6TH ANNUAL STEM

SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS

Forum & Expo

HOSTED BY NSTA

Kissimmee/Orlando, FL

July 12–14, 2017

#NSTA17

NSTA National Science Teachers Association

SAVE THE DATES

2017 NSTA AREA CONFERENCES ON SCIENCE EDUCATION

BALTIMORE
MARYLAND

10/5–10/7

MAKING SCIENCE ACCESSIBLE: FULL SPEED AHEAD

MILWAUKEE
WISCONSIN

11/9–11/11

MAKING WAVES: MOVING SCIENCE FORWARD!

NEW ORLEANS
LOUISIANA

11/30–12/2

CELEBRATE SCIENCE: INSPIRE, INTEGRATE, INNOVATE

PROFESSIONAL DEVELOPMENT STRANDS

ANCHORING OUR NATURAL TREASURES THROUGH ENVIRONMENTAL LITERACY

CHARTING THE COURSE FOR INNOVATION

TYING THE KNOT: COHERENCE IN 3D SCIENCE LEARNING

PREPARING ALL STUDENTS FOR THE VOYAGE

NAVIGATING STEM THROUGH THE *NGSS*

BUOYING UP LITERACY WITH SCIENCE

INSPIRE OUR YOUNG LEARNERS

INTEGRATE SCIENCE EDUCATION FOR ALL

INNOVATE SCIENCE EDUCATION FOR TOMORROW

FOR MORE INFORMATION AND UPDATES, VISIT **WWW.NSTA.ORG/CONFERENCES**

#NSTA17

NSTA National Science Teachers Association

6TH ANNUAL STEM Forum & Expo
HOSTED BY NSTA
Kissimmee/Orlando
July 12–14, 2017

6th Annual STEM Forum & Expo, *hosted by NSTA*

Kissimmee/Orlando, Florida • July 12–14, 2017

Wednesday Kickoff starts at 12 Noon and continues until 6:30 PM

Sponsors 2
Program Partners 2
President and Committee Welcome 3
STEM Forum & Expo Steering Committee 3
NSTA Conferences and STEM Forum & Expo Go Green! . . . 4

Registration, Travel, and Resort

Meeting Location and Times 5
Registration 5
Ground Transportation to/from Airport 5
Resort Shuttle and Transportation Services 5
Parking 5
Discounted Rental Cars 5
Map of Kissimmee/Orlando 6
Housing Questions 6

STEM Forum & Expo Resources

Exhibits 7
Presenters and Presiders Check-In 7
Wi-Fi at the Gaylord Palms 7
NSTA Science Store 7
Graduate Credit Opportunity 8
NSTA: STEM Starts Here 8
Audiovisual Needs 8
Business Services 8
First Aid/Emergency Services and Mother's Room 8
Online Session Evaluations/
Tracking Professional Development 8
Professional Development Documentation
Form . . . . . following p. 8

STEM Forum & Expo Resources, cont.

NSTA Conference App 9
Lost and Found 9
Floor Plans 10–13
NSTA Headquarters Staff 14–15
NSTA Officers, Board of Directors, Council, and
Alliance of Affiliates 15
Future NSTA Conferences and STEM Forum 16

STEM Forum & Expo Program

Highlights 17
STEM Education Week in Kissimmee 17
Strands 18
Opening Session: Student Panel Discussion 20
NSTA Press® Sessions 20
Closing Session: That's a Wrap…STEM-tastic Celebration
. 21

Wednesday Daily Program 23
Thursday Daily Program 27
Friday Daily Program 53
Saturday Daily Program 73

Indexes

Exhibitor List 74
Index of Exhibitor Workshops 88
Schedule at a Glance 92
Index of Participants 99
Index of Advertisers 104

National Science Teachers Association
1840 Wilson Blvd.
Arlington, VA 22201-3000
703-243-7100
E-mail: *conferences@nsta.org*
www.nsta.org

NSTA Affiliates

Association for Multicultural Science Education (AMSE)
Association for Science Teacher Education (ASTE)
Association of Science-Technology Centers (ASTC)
Council for Elementary Science International (CESI)
Council of State Science Supervisors (CSSS)
National Association for Research in Science Teaching (NARST)
National Middle Level Science Teachers Association (NMLSTA)
National Science Education Leadership Association (NSELA)
Society for College Science Teachers (SCST)

The 6th Annual STEM Forum & Expo, *hosted by NSTA*

NSTA and the STEM Forum Steering Committee are extremely grateful to the following companies and organizations for their generous support and contributions to the 6th Annual STEM Forum & Expo, *hosted by NSTA*.

Sponsors

Pitsco Education

Squishy Circuits

Vernier Software & Technologies

Program Partners

American Association of Chemistry Teachers (AACT)

American Association of Physics Teachers (AAPT)

American Society for Engineering Education (ASEE)

International Technology and Engineering Educators Association (ITEEA)

National Association of Biology Teachers (NABT)

National Council of Teachers of Mathematics (NCTM)

STEMx, managed by Battelle

The environment is important to science educators. These programs are recyclable and were printed on recycled paper.

Welcome to the 6th Annual STEM Forum & Expo, *hosted by NSTA*

Jennifer C. Williams

David T. Crowther

The National Science Teachers Association is proud to host the 6th Annual STEM Forum & Expo in Kissimmee, Florida. STEM in action is fully represented in the entertainment, educational, and ecotourism venues throughout central Florida. Science, Technology, Engineering, and Mathematics (STEM), working collectively and in concert with all academic disciplines in formal and informal education settings, strives to move forward and improve our world's culture, environment, and quality of life for all individuals. Therefore, we are thrilled to bring you this highly specialized professional development event that enables us, as educators, to help our students stay globally competitive in terms of innovation, while demonstrating real-life applications to concepts we are teaching.

NSTA, the STEM Forum's Steering Committee, and all our program partners have worked diligently to bring you an exciting program of sessions, featured panels, and a keynote address filled with strategies to stimulate your students' interests in STEM, ideas to begin or enhance STEM initiatives in your school or district, as well as ways to enhance the skills and knowledge of current and future STEM leaders at all levels. Please take some time this week to network with fellow STEM-minded colleagues from around the world. We are confident that you will not only learn from experts in the STEM education fields, but you will also share and learn from each other.

In conclusion, we encourage you to embrace the potential that STEM can add to your educational settings by using the tools, knowledge, and resources you will accumulate. On behalf of the Steering Committee and NSTA, thank you for making STEM a priority by attending this forum. We promise this experience will be invigorating, rewarding, energizing, and magical for you as we dive deeply into STEM here in central Florida.

Welcome!

Jennifer C. Williams, Steering Committee Chairperson, 6th Annual STEM Forum & Expo

David T. Crowther, 2017–2018 NSTA President

6TH ANNUAL STEM Forum & Expo

HOSTED BY NSTA

Kissimmee/Orlando

July 12–14, 2017

2017 STEM Forum Steering Committee

Chairperson

Jennifer C. Williams
Department Chair, Lower School Science
Isidore Newman School
New Orleans, LA

Committee Members

Lower Elementary/Early Childhood Strand Leader

Adriana Guerra
Kindergarten Teacher
E.P. Foster STEM Academy
Ventura, CA

Upper Elementary Strand Leader

Sandra Kellermann
Grade 4 Teacher
Lyman Elementary School
Gulfport, MS

Middle Level Strand Leader

Kenneth Williams
STEM Teacher
Oxon Hill Middle School
Fort Washington, MD

High School Strand Leader

Garrett Mason
Director of Innovation and Design
St. Martin's Episcopal School
Metairie, LA

Partnerships Strand Leader

Brenda Nixon
Co-Director, Gordon A. Cain Center
Louisiana State University
Baton Rouge, LA

Administrators Strand Leader

Tiffany Huitt
Principal
School of Science and Engineering Magnet
Dallas, TX

NSTA Conferences and STEM Forum & Expo Go Green!

The National Science Teachers Association is committed to meeting today's environmental challenges by adopting eco-friendly practices both in our own day-to-day operations and at our 6th Annual STEM Forum & Expo, conferences, workshops, and other events. In addition, we strongly encourage our contracted conference facilities to follow green practices as well. Here are some of the ways NSTA's conference department has worked to minimize our impact on the environment:

Online Forum Information and Personal Scheduler

Most of your STEM Forum & Expo arrangements can now be accomplished online *(www.nsta.org/stemforum).* Register and make your housing reservations on the web. Program details are available to you on our website using the Session Browser/Personal Scheduler. Scheduling information on our website is up to date and more complete than that available through a printed piece.

Final Forum Programs by E-Mail

Forum registrants are now given the option of receiving an electronic version (PDF) of the final program by e-mail approximately one week prior to the forum, further reducing printing and shipping requirements. Also, attendees are encouraged to use the NSTA Conference app, which provides all the tools necessary for a successful STEM Forum experience.

Recycled Paper and Sustainable Print Services

Forum programs are printed on recycled paper whenever possible. In addition, Freeport Press, the printer for our forum materials, takes its responsibility to the environment seriously and is determined to make its carbon footprint as small as possible. Freeport Press owns and operates a regenerative thermal pollution control unit that removes 98.5% of all VOCs. Through this process, Freeport Press uses the solvents in the printing process to fuel its burner, thus reducing the amount of natural gas consumed. Since Freeport Press uses soy-based inks, its publishers are approved by The American Soybean Association to include the SoySeal in their magazines. Freeport Press has also obtained certification with the Forest Stewardship Council® (FSC) to ensure paper products are being harvested from environmentally responsible sources.

Eco-Friendly Exhibition Practices

Our forum partner, Hargrove, Inc., offers many green product options and services in the production of our forum and conference exhibitions, including 100% recyclable carpet and padding, recycled exhibit structures, a "reclaimer" that recycles 92% of all solvents the company uses in production of graphics, use of LP natural gas in 75–90% of show-site vehicles, and many biodegradable and recycled products such as trash bags and wastebaskets. Their green efforts are extended operationally with reductions in electricity, heating fuel, and water usage, as well as a move to 100% recyclable and biodegradable products.

Gaylord Palms Resort & Convention Center's Green Efforts

The Gaylord Palms staff are committed to taking mindful steps toward minimizing their impact on the environment.

- Energy Efficiency: Have upgraded lighting to dimmable fluorescents. Also, exploring heating hot water via solar technology.
- Water Conservation: Have installed low-flow faucets and toilets as well as water-efficient landscaping on its grounds.
- Waste Reduction: Have implemented waste reducing practices, such as recycling cardboard, plastic, and paper products.
- Clean Air Initiatives: Have installed High Efficiency Particulate Air (HEPA) filters, as well as systematically clean air handler units and coils to ensure clean air and energy efficiency.
- Food-Related Practices: Gaylord Palms chefs work with Second Harvest Food Bank to provide excess prepared food to needy families and local soup kitchens, reducing waste.

"Go Green" at the 6th Annual STEM Forum & Expo!

- Recycle your forum programs in the clearly marked recycle bins located throughout the Convention Center.
- Recycle or reuse your plastic badge holders—you can either turn them in at the NSTA Registration Counter or use them at future conferences.
- If you prefer to bring handouts to your session, use double-sided printing and/or recycled paper.
- Walk or use public transportation when possible at the STEM Forum & Expo.
- Bring your own refillable water bottle to the forum. Water refill stations are located at every water fountain.
- In advance of the forum, presenters are encouraged to post their presentations and handouts online on the Session Browser/Personal Scheduler.
- Evaluate sessions attended online.

—*Photo courtesy of Gaylord Palms Resort & Convention Center*

Meeting Location and Times

STEM Forum & Expo will take place at the Gaylord Palms Resort & Convention Center. The STEM Forum registration, the exhibits, the NSTA Science Store, and sessions will be located at the Convention Center. The STEM Forum & Expo will begin on Wednesday, July 12, at 1:00 PM, starting with two hours of STEMx featured sessions, along with a First-Timers session from 2:00 to 2:45 PM, followed by the Student Panel, and an Evening Exhibits Preview and Welcome Reception. The Thursday keynote address will be given by Derek Muller, science communicator, filmmaker, and television presenter, 4:30 to 5:30 PM.

The STEM Forum & Expo will end on Friday with a Closing Session from strand leaders, 4:30 to 5:30 PM.

Registration

Registration is required for participation in all forum activities and the exhibits. The lapel badge e-mailed to you with your confirmation, or issued to you at registration on-site, is your "ticket of admission" to the Exhibit Hall and all non-ticketed forum activities.

NSTA Registration and the NSTA Science Store are both located in Exhibit Hall C of the Convention Center. NSTA Registration will be open the following hours:

Wed., July 12	12 Noon–7:00 PM
Thu., July 13	7:00 AM–5:30 PM
Fri., July 14	7:00 AM–5:30 PM

The NSTA Science Store will be open the following hours:

Wed., July 12	1:00–7:00 PM
Thu., July 13	7:30 AM–4:30 PM
Fri., July 14	7:30 AM–5:00 PM

If you misplace your badge or tickets, present your personal ID at the Badge Reprint Counter in the Registration Area and you will be issued replacements. Only one replacement badge will be issued.

Ground Transportation to/from Airport/Amtrak

Orlando International Airport (MCO) is located 21 miles from the Gaylord Palms.

NSTA has partnered with Mears Transportation to extend a $4 discount off round-trip shuttle service to/from the Gaylord Palms and the Orlando International Airport. To access the coupon, visit *bit.ly/2pDnQqz* or book online at *bit.ly/2pmjf98*.

Upon your arrival at the airport, proceed to one of the Mears Motor Shuttle ticket counters on Level 1 and present your coupon or your reservation number to the Mears counter attendant.

Taxi fare from the airport to the Gaylord Palms is $45–$75, depending on traffic.

The Amtrak station (KIS) at 111 East Dakin Avenue, Kissimmee, is approximately 11 miles from the resort and travel time is 22–24 minutes, depending on traffic. Visit *bit.ly/2p7VWIf* for maps, directions, and transportation options to the resort.

Shuttle & Transportation Services

The Gaylord Palms offers shuttle service to Walt Disney World® theme parks and the Disney Springs area. A daily schedule is available at the Concierge desk. For schedule and fees, call 407-586-2236 or phone ext. 62236 from hotel. To access a detailed map of the Gaylord Palms, visit *bit.ly/2oMYbqs*.

Hertz is located on-site for car rentals at the resort.

Hertz 407-586-2244 154080

Go to www.hertz.com *and use "154080" in the Discount/CDP/Club field.*

Parking

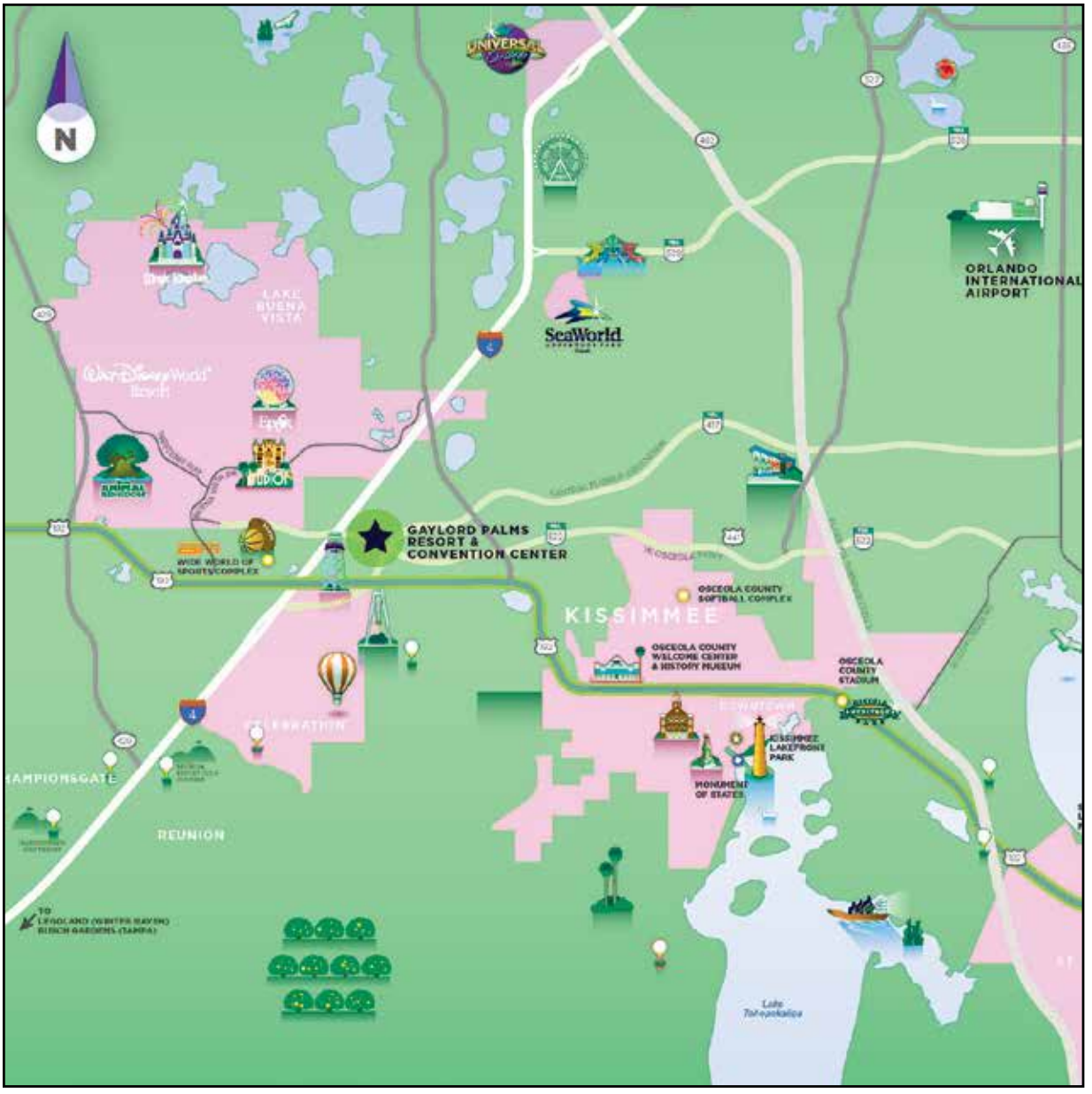
Resort self-parking is $22 a day; valet parking is available for $29 a day. (Tax is additional.) Rates are subject to change. Please note that special rates may apply for groups or special events. For directions to the Gaylord Palms as well as parking rates and maps, visit *bit.ly/2p7VWIf*.

Discounted Rental Cars

The toll-free number to contact an NSTA-designated car rental company is:

Enterprise 800-593-0505 16AH230

Go to www.enterprise.com *and use "16AH230" in the "Optional: Coupon, Customer, or Corporate Number" box. Click on "search" and enter PIN "NST."*



Gaylord Palms Resort & Convention Center
6000 W. Osceola Pkwy.
Kissimmee, Florida

Housing Questions or Concerns?
If you have any questions or concerns about your housing, please call the Gaylord Reservations Department at 877-491-0442, or visit the hotel lobby desk.

—Photo courtesy of Mike Weiss

Don't forget to visit the NSTA Science Store for a selection of titles as well as hundreds of STEM teaching resources.

NSTA Exhibits

The NSTA Exhibit Hall is a must-see! NSTA brings you the leading STEM education companies and organizations to showcase products, services, curricula, and much more. You'll discover something new and exciting in the world of STEM education.

The lapel badge e-mailed to you with your confirmation, or issued to you at registration on-site, is your "ticket of admission" to the Exhibit Hall and all non-ticketed forum activities. A map display of the Exhibit Hall is accessible via our Conference app. A complete list of exhibitors and contact information starts on page 74.

Exhibit Hall Hours. Located in Hall C of the Convention Center, exhibits will be open for viewing during the following hours:

Evening Exhibit Preview and Welcome Reception
Wed., July 12 4:30–6:30 PM

Exhibits
Thu., July 13 9:15 AM–3:00 PM
Fri., July 14 9:15 AM–3:00 PM

Lead Retrieval. NSTA exhibitors use lead retrieval, a paperless tracking system to allow them to receive fast, accurate information about forum attendees who have visited their booths. With the lead retrieval system, an exhibitor scans your badge as you visit the booth. This allows exhibitors to send information to you while the STEM Forum & Expo is still fresh in your mind.

Exhibitor Workshops. Exhibitor-sponsored workshops for STEM teachers are offered throughout the forum. These workshops give you an opportunity to use a variety of commercial instructional materials. Attendance is on a first-come, first-served basis. See page 88 for a complete listing of exhibitor workshops.

Presenters and Presiders Check-In

If you are presenting or presiding at a session, please check in at the Presenters/Presiders booth in the Registration Area.

Wi-Fi at the Gaylord Palms

Complimentary Wi-Fi is available on the hotel side of the Gaylord (front desk lobby, guest rooms, restaurants, pools, and atriums). Complimentary wireless access in the front desk lobby area is open (no password required), the SSID/network name is "GaylordLobby." The SSID/network name for access in the guest rooms, atriums, and restaurants is "Gaylord Hotels" and the login is last name and guest room number.

NSTA Science Store

Visit us at the NSTA Science Store to explore a wide selection of resources and gear you'll love! You'll find hundreds of books that uniquely blend accurate STEM content with sound teaching strategies for STEM educators of all grade ranges and disciplines. Not only do we have books covering a wide range of topics to help you sharpen your content knowledge and hone your teaching methods, but we also carry a complete line of NSTA gear you can't find anywhere else—such as T-shirts, mugs, and classroom supplies.

We offer convenient free shipping for book purchases to addresses within the United States when you place your order on-site at the STEM Forum. *Please note that free shipping is not offered to international addresses or for NSTA gear purchases.* We've lined up a number of unique opportunities for STEM Forum-goers:

- Exclusive author signings and meet-and-greet opportunities
- Our latest books—including *Argument-Driven Inquiry in Physics, Volume 1: Mechanics Lab Investigations for Grades 9–12; Creating a STEM Culture for Teaching and Learning; Eureka! Grade 3–5 Science Activities and Stories; Problem-Based Learning in the Earth and Space Science Classroom, K–12; Big Data, Small Devices: Investigating the Natural World Using Real-Time Data; Helping Students Make Sense of the World Using Next Generation Science and Engineering Practices;* and *Picture-Perfect STEM Lessons, K–2: Using Children's Books to Inspire STEM Learning*—and our newest children's books from NSTA Kids, such as *When the Sun Goes Dark, Next Time You See a Cloud,* and *Notable Notebooks: Scientists and Their Writings*
- "I Love Science" and NSTA gear product lines to show your love of science and pride in teaching
- Member discounts of 20% on NSTA Press® items and 10% on books from other publishers
- Daily book and gear specials, product giveaways, and more.

Graduate Credit Opportunity

STEM Forum & Expo attendees can earn one or two graduate-level credit/s in professional development through Dominican University of California (*dominicancaonline.com*).

Participants must attend the STEM Forum, complete the required assignments, and pay a fee of $95 for one credit or $190 for two credits. To learn more about the assignment requirements and registration, visit *bit.ly/2rMqk42*. ***Deadline is July 31.***

Interested in Joining NSTA?

Stop by **NSTA: STEM Starts Here,** located in the NSTA Science Store at the Convention Center. Find out more about the benefits of becoming an NSTA member, including all the best professional development and resources a STEM educator needs. If you received a six-month-free membership coupon at registration, please redeem it here.

Audiovisual Needs

NSTA will fulfill AV needs originally requested on the program proposals as long as the request is within the limits of equipment that NSTA provides (an LCD projector and screen). For any last-minute AV needs, presenters must arrange and pay for their own equipment. Audio Visual Production Solutions, the designated AV company on-site, will be located in Osceola Registration #1 at the Ballroom Level (Level 2) of the Convention Center.

Business Services

Located across from the "Jump for Joy" dolphin fountain, the FedEx Office Print & Ship Center offers a variety of services, including photocopying, scanning, faxing, use of computer work stations, office supplies, and same-day shipping. For more information, please call 407-586-2599.

During the week of the forum, hours will be:

Monday–Sunday 7:00 AM–7:00 PM

First Aid/Emergency Services and Mother's Room

STEM Forum attendees in need of first aid should dial extension "33" on any house phone to reach security who will dispatch assistance. In addition, a room for nursing mothers is located in room Registration 3 at the exhibit hall level of the Convention Center. See the NSTA Registration Desk for entry/key for mother's room.

Online Session Evaluations and Tracking Professional Development

All attendees can evaluate sessions online while simultaneously tracking their professional development certification (based on clock hours).

Help NSTA's **GREEN** efforts by completing session evaluations online July 12–25, 2017, while the session is fresh in your mind! **And this year, we're giving away an Apple iPad mini 2 Wi-Fi tablet to one lucky attendee who completes a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win!** To evaluate a session, attendees should follow these steps:

- Visit the STEM Forum session browser and search for part of the session title or presenter's name using the **Find Keyword** search option. *Note:* Our session evaluation system is designed to work from a computer and while it may work on smartphones/tablets, it is not really designed for them.
- Once you find the session you wish to evaluate, simply click the **Evaluate Session** button.
- Enter badge number (if you don't remember your badge number, click "help me find my badge number").
- When finished evaluating the session, click the **Submit Evaluation** button.
- Repeat this process for each session attended.

Concurrent session presenters may also complete evaluations for their own sessions in order to track professional development credit.

A Professional Development Documentation Form is included following this page to help attendees keep track of sessions/events attended that are NOT available for online session evaluation. This form can also be used to take notes on sessions attended that are available for online session evaluation.

Beginning August 7, 2017, an attendee can view his or her transcript at the NSTA Learning Center *(learningcenter.nsta.org)* by logging in and then clicking My Profile, where you'll find a Certificates tab. Attendees can also document credit for activities that are not being evaluated (e.g., Exhibit Hall visits). Each attendee is responsible for tracking his or her own attendance at such events. The transcript can be printed here and presented to an administrator who requires documentation of participation in the forum. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee's individual profile.

This form is for planning purposes only. Do NOT submit to NSTA.

6th Annual STEM Forum & Expo, *hosted by NSTA*
Professional Development Documentation Form

All attendees can evaluate concurrent teacher and exhibitor sessions online while simultaneously tracking professional development certification (based on clock hours). Use this form to keep track of all sessions/events attended during the 6th Annual STEM Forum & Expo, *hosted by NSTA*. Sessions/events such as exhibit hall visits are not available for online evaluation. However, these events still qualify for professional development.

Beginning August 7, 2017, STEM Forum transcripts can be accessed at the NSTA Learning Center *(learningcenter.nsta.org)* by logging on with your STEM Forum Badge ID# and first clicking on "My Profile" under the "Welcome." Here you'll find a "Certificates" tab to access your transcript. Keep this form and use it to add the following activities to your STEM Forum transcript. Completed transcripts can be printed from this website and presented to an administrator who requires documentation of participation in the forum. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee's individual profile.

First Name: _____ **Last Name:** _____ **Badge ID#** _____

Evaluate sessions by accessing the STEM Forum & Expo session browser: *www.nsta.org/stemforumbrowse*r. You will need your badge number to evaluate sessions. See page 8 of the program for instructions. **And this year, we're giving away an Apple iPad mini 2 Wi-Fi tablet to one lucky attendee who completes a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win!** *Note:* Our session evaluation system is designed to work from a computer and while it may work on smartphones/tablets, it is not really designed for them.

Sample Questions:

1. I selected this session:
   a. for immediate classroom use.
   b. based on the reputation of the speaker.
   c. to improve my personal pedagogical knowledge/skill.
   d. to improve my STEM content knowledge.
2. The session met my needs.
3. The information presented was clear and well organized.
4. Safe practices were employed.
5. The session avoided commercial solicitation (n/a for exhibitor workshops and NSTA Press® sessions).
6. The session should be repeated at another NSTA conference.

Sample Responses:

1=Strongly Agree 2=Agree 3=Neutral 4=Disagree 5=Strongly Disagree

Wednesday, July 12 1:00 PM–6:30 PM

Start Time	End Time	Activity/Event Title

Thursday, July 13 8:00 AM–5:30 PM

Start Time	End Time	Activity/Event Title

Friday, July 14 8:00 AM–5:30 PM

Start Time	End Time	Activity/Event Title

Saturday, July 15 8:15 AM–12:15 PM

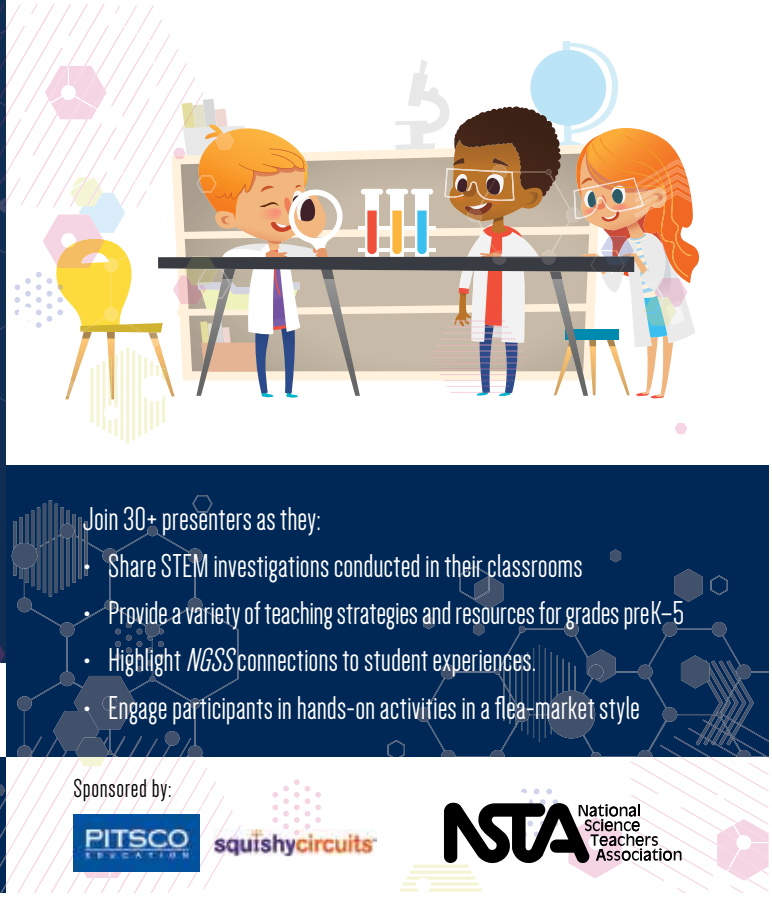
Start Time	End Time	Activity/Event Title

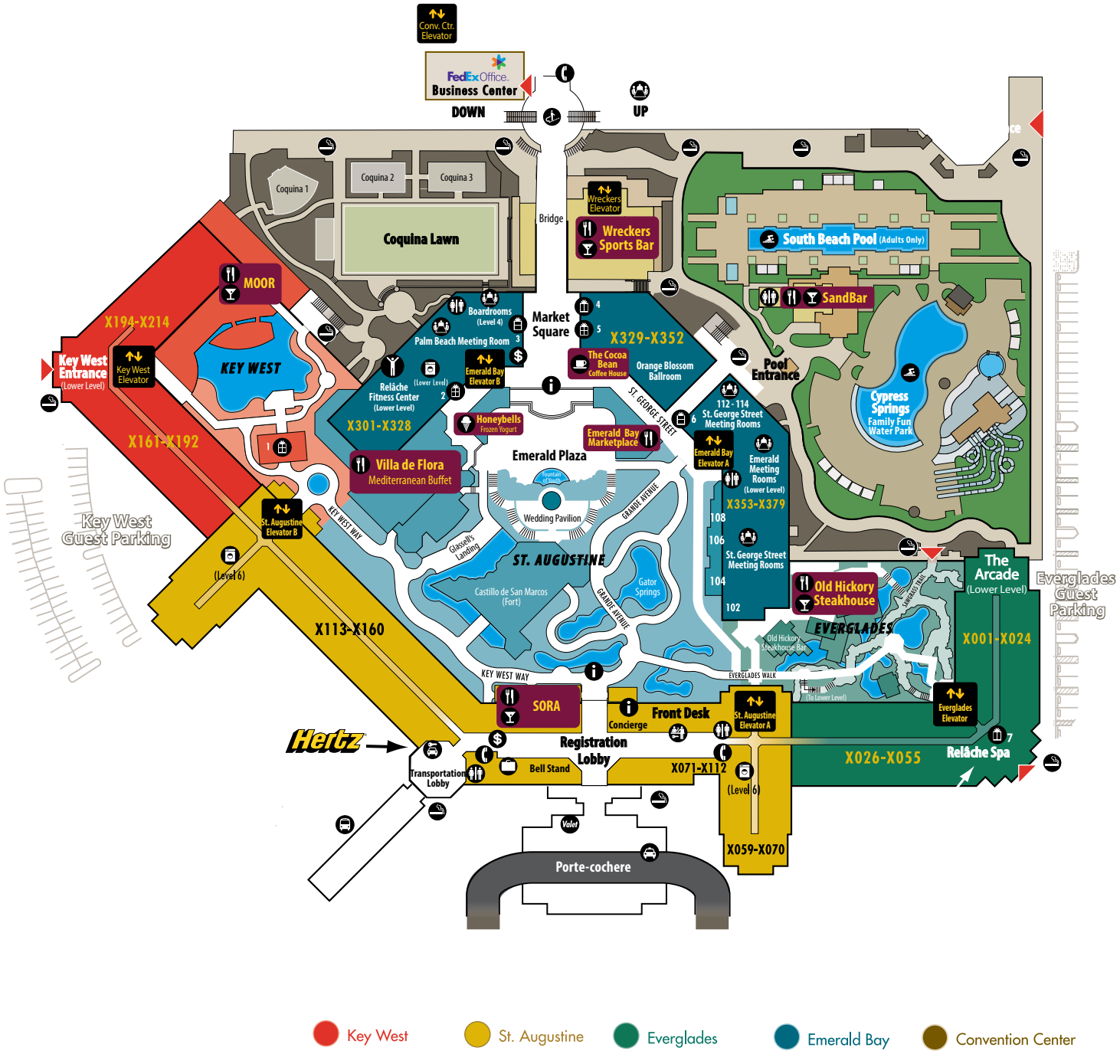
NSTA Conference App

Navigate the STEM Forum & Expo from the palm of your hand! The NSTA Conference app provides all the tools necessary for a successful STEM Forum & Expo experience. Features include the ability to view session and workshop listings by time and presenter; maps of the Convention Center and Exhibit Hall; social media plugins; and a note-taking tool. Scan QR code above or visit *www.nsta.org/conference app* to download the app. *Note:* Make sure to create a CrowdCompass account when logging in to be able to export any notes taken with the app.

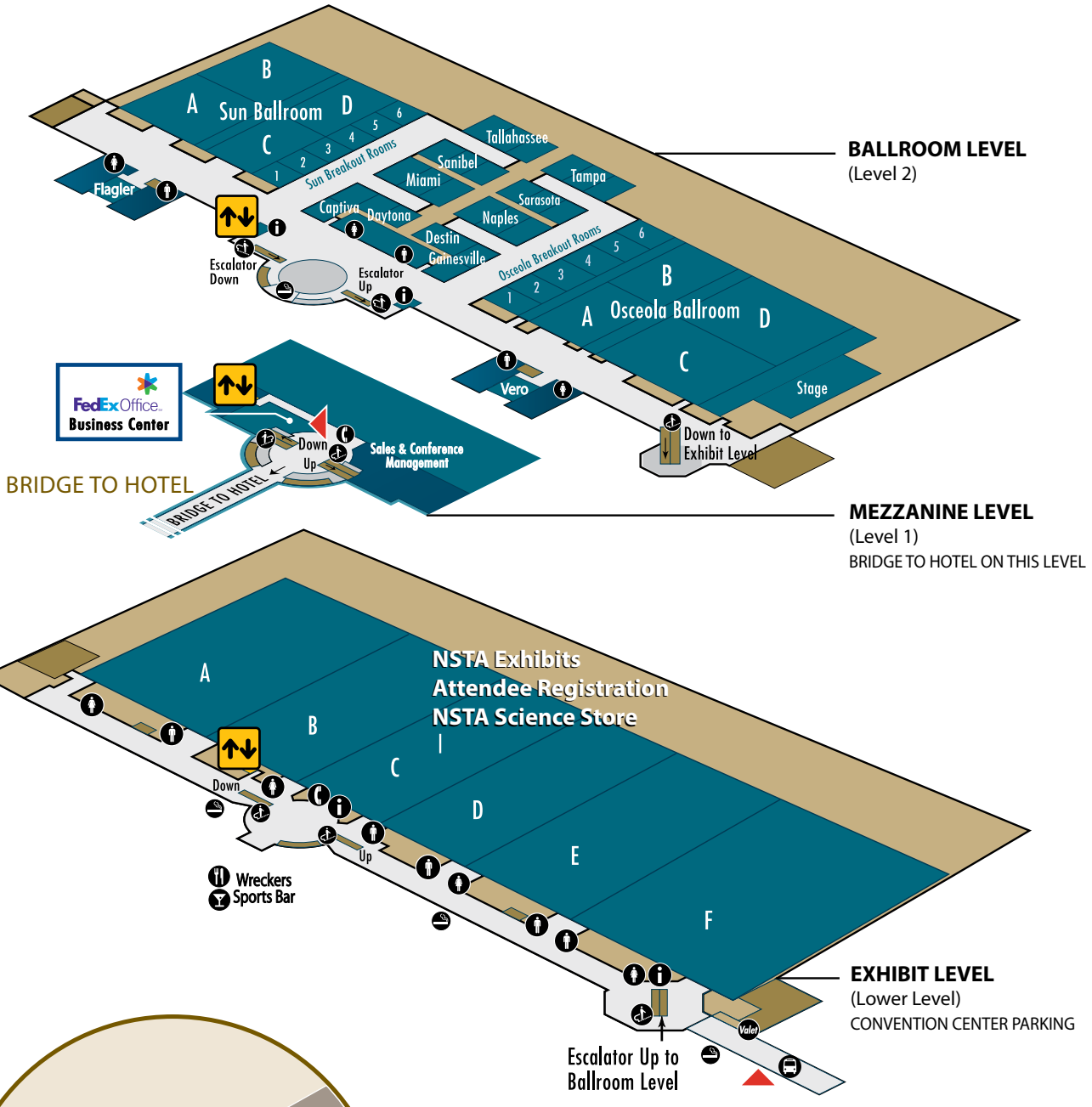
Lost and Found

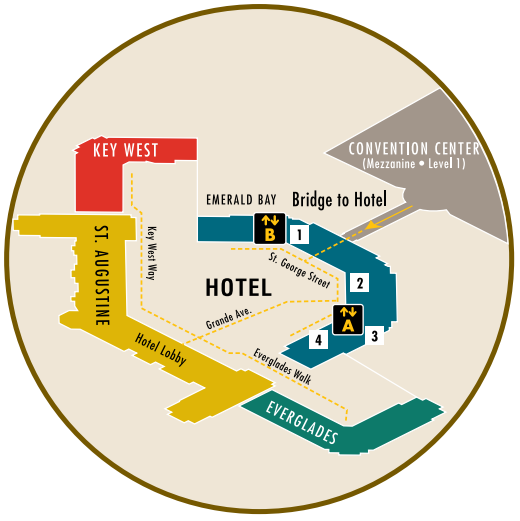
All lost-and-found items will be turned in at the NSTA Exhibitor Registration counter at the Convention Center.




