, Fayetteville, AR

NABT Committee Meeting: Membership Committee

Executive Boardroom • Committee (75 min) • GA

Sherry Annee, Brebeuf Jesuit Preparatory School, Indianapolis, IN and Sue Trammell, John A. Logan College, Carterville, IL

#835 Integrating Math Across the Biology Curriculum: Opportunities for Quantitative Skills in Biology

South Country • Curriculum Development • Demonstration (75 min) • HS

Whether you and your students are math wizards or math-phobic, it's easier than you think to infuse quantitative skills into your life science classroom. Learn about resources and a summer workshop opportunity with us!

Kristin Jenkins, BioQUEST, Madison, WI; Karen Lucci, Hopewell Valley High School, Pennington, NJ; Kelly Sturner, National Institute for Mathematical & Biological Synthesis, Knoxville, TN

**4:00PM – 5:00PM
Horizontal Transfer:
Live Recording**

Exhibit Hall • Special Program • GA

Put on your best Vector-hat, and join everyone's favorite science teacher podcast for an opportunity to participate in a live recording and get a chance to talk to some of your favorite biology teachers from across the country. Share your Teacher Hacks, and tell us what you've learned at the conference this year. This session promises to be a fun and unique experience for anyone and everyone who is interested in talking about what it means to be a modern science teacher.

Paul Andersen, Bozeman Science, Bozeman, MT and David Knuffke, Deer Park High School, Deer Park, NY

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

Exhibit Hall • Special Program • GA

It's last call in the Exhibit Hall. This is your last chance to talk with exhibitors and get those freebies for the classroom! Join us for a podcast, poster session, and prize drawings as we close the 2015 Exhibit Hall.

7:00PM – 9:00PM

**BELS Benefit Dinner Featuring
Carl Zimmer**

Ballroom A • Special Event (Tickets Required) •
GA

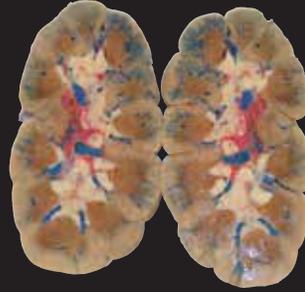
See page 10 for biography.

NABT is proud to honor Carl Zimmer with the 2015 Distinguished Service Award during a special dinner benefitting the NABT Biology Educator Leadership Scholarship (BELS). Reporting from the frontiers of biology, Zimmer is an award-winning journalist whose articles, essays, books, and blog posts have become required reading for the biology educator community.

Zimmer will be our guest of honor and featured speaker, where he will talk about his experiences as a science writer, documenter of tattoos, and other topics raised by the audience. Bring your questions and books for the private signing to follow.



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SATURDAY NOVEMBER 14

ABBREVIATION KEY

E: Elementary School

MS: Middle School

HS: High School

2Y: Two-Year College

4Y: Four-Year College

GA: General Audience

AP[®] is a registered trademark.



7:00AM – 8:15AM**NABT Past President's Breakfast**Centro, Omni Hotel • Special Event
Invitation Only**Four-Year Section Executive Meeting**

Blackstone • Committee Meeting

8:30AM – 9:45AM**#826 Taking the Chemical Mystery out of Biology**551A • AP Biology • Hands-on Workshop
(75 min) • HS

Understanding basic chemistry makes us better biology instructors. Join two veteran AP Biology teachers and learn strategies that will help your students visualize the chemistry of biological systems. Emphasis will be on bonding and bioenergetics.

Patricia Weethee, Grove City High School, Grove City, OH and Ryan Reardon, Jefferson County International Baccalaureate School, Irondale, AL

#930 Enhancing Biology Teaching Though Lesson Analysis

551B • Instructional Strategies & Technologies • Demonstration (75 min) • ES, MS, HS

In this session, we will share our current lesson analysis work with elementary and middle school teachers, and ask your ideas and perspectives concerning lesson analysis work with high school biology teachers.

Jody Bintz, BSCS, Colorado Springs, CO

#762 Integrated Learning for a Changing Planet

552A • 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. Receive lesson plans on CD-ROM.

Comfort Ateh, Providence College, Providence, RI

#814 Create. Curate. Connect.

552B • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • GA

What skills and abilities do we want our students to own when they leave our course? Bring your laptop•tablet and dive into educational technology tools, ideas, and projects. Let's talk about our students as makers, collaborators, and producers.

Robin Heyden, Heyden Ty, Alameda, CA and David Knuffke, Deer Park High School, Deer Park, NY

#828 Biotechnology 101: Model the Most Crucial Biotech Skills and Techniques with Confidence554A • Biotechnology • Hands-on Workshop
(75 min) • MS, HS

Learn how to train students on the use of micropipettes and other critical biotechnology skills. Facilitate student learning of concepts like microvolumes, dilution factors, electrophoresis, and PCR. Virtual and hands-on resources will be provided.