Conv. Ctr. Elevator
FedEx Office Business Center
DOWN
UP
Coquina 1
Coquina 2
Coquina 3
Coquina Lawn
Bridge
Wreckers Elevator
Wreckers Sports Bar
South Beach Pool (Adults Only)
SandBar
MOOR
X194-X214
Key West Entrance (Lower Level)
Key West Elevator
KEY WEST
Boardrooms (Level 4)
Palm Beach Meeting Room
Market Square
X329-X352
The Cocoa Bean Coffee House
Orange Blossom Ballroom
Pool Entrance
Cypress Springs Family Fun Water Park
Relâche Fitness Center (Lower Level)
Emerald Bay Elevator B
X301-X328
Honeybells Frozen Yogurt
ST. GEORGE STREET
112 - 114 St. George Street Meeting Rooms
Emerald Bay Marketplace
Emerald Bay Elevator A
Emerald Meeting Rooms (Lower Level)
X353-X379
X161-X192
Villa de Flora Mediterranean Buffet
Emerald Plaza
Wedding Pavilion
GRANDE AVENUE
St. George Street Meeting Rooms
Key West Guest Parking
St. Augustine Elevator B
KEY WEST WAY
Glassells Landing
ST. AUGUSTINE
Castillo de San Marcos (Fort)
Gator Springs
(Level 6)
X113-X160
Old Hickory Steakhouse
EVERGLADES
The Arcade (Lower Level)
Everglades Guest Parking
X001-X024
Old Hickory Steakhouse Bar
EVERGLADES WALK
(To Lower Level)
Everglades Elevator
SORA
Front Desk
Concierge
St. Augustine Elevator A
Hertz
Registration Lobby
Transportation Lobby
Bell Stand
X071-X112
X026-X055
Relâche Spa
(Level 6)
Valet
X059-X070
Porte-cochere
Key West
St. Augustine
Everglades
Emerald Bay
Convention Center

& Convention Center





ADDITIONAL HOTEL-SIDE MEETING ROOMS:

1 **HEMINGWAY & SANCHEZ BOARDROOMS** (B)
Level 4 (hotel) via Emerald Bay Elevators

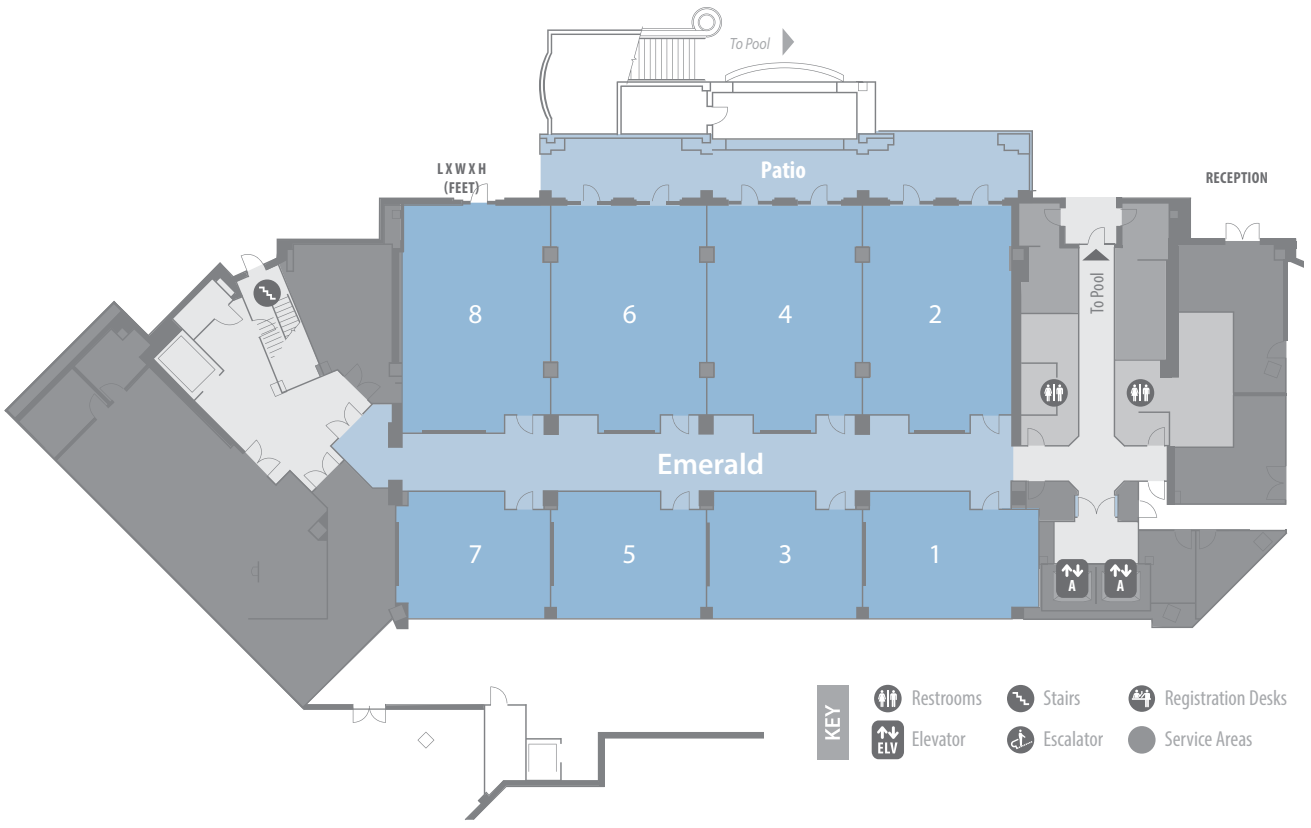
PALM BEACH MEETING ROOM
Atrium Level (hotel)

2 **ORANGE BLOSSOM BALLROOM**
Atrium Level (hotel) on St. George Street

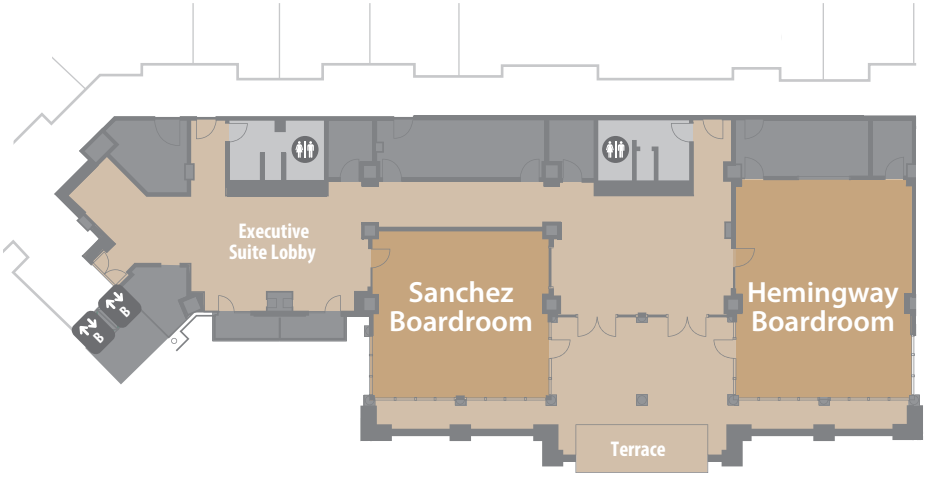
3 **EMERALD 1-8 MEETING ROOMS** (A)
Lower Level (hotel) via Emerald Bay Elevators

4 **ST. GEORGE MEETING ROOMS**
Atrium Level (hotel) on St. George Street

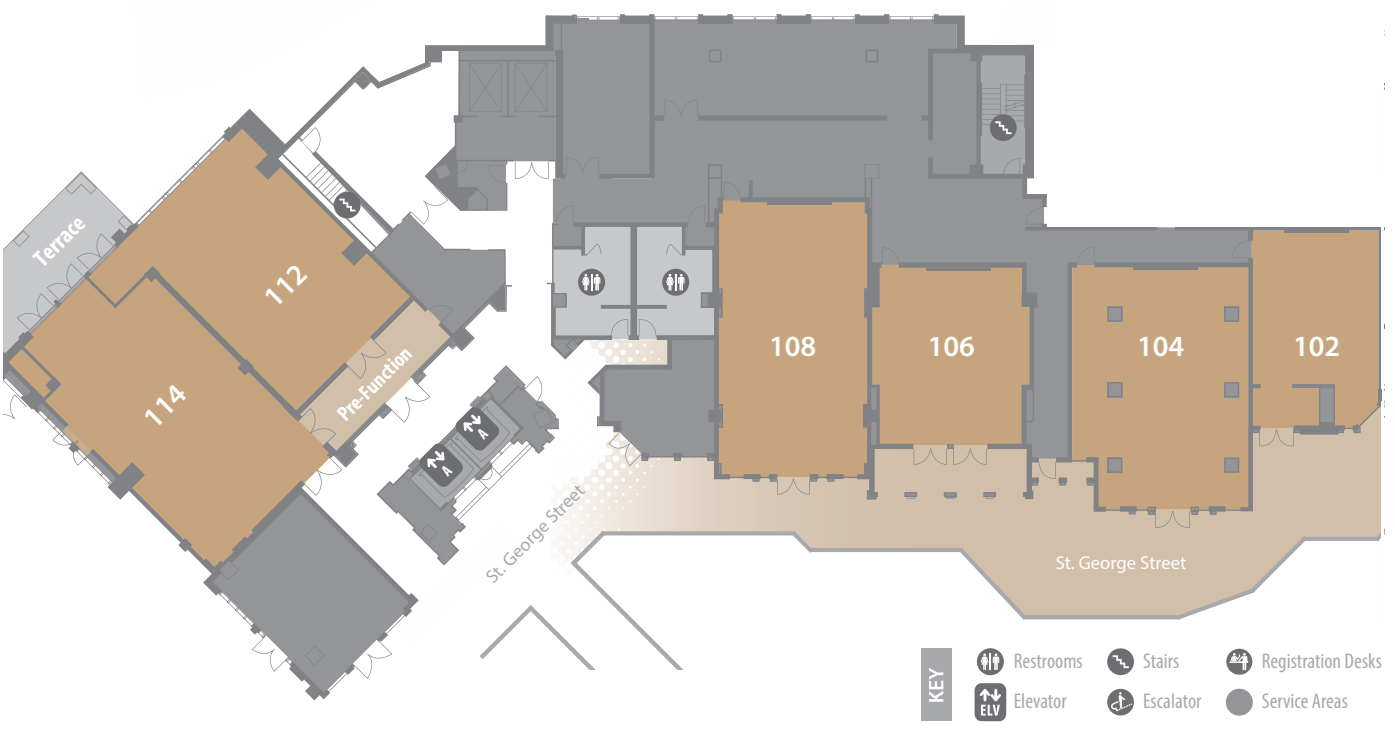
Emerald Bay Meeting Rooms
Lower Level



Executive Boardrooms
Fourth Floor



St. George Meeting Rooms
Atrium Level



Executive Office

David Evans, Executive Director
Michelle Butler, Executive Administrator and Manager

Board Relations

Michelle Butler, Executive Administrator and Manager
Shawn Crowder, Administrative Coordinator

Data Analytics

Todd Wallace, Assistant Executive Director and CIO

Human Resources

Irene Doley, Assistant Executive Director
Janine Smith, HR Benefits Manager and Generalist

Learning Center

Flavio Mendez, Assistant Executive Director
Vacant, eLearning Engagement Specialist

Nominations and Teacher Awards Programs

Amanda Upton, Manager

Office of Communications and Legislative and Public Affairs

Jodi Peterson, Assistant Executive Director, Legislative and Public Affairs
Cindy Workosky, Communications Specialist
Kate Falk, Senior Manager, Public Relations
Tim Weber, Assistant Executive Director, Web and News

Professional Programs

John Putnam Assistant Executive Director
Wendy Binder, SPIR Project Director
Dayna Anderson, Program Manager
Sharlene Steward, Program Coordinator

Program Integration

Jennifer Horak, Assistant Executive Director
Ted Willard, Program Director, NGSS@NSTA
Shawn Crowder, Administrative Coordinator
Kim Stilwell, Manager, New Business Development

Conferences Division

Delores Howard, Associate Executive Director

Conferences and Meetings

Dina Weiss, Associate Director
Linda Crossley, Assistant Director/Managing Editor
Donna Fletcher, Conference Coordinator
Beverly Shaw, Conference Administrator
Christina Dierssen, Project Editor
Kimberlyn McDonald, Registration Supervisor/Administrative Assistant
Jasmine Dandridge, Database Coordinator
Marcelo Nunez, Exhibit Services Coordinator

Exhibits/Sales

Jason Sheldrake, Assistant Executive Director
Kimberly Hotz, Senior Manager, Exhibitor Operations
Jeffrey LeGrand-Douglass, Account Manager
Becky Shoemaker, Advertising Production Manager
Danielle McNeill, Project Manager, NSTA Mailing List

Content Division

David Beacom, Associate Executive Director and Chief Content Officer
Emily Brady, Executive Administrator/Editor, NSTA Recommends

Art and Design

Will Thomas, Director
Joseph Butera, Senior Graphic Designer
Hima Bichali, Graphic Designer

e-Products

Leisa Clark, Assistant Executive Director
Kara Pantalena, Senior Instructional Designer
Eleanore Dixon-Roche, e-Learning Multimedia Specialist

Journals

Ken Roberts, Assistant Executive Director
Kate Sedor, Associate Editor
Luke Towler, Editorial Assistant

Science & Children

Linda Froschauer, Field Editor
Valynda Mayes, Managing Editor

Science Scope

Inez Fugate Liftig, Field Editor
Ken Roberts, Assistant Executive Director, Journals

The Science Teacher

Stephen C. Metz, Field Editor
Scott Stuckey, Managing Editor

Journal of College Science Teaching

Ann Cutler, Field Editor
Caroline Barnes, Managing Editor

Marketing, Social Media & eMessaging

Lauren Jonas, Assistant Executive Director
Jennifer Gulley, Marketing Manager
Korei Martin, Social Media Coordinator

New Products

Tyson Brown, Assistant Executive Director

NSTA Press

Claire Reinburg, Assistant Executive Director
Rachel Ledbetter, Managing Editor, Books (NSTA Press)
Amanda Van Beuren, Associate Editor
Donna Yudkin, Book Acquisitions Coordinator
Vacant, Associate Editor

NSTA Reports

Lynn Petrinjak, Editor
Debra Shapiro, Associate Editor

Printing and Production

Catherine Lorrain, Director
Jack Parker, Electronic Prepress

Strategic Initiatives

Rick Bounds, Assistant Executive Director
Alison Thalmann, Senior Associate, Professional Development Relationships

Operations Division

Moira Fathy Baker, Deputy Executive Director, and CFO
Azi Ambrishami, Administrative Coordinator

Business & Finance

Brian Short, Assistant Executive Director
Diane Cash, Senior Manager, A/P and Internal Compliance
Elsie Maka, Senior Manager, Inventory Control
Jodie Rozzell, Director of Grants and Contracts
Gaby Bathiche, Accountant
La'Keisha Hines, Accounting Associate
Shantee Young, Accounts Receivable Specialist

Chapter Relations and Membership

Vacant, Director of Membership and Chapter Relations
Azi Ambrishami, Administrative Coordinator

Customer Service

Nelly Guacheta, Director, Service Central
Cindy Thomas, Senior Manager
Russell Williams, Customer Service Representative, Data Entry
Kiara Singleton, Customer Service Representative, Data Entry, Publication Sales
LaToya Parks, Coordinator, CSR/Data Entry, Publication Sales
Kristen Reiss, Customer Service Representative, Coordinator

Facilities and Operations

Rodney Palmer, Building Engineer
Donovan Parker, Assistant Manager, Mailing Services
Joe Harpe, Mailing Services Assistant

Information Technology

Ryan Foley, Assistant Executive Director, Systems Development and CTO
Mike Sullivan, Director, IT
Edwin Pearce, Manager, IT Support
Michelle Chauncey, Director of Quality Assurance and Database Integrity
Edward Hausknecht, Web and Database Developer
Martin Lopong, Manager, Web Development

Strategic Development & Research Division

Al Byers, Associate Executive Director
Caroline Nichols, Executive Administrator and International Program Coordinator

Science Education Competitions

Acacia McKenna, Director, Competitions
Tonya Hunt, Administrative Assistant, Competitions

AEOP U.S. Army Education Outreach Program

Sue Whitsett, AEOP Project Director
Erin Lester, eCYBERMISSION Project Manager
Frank Curcio, eCYBERMISSION Outreach Specialist
Matt Hartman, eCYBERMISSION Content Manager
Tinika Fails, eCYBERMISSION Manager, Volunteer Programming
Alexandra Wakely, eCYBERMISSION Outreach Specialist
Jasmine Culver, eCYBERMISSION Administrative Assistant
Elana McGovern, eCYBERMISSION Administrative Assistant
Deborah Murray, AEOP Budget and Project Manager
Dimetrius Simon, AEOP Communications Coordinator
Marcia Akeung, AEOP Logistics Coordinator
Jarod Phillips, GEMS Project Manager
Renee Wells, GEMS Administrative Assistant

NSTA Officers, Board of Directors, Council, and Alliance of Affiliates

NSTA Mission Statement

The mission of NSTA is to promote excellence and innovation in science teaching and learning for all.

Officers and Board of Directors

David T. Crowther, President
Christine Anne Royce, President-Elect
Mary S. Gromko, Retiring President

Jennifer S. Thompson, Preschool/Elementary
Kenneth L. Huff, Middle Level
Carrie Jones, High School Science Teaching
Elizabeth Allan, College Science Teaching
John Olson, Coordination and Supervision of Science Teaching
Dennis Schatz, Informal Science
Natacia Campbell, Multicultural/Equity
Eric J. Pyle, Preservice Teacher Preparation
Eric Brunsell, Professional Development
Emily Schoerning, Research in Science Education

David Evans, Executive Director
LeRoy Lee, Treasurer

Council

David T. Crowther, President

Carolyn Higgins, District I
Doug Hodum, District II
Mary C. H. Weller, District III
Mary L. Loesing, District IV
Zoe Evans, District V
Cindi Smith-Walters, District VI
Sheila Smith, District VII
Dennis Alan Casey, District VIII
Brenda Walsh, District IX
Shannon Hudson, District X
J. Carrie Launius, District XI
Nicole Vick, District XII
Deb Novak, District XIII
Jen Gutierrez, District XIV
Tom Cubbage, District XV
Camille T. Stegman, District XVI
Midge Yergen, District XVII
Gabe Kraljevic, District XVIII

Alliance of Affiliates

James McDonald, CESI Chairperson and Affiliate Representative
Patricia D. Morrell, ASTE Affiliate Representative
Sharon Delesbore, AMSE Affiliate Representative
Margaret Glass, ASTC Affiliate Representative
Tiffany Neil, CSSS Affiliate Representative
Deborah Hanuscin, NARST Affiliate Representative
Mary Lou Lipscomb, NMLSTA Affiliate Representative
Bob Sotak, NSELA Affiliate Representative
Brian Shmaefsky, SCST Affiliate Representative

All cities are subject to change pending final negotiation.

National Conferences on Science Education

Atlanta, Georgia
March 15–18, 2018

St. Louis, Missouri
April 11–14, 2019

Boston, Massachusetts
March 26–29, 2020

Chicago, Illinois
April 8–11, 2021

7th Annual STEM Forum & Expo, *hosted by NSTA*

Philadelphia, Pennsylvania—July 11–13, 2018

Area Conferences on Science Education

2017 Area Conferences

Baltimore, Maryland—October 5–7
Milwaukee, Wisconsin—November 9–11
New Orleans, Louisiana—November 30–December 2

2018 Area Conferences

Reno, Nevada—October 11–13
Gaylord National Harbor, Maryland—November 15–17
Charlotte, North Carolina—November 29–December 1

Keynote Address

Thursday, July 13, 4:30–5:30 PM

Derek Muller
Science Communicator, Filmmaker, Television Presenter, and Creator of YouTube Channel Veritasium

The Uncomfortable Effort of Thinking

Thinking is hard. This is something clearly shown on Derek's YouTube videos where he interviews people on the street. Misconceptions about science abound. And they are not easy to change in traditional educational settings because the people who hold them are not even aware of these misconceptions. Prior knowledge is essential to think about when teaching, but incorrect prior knowledge is even more important. This is because it has a devastating impact on perception—people don't even perceive that what is being presented differs from their prior knowledge. Join Derek has he discusses evidence he's collected about these phenomena and methods that have shown promise in helping to affect conceptual change both in traditional educational settings and on YouTube.

(See page 51 for details.)

First-Timers Orientation

Come learn about the STEM Forum & Expo program and networking opportunities for registrants who are first-time attendees. See page 23 for details.

STEM Education Week in Kissimmee

NSTA is pleased to announce that Mayor Jose Alvarez has proclaimed July 10–16, 2017, STEM Education Week in Kissimmee, Florida. STEM Education Week highlights the importance of improving the participation and performance of America's students in STEM so that our next generation will exceed the level of innovation, problem solving, and technological advancement required in a globally competitive environment.

Wednesday, July 12

1:00–1:45 PM	STEMx Featured Sessions	23
2:00–2:45 PM	First-Timers Orientation	23
2:00–2:45 PM	STEMx Featured Sessions	23
3:00–3:45 PM	STEMx Featured Sessions	23
3:00–4:15 PM	Opening Session: Student Panel Discussion	25
4:30–6:30 PM	Evening Exhibits Preview and Welcome Reception	25

Thursday, July 13

8:00–9:00 AM	Featured Panels	27
8:00–9:00 AM	Sessions, Exhibitor Workshops	28
9:15 AM–3:00 PM	Exhibits	30
9:30–10:30 AM	Featured Panel	30
9:30–10:30 AM	Sessions, Exhibitor Workshops	32
10:30 AM–12 Noon	Elementary STEM Showcase!	37
11:00 AM–12 Noon	Sessions, Exhibitor Workshops	38
1:30–2:30 PM	Featured Panel	43
1:30–2:30 PM	Sessions, Exhibitor Workshops	43
3:00–4:00 PM	Sessions, Exhibitor Workshops	47
4:30–5:30 PM	Keynote Address: Derek Muller	51

Friday, July 14

8:00–9:00 AM	Featured Panels	53
8:00–9:00 AM	Sessions, Exhibitor Workshops	54
9:15 AM–3:00 PM	Exhibits	56
9:30–10:30 AM	Sessions, Exhibitor Workshops	56
11:00 AM–12 Noon	Sessions, Exhibitor Workshops	60
1:30–2:30 PM	Featured Administrators Workshop	64
1:30–2:30 PM	Sessions, Exhibitor Workshops	64
3:00–4:00 PM	Sessions, Exhibitor Workshops	68
4:30–5:30 PM	Closing Session: That's a Wrap…STEM-tastic Celebration.	71

Saturday, July 15

8:15 AM–12:15 PM	Off-site Energy and Waves Physics Lab at Magic Kingdom® (Ticket Required, preregistration only)	73

An index of all strand sessions starts on page 92.

Lower Elementary/Early Childhood

LE Students in the lower elementary grades are beginning to understand the world around them and the role they play in it. They are curious and want to make sense of their surroundings. By providing students with inquiry-based experiences in Science, Technology, Engineering, and Mathematics, we can unlock each student's natural curiosity and help them understand the world in an engaging way. The foundational skills learned and mastered through the integration of STEM during the early years, if done right, will help these students be critical thinkers and makers who can innovate the future they will be a part of. Sessions in this strand will emphasize open-ended and active exploration, play, and investigation of the real world through the lens of *NGSS*.

Upper Elementary

UE How do we respond to research that indicates that by the time our students reach the fourth grade, a third of them will lose interest in science? How do we ensure that our students develop a solid foundation in the STEM areas so that they are prepared to both work and live in the 21st century? To reverse this trend and ignite their interest in future STEM careers, elementary students need quality learning activities and experiences that spark curiosity, promote confidence, support the rigor of current standards, and develop competence in STEM subjects. The sessions in this strand showcase programs and instructional strategies that support STEM and have been successfully integrated into the elementary core curriculum.

Middle Level

M Engaging students through opportunities to explore STEM fields of study that support the NRC *Framework* and the *Next Generation Science Standards* is a top priority at the middle school level. A successful middle school STEM program allows students to create, innovate, communicate, collaborate, and iterate projects that are driven by their own interests. The sessions in this strand showcase learning environments where Science, Technology, Engineering, and Mathematics interconnect to serve as a vehicle for discovery, innovation, and independent problem solving while also meeting rigorous content standards.

High School

HS As we prepare high school students to enter the workforce and college, students must not only understand but apply their understanding in the context of real-world problem solving. Nowhere is this more important than in STEM for grades 9–12. The sessions in this strand will highlight innovative, hands-on, student-centered approaches to STEM topics that cross subject boundaries.

Partnerships

Pa Partnerships among community, business/industry, and education-focused entities often connect preK–16 schools and universities to valuable resources. Leveraging those partnerships can also be key to preparing students to meet the needs of a dynamic workforce that is constantly changing. As the nation recognizes the importance of STEM education to our economic future, collaborations in STEM education between preK–16 and business and cultural communities are becoming increasingly prevalent. The sessions in this strand highlight select preK–16 partnership initiatives that have been successfully implemented and have demonstrated positive outcomes.

Administrators

A Successful STEM programs at the primary and secondary levels align the interrelated nature of science and mathematics education with an emphasis on technology and engineering through hands-on and real-life applications where students develop the skills and mind-sets needed to answer complex questions, investigate global issues, and develop solutions for real challenges. This is an incredibly exciting time in education as we shift to support the development of these skills in STEM and across the curriculum. The sessions in this strand will highlight how administrators can best support innovative, hands-on, student-centered approaches to STEM education.

Visit NSTA's SCIENCE STORE

Hall C

STORE HOURS

Wednesday, July 12	1:00 PM – 7:00 PM
Thursday, July 13	7:30 AM – 4:30 PM
Friday, July 14	7:30 AM – 5:00 PM

Travel light with **FREE Shipping** for in-store orders!

We have the latest resources for science teachers, including new releases and bestsellers!

- Purchase fun NSTA-branded gear—unique hats, shirts, mugs, and more.
- Join NSTA to get member pricing: 20% off bestseller NSTA Press® titles.
- Ask about our NSTA gift cards—great gift idea!

Download the conference app or follow #STEMforum for special giveaways, contests, and more throughout the conference!

Visit *www.nsta.org/store* to make a purchase today, or call 800-277-5300.

NSTA National Science Teachers Association

—Courtesy of Jennifer C. Williams

—Photo of 2016 STEM Forum & Expo Student Panel

Student Panel Discussion: The Power of STEM Education

Wednesday, July 12, 3:00–4:15 PM

Palm Beach, Gaylord Palms

Introductions and Moderator:

Erin Lester, eCYBERMISSION Project Manager, U.S. Army Educational Outreach Program, NSTA, Arlington, Va.

Student Panelists from Orangewood Christian High School, Maitland, Fla.:

- **Matt Gallagher**
- **India Miller**
- **Kassidy Marshall**
- **Alex Rubio**

For more than 50 years, the U.S. Army has supported a wide range of educational opportunities in STEM for our youth and undergraduate students, as well as our valued teachers. A diverse panel of students from the U.S. Army Educational Outreach Program (AEOP) will describe their experiences with the AEOP programs they have participated in, the importance of STEM in their lives and school experiences, how STEM will help them in their futures, and why they think STEM is important.

AEOP aims to provide both students and teachers with diverse opportunities that effectively engage, inspire, and attract the next generation of STEM talent and expose participants to Department of Defense (DoD) STEM careers.

NSTA Press Sessions

NSTA Press® books offer new classroom ideas and standards-based strategies. Join NSTA Press authors for these sessions linked to the topics of their books.

Thursday, July 13

1:30–2:30 PM

Uncovering K–2 Students' Ideas in Science, Mathematics, and Engineering: STEM-Focused Formative Assessment

The Power of Investigating: Guiding Authentic Assessments

Friday, July 14

9:30–10:30 AM

Water and People: An Example Hydrology Unit for Grades 8–12

Uncovering Grades 2–8 Students' Ideas About Magnets and Magnetic Interactions

11:00 AM–12 Noon

Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6–8

11:00 AM–12 Noon, cont.

Picture-Perfect STEM Lessons: Using Children's Books to Inspire STEM Learning

The Power of Questioning

1:30–2:30 PM

Pendulums and Crooked Porch Swings: A Model for Connecting Science and Engineering

—Photo of 2016 STEM Forum & Expo Closing Session

That's A Wrap…A STEM-tastic Celebration

Wrap Up/Strand Leaders' Reports

Friday, July 14, 4:30–5:30 PM

Palm Beach, Gaylord Palms

Join us for a STEM-tastic wrap-up session from the 6th Annual STEM Forum & Expo's Steering Committee. Share in fond memories and reflect upon the deep learning experienced at this year's STEM Forum. Celebrate the magical sessions, panels, workshops, and networks created during your time in central Florida. You will have the opportunity to question our Steering Committee members and you will discover ways to be a part of the magic by becoming involved in future STEM Forums. **One lucky attendee will have the chance to win a free registration to the 7th Annual STEM Forum & Expo in Philadelphia in 2018.** So come to our STEM-tastic celebration!

Steering Committee:

- **Jennifer C. Williams,** Steering Committee Chairperson, and Department Chair, Lower School Science, Isidore Newman School, New Orleans, La.
- **Adriana Guerra,** *Lower Elementary/Early Childhood Strand Leader,* and Kindergarten Teacher, E.P. Foster STEM Academy, Ventura, Calif.
- **Sandra Kellermann,** *Upper Elementary Strand Leader,* and Grade 4 Teacher, Lyman Elementary School, Gulfport, Miss.
- **Kenneth Williams,** *Middle Level Strand Leader,* and STEM Teacher, Oxon Hill Middle School, Fort Washington, Md.
- **Garrett Mason,** *High School Strand Leader,* and Director of Innovation and Design, St. Martin's Episcopal School, Metairie, La.
- **Brenda Nixon,** *Partnerships Strand Leader,* and Co-Director, Gordon A. Cain Center, Louisiana State University, Baton Rouge
- **Tiffany Huitt,** *Administrators Strand Leader,* and Principal, Science/Engineering Magnet High School, Dallas, Tex.

—Photo courtesy of Experience Kissimmee

Venture deep into the Florida Everglades with an airboat tour. Get an in-depth look at the alligators, birds, and plants that inhabit the wetlands.

1:00–1:45 PM Presentation

M **STEMx Session: Building a Foundation for Effective Rural STEM Engagement**

(Grades 5–9) *Osceola B, Gaylord Palms*

J. Wesley Hall (@WesleyHall; @theTSIN; *hallj@battelle.org)* and **Brandi Stroecker** (@STEMignites; @theTSIN; *stroecker@battelle.org),* Tennessee STEM Innovation Network–Battelle, Nashville

Discover how Tennessee successfully engaged rural students in STEM learning through a statewide strategy and deployment of an online interdisciplinary STEM tool called Learning Blade.

1:00–1:45 PM Hands-On Workshops

A **STEMx Session: School Leaders 2.0**

(Grades 6–12) *Osceola A, Gaylord Palms*

Stephanie Johnson (@docsvj; @osln; *johnsonsa@battelle.org),* Battelle Memorial Institute, Columbus, Ohio

Stephanie Lammlein *(slammlein@biomedscienceacademy.org),* Bio-Med Science Academy, Rootstown, Ohio

Larry Johnson (@ljchsinghim2; *ljohnso6@apslearns.org),* Firestone Community Learning Center, Akron, Ohio

Innovative schools need leaders who think differently. Learn about and experience how the Innovative Leaders Institute has changed the way school leaders are trained.

2:00–2:45 PM Presentations

First-Timers Orientation

(Grades P–12) *Orange Blossom Ballroom, Gaylord Palms*

NSTA Board and Council

Come learn about the STEM Forum program and networking opportunities for registrants who are first-time attendees. Join us for tips on navigating the forum and learn how to make the most of the amazing opportunities available over the next few days.

A **STEMx Session: Creating a Pathway to STEM Success—Recognizing STEM Schools**

(Grades K–12) *Osceola B, Gaylord Palms*

Lauren Allen (@AllnSTEM; *lauren.allen@dc.gov),* D.C. Office of the State Superintendent of Education, Washington, D.C.

Curtis Pyke *(cpyke@gwu.edu),* The George Washington University, Washington, D.C.

Michael Ford *(mford91e@gmail.com),* Gunston Middle School, Arlington, Va.

This presentation engages administrators and school leaders in discussing the challenges and rewards in piloting a STEM school recognition process.

Strands

The STEM Form & Expo Steering Committee has planned the forum around six strands, enabling you to focus on a specific area of interest or need. Strand events are identified by icons throughout the daily program. For strand descriptions, see page 18. On page 92, you will find the sessions grouped according to their strand.

LE **Lower Elementary/ Early Childhood**

HS **High School**

UE **Upper Elementary**

Pa **Partnerships**

M **Middle Level**

A **Administrators**

The following icon will be used throughout this program.

NSTA Press® Sessions

The ideas and opinions expressed in the forum sessions, and in any handout materials provided, are those of the presenter. They are not those of the National Science Teachers Association nor can any endorsement by NSTA be claimed.

2:00–2:45 PM Hands-On Workshop

UE **STEMx Session; STEM in the Real World—Making It Matter**

(Grades 3–9) *Osceola A, Gaylord Palms*

Jodi Zeis *(mrszteachesme@yahoo.com),* South Carolina's Coalition for Mathematics & Science, Clemson

Experience specific strategies to engage groups of students who are underrepresented in STEM fields. Learn how to make STEM matter now to encourage purposeful learning

3:00–3:45 PM Presentations

Pa **STEMx Session: Harnessing Competition to Fuel Interest in STEM**

(Grades 5–12) *Osceola A, Gaylord Palms*

Evan Curran (@MakerMinded; *currane@battelle.org),* Tennessee STEM Innovation Network–Battelle, Nashville

Heather Sherman (@hbelle88; *sherman@battelle.org),* Ohio STEM Learning Network/Battelle, Columbus

Explore how Tennessee and Ohio successfully used competition to promote school engagement with local and national STEM activities.

Pa **STEMx Session: Computer Science Is More Than Coding! Implementing the Computer Science Framework into Your Region**

(Grades 5–12) *Osceola B, Gaylord Palms*

Angela Hemmingway *(angela.hemingway@stem.idaho.gov),* Idaho STEM Action Center, Boise
Kelly Gaier Evans (@kellymgaier; *gaierk@battelle.org),* Ohio STEM Learning Network/Battelle, Columbus
Jarred Corwin (@JarredCorwin; *jcorwin@doe.in.gov),* Indiana Dept. of Education, Indianapolis

Are you interested in adding computer science to your school's curriculum? Come learn about four states that are integrating the new CS Framework into their programs!

Mark Your Calendars for Next Year's STEM Forum & Expo

We're excited to announce the following site/dates for the 7th Annual STEM Forum & Expo, *hosted by NSTA*:

Philadelphia, Pennsylvania
July 11–13, 2018

More details to come at
www.nsta.org/conferences

FIRST TIMER?

NEED SOME HELP NAVIGATING YOUR FIRST STEM FORUM & EXPO?
JOIN US AND WE'LL SHOW YOU THE ROPES.

First-Timers Orientation

Wednesday, July 12, 2:00–2:45 PM

Orange Blossom Ballroom
Gaylord Palms

NSTA National Science Teachers Association

3:00–4:15 PM Opening Session

Student Panel Discussion: The Power of STEM Education

(General) *Palm Beach, Gaylord Palms*

Introductions and Moderator: **Erin Lester,** eCYBERMISSION Project Manager, U.S. Army Educational Outreach Program, NSTA, Arlington, Va.

Student Panelists:
Matt Gallagher, Kassidy Marshall, India Miller, and **Alex Rubio,** Students, Orangewood Christian High School, Maitland, Fla.

The need for STEM literacy—the ability to understand and apply concepts from science, technology, engineering, and mathematics in order to solve our nation's most complex problems—is growing exponentially. The requirement for STEM literacy goes beyond the traditional STEM occupations of scientist, engineer, and mathematician. In addition, the United States and the Army have a growing need for highly qualified, STEM-literate technicians and skilled workers in advanced manufacturing, logistics, management, and other technology-driven fields.

For more than 50 years, the U.S. Army has supported a wide range of educational opportunities in STEM for our youth and undergraduate students, as well as our valued teachers. From elementary school through undergraduate school, students of all proficiency levels, interests, and social and economic backgrounds are encouraged to participate in real-world STEM experiences while also engaging with Army-sponsored mentors. These STEM experiences include competitions; STEM enrichment programs; and opportunities for apprenticeships, internships, and scholarships.

A diverse panel of students from the U.S. Army Educational Outreach Program (AEOP) will describe their experiences with the AEOP programs they have participated in, the importance of STEM in their lives and school experiences, how STEM will help them in their futures, and why they think STEM is important. AEOP aims to provide both students and teachers with diverse opportunities that effectively engage, inspire, and attract the next generation of STEM talent and expose participants to Department of Defense (DoD) STEM careers.

4:30–6:30 PM Evening Exhibit Preview and Welcome Reception

Hall C, Gaylord Palms

Please join us for this exclusive sneak preview of the Exhibit Hall. Be among the first to take in the sights and sounds of the Expo as you enjoy complimentary refreshments throughout the exhibit hall. Exhibitors will have hands-on activities, free resources, giveaways, best practices, and more—all tailored specifically to teachers' needs. Brand-new and soon-to-be-released STEM resources will be featured by industry leaders. Don't forget to come back for our regular exhibit hours on Thursday and Friday.

For a complete list of exhibitors, see page 74.

—Photo courtesy of Mike Weiss

Fun activities abound at the second-annual Elementary STEM Showcase. Be sure to stop in at this flea market–style event on Thursday, 10:30 AM–12 Noon in Hall C.

8:00–9:00 AM Featured Panels

Pa

How Business/Industry/Nonprofit Partnerships Help Prepare PreK–16 Students to Meet the Needs of the Future

(General) *Orange Blossom Ballroom, Gaylord Palms*

Moderator: **Brenda Nixon** *(bnixon@lsu.edu),* Partnerships Strand Leader, and Co-Director, Gordon A. Cain Center, Louisiana State University, Baton Rouge

Frazier Wilson, Vice President, Shell Oil Company Foundation, and Director, Workforce and Strategic Community Initiative, Shell, Houston, Tex.
Reo Pruiett, Director, Programs, Educate Texas, Dallas
Angel Price, Engineering Services Manager, Disney's Animal Kingdom Park, Orlando, Fla.

Innovation in STEM has been pivotal in meeting the workforce demands of today. Our students need to be collaborative problem solvers as well as members of a highly skilled workforce. How can preK–16 educators engage business, industry, and nonprofits to assist in creating students who are well prepared for the dynamic workforce needs of the future and to drive the leading edge of STEM innovation?

This session provides an opportunity for attendees to better understand how business, industry, and nonprofit organizations are interfacing with preK–16 schools to meet those demands. Panel members will discuss how they have partnered with schools and provided STEM resources or employee assistance to help implement quality STEM education in K–16 schools. Members of the audience will have the opportunity to ask questions following the panelists' presentations.

Inclusive STEM Schools: Making STEM for All a Reality

(General) *Osceola A, Gaylord Palms*

Sponsored by STEMx, managed by Batelle

Moderator: **Michael Feder** *(federm@battelle.org),* Battelle, Arlington, Va.

Panelists:
David Burns, Director, Ohio STEM Learning Network/Battelle, Columbus
Sandy Watkins *(sandy@TSIN.org),* Principal-in-Residence, Tennessee STEM Innovation Network–Battelle, Nashville
Larry Johnson, Principal, Firestone Community Learning Center, Akron, Ohio

STEMx members have developed networks of inclusive STEM schools to improve educational opportunities and outcomes across the country. Come talk to the experts about what makes these schools special, how they stack up, and what lessons you can apply to your school and classroom.

Engaging Diverse Learners and Special Needs Students in STEM

(General) *Osceola B, Gaylord Palms*

Moderator: **Janella Watson,** Director of Communications, Providence Children's Museum, Providence, R.I.

Panelists:
Gina Tesoriero *(ginatesoriero@gmail.com),* STEM Special Education Teacher, M.S. 319 Maria Teresa Mirabal School, New York, N.Y.
Delia Meza *(dmeza@nysci.org),* Early Childhood Science Coordinator, New York Hall of Science, Corona

Explore programs, practices, and approaches that nurture curiosity, agency, and a love of STEM learning in students with special needs. In this panel, we'll hear powerful stories from educators engaging learners of all ages in engineering design, making, and sensory-rich STEM exploration, as well as unique community partnerships that encourage and support students with special needs to pursue STEM pathways.

8:00–9:00 AM Presentations

UE **Getting Graphic with Your Details? Now That's a Novel Approach!**

(Grades 3–8) *Emerald 3, Gaylord Palms*

Sandi Sumerfield (@ssumerfield; *sandi@warmbluewaters.com),* Hamilton County ESC, Cincinnati, Ohio

Let's explore blending scientific inquiry with literacy practices as students learn to communicate the details and findings of their investigations using a graphic novel format.

UE **Math Matters: A Closer Look at the "M" in STEAM**

(Grades 3–5) *Emerald 5, Gaylord Palms*

Sarah Bush (@sarahbbush; *sarah.bush@ucf.edu),* University of Central Florida, Orlando

Kristin Cook *(kcook@bellarmine.edu),* Bellarmine University, Louisville, Ky.

Richard Cox, Jr. (@OMESCoach; *richard.cox@bullitt.kyschools.us),* Old Mill Elementary School, Mount Washington, Ky.

We will share practical strategies for maximizing the use of STEAM investigations by placing a greater focus on the "M" in STEAM.

LE **Structure and Play: Teaching Engineering Through Music Composition**

(Kindergarten) *Emerald 7, Gaylord Palms*

Elissa Johnson-Green *(elissa_johnsongreen@uml.edu),* UMass Lowell, Mass.

Hear about an immersive, integrated engineering-music curriculum that was implemented using music composition and architectural design precepts to engage students in engineering skills practice.

8:00–9:00 AM Hands-On Workshops

UE **Student Interest Leads the Way Through STEM in Earth Science**

(Grades 3–6) *Emerald 2, Gaylord Palms*

Tamra Lamb *(talamb@bullochschools.org),* Mattie Lively Elementary School, Statesboro, Ga.

Katie Brkich *(kbrkich@georgiasouthern.edu),* Georgia Southern University, Statesboro

We share how student interest helped guide a unit on Earth science that used STEM integration and three-dimensional learning, plus phenomenon- and place-based inquiry.

UE **Using the Science of Flight to Teach *NGSS* and *CCSS* to Upper Elementary Students**

(Grades 3–6) *Emerald 4, Gaylord Palms*

Lee Siudzinski *(lee@blueskyfoundation.org),* Blue Sky Educational Foundation, Three Lakes, Wis.

Erron Sagen *(erron.sagen@gmail.com),* Oakwood Elementary School, Oshkosh, Wis.

Teaching an aviation curriculum that integrates *NGSS* and *CCSS* is the perfect way to motivate students to learn and apply the four forces of flight.

UE **Model-Eliciting Activities: Real-World Interdisciplinary STEM Lessons**

(Grades K–8) *Emerald 6, Gaylord Palms*

Deborah Kozdras (@USFStavros; *dkozdras@usf.edu),* University of South Florida, Tampa

Christine Angel Danger (@AngelDanger10; *christine.danger@sdhc.k12.fl.us),* Hillsborough County Public Schools, Tampa, Fla.

Students need to see the relevance to the real world. Model-Eliciting Activities provide realistic scenarios that offer opportunities for engaging interdisciplinary STEM lessons.

A **Cultivating the Whole Plant, Not Just the STEM**

(Grades 4–College) *Emerald 8, Gaylord Palms*

Anthony Williams (@beaconhouseinc; *williamsbiology2015@gmail.com),* Dr. Martin Luther King, Jr. Middle School, Germantown, Md.

Attention will be paid to demonstrating how administrators can effectively support and build STEM programs at their schools by evaluating resources, developing and stewarding a vision, and by expanding their focus to all contents supporting critical thinking, problem solving, and collaborative work.

HS **Electrified Paper: Electrical Engineering Meets the Arts**

(Grades 7–12) *St. George 106, Gaylord Palms*

Gila Stein and **Orly Nadler** (@orlynadler; *nadlero@maayanot.org),* Ma'Ayanot Yeshiva High School for Girls, Teaneck, N.J.

What if your students could use science, technology, electrical engineering, and art to illuminate their thinking? Using simple materials like copper tape, Surface Mount LEDs, and batteries, your students can make their notebooks light up by creating intricate paper circuitry designs while exploring basic scientific concepts like conductivity, current flow, simple circuit design, and mechanical switches.

HS **Smartphone Physics: Newton's Second Law**

(Grades 9–College) *St. George 108, Gaylord Palms*

Aaron Osowiecki *(aosowiecki@bostonpublicschools.org),* Boston Latin School, Boston, Mass.

Use the sensors in a smartphone to collect force and acceleration data to investigate Newton's second law of motion.

HS **Learning and Teaching STEM Through Game Design**

(Grades 9–12) *St. George 114, Gaylord Palms*

Meredith Thompson (@Meredith_M_T; *meredith.m.thompson@gmail.com),* Harvard University, Cambridge, Mass.

Games are serious fun and a great way to motivate STEM learning. Let's explore how to engage students in designing games.

LE **Launching an Elementary STEM Program**

(Grades P–5) *Tampa 2, Gaylord Palms*

Kim Stilwell (@kimstilwellnsta; *kstilwell@nsta.org),* Manager, New Business Development, NSTA, Arlington, Va.

Need ideas for where to start with building an elementary STEM program or enhancing your current program? The initial steps in building an elementary STEM program can be an overwhelming thought. Presenters will share their success stories and how using *Picture-Perfect Science* resources became part of the foundation to a successful implementation. Leave with links to helpful resources and ideas on how to start an elementary STEM program.

LE **STEMulating Students' Natural Curiosities Through Literature**

(Grades P–3) *Tampa 3, Gaylord Palms*

Frances Hamilton *(franceshamilton87@gmail.com)* and **Sandra Lampley** *(sandra.lampley@uah.edu),* The University of Alabama in Huntsville

Investigate ways to tap into students' natural curiosities by exploring strategies for integrating reading with STEM activities.

8:00–9:00 AM Exhibitor Workshops

Science Teacher, STEM Teacher…What's the Difference?

(Grades K–11) *Naples 1/2, Gaylord Palms*

Sponsor: STEMscopes

Judy Zimny *(jzimny@acceleratelearning.com),* Accelerate Learning, Inc., Houston, Tex.

When teachers transition from science to STEM, many things change. The actions teachers select still meet the needs of their students, but now incorporate 21st-century skills, problem solving, and the design practices of scientists and engineers. As you shift to STEM, why not earn a National Certificate for STEM Teaching?

What Does Argumentation Look Like in an Elementary Classroom?

(Grades K–5) *Osceola 2, Gaylord Palms*

Sponsor: Delta Education/School Specialty Science–FOSS

Darrick Wood, Distance Learning Coordinator, Louisville, Ky.

Kathy Armstrong, Northside Elementary School, Midway, Ky.

Join FOSS Next Generation Program consultants to learn about science practices within the context of active investigations. Experience analyzing and interpreting data, constructing explanations, and engaging in argumentation from evidence as tools to deepen student learning within a FOSS lesson.

Investigate Evolution and Practice STEM Skills with Middle School and Early High School Students

(Grades 7–10) *Osceola 4, Gaylord Palms*

Sponsor: HHMI BioInteractive

Mary Williams *(mawilliams@altamontschool.org),* The Altamont School, Birmingham, Ala.

Learn how to use HHMI BioInteractive's free evolution resources to provide students with opportunities to work with scientific data. BioInteractive's engaging multimedia resources facilitate understanding natural selection, adaptation, and diversity through analyzing and interpreting data, as well as using evidence to construct explanations.

Reclaiming the Metal
(Grades 6–8) *Osceola 5, Gaylord Palms*
Sponsor: Lab-Aids, Inc.
Amy Reijmer, Oconee Middle School, Bogart, Ga.
From the SEPUP middle level physical science program, participants role-play a scenario involving pretreatment of copper containing liquid wastes from computer circuit board manufacture. They examine trade-offs of metal replacement and chemical precipitation, techniques actually used in industrial applications, and in so doing, come to understand the science behind complex environmental issues.

Left at the Scene of the Crime: Introduction to Forensic Science
(Grades 6–College) *Osceola 6, Gaylord Palms*
Sponsor: Edvotek Inc.
Danielle Snowflack *(info@edvotek.com),* Edvotek Inc., Washington, D.C.
Explore genetic diversity using forensic science! Your students become crime scene investigators as they analyze biological evidence using DNA fingerprinting, a technique that identifies people via genetic differences. Gel electrophoresis is used to create DNA fingerprints from crime scene and suspect samples. A match between samples suggests which suspect committed the crime. Receive a free gift for attending.

Out-of-School STEM Enrichment: AEOP Program Design Collaboration
(Grades K–12) *Sarasota 1/2, Gaylord Palms*
Sponsor: AEOP
Jarod Phillips, GEMS Project Manager, U.S. Army Educational Outreach Program, NSTA, Arlington, Va.
Come learn about what AEOP can do for your students' STEM enrichment outside of school time! The Army Educational Outreach Program (AEOP) sponsors Out-of-School programs across the nation for K–12 students. You will get a chance to work with colleagues in developing your ideal (fictional) program and seeing how it stacks up to the programs offered by AEOP!

9:15 AM–3:00 PM Exhibits

Hall C, Gaylord Palms
Come stroll through the exposition picking up tips, product samples, and ideas to spark your imagination. Please note that no sessions are scheduled from 12 Noon to 1:30 PM during our exclusive exhibit hall hours.

9:30–10:30 AM Featured Panel

Shift Makers: How Informal Educators Are Making a Shift to Better Support STEM and Learner-Centered Science
(General) *Osceola A, Gaylord Palms*

Organizer: **Karen Hays** *(khays@denverzoo.org),* Youth Programs Manager, Denver Zoo, Denver, Colo.

Panelists:
Cynthia Jones *(cynthiaj@thehenryford.org),* General Manager, Henry Ford Museum and Ford Rouge Factory Tour, The Henry Ford, Dearborn, Mich.
Seun Phillips *(seun.phillips@mi-sci.org),* Vice President of Education and Engagement, Michigan Science Center, Detroit
Heather Norton, Vice President of Education, Orlando Science Center, Orlando, Fla.

Exciting forces are influencing science education today—STEM education and the NRC *Framework.* Both provide teachers with opportunities and also challenges that cannot be addressed alone. Informal environments are ideal for STEM learning, as well as learner-centered interests and curiosities in science. What kinds of experiences are needed to support STEM learning and the science and engineering practices? How might your local informal science organizations be able to connect you and your students to careers in science and meaningful, authentic science experiences? Join this panel of informal science organizations to discuss how we should shift our STEM thinking to better support your STEM learning.

National Inventors Hall of Fame®

Inspiring future innovators

Where big ideas become the next big thing.®

By hosting **Invention Playground, Camp Invention, Club Invention** or **Invention Project,** you are partnering with the only nationally recognized programs backed by the **National Inventors Hall of Fame.**

The National Inventors Hall of Fame provides educators the strategies, materials and tools necessary to nurture curiosity into big ideas through STEM-based curricula in an out-of-school time setting.

Come visit us at Booth #513!

Programs for preschool through 9th grade students.
800.968.4332 | **invent.org/inspire**

To host a program in your community, send inquiries to **NIHFatmyschool@invent.org**

Camp Invention®

Invention Project®

Club Invention®

Invention Playground®

In partnership with the United States Patent and Trademark Office

9:30–10:30 AM Presentations

Pa **Targeted Interventions Through Skilled Peer Mentoring in University STEM Research Labs for Promoting STEM College and Career Readiness in High School Students**

(Grades 9–College) *Destin 1, Gaylord Palms*

Vicky Zygouris-Coe (@vzygouri; *vzygouri@ucf.edu),* University of Central Florida, Orlando

Hear about lessons learned from a partnership between a metropolitan university and a school district in an effort to improve high school students' STEM college and career readiness.

HS **Recruiting Underrepresented and Low-Income Students into STEM Research Programs**

(Grades 6–12) *Destin 2, Gaylord Palms*

CANCELED

Filomena Vine, Ed.W. Clark High School, Las Vegas, Nev.

Scientific research, participation in STEM competitions, and ongoing community support can be used for maximizing student achievement and for overcoming socioeconomic or ethnic barriers.

M **ASEE Session: Polar ICE: Bringing the Poles to Your Classroom**

(Grades 6–12) *Emerald 1, Gaylord Palms*

Liesl Hotaling *(lieslhotaling@yahoo.com),* Eidos Education, Highlands, N.J.

Networks of sensors and sensor platforms are being deployed across polar systems to provide near real-time data from the poles. Polar Interdisciplinary Coordinated Education (ICE) provides classroom access to the Antarctic and Arctic regions through polar data, observations, and interactions with the scientists. Polar ICE offers lessons and student research ideas available for immediate classroom implementation, as well as professional development workshops for teachers across the country.

UE **Developing Resilience in the Science Classroom**

(Grades K–8) *Emerald 3, Gaylord Palms*

Bonnie Laabs, Hamline Elementary School, St. Paul, Minn.

Gain a better understanding of how stress and trauma impact school success. Learn how to build a trauma-sensitive science classroom that promotes resiliency in learning.

LE **The "T" and "S" in STEM and Early Childhood: Helping Young Children Explore Their World**

(Grades P–3) *Emerald 5, Gaylord Palms*

Tamara Kaldor (@chiplaypro; @TEC_Center; *tkaldor@erikson.edu),* TEC Center at Erikson Institute, Chicago, Ill.

Screens and technology tools can become magnifying Roehriges, mirrors, and windows for young children's exploration of the world around them…and they can be powerful research tools.

A **Revolutionizing Education Through an Integrated STEAM Model**

(Grades 5–12) *Emerald 7, Gaylord Palms*

Heather Soja *(heather_soja@uwharriecharter.org)* and **Casey Harris** *(casey_harris@uwharriecharter.org),* Uwharrie Charter Academy, Asheboro, N.C.

Explore ways to boldly lead your school or district to transform education by integrating STEAM across the curriculum with the support of community partners.

M **Igniting Student Interest and Learning in Engineering: Classroom Applications/Tools/Resources from the 2016 Northrop Grumman Foundation Teachers Academy Fellows**

(Grades 5–8) *Gainesville 1, Gaylord Palms*

Jennifer Basalari *(jennifer.basalari@ocps.net),* Lakemont Elementary School, Winter Park, Fla.

Kara Mathews *(mathews.kara@brevardschools.org),* Central Middle School, Melbourne, Fla.

Steve Kirsche *(stephen.kirsche@stjohns.k12.fl.us),* Liberty Pines Academy, Saint Johns, Fla.

Come learn and experience how a cohort of middle school teachers gained a better understanding of the knowledge and skills needed in the corporate and industrial community for a scientifically and technologically literate workforce and how these experiences may be translated into classroom applications.

UE **WIDA Session: Doing and Talking Science with ELLs**

(Grades 3–8) *Osceola B, Gaylord Palms*

Rita MacDonald *(rkmacdonald@wisc.edu),* Wisconsin Center for Education Research, Madison

WIDA stands for World-Class Instructional Design and Assessment. Discover through video examples and discussion how to implement discourse facilitation moves to strengthen students' reasoning and complex language in ways fully inclusive of English language learners.

HS **Teaching Students to Ask Their Own STEM Questions**
(General) *Palm Beach, Gaylord Palms*
Sarah Westbrook (@rightquestion; *sarah.westbrook@rightquestion.org)* and **John Sessler** *(sslerjohn@gmail.com),* The Right Question Institute, Cambridge, Mass.
How can STEM educators strengthen all students' question-asking skills? Explore the Question Formulation Technique (QFT), a simple yet powerful step-by-step process that teaches students how to produce, improve, and strategize on how to use their own questions. Work actively with classroom examples from elementary through higher education showing how the QFT is used to spark scientific inquiry and leave ready to immediately implement and share.

Pa **DNA Barcoding**
(Grades 10–College) *St. George 112, Gaylord Palms*
Jeff Dykes (*jdykes@wvc.edu*), Wenatchee Valley College at Omak Campus, Omak, Wash.
Are you interested in your students participating in a real-world research project? Find out about having them use DNA Barcoding to identify plants. The DNA target sequence is amplified by PCR (Polymerase Chain Reaction) and the DNA sequence is compared to a database of known organisms. Organisms not known are added to the database.

9:30–10:30 AM Hands-On Workshops

UE **Teaching Life Science Through STEM Integration: Bee-Friendly Projects**
(Grades 4–6) *Emerald 2, Gaylord Palms*
Drew Ayres *(dayres@purdue.edu),* Purdue University, West Lafayette, Ind.
Leave with a 12-lesson unit plan that is focused on teaching plant science, soil types, and engineering design/technology design.

UE **Beam vs. Suspension Bridges**
(Grades 3–5) *Emerald 4, Gaylord Palms*
Lukas Hefty (@LukasHefty; *heftyl@pcsb.org),* Pinellas County Schools, Largo, Fla.
Geraldina Ruso *(rodriguez.geri@gmail.com),* Douglas L. Jamerson, Jr. Elementary School, Saint Petersburg, Fla.
Use models to investigate the difference between beam and suspension bridges. Connect the investigation to a broader engineering unit focused on bridge design.

M **Climate Change and Nano-Bio-Sensor Science**
(Grades 5–8) *Emerald 6, Gaylord Palms*
Jonathan Bonner *(jonathan.bonner@rocketmail.com),* CFM Group, Tuscaloosa, Ala.
Karen Boykin *(kboykin@ua.edu),* The University of Alabama, Tuscaloosa
This Earth science module introduces emerging technology for reducing greenhouse gases with nano-bioplastics and 3D printers to tackle environmental issues students face in their lifetime.

HS **AAPT Session: Star Spectra Science**
(Grades 6–College) *Emerald 8, Gaylord Palms*
Dolores Gende (@AAPTHQ; @dgende; *dgende@gmail.com),* North Broward Preparatory School, Coconut Beach, Fla.
Use colored buttons and balloons to simulate how astronomers analyze spectra to learn about star composition, color, black body radiation curves, and luminosity.

M **Energy Carnival**
(Grades 6–8) *Orange Blossom Ballroom, Gaylord Palms*
Kimberly Stalker (@KimStalker; *kimestalker@gmail.com)* and **Melissa Szentmiklosi** *(melissa_szentmiklosi@scps.k12.fl.us),* South Seminole Middle School, Casselberry, Fla.
Discover how creativity can get learners excited by infusing Energy *NGSS* with carnival attraction stations, where the final goal is creating an "Energetic" attraction!

Pa **Planning and Designing Safe and Sustainable Science Facilities for STEM-Based Science (Science Facilities 101)**
(Grades K–12) *Sarasota 3, Gaylord Palms*
LaMoine Motz *(llmotz@comcast.net),* 1988–1989 NSTA President, and The Motz Consulting Group, White Lake, Mich.
So you want new science facilities? Does your curriculum define your science teaching facility? With more than 20 years of conducting visits and presentations of new/renovated school science facilities, the author team of *NSTA Guide to Planning School Science Facilities* (2nd ed.) will present the "basics" of science facility planning for safe, ergonomically designed, and sustainable facilities.

Pa **A STEM Teacher Experience—Army Educational Outreach Program (AEOP): RESET**

(Grades 6–12) *St. George 104, Gaylord Palms*

Lindsey Dahl *(ldahl@eriesd.org),* Woodrow Wilson Middle School, Erie, Pa.

Join me for an interactive session that will provide you with access to STEM lessons that follow the legacy cycle. You'll also find out how you can be part of a community of STEM educators through the Research Experiences for STEM Educators and Teachers (RESET) program sponsored by AEOP.

M **Connect-an-Engineer**

(Grades 5–9) *St. George 108, Gaylord Palms*

Jeffery Townsend *(scott.townsend@eku.edu)* and **Mary Lamar** *(mfl37660@gmail.com),* Eastern Kentucky University, Corbin

Introduce middle schoolers to the general field of engineering, specific sub-disciplines of engineering, and connections to their everyday lives. Free lessons and unit plan materials!

M **STEAM Projects, Digital Science Fairs, and Student Performances**

(Grades 5–12) *St. George 114, Gaylord Palms*

David Lockett (@DavidJLockett; *david.lockett@lwcharterschools.com),* Edward W. Bok Academy, Lake Wales, Fla.

Having trouble helping students conceptualize science fair projects, STEAM performances, and other competitions? Discover an effective method for teaching students to design experiments from simple investigations. Learn integration strategies that provide a better way to integrate science, literacy, and technology.

LE **"STEAM" Up Your Classroom with Cool Design Challenges!**

(Grades K–4) *Tampa 1, Gaylord Palms*

Caryn Walker *(caryn.walker@jefferson.kyschools.us),* Jefferson County Public Schools, Louisville, Ky.

Laura Keeling *(laura.keeling@jefferson.kyschools.us),* Tully Elementary School, Louisville, Ky.

Come join our exploration of how the engineering design process can support STEAM education and classroom instruction. We will create, design, test, and improve!

LE **Literacy + STEM = A Launchpad for Success**

(Grades P–3) *Tampa 2, Gaylord Palms*

Kalynda Pearce (@LovSunshine1115; *kjpearce8@msn.com),* Lake Ridge Elementary School, Nampa, Idaho

Quincey Williamson *(qwilliamson@nsd131.org),* Nampa (Idaho) School District 131

We invite teachers to engage in strategies that use picture books and science challenges to increase the learning and language opportunities, particularly for English language learners.

LE **Unlock the Gardening Experience**

(Grades P–3) *Tampa 3, Gaylord Palms*

Mary Hess *(marylynn_hess@scps.us),* Goldsboro Elementary Magnet School, Sanford, Fla.

Unearth meaningful, innovative approaches to effectively engage learners through gardening, using real-world experiences that support *NGSS.* Discover the latest research that supports STEM education.

9:30–10:30 AM Exhibitor Workshops

Make Science Night Meaningful with STEMrangers

(Grades 3–12) *Naples 1/2, Gaylord Palms*

Sponsor: STEMscopes

Reid Whitaker *(reid@acceleratelearning.com)* and **Lisa Webber** *(lwebber@acceleratelearning.com),* Accelerate Learning, Inc., Houston, Tex.

Designed with Phillipe Cousteau and EarthEcho International, STEMrangers is a school science night kit that empowers students, teachers, and parents to take on real-world problems and understand their role in solving them.

Integrating Chromebook and BYOD with Vernier Technology

(Grades 3–12) *Naples 3, Gaylord Palms*

Sponsor: Vernier Software & Technology

David Carter *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.

Participate in fun and engaging experiments that compare grip strengths, investigate pressure/volume relationships, and match position graphs, all using Vernier digital tools with Chromebooks or BYOD. See how sensor-based experiments teach students about data collection and analysis—practices that promote STEM inquiry, improve STEM literacy, and authentically boost test scores.

Keep Your Head Above Water with Magnetic Water Molecule Models

(Grades 6–College) *Osceola 1, Gaylord Palms*

Sponsor: 3D Molecular Designs

Kristine Herman *(kris.herman@3dmoleculardesigns.com),* 3D Molecular Designs, Milwaukee, Wis.

Engage students by modeling chemical and physical properties of water using hands-on/minds-on magnetic water molecules. Explore common water phenomena such as density, erosion, and weathering. Explain the phases of water, density, and solubility. Elaborate on the water cycle and its impact on the ecosystem. Evaluate student learning with models.

Make Sure Your Makerspace Has Options for All Students!

(Grades K–8) *Osceola 2, Gaylord Palms*

Sponsor: Delta Education/Frey Scientific

Darrick Wood, Distance Learning Coordinator, Louisville, Ky.

Kathy Armstrong, Northside Elementary School, Midway, Ky.

For students to develop the proper range of skills required of "makers," a makerspace should provide tools and resources to help them grow as scientists. Many makerspaces now include supplemental curriculum options that give students, curious about science, resources designed for exploring classroom concepts in a maker setting.

Space-Docking Failure: Phenomena, 3-D Instruction, and Amplify Science for Grades 6–8

(Grades 6–8) *Osceola 3, Gaylord Palms*

Sponsor: Amplify

Carissa Romano *(amplifyscience@berkeley.edu)* and **Sophia Lambertsen** *(amplifyscience@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley

Experience how students investigate a failed spacecraft docking while figuring out principles of force and motion and engaging in three-dimensional learning. Participants will get a hands-on dive into Amplify Science for grades 6–8, engaging with this new *NGSS*-designed curriculum from The Lawrence Hall of Science.

Plunging into Data About Climate Change and Coral Bleaching

(Grades 9–College) *Osceola 4, Gaylord Palms*

Sponsor: HHMI BioInteractive

Scott Sowell *(sowells@duvalschools.org),* Darnell-Cookman School of the Medical Arts, Jacksonville, Fla.

Immerse students in authentic data about the phenomenon of coral bleaching and its connection to climate change. Using a free inquiry-based activity developed by HHMI BioInteractive, participants will construct, analyze, and interpret graphical representations of data to generate conclusions about the effects of climate change on coral reefs worldwide.

***NGSS* Waves: Make an Abstract Concept Become Visible!**

(Grades 6–8) *Osceola 5, Gaylord Palms*

Sponsor: Lab-Aids, Inc.

Amy Reijmer, Oconee Middle School, Bogart, Ga.

Experience two exemplary *NGSS*-focused activities from SEPUP. Anchored in the context of health issues around various types and levels of wave exposure, activities model seamless integration of the three dimensions, ELA, and math standards. We will explore the relationship between visible light frequency and energy through the use of a phosphorescent material and use light boxes to explore reflection and refraction.

Beyond the Punnett Square

(Grades 7–College) *Osceola 6, Gaylord Palms*

Sponsor: B.A.C.K. for Learning

Mary Holland *(mholland@backforlearning.com),* B.A.C.K. for Learning, Casa Grande, Ariz.

We have all taught genetics and probability using the traditional Punnett square. What if you could use hands-on kits that interconnect the concepts of cell division, inheritance, and protein synthesis? More than just kits, this workshop incorporates a method of teaching that will have you teaching more and grading less.

Flinn Scientific's STEM Design Challenge™ Activities

(Grades 6–12) *Sarasota 1/2, Gaylord Palms*

Sponsor: Flinn Scientific, Inc.

Janet Hoekenga *(jhoekenga@flinnsci.com),* Flinn Scientific, Inc., Batavia, Ill.

This hands-on interactive workshop will help you integrate STEM scientific inquiry and engineering design principles into your curriculum. Join Flinn Scientific in a "build-it-yourself" lab project that will actively engage students and increase their understanding of concepts that cut across scientific disciplines. Interactive demonstrations highlight science and engineering practices such as reasoning based on the evidence. Handouts for all activities!

10:30 AM–12 Noon Special Session

Elementary STEM Showcase!

(Grades P–5) *Exhibit Hall C, Gaylord Palms*

Sponsored by Pitsco Education and Squishy Circuits

Organized by ***Linda Froschauer*** (fro2@me.com), *2006–2007 NSTA President, Pasadena, Calif.*

Karen Ansberry *(karen@pictureperfectscience.com)* and **Emily Morgan** *(emily@pictureperfectscience.com),* Picture-Perfect Science, West Chester, Ohio
Chris Barton, Author, Austin, Tex.
Sarah B. Bush *(sarah.bush@ucf.edu),* University of Central Florida, Orlando
Kristin Cook *(kcook@bellarmine.edu),* Bellarmine University, Louisville, Ky.
Shelly L. Counsell *(slcnsell@memphis.edu),* The University of Memphis, Tenn.
Richard Cox, Jr. *(richard.cox@bullitt.kyschools.us),* Old Mill Elementary School, Mount Washington, Ky.
Barbara Ehlers *(ehlersb@uiu.edu),* Upper Iowa University, Fayette
Joan Gillman *(joan.gillman@calhoun.org),* The Calhoun School, New York, N.Y.
Rachelle Haroldson *(rachelle.haroldson@uwrf.edu),* University of Wisconsin–River Falls
Lukas Hefty *(heftyl@pcsb.org),* Pinellas County Schools, Largo, Fla.
Kate Hutchinson, Museum of Science, Boston, Mass.
Shana Keller *(shanakeller@yahoo.com),* Author, Pittsburgh, Pa.
J. Carrie Launius *(janetcarrie@gmail.com),* NSTA Director, District XI, Saint Louis, Mo.
Julie V. McGough *(mrmagoojulie2@att.net),* Valley Oak Elementary School, Fresno, Calif.
Lori Norton-Meier *(lori.nortonmeier@louisville.edu),* University of Louisville, Ky.
Lisa Nyberg (*lnyberg@csufresno.edu),* California State University, Fresno
Melissa Parks *(mparks@stetson.edu),* Stetson University, Deland, Fla.
Felicia Peat *(fpeat@wkno.org),* WKNO–Public Broadcasting of the Mid-South, Cordova, Tenn.
Christine Anne Royce *(caroyce@aol.com),* NSTA President-Elect, and Shippensburg University, Shippensburg, Pa.
Ann Rubino *(maudthemarmot@gmail.com),* Retired Educator, Shorewood, Ill.
Stephanie Selznick *(sselznick71@gmail.com),* Endeavor Elementary School, Orlando, Fla.

Melissa Sleeper *(melissa.sleeper@indianriverschools.org),* Gifford Middle School, Vero Beach, Fla.
Jennifer Swanson *(jennifer@jenniferswansonbooks.com),* Author, Jacksonville, Fla.
Juliana Texley *(texle1j@cmich.edu),* 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant
Megan Veldhuizen *(mrsveldhuizen@gmail.com),* Lawton (Okla.) Public Schools
Laurie Wallmark *(laurie@lauriewallmark.com),* Raritan Valley Community College, North Branch, N.J.

The Elementary STEM Showcase brings together approximately 30 leaders in STEM education who will provide a variety of preK–5 STEM teaching strategies and resources. Featured materials include NSTA Press® books, award-winning books from the Best STEM Books list, and strategies from the NSTA preK–5 journal, *Science & Children. NGSS* connections to student experiences will be highlighted during this flea market–style sharing experience where participants will engage in hands-on activities and interact with presenters about STEM investigations.

Participants will learn from this energy-filled experience and leave with ideas to use with students and colleagues. The Elementary STEM Showcase will be one of the featured events held during the STEM Forum & Expo, as well as the only elementary session provided during the Thursday 10:30 AM–12 Noon time slot.

Free copy of *Bringing STEM to the Elementary Classroom* to the first 10 participants PLUS all attendees have a chance to win an iPad!

11:00 AM–12 Noon Presentations

Pa **Enhancement of Education Through a STEM Pipeline Partnership Model: Engaging K–12, Community College, and University Students with a Focus on Genetics and GMOs**

(Grades 9–College) *Destin 1, Gaylord Palms*

Tara Turley-Stoulig *(tturley@selu.edu),* Southeastern Louisiana University, Hammond

I'll share an approach and results of student exposure to technologies with rapidly advancing fields involving GMO investigation and scientific literacy creating a broad impact at progressive STEM levels.

HS **How We, as Educators, Can Increase the Number of Women of Color in the Field of STEM**

(Grades 9–College) *Destin 2, Gaylord Palms*

Shonnileigh Westcarth, Nova Southeastern University, Fort Lauderdale, Fla.

Let's discuss how we, as educators, can increase the number of minority women in the field of STEM.

M **ASEE Session: AMP-Up Middle School Science and Math Through STEM Connections Classrooms**

(Grades 6–8) *Emerald 1, Gaylord Palms*

Jeffrey Rosen *(jeff.rosen@ceismc.gatech.edu),* CEISMC, Georgia Institute of Technology, Atlanta, Ga.

Receive an overview of the integrated middle school curriculum materials designed as part of the AMP-IT-UP NSF Math/Science Partnership project. The materials, created for STEM Connections classes and core math and science courses, are available for free download.

Pa **What's Happening with STEM in Libraries?**

(General) *Emerald 5, Gaylord Palms*

Chandra Jones *(cjones@denverlibrary.org),* Denver Public Library, Denver, Colo.

Find out what's happening with STEM in school and public libraries, and leave with projects you can use right away.

A **You Can't Have STEM Without Science: Combating the Barriers to Elementary Science Education**

(Grades K–5) *Emerald 7, Gaylord Palms*

Heidi Brennan (@heidibrennan13; *heidi.brennan@fldoe.org),* Florida Dept. of Education, Tallahassee

This panel discussion with be facilitated by Heidi Brennan, the elementary science specialist with the Florida Department of Education. Administrators from across the state will discuss how they support science instruction and overcome issues such as funding and time management.

M **Colonizing Mars with Minecraft**

(Grades 5–8) *Gainesville 1, Gaylord Palms*

Selene Willis (@mswillisscience; *mswillisscience@gmail.com),* **Mandy Howell** (@mrshowellmath; *mhowell@shorecrest.org),* and **Sandra Janack** *(sjanack@shorecrest.org),* Shorecrest Preparatory School, St. Petersburg, Fla.

Take your middle school students to Mars using Minecraft. Learn about this collaborative science and math unit that teaches more than the solar system and geometry through the science of space exploration.

M **Creating Android Apps in the Science Classroom**

(Grades 6–9) *Gainesville 2, Gaylord Palms*

Hector Telford (*hector@hu-ms2.org*), Howard University Middle School of Mathematics and Science, Washington, D.C.

Explore the use of MIT App Inventor to create android apps to enhance teaching and learning in science. Participants will learn how students can use this program to explore and reinforce scientific concepts. (Participants need an Android phone or tablet.)

HS **Corrosion: The Application of Redox Chemistry**

(Grades 6–12) *Orange Blossom Ballroom, Gaylord Palms*

Sherri Rukes *(sherri.rukes@d128.org),* Libertyville High School, Libertyville, Ill.

Join me for labs, demonstrations, and examples that make oxidation reductions and corrosion engineering more exciting, practical, and easy to teach and learn. Pick up connections to all areas of science and engineering (STEM) and a CD of information.

HS **NCTM Session: Teaching Matters! Turn High-Quality Standards into Successful STEM Learning**

(General) *Osceola B, Gaylord Palms*

Diane Briars *(djbmath@comcast.net),* National Council of Teachers of Mathematics, Pittsburgh, Pa.

Explore eight research-based teaching practices that produce high levels of STEM learning. I'll show you how to implement these practices in your classroom and share common pitfalls to avoid.

Pa **K–12 STEM Outreach Opportunities with the Department of Defense**

(General) *Palm Beach, Gaylord Palms*

Richard Baker *(richard.baker.1@us.af.mil),* U.S. Air Force STEM Outreach Programs, Dayton, Ohio

This session is presented by the directors of the DoD K–12 STEM Outreach Opportunities with the Department of Defense. The Army, Navy, and Air Force, along with dozens of other Department of Defense agencies, provide numerous outreach opportunities to children, teachers, and schools across the country. We will highlight these activities and provide you with information on how to get involved with DoD STEM outreach!

HS **High-Paying STEM Careers in the Medical Field That Use the *NGSS* Life Science Performance Expectations**

(Grades 9–12) CANCELED *St. George 102, Gaylord Palms*

Alejandro Meléndez *(amelendez@lsc.org),* Liberty Science Center, Jersey City, N.J.

Experience the opportunity to speak with a surgical team, discuss careers pathways, and watch a surgical procedure!

Pa **Practicing the Art of Teaching Through Simulations and Games**

(Grades 9–12) *St. George 106, Gaylord Palms*

Meredith Thompson (@Meredith_M_T; *meredith.m.thompson@gmail.com),* Harvard University, Cambridge, Mass.

We will share and play a set of open-source games for teacher skills designed in collaboration with teachers, districts, and schools of education.

M **Hope on the Horizon: STEM, PBL, and Service Learning for Middle School Students**

(Grades 6–8) *Tampa 1, Gaylord Palms*

Matt Ehresman (@ehresman79; *ehresmanm@centergrove.k12.in.us),* Center Grove Community School Corp., Greenwood, Ind.

Use STEM, PBL, and online/blended learning to create opportunities for middle school students to solve problems on a global scale.

M **Going Green! Development of an Online Teacher Institute for Implementing a Hands-On Climate Change Curriculum**

(Grades 5–8) *Tampa 2, Gaylord Palms*

Rhonda Christensen *(rhonda.christensen@gmail.com)* and **Gerald Knezek** *(knezek@unt.edu),* University of North Texas, Denton

Introducing an online professional development institute to sustain and expand hands-on STEM curricular activities related to standby power and climate change.

11:00 AM–12 Noon Hands-On Workshops

HS **CHANGE the Way You Teach Climate Change: A Multidisciplinary STEM Approach**

(Grades 9–12) *Emerald 4, Gaylord Palms*

Allan Feldman *(afeldman@usf.edu)* and **Linda Schmitt** *(linda.schmitt@sdhc.k12.fl.us),* University of South Florida, Tampa

Tracy Flanagan *(tracy.flanagan@sdhc.k12.fl.us),* Strawberry Crest High School, Dover, Fla.

Participate in a role-playing STEM game about the mitigation of storm surge as scientists, engineers, policy-makers, etc. and learn about the NSF-funded CHANGE curriculum project.

Pa **What Happens in Vegas Ends Up Going to the Landfill: A Unique Partnership Highlighting the Vegas Waste Stream**

(Grades 4–12) *Emerald 6, Gaylord Palms*

Craig Rosen (@RosenCraig; @greenpowerdri; *craig.rosen@dri.edu),* Desert Research Institute, Las Vegas, Nev.

Mackenzie Peterson *(mackenzie.peterson@dri.edu),* Desert Research Institute, Reno, Nev.

Presider: Leah Madison *(leah.madison@dri.edu),* Desert Research Institute, Reno, Nev.

We will highlight a unique partnership in Las Vegas that provided free professional development and hands-on lessons on the waste stream, from the Vegas strip to the landfill.

Pa **The Architects Have Started Without Me: What Do I Do Now? (Science Facilities 102)**

(Grades K–12) *Sarasota 3, Gaylord Palms*

LaMoine Motz *(llmotz@comcast.net),* 1988–1989 NSTA President, and The Motz Consulting Group, White Lake, Mich.

Is your district planning for new science facilities? Are you involved? If not, you need to before it is too late. In an advanced course (An Extension of Science Facilities 101 session) the NSTA author team for *NSTA Guide to Planning School Science* Facilities (2nd ed.) will present more detailed information and examples of safe, ergonomically correct, and functional science facilities for STEM-based science. Budgeting, working with the architect, technology, and special adjacencies will also be presented.

M **STEM and Your Food Choices: The Connections**

(Grades 5–8) *St. George 104, Gaylord Palms*

Miriam Cooper (@mimcooper; *mimcooper63@gmail.com),* Science and Our Food Supply Facilitator, Green Cove Springs, Fla.

Using free FDA hands-on resources, learn how to help students take control of their health by exploring the association between food choices and disease.

M **Ahoy! STEM Mates: Let's Explore the Engineering Design Process**

(Grades 5–9) *St. George 108, Gaylord Palms*

Matt Kempton and **Michael Carraway** *(michael.carraway@ccboe.net),* Lakeside Middle School, Evans, Ga.

In STEM, science and math connections to other disciplines become relevant. Explore the engineering design process by designing a boat powered by kinetic and potential energy using the provided materials. Leave with a lesson plan you can use immediately.

HS **AACT Session: Building a Gas Law Unit Plan Using American Association of Chemistry Teachers (AACT) Resources**

(Grades 9–12) *St. George 112, Gaylord Palms*

Kimberly Duncan (@chemduncan; @AACTconnect; *k_duncan@acs.org),* American Association of Chemistry Teachers, Washington, D.C.

Join us as we show you how to put together a successful unit plan using the wide variety of classroom resources available on AACT's website.