Liss O'Connell, Diman Regional Vocational Technical High School, Fall River, MA

#870 Using Modeling and Student Generated Videos as a Mechanism to Teach Systems Thinking

554B • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • MS, HS, 2Y

Modeling offers a way for students to visually or kinesthetically represent biological processes. Creating video can challenge students to explore and communicate the links between these processes. Come learn to help students produce quality videos.

Rachel Sanders, Rivendell Academy, Orford, NH and Meghan Wilson, Hartford High School, White River Junction, VT

#711 Using Yeast-Sodium Alginate Spheres to Investigate Enzyme Kinetics and Respiration555A • AP Biology • Hands-on Workshop
(75 min) • HS, 2Y, 4Y

Participants will make yeast spheres to investigate effects of substrate concentration and temperature on an enzymatic reaction and how different sugars and sugar substitutes affect respiration. Also discussion of use of statistical analysis.

Pam Bryer, Bowdoin College, Brunswick, ME

#808 Emphasizing Biological Core Concepts Using Modeling Activities in an Introductory Cell and Molecular Biology Course

556A • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Participants will learn how Vision & Change impacted a large introductory biology course for majors by completing a modeling exercise similar to one used in the course, reviewing associated assessments, and analyzing examples of student work.

Jon Stoltzfus, Teresa McElhinny, and Andrea Biere-ma, Michigan State University, East Lansing, MI

#784 Science Writing Using an Explanation Tool556B • General Biology • Hands-on Workshop
(75 min) • ES, MS, HS

The goal of this workshop is to provide science teachers with a practical example on how to use a Science Explanation Tool. This tool helps students to link evidence to their science claim. Teachers will practice using the tool from a student lense.

Diana Siliezar-Shields and Sonalya Jayasuriya, Barrington High School, Barrington, RI and Chi Klein, Saint Stephen's Episcopal School, Bradenton, FL

8:30AM – 9:45AM *continued***#908 Birds, Meet Your Inner Dino**

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

Did birds really evolve from dinosaurs? What is the evidence? Find out with our hands on activities, videos, and interactives. Walk away with classroom resources tied to the NGSS science practices and a turkey dissection activity for Thanksgiving.

Valerie May, Woodstock Academy, Woodstock, CT;
Mark Eberhard, St. Clair High School, St. Clair, MI;
Laura Bonetta, HHMI BioInteractive, Chevy Chase, MD

#900 A Practical Guide to Aligning Existing Materials to the NGSS

Providence Ballroom I & IV • Curriculum Development • Hands-on Workshop (75 min) • HS, 2Y, GA

Want to better align your curriculum to the NGSS? Gain experience and advice on using the EQUIP rubric to evaluate an example lesson, while developers and teachers share their approach to revising and implementing lessons and units for the NGSS.

Hillary Lauren, Barbara Hug, and Chandana Jasti,
University of Illinois at Urbana - Champaign,
Champaign, IL

#771 Genetics Projects that are More Than Skin Deep

Providence Ballroom II & III • General Biology • Hands-on Workshop (75 min) • MS, HS

Go below the surface, use common and rare genetic disorders to engage an understanding of human genetics, beyond Mendelian single-gene disorders. Get students thinking beyond what does an affected person look like to grapple with real inheritance.

Kelly East and Madelene Loftin, HudsonAlpha
Institute for Biotechnology, Huntsville, AL

#710 BioCONNECT (Biology and Cancer Online Education Connecting Teens)

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

BioCONNECT, an innovative curriculum for biology and science courses, is designed to increase cancer AWARENESS and empower students to take ACTION. Students develop problem-solving and decision making skills with real-life CONNECTIONS.

Casandra Gabriele, Rutgers School of Public Health,
New Brunswick, NJ

#734 Using Data and Graphics to Stimulate Student Learning

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

Learn how to use available data and graphics to generate activities that require students to observe, ask questions and generate conclusions. Examples will include population growth, ozone depletion, global climate change, and energy use.

Linda Sigismondi, University of Rio Grande, Rio
Grande, OH

#783 Conservation and Captive Breeding: How is Population Genetics used to Manage the Captive Animal Population?

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

Teachers will discover the ways in which Zoos in North America manage their captive animal populations. Investigate how animals are cared for and how genetic diversity is maintained in captive populations. Come discuss data and play the Mating Game!

Marley O'Neil, Zoo New England, Boston, MA

NABT Committee Meeting: Professional Development Committee

Executive Board Room • Committee (75 min) • GA

Catherine Ambros, Somerville Middle School,
Somerville, NJ

8:30AM – 10:30AM**GPC Workshop: Citizen Science – Teaching Conservation**

557 • Special Program • Symposium (120 min) • GA

Key projects for the GPC Poster sessions will be highlighted to illustrate how citizen science programs engage communities and teach conservation locally, regionally, nationally, and globally.