HS **Spanning the "STEM" Acronym: Bridging Science and Math**

(Grades 8–12) *St. George 114, Gaylord Palms*

Jeffrey Lukens *(jeffreylukens0613@gmail.com),* Sioux Falls (S.Dak.) School District

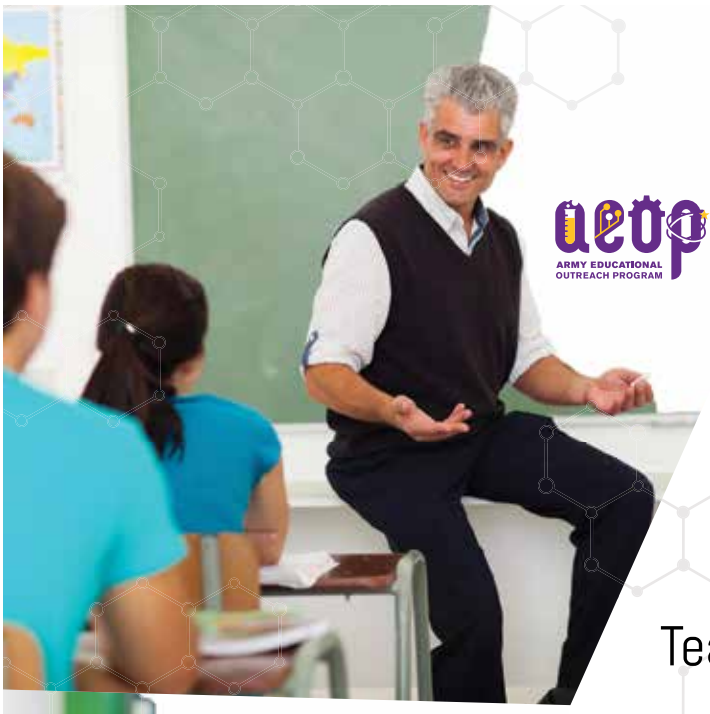
Science and math are the "bookends" of STEM education. Integrating science and math can be seamless, natural, and painless. Come join the fun as we collect and analyze data!

HS **Using Puzzling Phenomena and Modeling in Diverse Classrooms**

(Grades 9–12) *Tampa 3, Gaylord Palms*

Kat Lucido, Wendell Phillips Academy High School, Chicago, Ill.

Join me for this interactive talk that will lead you through the planning, implementation, and assessment of a unit planned around puzzling phenomena and the *NGSS.*



ARMY EDUCATIONAL OUTREACH PROGRAM

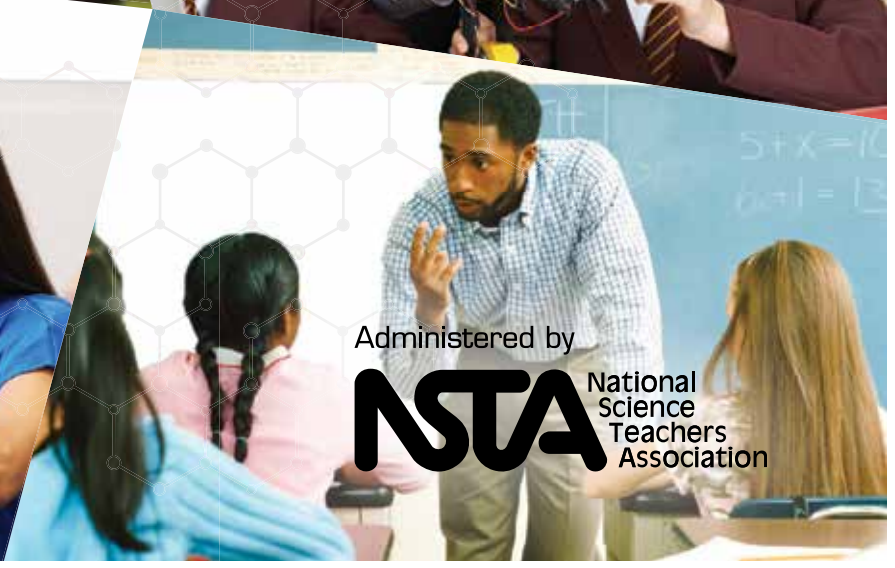
eCYBERMISSION
ACCEPT THE CHALLENGE

U.S.ARMY

eCYBERMISSION is a national web-based STEM competition for students in grades 6-9.

Teachers can apply for Mini-Grants to support the implementation of student projects.

www.ecybermission.com/AdvisorResources



Administered by

National Science Teachers Association

11:00 AM–12 Noon Exhibitor Workshops

DIVE-IN to Engineering by STEMscopes

(Grades 5–8) *Naples 1/2, Gaylord Palms*

Sponsor: STEMscopes

Reid Whitaker *(reid@acceleratelearning.com)* and **Lisa Webber** *(lwebber@acceleratelearning.com),* Accelerate Learning, Inc., Houston, Tex.

In this interactive, engaging, and hands-on session, the DIVE (Deconstruct, Imitate, Vary, and Explore) process is investigated. Facilitation techniques are modeled as collaboration and consensus are also challenged. Come check out our new grades 5–8 engineering products called DIVE-in Engineering!

Integrating BYOD and Chromebook with Vernier Technology

(Grades 3–12) *Naples 3, Gaylord Palms*

Sponsor: Vernier Software & Technology

David Carter *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.

Participate in fun and engaging experiments that compare grip strengths, investigate pressure/volume relationships, and match position graphs, all using Vernier digital tools with BYOD or Chromebooks. See how sensor-based experiments teach students about data collection and analysis—practices that promote STEM inquiry, improve STEM literacy, and authentically boost test scores.

Enzymes! Breaking It Down and Building It Up

(Grades 9–College) *Osceola 1, Gaylord Palms*

Sponsor: 3D Molecular Designs

Gina Vogt *(gina.vogt@3dmoleculardesigns.com),* MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Engage your students in investigating enzyme structure/function using multiple modeling strategies. Explore and explain catabolism, anabolism, and competitive/noncompetitive inhibition with hands-on/minds-on instructional materials. Elaborate on insecticide inhibition at an enzyme active site resulting in unintended consequences. Evaluate student learning with an enzyme molecular story. Handouts!

CPO Science Engineering Design: Learning About Collisions and Restraints

(Grades 5–12) *Osceola 2, Gaylord Palms*

Sponsor: CPO Science/Frey Scientific

Kat Mills, School Specialty Science, Rosharon, Tex.

See STEM standards that integrate middle school and high school physical science ideas in action. Step through the CPO Science engineering cycle in a collaborative 1:1 student platform. Use your creativity as you build a basis for understanding the dynamics of collisions in vehicle-related incidents. Learn how Newton's third law, conservation of energy, and momentum play a role.

The Mystery of Poisonous Newts: Phenomena, 3-D Instruction, and Amplify Science for Grades 6–8

(Grades 6–8) *Osceola 3, Gaylord Palms*

Sponsor: Amplify

Carissa Romano *(amplifyscience@berkeley.edu)* and **Sophia Lambertsen** *(amplifyscience@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley

Experience how students investigate a population of deadly newts while figuring out principles of natural selection and engaging in three-dimensional learning. Participants will get a hands-on dive into Amplify Science for grades 6–8, engaging with this new K–8 *NGSS*-designed curriculum from The Lawrence Hall of Science.

Using HHMI BioInteractive Resources to Bring Math into the Biology Lesson

(Grades 9–College) *Osceola 4, Gaylord Palms*

Sponsor: HHMI BioInteractive

Robin Bulleri *(rbulleri@chccs.k12.nc.us),* Carrboro High School, Carrboro, N.C.

Looking for engaging and authentic ways to use quantitative analysis in your high school biology lessons? We will share free classroom-ready HHMI BioInteractive resources that use ecology (Great Elephant Census) and natural selection (Galápagos Finches) to expose students to computational thinking.

STEM in Action: What eCYBERMISSION Can Do for You

(Grades 6–9) *Sarasota 1/2, Gaylord Palms*

Sponsor: AEOP

Erin Lester, eCYBERMISSION Project Manager, U.S. Army Educational Outreach Program, NSTA, Arlington, Va.

Learn about this online STEM competition with NO registration fee from those who have participated. Also, find out how to implement this project-based learning experience in your grades 6–9 classrooms, with mini-grants available to participants!

1:30–2:30 PM Featured Panel

A Administrators' Panel: The Global Context for STEM Education

(General) *Osceola A, Gaylord Palms*

Moderator: **Tiffany Huitt** *(thuitt@dallasisd.org),* Administrators Strand Leader, and Principal, School of Science and Engineering Magnet, Dallas, Tex.

Panelists:
Karim Virani *(karim.virani@bigthought.org),* Information Technology Director, Big Thought, Dallas, Tex.
Jenny Christian *(jechristian@dallasisd.org),* Science Director, STEM Department, Dallas (Tex.) ISD
Meghan Groome *(mgroome@nyas.org),* Senior Vice President of Education, The New York Academy of Sciences, New York
Daniel Bartels *(daniel_bartels@collegiate-va.org),* STEAM Coordinator, Middle and Upper Schools at Collegiate School, and Director of Integrative STEM Education, CodeVA, Richmond, Va.

How do you prepare students for jobs that do not exist? How do you prepare students with skills that educators may not possess? Millions of the good jobs now and in the future will require high-tech skills, but in the U.S. there is a shortage of young people prepared to step into those roles. STEM knowledge is crucial to 21st-century skills, including computer programming, robotics, medical technology, and the operation of advanced machinery. Yet the U.S. Department of Education says only 16% of American high school seniors are proficient in math and interested in a STEM career.

Our panel will identify transformational practices and strategies in STEM education needed to prepare the next generation with skills necessary to drive innovation and economic growth within a global context.

1:30–2:30 PM Presentations

Pa Designing Professional Development for STEM Integration

(Grades 6–8) *Destin 2, Gaylord Palms*

Drew Ayres *(dayres@purdue.edu)* and **Selcen Guzey** *(sguzey@purdue.edu),* Purdue University, West Lafayette, Ind.
The ability to integrate the STEM disciplines begins with effective professional development. We will explain successfully implemented professional development.

HS ITEEA Session: Makerspace and STEM Lab Safety

(General) *Emerald 1, Gaylord Palms*

Tyler Love (@UMES_Tech_Dept; *tslove@umes.edu),* University of Maryland Eastern Shore, Princess Anne
Design guidelines and instructional strategies for safer makerspaces and STEM labs will be discussed from Ken Roy (NSTA) and Tyler Love's (ITEEA) book.

UE PLUM LANDING: Rx to Explore—Creating a New Curriculum Pathway to Foster Urban Children's Interest in Outdoor STEM Learning

(Grades 2–4) *Emerald 3, Gaylord Palms*

Brianne Keith, WGBH Education, Brighton, Mass.
Join me as I present findings and new curricular materials from PLUM LANDING: Rx to Explore for outdoor STEM learning in urban areas for children ages 6–9.

UE Creating and Implementing STEM Curriculum Webs Across the Content Areas

(Grades K–6) *Emerald 5, Gaylord Palms*

Lisa Roberts (@GrandviewTigers; *lroberts@mccsc.edu)* and **Eddie Pierce** (@GrandviewTigers; *epierce@mccsc.edu),* Grandview Elementary School, Bloomington, Ind.
Hear how to connect STEM throughout all content areas, including art, music, and PE. We will take you through the process of creating a cross-curricular web.

M A Picture Is Worth a Thousand Words: Strategies to Support Superb Sketches in the Classroom

(Grades 2–12) *Gainesville 2, Gaylord Palms*

Gina Tesoriero (@Miss_STEM; *ginatesoriero@gmail.com),* M.S. 319 Maria Teresa Mirabal School, New York, N.Y.
Amanda Solarsh *(amandasolarsh@gmail.com),* Simon Baruch MS104, New York, N.Y.
Explore the importance of sketching within the engineering design process. To make their vision a reality, designers need to create sketches that speak for themselves. Learn how to support students' sketching abilities to prepare them for future careers.

HS **Using Models to Teach How Crime Scene Blood Spatter Evidence Tells a Story**
(Grades 9–College) *Orange Blossom Ballroom, Gaylord Palms*
Anthony Bertino *(abertino@nycap.rr.com),* Retired Educator, Schenectady, N.Y.
Patricia Nolan Bertino *(nolanp@nycap.rr.com),* Retired Educator, Schenectady, N.Y.
Using easy-to-understand, inexpensive models, participants apply math and physics to determine blood's direction, impact angle, area of convergence and origin, and if the evidence is consistent with eyewitness accounts. Handouts!

Pa **Partnership Bootcamp**
(General) *Osceola B, Gaylord Palms*
Sally Creel (@STEMSally; *sally.creel@cobbk12.org),* Cobb County School District, Marietta, Ga.
Effective STEM projects and programs embrace partnerships between the school and community. Where do you start? Partnership Bootcamp, that's where! Learn who to reach out to, how to ask, what to ask, and how to keep it going.

LE **NSTA Press® Session: Uncovering K–2 Students' Ideas in Science, Mathematics, and Engineering: STEM-Focused Formative Assessment**
(Grades P–2) *Palm Beach, Gaylord Palms*
Page Keeley, 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.
Before developing or implementing STEM lessons, it is important to uncover the ideas young students bring to the classroom that affect their learning and inform teaching.

HS **Do You Need a New Science Lab?**
(Grades 6–11) *St. George 102, Gaylord Palms*
Ruth Ruud *(ruudruth61@gmail.com),* Cleveland State University, Cleveland, Ohio
Win a Shell Science Lab Makeover ($20,000 value) for your school! Are you a middle school or high school science teacher in need of a science lab makeover? Attend this session and learn how you can apply to win the Shell Science Lab Makeover! You will have an opportunity to actually begin to complete the application and have your questions answered.

1:30–2:30 PM Hands-On Workshops

UE **Bringing STEM Discourse to Life with Stop-Motion Animation**
(General) *Emerald 2, Gaylord Palms*
Gayle Evans (@ufteach1; *gnevans@coe.ufl.edu)* and **Kristen Apraiz** *(kapraiz@coe.ufl.edu),* University of Florida, Gainesville
Stop-motion video is a powerful tool for stimulating discourse. Participants will film stories, analyze films for STEM concepts, and use films to guide discourse.

UE **The Marvelous, Miraculous Circus Machine!**
(Grades 2–8) *Emerald 4, Gaylord Palms*
Karen Bell *(karen@circusarts.org)* and **Robin Eurich** *(robin@circusarts.org),* The Circus Arts Conservatory, Sarasota, Fla.
Rebekka Stasny (@ascienceteacher; *ascienceteacher@gmail.com),* Rowlett Middle Academy, Bradenton, Fla.
Ladies and Gentlemen, boys and girls, children of all ages! The Circus Arts Conservatory in partnership with USF Center for PAInT proudly presents...The Marvelous, Miraculous Circus Machine! Inspired by cause and effect, chain reaction machines, and combined with the engineering feats of the circus, students will learn through trial and error scientific principles, including balanced and unbalanced forces, mass, and potential and kinetic energy.

UE **Designing Solutions: Using Roof Models to Explore Surface Water Runoff**
(Grades 4–6) *Emerald 6, Gaylord Palms*
Candace Lutzow-Felling *(cjl6b@eservices.virginia.edu),* Blandy Experimental Farm, Boyce, Va.
Debbie Biggs *(biggsd@clarke.k12.va.us),* Clarke County High School, Berryville, Va.
Participate in this hands-on session about a watershed systems unit. Design and engineer a roof model to explore the impacts of water runoff. Lessons provided.

LE **NSTA Press® Session: The Power of Investigating: Guiding Authentic Assessments**
(Grades P–6) *Sarasota 3, Gaylord Palms*
Lisa Nyberg (@docnyberg; *lnyberg@csufresno.edu),* California State University, Fresno
Julie McGough (@jvmcgough1; *mrmagoojulie2@att.net),* Valley Oak Elementary School, Fresno, Calif.
Learn hands-on strategies to launch investigations through questioning. Engage in collaboration, reading, and writing to bring science to life! Investigations will fuel student thinking and learning!

M **Using Inquiry-Based Learning to Activate Student Growth**

(Grades K–12) *St. George 104, Gaylord Palms*

CANCELED

Joe Ferrara, The University of Texas at Dallas, Richardson

Discover an inquiry-based approach to learning that engages and motivates students. Experience an introduction to instructional standards and PBL cases that can transform any classroom.

HS **Teaching Environmental Sustainability Using a Free Place-Based Watershed Model**

(Grades 8–12) *St. George 108, Gaylord Palms*

Carolyn Staudt (@cjstaudt; *cstaudt@concord.org),* The Concord Consortium, Concord, Mass.

Model My Watershed is a free web-based application that invites students to explore the condition of their local watershed with a scientifically valid watershed model.

HS **AACT Session: Building a Periodic Table Unit Plan Using American Association of Chemistry Teachers (AACT) Resources**

(Grades 9–12) *St. George 112, Gaylord Palms*

Kimberly Duncan (@chemduncan; @AACTconnect; *k_duncan@acs.org),* American Association of Chemistry Teachers, Washington, D.C.

Come learn how to put together a successful unit plan using the wide variety of classroom resources available on AACT's website.

HS **Building Mousetrap Vehicles to Integrate Science, Technology, Engineering, and Mathematics**

(Grades 6–College) *St. George 114, Gaylord Palms*

Karen Ostlund (@karen_ostlund; *klostlund@utexas.edu),* 2012–2013 NSTA President, and The University of Texas at Austin

Alden Balmer *(alden_balmer@roundrockisd.org),* Mc High School, Austin, Tex.

Build a mousetrap vehicle to integrate science, technology, engineering, and mathematics by modifying variables to increase speed or distance traveled.

LE **Starting STEM Early**

(Grades P–2) *Tampa 1, Gaylord Palms*

Ruben Rosario *(rrosario@lsc.org)* and **Kengo Yamada** (@MisterKengo; *kyamada@lsc.org),* Liberty Science Center, Jersey City, N.J.

Engage in activities that embed matter, energy, and engineering into the early childhood curriculum.

LE **Materials in a Green, Clean World: Engaging Our Youngest Scientists with a Hands-On/Minds-On Physical Science Curriculum for Grades K–2**

(Grades K–3) *Tampa 2, Gaylord Palms*

Anne Stevenson *(steve020@umn.edu),* University of Minnesota Extension Center for Youth Development, Andover

Explore a new curriculum designed to engage children in the practices of scientists and engineers. Learning activities utilize a guided inquiry approach to explore materials and polymer (plastic) science.

LE **The Blended Revolution: Blended Learning in the Early Childhood Classroom**

(Grades P–2) *Tampa 3, Gaylord Palms*

Sarah Allen (@msallenteaches; *sallen@indiancreekschool.org)* and **Kelly Bryant** (@K3llyBryant; *kbryant@indiancreekschool.org),* Indian Creek School, Crownsville, Md.

Come learn how to make your Early Childhood curriculum more inclusive of STEAM elements, including purposeful and transformative technology use, sensory and multi-modality experiences, and interdisciplinary and inquiry-based learning. Please bring your smart device.

1:30–2:30 PM Exhibitor Workshops

Argumentation: A STEM Strategy to Increase Student Talk

(Grades 3–College) *Naples 1/2, Gaylord Palms*

Sponsor: STEMscopes

Terry Talley *(ttalley@acceleratelearning.com)* and **Jacque Garcia** *(jgarcia@acceleratelearning.com),* Accelerate Learning, Inc., Houston, Tex.

Model successful implementation of consensus building through argumentation and learn how to reduce teacher talk and increase purposeful student talk around intriguing science concepts that matter. Bring ELA skills into the STEM classroom—the 21st-century skills of communication and collaboration are essential! New topic this year.

Make Science, Coding, and Robotics Come to Life with LEGO® Education WeDo 2.0

(Grades K–5) *Naples 3, Gaylord Palms*

Sponsor: LEGO Education

Laura Jackson, Retired Educator, Lee's Summit, Mo.

Did you know that LEGO Education makes science, coding, and robotics come to life? With WeDo 2.0, elementary students can explore, create, and share discoveries as they build solutions to real-world, standards-based projects. Come experience a hands-on STEM resource that develops students' confidence to ask questions, find answers, and solve problems!

Cells as Protein Engineers!

(Grades 9–College) *Osceola 1, Gaylord Palms*

Sponsor: 3D Molecular Designs

Gina Vogt *(gina.vogt@3dmoleculardesigns.com),* MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Developing and using models is identified as an important *NGSS* science and engineering practice. We will use hands-on/minds-on materials to model the cellular processes of DNA replication, transcription, and translation. Handouts and information on borrowing kits from a university model lending library program will be provided.

Quest for Space ISS STEM Experiments

(Grades 4–12) *Osceola 3, Gaylord Palms*

Sponsor: Quest Institute for Quality Education

Danny Kim *(dkim@thequestinstitute.com),* Quest Institute for Quality Education, San Jose, Calif.

The Quest for Space Program provides an automated closed-environment platform for youth to participate in science, technology, engineering, and mathematics (STEM) activities onboard the International Space Station. At lower costs and with fewer required skills, this platform introduces youth to a future of curiosity and innovation through engaging Project-Based Learning opportunities.

Got Lactase? Exploring Genetics with HHMI BioInteractive Resources

(Grades 9–College) *Osceola 4, Gaylord Palms*

Sponsor: HHMI BioInteractive

Robin Bulleri *(rbulleri@chccs.k12.nc.us),* Carrboro High School, Carrboro, N.C.

Why can some people digest milk and others can't? Trace the genetics and evolution of lactose tolerance using free HHMI BioInteractive resources. This exploration, which links classical and molecular genetics, is appropriate for all levels of biology learners.

Introduction to Llongwill Digital USA

(Grades K–8) *Osceola 5, Gaylord Palms*

Sponsor: Llongwill Digital USA

Angela Romero *(aromero@llongwilldigitalusa.com),* Llongwill Digital USA, Houston, Tex.

Kelechi Ubaha *(kubaha@llongwilldigitalusa.com),* Fort Bend ISD, Sugar Land, Tex.

We are revolutionizing accessibility to data collection equipment. As a company, we want to connect educators through scientific engagement. We offer development of curricula and provide teacher training. Join us as our innovative company changes how educators and districts do business with a sensor-based company.

Use Science to Teach Reading, Reading to Teach Science

(Grades K–6) *Osceola 6, Gaylord Palms*

Sponsor: Learning A–Z

Lori Smith *(lori.smith@learninga-z.com),* Learning A–Z, Tucson, Ariz.

Come explore Science A–Z, which contains digital, leveled content that strengthens students' reading and scientific literacy simultaneously and provides resources to help introduce students to concepts and skills in STEM fields. Free trials will be given to all participants, allowing access to free products post-conference!

Drought in Africa Inspires Students to Invent a Smart Irrigation System

(Grades 6–12) *Sarasota 1/2, Gaylord Palms*

Sponsor: Texas Instruments

Fred Fotsch, Texas Instruments, Dallas

Come learn how to create a project-based camp or classroom lesson that enables students to apply concepts, such as photosynthesis and the cycle, to design a smart irrigation system. Inspired by real-world events, students are motivated to apply problem-solving skills and learn some basic programming to come up with innovative solutions to the drought situation in southern Africa.

3:00–4:00 PM Presentations

M **Models of STEM Integration Teaching**

(Grades 6–8) *Destin 1, Gaylord Palms*

Drew Ayres *(dayres@purdue.edu)* and **Selcen Guzey** *(sguzey@purdue.edu),* Purdue University, West Lafayette, Ind.

Emphasis will be placed on models of STEM integration that have been successfully implemented in classrooms, including co-teaching, collaborative teaching, individual teaching, or entire courses.

HS **NCTM Session: Engaging Students in the Mathematical Modeling Process via Data Collection and Analysis**

(Grades 8–College) *Emerald 1, Gaylord Palms*

Maria Hernandez (@mathmodeling; *hernandez@ncssm.edu),* North Carolina School of Science and Mathematics, Durham

Focused on how we can engage students in the math modeling process, we will explore some data collection and analysis activities using Logger*Pro* and connect our work to the GAIMME Report. GAIMME stands for Guidelines for Assessment and Instruction in Mathematical Modeling Education.

UE **Developing Positive Mind-Sets: Encouraging Elementary Students to Think Like Engineers**

(Grades 1–5) *Emerald 3, Gaylord Palms*

Kathryn (Katy) Hutchinson (@eie_org), Museum of Science, Boston, Mass.

Whether you're new to engineering or already making it part of your curriculum, you'll gain insights around positive habits of thinking students develop when engineering.

LE **Young Engineers in the Woods: Bringing Engineering Design Challenge to the Outdoor Classroom**

(Grades P–2) *Emerald 5, Gaylord Palms*

Erica Green *(egreen@fwsu.org),* Bellows Free Academy Fairfax, Vt.

Come explore the concept of the Engineering Design Challenge as it is used outdoors and how it connects to the learning of young children.

A **Elementary Principals...Are You Ready for the *NGSS?***

(Grades K–5) *Emerald 7, Gaylord Palms*

Sarah Pauch *(spauch@readington.k12.nj.us),* Readington Township Public Schools, Whitehouse Station, N.J.

Kristen Higgins (@TBSTiger; *khiggins@readington.k12.nj.us),* Three Bridges School, Three Bridges, N.J.

This session is designed to prepare elementary principals and science supervisors to lead their teachers in a successful rollout of the *Next Generation Science Standards (NGSS).*

Pa ***Camino a la Ciencia:* A Program Designed to Recruit, Retain, and Train Hispanic Women in STEM Disciplines**

(Grades 9–College) *Gainesville 1, Gaylord Palms*

April Marchetti (@AprilMarchetti; *amarchet@rmc.edu),* and **Robert Patterson** *(robertpatterson@rmc.edu),* -Macon College, Ashland, Va.

We will share a partnership between high schools, higher education, corporations, nonprofits, and governmental agencies to engage Hispanic girls in STEM education.

HS **Female STEM Major Selection and Persistance**

(Grades 9–College) *St. George 102, Gaylord Palms*

Jessica Mitchell (@docjsmitchell; *jmitchell12@una.edu),* **Erica Blackstock** *(eblackstock@una.edu),* and **Candice Gonzalez** *(cgonzalez@una.edu),* University of North Alabama, Florence

Review findings from a research study conducted on a college campus that was designed to explore the experiences of female STEM majors. Recommendations for promoting STEM majors to this underrepresented population will be presented.

3:00–4:00 PM Hands-On Workshops

UE **Erosion Trays in Elementary STEM: How to Make and Implement Erosion Trays in K–5**

(Grades K–5) *Emerald 2, Gaylord Palms*

Justine Kim *(justine.nicolle.kim@gmail.com),* University of Minnesota, Minneapolis

Learn how to make affordable erosion trays and see how they can be used in interactive K–5 STEM units. See the demonstrations, leave with lesson plans!

UE **STEM Is FUNdamental**

(Grades 3–5) *Emerald 4, Gaylord Palms*

Nicole Rivera (@orlandoscience; *nrivera@osc.org),* Orlando Science Center, Orlando, Fla.

Engineering design challenges are the best way to engage youth in STEM. Experience a challenge and gain strategies that can be implemented with your students! Participants will work in small groups of three to six people to design and create a sail for a vehicle to transport goods across a canyon, using a natural renewable resource: wind.

UE **STEM-Integrated Upper Elementary Lessons That Increase Student Achievement**

(Grades 3–5) *Emerald 6, Gaylord Palms*

Susan Butler (@ufteacherprep; *sbutler@coe.ufl.edu),* University of Florida, Gainesville

Experience an integrated STEM lesson that addresses all four STEM disciplines. Get access to 70 upper elementary STEM lessons that raised student achievement.

HS **NABT Presents: Simple, Inexpensive Ways to Develop Understanding of the Most Difficult Biological Concepts**

(Grades 8–College) *Emerald 8, Gaylord Palms*

Chi Klein (@chi_molecule; *chi.t.klein@gmail.com),* Saint Stephen's Episcopal School, Bradenton, Fla.

Addressing crowdsourced feedback on the most difficult biological concepts to teach, participants will explore active non-lecture content delivery with cheap materials. Student learning will focus on models, representations, and data analysis.

M **Coasting Through Physics: Bring the Thrill of Roller Coasters to Your Classroom!**

(Grades 4–9) *Osceola A, Gaylord Palms*

Shanna Hall-David *(shanna.david@hsv-k12.org),* Hampton Cove Middle School, Owens Cross Roads, Ala.

Hold on for the ride of your life! Make a marble roller coaster using everyday supplies that can be found in any classroom. Have your class rolling and coasting through physics as we examine roller coaster design and how Newton's laws affect riders.

M **Support Data Analysis in Your Classroom with a Simple Strategy for Understanding and Using Statistical Significance**

(Grades 6–9) *Sarasota 3, Gaylord Palms*

Matthew Mirabello *(mmirabello@amnh.org),* American Museum of Natural History, New York, N.Y.

Gina Tesoriero (@Miss_STEM; *ginatesoriero@gmail.com),* M.S. 319 Maria Teresa Mirabal School, New York, N.Y.

Explore the effects that sample size and variation can have on statistical significance when evaluating and analyzing a data set. Engage in and learn some strategies to make rigorous data-based explanations and conclusion writing accessible to middle school students.

M **Integrating Technology into Middle School *NGSS* Engineering Design Performance Expectations**
(Grades 5–12) *St. George 104, Gaylord Palms*
Ruben Rosario *(rrosario@lsc.org)* and **Deepa Shah** (@Celestine; *dshah@lsc.org),* Liberty Science Center, Jersey City, N.J.
Learn how to integrate technology into the *NGSS* engineering design performance expectations. Explore hands-on examples using 3D-printed materials and electronic components.

M **60 Minutes to Success: STEM Ed Quality Framework**
(General) *St. George 106, Gaylord Palms*
Kevin Cornell (@DRSTEMCENTER; *cornellscorner@gmail.com)* and **Michael O'Shaughnessy** *(michael.oshaughnessy@mcesc.org),* Montgomery County Educational Service Center, Dayton, Ohio
The Dayton Regional STEM Center uses its nationally recognized STEM Ed Quality Framework to enhance STEM learning for teachers, as well as industry and higher education.

M **Meteoroids, Asteroids, and Moons, Oh My!**
(Grades 3–8) *St. George 108, Gaylord Palms*
Joan Gillman *(joan.gillman@calhoun.org),* The Calhoun School, New York, N.Y.
Presider: Sherri Cianca *(scianca@niagara.edu),* Niagara University, Niagara University, N.Y.
For this workshop, STEM skills will be emphasized. We will design, build, and test moon landing devices that allow two "marshmallow" people to land softly on the moon.

Pa **We Do 2.0: Bringing Science to Life with We Do 2.0 Robots**
(Grades 2–5) *St. George 114, Gaylord Palms*
David Garringer *(dag8819@lausd.net)* and **Oscar Rios** *(ocrios13@gmail.com),* Stanley Mosk Elementary School, Winnetka, Calif.
Make science come to life: participants will engage in a hands-on experience on how to use LEGO WeDo 2.0 for teaching the *CCSS* and *NGSS* by staff from Stanley Mosk Elementary School, a LEGO Education Model School.

LE **Rediscovering and Exploring Science Through the Arts**
(Grades P–K) *Tampa 1, Gaylord Palms*
Jeanne Wall (@Wolf_Trap), Wolf Trap Institute for Early Learning Through the Arts, Vienna, Va.
Drama, creative movement, puppetry, and music are engaging tools for the exploration of physical science, Earth science, and life science, three main areas of early childhood science education. We will use arts-integrated strategies to expand a child's knowledge of the world while developing skills that promote approaches to learning, observation skills, descriptive skills, and problem solving through exploring magnets, unique environments, what living things need to survive, and principles of engineering.

LE **Arts in Application: Dance in Kindergarten Math**
(Grades P–K) *Tampa 2, Gaylord Palms*
Rachel Knudson, Wolf Trap Institute for Early Learning Through the Arts, Vienna, Va.
Be inspired by the natural connection between math and dance to ignite your imagination as you create multisensory experiences for the kindergarten classroom.

LE **Crowdfunding Your STEM Project**
(Grades P–12) *Tampa 3, Gaylord Palms*
Nancy Sale *(butterflybonanza@yahoo.com),* Lillie C. Evans K–8 Center, Miami, Fla.
Using an online crowdfunding site, teachers can secure STEM project funding. Leave with a high probability of being funded. BYOD (bring your own device).

3:00–4:00 PM Exhibitor Workshops

DNA Structure and Function with a Twist of CRISPR

(Grades 9–College) *Osceola 1, Gaylord Palms*

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman *(herman@msoe.edu),* MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Explore a variety of hands-on/minds-on instructional materials that introduce students to DNA as a double-stranded helical molecule, as information (a sequence of As and Ts and Gs and Cs) that encodes proteins, and as a 3.2 billion base pair genome that can now be edited with CRISPR/Cas9 technology.

Is the Taste for STEM in Your Genes?

(Grades 7–College) *Osceola 2, Gaylord Palms*

Sponsor: miniPCR

Leslie Prudhomme, Mass Insight Education, Boston, Mass.

A single nucleotide change in your DNA can make you a supertaster. Join in to explore the molecular genetics of taste using PCR and gel electrophoresis. Discover how to amplify and analyze your genes, linking your PTC taste receptor DNA sequence to your own taster phenotype.

HHMI BioInteractive Resources Exploring Human Skin Color

(Grades 9–College) *Osceola 4, Gaylord Palms*

Sponsor: HHMI BioInteractive

Kenyatta McKie *(kenyatta.mckie@browardschools.com),* Broward County Public Schools, Fort Lauderdale, Fla.

Dive into an example of polygenic inheritance by studying the variation in human skin color. We will explore activities related to *The Biology of Skin Color* short film, including one that uses evidence and mathematical modeling to explain how SNPs are used to study genes and phenotypes in polygenic traits.

Analyzing and Interpreting Real-Time Weather Data

(Grades 6–12) *Osceola 6, Gaylord Palms*

Sponsor: Earth Networks

Mark Hyer *(mhyer@earthnetworks.com),* Earth Networks, Germantown, Md.

Ed Mansouri *(emansouri@weatherstem.com),* WeatherSTEM, Tallahassee, Fla.

Explore how your students can use real-time weather data to discover new patterns and generate reports. Join Earth Networks and WeatherSTEM as they share analytical, statistical, visual, API, and coding tools designed to advance science and engineering practices. Get an introduction to big data driven from global weather observations, including global lightning data. We will also share a numerical forecasting tool designed to build predictive models.

Zombie Apocalypse!

(Grades 6–12) *Sarasota 1/2, Gaylord Palms*

Sponsor: Texas Instruments

Jeffrey Lukens, Sioux Falls (S.Dak.) School District

Be part of a zombie apocalypse! Learn about disease-spread modeling using simulations and fun story lines about a zombie outbreak. Applicable for middle school and high school, this workshop is sure to scare you and your little zombies with its exciting Hollywood themes used to engage students in learning science!

4:30–5:30 PM Keynote Address: The Uncomfortable Effort of Thinking

(General) *Osceola C/D, Gaylord Palms*

Derek Muller (@Veritasium), Science Communicator, Filmmaker, Television Presenter, and Creator of YouTube Channel Veritasium, Los Angeles, Calif.

Welcome: David T. Crowther, NSTA President, and University of Nevada, Reno

Presider: Jennifer C. Williams, Steering Committee Chairperson, 2017 STEM Forum & Expo, and Department Chair Lower School Science, Isidore Newman School, New Orleans, La.

Thinking is hard. This is something clearly shown on Derek's YouTube videos where he interviews people on the street. Misconceptions about science abound. And they are not easy to change in traditional educational settings because the people who hold them are not even aware of these misconceptions. Prior knowledge is essential to think about when teaching, but incorrect prior knowledge is even more important. This is because it has a devastating impact on perception—people don't even perceive that what is being presented differs from their prior knowledge. Join Derek has he discusses evidence he's collected about these phenomena and methods that have shown promise in helping to affect conceptual change both in traditional educational settings and on YouTube.

Derek Muller (@Veritasium) is a science communicator, filmmaker, and television presenter. He is best known for creating and hosting Veritasium, a YouTube channel about science. Started in 2011, Veritasium is a science video blog featuring experiments, expert interviews, cool demos, and discussions with the public about "everything science." The channel has over 4 million subscribers. The 230+ videos on the channel have been seen more than 330 million times. Topics of videos range from how transistors work to the history of the kilogram, quantum entanglement and Bell's inequalities, to extreme demonstrations of the Magnus effect and gyroscopic precession.

Based on his YouTube success, Derek was recruited to work in traditional media, starting as a host on the Australian ABC's Catalyst *science magazine program. In 2015, he hosted the award-winning international documentary,* Uranium: Twisting the Dragon's Tail for PBS, *tracing the impact of radioactivity from its discovery through to the present. In 2016, he hosted* Digits, *a documentary on the past, present, and future of the internet for Curiosity Stream, and he is a correspondent on the new Netflix show,* Bill Nye Saves the World. *Recently, he also launched a new YouTube channel, Sciencium.*

NSTA Book Club Membership

Save up to 50% on our bestselling titles...

When you sign up for or renew your NSTA membership, select the book club membership option, choose three books from any grade level and on topics readers love—*NGSS*, STEM, literacy, assessment, and more—then wait for your favorite books to arrive on your doorstep while enjoying all of your other NSTA member benefits.

See all membership options, including regular, new teacher, and institutional memberships, at *www.nsta.org/membership*

Become an NSTA Book Club Member at
www.nsta.org/bookclub

NSTA National Science Teachers Association

8:00–9:00 AM Featured Panels

Pa

How Business/Industry/Nonprofit Partnerships Help Prepare PreK–16 Students to Meet the Needs of the Future

(General) *Orange Blossom Ballroom, Gaylord Palms*

Moderator: **Brenda Nixon** *(bnixon@lsu.edu),* Partnerships Strand Leader, and Co-Director, Gordon A. Cain Center, Louisiana State University, Baton Rouge

Frazier Wilson, Vice President, Shell Oil Company Foundation, and Director, Workforce and Strategic Community Initiative, Shell, Houston, Tex.
Reo Pruiett, Director, Programs, Educate Texas, Dallas
D'Yanna Craighead, Manager of Technology, Disney Support Systems, Walt Disney Attractions, Orlando, Fla.

Innovation in STEM has been pivotal in meeting the workforce demands of today. Our students need to be collaborative problem solvers as well as members of a highly skilled workforce. How can preK–16 educators engage business, industry, and nonprofits to assist in creating students who are well prepared for the dynamic workforce needs of the future and to drive the leading edge of STEM innovation?

This session provides an opportunity for attendees to better understand how business, industry, and nonprofit organizations are interfacing with preK–16 schools to meet those demands. Panel members will discuss how they have partnered with schools and provided STEM resources or employee assistance to help implement quality STEM education in K–16 schools. Members of the audience will have the opportunity to ask questions following the panelists' presentations.

Inclusive STEM Schools: Making STEM for All a Reality

(General) *Osceola A, Gaylord Palms*

Sponsored by STEMx, managed by Batelle

Moderator: **Michael Feder** *(federm@battelle.org),* Battelle, Arlington, Va.

Panelists:
David Burns, Director, Ohio STEM Learning Network/Battelle, Columbus
Sandy Watkins *(sandy@TSIN.org),* Principal-in-Residence, Tennessee STEM Innovation Network–Battelle, Nashville
Larry Johnson, Principal, Firestone Community Learning Center, Akron, Ohio

STEMx members have developed networks of inclusive STEM schools to improve educational opportunities and outcomes across the country. Come talk to the experts about what makes these schools special, how they stack up, and what lessons you can apply to your school and classroom.

Engaging Diverse Learners and Special Needs Students in STEM

(General) *Osceola B, Gaylord Palms*

Moderator: **Janella Watson,** Director of Communications, Providence Children's Museum, Providence, R.I.

Panelists:
Gina Tesoriero *(ginatesoriero@gmail.com),* STEM Special Education Teacher, M.S. 319 Maria Teresa Mirabal School, New York, N.Y.
Delia Meza *(dmeza@nysci.org),* Early Childhood Science Coordinator, New York Hall of Science, Corona

Explore programs, practices, and approaches that nurture curiosity, agency, and a love of STEM learning in students with special needs. In this panel, we'll hear powerful stories from educators engaging learners of all ages in engineering design, making, and sensory-rich STEM exploration, as well as unique community partnerships that encourage and support students with special needs to pursue STEM pathways.

8:00–9:00 AM Presentations

A K–8 Model for STEM Teaching, Learning, and Professional Development Using EiE

(Grades K–8/College) *Emerald 7, Gaylord Palms*

Trudy Giasi *(giasitrudy@gmail.com),* Columbus (Ohio) City Schools

Tanya Taylor *(tanyataylor@metroparks.net),* Columbus and Franklin County Metro Parks, Westerville, Ohio

Come hear about a STEM/STEAM professional development and implementation model developed in partnership between a large urban school district and a university. This model uses Engineering is Elementary(EiE) resources.

Meeting the Needs of Fragile Schools

(Grades 5–12) *Gainesville 1, Gaylord Palms*

Samuel Crupi (@OCPSSCrupi; *samuel.crupi@ocps.net),* Orange County Public Schools, Orlando, Fla.

Learn how to meet the needs of science education in schools that have demonstrated low levels of performance across disciplines at the middle school/secondary level. Data-driven intervention relies on student involvement and are essential to growth. This session provides an outline to accomplish the sharing of information to drive student performance as a component of the short form course. Leave with a research-based tool for use in your school and district to drive science achievement.

Helping Children Recognize the Presence and Impact of STEM: Explorations with Physical Structures, Everyday Household Tools, and Plants

(Grades 3–6) *Palm Beach, Gaylord Palms*

Donna Knoell *(dknoell@sbcglobal.net),* Educational Consultant, Overland Park, Kans.

Join me as I model strategies and activities to engage students in STEM applications, constructing physical structures (bridges, buildings, etc.), exploring everyday objects, and growing plants. Handouts!

Hacking Data with High Schoolers

(Grades 8–12) *St. George 102, Gaylord Palms*

Morgan Stewart (@morganrstewart; *morganrstewart@gmail.com),* Sealed Air Corp., Duncan, S.C.

Shannon Kao (@ShannonKao; *skao127@gmail.com),* Stanford University, Stanford, Calif.

Let's use public data sets to explore data-driven investigations with basic statistics and programming. We'll highlight finding open data sets and portfolio-worthy example projects.

Science and Literacy in the K–5 Classroom

(Grades K–5) *Tampa 3, Gaylord Palms*

Leisa Clark, Assistant Executive Director, e-Products, NSTA, Arlington, Va.

Engage in science and literacy in your classroom. This presentation will cover the practices and crosscutting concepts of three-dimensional learning and how to engage your elementary students in science and literacy through e-books. Find out how to use digital multimedia to enhance student learning of science, English language arts, and mathematics.

8:00–9:00 AM Hands-On Workshops

UE **Looking into STEM Activities as Inspiration for Capturing and Keeping Student Interest in Science**

(Grades 3–5) *Emerald 2, Gaylord Palms*

Melissa Parks *(mparks@stetson.edu),* Stetson University, Deland, Fla.

Let's talk STEM as well as happy and engaged students. As we complete STEM activities, we will discuss how to find, implement, and modify STEM activities to meet the needs of diverse learners.

HS **NABT and BSCS Present: Identify and Interpret—A Strategy to Help Students Make Sense of Difficult Information**

(Grades 10–12) *Emerald 8, Gaylord Palms*

Chi Klein (@chi_molecule; *cklein@saintstephens.org),* Saint Stephen's Episcopal School, Bradenton, Fla.

Lesley Kirkley *(lularoebylesleykirkley@gmail.com),* Pasco County Schools, Land O' Lakes, Fla.

Engage with a powerful Identify and Interpret (I2) strategy in your classroom to help your students make sense of the information presented in graphs, complex figures, and data tables.

M **Applying Shujaa's D.R.C. Model as an Approach for Implementing the *Next Generation Science Standards***

(General) *St. George 104, Gaylord Palms*

Emily Jackson *(emilyjackson525@gmail.com),* Glen Oaks High School, Baton Rouge, La.

Explore lesson design methods that employ Deconstruction, Reconstruction, and Construction Modeling. Gain useful resources for K–12 STEM activities in both the formal and informal classrooms.

8:00–9:00 AM Exhibitor Workshops

Take a Walk Through the Molecular World with Watercolor Landscapes

(Grades 9–College) *Osceola 1, Gaylord Palms*

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman *(herman@msoe.edu),* MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Use vibrant watercolor landscapes to explore the molecular world in the cellular context within which proteins function. David Goodsell's Tour of the Human Cell Panorama traces the production and secretion of antibodies. His new Flu Fight: Immunity & Infection Panorama illustrates how antibodies work to block the influenza infection cycle.

Improving STEM Education with JoVE Video Resources

(Grades 9–College) *Osceola 2, Gaylord Palms*

Sponsor: JoVE

Dave Cox *(dave.cox@jove.com),* JoVE, Cambridge, Mass.

JoVE Science Education provides STEM students with an engaging, easy-to-follow video guide through hundreds of essential scientific and medical techniques. With this resource, faculty around the country are seeing improvements to learning outcomes and STEM retention. Join us and see the value of JoVE Science Education for yourself.

Is Cancer in My DNA?

(Grades 6–12) *Osceola 4, Gaylord Palms*

Sponsor: Fisher Science Education

April Fischione *(april.fischione@thermofisher.com),* Fisher Science Education, Pittsburgh, Pa.

Through a complete hands-on session, help Jane determine if she has a genetic predisposition to colon cancer. Learn how genetic mutations can cause cancer and the role genes play in cancer risk by examining family history and comparing DNA sequencing and lab analysis in this real-life case study.

Investigating a Cliff Model

(Grades 6–8) *Osceola 5, Gaylord Palms*

Sponsor: Lab-Aids, Inc.

Amy Reijmer, Oconee Middle School, Bogart, Ga.

Engineer a coastal breakwater and analyze the trade-offs of the design. Explore how the natural world is influenced by our engineered world, which in turn creates more societal issues that must be solved through science and engineering practices. Activities exemplify *NGSS* and show how SEPUP embeds the engineering practices and uses real issues to powerfully deliver content learning.

Using Maggots, Flies, and Flesh to Solve a Mystery!
(Grades 6–12) *Sarasota 1/2, Gaylord Palms*
Sponsor: Texas Instruments
Jeffrey Lukens, Sioux Falls (S.Dak.) School District
A decomposing corpse is found in a field. Four possible missing persons fit the description. But who is it? Using clues near the scene will help determine identity. Forensic anthropologist and director of the Human ID Lab of Colorado, Dr. Diane France helped to develop this free middle school and high school forensic science lesson.

9:15 AM–3:00 PM Exhibits

Hall C, Gaylord Palms
Come stroll through the exposition picking up tips, product samples, and ideas to spark your imagination. Please note that no sessions are scheduled from 12 Noon to 1:30 PM during our exclusive exhibit hall hours.

9:30–10:30 AM Presentations

M **Cultural Competence and Effective Communication in Students' Transformation**
(General) *Destin 1, Gaylord Palms*
Kelly Haynes *(khaynes@bakerschools.org),* Baker High School, Baker, La.
Tara Beth Hollins (@TaraBethHollins; *tarabethhollins@yahoo.com),* Port Allen High School, Port Allen, La.
Presider: Chastity Wilson *(chastitylw@yahoo.com),* Opelousas Junior High School, Opelousas, La.
Build awareness and sensitivity to the culture-based genius that students bring to the classroom using science inquiry strategies. Emphasis will be placed on a model for the inclusion of culturally relevant content that accommodates student backgrounds and methods of learning.

Pa **Bridging Gaps: Making Partnership Connections Work for STEM Student Learning and Teacher Effectiveness**
(Grades 4–College) *Destin 2, Gaylord Palms*
Dewayne Morgan (@USMAsker; *dmorgan@usmd.edu),* University System of Maryland, Adelphi
Hear about the Minority Student Pipeline Math Science Partnership, an NSF-funded strong multifaceted STEM learning partnership between universities, community colleges, and a K–12 school system.

HS **NCTM Session: The Teacher Role in Planning for and Enacting Mathematical Modeling Tasks**
(Grades 6–College) *Emerald 1, Gaylord Palms*
Maria Hernandez (@mathmodeling; *hernandez@ncssm.edu),* North Carolina School of Science and Mathematics, Durham
Focused on the teacher role, I will share resources that can help us develop the practices that support students in their mathematical modeling experiences.

HS **The Implementation and Impact of Advanced Placement® Science Courses on Students in an Experiment**
(Grades 9–12) *Emerald 3, Gaylord Palms*
Raymond McGhee *(rmcghee@equalmeasure.org),* Equal Measure, Philadelphia, Pa.
In this presentation, I'll describe the classroom implementation highlights as well as report on the impact evaluation results on students' scientific inquiry skills and their perceived ability to engage in scientific inquiry.

UE **Authors Wanted! How to Get Your Article Published in an NSTA Journal**
(General) *Emerald 5, Gaylord Palms*
Linda Froschauer *(fro2@me.com),* 2006–2007 NSTA President, Pasadena, Calif.
Learn how to successfully prepare and submit an article for publication in an NSTA journal.

LE **STEMing into the Future: How to Build a STEM Program Within an Elementary School**
(Grades P–5) *Emerald 7, Gaylord Palms*
Michael Pisseri *(mpisseri@stamfordct.gov)* and **Kyle Runfola** *(krunfola@ci.stamford.ct.us),* Davenport Ridge Elementary School, Stamford, Conn.
Looking to STEM into the future? Find out how to incorporate STEM education into your elementary classroom.

M **STEM Projects for the Science Classroom**
(Grades 3–12) *Osceola A, Gaylord Palms*
DJ West (@djwest78; *djwest78@gmail.com),* Schoolcraft College, Livonia, Mich.
Emphasis will be placed on best practices in STEM projects, review and evaluation of STEM projects, and resources that support the development of a STEM environment in the classroom. Leave with resources you can use in class.

iMakeMedia

(Grades 3–8) *Osceola B, Gaylord Palms*

Kevin Cornell (@originalmisterc; *learningscienceisfun@gmail.com),* Learning Science is Fun, Dayton, Ohio

Grab a seat and enjoy a good beat. Join Mister C to experience hands-on science during this high-intensity multimedia session. Learn how to record and publish your lessons on the fly!

Urban STEM-ification

(Grades K–12) *Palm Beach, Gaylord Palms*

Sally Creel (@STEMSally; *sally.creel@cobbk12.org),* Cobb County School District, Marietta, Ga.

Join me as I share a journey toward infusing STEM into a large urban school district in Metro-Atlanta. I'll share and discuss what worked and what didn't…along the way.

NSTA Press® Session: Water and People: An Example Hydrology Unit for Grades 8–12

(Grades 8–College) *St. George 102, Gaylord Palms*

Russell Colson *(colson@mnstate.edu),* Minnesota State University Moorhead

Mary Colson (@MnMColson; *mc@moorheadschools.org),* Horizon Middle School, Moorhead, Minn.

Explore how to expand a unit on surface water runoff to include engineering problems and mathematical models using science reasoning challenges and experiments from the NSTA Press book *Learning to Read the Earth and Sky*.

Using Student Research as a Vehicle for Student Engagement and Development in Science

(Grades 6–9) *Vero, Gaylord Palms*

Brian Ogle *(bogle@beaconcollege.edu),* Beacon College, Leesburg, Fla.

Active participation in research creates a dynamic learning environment that cultivates science literacy, meets standards, and fosters engagement in the field.

9:30–10:30 AM Hands-On Workshops

Where It Stops, Nobody Knows: ELA Through STEM

(Grades K–5) *Emerald 4, Gaylord Palms*

Clay Nolan (@STEMuClaytion; *cnolan@caboces.org),* Cattaraugus-Allegany-BOCES, Olean, N.Y.

Presider: Ada Lynne Lopez *(ada.lopez@sas.com),* SAS Institute Inc., Cary, N.C.

Discussion centers on how to design lessons that incorporate literacy through a STEM lens. We will explore how using a nonfiction book can kick off a lesson series and infuse literacy, science, and math from the content of the book while meeting grade level–specific *CCSS*.

Where Would a Space Explorer Find Water and Oxygen?

(Grades 3–8) *Emerald 6, Gaylord Palms*

Karen Roark *(kcroark@gmail.com),* NASA Ames Research Center, Mountain View, Calif.

This workshop will help your students answer the question: What can I do to make clean water? (by designing and building their own water filtering system).

Terra Troopers: A STEM Partnership with the Girl Scouts of Western Oklahoma and Devon Energy

(Grades K–12) *Gainesville 2, Gaylord Palms*

Sharica Robinson *(srobinson@gswestok.org),* Girl Scouts Western Oklahoma, Oklahoma City

Allison Bailey *(allison.bailey@dvn.com),* Devon Energy, Oklahoma City, Okla.

Engage in activities and learn about a Devon Energy partnership with the Girl Scouts Western Oklahoma to expand STEM education focused on the oil and natural gas industry to girls in Oklahoma.

What's the Big Idea? A Glimpse into Current Themes for STEM Educators

(Grades 6–8) *Sarasota 3, Gaylord Palms*

Marianne Phillips *(marianne.phillips@tamusa.edu),* Texas A&M University–San Antonio

Julie Vowell *(jevowell@txwes.edu),* Texas Wesleyan University, Fort Worth

Discussion centers on current pedagogical themes important for STEM instruction. Then, participants will create a collage of what each theme would look like in the classroom.

M **Coding Across the Curriculum**
(Grades 3–10) *St. George 104, Gaylord Palms*
Erin Dunroe, Lake Center Middle School, Santa Fe Springs, Calif.
CANCELED
Learn to use the coding program Scratch to incorporate STEM across multiple content areas, including example projects and rubrics. Participants will create a Scratch project.

HS **Strengthening Science Learning Through Disciplinary Literacy**
(Grades 9–12) *St. George 106, Gaylord Palms*
Vicky Zygouris-Coe *(vzygouri@ucf.edu),* University of Central Florida, Orlando
In this session, I'll demonstrate how to use science-specific instructional strategies that develop science and literacy learning in tandem.

UE **NSTA Press® Session: Uncovering Grades 2–8 Students' Ideas About Magnets and Magnetic Interactions**
(Grades 2–8) *St. George 108, Gaylord Palms*
Susan Cooper *(sjcooper@fgcu.edu),* Florida Gulf Coast University, Fort Myers
Learn how formative assessment can give you the information you need about students' ideas related to magnets and magnetic interactions in order to design and implement successful scientific investigations and engineering challenges that involve magnets. We will also share how these probes were used with preservice teachers.

M **AACT Session: Elementary and Middle School Chemistry: Demonstrations and Lab Activities on a Shoestring Budget**
(Grades 3–8) *St. George 112, Gaylord Palms*
Kimberly Duncan (@chemduncan; @AACTconnect; *k_duncan@acs.org),* American Association of Chemistry Teachers, Washington, D.C.
Come learn how you can implement budget-friendly classroom demonstrations, labs, and activities to teach fundamental chemistry topics in your elementary or middle school classroom.

HS **Data Analysis Made Easy: Connecting Math and Science Through Technology**
(Grades 7–College) *St. George 114, Gaylord Palms*
Karlheinz Haas *(khaas@thepineschool.org),* The Pine School, Hobe Sound, Fla.
Increase student engagement in analysis and evaluation of real data. Engage students of different ability levels in mathematical modeling with measurements not previously accessible in the classroom.

LE **Start with STEM: Water, Wind, and Weather**
(Grades P–2) *Tampa 1, Gaylord Palms*
Juliana Texley (@JulianaTexley; *texle1j@cmich.edu),* 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant
Ruth Ruud *(ruudruth61@gmail.com),* Cleveland State University, Cleveland, Ohio
The earliest engineers can explore water, wind, and weather using their senses and building sound understandings. Come play with us, read, recite poetry, sing, and even dance a bit to explore ideas for early childhood STEM.

LE **STEM and Literacy: An Integration**
(Grades K–5) *Tampa 2, Gaylord Palms*
Chenita Jarrett (@chenitajarrett; *chenitaus@gmail.com),* Fulton County Schools, Atlanta, Ga.
Have you ever heard, "We can find time to teach science"…? Come engage in STEM activities and learn how to connect STEM lessons to elementary literacy concepts. Leave with resources to suggested book lists and STEM lesson ideas.

LE **Warming Up to Engineering with Solar Ovens**
(Grades 3–6) *Tampa 3, Gaylord Palms*
Susan Ramsey (@Ramseyscience; @CCS_iSTEM; *susanbradyramsey@gmail.com)* and **Christy Scott** (@CCS_iSTEM; *scottc1@charlottesvilleschools.org),* Charlottesville (Va.) City Schools
Increase the impact of your solar oven engineering challenge by gathering quantifiable data on different insulators, and providing evidence-based justifications on the creation of your solar oven.

9:30–10:30 AM Exhibitor Workshops

Understanding Air Pollution and Energy Choices Through Hands-On STEM Activities

(Grades 6–College) *Naples 1/2, Gaylord Palms*

Sponsor: U.S. EPA

Gayle Hagler and **Rebecca Dodder,** U.S. EPA Research Triangle Park, Durham, N.C.

Join us for two hands-on educational tools developed by EPA researchers that foster STEM skills while learning about air quality, energy, and the environment. We will highlight EPA STEM outreach resources, demonstrate building a Particulate Matter air sensor kit, and play a board game called Generate! focused on energy choices.

Hands-On Robotics and Coding: Think Like an Engineer with LEGO® MINDSTORMS® Education EV3

(Grades 5–12) *Naples 3, Gaylord Palms*

Sponsor: LEGO Education

Laura Jackson, Retired Educator, Lee's Summit, Mo.

How can you prepare students for STEM-related fields? Join us for this workshop to learn ways to integrate science, technology, engineering, and math through hands-on learning with LEGO MINDSTORMS Education EV3. Participants will gain the foundational knowledge of robotics, coding, and programming in order to solve real-world problems.

Students Modeling the Molecular World

(Grades 9–College) *Osceola 1, Gaylord Palms*

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman *(herman@msoe.edu),* MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Explore interactive instructional materials and different kinds of student-centered, three-dimensional modeling programs that introduce basic concepts of protein structure and function and their relevance to current research. These programs, which include training in computer visualization software and 3-D protein model design, can be used inside or outside your classroom.

How to Use Dry Ice

(Grades 4–12) *Osceola 2, Gaylord Palms*

Sponsor: Penguin Brand™ Dry Ice

Crystal Dixon *(crystal@sciencekiddo.com),* The Science Kiddo, Portland, Ore.

In this workshop, we will demonstrate fun and engaging ways to use dry ice in the classroom.

Blackout! Phenomena, 3-D Instruction, and Amplify Science for Grades K–5

(Grades K–5) *Osceola 3, Gaylord Palms*

Sponsor: Amplify

Carissa Romano *(amplifyscience@berkeley.edu)* and **Sophia Lambertsen** *(amplifyscience@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley

Experience how students investigate a town that is experiencing frequent blackouts while figuring out principles of energy and engaging in three-dimensional learning. Participants will get a hands-on dive into Amplify Science for grades K–5, engaging with this new K–8 *NGSS*-designed curriculum from The Lawrence Hall of Science.

STEM Design Challenge

(Grades 1–8) *Osceola 4, Gaylord Palms*

Sponsor: Fisher Science Education

April Fischione *(april.fischione@thermofisher.com),* Fisher Science Education, Pittsburgh, Pa.

Discover how to create and develop questions about force, energy, and motion for an engaging classroom lab. Then, solve an engineering problem using creative and realistic world processes while supporting your understanding with fun and exciting team competition. Finally, learn how to bring this Project-Based Learning program to your community!

Motions, Graphs, Speed, and Collisions

(Grades 6–8) *Osceola 5, Gaylord Palms*

Sponsor: Lab-Aids, Inc.

Amy Reijmer, Oconee Middle School, Bogart, Ga.

Using specially designed carts, tracks, and weights, students investigate the role of mass and speed in collisions. We will explore the development of concepts in an issues-based approach that studies applications of Newton's laws in a context of automobile safety.

Hands-On STEM for Grades K–8
(Grades K–8) *Osceola 6, Gaylord Palms*
Sponsor: SAE International
Meghan Stoyanoff *(meghan.stoyanoff@sae.org)* and **Amy Smith** *(amy.smith@sae.org),* SAE International, Warrendale, Pa.
Looking for a hands-on way to keep students engaged with STEM concepts? A World In Motion (AWIM) is a teacher-administered, industry volunteer–assisted program that incorporates science, technology, engineering, and math learning experiences through hands-on activities. Along with an overview of AWIM's methodology, this workshop will show you how to breathe new life into your classroom by challenging students to design and construct balloon-powered cars.

STEM and *NGSS:* How *NGSS* Fits with Science, Engineering, Technology, and Math (and *CCSS!*)
(Grades 6–9) *Sarasota 1/2, Gaylord Palms*
Sponsor: AEOP
Matthew Hartman, eCYBERMISSION Content Manager, U.S. Army Educational Outreach Program, NSTA, Arlington, Va.
Everyone knows that *NGSS* includes science and engineering, but in this workshop we will discuss how *NGSS* matches up with the *CCSS.* Come learn how these all fit together and find out about the eCYBERMISSION Competition, a chance for your middle school students to use what they are learning in a practical setting.

11:00 AM–12 Noon Presentations

M **Transforming Students' Ideas About STEM and School Learning in an Informal Setting**
(Grades 6–College) *Destin 1, Gaylord Palms*
Angelia Reid-Griffin (@wcejrseahawk; *griffina@uncw.edu),* University of North Carolina Wilmington
The practice of mentoring has been known to positively influence the behaviors and career choices of many. During a summer STEM program for middle school children, the role of mentoring was explored. Join me as we analyze how the experience transforms students' STEM interests and confidence.

Pa **Abbott Operation Discovery: A Partnership Approach to Creating a Global Program**
(Grades 4–9) *Destin 2, Gaylord Palms*
Christine Caldwell, Catalysis LLC, Portland, Ore.
Kristen Manivilovski and **Monica Bomani** *(monica.bomani@abbott.com),* Abbott Laboratories, Abbott Park, Ill.
Learn how a middle school, an engineer, and a science consultant created an effective partnership to develop a relevant, sustainable, and global program model.

M **ASEE Session: Using an Engineering Frame to Map Engineering Design into Your STEM Curriculum**
(Grades 4–7) *Emerald 1, Gaylord Palms*
Nancy Ruzycki, University of Florida, Gainesville
Teachers want to embed more engineering design into their curriculum, but many are bound by guides that limit engineering activities. Discover how to use a frame structure to embed an engineering design activity that meets current content standards in your lessons. This frame routine has been tested with teachers in several Florida school districts and was rated highly useful as a tool.

UE **STEM and Trade Books: Strange Bedfellows**
(Grades P–8, College) *Emerald 2, Gaylord Palms*
J. Carrie Launius (@janetcarrie; *janetcarrie@gmail.com),* NSTA Director, District XI, Saint Louis, Mo.
Juliana Texley (@JulianaTexley; *texle1j@cmich.edu),* 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant
Emily Brady, Executive Administrator and Manager, NSTA Recommends, NSTA, Arlington, Va.
Wondering how to add literacy to STEM? Learn about NSTA's Best STEM Book initiative and how to identify a STEM book.

HS **Greenway Case Study: Using Technology and Maps to Inform Development Decisions**
(Grades 9–College) *Emerald 3, Gaylord Palms*
Jenna Hartley (@JHartleySTEM; *hartley.jenna@epa.gov),* U.S. EPA Research Triangle Park, Durham, N.C.
Greenway Case Study puts students in the decision-making role. Students generate a justification for whether they support a proposed greenway route using maps and web-based interactive tools from the EPA's *EnviroAtlas* tool.

LE **5Ez Steps to Building an Elementary Science Curriculum**
(Grades K–5) *Emerald 5, Gaylord Palms*
Clay Nolan (@STEMuClaytion; *cnolan@caboces.org),* Cattaraugus-Allegany-BOCES, Olean, N.Y.
Our established lessons are built on the 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson model. We will share how to design a process for constructing an elementary STEM curriculum that meets the *NGSS* and gets results.

A Defining and Transitioning into a STEM School

(General) *Emerald 7, Gaylord Palms*

Susan Butler (@ufteacherprep; *sbutler@coe.ufl.edu),* University of Florida, Gainesville

Shari Bremekamp (@CTESLions; @sharbrem; *shari.bremekamp@palmbeachschools.org),* Cypress Trails Elementary School, West Palm Beach, Fla.

Fred Barch (@ufteacherprep; *barchs@aol.com),* Boynton Beach Community High School, Boynton Beach, Fla.

Jennifer Galindo (@grassy_waters; *jennifer.galindo@palmbeachschools.org),* The School District of Palm Beach County, West Palm Beach, Fla.

Sandra Jinks *(cayealo@palmbeach.k12.fl.us),* Palm Springs Community Middle School, Palm Springs, Fla.

Annmare Dilbert (@Crosspointe_El; *annmarie.dilbert@palmbeachschools.org),* Crosspointe Elementary School, Boynton Beach, Fla.

A committee of 15 principals in the School District of Palm Beach County created a professional learning community that studied the attributes of effective STEM schools. The result was a STEM School Rubric that they used as a road map to transform their schools into STEM-focused institutions. The principals will share the benefits and barriers they encountered on this journey to STEM school status.

HS Creating Real-World Connections: Integrating Comics and Pop Culture into a STEM Classroom

(Grades 6–College) *Orange Blossom Ballroom, Gaylord Palms*

Shari Brady (@Scienceof_org; *shari@thescienceof.org)* and **Matt Brady** (@Scienceof_org; *matt@thescienceof.org),* Parkland Magnet High School, Winston-Salem, N.C.

Use comics and pop culture to bring real-world relevance to your STEM classroom with *www.thescienceof.org.*

M NSTA Press® Session: Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6–8

(Grades 6–8) *Osceola B, Gaylord Palms*

Victor Sampson (@drvictorsampson; *victor.sampson@gmail.com),* The University of Texas at Austin

Hear about Argument-Driven Inquiry and how it can help students learn to use disciplinary core ideas, crosscutting concepts, and science and engineering practices to explain natural phenomena.

UE Differentiating Instruction to Make STEM Accessible to ALL Children

(Grades 3–6) *Palm Beach, Gaylord Palms*

Donna Knoell *(dknoell@sbcglobal.net),* Educational Consultant, Overland Park, Kans.

Join me as I model differentiation strategies and activities, using classroom makerspaces to maximize exploration, inquiry, and discourse, and make STEM learning accessible to ALL children. Handouts!

M Incorporating GLOBE and Inquiry into Middle School Science

(Grades 6–8) *Vero, Gaylord Palms*

Daniel Stokes, Alfonza W. Davis Middle School, Omaha, Neb.

Presider: Carol Engelmann, University of Nebraska Omaha

Discussion centers on strategies used to measure a student's attitude toward science as measured by a pre- and post-intervention survey.

11:00 AM–12 Noon Hands-On Workshops

UE **Critter Scene Investigation (CSI): Scat on the iPods**
(Grades 3–8) *Emerald 4, Gaylord Palms*
Tanya Taylor *(tanyataylor@metroparks.net),* Columbus and Franklin County Metro Parks, Westerville, Ohio
Investigate created "evidence" using field guides loaded on iPods. Explore maps, bags of tracks, sheds, and scat in this fun inquiry activity.

UE **Cultural Connections to Science: The Northern Lights**
(Grades 4–6) *Emerald 6, Gaylord Palms*
Lori Schoening *(llschoening@alaska.edu),* **Lynda McGilvary** *(lmmcgilvary@alaska.edu),* and **Doreen Hayward** *(dehayward@alaska.edu),* Geophysical Institute, Fairbanks, Alaska
Discover free *NGSS*-focused resources for teaching about the aurora that incorporates Iñupiat culture and language and embeds proven strategies for engaging indigenous learners in science.

HS **AAPT Session: DNA Science**
(Grades 9–College) *Emerald 8, Gaylord Palms*
Dolores Gende (@AAPTHQ; @dgende; *dgende@gmail.com),* North Broward Preparatory School, Coconut Beach, Fla.
Using a pen spring, a laser, and a protractor, model how Rosalind Franklin determined the pitch angle of DNA using physics and biology.

Pa **Enhancing Water Education Through a University and School District Partnership**
(Grades 4–6, College) *Gainesville 2, Gaylord Palms*
Yilin Zhuang (@marionwet; *yilinz@ufl.edu),* UF/IFAS Extension Marion County, Ocala, Fla.
Learn about extension-based programs that enhance water education with an interactive and hands-on approach through a partnership between university and school district.

M **Hands-On Performance Assessment of the *CCSS* and *NGSS*: An Effective Formative Assessment Strategy**
(Grades 5–9) *St. George 104, Gaylord Palms*
Deborah Tucker *(deborahlt@aol.com),* Independent Science Education Consultant, Napa, Calif.
Grant Gardner (@Assessmentserv; *grantmgardner@msn.com),* Assessment Services, Inc., Pepperell, Mass.
Engage in a hands-on performance task. Explore how this form of assessment is used to demonstrate student mastery of the *CCSS* and *NGSS*.

M **Using Grand Challenges to Engage Students in STEM**
(Grades 6–8) *St. George 106, Gaylord Palms*
Tania Pachuta (@STEMtania; *tania.pachuta@cobbk12.org),* Cobb County School District, Marietta, Ga.
What are Grand Challenges and how can we use them to engage students in authentic STEM learning? View exemplar projects and create your own!

UE **NSTA Press® Session: *Picture-Perfect STEM Lessons*: Using Children's Books to Inspire STEM Learning**
(Grades K–5) *St. George 108, Gaylord Palms*
Emily Morgan (@PPSLessons; *emily@pictureperfectscience.com)* and **Karen Ansberry** *(karen@pictureperfectscience.com),* Picture-Perfect Science, West Chester, Ohio
The authors of *Picture-Perfect STEM Lessons* will share lessons that integrate STEM and literacy through the use of STEM-related picture books.

HS **Project-Based Assessments in a Biology Modeling Classroom**
(Grades 9–12) *St. George 114, Gaylord Palms*
Becky Rollo *(rollor@wcsoh.org),* Westerville Central High School, Westerville, Ohio
Ashley Evans *(evansa@wcsoh.org),* Westerville North High School, Westerville, Ohio
Valecia Kelly *(fresta8990@gmail.com),* Shroder High School, Cincinnati, Ohio
Kaeri King (@kaeriking; *kaeriking75@gmail.com),* Groveport Madison High School, Groveport, Ohio
Tired of final exams that kids don't study for and won't remember? Come integrate *NGSS*-focused project-based assessments in a biology modeling classroom.

LE **STEM on a Shoestring**
(Grades K–4) *Tampa 1, Gaylord Palms*
Julianne Ross-Kleinmann (@JBR_Kleinmann; *jbross.stem.pln@gmail.com),* The Foote School, New Haven, Conn.
Interested in incorporating STEM into your curriculum but have limited resources? Experience how third-graders learn and apply the Museum of Science's engineering design process using spaghetti, index cards, Life Savers®, pipe cleaners, shoe boxes, and other household items to tackle collaborative and independent design challenges.

NSTA Press® Session: The Power of Questioning
(Grades P–6) *Tampa 2, Gaylord Palms*
Lisa Nyberg (@docnyberg; *lnyberg@csufresno.edu),* California State University, Fresno
Julie McGough (@Jvmcgough1; *mrmagoojulie2@att.net),* Valley Oak Elementary School, Fresno, Calif.
Learn questioning strategies integrated in a dynamic model to engage powerful practices, depth of knowledge, and communication skills with *CCSS* and science standards!

Stories and STEM: Integrating Literacy and STEM in Early Childhood
(Grades K–3) *Tampa 3, Gaylord Palms*
Meredith Fraysure (@AfterSchoolRead; *mfraysure@literacypbc.org),* Literacy Coalition of Palm Beach County, Boynton Beach, Fla.
Learn how to connect literature with STEM along with completing several experiments that are fun and inexpensive. Lesson plans and suggested book lists will be provided!

11:00 AM–12 Noon Exhibitor Workshops

Project/Presentation Time…Now What? FOLDABLES!
(Grades 3–12) *Naples 1/2, Gaylord Palms*
Sponsor: *Dinah.com*
Bob Stremme *(karlrobdz@gmail.com), Dinah.com,* San Antonio, Tex.
Research completed, data gathered—you're ready to tell everyone about your STEM project. Learn how to use envelopes, paper, scissors, and glue to construct a Foldable display and assemble your information for all to see. Leave with a working sample, ready for your next day in the classroom.

Blending Modeling and Storytelling to Engage Students in Science and Engineering Practices
(Grades 5–College) *Osceola 1, Gaylord Palms*
Sponsor: 3D Molecular Designs
Kristine Herman *(kris.herman@3dmoleculardesigns.com),* 3D Molecular Designs, Milwaukee, Wis.
Explore science and engineering practices with stories and hands-on modeling. Combine physical tangram sets and a tale about the Nintendo Empire to encourage collaboration and discuss how scientific models evolve. A black box activity demonstrates how scientists gather data to explain phenomena and design and build models to test hypotheses.

Developing Project-Based STEM Lessons for Your Classroom
(Grades K–12) *Osceola 2, Gaylord Palms*
Sponsor: Rokenbok Education
Caitlin Bigelow *(caitlinb@rokenbokeducation.org),* Rokenbok Education, San Diego, Calif.
Join Rokenbok Education as they dive into the world of design and engineering. Go hands-on with a building challenge and learn how to implement a project-based STEM curriculum for your classroom.

The Power of Modeling in K–8 Classrooms
(Grades K–8) *Osceola 3, Gaylord Palms*
Sponsor: Amplify
Carissa Romano *(amplifyscience@berkeley.edu)* and **Sophia Lambertsen** *(amplifyscience@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley
How can students create and use models to enhance, explain, and expand their thinking? Experience a variety of ways students deepen and demonstrate their understanding of scientific phenomena through the use of models. Engage with K–8 exemplars from Amplify Science, the new *NGSS*-designed curriculum from The Lawrence Hall of Science.

Introduction to Llongwill Digital USA
(Grades K–8) *Osceola 5, Gaylord Palms*
Sponsor: Llongwill Digital USA
Angela Romero *(aromero@llongwilldigitalusa.com),* Llongwill Digital USA, Houston, Tex.
Kelechi Ubaha *(kubaha@llongwilldigitalusa.com),* Fort Bend ISD, Sugar Land, Tex.
We are revolutionizing accessibility to data collection equipment. As a company, we want to connect educators through scientific engagement. We offer development of curricula and provide teacher training. Join us as our innovative company changes how educators and districts do business with a sensor-based company.

Beyond the Punnett Square
(Grades 7–College) *Osceola 6, Gaylord Palms*
Sponsor: B.A.C.K. for Learning
Mary Holland *(mhollandaz@backforlearning.com),* B.A.C.K. for Learning, Casa Grande, Ariz.
We have all taught genetics and probability using the traditional Punnett square. What if you could use hands-on kits that interconnect the concepts of cell division, inheritance, and protein synthesis? More than just kits, this workshop incorporates a method of teaching that will have you teaching more and grading less.

Drought in Africa Inspires Students to Invent a Smart Irrigation System

(Grades 6–12) *Sarasota 1/2, Gaylord Palms*

Sponsor: Texas Instruments

Fred Fotsch, Texas Instruments, Dallas

Come learn how to create a project-based camp or classroom lesson that enables students to apply concepts, such as photosynthesis and the water cycle, to design a smart irrigation system. Inspired by real-world events, students are motivated to apply problem-solving skills and learn some basic programming to come up with innovative solutions to the drought situation in southern Africa.

1:30–2:30 PM Administrators Featured Workshop

A

Design Thinking: A Hands-On Workshop for Navigating Challenges in Your Class, School, and Life

(General) *Osceola A, Gaylord Palms*

Facilitators:

Ela Ben-Ur *(ela@innovatorscompass.org),* Founder, Innovators' Compass, Cambridge, Mass.

Garrett Mason *(garrett.mason@stmsaints.com),* High School Strand Leader, and Director of Innovation and Design, St. Martin's Episcopal School, Metairie, La.

As educators, we not only help students learn subject content, but more importantly, also nurture in them the mind-sets and skills they will need to be successful in life. These mind-sets and skills unfold from the questions we ask. Surprisingly, there are five root questions that drive "innovators" of all kinds—whether a curious two-year-old or a professional engineer.

What happens when educators and students use these questions as a compass to find new possibilities in our schools and lives? On big challenges and small ones? Throughout curriculum and school culture? It is because Design Thinking articulates each of these questions and invites people to explore them in diverse ways that it has had a growing impact in the primary, secondary, and postsecondary schools across the country.

Join us as we delve headfirst into Design Thinking through this experiential workshop where we'll practice applying our own skills and mind-sets in expanding how problem solving happens in our classrooms and schools. This workshop is geared toward both administrators and teachers to understand how Design Thinking can not only enhance your STEM program, but also strengthen the very culture of thinking at your school.

1:30–2:30 PM Presentations

M

Manufacturing and Engineering: Working Together to Support Real-World Problem Solving

(Grades 2–12) *Destin 1, Gaylord Palms*

Amanda Solarsh *(amandasolarsh@gmail.com),* Simon Baruch MS104, New York, N.Y.

Gina Tesoriero (@Miss_STEM; *ginatesoriero@gmail.com),* M.S. 319 Maria Teresa Mirabal School, New York, N.Y.

So you have designed a solution to a problem…now what? Learn how manufacturing is an integral component of the engineering design process.

Pa

University of Florida Partners with Palm Beach County Schools

(Grades K–5) *Destin 2, Gaylord Palms*

Alicia Foy (@aliciafoy1; *alicia.foy@palmbeachschools.org),* Poinciana Elementary STEM, Boynton Beacch, Fla.

Teachers in Palm Beach County connected with University of Florida scientists, engineers, mathematicians, technology specialists, and educational leaders to integrate new interdisciplinary content knowledge using Problem- and Project-based teaching strategies. Content clinics, field trips, and written PBL lesson plan requirements enhanced the learning and collaborative process. Hear how this partnership led to strengthened STEM knowledge and practice in Palm Beach County schools.

Pa

ITEEA Session: iSTEM Elementary Education—Preparing STEM Teacher Leaders

(Grades K–8) *Emerald 1, Gaylord Palms*

Lindsey Gerding *(gerdinl1@tcnj.edu),* **Annie Goodwin** (@MsGoodwin3; *goodwia3@tcnj.edu),* and **Rebecca Turner** *(turner25@tcnj.edu),* The College of New Jersey, Trenton

Tanner Huffman (@tannerhuffman; *huffmant@tcnj.edu),* International Technology and Engineering Educators Association, Reston, Va.

Through a partnership between TCNJ's Schools of Education and Engineering, the Integrative-STEM program is designed as a multidisciplinary major to prepare K–6 (8) teacher leaders.

Pa

Developing a STEM Outreach Agenda

(College) *Emerald 3, Gaylord Palms*

Sara McCubbins *(samccub@gmail.com),* College of DuPage, Glen Ellyn, Ill.

Hear how we developed, promoted, and executed a series of STEM outreach events designed to increase awareness of STEM and reduce STEM attrition rates.

UE **Addressing *NGSS* with Technology in the Field**
(Grades K–6) *Emerald 5, Gaylord Palms*
Suzanne Zietlow, Discovery Charter School, Columbus, Wis.
CANCELED
Discover ways to address *NGSS* in the field/outdoor classroom with the purposeful use of technology.

UE **Revamping Science Class**
(Grades 3–5) *Emerald 7, Gaylord Palms*
Patrice Semicek (@PSemicek; *psemicek@mciu.org),* Montgomery County Intermediate Unit 23, Norristown, Pa.
Providing cross-content instruction in the elementary classroom through Project-Based Learning takes planning and preparation. Come see how one grade 5 team revamped their materials.