Emma Greig, Project Feeder Watch, Cornell Lab of
Ornithology, Ithaca, NY; Chelle King, Patricia and
Phillip Frost Museum of Science, Miami, FL; and
Karen Oberhauser, University of Minnesota,
St. Paul, MN

Introductory Biology Task Force Workshop

Ballroom E • Invitation Only

10:00AM – 10:30AM**#820 Moving Students Toward Authentic Research – Building an Extended-inquiry First-Year Laboratory that Emphasizes Mentoring, Feedback, and Authoring**

551A • Curriculum Development • Paper (30 min) • 4Y

Come see how we provide a more realistic research experience in introductory biology by extending time for redesign and replication; employing instructors as mentors who do not grade their students; and having students publish in a course journal.

Donald French, John Stewart, and Michael Moore,
Oklahoma State University, Stillwater, OK

#798 Moving Active Learning from College to High School Classrooms: A Case of POGIL and PI in Biology

551B • Instructional Strategies & Technologies • Paper (30 min) • HS, GA
Presentation will describe efforts to assist teachers in moving the university-based teaching strategies—Process-Oriented Guided Inquiry Learning (POGIL) and Peer Instruction (PI)—into the high school biology classroom; including initial curriculum design and early data collected for an efficacy study.

Grant Gardner, Jennifer Parrish, Tom Cheatham and Leigh Gostowski, Middle Tennessee State University, Murfreesboro, TN

#752 Generating Student-Focused Active Learning Environments in Lecture Settings

552A • Instructional Strategies & Technologies • Hands-on Workshop (30 min) • 2Y, 4Y
Facilitate engagement and active-learning in large-lecture courses by shifting responsibility of learning on students through the use of “flipped” style scenario-based collaborative activities and group exams assessing individual knowledge.

Kristy Daniel, Texas State University, San Marcos, TX

#810 Student Research: Strategies and Tools to Successfully Implement in the Classroom

552B • Science Practices • Hands-on Workshop (30 min) • MS, HS
Interested in engaging your students in original research projects but not sure how to begin? Join us as we interactively step you through the process of taking novice researchers through a research project from start to finish.

Jennifer Dye, Pope John Paul II High School, Hendersonville, TN; Rachel Lytle, Brentwood High School, Brentwood, TN; Kim Sadler, Middle Tennessee State University, Murfreesboro, TN

#714 Anatomy and Physiology Outside of the Box

554A • Anatomy & Physiology • Paper (30 min) • HS, GA
Break away from PowerPoints and multiple choice... a high school Anatomy/Physiology elective becomes hands-on, active, creative, and inspiring. We will present activities, posters, videos, case studies, and much more.

Cate Hibbitt, Lincoln School, Providence, RI

#837 Utilizing Models in Biology

554B • General Biology • Hands-on Workshop (30 min) • HS
Explore engagement strategies that incorporate models and enable students to gain a deeper understanding of biological concepts. Experience creative approaches to instruction that clarify complex processes while making the learning process enjoyable.

Rebecca Brewer, Troy High School, Troy, MI

#869 The Peer Mentor Program of IBIS (Integrating Biology with Inquiry Skills)

555B • Instructional Strategies & Technologies • Hands-on Workshop (30 min) • HS, 2Y, 4Y
We'll discuss how we've incorporated a peer mentor program into our inquiry-based, mixed major introductory biology course. We'll demonstrate how peer mentors are trained and how they serve our students in and out of the classroom.

Rachel Pigg, Troy Nash and Suann Yang, Presbyterian College, Clinton, SC and Tarren Shaw, The University of Oklahoma, Norman, OK

#935 Award Winning Strategies at the Four-Year Level

556A • Instructional Strategies & Technologies • Demonstration (30 min) • GA
Join the winner of this year's Four-Year Section Biology Teaching Award as he discusses successful strategies that help students get the foundational information and structure they need to begin to working through deeper questions and real-world problems.

Kevin Drace, Mercer University, Macon, GA

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10:45AM – 11:45AM**GENERAL SESSION SPEAKER****Christopher T. Martine**

See page 9 for biography.

Plants are Cool, Too: Wily Nightshades and the Glossy Age of Biodiversity**Ballroom A • Special Speaker • GA**

The wild bush tomatoes of Australia have been described as “gender-bending” plants with a penchant for manipulating bee visitors. Putting this system into an ecology and evolution framework has resulted in novel understandings of plant reproductive biology and led to the discovery of new species. It has also helped to generate the sort of dynamic stories that the teaching of botany often requires — including the use of new/social media to enhance the storytelling. At a time when botanical education and interest in plants each appear to be in decline, Dr. Martine finds good stories and embraces new ways of sharing them, critical steps in the “rebranding” of Botany. Likewise, he illustrates how a willingness among scientists to engage the public in new and dynamic ways can result in a rebirth of interest in biodiversity science — and a recognition that the Earth is still full of organisms and phenomena waiting to be discovered. Perhaps more importantly, Dr. Martine will show how interaction of scientists and non-scientists in informal public e-spaces reinforces the fact that scientists are human — and that anyone, with the right passion and training, can become a scientist themselves.