Pa **Partnering with Business/Industry to Provide STEM Career Opportunities for High School Students**
(Grades 6–12) *Gainesville 1, Gaylord Palms*
Amy Davis *(amy.davis@aiu3.net),* Allegheny Intermediate Unit 3, Homestead, Pa.
Let's get high school students out of the four walls of our school buildings and into the real world. Experience STEM as a career!

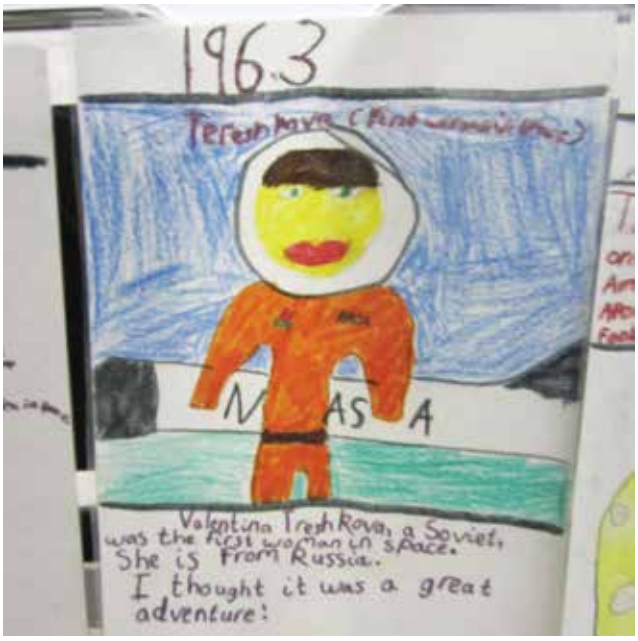
HS **Engaging the Virtual Student in STEM**
(Grades 9–12) *Orange Blossom Ballroom, Gaylord Palms*
Amsler Burns, Kimberly Cloran (@physicsophysics; *kcloran@flvs.net),* and **Linda Childs** *(l.childs@flvs.net),* Florida Virtual School, Orlando
We will showcase strategies that engage virtual students in STEM, including ways to connect virtual students with the real-life science community!

HS **Apple Valley High School Fab Lab and Multimedia Makerspace E3STEM Grant**
(Grades 6–12) *Osceola B, Gaylord Palms*
Christopher Lee (@AVHS_STEM; *christopher.lee@district196.org),* Apple Valley High School, Apple Valley, Minn.
The Apple Valley High School Fabrication Lab and Multimedia Makerspace, with support from the E3STEM grant, have integrated STEM activities throughout the school and community.

Pa **The Strategic Undergraduate STEM Talent Acceleration Initiative (SUSTAIN)**
(College) *Palm Beach, Gaylord Palms*
John Tillotson (@johnwtillotson; *jwtillot@syr.edu),* **Jason Wiles, Julia Snyder,** and **Jeremy Sloane,** Syracuse University, Syracuse, N.Y.
Find out about the Syracuse University SUSTAIN Project, an NSF-funded effort designed to recruit, support, and retain high-achieving undergraduate STEM students from low-income and underrepresented backgrounds.

HS **Effective Food Safety Curriculum for STEM Teachers: A Case Study**
(Grades 7–College) *St. George 102, Gaylord Palms*
Yaohua Feng *(yhfeng@ucdavis.edu)* and **Christine Bruhn** *(cmbruhn@ucdavis.edu),* University of California, Davis
We will describe an effective food safety curriculum that was piloted in high schools in California. Students reported a significant increase in food safety knowledge and behavior.

M **The Transition—From STEM Student to STEM Teacher**
(Grades 6–12) *Vero, Gaylord Palms*
Nichelle Wollberg, Lake Holcombe School, Holcombe, Wis.
Chelsey Turner (@ChelseyJTurner2), Viking Middle School, Woodville, Wis.
Rachelle Haroldson, University of Wisconsin–River Falls
First-year teachers who went through a STEM teacher preparation program will share their experiences transitioning from being a STEM student to a STEM teacher.



1:30–2:30 PM Hands-On Workshops

UE **DeSTEMber: 31 Days of Standards-Focused Curriculum**
(Grades 3–6) *Emerald 4, Gaylord Palms*
Itzel Gutierrez (@girlstart; *itzel@girlstart.org),* Girlstart, Austin, Tex.
Spark STEM excitement in your classroom with 31 days of fun, innovative activities in this hands-on workshop.

UE **Toying with Engineering During Literacy: Designing a Literature-Based Cardboard Automaton**
(Grades 3–6, College) *Emerald 6, Gaylord Palms*
Jennifer Shettel (@readndr; *jennifer.shettel@millersville.edu),* **Charlton Wolfgang** (@docwolfgang), and **Janet White** (@jwmatheduc; *jwhite@millersville.edu),* Millersville University, Millersville, Pa.
Explore the world of cardboard automata and mechanisms! Participants will discover how to integrate engineering concepts with literacy standards through this engaging hands-on workshop.

HS **AAPT Session: Nerve Science**
(Grades 6–College) *Emerald 8, Gaylord Palms*
Dolores Gende (@AAPTHQ; @dgende; *dgende@gmail.com),* North Broward Preparatory School, Coconut Beach, Fla.
Build model axons from vinyl tubing, salted gelatin, and metal tacks. Investigate the role of resistivity in both physical and biological contexts.

HS **SENSE IT: Student-Built Water Quality Sensors**
(Grades 7–College) *Gainesville 2, Gaylord Palms*
Liesl Hotaling *(lieslhotaling@yahoo.com),* Eidos Education, Highlands, N.J.
The SENSE IT program challenges participating students to construct, deploy, and interpret data from their own water quality sensors. To build and understand their sensors, students must use a wide range of core knowledge of mathematics and physical science, as well as learn practical hands-on technology skills such as soldering and debugging circuits.

M **Infusing Computational Thinking into Science Classrooms**
(Grades 6–8) *Sarasota 3, Gaylord Palms*
Melody Hagaman (@ProjectGUTS), Centennial High School, Las Cruces, N.Mex.
Sheryl Arriola *(sheryl.arriola@browardschools.com),* Westglades Middle School, Parkland, Fla.
Get introduced to computational thinking through modeling and simulation of real-world phenomena. Participants will deconstruct and modify a computer model, conduct experiments using the model as a test bed, and reflect on what students learn when engaged in computational thinking in a science context. Laptops recommended.

M **Get Ready: A Total Solar Eclipse Is Coming to the United States!**
(Grades P–12) *St. George 104, Gaylord Palms*
Karen Roark *(kcroark@gmail.com),* NASA Ames Research Center, Mountain View, Calif.
This is a perfect chance to teach everything you can about the dynamics of the motion of the Earth and moon. Students learn about solar eclipses, sunspots, and solar storms through a series of hands-on activities, games, and lessons. Sun safety, solar careers (including women in space, research jobs, and salaries), and science blogs matching the *NGSS* included.

UE **NSTA Press® Session: Pendulums and Crooked Porch Swings: A Model for Connecting Science and Engineering**
(Grades 3–8) *St. George 108, Gaylord Palms*
Susan Cooper *(sjcooper@fgcu.edu),* Florida Gulf Coast University, Fort Myers
Experience a hands-on model lesson that connects a scientific investigation to an engineering problem. It can also be used for teacher and administrator professional development.

HS **Building Leadership and Mentoring Through STEM-Based Literacy Projects**
(Grades P–K, 9–12) *St. George 114, Gaylord Palms*
Donna Jagielski *(djagiels@asu.edu),* Roosevelt Elementary School District No. 66, Phoenix, Ariz.
This program focuses on how teachers and administrators can foster opportunities for high school students to develop leadership and mentoring skills by bringing STEM-based literacy and hands-on projects to primary and early childhood students.

LE **STEM Integration and Children's Play**
(Grades P–3) *Tampa 1, Gaylord Palms*
Cynthia Gardner *(cgardner@lander.edu)* and **Chris Sacerdote,** Lander University, Greenwood, S.C.
How does children's play provide the groundwork for STEM? Experience activities designed to integrate play with children's learning within and across the STEM disciplines.

LE **Weather, Here and There**
(Grades K–2) *Tampa 2, Gaylord Palms*
Margaret Giunta *(giuntam@pcsb.org),* Douglas L. Jamerson, Jr. Elementary School, Saint Petersburg, Fla.
Vickei Hrdina (@STEMesd112; *vickei.hrdina@esd112.org),* Educational Service District 112, Vancouver, Wash.
Learn how teachers in different states joined forces to bring students an authentic STEM learning experience through an integrated weather and climate module featuring an Aesop's fable.

LE **"Don't Call Us Kinders, We're Engineers!" Engineering Education for Young Students**
(Grades K–2) *Tampa 3, Gaylord Palms*
Emily Poster *(eposter@smm.org),* Science Museum of Minnesota, Saint Paul
Learn about the Science Museum of Minnesota's development of K–2 engineering lessons and engage in a hands-on kindergarten engineering challenge.

1:30–2:30 PM Exhibitor Workshops

Getting Students Through the Cellular Membrane
(Grades 9–College) *Osceola 1, Gaylord Palms*
Sponsor: 3D Molecular Designs
Gina Vogt *(gina.vogt@3dmoleculardesigns.com),* MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
Support three-dimensional learning with materials that engage students in an exploration of the unique chemical and physical properties of water and the membranes that separate cells from their surrounding environment. Construct a model to explain diffusion, osmosis, and active and passive transport of molecules across the cell membrane.

Reconceptualizing Chemistry Through Play: Ionic Bonding
(Grades 7–12) *Osceola 2, Gaylord Palms*
Sponsor: PlayMada Games
Edward Wang *(edwardw@playmadagames.com),* PlayMada Games, New York, N.Y.
Discover a new way to teach fundamental chemistry ideas in a fun and engaging way! Explore Collisions™, a digital chemistry game, and experience game play that provides students with a deepened understanding of key concepts including cation-anion attraction, neutrality, and ionic ratios. Bring your laptop/tablet for this lively hands-on session!

STEM Institute: Thinking Like an Engineer
(Grades K–8) *Osceola 3, Gaylord Palms*
Sponsor: Pearson
Katie MacDonald *(katie.macdonald@pearson.com)* and **Thomas Gantt** *(tom.gant@pearson.com),* Pearson Education, Boston, Mass.
Learn about the science and engineering practices and how they connect to science concepts. We will engage in the engineering design process and discuss ways to incorporate engineering into science lessons. Connections will be made to language arts and mathematics as well.

The Chemistry of Glow Sticks
(Grades 6–12) *Osceola 4, Gaylord Palms*
Sponsor: Fisher Science Education
April Fischione *(april.fischione@thermofisher.com),* Fisher Science Education, Pittsburgh, Pa.
Relive your childhood by making your own glow stick. You may have wondered what happens when you snap a glow stick that causes it to glow. Join us for a fun chemistry experiment where you will create a glowing chemical reaction.

Science Storylines and the Driving Question Board: Keeping *NGSS*-Focused Curricula Student Driven
(Grades K–12) *Osceola 5, Gaylord Palms*
Sponsor: Activate Learning
Heather Milo, Activate Learning, Greenwich, Conn.
What if K–12 lessons could both meet the standards and leverage student curiosity about the natural world? Join us for an engaging workshop on storyline coherence as a means to not only have pedagogy meet the *NGSS,* but also build on students' questions using the Driving Question Board. One such storyline from the IQWST Middle School Curriculum will be raffled at the end!

Using Video Games to Encourage STEM Learning in Middle School
(Grades 5–8) *Osceola 6, Gaylord Palms*
Sponsor: Meadowlark Science and Education, LLC
Charles Raffety *(charles.raffety@umontana.edu)* and **Andrij Holian** *(andrij.holian@umontana.edu),* University of Montana, Missoula
Paulette Jones *(paulette@meadowlarkscience.com),* Meadowlark Science and Education, LLC, Missoula, Mont.
This workshop will provide a short background on the process used to develop STEM video games and additional curriculum support materials. Sample learning exercises from games will be demonstrated to illustrate the basis for STEM learning and use in classroom settings.

3:00–4:00 PM Presentations

M **Building Community Partnerships Through Family STEM Night**

(Grades 6–8) *Destin 1, Gaylord Palms*

Cathie Mullins *(mullinsc@pcsb.org),* Morgan Fitzgerald Middle School, Largo, Fla.

Research shows that strengthening community partnerships leads to increased motivation and learning engagement for students. Hear how businesses supported Family STEM Night at our school.

Pa **Partnerships: Creating Statewide Career Resources for Teachers, Parents, and Students**

(Grades 7–College) *Destin 2, Gaylord Palms*

Joan Matz (@IL-IT_LEx; *jmatz@comptia.org),* Creating IT Futures Foundation, Downers Grove, Ill.

Receive strategies for building successful partnerships with employers, and hear best practices on creating new tools for teachers, students, and parents.

HS **Not Your Parents' Lecture: Strategies for Learner-Centered Instruction**

(Grades 6–12) *Emerald 1, Gaylord Palms*

Mark Waxmonsky (@markwaxmonsky; *mark.waxmonsky@knoxschools.org)* and **Alicia Signore** *(alicia.signore@knoxschools.org),* L&N STEM Academy, Knoxville, Tenn.

In comparing *CCSS* for math and science, significant crossover was discovered. This presentation models authentic, cross-curricular, learner-centered opportunities for all classrooms.

LE **STEAMing Ahead: Integrating the Arts into STEM Instruction**

(Grades K–2) *Emerald 3, Gaylord Palms*

Heather Ribblett *(heather.ribblett@kcd.org),* **Rebecca Gallion** *(rebecca.gallion@kcd.org),* and **LuAnn Hayes** *(luann.hayes@kcd.org),* Kentucky Country Day School, Louisville

Gain practical strategies for integrating the arts into STEM instruction in the primary classroom. We will discuss planning, assessment, and examples of STEAM in action.

UE **Exploration and Discovery Through Maps: Teaching Science with Technology**

(Grades 4–5) *Emerald 5, Gaylord Palms*

Jenna Hartley (@JHartleySTEM; *hartley.jenna@epa.gov),* U.S. EPA Research Triangle Park, Durham, N.C.

Engage young learners in exploration with a three-part lesson package that includes hands-on activities, the outdoors, and a high-tech web-based mapping tool developed by the EPA *(EnviroAtlas).*

A **Transforming K–12 STEM Education Through Leader and Teacher Development**

(Grades K–12) *Emerald 7, Gaylord Palms*

Jonathon Wetherington (@ScienceinGCPS; *jonathon_wetherington@gwinnett.k12.ga.us)* and **Bonnie Brush** (@blbbrush; *bonnie_brush@gwinnett.k12.ga.us),* Gwinnett County Public Schools, Suwanee, Ga.

Experience our STEM instructional transformation facilitated through the implementation of professional development laboratory schools, leadership development, and professional learning focusing on Problem/Project-Based Learning.

Pa **Growing STEM in the Park: Formal/Informal Education Partnerships**

(General) *Gainesville 1, Gaylord Palms*

Tanya Taylor, Columbus and Franklin County Metro Parks, Westerville, Ohio

STEM—it's in the park. Student understanding and test scores grow when classroom teachers and park naturalists partner in this standard-based life science curriculum. Come find out about the Students Exploring Ecosystem Dynamics (SEED) program.

Pa **Using National Science Olympiad STEM Events to Address *NGSS* Crosscutting Concepts and Content**

(Grades 6–12) *Osceola B, Gaylord Palms*

Donna Young *(dlyoung.nso@gmail.com),* NASA NSO STEM Coordinator, Bullhead City, Ariz.

Hear how National Science Olympiad regional, state, and national competitions include STEM events and supporting resources that can be easily incorporated into existing curricula to actively engage students.

UE **NASA and Science Literature Books**

(Grades K–5) *Palm Beach, Gaylord Palms*

Lester Morales (@NASAKSCEPDC; *lester.morales@nasa.gov),* NASA Kennedy Space Center, Fla.

Find out about NASA's literature books for the K–5 classroom and how to use these books to engage students, increase vocabulary, and increase interest in science literacy.

HS **Climate Change, Teenagers, and Butterflies**
(Grades 9–12) *St. George 102, Gaylord Palms*
Betsy Payne *(payne@ansp.org),* The Academy of Natural Sciences of Drexel University, Philadelphia, Pa.
Cash'e Chapman, Student, Science Leadership Academy @ Beeber, Philadelphia, Pa.
N'aignae Starnes *(naestar7@gmail.com),* Student, Franklin Learning Center, Philadelphia, Pa.
Explore a model to empower youth to better understand how scientists study climate change in different habitats and countries focusing on a species, in this case butterflies in Costa Rica.

—*Photo courtesy of Mike Weiss*

3:00–4:00 PM Hands-On Workshops

UE **Supporting STEM Education in the Inclusion Classroom**
(Grades 3–5) *Emerald 2, Gaylord Palms*
Mindy Gumpert *(mgump001@odu.edu),* Old Dominion University, Norfolk, Va.
Engage in a STEM activity by collaboratively designing a vehicle. This lesson provides scaffolds to ensure active participation of students with disabilities.

UE **Building Understandings Through Shared Concepts in Science and Music**
(Grades 3–6) *Emerald 4, Gaylord Palms*
Terry Wolkowicz *(twolkowicz@nbsymphony.org),* New Bedford Symphony Orchestra, New Bedford, Mass.
Ronald Sherwin *(rsherwin@umassd.edu),* UMass Dartmouth, North Dartmouth, Mass.
Scientific concepts explored using a concept-based arts integration model can provide multiple pathways for students to build understanding while creating learning environments that support transfer of learning.

UE **Teaching Engineering, Motion, and Energy Through Rube Goldberg**
(Grades 1–2, 4–7) *Emerald 6, Gaylord Palms*
Elaine Sevin *(elainesevin@newmanschool.org),* Isidore Newman School, New Orleans, La.
This introduction to STEM for elementary classrooms will allow participants to explore motion and energy while creating their own Rube Goldberg machine using found objects.

M **ITEEA Session: Engineering for All—Designing Solutions to Global Issues**
(Grades 6–8) *Emerald 8, Gaylord Palms*
Anita Deck *(adeck@iteea.org),* International Technology and Engineering Educators Association, Crab Orchard, W.Va.
Employ authentic social contexts for a hands-on approach to teaching STEM ideas and practices using the NSF-funded Engineering for All curriculum.

Pa **Consensus Discussions: An Approach to Scoring Scientific Explanations**
(Grades 3–8) *Gainesville 2, Gaylord Palms*
Julie Jacobi *(jjacobi@luc.edu),* Center for Science and Mathematics Education, Loyola University Chicago, Ill.
We will look at student work on constructing scientific explanations and engage in a consensus discussion around scoring that work. Get out of your usual scoring routine! Discover how engaging in consensus discussions in your school or professional learning community can help you gain a deeper understanding of student thinking.

LE **Story Starts with STEM**
(Grades P–4) *Osceola A, Gaylord Palms*
Jennifer C. Williams (@ScienceJennifer; *jenniferwilliams@newmanschool.org),* Steering Committee Chairperson, 6th Annual STEM Forum & Expo, and Isidore Newman School, New Orleans, La.
Tiffany Abshire *(tabshire@mceschool.com),* Mount Carmel School, Abbeville, La.
Promote your students' enthusiasm and understanding of scientific concepts by integrating children's literature into project-based experiments and activities. Join us as we explore the seamless blend of "story time" and STEM. Leave with a bibliography of suggested titles and complementary STEM activities.

M **Applying Systems Thinking Strategies to Address Real-World Problems**
(Grades 5–12) *Sarasota 3, Gaylord Palms*
Brenda Breil *(bbreil@pky.ufl.edu),* P.K. Yonge Developmental Research School, Gainesville, Fla.
Systems thinking strategies help students think critically about authentic problems, and design solutions to address issues that span a range of disciplines.

M **Measuring Sea Level from Space**
(Grades 6–8) *St. George 104, Gaylord Palms*
Candice Autry *(cautry@sheridanschool.org),* Sheridan School, Washington, D.C.
Analyze and interpret ocean depths to plot sea surface height. Attendees will practice making two-dimensional data become three-dimensional; in turn, bolstering visual-spatial conception skills.

HS **How to Build a Better Muscle**
(Grades 7–College) *St. George 106, Gaylord Palms*
Stacy Thibodeaux (@stacythib; *svthibodeaux@gmail.com),* Southside High School, Youngsville, La.
Investigate muscle structure, collect data on muscle fatigue, and build a better muscle based on structure following function in anatomy and physiology.

UE **STEM Lesson Guideposts™: Mapping STEM Lessons into Your Curriculum**
(Grades 2–8) *St. George 108, Gaylord Palms*
Jo Anne Vasquez *(jvasquez@stemlessonessentials.com),* 1996–1997 NSTA President, and Rocks to Rainbows, LLC, Gilbert, Ariz.
Michael Comer (@mathscience1107; *comermwcdad@aol.com),* Pearson Education, Boston, Mass.
This interactive session will introduce a newly developed research-based process for developing practical integrated STEM lessons and units using your school or district standards and curriculum.

HS **Design a Cell Phone Case to Protect Your Phone**
(Grades 6–College) *St. George 114, Gaylord Palms*
Susan Ramsey (@Ramseyscience; *susanbradyramsey@gmail.com)* and **Christy Scott** (@CCS_iSTEM; *scottc1@charlottesvilleschools.org),* Charlottesville (Va.) City Schools
Using force plates to gather data, participants will design a cell phone case to reduce the force on their phone. Multiple iterations will be done over the course of 60 minutes to move through the design process.

LE **Ignite Discovery: STEM Foundations**
(Preschool) *Tampa 1, Gaylord Palms*
Nylah Rampersad (@orlandoscience; *nrampersad@osc.org),* Orlando Science Center, Orlando, Fla.
Centers don't need a science museum to incorporate STEM and Engineering Design Challenges into the classroom. Learn how to bring hands-on STEM challenges into any preschool center.

UE **Designing with Electrical Circuits**
(Grades 3–5) *Tampa 2, Gaylord Palms*
Barbara Adcock (@adcockhome; *barbara.adcock@powhatan.k12.va.us)* and **Elizabeth Kirk** *(elizabeth.kirk@powhatan.k12.va.us),* Powhatan County Public Schools, Powhatan, Va.
Explore basic circuit design, differences between incandescent and LED lights, and design and create an electronic study guide. Leave with several design briefs that require very few supplies and can be done on a shoestring budget!

UE **Blow the Roof Off!**
(Grades 3–6) *Tampa 3, Gaylord Palms*
Karen Ostlund (@karen_ostlund; *klostlund@utexas.edu),* 2012–2013 NSTA President, and The University of Texas at Austin
Strong winds generated by hurricanes and tornadoes can lift the roof off a house. Use a model for the engineering design process that integrates the *NGSS* three dimensions to design a better roof.

3:00–4:00 PM Exhibitor Workshop

Water Chemistry Lab
(Grades 9–12) *Osceola 4, Gaylord Palms*
Sponsor: Fisher Science Education
April Fischione *(april.fischione@thermofisher.com),* Fisher Science Education, Pittsburgh, Pa.
Determine several chemical parameters of water samples from three bodies of water to determine water quality. Using field tools, laboratory equipment, and chemistry, you will investigate a real-world water quality case study.

4:30–5:30 PM Closing Session: That's A Wrap…A STEM-tastic Celebration

(General) *Palm Beach, Gaylord Palms*

Steering Committee:
Jennifer C. Williams, Steering Committee Chairperson, and Isidore Newman School, New Orleans, La.
Adriana Guerra, Lower Elementary/Early Childhood Strand Leader, and E.P. Foster STEM Academy, Ventura, Calif.
Sandra Kellermann, Upper Elementary Strand Leader, and Harrison County School District, Gulfport, Miss.
Kenneth Williams, Middle Level Strand Leader, and Oxon Hill Middle School, Fort Washington, Md.
Garrett Mason, High School Strand Leader, and St. Martin's Episcopal School, Metairie, La.
Brenda Nixon, Partnerships Strand Leader, and Gordon A. Cain Center, Louisiana State University, Baton Rouge
Tiffany Huitt, Administrators Strand Leader, and School of Science and Engineering Magnet, Dallas, Tex.

Join us for a STEM-tastic wrap-up session from the 6th Annual STEM Forum & Expo's Steering Committee. Share in fond memories and reflect upon the deep learning experienced at this year's STEM Forum. Celebrate the magical sessions, panels, workshops, and networks created during your time in central Florida. You will have the opportunity to question our Steering Committee members and you will discover ways to be a part of the magic by becoming involved in future STEM Forums.

One lucky attendee will have the chance to win a free registration to the 2018 STEM Forum & Expo in Philadelphia…so come to our STEM-tastic celebration!

SAVE THE DATE

NSTA NATIONAL CONFERENCE ON SCIENCE EDUCATION

Atlanta, Georgia | March 15-18, 2018

CONFERENCE STRANDS

Focusing On Evidence of 3-D Learning
Imagining Science as the Foundation for STEM
Reflecting On Access for All Students
Comprehending the Role of Literacy in Science

WWW.NSTA.ORG/ATLANTA

#NSTA18

National Science Teachers Association

8:15 AM–12:15 PM Post-Conference Workshop

Energy and Waves Physics Lab at Magic Kingdom® (S-1)

Sponsored by Disney Youth Group Programs

SOLD OUT

The uniquely themed lands of the Magic Kingdom Park form the basis of this examination of light and sound energy and its relationship to creating one-of-a-kind Disney experiences. The learning adventure begins with participants interacting with common everyday items, showcasing real-world examples of the many forms of energy, and how the movement of energy is often in the form of a wave.

Participants engage in discussion and hands-on activities that form the foundation of their exploration of sound and light at work at the Magic Kingdom Park. Sound is a familiar part of our lives and provides information about the world around us. Guided by a Disney Y.E.S. facilitator, participants investigate sound and how it is produced and how it travels. A select attraction showcases the impact sound has on us in different ways!

The participants' journey continues into the amazing world of light and a look at the Electromagnetic Spectrum. Refraction, reflection, absorption, and wave components are revealed through study and group discussion. A trip to Liberty Square® provides an illuminating understanding of the power of light in creating some delightfully "haunting" special effects!

Note: Participants will be required to bring a photo ID. Cameras are permitted; however, no photos are allowed when the participants are backstage. Registrants must meet in the hotel lobby no later than 8:15 AM for a prompt 8:30 AM departure. This registered educators–only workshop is 2 1/2 hours although Disney is providing a complimentary admission ticket the day of the event. Therefore, buses will leave the park, returning to the hotel at the following times: 12 Noon and 5:00 PM. *(Anyone wanting to stay longer than 5:00 PM will need to make his/her own arrangements.)*

Exhibitors

Some exhibitors have classified their products by grade level.

Elementary	E
Middle School	M
High School	HS
College	C

Scan the QR code for a map display of the Exhibit Hall on our conference app.

—*Courtesy of MikeWeiss*

3D Molecular Designs **#407**
1050 N. Market, CC130A M, HS, C
Milwaukee, WI 53202
Phone: 414-774-6562
E-mail: *contactus@3dmoleculardesigns.com*
Website: *www.3dmoleculardesigns.com*

Hands-on and minds-on! Our kits and models focus on core ideas and crosscutting concepts in biology, chemistry, physical, and life sciences. We involve teachers in developing products and field testing. Kits support STEM, *NGSS*, AP, and IB. Ask about our Dynamic DNA Kit, Synapse Construction Kit, and influenza cellular landscape.

A+ Educators **#713**
7227 N. 16th St. E, M, HS
Phoenix, AZ 85020
Phone: 602-906-6017
E-mail: *rebecca.carter@4aplus.com*
Website: *www.4aplus.com*

At A+ Educators, our mission is to help build stronger K–12 schools by offering the highest quality and most effective education support services available today. We are dedicated to providing educators and schools nationwide with the most innovative and engaging professional development workshops and forward-facing classroom technology solutions.

AC Supply Co. **#708**
1746 Winding Glen Dr. E, M, HS
St. Charles, MO 63303
Phone: 800-536-0238
E-mail: *acsupply@swbell.net*
Website: *www.acsupplyco.com*

AC Supply provides a wide array of hands-on activities with curriculum support for STEM education. Featuring Estes Rocketry; K'NEX; alternative energy; snap circuits; robotics; aerospace; CO2 dragsters; bridge building; house framing; balsa, basswood, and raw materials, and more—all at budget-saving prices!

Activate Learning **#700**
44 Amogerone Crossway, Suite 7862 E, M
Greenwich, CT 06836
Phone: 646-502-5231
E-mail: *info@activatelearning.com*
Website: *www.activatelearning.com*

Activate Learning is a leading publisher of investigation-centered, K–8 science curricula. Active Science (K–5) uses activities to develop problem-solving and communication skills across content areas. IQWST is a rigorous, grades 6–8 *NGSS* science curriculum that challenges and supports students as they investigate questions, engage in scientific practices, and explain scientific phenomena

AEOP eCYBERMISSION and GEMS **#312**
E, M, HS, C
1840 Wilson Blvd.
Arlington, VA 22201
Phone: 703-312-9360
E-mails: *missioncontrol@ecybermission.com; aeopgems@nsta.org*
Website: *www.usaeop.com*

The National Science Teachers Association administers and provides support to U.S. Army Educational Outreach Programs that engage students in real-world STEM experiences. Come learn about eCYBERMISSION, an online competition free to grades 6–9 students, as well as GEMS and Camp Invention, summer STEM enrichment programs for grades K–12 teachers and students.

American Association of Chemistry Teachers **#323**
E, M, HS
1155 16th St., NW
Washington, DC 20036
Website: *teachchemistry.org*

The American Association of Chemistry Teachers (AACT) is a professional community by and for K–12 teachers of chemistry. AACT offers chemistry teaching resources, a periodical about teaching chemistry in the K–12 classroom, professional development opportunities, and more.

American Association of Physics Teachers #320 E, M, HS, C
1 Physics Ellipse
College Park, MD 20740
Phone: 301-209-3326
E-mail: *swills@aapt.org*
Website: *www.aapt.org*

The American Association of Physics Teachers (AAPT) is the premier global professional society dedicated to improving the understanding and appreciation of physics through teaching. We offer numerous physics-based resources to develop, improve, and promote best practices for high school science teachers. Stop by our booth at the STEM Forum for interactive demos based on lessons from *The Physics Teacher*, and win a free prize.

American Lab Design #514 E, M, HS, C
PO Box 2351
Daytona Beach, FL 32115
Phone: 800-494-3237
E-mail: *mikelee@americanlabdesign.com*
Website: *www.americanlabdesign.com*

Based in Florida, American Lab Design is an American-owned designer and manufacturer of science labs for over 24 years. They are the sole manufacturer of the four-student endeavor workstation and the A-frame lab stool.

American Society for Engineering Education #322 E, M, HS, C
1818 N St. NW
Washington DC 20017
Phone: 202-288-6222
E-mail: *l.jennings@asee.org*
Website: *www.asee.org*

The American Society for Engineering Education is a nonprofit organization of individuals and institutions committed to furthering education in engineering and engineering technology. ASEE develops policies and programs that enhance professional opportunities for engineering faculty members, and promotes activities that support increased student enrollments in engineering and engineering technology colleges and universities.

American Society for Nondestructive Testing #602 M, HS, C
1711 Arlingate Lane
Columbus, OH 43228
Phone: 614-274-6003
E-mail: *james@asnt.org*
Website: *www.asnt.org*

Critical to public safety, nondestructive testing (NDT) is the examination of an object or material in a manner that does not damage them. Most are not aware of NDT, but its impact is everywhere from the buildings we occupy to the products we use to the transportation we take.

Amplify #621 E, MS
55 Washington St., 8th Floor
Brooklyn, NY 11201
Phone: 800-823-1969
E-mail: *science@amplify.com*
Website: *www.amplify.com*

Amplify Science, written and developed by The Lawrence Hall of Science, is a brand new K–8 science curriculum designed to address the *NGSS*. Students learn to investigate, talk, read, write, think, and argue like real scientists and engineers through investigations of real-world problems and scientific phenomena.

Anatomage, Inc. #527 HS, C
303 Almaden Blvd.
Suite 700
San Jose, CA 95110
Phone: 408-885-1474, x2
E-mail: *info@anatomage.com*
Website: *www.anatomage.com*

Anatomage products are used in tens of thousands of institutions worldwide. These include imaging equipment, radiology software, and display equipment. Anatomage products have been featured on TED, BBC, and PBS due to their originality and positive impact. Anatomage is dedicated to making innovative products and creating the highest quality experiences

Ardusat #516 E, M, HS, C
341 S. Main St., Suite 111
Salt Lake City, UT 84111
Phone: 801-871-5516
E-mail: *info@ardusat.com*
Website: *www.ardusat.com*

Ardusat is a complete STEM program for schools looking for an interactive and effective STEM solution. Ardusat provides open curriculum resources mapped to local standards, as well as eHub where students build experiments and share their findings. Activities range from using an Arduino and sensors, to running experiments on satellites in space.

B.A.C.K. for Learning #622 M, HS, C
561 W. Lucky Penny Place
Casa Grande, AZ 85122
Phone: 480-313-7168
E-mail: *mholland@backforlearning.com*
Website: *www.backforlearning.com*

We sell biology active learning kits designed to help teach DNA, protein synthesis, patterns of inheritance, mitosis and meiosis, and cells.

BirdBrain Technologies #603 E, M, HS, C
544 Miltenberger St.
Pittsburgh, PA 15219
Phone: 888-371-6161
E-mail: *sales@birdbraintechnologies.com*
Website: *www.birdbraintechnologies.com*

BirdBrain Technologies creates and commercializes educational robots and robot kits designed to support engineering and computer science, as well as foster a Project-Based Learning approach in everyday classrooms. We are devoted to integrating engineering and computer science with traditional core subjects by creating robots and electronics that can foster natural interdisciplinary projects.

Exhibitors

Bricks 4 Kidz® **#303**
701 Market St., Suite 113 E
St. Augustine, FL 32095
Phone: 904-824-3133
E-mail: *rewing@creativelearningcorp.com*
Website: *www.bricks4kidz.com*

Bricks 4 Kidz is an innovative program that offers STEM-based after-school enrichment classes and workshops, in-school workshops, camps, and birthday parties where kids build, learn, and play with LEGO® bricks.

Citizen Scientific Workshop **#620**
4748 Fenton St. E, M, HS, C
Garden City, ID 83709
Phone: 208-850-7477
E-mail: *djultis@citizenscientificworkshop.com*
Website: *www.citizenscientificworkshop.com*

Citizen Scientific Workshop produces educational creative scientific products for makers of all ages and skill levels. From robots to 3D printing and environmental sciences, we offer unique opportunities to ignite your home, workshop, or classroom with the spirit of invention and maker culture.

CoderZ™ by Intelitek **#426**
18 Tsienneto Rd. M, HS
Derry NH 03038
Phone: 603-413-2607
E-mail: *dconnors@intelitek.com*
Website: *www.intelitek.com*

CoderZ from Intelitek is a cloud-based learning environment for coding with real and virtual 3D robots. CoderZ integrates all STEM disciplines in a fun and accessible way by using a 3D game engine with simulated robots, while combining elements of math and engineering.

Cosmosphere International SciEd Center & Space Museum **#430**
E, M, HS, C
1100 N. Plum St.
Hutchinson, KS 67501
Phone: 620-665-9323
E-mail: *laurieg@cosmo.org*
Website: *www.cosmo.org*

Learn how immersive, grade-specific *NGSS* curriculum coupled with the most unique collection of space artifacts in the world can bring STEM lessons to life in your classroom. Visit the Cosmosphere exhibit to discuss both on-site and distance learning opportunities that make STEM subjects engaging for every student.

Cubit **#720**
344 Thomas L. Berkley Dr. E, M
Oakland, CA 94612
Phone: 415-515-5399
E-mail: *jason@cubit.cc*
Website: *www.cubit.cc*

It's the sense of optimism, fun, and a technology that "just works" that builds successful STEAM programs. Cubit is a modular robotics platform designed by engineers and educators for K–12 STEAM education. This key difference means that we understand the demands faced by educators to retrospectively design a STEAM technology platform.

Delta Education/School Specialty Science **#400**
80 Northwest Blvd.
Nashua, NH 03063
Phone: 800-258-1302
E-mail: *customerservice.delta@schoolspecialty.com*
Website: *www.deltaeducation.com*

Delta Education has been the leader in classroom-tested, hands-on science solutions for over 30 years. From engaging core and supplemental curriculum like Full Option Science System (FOSS) and Delta Science Modules, to informational texts and reliable science and math classroom supplies, we have the selection and expertise that teachers trust.

Dinah.com **#612**
PO Box 690328 E, M, HS, C
San Antonio, TX 78269
Phone: 210-698-0123
E-mail: *orders@dinah.com*
Website: *www.dinah.com*

Dinah.com is an educational publishing and consulting company owned by Dinah Zike, with downloadable resources for educators, featuring Notebooking Central, Visual Kinesthetic Vocabulary (VKVs), PHOTOinfer, Paperosophy, and LOCOmotion product lines, as well as Foldables® and Notebook Foldables® products. Knowledge unfolds.

DroneCurriculum.net **#607**
3983 S. McCarran Blvd. M, HS, C
Suite 534
Reno, NV 89502
Phone: 775-825-2263
E-mail: *sales@dronecurriculum.net*
Website: *dronecurriculum.net*

We offer a 16-unit curriculum that focuses on the elements of STEM education. Besides addressing essential concepts of drone design, each unit includes problem-solving activities that are aimed at enhancing student understanding, as well as teacher lesson plans, unit handouts, PowerPoint presentations, vocabulary lists, and comprehensive quizzes. We also offer a Learn-to-Fly curriculum.

DuinoKit **#727**
288 Harley Cole Rd. M, HS, C
Whittier, NC 28789
Phone: 828-226-5381
E-mail: *dan@duinokit.com*
Website: *www.duinokit.com*

DuinoKit is an interactive, hands-on system for learning about electronics and programming. Developed by a teacher, DuinoKits were developed to provide discovery-based learning along with engaging lessons and projects for work with Arduino and Raspberry Pi.

Earth Networks **#725**
12410 Milestone Center Dr. E, M, HS
Suite 300
Germantown, MD 20876
Phone: 301-250-4123
E-mail: *mhyer@earthnetworks.com*
Website: *www.earthnetworks.com*

Earth Networks offers a web-based instructional program that enables K–12 schools to use live weather and environmental data to improve student achievement across science, technology, math, and geography. Make your STEM curriculum shine. Spark creativity, collaboration, and analytical thinking with a weather-infused STEM curriculum while adding protection against severe weather threats.

Educational Innovations, Inc. **#523**
5 Francis J. Clarke Circle E, M, HS, C
Bethel, CT 06801
Phone: 203-748-3224
E-mail: *info@teachersource.com*
Website: *www.teachersource.com*

At Educational Innovations, we only select STEM materials that ignite curiosity, collaboration, and confidence. Come see interactive science education at its best—and most fun! After the forum, visit *www.TeacherSource.com,* where you'll find helpful blogs, lessons, and newsletters full of ideas for bringing science to life.

Edvotek Inc. **#308**
1121 5th St. NW M, HS, C
Washington, DC 20001
Phone: 202-370-1500
E-mail: *info@edvotek.com*
Website: *www.edvotek.com*

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

EF Explore America **#417**
2 Education Circle M, HS
Cambridge, MA 02141
Phone: 800-503-2323
Website: *efexploreamerica.com*

EF Explore America, the domestic division of EF Education First, provides all-inclusive tours to help students and teachers go beyond the classroom and into the world around them. EF Explore America has recently launched STEM tours where your students have the chance to discover real-world applications of these subjects by learning from industry experts in cutting-edge locations such as Boston, San Francisco, and New York City.

Emersive Learning from Science First, LLC **#702** E, M, HS, C
86475 Gene Lasserre Blvd.
Yulee, FL 32097
Phone: 800-875-3214
E-mail: *info@sciencefirst.com*
Website: *sciencefirst.com*

We bring to you Emersive Learning! Our products focus on experiential learning in all areas of science and we are committed to science using hands-on activities. We now provide even more laboratory equipment and curriculum for your science lab. We support STEM teaching and make learning into FUN experiences!

Engineer Your World from the University of Texas **#608** HS
10100 Burnet Rd.
Austin, TX 78758
Phone: 512-471-3099
E-mail: *marie.girardot@austin.utexas.edu*
Website: *engineeryourworld.org*

The University of Texas at Austin has developed a project-based engineering curriculum with comprehensive teacher support that has been implemented in 160+ high schools. Students engage in interesting hands-on activities requiring the application of analytical reasoning, critical thinking, communication, and collaboration skills. Students can also apply to earn dual-enrollment credit.

Engineering is Elementary® (EiE) **#716**
1 Science Park E, M
Boston, MA 02114
Phone: 617-589-3121
E-mail: *eie@mos.org*
Website: *www.eie.org*

Engineering is Elementary offers 20 integrated STEM units to be used flexibly (grades 1–5). It is research based, teacher tested, and meets the *NGSS*. Through hands-on design challenges, students apply science and math to design, create, and improve possible solutions. Through this constructivist, project-based experience, students realize—everyone can engineer!

ETA hand2mind **#512**
500 Greenview Court E, M
Vernon Hills, IL 60061
Phone: 800-445-5985
E-mail: *info@hand2mind.com*
Website: *www.hand2mind.com*

ETA hand2mind's STEM in Action™ modules seamlessly integrate science, technology, engineering, math, and literacy into real-world problems and target three major science genres—life, Earth, and physical. Developed in partnership with Purdue University, the modular lessons are teacher friendly, while the activities are fun and engaging for students.

Exhibitors

ExploreLearning **#309**
110 Avon St., Suite 300 E, M, HS
Charlottesville, VA 22902
Phone: 866-882-4141
E-mail: *sales@explorelearning.com*
Website: *www.explorelearning.com*

ExploreLearning develops online solutions to improve student learning in math and science ExploreLearning Gizmos are the world's largest library of interactive, online simulations for math and science in grades 3–12. ExploreLearning Reflex (*www.reflexmath.com*) is the most powerful solution available for math fact fluency.

Expo Enterprise **#326**
3560 Polaris Ave., Suite 27
Las Vegas, NV 89103
Phone: 702-272-2666
E-mail: *expo32832@yahoo.com*

FDA Center for Food Safety and Applied Nutrition **#615**
E, M, HS
c/o Graduate School USA
600 Maryland Ave. SW
Washington, DC 20024
Phone: 202-314-4713
E-mail: *isabelle.howes@graduateschool.edu*
Website: *teachfoodscience.org*

FDA's Center for Food Safety and Applied Nutrition (CFSAN) offers free food safety and nutrition education materials. FDA and NSTA collaborated to create Science and Our Food Supply, an innovative, interactive curriculum for middle school and high school classrooms. Stop by our booth to learn more about FDA resources and opportunities.

Feel Good, Inc. **#626**
1460 Gemini Blvd., Suite 8
Orlando, FL 32837
Phone: 407-986-3351
E-mail: *support@feelgoodinc.org*
Website: *www.feelgoodinc.org*

Feel Good, Inc. provides portable TENS (transcutaneous electrical nerve stimulation) units offering wide variety of benefits, including alleviating back, nerve, and diabetic pain and migraines. Our units can also improve circulation and sleep patterns, as well as have been shown to decrease the use of pain relievers that can cause negative side effects.

***FIRST*®** **#520**
200 Bedford St. E, M, HS
Manchester, NH 03101
Phone: 603-666-3956
E-mail: *marketing@firstinspires.org*
Website: *www.firstinspires.org*

FIRST is More Than Robots. K–12 programs engage students in exciting, mentor-based research and robotics programs that help them become science and technology leaders, as well as well-rounded contributors to society. Participation is proven to encourage STEM education and careers, inspire tomorrow's innovators, and enhance 21st-century work-life skills.

Fisher Science Education **#300**
300 Industry Dr. E, M, HS, C
Pittsburgh, PA 15275
Phone: 412-329-2904
E-mail: *april.fischione@thermofisher.com*
Website: *www.fishersci.com*

Fisher Science Education provides today's teachers with the cutting-edge products they need to prepare their students for STEM careers. From anatomy to zoology and everything in between, Fisher Science Education can supply you with all the necessities for your educational laboratory setting.

FLEXHIBIT **#731**
211 W. 2nd Ave. E, M, HS
Spokane, WA 99201
Phone: 509-413-2099
E-mail: *louise@flexhibit.com*
Website: *www.flexhibit.com*

FLEXHIBIT designs and builds multi-user, multi-outcome, hands-on STEM School Carts, which are designed with education in mind. The physical sciences are at the forefront of our first gallery of STEM School Carts and come with detailed *NGSS* curriculum for ease of teaching.

Flinn Scientific **#500**
PO Box 219 M, HS
Batavia, IL 60510
Phone: 800-452-1261
E-mail: *flinn@flinnsci.com*
Website: *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 schools, high schools, and higher education.

Florida Science Olympiad **#302**
825 S. Bumby E, M, HS
Orlando, FL 32803
Phone: 407-920-6453
E-mail: *mike@floridascienceolympiad.org*
Website: *floridascienceolympiad.org*

Florida Science Olympiad is a science competition for elementary, middle school, and high school students. Teams of 15 students compete at regional, state, and national competitions. Events are designed around the *NGSS*.

Frey Scientific/CPO Science School Specialty Science **#402**
80 Northwest Blvd.
Nashua, NH 03063
Phone: 800-225-3739
E-mail: *customercare.frey@schoolspecialty.com*
Website: *www.freyscientific.com*

Over the years, we've brought you breakthrough educational products created specifically with the needs of students and teachers in mind. Look to Frey Scientific for the best in STEM resources, hands-on kits, and other investigation-based programs that we have developed to engage your students and enhance your instruction.

Geophysical Institute University of Alaska Fairbanks **#617**
E, M
903 Koyukuk Dr.
Fairbanks, AK 99775
Phone: 907-474-7863
E-mail: *lmmcgilvary@alaska.edu*
Website: *gi.alaska.edu*

Leading the nation in auroral science for nearly 70 years, this exhibit showcases products developed for Learning through Cultural Connections: The Northern Lights. Designed to blend Alaska Native culture and language with the science of the aurora, products include student and teacher guides for grades 3–8 and video products infused with Iñupiat culture and language.

—*Courtesy of Mike Weiss*

Georgia Aquarium **#521**
225 Baker St. NW E, M, HS
Atlanta GA 30313
Phone: 404-581-4000
Website: *www.georgiaaquarium.org*

Georgia Aquarium is an entertaining, intriguing, and educational experience for guests of all ages. While promoting a fun and enjoyable learning experience, the Aquarium instills in its guests a new appreciation for the world's aquatic biodiversity.

Grand Classroom **#422**
PO Box 7166 E, M, HS
Charlottesville, VA 22911
Phone: 434-975-2629
E-mail: *maryannchapman@grandclassroom.com*
Website: *www.grandclassroom.com*

Grand Classroom is a student travel organization, emphasizing outdoor educational experiences in national parks, major U.S. cities, and international destinations.

HHMI BioInteractive **#412**
4000 Jones Bridge Rd. M, HS, C
Chevy Chase, MD 20815
E-mail: *octavainij@hhmi.org*
Website: *www.hhmi.org/biointeractive*

HHMI BioInteractive develops free resources, including short films, virtual labs, apps, and print materials that are based on real data and highlight the science practices. These high-quality multimedia resources are developed, vetted, and field-tested by educators and scientists—and are all tied to major curriculum standards.

International Technology and Engineering Educators Association (ITEEA) **#327**
1914 Association Dr., Suite 201 E, M, HS, C
Reston, VA 20191
Phone: 703-860-2100
E-mail: *iteea@iteea.org*
Website: *www.iteea.org*

The International Technology and Engineering Educators Association is the professional organization for technology, innovation, design, and engineering educators. Our mission is to promote technological literacy for all by supporting the teaching of technology and engineering. ITEEA strengthens the profession through leadership, professional development, membership services, publications, and classroom activities.

JoVE **#618**
1 Alewife Center HS, C
Suite 200
Cambridge, MA 02140
Phone: 617-401-7717
E-mail: *subscriptions@jove.com*
Website: *www.jove.com*

JoVE is the leading producer and publisher of video resources created to increase the productivity of research and education in science, medicine, and engineering. JoVE has produced over 7,000 video articles demonstrating experiments filmed at top research institutions and delivered online to millions of scientists, educators, and students worldwide.

Exhibitors

KaBOOM! **#306**
4301 Connecticut Ave. E, M
Washigton, DC 20008
Phone: 202-464-6185
E-mail: *GoOutandPlay@kaboom.org*
Website: *www.kaboom.org/resources/rigamajig*

KaBOOM! is the national nonprofit dedicated to ensuring that all children get the balance of active play they need to become healthy and successful adults. Join KaBOOM! in playing, building, and tinkering with Rigamajig, an innovative large-scale building kit for kids of all ages. Curriculum suggestions, a video of Rigamajig in use, and information about purchasing and grants are also available.

K'NEX Education **#633**
2990 Bergey Rd. E, M, HS
Hatfield, PA 19440
Phone: 800-822-5639, x885/616-581-5955
E-mail: *wfischer@knex.com*
Website: *www.knexeducation.com*

K'NEX Education develops curriculum supported science, technology, engineering, and math (STEM) sets for use in elementary, middle school, and high school classrooms. Making it easy to incorporate K'NEX into the classroom, our inquiry-based teachers guides include objectives, activities, key concepts, journals, and worksheets. Everything the teacher needs to not only teach the students, but also assess what they have learned.

Koantum **#530**
14 Wood St. E
San Francisco, CA 94118
Phone: 415-886-7577
E-mail: *info@koantum.com*
Website: *www.koantum.com*

Koantum is an interactive e-learning platform and accompanied content specifically designed to teach science to K–5 students based on the *NGSS*, using the 5E Instructional Model.

Lab-Aids, Inc. **#413**
17 Colt Court M, HS
Ronkonkoma, NY 11779
Phone: 800-381-8003
E-mail: *metheridge@lab-aids.com*
Website: *www.lab-aids.com*

For over 53 years, our company has been developing, manufacturing, and publishing core curriculum and supplementary programs that help students better understand science concepts through direct experience. Backed by decades of research, our programs give you the tools to teach, inspire, and help students become science literate citizens.

Learning A-Z **#723**
1840 E. River Rd., Suite 320
Tucson, AZ 85718
Phone: 866-889-3729
E-mail: *support@learninga-z.com*
Website: *www.learninga-z.com*

Science A-Z® is an award-winning K–6 science resource that allows seamless integration of ---science and literacy into daily instruction. Science A–Z allows students to easily access developmentally appropriate content. Resources are available in printable, projectable, online, and mobile formats.

Learning Blade **#526**
340 Frazier Ave. M, HS
Chattanooga, TN 37415
Phone: 423-681-9733
E-mail: *joshua@learningblade.com*
Website: *www.learningblade.com*

Learning Blade™ is an interactive, web-based supplemental system for increasing student interest in and attitudes toward STEM careers. Learning Blade introduces students to these and other skills in middle school, a critical age

for beginning career path decisions. Students pursue engaging missions about real-world STEM problems in an entertaining format.

LEGO® Education **#418**
501 Boylston St. E, M, HS
Boston, MA 02116
Phone: 800-362-4308
E-mail: *orders@legoeducation.us*
Website: *www.LEGOeducation.com*

LEGO Education combines the unique excitement of LEGO bricks with hands-on classroom solutions and curriculum in areas including science, technology, engineering and math. Visit the LEGO Education booth to learn more about our STEM solutions, including LEGO MINDSTORMS® Education EV3, Machines & Mechanisms, and WeDo 2.0.

Llongwill Digital USA **#627**
1434 W. Sam Houston Pkwy. N E, M
Suite 110
Houston, TX 77043
Phone: 281-888-5079
E-mail: *aromero@llongwilldigitalusa.com*
Website: *www.llongwilldigitalusa.com*

Llongwill Digital creates easy data-collecting sensors for science curriculum, instructional materials, and STEM education. We offer you 150+ sensor-based science laboratory equipment that help students work collaboratively, solve real-world problems, and develop communication and self-management skills. Stop by to discover new strategies and practices on how to make your science lessons focused on the standards and keep students actively engaged and successful in learning. We also offer supportive professional development, training, and student workshops.

Marine Resources. Development Foundation **#715**
E, M, HS, C
51 Shoreland Dr.
Key Largo, FL 33037
Phone: 305-451-1139
E-mail: *jessica@marinelab.org*
Website: *www.marinelab.org*

Located in Key Largo, MarineLab has been providing STEM education through snorkeling, scuba diving, and hands-on labs and lectures about the ocean long before it was called STEM education! MarineLab is a program of the Marine Resources Development Foundation, a 501(c)3 nonprofit organization.

The Markerboard People **#506**
1611 N. Grand River Ave. E, M, HS, C
Lansing, MI 48906
Phone: 800-379-3727
E-mail: *feedback@dryerase.com*
Website: *www.dryerase.com*

We offer student dry-erase markerboards and response boards in class sets at unbeatable prices! They're great for instant response and instant assessment Single- and double-sided available—perfect for science, math, language arts, graphing, handwriting, and more. Long lasting, nontoxic, ultra-low-odor markers, and durable student erasers, too!

McGraw-Hill Education **#432**
8787 Orion Place
Columbus, OH 43240
Phone: 786-831-1420
E-mail: *marta.acosta@mheducation.com*
Website: *www.mheducation.com/prek-12*

We are McGraw-Hill Education—The digital learning science company intent on changing the world of education through highly personalized learning experiences, improving learning outcomes around the world.

Meadowlark Science and Education, LLC® **#613**
M
PO Box 16684
Missoula, MT 59808
Phone: 406-426-1001
E-mail: *paulette@meadowlarkscience.com*
Website: *www.meadowlarkscience.com*

Meadowlark Science and Education works to bring an innovative solution for teachers to address the STEM and environmental health sciences. Interactive educational video games (iEVGs) can enhance learning by using the game world and the real world of the student. More detailed evaluation results are available on our website (*www.meadowlarkscience.com*).

Microduino **#630**
2659 Townsgate Rd. E, M, HS, C
Suite 213
Westlake Village, CA 91361
Phone: 818-900-0804
E-mail: *laura@microduino.cc*
Website: *www.microduinoinc.com*

Since 2012, Microduino is a leading manufacturer of electronic building blocks and modules. We take great pride in our product and have worked hard to build a community of makers and electronic enthusiasts of all ages and skill sets. We invite you to join us and test the bounds of your creativity and ingenuity. As the world becomes more and more tech driven, such knowledge will only become more valuable.

miniPCR **#601**
1770 Massachusetts Ave. M, HS, C
Cambridge, MA 02140
Phone: 781-990-8727
E-mail: *team@minipcr.com*
Website: *www.minipcr.com*

The complete biotech lab for your classroom. The DNA Discovery System™ includes a miniPCR™ thermal cycler, blueGel™ electrophoresis with transilluminator, and a micropipette at prices schools can afford. Teach DNA science hands on. By the same team that brings you the national Genes in Space™ STEM competition.

MSOE Center for BioMolecular Modeling **#409**
1025 N. Broadway St.
Milwaukee, WI 53202-3109
Phone: 414-277-2824
E-mail: *herman@msoe.edu*
Website: *cbm.msoe.edu*

As an instructional materials development laboratory, we create student-centered, hands-on kits and models for the molecular biosciences. Through our professional development experiences, teachers learn active teaching skills and are involved in developing and field testing new kits. Ask about our outreach programs—SMART Teams and Science Olympiad Protein Modeling Event.

Nasco **#421**
901 Janesville Ave. E, M, HS
Fort Atkinson, WI 53538
Phone: 800-558-9595
E-mail: *info@enasco.com*
Website: *www.enasco.com*

Nasco has an array of products to aid in your teaching of a STEM curriculum. In our 21st-century economy, a quality education for all students in necessary to prepare them to prosper in work and life

National Association of Biology Teachers (NABT) **#325**
HS, C
11 Main St., Suite D
Warrenton, VA 20186
Phone: 719-596-9782
E-mail: *jreevespepin@nabt.org*
Website: *www.nabt.org*

Established in 1938, the National Association of Biology Teachers continues to be recognized as a leader in life science education. Thousands of educators have joined NABT to share experiences and expertise with colleagues from around the world, keep up with trends and developments in the field, and grow professionally.

National Council of Teachers of Mathematics (NCTM) **#324**
E, M, HS, C
1906 Association Dr.
Reston, VA 20191
Phone: 703-620-9840
E-mail: *mbarbagallo@nctm.org*
Website: *www.nctm.org*

The National Council of Teachers of Mathematics is the public voice of mathematics education, supporting teachers to ensure equitable mathematics learning of the highest quality for each and every student through vision, leadership, professional development, and research.

National Flight Academy **#434**
1 Fetterman Way M, HS
NAS Pensacola, FL 32508
Phone: 850-308-8950
E-mail: *info@nationalflightacademy.com*
Website: *www.nationalflightacademy.com*

The National Flight Academy delivers an immersive naval aviator experience designed to inspire and engage students in STEM. Modeled as an aircraft carrier, the National Flight Academy has grades 7–12 students undergo missions alongside their squadron teammates that involve hands-on applications as they solve problems.

National Geographic Learning | Cengage **#406**
E, M, HS, C
20 Channel Center St.
Boston, MA 02210
Phone: 888-915-3276
E-mail: *schoolcustomerservice@cengage.com*
Website: *www.ngl.cengage.com*

National Geographic Learning, a part of Cengage, provides quality preK–12, academic, and adult education instructional solutions for reading, science, social studies, mathematics, world languages, ESL/ELD, advanced, honors, electives, career and technical education, and professional development. See our new catalog at *NGL.Cengage.com/catalogs*.

National Institute for STEM Education **#508**
E, M, HS
5177 Richmond Ave., Suite 1025
Houston, TX 77056
Phone: 281-833-4503
E-mail: *david@acceleratelearning.com*
Website: *www.getstemcertified.com*

The National Institute for STEM Education (NISE) certifies teachers, campuses, and districts in STEM teaching using a competency-based, academic coach-led online learning platform in which educators produce a portfolio of work that demonstrates proficiency across 15 STEM teacher actions.

National Institute of Biomedical Imaging and Bioengineering, NIH **#609**
31 Center Dr. HS
Bethesda, MD 20892
Phone: 301-496-9208
E-mail: *coneyjohnsons@mail.nih.gov*
Website: *www.nibib.nih.gov*

The National Institute of Biomedical Imaging and Bioengineering (NIBIB) supports research to create biomedical technologies to improve health. Stop by our booth to play our bioengineering game, check out our new health apps, watch cool videos, and learn about other free science education resources.

National Inventors Hall of Fame /Camp Invention **#513**
E, M
3701 Highland Park NW
North Canton, OH 44720
Phone: 330-645-8023
E-mail: *kseagren@invent.org*
Website: *www.campinvention.org*

WHERE BIG IDEAS BECOME THE NEXT BIG THING. Camp Invention is the only nationally recognized nonprofit summer enrichment program for K–6 students that is inspired by the greatest innovators around—the Inductees of the National Inventors Hall of Fame®. At Camp Invention, children are empowered to question, brainstorm, collaborate, and invent!

Nomad Press **#706**
2456 Christian St. E, M
White River Junction, VT 05001
Phone: 802-649-1995
E-mail: *rachel@nomadpress.net*
Website: *www.nomadpress.net*

Ever met a kid who isn't curious? Kids are natural scientists. They want to know about the physical and natural worlds around them. Nomad Press titles engage young scientists in the scientific process as they find themselves thinking critically, making predictions, conducting experiments, documenting observations, and making discoveries about the real world.

NSTA Hub **#319**
1840 Wilson Blvd.
Arlington, VA 22201
Website: *www.nsta.org*

Stop by the NSTA Hub and pick up your #STEMForum tweetshirt (while supplies last) and find out how you can maximize your STEM Forum experience and learn more about the opportunities NSTA has for you.

Ocean Optics, Inc. **#722**
830 Douglas Ave. M, HS, C
Dunedin, FL 34698
Phone: 727-733-2447
E-mail: *info@oceanoptics.com*
Website: *www.oceanoptics.com*

Students can now study scientific principles on the same world-class equipment used by leading researchers at university and government labs. Thousands of science educators have used spectroscopy education kits and fiber optic accessories from miniature spectroscopy pioneer Ocean Optics to create fun and engaging experiments for hands-on classroom learning.

Orlando Science Center **#701**
777 E. Princeton St. E, M, HS
Orlando, FL 32803
Phone: 407-514-2000
E-mail: *classes@osc.org*
Website: *www.osc.org*

Orlando Science Center offers programs that supplement classroom learning with valuable informal education and increase competency in STEM (science, technology, engineering, and math) skills. Our educational programs include teacher professional development, teacher training, and in-classroom support for Engineering is Elementary®, guided field trips, experimental labs, and off-site programming.

PASCO scientific **#501**
10101 Foothills Blvd. E, M, HS, C
Roseville, CA 95747
Phone: 800-772-8700
Website: *www.pasco.com*

A leader in STEM education, PASCO scientific transforms science education and student learning with award-winning probeware, software, and curricula that promote science inquiry and 21st-century readiness skills. Today teachers and students worldwide use PASCO solutions for physics, biology, chemistry, Earth, and environmental sciences, as well as programming and robotics.

PCG Education **#632**
148 State St. E, M, HS, C
10th Floor
Boston, MA 02109
Phone: 617-426-2026
E-mail: *rvineyard@pcgus.com*
Website: *www.publicconsultinggroup.com/education*

Our consulting services help schools, school districts, and state education agencies/ministries identify and implement ways to improve programs and processes, optimize financial resources, and promote student success. Our technology solutions give educators the means to gather, manage, and analyze data, including student performance information, to make effective instructional decisions.

Pearson Education **#712**
1900 E. Lake Ave. E, M, HS
Glenview, IL 60025

Pearson is working to create real results that break through the challenges in education today. We partner with educators to deliver new personalized ways of learning through effective, scalable assessment, instructional tools, services, and technologies. We help individuals improve learning outcomes and achieve their own definitions of success.

Penguin Brand™ Dry Ice **#624**
2530 Sever Rd., Suite 300 E, M, HS, C
Lawrenceville, GA 30043
Phone: 678-985-7300
E-mail: *brad.sanders@airgas.com*
Website: *dryiceideas.com*

Airgas, through its Penguin Brand Dry Ice brand, is the leading producer of dry ice in the United States. Airgas serves customers in the food processing, food service, pharmaceutical, and biotech industries. Airgas Dry Ice is also the largest wholesale dry ice distributor to grocery and other retail outlets nationwide with over 5,000 grocery stores coast to coast on a direct-delivery basis.

Pitsco Education **#301**
915 E. Jefferson St. E, M, HS
Pittsburg, KS 66762
Phone: 800-358-4983
E-mail: *orders@pitsco.com*
Website: *www.pitsco.com*

Pitsco is your STEM resource. Every product we engineer, every activity we write, every curriculum we develop, and every solution we design is provided for the purpose of helping students around the world use their hands to engage their minds to learn and succeed—in the classroom and in life!

PlayMada Games **#431**
261 Madison Ave., 9th Floor M, HS
New York, NY 10016
Phone: 844-222-2320
E-mail: *info@playmadagames.com*
Website: *www.playmadagames.com*

PlayMada Games is a devoted team of educators, designers, and developers on a mission to bring game-based learning experiences into high school science classrooms. We create digital games that give students a deepened understanding of fundamental scientific concepts while exploring systems of science through play.

Quest Institute for Quality Education **#519**
100 Skyway Dr.
San Jose, CA 95111
Phone: 408-219-3382
E-mail: *sbakken@thequestinstitute.com*
Website: *www.questforspace.com*

Quest Institute presents an educational International Space Station (ISS) Space STEM program robust enough to reach the hardest to serve youth while supporting mentors with lesson materials, online community, and technical support. Combining Windows 10, LEGO® MINDSTORMS®, and patented hardware, the student-designed and developed programming uploads to the ISS with real-time data access.

Rokenbok Education **#709**
233 A St. E, M, HS
San Diego, CA 92101
Phone: 858-259-4433
E-mail: *caitlinb@rokenbokeducation.org*
Website: *www.rokenbokeducation.org*

Our mission is to help all school-age children prepare for a lifetime of learning about science and technology. Rokenbok's STEM education program levels the playing field for underserved children by providing deep Project-Based Learning for all students. We make STEM easier for educators to teach while being highly cost-effective for schools and youth programs.

SAE International **#424**
400 Commonwealth Dr. E, M
Warrendale, PA 15096
Phone: 724-772-8569
Website: *www.sae.org*

Our K–8 STEM education solution—A World In Motion (AWIM) program is a teacher-administered, industry volunteer-assisted program that brings science, technology, engineering and math (STEM) education to life in the classroom. Bench marked to the national standards, the AWIM program incorporates integrated STEM learning experiences through hands-on activities that reinforce classroom STEM learning.

School Specialty Science **#400**
80 Northwest Blvd.
Nashua NH 03063

School Specialty Science brings together the very best curriculum with FOSS® and CPO Science, classroom resources, equipment, and furniture with Delta Education and Frey Scientific. Together, these effective teaching and learning solutions serve all the needs of preK–12 science teachers, curriculum specialists, and administrators.

SME—Florida Section **#313**
PO Box 1060 E, M, HS
Mulberry, FL 33860
Phone: 863-781-5475
E-mail: *george.opderbeck@mosaicco.com*
Website: *flsme.org*

SME (Society for Mining, Metallurgy & Exploration) strives to create an enlightened public who understand the importance of mining and minerals in everyday life.

Southern Science Supply **#600**
2914 Oakleaf Dr. E, M, HS, C
San Antonio, TX 78209
Phone: 210-887-0479
E-mail: *carol@southernsciencesupply.com*
Website: *www.southernsciencesupply.com*

Magnify what you do with the MicroSight, MicroZoom, and ProScope Microscopes. These magnificent microscopes are available in USB, Wi-Fi, and portable models and will allow you to see the world in brilliant detail. Many accessories are available for each model, as well as unique specimen observation kits and lesson plan booklets. Come scope us out!

Squishy Circuits **#714**
19721 Nowthen Blvd. E
Anoka, MN 55303
E-mail: *matt@squishycircuits.com*
Website: *www.squishycircuits.com*

Squishy Circuits uses conductive and insulating play dough to teach the basics of electrical circuits in a fun, hands-on way. Let your creations come to life as you light them up with LEDs, make noises with buzzers, and spin with the motor.

Start Engineering **#703**
4405 Westover Place E, M, HS
Washington, DC 20016
Phone: 202-244-5575
E-mail: *bblack@start-engineering.com*
Website: *www.start-engineering.com*

The mission of Start Engineering is to make the wonderful world of engineering exciting and accessible to as many kids as possible. We publish educational books, develop information resources, and collaborate with individuals and groups to bring a good word about engineering to K–12 audiences of all kinds.

STEAM Dreamers, LLC **#307**
PO Box 12015 E
Fort Pierce, FL 34979-2015
Phone: 772-453-9670
E-mail: *mpowerssteam@gmail.com*
Website: *www.steamdreamers.com*

Our books, *STEAM Design Challenges* published by Creative Teaching Press, are designed to support teachers in implementing the Engineering Design Process while integrating national standards from other disciplines. Each unique lesson includes a list of standards, science background information, and literacy connections. Students are inspired to act as scientists and engineers through our engaging and rewarding lessons.

STEM Jobs **#614**
420 Rouser Rd. M, HS
Building #3
Coraopolis, PA 15108
Phone: 412-269-1663
E-mail: *ellen.pomerantz@stemjobs.com*
Website: *www.stemjobs.com*

STEM Jobs connects "Classrooms-to-Careers" in an engaging and dynamic format. Our industry-leading platform includes a print magazine, website, and educational tools designed to aid teachers and inspire students to pursue STEM education and careers. We encourage students to #dowhatyoulove.

STEM Revolution **#414**
764 S. Clearwater Loop E, M, HS
Post Falls, ID 83854
Phone: 855-445-3942
E-mail: *lorna@stembususa.org*
Website: *www.STEMrevolution.com*

Designed by Stanford and MIT PhDs, STEM Revolution provides a full methodology with offerings, such as STEM Teacher Training, the STEMbus mobile-lab, innovative camps, STEM strategy planning, and a STEM school curriculum. Working with cutting-edge technology like Virtual Reality, Drones, Arduinos, and Minecraft—students learn robotics, electrical design, and coding.

STEM Sims **#606**
408 W. University Ave. E, M, HS
Suite 306
Gainesville, FL 32601
Phone: 352-371-2567
E-mail: *stemsims@stemsims.com*
Website: *stemsims.com*

STEM Sims provides grades 4–12 educators and students with high-quality, contextual, interactive simulations and virtual learning products that reinforce core STEM principles using effective research-based pedagogy. In addition to over 100 simulations, STEM Sims offers nearly 2,000 standards-based lessons, backgrounds, assessments, teachers guides, and videos authored by content experts.

—Courtesy of MikeWeiss

Exhibitors

STEMPilot, Inc. **#721**
20 S. Commons Rd. E, M, HS
Waterbury, CT 06704
Phone: 203-527-5747
E-mail: *shannon@stempilot.com*
Website: *www.stempilot.com*

At STEMPilot, we have developed an affordable K–12 curriculum, based around aviation and simulation. Using flight simulators, you will be able to engage students while applying STEM disciplines in a meaningful Project-Based Learning program.

STEMscopes **#507**
5177 Richmond Ave., Suite 1025 E, M, HS
Houston, TX 77056
Phone: 281-833-4503
E-mail: *david@acceleratelearning.com*
Website: *www.acceleratelearning.com*

STEMscopes, created by Accelerate Learning Inc., is an award-winning, research-based national leader in preK–12 STEM curricula. Used by over 3.5 million students across 45 states, STEMscopes provides comprehensive digital resources, supplemental print materials, and hands-on exploration kits that drive engagement and academic growth.

STEMulation Learning Systems **#331**
603 Hamline Ave. S HS
St. Paul, MN 55116
Phone: 612-269-3817
E-mail: *mcpohl@gmail.com*
Website: *www.stemulationlearning.com*

We offer flight simulation labs for schools. We will be bringing our large Surround View Flight Simulator to demo flights. Stop by to check it out…it will be very impressive! Or see it at *STEMulationlearning.com*.

TeacherGeek Inc. **#531**
16551 Ridge Rd. E, M, HS, C
Holley, NY 14470
Phone: 888-433-5345
E-mail: *sales@teachergeek.com*
Website: *www.teachergeek.com*

We offer Rockstar Maker/STEM/science supplies, free amazing curricula, and ultra-engaging activities. Our products are incredibly affordable, *NGSS* focused, as well as made in the United States. Stop to learn how to make real working contraptions, incorporate recycling bin materials, and get kits that innovate and reach higher cognitive domains.

Ten80 Education Inc. **#522**
26F Congress St., Suite 338 E, M, HS
Saratoga Springs, NY 12866
Phone: 855-836-8033
E-mail: *mjsmith@ten80education.com*
Website: *www.ten80education.com*

Ten80 develops and publishes K–12 science, technology, engineering, and mathematics (STEM) curriculum, trains educators in the art of STEM, and organizes events that motivate students to engage and learn over time. Ten80 is a team of education and STEM professionals who saw the need for a more integrated, interactive way of teaching science and mathematics.

Texas Instruments **#525**
13532 N. Central Expressway E, M, HS, C
MS 3817
Dallas, TX 75243
Phone: 800-TICARES (842-2737)
E-mail: *ti-cares@ti.com*
Website: *education.ti.com*

Texas Instruments provides free classroom activities that enhance math, science, and STEM curricula; technology that encourages students to develop a deeper understanding of concepts; and professional development that maximizes your investment in TI technology.

Toshiba/NSTA ExploraVision **#316**
1840 Wilson Blvd. E, M, HS
Arlington, VA 22201
E-mail: *exploravision@nsta.org*
Website: *www.exploravision.org*

The ExploraVision competition for K–12 students engages the next generation in real-world problem solving with a strong emphasis on STEM. ExploraVision challenges students to envision and communicate new technology 20 years in the future through collaborative brainstorming and research of current science and technology.

Turner Designs **#502**
1995 N. 1st St. HS, C
San Jose, CA 95112
Phone: 877-316-8049
E-mail: *sales@turnerdesigns.com*
Website: *www.turnerdesigns.com*

Environmental scientists and educators have depended on Turner Designs for over 45 years to provide reliable, affordable, and easy-to-use field and laboratory instrumentation. Turner Designs offers small, lightweight one-button fluorometers ideal for quick in situ field measurements of chlorophyll or phycocyanin, as well as several handheld fluorometers for identification of Harmful Algal Blooms (HABs) or general water quality parameters.

U.S. Environmental Protection Agency **#433**
E, M, HS, C
1200 Pennsylvania Ave. NW
MC 8101R
Washington, DC 20004
Phone: 202-564-6620
E-mail: *askanepascientist@epa.gov*
Website: *www.epa.gov/research*

Science at EPA provides the foundation for credible decision-making to safeguard human health and ecosystems from environmental pollutants. Visit our booth and pick up some STEM resources based upon the work of our scientists and engineers, including experts in the Office of Research and Development, the scientific arm of EPA.

U.S. Navy Recruiting Command **#733**
5722 Integrity Dr. C
Millington, TN 38054
Phone: 800-USA-NAVY
Website: *www.navy.com*

You're looking for a job or career that maximizes your talents, challenges you to take on a leadership role, and gives you an adrenaline rush in the process. YOU'VE JUST FOUND IT! The U.S. Navy puts you in command of cutting-edge technology, advanced systems, billions of dollars in aviation, submarine, and surface ship equipment. Envision yourself as a Navy officer, and ACCELERATE YOUR LIFE™. More information at *www.NAVY.com* or 1-800-USA-NAVY.

UL **#532**
333 Pfingsten Rd. M
Northbrook, IL 60062
Phone: 847-664-1354
E-mail: *dennis.avelar@ul.com*
Website: *www.ulxplorlabs.org*

Looking for creative solutions, not prescribed results? Learn how to use XplorLabs to engage students in solving extreme engineering challenges. Learn about a new, free middle school resource built by practicing UL scientists and engineers that meet the *NGSS*.

Unmanned Safety Institute (USI) **#335**
4240 Airport Rd. E, M, HS, C
Cincinnati, OH 45226
E-mail: *info@unmannedsafetyinstitute.org*
Website: *unmannedsafetyinstitute.org*

The Unmanned Safety Institute is a world leader in unmanned aviation education and has been providing its STEM curriculum in high schools since 2015.

Vernier Software & Technology **#401**
13979 SW Millikan Way E, M, HS, C
Beaverton, OR 97005
Phone: 888-837-6437
E-mail: *info@vernier.com*
Website: *www.vernier.com*

Vernier Software & Technology is a leading innovator of scientific data-collection technology. Focused on STEM, Vernier is dedicated to developing creative ways to teach and learn using hands-on science. Vernier creates easy-to-use science interfaces, sensors, and graphing/analysis software. Vernier's technology-based solutions enhance STEM education, increase learning, and build students' critical-thinking skills.

Vizitech USA **#515**
103 E. Sumter St. E, M, HS, C
Eatonton, GA 31024
Phone: 706-749-8099
E-mail: *csr@vizitechusa.com*
Website: *www.vizitechusa.com*

Changing the way America learns through 3D technology. Vizitech USA is an education and training company specializing in 3D technology, augmented reality (AR), and virtual reality (VR) learning programs. We take complex concepts and processes, such as frog dissection in the classroom or safety training in the workplace, and recreate them virtually for an interactive, safe learning experience.

Waterford Press **#707**
1123 Overcash Dr. E, M, HS, C
Dunedin, FL 34698
Phone: 800-434-2555
E-mail: *kavanagh.jill@waterfordpress.com*
Website: *www.waterfordpress.com*

Waterford Press publishes the largest line of folding-format reference guides in the industry. Our mission is to connect people to the natural world by making knowledge about wildlife and plant identification, outdoor recreation, ecotourism, and safety and survival skills accessible to a wide audience. All products are made in the United States.