10:00AM – 10:30AM *continued***#805 Using Rubrics in Undergraduate Biology Courses to Advance Understanding of Complex Biological Concepts****556B • Instructional Strategies & Technologies • Paper (30 min) • 2Y, 4Y**

In this session, we will present research findings and discuss strategies for how undergraduate instructors can use rubrics as teaching tools to encourage students to use metacognitive reflection to improve understanding of complex concepts.

Jaime Sabel, University of Nebraska-Lincoln, Lincoln, NE

#739 Apply for an NABT Award!**Newport • General Biology • Paper (30 min) • GA**

Curious about the NABT Awards? Want to learn more about specific awards, how to apply, or what judges are really looking for? Come for a brief presentation and Q&A with award committee members.

Priya DasSarma, University of Maryland, Baltimore, MD; Jason Crean, Lyons Township High School, La Grange, IL; Kirstin Milks, Bloomington High School South, Bloomington, IN

#881 Pairing Content and Skills for Instruction and Assessment**Kent • AP Biology • Hands-on Workshop (30 min) • HS**

This session will focus on strategies for writing high-quality assessment questions that align with AP Biology Learning Objectives and NGSS Performance Expectations

Mitch Price, Educational Testing Services, Princeton, NJ

10:30AM – 10:45AM**NABT Coffee Break****Ballroom A • Special Program**

Get a local treat and grab your seat as conference draws to a close with a presentation by our final general session speaker.

12:00PM – 1:00PM**NABT Honors Luncheon****Rotunda • Special Event (Tickets Required)**

The grand finale of the NABT Conference, this celebration honors exceptional biology teachers. Join us as we recognize the accomplishments and professional contributions of all of the 2015 NABT Award recipients, including the Outstanding Biology Teacher Award (OBTA) honorees. Everyone is welcome to attend!

2:00PM – 6:00PM**B2 Scholars Workshop****Blackstone • Invitation Only**



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EXHIBIT HALL HOURS

THURSDAY

Exhibit hours: 12:30PM – 6:30PM

Energy Break: 12:30PM – 1:45PM

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Exhibit Hall Opening Reception:

4:00PM – 6:30PM

Sponsored by **BIO CORPORATION** **BIO-RAD**

FRIDAY

Exhibit hours: 9:30AM – 5:30PM

Closing Reception, Podcast, Treasure Hunt and Prize Announcements:

4:00PM–5:30PM

**3D Molecular Designs
Booth 207**

Milwaukee, WI • www.3dmoleculardesigns.com

3D Molecular Designs is a leader in creating innovative kits and models that help students understand core concepts in the molecular biosciences. In addition to developing our own kits and models, we also collaborate with the MSOE Center for BioMolecular Modeling to turn their best ideas and prototypes into products.

**Accelerate Learning
Booth 316**

Houston, TX • www.acceleratelearning.com

Accelerate Learning, in conjunction with Rice University, has created the most widely used PreK-12 science curriculum in Texas, STEMscopes™—and now it's available nationally. STEMscopes now offers a variety of curriculum and professional development solutions that support early learning, NGSS, and customized state-aligned curriculum.

**The American Phytopathological Society
Booth 109**

St. Paul, MN • www.apsnet.org

Don't get caught with your plants down! Visit the APS booth to learn more about engaging students in biology through the study of plant pathology. Inspire a career in plant pathology and collect materials to help foster a budding scientist!

**American Physiological Society
Booth 217**

Bethesda, MD • www.the-aps.org

The American Physiological Society (APS) is a nonprofit devoted to fostering education, scientific research, and dissemination of information in the physiological sciences. Our K-12 education programs emphasize that science is NOT facts in a book it is a way of learning new things. All resources are free and online.

2015 EXHIBIT HALL FLOOR PLAN



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American Society for Microbiology Booth 516

Washington, D.C. • www.asm.org

The ASM Education Board offers microbiological science resources for students, early-career scientists, and faculty. Information on microbiology careers, research fellowships, curriculum materials, and ASM events is available at the booth. Featured this year are K-12 outreach posters and peer-reviewed K-12 classroom activities focused on microbial discovery.

American Society of Human Genetics/ Genetics Society of America Booth 208

Bethesda, MD

www.ashg.org • www.genetics-gsa.org

The American Society of Human Genetics (ASHG), founded in 1948, and the Genetics Society of America (GSA), founded in 1931, work closely together to support geneticists and educate the public. Stop by our booth and learn about the programs GSA and ASHG offer for students and educators!

American Society of Plant Biologists Booth 415

Rockville, MD • www.aspb.org

ASPB is a professional society devoted to the advancement of the plant sciences. It publishes two world-class journals and organizes events that are key to the advancement of the science. Membership is open to anyone from any nation engaged in any part of the full spectrum of plant science.

Amgen Biotech Experience Program Office Booth 619

Waltham, MA • www.amgenbiotechexperience.com

The Amgen Biotech Experience is an innovative science education program that provides teacher professional development, curriculum materials, and research-grade equipment and supplies to secondary schools. The program features a hands-on molecular biology curriculum designed to introduce students to the excitement of scientific discovery.

Bedford, Freeman & Worth (BFW) Publishing Group Booth 410

New York, NY • www.bfwpub.com/highschool

Bedford, Freeman, & Worth (BFW) Publishers is the prestigious publisher of groundbreaking AP®, pre-AP®, and NGSS-focused textbooks for high school students.

Bio Corporation Booth 514

Alexandria, VA • www.biologyproducts.com

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Bio-Rad Laboratories Booth 401

Hercules, CA • www.bio-rad.com

Depend on Bio-Rad for tools, technologies and expertise to enable genomic and proteomic analysis. Bio-Rad provides instrumentation and reagents for droplet digital PCR, conventional and real-time PCR, amplification reagents and primers, flow cytometry, xMAP technology, cancer biomarkers, electrophoresis, blotting-systems, chromatography, imaging, cell counting, cell imaging and antibodies.

Bone Clones Booth 615

Canoga Park, CA • www.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.

Carolina Biological Supply Company Booth 608

Burlington, NC • www.carolina.com

From our beginnings in 1927, Carolina Biological Supply Company has grown to become a leading supplier of science teaching materials. Today, from our headquarters in Burlington, North Carolina, we serve customers worldwide, including teachers, professors, home-school educators, and professionals in health and science-related fields.

Cell Zone, Inc. Booth 510

Springfield, MA • www.cellzone.org

Cell Zone makes hands-on biology classroom learning tools that increase success for more students. Our products create an inclusive environment where learning improves for all students. Use of our products turns the classroom into an active learning environment. Visit us to see how science can be for everyone.

Cengage Learning Booth 515

San Francisco, CA • www.cengage.com

Cengage Learning is a leading educational content, technology, and services company for the higher education and K-12, professional and library markets worldwide. The company provides superior content, personalized services and course-driven digital solutions that accelerate student engagement and transform the learning experience.

Chill Expeditions, LLC Booth 215

Bala Cynwyd, PA • www.chillexpeditions.com

Chill Expeditions is a premier purveyor of student educational travel and eco-immersion in Central America, South America, Spain, and Greece. Owned and operated by former teachers, Chill Expeditions creates unparalleled experiential learning programs for middle school through university groups, customized to fit each teacher's educational goals.

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Clemson University Booth 317

Clemson, SC

www.clemson.edu/CAFLS/departments/biosci/

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 that are specifically designed to improve science-content knowledge. This program is fully in a distance-learning format.

● Cogent Education Booth 407

Athens, GA • www.cogenteducation.com

Cogent Education is dedicated to assisting teachers by creating interactive case study software that provides captivating real-world scenarios where students learn difficult biological concepts through inquiry and problem-solving. Funded by NIH and NSF, our Interactive Cases were designed by scientists to provide students opportunities to act like real scientists.

The Earthwatch Institute Booth 111

Boston, MA • www.earthwatch.org

Earthwatch is an international environmental charity with over 40 years of experience in bringing together students, educators, and scientists to conduct scientific research for the good of the planet. All bring their knowledge, passion, and experience to improve scientific understanding, and inspire change across all touch-points in their lives.

Ecology Project International Booth 203

Missoula, MT • www.ecologyproject.org

Ecology Project International is a non-profit organization dedicated to developing place-based, ecological education partnerships between local experts and high school students to address critical conservation issues. We engage youth from local communities and the United States in conservation as they learn about and help protect threatened species and habitats.

Edvotek Booth 411

Washington, D.C. • www.edvotek.com

Edvotek manufactures research-grade biotechnology education experiments, biologics, reagents and equipment for high schools and colleges. Experiments include DNA Fingerprinting, Electrophoresis, Forensics, PCR, Molecular Cloning, Immunology, Environmental Science and AP Biology. Products offer hands-on investigations with options for student participation in inquiry-based extensions that merge science and education.

Evolve Tours Booth 206

Toronto, ON • www.evolutetours.com

Evolve Tours organizes biology research and study tours for school groups to destinations around the world. We operate remote Eco lodges and work with local government conservation authorities and grassroots community organizations. Students contribute to on-the-ground biological research and policy decisions in communities around the globe.

● Flinn Scientific Booth 406

Batavia, IL • www.flinnsci.com

Flinn Scientific is the leader in science and laboratory chemical safety. Publisher of the world-renowned Flinn Science Catalog Reference Manual, Flinn develops and offers a full line of chemistry, biology, physics, life science, Earth science, physical science, and safety products for middle and high schools.

Frey Scientific Booth 519

Nashua, NH • www.freyscientific.com

Frey Scientific offers a complete line of supplies, equipment, technology, and lab design services for grades K-12. Among its secondary level supplemental science curriculum offerings, Inquiry Investigations® and iNeo/SCI® are proven to support student achievement through hands-on and virtual lab experiences.

● G-Biosciences Booth 307

Saint Louis, MO

www.Gbiosciences.com/Education

G-Biosciences currently offers over 60 hands-on laboratory kits to introduce grade 9 to college students to techniques in biotechnology, microbiology, molecular biology, proteomics and immunotechnology. G-Biosciences has partnered with Ellyn Daugherty's Biotechnology: Science for the New Millennium program to introduce new, engaging, hands-on laboratory kits to accompany the best-selling textbook.

Hayden-McNeil Publishing Booth 303

Plymouth, MI • www.hmpublishing.com

Hayden-McNeil is a leading publisher of custom course materials. We partner with educators to create course-specific, print or digital textbooks and lab manuals. In addition, our best-selling student lab notebooks contain crisp, carbonless copies of each page and discipline specific reference materials. Partner with Hayden-McNeil for all your lab needs.

Holbrook Travel Booth 311

Gainesville, FL • www.holbrooktravel.com

Holbrook Travel specializes in educational travel programs for students and professional development workshops for teachers to Latin America, East Africa, and beyond. Since 1974, we've helped educators design teacher-led student field expeditions that offer engaging, hands-on learning opportunities. All trips are customized to your dates, curriculum, and budget.

Howard Hughes Medical Institute (HHMI BioInteractive) Booth 623

Chevy Chase, MD • www.BioInteractive.org

HHMI BioInteractive produces free educational resources that tell important stories of scientific discovery. Based on real data and highlighting research practices, our short films, virtual labs, apps and print materials combine important science with engaging presentation. These multimedia resources are developed, vetted, and field-tested by educators and scientists.

It's About Time Booth 211

Mt. Kisco, NY • www.iat.com

IT'S ABOUT TIME® is the global leader in research-based STEM curricula for 5-12 and college students. Modeled on the way practicing scientists, engineers and mathematicians work, the IT'S ABOUT TIME® project-driven STEM solutions give educators tools to create a meaningful learning environment that deepens student engagement and problem-solving skills.

Johnson & Wales University Booth 107

Providence, RI • www.jwu.edu

Johnson & Wales University, is a nonprofit, private, accredited institution. An innovative educational leader, JWU offers a range of undergraduate and graduate degree programs that inspire professional success and lifelong personal and intellectual growth by integrating arts and sciences, professionally focused education and work experience with leadership and development opportunities.

Late Nite Labs Booth 300

New York, NY • www.latenitelabs.com

Late Nite Labs is the leading innovator of digital science labs. Our realistic science lab simulations offer an authentic, accessible experience that moves learning beyond the classroom. Give students the freedom to experiment and learn from their mistakes—at their own pace, at any time or place. Learn more: latenitelabs.com

Maderas Rainforest Conservancy Booth 306

Miami, FL • www.maderasrfc.org

The Maderas Rainforest Conservancy 501 (c) 3, was established to promote the conservation and management of Mesoamerican forests through education, conservation and community outreach. We are funded by travel opportunities available for groups and researchers. Our fair trade booth offers products made by our women's entrepreneurship project.

Massachusetts & Connecticut Association of Biology Teachers Booth 416

Franklin, MA • www.massbioteachers.blogspot.com
www.ccsu.edu/CTABT

We are affiliates of the National Association of Biology Teachers. We are dedicated to promoting the professional growth and development of biology teachers in Massachusetts and Connecticut to enhance their effectiveness in the classroom and community. Making connections locally.

● The MiniOne Electrophoresis Booth 309

San Diego, CA • www.theminione.com

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● miniPCR Booth 614

Cambridge, MA • www.minipcr.com

Teach hands-on DNA biology with miniPCR™. The miniPCR DNA Discovery System™ is an innovative, complete, and affordable biotechnology lab under \$1,000, including a PCR machine, gel electrophoresis system, and micropipette. miniPCR Learning Labs™ engage students in hands-on inquiry. Push the limits of DNA discovery in your own classroom.

Nasco Booth 310

Fort Atkinson, WI • www.enasco.com

Nasco has proudly served teachers since 1941 and will celebrate 75 years in 2016. Our preserving room staff has a combined 205 years of experience offering top quality specimens. We specialize in Live Material, and quality equipment for your classroom and laboratory needs. We at Nasco are "Dedicated to Delivery".

National Center for Science Education Booth 408

Oakland, CA • www.ncse.org

NCSE defends the teaching of evolution and climate science. NCSE provides information, resources, and advice to schools, teachers, parents, and concerned citizens defending science education. Our 5000 members are scientists, teachers, clergy, and citizens with diverse religious and political affiliations.

National Library of Medicine Booth 518

Bethesda, MD • www.nlm.nih.gov

The National Library of Medicine provides K-12 teachers and students with FREE, reliable science and health information resources and programs to help introduce, reinforce, and supplement education programs. Resources include biology, careers, chemistry, environmental health science, forensics, general health, genetics, and HIV/AIDS. For more information, please visit sis.nlm.nih.gov/outreach/k12.html.

New York Chiropractic College Booth 315

Seneca Falls, NY • www.nycc.edu

NYCC offers an on-line Master's degree in Human Anatomy & Physiology Instruction which provides both the skills and credential to teach A&P at the undergraduate level. Classes begin twice a year (September & January) and are limited to 30 students per cohort.

Northern Michigan University Booth 318

Marquette, MI • www.nmu.edu/biology/node/110

Northern Michigan University's Master of Science in Post-Secondary Biology Education program combines a graduate-level science curriculum with pedagogical training so graduates will be well prepared to compete for full-time community college instructional positions immediately upon graduation and to support application to PhD programs.

Nutrients for Life Foundation Booth 216

Washington, D.C. • www.nutrientsforlife.org

The Nutrients for Life Foundation is an organization consisting of members and collaborative partners that develops and distributes science-based materials to improve plant nutrient literacy, soil health knowledge and promote crop nutrients' role in sustaining a growing population. We provide free curriculum, posters, and more to educators about crop nutrients.

Ocean First Education Booth 214

Boulder, CO • www.oceanclassrooms.com

Ocean First Education brings science to life by combining research and education through engaging, interactive online courses. Our team of scientists, educators, and eLearning experts develops innovative approaches to marine science concepts. Our goal is to connect students and educators to the ocean regardless of where they live.

OHAUS Corporation Booth 101

Parsippany, NJ • www.ohaus.com

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OpenStax College Rice University Inc Booth 509

Houston, TX • www.openstaxcollege.org

OpenStax College is Rice University's non-profit textbook initiative committed to improving access to quality learning materials. Made possible through generous support of philanthropic foundations, OpenStax College provides free textbooks, developed and peer-reviewed by educators to ensure they are readable, accurate and meet the scope and sequence requirements of your course.

PASCO Scientific Booth 200

Roseville, CA • www.pasco.com

Help students "think science" with PASCO Scientific's award-winning, state-of-the-art science learning environment. Integrating STEM and the latest standards-based content, probeware, and data collection and analysis software, PASCO science solutions are easy to use, cost-effective, and work on your devices: iPad®, iPhone®, Chromebook™, Android™ tablets and phones, and Mac® and Windows® computers.

Pearson Booth 506

San Francisco, CA • www.pearsoned.com

As the #1 college science publisher worldwide, Pearson is dedicated to providing innovative, effective solutions for teaching challenges in biology. Stop by our booth to explore the new Second Edition of Campbell Biology in Focus, new assignment options in MasteringBiology™, and more. www.pearsonhighered.com

Personal Genetics Education Project, Harvard Medical School Booth 210

Boston, MA • www.pged.org

The Personal Genetics Education Project (pgEd) from Harvard Medical School creates a freely available curriculum on cutting-edge topics in genetics. pgEd lessons utilize a broad range of relevant lenses for engaging students in discussions about the potential benefits and implications of knowing more about one's genetic make-up.

Project Lead The Way Booth 117

Indianapolis, IN • www.pltw.org

Project Lead The Way (PLTW) is a nonprofit organization that provides a transformative K-12 learning experience. Through computer science, engineering, and biomedical science pathways, students learn problem-solving, critical and creative thinking, communication, and collaboration. PLTW empowers students to develop in-demand knowledge and skills necessary to thrive in an evolving world.

Qubit Systems Inc. Booth 103

Kingston, ON • www.qubitsystems.com

Qubit Systems has been providing instruments and software for teaching biology in the laboratory for over 20 years. Our Q-Box lab packages are adaptable for measuring a range of physiological processes in plants, animals, humans, aquatic organisms, tissues and organelles. We also provide analysers for environmental monitoring and control.

Sapling Learning Booth 301

Austin, TX • www.saplinglearning.com

Created by master's- and Ph.D.-level educators, Sapling Learning's instructional online homework engages students and empowers educators. From an easy-to-use platform to freedom of textbook choice and unsurpassed subject-matter expert support, Sapling Learning has all the tools needed to support your General & Introductory Biology, Genetics and Human Biology courses.

SeaWorld Parks & Entertainment LLC Booth 400

Orlando, FL • www.seaworld.com/teachers

For over 50 years, the SeaWorld and Busch Gardens parks have provided educators with resources and experiences to advance their knowledge and appreciation of biological principles. Today, the parks provide teacher workshops, distance learning courses, teacher guides, videos and live streams from the parks to enhance your biology lesson plans.

Simbio Booth 201

Ithaca, NY • www.simbio.com

SimBio is a leading developer of interactive, simulation-based labs in biology, used in over 20% of colleges and universities. Please stop by our booth if you would like to talk to an author, see our newest ecology, evolution, genetics, and cell-biology labs, and/or register for FREE evaluation software.

Thermo Fisher Scientific Booth 314

Carlsbad, CA • www.thermofisher.com

Thermo Fisher Scientific is the world leader in serving science. Our mission is to enable our customers to make the world healthier, cleaner and safer. Through our Thermo Scientific, Applied Biosystems, Invitrogen and Gibco brands, we offer an unmatched combination of innovative technologies, purchasing convenience and support.

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February 29 – Microbrew Submission Deadline

March 14 – Travel Award Deadline

May 16 – Discount Registration Deadline

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Participants examine the role of learning outcomes in course design and explore a wide range of techniques and tools that effectively assess student learning.

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- Visual Media Briefs
- Laboratory Protocols
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www.asmcue.org

www.biology-scholars.org

jimbe.asm.org

www.microbelibrary.org

www.asm.org/educators

www.facultyprograms.org

The Tree Room Booth 517

Berkeley, CA • www.treerom.org

UC Berkeley's landmark Understanding Evolution website just got even better with The Tree Room. This freely available companion site for educators and students from middle school through college-level brings evolutionary relationships to life with interactives, vetted lessons, teaching tips, clarifications of common misconceptions, and more.

Turning Technologies Booth 414

Youngstown, OH • www.turningtechnologies.com

Engage, monitor and measure with Turning Technologies' learning solutions. TurningPoint Cloud is a cloud-based interface that offers secure collection of data. Seamlessly poll with PowerPoint®, over any application or conduct self-paced assessments. Gather detailed reports with ResponseCard clickers or with ResponseWare via any web-enabled device.

UMass Amherst Summer Programs Booth 115

Amherst, MA

www.umass.edu/summer/precollege

UMass Amherst Summer Programs offers residential pre-college summer intensives for high school students in the sciences, humanities and arts. 2-week STEM programs include: Astronomy, Engineering, Forensic Chemistry, Kinesiology and more, as well as 6-week lab research opportunities in Biology, Biochemistry, Psychology and Food Science. With co-curricular programming and college prep.

● Vernier Software & Technology Booth 500

Beaverton, OR • www.vernier.com

Vernier Software & Technology is the leader in data collection technology for biology, life science, and environmental science education. Our award-winning hardware, software, and curricula will help integrate technology and inquiry into your courses. Stop by our booth to see what's new and enter to win a Vernier LabQuest 2!

Walking Tree Travel Booth 409

Denver, CO • www.walkingtree.org

Walking Tree partners with wildlife research institutions and non-profit conservation organizations in dozens of countries to provide meaningful and educational international volunteer experience for middle and high school students and teachers. Participants work in the field alongside experts and explore careers in biology, conservation/sustainable development, and wildlife science.

Washington University in St. Louis - University College Booth 218

St. Louis, MO • ucollege.wustl.edu/msinbiology

Teachers earn their Master of Science in Biology degree in two years through this hybrid program that combines life science content knowledge with pedagogy & leadership projects. It consists of two, three week summer institutes in residence. The remaining coursework during the 2 academic years is completed through distance learning.

WGBH Educational Foundation / Nova Booth 616

Boston, MA • pbs.org/nova/labs

NOVA Labs is a free digital platform that engages participants in activities and games that foster authentic scientific exploration. Participants take part in real-world investigations by using the same data that scientists use. Their learning is supported by the quality science videos that NOVA has been making for 42 years.

Wisconsin Fast Plants Program Booth 618

Madison, WI • www.fastplants.org

The Wisconsin Fast Plants Program of UW-Madison freely shares innovative resources for teaching science at all levels with rapid-growing Fast Plants. We bring to NABT and share online NGSS-aligned resources, AP Biology investigation materials, and research work. From life cycle, to genetics, evolution and environment, Fast Plants bring science alive.

WorldStrides Booth 219

Charlottesville, VA • www.worldstrides.com

WorldStrides is the nation's largest and most respected accredited travel organization, helping 300,000 students travel each year to destinations in more than 90 countries. Our programs are marked by exceptional service, a superior safety record, and a personalized approach to educational travel that is unmatched in the field.

W.W. Norton & Company Booth 302

New York, NY • www.wwnorton.com

The oldest and largest publishing house owned wholly by its employees, W.W. Norton, Inc. publishes about 400 trade, college, and professional titles each year.



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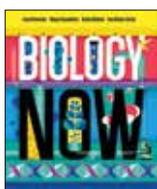
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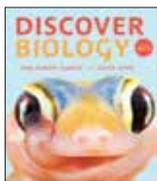
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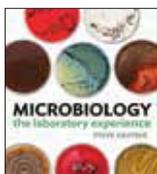
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