Index of Exhibitor Workshops

3D Molecular Designs (Booth #407)

Thursday, July 13	9:30–10:30 AM	Osceola 1, Gaylord Palms	Keep Your Head Above Water with Magnetic Water Molecule Models (p. 35)
Thursday, July 13	11:00 AM–12 Noon	Osceola 1, Gaylord Palms	Enzymes! Breaking It Down and Building It Up (p. 42)
Thursday, July 13	1:30–2:30 PM	Osceola 1, Gaylord Palms	Cells as Protein Engineers! (p. 46)
Friday, July 14	11:00 AM–12 Noon	Osceola 1, Gaylord Palms	Blending Modeling and Storytelling to Engage Students in Science and Engineering Practices (p. 63)
Friday, July 14	1:30–2:30 PM	Osceola 1, Gaylord Palms	Getting Students Through the Cellular Membrane (p. 67)

Activate Learning (Booth #700)

Friday, July 14	1:30–2:30 PM	Osceola 5, Gaylord Palms	Science Storylines and the Driving Question Board: Keeping *NGSS*-Focused Curriculum Student Driven (p. 67)

AEOP eCYBERMISSION and GEMS (Booth #312)

Thursday, July 13	8:00–9:00 AM	Sarasota 1/2, Gaylord Palms	Out-of-School STEM Enrichment: AEOP Program Design Collaboration (p. 30)
Thursday, July 13	11:00 AM–12 Noon	Sarasota 1/2, Gaylord Palms	STEM in Action: What eCYBERMISSION Can Do for You (p. 42)
Friday, July 14	9:30–10:30 AM	Sarasota 1/2, Gaylord Palms	STEM and *NGSS*: How *NGSS* Fits with Science, Engineering, Technology, and Math (and *CCSS*!) (p. 60)

Amplify (Booth #621)

Thursday, July 13	9:30–10:30 AM	Osceola 3, Gaylord Palms	Space-Docking Failure: Phenomena, 3-D Instruction, and Amplify Science for Grades 6–8 (p. 35)
Thursday, July 13	11:00 AM–12 Noon	Osceola 3, Gaylord Palms	The Mystery of Poisonous Newts: Phenomena, 3-D Instruction, and Amplify Science for Grades 6–8 (p. 42)
Friday, July 14	9:30–10:30 AM	Osceola 3, Gaylord Palms	Blackout! Phenomena, 3-D Instruction, and Amplify Science for Grades K–5 (p. 59)
Friday, July 14	11:00 AM–12 Noon	Osceola 3, Gaylord Palms	The Power of Modeling in K–8 Classrooms (p. 63)

B.A.C.K. for Learning (Booth #622)

Thursday, July 13	9:30–10:30 AM	Osceola 6, Gaylord Palms	Beyond the Punnett Square (p. 36)
Friday, July 14	11:00 AM–12 Noon	Osceola 6, Gaylord Palms	Beyond the Punnett Square (p. 63)

Delta Education/Frey Scientific (Booths #400 and #402)

Thursday, July 13	9:30–10:30 AM	Osceola 2, Gaylord Palms	Make Sure Your Makerspace Has Options for All Students! (p. 35)

Delta Education/School Specialty Science–FOSS (Booth #400)

Thursday, July 13	8:00–9:00 AM	Osceola 2, Gaylord Palms	What Does Argumentation Look Like in an Elementary Classroom? (p. 29)

Dinah.com (Booth #612)

Friday, July 14	11:00 AM–12 Noon	Naples 1/2, Gaylord Palms	Project/Presentation Time…Now What? FOLDABLES! (p. 63)

Earth Networks (Booth #725)

Thursday, July 13	3:00–4:00 PM	Osceola 6, Gaylord Palms	Analyzing and Interpreting Data Using Real-Time Weather Data (p. 50)

Edvotek Inc. (Booth #308)

Thursday, July 13	8:00–9:00 AM	Osceola 6, Gaylord Palms	Left at the Scene of the Crime: Introduction to Forensic Science (p. 30)

Fisher Science Education (Booth #300)

Friday, July 14	8:00–9:00 AM	Osceola 4, Gaylord Palms	Is Cancer in My DNA? (p. 55)
Friday, July 14	9:30–10:30 AM	Osceola 4, Gaylord Palms	STEM Design Challenge (p. 59)
Friday, July 14	1:30–2:30 PM	Osceola 4, Gaylord Palms	The Chemistry of Glow Sticks (p. 67)
Friday, July 14	3:00–4:00 PM	Osceola 4, Gaylord Palms	Water Chemistry Lab (p. 70)

Flinn Scientific, Inc. (Booth #500)

Thursday, July 13	9:30–10:30 AM	Sarasota 1/2, Gaylord Palms	Flinn Scientific's STEM Design Challenge™ Activities (p. 36)

Frey Scientific/CPO Science School Specialty Science (Booth #402)

Thursday, July 13	11:00 AM–12 Noon	Osceola 2, Gaylord Palms	CPO Science Engineering Design: Learning About Collisions and Restraints (p. 42)

HHMI BioInteractive (Booth #412)

Thursday, July 13	8:00–9:00 AM	Osceola 4, Gaylord Palms	Investigate Evolution and Practice STEM Skills with Middle School and Early High School Students (p. 29)
Thursday, July 13	9:30–10:30 AM	Osceola 4, Gaylord Palms	Plunging into Data About Climate Change and Coral Bleaching (p. 35)
Thursday, July 13	11:00 AM–12 Noon	Osceola 4, Gaylord Palms	Using HHMI BioInteractive Resources to Bring Math into the Biology Lesson (p. 42)
Thursday, July 13	1:30–2:30 PM	Osceola 4, Gaylord Palms	Got Lactase? Exploring Genetics with HHMI BioInteractive Resources (p. 46)
Thursday, July 13	3:00–4:00 PM	Osceola 4, Gaylord Palms	HHMI BioInteractive Resources Exploring Human Skin Color (p. 50)

JoVE (Booth #618)

Friday, July 14	8:00–9:00 AM	Osceola 2, Gaylord Palms	Improving STEM Education with JoVE Video Resources (p. 55)

Lab-Aids, Inc. (Booth #413)

Thursday, July 13	8:00–9:00 AM	Osceola 5, Gaylord Palms	Reclaiming the Metal (p. 30)
Thursday, July 13	9:30–10:30 AM	Osceola 5, Gaylord Palms	NGSS Waves: Make an Abstract Concept Become Visible! (p. 35)
Friday, July 14	8:00–9:00 AM	Osceola 5, Gaylord Palms	Investigating a Cliff Model (p. 55)
Friday, July 14	9:30–10:30 AM	Osceola 5, Gaylord Palms	Motions, Graphs, Speed, and Collisions (p. 59)

Index of Exhibitor Workshops

Learning A-Z (Booth #723)

Thursday, July 13	1:30–2:30 PM	Osceola 6, Gaylord Palms	Use Science to Teach Reading, Reading to Teach Science (p. 47)

LEGO® Education (Booth #418)

Thursday, July 13	1:30–2:30 PM	Naples 3, Gaylord Palms	Make Science, Coding, and Robotics Come to Life with LEGO® Education WeDo 2.0 (p. 46)
Friday, July 14	9:30–10:30 AM	Naples 3, Gaylord Palms	Hands-On Robotics and Coding: Think Like an Engineer with LEGO® MINDSTORMS® Education EV3 (p. 59)

Llongwill Digital USA (Booth #627)

Thursday, July 13	1:30–2:30 PM	Osceola 5, Gaylord Palms	Introduction to Llongwill Digital USA (p. 46)
Friday, July 14	11:00 AM–12 Noon	Osceola 5, Gaylord Palms	Introduction to Llongwill Digital USA (p. 63)

Meadowlark Science and Education, LLC® (Booth #613)

Friday, July 14	1:30–2:30 PM	Osceola 6, Gaylord Palms	Using Video Games to Encourage STEM Learning in Middle School (p. 67)

miniPCR (Booth #601)

Thursday, July 13	3:00–4:00 PM	Osceola 2, Gaylord Palms	Is the Taste for STEM in Your Genes? (p. 50)

MSOE Center for BioMolecular Modeling (Booth #409)

Thursday, July 13	3:00–4:00 PM	Osceola 1, Gaylord Palms	DNA Structure and Function with a Twist of CRISPR (p. 50)
Friday, July 14	8:00–9:00 AM	Osceola 1, Gaylord Palms	Take a Walk Through the Molecular World with Watercolor Landscapes (p. 55)
Friday, July 14	9:30–10:30 AM	Osceola 1, Gaylord Palms	Students Modeling the Molecular World (p. 59)

Pearson Education (Booth #712)

Friday, July 14	1:30–2:30 PM	Osceola 3, Gaylord Palms	STEM Institute: Thinking Like an Engineer (p. 67)

Penguin Brand™ Dry Ice (Booth #624)

Friday, July 14	9:30–10:30 AM	Osceola 2, Gaylord Palms	How to Use Dry Ice (p. 59)

Pitsco Education and Squishy Circuits (Booths #301 and #714)

Thursday, July 13	10:30 AM–12 Noon	Hall C, Gaylord Palms	Elementary STEM Showcase! (p. 37)

PlayMada Games (Booth #431)

Friday, July 14	1:30–2:30 PM	Osceola 2, Gaylord Palms	Reconceptualizing Chemistry Through Play: Ionic Bonding (p. 67)

Quest Institute for Quality Education (Booth #519)

Thursday, July 13	1:30–2:30 PM	Osceola 3, Gaylord Palms	Quest for Space ISS STEM Experiments (p. 46)

Rokenbok Education (Booth #709)

Friday, July 14	11:00 AM–12 Noon	Osceola 2, Gaylord Palms	Developing Project-Based STEM Lessons for Your Classroom (p. 63)

SAE International (Booth #424)

Friday, July 14	9:30–10:30 AM	Osceola 6, Gaylord Palms	Hands-On STEM for Grades K–8 (p. 60)

STEMscopes (Booth #507)

Thursday, July 13	8:00–9:00 AM	Naples 1/2, Gaylord Palms	Science Teacher, STEM Teacher. . .What's the Difference? (p. 29)
Thursday, July 13	9:30–10:30 AM	Naples 1/2, Gaylord Palms	Make Science Night Meaningful with STEMrangers (p. 35)
Thursday, July 13	11:00 AM–12 Noon	Naples 1/2, Gaylord Palms	DIVE-IN to Engineering by STEMscopes (p. 42)
Thursday, July 13	1:30–2:30 PM	Naples 1/2, Gaylord Palms	Argumentation: A STEM Strategy to Increase Student Talk (p. 46)

Texas Instruments (Booth #525)

Thursday, July 13	1:30–2:30 PM	Sarasota 1/2, Gaylord Palms	Drought in Africa Inspires Students to Invent a Smart Irrigation System (p. 47)
Thursday, July 13	3:00–4:00 PM	Sarasota 1/2, Gaylord Palms	Zombie Apocalypse! (p. 50)
Friday, July 14	8:00–9:00 AM	Sarasota 1/2, Gaylord Palms	Using Maggots, Flies, and Flesh to Solve a Mystery! (p. 56)
Friday, July 14	11:00 AM–12 Noon	Sarasota 1/2, Gaylord Palms	Drought in Africa Inspires Students to Invent a Smart Irrigation System (p. 64)

U.S. Environmental Protection Agency (Booth #433)

Friday, July 14	9:30–10:30 AM	Naples 1/2, Gaylord Palms	Understanding Air Pollution and Energy Choices Through Hands-On STEM Activities (p. 59)

Vernier Software & Technology (Booth #401)

Thursday, July 13	9:30–10:30 AM	Naples 3, Gaylord Palms	Integrating Chromebook and BYOD with Vernier Technology (p. 35)
Thursday, July 13	11:00 AM–12 Noon	Naples 3, Gaylord Palms	Integrating BYOD and Chromebook with Vernier Technology (p. 42)

Schedule at a Glance

Lower Elementary/Early Childhood Strand

Thursday

8:00–9:00 AM	K	Emerald 7, Gaylord Palms	Structure and Play: Teaching Engineering Through Music Composition (p. 28)
8:00–9:00 AM	P–5	Tampa 2, Gaylord Palms	Launching an Elementary STEM Program (p. 29)
8:00–9:00 AM	P–3	Tampa 3, Gaylord Palms	STEMulating Students' Natural Curiosities Through Literature (p. 29)
9:30–10:30 AM	P–3	Tampa 2, Gaylord Palms	Literacy + STEM = A Launchpad for Success (p. 34)
9:30–10:30 AM	P–3	Tampa 3, Gaylord Palms	Unlock the Gardening Experience (p. 34)
9:30–10:30 AM	P–3	Emerald 5, Gaylord Palms	The "T" and "S" in STEM and Early Childhood: Helping Young Children Explore Their World (p. 32)
9:30–10:30 AM	K–4	Tampa 1, Gaylord Palms	"STEAM" Up Your Classroom with Cool Design Challenges! (p. 34)
1:30–2:30 PM	P–2	Palm Beach, Gaylord Palms	NSTA Press® Session: Uncovering K–2 Students' Ideas in Science, Mathematics, and Engineering: STEM-Focused Formative Assessment (p. 44)
1:30–2:30 PM	P–6	Sarasota 3, Gaylord Palms	NSTA Press® Session: The Power of Investigating: Guiding Authentic Assessments (p. 44)
1:30–2:30 PM	K–3	Tampa 2, Gaylord Palms	Materials in a Green, Clean World: Engaging Our Youngest Scientists with a Hands-On/Minds-On Physical Science Curriculum for Grades K–2 (p. 45)
1:30–2:30 PM	P–2	Tampa 1, Gaylord Palms	Starting STEM Early (p. 45)
1:30–2:30 PM	P–2	Tampa 3, Gaylord Palms	The Blended Revolution: Blended Learning in the Early Childhood Classroom (p. 45)
3:00–4:00 PM	P–K	Tampa 1, Gaylord Palms	Rediscovering and Exploring Science Through the Arts (p. 49)
3:00–4:00 PM	P–K	Tampa 2, Gaylord Palms	Arts in Application: Dance in Kindergarten Math (p. 49)
3:00–4:00 PM	P–12	Tampa 3, Gaylord Palms	Crowdfunding Your STEM Project (p. 49)
3:00–4:00 PM	P–2	Emerald 5, Gaylord Palms	Young Engineers in the Woods: Bringing Engineering Design Challenge to the Outdoor Classroom (p. 47)

Friday

8:00–9:00 AM	K–5	Tampa 3, Gaylord Palms	Science and Literacy in the K–5 Classroom (p. 54)
9:30–10:30 AM	3–6	Tampa 3, Gaylord Palms	Warming Up to Engineering with Solar Ovens (p. 58)
9:30–10:30 AM	K–5	Tampa 2, Gaylord Palms	STEM and Literacy: An Integration (p. 58)
9:30–10:30 AM	P–2	Tampa 1, Gaylord Palms	Start with STEM: Water, Wind, and Weather (p. 58)
9:30–10:30 AM	P–5	Emerald 7, Gaylord Palms	STEMing into the Future: How to Build a STEM Program Within an Elementary School (p. 56)
11:00 AM–12 Noon	K–3	Tampa 3, Gaylord Palms	Stories and STEM: Integrating Literacy and STEM in Early Childhood (p. 63)
11:00 AM–12 Noon	K–5	Emerald 5, Gaylord Palms	5Ez Steps to Building an Elementary Science Curriculum (p. 60)
11:00 AM–12 Noon	K–4	Tampa 1, Gaylord Palms	STEM on a Shoestring (p. 62)
11:00 AM–12 Noon	P–6	Tampa 2, Gaylord Palms	NSTA Press® Session: The Power of Questioning (p. 63)
1:30–2:30 PM	P–3	Tampa 1, Gaylord Palms	STEM Integration and Children's Play (p. 66)
1:30–2:30 PM	K–2	Tampa 2, Gaylord Palms	Weather, Here and There (p. 67)
1:30–2:30 PM	K–2	Tampa 3, Gaylord Palms	"Don't Call Us Kinders, We're Engineers!" Engineering Education for Young Students (p. 67)
3:00–4:00 PM	P	Tampa 1, Gaylord Palms	Ignite Discovery: STEM Foundations (p. 70)
3:00–4:00 PM	K–2	Emerald 3, Gaylord Palms	STEAMing Ahead: Integrating the Arts into STEM Instruction (p. 68)
3:00–4:00 PM	P–4	Osceola A, Gaylord Palms	Story Starts with STEM (p. 69)

Upper Elementary Strand

Wednesday

2:00–2:45 PM	3–9	Osceola A, Gaylord Palms	STEMx Session: STEM in the Real World—Making It Matter (p. 23)

Thursday

8:00–9:00 AM	K–8	Emerald 6, Gaylord Palms	Model-Eliciting Activities: Real-World Interdisciplinary STEM Lessons (p. 28)
8:00–9:00 AM	3–8	Emerald 3, Gaylord Palms	Getting Graphic with Your Details? Now That's a Novel Approach! (p. 28)
8:00–9:00 AM	3–5	Emerald 5, Gaylord Palms	Math Matters: A Closer Look at the "M" in STEAM (p. 28)
8:00–9:00 AM	3–6	Emerald 2, Gaylord Palms	Student Interest Leads the Way Through STEM in Earth Science (p. 28)
8:00–9:00 AM	3–6	Emerald 4, Gaylord Palms	Using the Science of Flight to Teach *NGSS* and *CCSS* to Upper Elementary Students (p. 28)
9:30–10:30 AM	4–6	Emerald 2, Gaylord Palms	Teaching Life Science Through STEM Integration: Bee-Friendly Projects (p. 33)
9:30–10:30 AM	3–5	Emerald 4, Gaylord Palms	Beam vs. Suspension Bridges (p. 33)
9:30–10:30 AM	3–8	Osceola B, Gaylord Palms	WIDA Session: Doing and Talking Science with ELLs (p. 32)
9:30–10:30 AM	K–8	Emerald 3, Gaylord Palms	Developing Resilience in the Science Classroom (p. 32)
1:30–2:30 PM	K–C	Emerald 2, Gaylord Palms	Bringing STEM Discourse to Life with Stop-Motion Animation (p. 44)
1:30–2:30 PM	2–4	Emerald 3, Gaylord Palms	PLUM LANDING: Rx to Explore—Creating a New Curriculum Pathway to Foster Urban Children's Interest in Outdoor STEM Learning (p. 43)
1:30–2:30 PM	2–8	Emerald 4, Gaylord Palms	The Marvelous, Miraculous Circus Machine! (p. 44)
1:30–2:30 PM	4–6	Emerald 6, Gaylord Palms	Designing Solutions: Using Roof Models to Explore Surface Water Runoff (p. 44)
1:30–2:30 PM	K–6	Emerald 5, Gaylord Palms	Creating and Implementing STEM Curriculum Webs Across the Content Areas (p. 43)
3:00–4:00 PM	3–5	Emerald 4, Gaylord Palms	STEM Is FUNdamental (p. 48)
3:00–4:00 PM	3–5	Emerald 6, Gaylord Palms	STEM-Integrated Upper Elementary Lessons That Increase Student Achievement (p. 48)
3:00–4:00 PM	1–5	Emerald 3, Gaylord Palms	Developing Positive Mind-Sets: Encouraging Elementary Students to Think Like Engineers (p. 47)
3:00–4:00 PM	K–5	Emerald 2, Gaylord Palms	Erosion Trays in Elementary STEM: How to Make and Implement Erosion Trays in K–5 (p. 48)

Friday

8:00–9:00 AM	3–5	Emerald 2, Gaylord Palms	Looking into STEM Activities as Inspiration for Capturing and Keeping Student Interest in Science (p. 55)
8:00–9:00 AM	3–6	Palm Beach, Gaylord Palms	Helping Children Recognize the Presence and Impact of STEM: Explorations with Physical Structures, Everyday Household Tools, and Plants (p. 54)
9:30–10:30 AM	P–C	Emerald 5, Gaylord Palms	Authors Wanted! How to Get Your Article Published in an NSTA Journal (p. 56)
9:30–10:30 AM	3–8	Osceola B, Gaylord Palms	iMakeMedia (p. 57)
9:30–10:30 AM	3–8	Emerald 6, Gaylord Palms	Where Would a Space Explorer Find Water and Oxygen? (p. 57)
9:30–10:30 AM	2–8	St. George 108, Gaylord Palms	NSTA Press® Session: Uncovering Grades 2–8 Students' Ideas About Magnets and Magnetic Interactions (p. 58)
9:30–10:30 AM	K–5	Emerald 4, Gaylord Palms	Where It Stops, Nobody Knows: ELA Through STEM (p. 57)
11:00 AM–12 Noon	4–6	Emerald 6, Gaylord Palms	Cultural Connections to Science: The Northern Lights (p. 62)
11:00 AM–12 Noon	P–8,C	Emerald 2, Gaylord Palms	STEM and Trade Books: Strange Bedfellows (p. 60)
11:00 AM–12 Noon	3–8	Emerald 4, Gaylord Palms	Critter Scene Investigation (CSI): Scat on the iPods (p. 62)
11:00 AM–12 Noon	3–6	Palm Beach, Gaylord Palms	Differentiating Instruction to Make STEM Accessible to ALL Children (p. 61)
11:00 AM–12 Noon	K–5	St. George 108, Gaylord Palms	NSTA Press® Session: Picture-Perfect STEM Lessons: Using Children's Books to Inspire STEM Learning (p. 62)
1:30–2:30 PM	3–6,C	Emerald 6, Gaylord Palms	Toying with Engineering During Literacy: Designing a Literature-Based Cardboard Automaton (p. 66)

1:30–2:30 PM	3–8	St. George 108, Gaylord Palms	NSTA Press® Session: Pendulums and Crooked Porch Swings: A Model for Connecting Science and Engineering (p. 66)
1:30–2:30 PM	3–6	Emerald 4, Gaylord Palms	DeSTEMber: 31 Days of Standards-Focused Curriculum (p. 66)
1:30–2:30 PM	K–6	Emerald 5, Gaylord Palms	Addressing *NGSS* with Technology in the Field (p. 65)
1:30–2:30 PM	3–5	Emerald 7, Gaylord Palms	Revamping Science Class (p. 65)
3:00–4:00 PM	3–5	Emerald 2, Gaylord Palms	Supporting STEM Education in the Inclusion Classroom (p. 69)
3:00–4:00 PM	3–6	Tampa 3, Gaylord Palms	Blow the Roof Off! (p. 70)
3:00–4:00 PM	2–8	St. George 108, Gaylord Palms	STEM Lesson Guideposts™ Mapping STEM Lessons into Your Curriculum (p. 70)
3:00–4:00 PM	4–5	Emerald 5, Gaylord Palms	Exploration and Discovery Through Maps: Teaching Science with Technology (p. 68)
3:00–4:00 PM	3–6	Emerald 4, Gaylord Palms	Building Understandings Through Shared Concepts in Science and Music (p. 69)
3:00–4:00 PM	1–2,4–7	Emerald 6, Gaylord Palms	Teaching Engineering, Motion, and Energy Through Rube Goldberg (p. 69)
3:00–4:00 PM	P–6	Palm Beach, Gaylord Palms	NASA and Science Literature Books (p. 68)
3:00–4:00 PM	3–5	Tampa 2, Gaylord Palms	Designing with Electrical Circuits (p. 70)

Middle Level Strand

Wednesday

1:00–1:45 PM	5–9	Osceola B, Gaylord Palms	STEMx Session: Building a Foundation for Effective Rural STEM Engagement (p. 23)

Thursday

9:30–10:30 AM	5–8	Emerald 6, Gaylord Palms	Climate Change and Nano-Bio-Sensor Science (p. 33)
9:30–10:30 AM	6–12	Emerald 1, Gaylord Palms	ASEE Session: Polar ICE: Bringing the Poles to Your Classroom (p. 32)
9:30–10:30 AM	5–9	St. George 108, Gaylord Palms	Connect-an-Engineer (p. 34)
9:30–10:30 AM	5–8	Gainesville 1, Gaylord Palms	Igniting Student Interest and Learning in Engineering: Classroom Applications/Tools/Resources from the 2016 Northrop Grumman Foundation Teachers Academy Fellows (p. 32)
9:30–10:30 AM	6–8	Orange Blossom Blrm., Gaylord	Energy Carnival (p. 33)
9:30–10:30 AM	5–12	St. George 114, Gaylord Palms	STEAM Projects, Digital Science Fairs, and Student Performances (p. 34)
11:00 AM–12 Noon	6–9	Gainesville 2, Gaylord Palms	Creating Android Apps in the Science Classroom (p. 38)
11:00 AM–12 Noon	6–8	Tampa 1, Gaylord Palms	Hope on the Horizon: STEM, PBL, and Service Learning for Middle School Students (p. 39)
11:00 AM–12 Noon	5–9	St. George 108, Gaylord Palms	Ahoy! STEM Mates: Let's Explore the Engineering Design Process (p. 40)
11:00 AM–12 Noon	5–8	St. George 104, Gaylord Palms	STEM and Your Food Choices: The Connections (p. 40)
11:00 AM–12 Noon	5–8	Tampa 2, Gaylord Palms	Going Green! Development of an Online Teacher Institute for Implementing a Hands-On Climate Change Curriculum (p. 39)
11:00 AM–12 Noon	5–8	Gainesville 1, Gaylord Palms	Colonizing Mars with Minecraft (p. 38)
11:00 AM–12 Noon	6–8	Emerald 1, Gaylord Palms	ASEE Session: AMP-Up Middle School Science and Math Through STEM Connections Classrooms (p. 38)
1:30–2:30 PM	2–12	Gainesville 2, Gaylord Palms	A Picture Is Worth a Thousand Words: Strategies to Support Superb Sketches in the Classroom (p. 43)
1:30–2:30 PM	K–12	St. George 104, Gaylord Palms	Using Inquiry-Based Learning to Activate Student Growth (p. 45)
3:00–4:00 PM	P–C	St. George 106, Gaylord Palms	60 Minutes to Success: STEM Ed Quality Framework (p. 49)
3:00–4:00 PM	4–9	Osceola A, Gaylord Palms	Coasting Through Physics: Bring the Thrill of Roller Coasters to Your Classroom! (p. 48)
3:00–4:00 PM	3–8	St. George 108, Gaylord Palms	Meteoroids, Asteroids, and Moons, Oh My! (p. 49)
3:00–4:00 PM	6–8	Destin 1, Gaylord Palms	Models of STEM Integration Teaching (p. 47)
3:00–4:00 PM	5–12	St. George 104, Gaylord Palms	Integrating Technology into Middle School *NGSS* Engineering Design Performance Expectations (p. 49)
3:00–4:00 PM	6–9	Sarasota 3, Gaylord Palms	Support Data Analysis in Your Classroom with a Simple Strategy for Understanding and Using Statistical Significance (p. 48)

Friday

8:00–9:00 AM	1–C	St. George 104, Gaylord Palms	Applying Shujaa's D.R.C. Model as an Approach for Implementing the *Next Generation Science Standards* (p. 55)
8:00–9:00 AM	5–12	Gainesville 1, Gaylord Palms	Meeting the Needs of Fragile Schools (p. 54)
9:30–10:30 AM	3–10	St. George 104, Gaylord Palms	Coding Across the Curriculum (p. 58)
9:30–10:30 AM	K–C	Destin 1, Gaylord Palms	Cultural Competence and Effective Communication in Students' Transformation (p. 56)
9:30–10:30 AM	6–8	Sarasota 3, Gaylord Palms	What's the Big Idea? A Glimpse into Current Themes for STEM Educators (p. 57)
9:30–10:30 AM	3-12	Osceola A, Gaylord Palms	STEM Projects for the Science Classroom (p. 56)
9:30–10:30 AM	3–8	St. George 112, Gaylord Palms	AACT Session: Elementary and Middle School Chemistry: Demonstrations and Lab Activities on a Shoestring Budget (p. 58)
9:30–10:30 AM	6–9	Vero, Gaylord Palms	Using Student Research as a Vehicle for Student Engagement and Development Science (p. 57)
in 11:00 AM–12 Noon	4-7	Emerald 1, Gaylord Palms	ASEE Session: Using an Engineering Frame to Map Engineering Design into Your STEM Curriculum (p. 60)
11:00 AM–12 Noon	6–8	St. George 106, Gaylord Palms	Using Grand Challenges to Engage Students in STEM (p. 62)
11:00 AM–12 Noon	6–C	Destin 1, Gaylord Palms	Transforming Students' Ideas About STEM and School Learning in an Informal Setting (p. 60)
11:00 AM–12 Noon	5–9	St. George 104, Gaylord Palms	Hands-On Performance Assessment of the *CCSS* and *NGSS:* An Effective Formative Assessment Strategy (p. 62)
11:00 AM–12 Noon	6–8	Vero, Gaylord Palms	Incorporating GLOBE and Inquiry into Middle School Science (p. 61)
11:00 AM–12 Noon	6–8	Osceola B, Gaylord Palms	NSTA Press® Session: Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6–8 (p. 61)
1:30–2:30 PM	P–12	St. George 104, Gaylord Palms	Get Ready: A Total Solar Eclipse Is Coming to the United States! (p. 66)
1:30–2:30 PM	2–12	Destin 1, Gaylord Palms	Manufacturing and Engineering: Working Together to Support Real-World Problem Solving (p. 64)
1:30–2:30 PM	6–8	Sarasota 3, Gaylord Palms	Infusing Computational Thinking into Science Classrooms (p. 66)
1:30–2:30 PM	6–12	Vero, Gaylord Palms	The Transition—From STEM Student to STEM Teacher (p. 65)
3:00–4:00 PM	6–8	St. George 104, Gaylord Palms	Measuring Sea Level from Space (p. 70)
3:00–4:00 PM	5–12	Sarasota 3, Gaylord Palms	Applying Systems Thinking Strategies to Address Real-World Problems (p. 70)
3:00–4:00 PM	6–8	Destin 1, Gaylord Palms	Building Community Partnerships through Family STEM Night (p. 68)
3:00–4:00 PM	6–8	Emerald 8, Gaylord Palms	ITEEA Session: Engineering for All—Designing Solutions to Global Issues (p. 69)

High School Strand

Thursday

8:00–9:00 AM	9–12	St. George 114, Gaylord Palms	Learning and Teaching STEM Through Game Design (p. 29)
8:00–9:00 AM	9–C	St. George 108, Gaylord Palms	Smartphone Physics: Newton's 2nd Law (p. 29)
8:00–9:00 AM	7–12	St. George 106, Gaylord Palms	Electrified Paper: Electrical Engineering Meets the Arts (p. 29)
9:30–10:30 AM	1–C	Palm Beach, Gaylord Palms	Teaching Students to Ask Their Own STEM Questions (p. 33)
9:30–10:30 AM	6–C	Emerald 8, Gaylord Palms	AAPT Session: Star Spectra Science (p. 33)
11:00 AM–12 Noon	9–12	St. George 112, Gaylord Palms	AACT Session: Building a Gas Law Unit Plan Using American Association of Chemistry Teachers (AACT) Resources (p. 40)
11:00 AM–12 Noon	K–C	Osceola B, Gaylord Palms	NCTM Session: Teaching Matters! Turn High-Quality Standards into Successful STEM Learning (p. 38)
11:00 AM–12 Noon	6–12	Orange Blossom Blrm., Gaylord	Corrosion: The Application of Redox Chemistry (p. 38)
11:00 AM–12 Noon	9–12	Tampa 3, Gaylord Palms	Using Puzzling Phenomena and Modeling in Diverse Classrooms (p. 40)
11:00 AM–12 Noon	9–C	Destin 2, Gaylord Palms	How We, as Educators, Can Increase the Number of Women of Color in the Field of STEM (p. 38)
11:00 AM–12 Noon	8–12	St. George 114, Gaylord Palms	Spanning the "STEM" Acronym: Bridging Science and Math (p. 40)
11:00 AM–12 Noon	9–12	Emerald 4, Gaylord Palms	CHANGE the Way You Teach Climate Change: A Multidisciplinary STEM Approach (p. 40)

11:00 AM–12 Noon	9–12	St. George 102, Gaylord Palms	High-Paying STEM Careers in the Medical Field That Use the *NGSS* Life Science Performance Expectations (p. 39)
1:30–2:30 PM	8–12	St. George 108, Gaylord Palms	Teaching Environmental Sustainability Using a Free Place-Based Watershed Model (p. 45)
1:30–2:30 PM	6–11	St. George 102, Gaylord Palms	Do You Need a New Science Lab? (p. 44)
1:30–2:30 PM	9–C	Orange Blossom Blrm., Gaylord	Using Models to Teach How Crime Scene Blood Spatter Evidence Tells a Story (p. 44)
1:30–2:30 PM	6–C	St. George 114, Gaylord Palms	Building Mousetrap Vehicles to Integrate Science, Technology, Engineering, and Mathematics (p. 45)
1:30–2:30 PM	P–C	Emerald 1, Gaylord Palms	ITEEA Session: Makerspace and STEM Lab Safety (p. 43)
1:30–2:30 PM	9–12	St. George 112, Gaylord Palms	AACT Session: Building a Periodic Table Unit Plan Using American Association of Chemistry Teachers (AACT) Resources (p. 45)
3:00–4:00 PM	8–C	Emerald 8, Gaylord Palms	NABT Presents: Simple, Inexpensive Ways to Develop Understanding of the Most Difficult Biological Concepts (p. 48)
3:00–4:00 PM	8–C	Emerald 1, Gaylord Palms	NCTM Session: Engaging Students in the Mathematical Modeling Process via Data Collection and Analysis (p. 47)
3:00–4:00 PM	9–C	St. George 102, Gaylord Palms	Female STEM Major Selection and Persistance (p. 48)

Friday

8:00–9:00 AM	8–12	St. George 102, Gaylord Palms	Hacking Data with High Schoolers (p. 54)
8:00–9:00 AM	10–12	Emerald 8, Gaylord Palms	NABT and BSCS Present: Identify and Interpret—A Strategy to Help Students Make Sense of Difficult Information (p. 55)
9:30–10:30 AM	6–C	Emerald 1, Gaylord Palms	NCTM Session: The Teacher Role in Planning for and Enacting Mathematical Modeling Tasks (p. 56)
9:30–10:30 AM	9–12	Emerald 3, Gaylord Palms	The Implementation and Impact of Advanced Placement® Science Courses on Students in an Experiment (p. 56)
9:30–10:30 AM	7–C	St. George 114, Gaylord Palms	Data Analysis Made Easy: Connecting Math and Science Through Technology (p. 58)
9:30–10:30 AM	8–C	St. George 102, Gaylord Palms	NSTA Press® Session: Water and People: An Example Hydrology Unit for Grades 8–12 (p. 57)
9:30–10:30 AM	9–12	St. George 106, Gaylord Palms	Strengthening Science Learning Through Disciplinary Literacy (p. 58)
11:00 AM–12 Noon	6–C	Orange Blossom Blrm., Gaylord	Creating Real-World Connections: Integrating Comics and Pop Culture into a STEM Classroom (p. 61)
11:00 AM–12 Noon	9–12	St. George 114, Gaylord Palms	Project-Based Assessments in a Biology Modeling Classroom (p. 62)
11:00 AM–12 Noon	9–C	Emerald 3, Gaylord Palms	Greenway Case Study: Using Technology and Maps to Inform Development Decisions (p. 60)
11:00 AM–12 Noon	9–C	Emerald 8, Gaylord Palms	AAPT Session: DNA Science (p. 62)
1:30–2:30 PM	6–C	Emerald 8, Gaylord Palms	AAPT Session: Nerve Science (p. 66)
1:30–2:30 PM	7–C	Gainesville 2, Gaylord Palms	SENSE IT: Student-Built Water Quality Sensors (p. 66)
1:30–2:30 PM	7–C	St. George 102, Gaylord Palms	Effective Food Safety Curriculum for STEM Teachers: A Case Study (p. 65)
1:30–2:30 PM	6–12	Osceola B, Gaylord Palms	Apple Valley High School Fab Lab and Multimedia Makerspace E3STEM Grant (p. 65)
1:30–2:30 PM	9–12	Orange Blossom Blrm., Gaylord	Engaging the Virtual Student in STEM (p. 65)
1:30–2:30 PM	P–K, 9–12	St. George 114, Gaylord Palms	Building Leadership and Mentoring Through STEM-Based Literacy Projects (p. 66)
3:00–4:00 PM	9–12	St. George 102, Gaylord Palms	Climate Change, Teenagers, and Butterflies (p. 69)
3:00–4:00 PM	6–C	St. George 114, Gaylord Palms	Design a Cell Phone Case to Protect Your Phone (p. 70)
3:00–4:00 PM	6–12	Emerald 1, Gaylord Palms	Not Your Parents' Lecture: Strategies for Learner-Centered Instruction (p. 68)
3:00–4:00 PM	7–C	St. George 106, Gaylord Palms	How to Build a Better Muscle (p. 70)

Partnerships Strand

Wednesday

3:00–3:45 PM	5–12	Osceola B, Gaylord Palms	STEMx Session: Computer Science Is More Than Coding! Implementing the Computer Science Framework into Your Region (p. 24)
3:00–3:45 PM	5–12	Osceola A, Gaylord Palms	STEMx Session: Harnessing Competition to Fuel Interest in STEM (p. 23)

Thursday

8:00–9:00 AM	P–C	Orange Blossom Blrm., Gaylord	How Business/Industry/Nonprofit Partnerships Help Prepare PreK–16 Students to Meet the Needs of the Future (p. 27)
9:30–10:30 AM	6–12	St. George 104, Gaylord Palms	A STEM Teacher Experience—Army Educational Outreach Program (AEOP): RESET (p. 34)
9:30–10:30 AM	10–C	St. George 112, Gaylord Palms	DNA Barcoding (p. 33)
9:30–10:30 AM	K–12	Sarasota 3, Gaylord Palms	Planning and Designing Safe and Sustainable Science Facilities for STEM-Based Science (Science Facilities 101) (p. 33)
9:30–10:30 AM	9–C	Destin 1, Gaylord Palms	Targeted Interventions Through Skilled Peer Mentoring in University STEM Research Labs for Promoting STEM College and Career Readiness in High School Students (p. 32)
11:00 AM–12 Noon	K–12	Sarasota 3, Gaylord Palms	The Architects Have Started Without Me: What Do I Do Now? (Science Facilities 102) (p. 40)
11:00 AM–12 Noon	P–C	Emerald 5, Gaylord Palms	What's Happening with STEM in Libraries? (p. 38)
11:00 AM–12 Noon	K–C	Palm Beach, Gaylord Palms	K–12 STEM Outreach Opportunities with the Department of Defense (p. 39)
11:00 AM–12 Noon	9–12	St. George 106, Gaylord Palms	Practicing the Art of Teaching Through Simulations and Games (p. 39)
11:00 AM–12 Noon	4–12	Emerald 6, Gaylord Palms	What Happens in Vegas Ends Up Going to the Landfill: A Unique Partnership Highlighting the Vegas Waste Stream (p. 40)
11:00 AM–12 Noon	9–C	Destin 1, Gaylord Palms	Enhancement of Education Through a STEM Pipeline Partnership Model: Engaging K–12, Community College, and University Students with a Focus on Genetics and (p. 38)
1:30–2:30 PM	K–C	Osceola B, Gaylord Palms	Partnership Bootcamp (p. 44)
1:30–2:30 PM	6–8	Destin 2, Gaylord Palms	Designing Professional Development for STEM Integration (p. 43)
3:00–4:00 PM	2–5	St. George 114, Gaylord Palms	We Do 2.0: Bringing Science to Life with We Do 2.0 Robots (p. 49)
3:00–4:00 PM	9–C	Gainesville 1, Gaylord Palms	*Camino a la Ciencia*: A Program Designed to Recruit, Retain, and Train Hispanic Women in STEM Disciplines (p. 47)

Friday

8:00–9:00 AM	P–C	Orange Blossom Blrm., Gaylord	How Business/Industry/Nonprofit Partnerships Help Prepare PreK–16 Students to Meet the Needs of the Future (p. 53)
9:30–10:30 AM	K–12	Gainesville 2, Gaylord Palms	Terra Troopers: A STEM Partnership with the Girl Scouts of Western Oklahoma and Devon Energy (p. 57)
9:30–10:30 AM	4–C	Destin 2, Gaylord Palms	Bridging Gaps: Making Partnership Connections Work for STEM Student Learning and Teacher Effectiveness (p. 56)
11:00 AM–12 Noon	4–9	Destin 2, Gaylord Palms	Abbott Operation Discovery: A Partnership Approach to Creating a Global Program (p. 60)
11:00 AM–12 Noon	4–6,C	Gainesville 2, Gaylord Palms	Enhancing Through a University and School District Partnership (p. 62)
1:30–2:30 PM	C	Palm Beach, Gaylord Palms	The Strategic Undergraduate STEM Talent Acceleration Initiative (SUSTAIN) (p. 65)
1:30–2:30 PM	C	Emerald 3, Gaylord Palms	Developing a STEM Outreach Agenda (p. 64)
1:30–2:30 PM	6–12	Gainesville 1, Gaylord Palms	Partnering with Business/Industry to Provide STEM Career Opportunities for High School Students (p. 65)
1:30–2:30 PM	K–5	Destin 2, Gaylord Palms	University of Florida Partners with Palm Beach County Schools (p. 64)

1:30–2:30 PM	K–8	Emerald 1, Gaylord Palms	ITEEA Session: iSTEM Elementary Education—Preparing STEM Teacher Leaders (p. 64)
3:00–4:00 PM	7–C	Destin 2, Gaylord Palms	Partnerships: Creating Statewide Career Resources for Teachers, Parents, and Students (p. 68)
3:00–4:00 PM	6–12	Osceola B, Gaylord Palms	Using National Science Olympiad STEM Events to Address *NGSS* Crosscutting Concepts and Content (p. 68)
3:00–4:00 PM	3–8	Gainesville 2, Gaylord Palms	Constructing Explanations: Consensus Discussions in Professional Learning Communities (p. 69)
3:00–4:00 PM	P–C	Gainesville 1, Gaylord Palms	Growing STEM in the Park: Formal/Informal Education Partnerships (p. 68)

Administrators Strand

Wednesday

1:00–1:45 PM	6–12	Osceola A, Gaylord Palms	STEMx Session: School Leaders 2.0 (p. 23)
2:00–2:45 PM	K–12	Osceola B, Gaylord Palms	STEMx Session: Creating a Pathway to STEM Success—Recognizing STEM Schools (p. 23)

Thursday

8:00–9:00 AM	4–C	Emerald 8, Gaylord Palms	Cultivating the Whole Plant, Not Just the STEM (p. 28)
9:30–10:30 AM	5–12	Emerald 7, Gaylord Palms	Revolutionizing Education Through an Integrated STEAM Model (p. 32)
11:00 AM–12 Noon	K–5	Emerald 7, Gaylord Palms	You Can't Have STEM Without Science: Combating the Barriers to Elementary Science Education (p. 38)
1:30–2:30 PM	P–C	Osceola A, Gaylord Palms	Administrators' Panel: The Global Context for STEM Education (p. 43)
3:00–4:00 PM	K–5	Emerald 7, Gaylord Palms	Elementary Principals…Are You Ready for the *NGSS*? (p. 47)

Friday

8:00–9:00 AM	K–8,C	Emerald 7, Gaylord Palms	A K–8 Model for STEM Teaching, Learning, and Professional Development Using EiE (p. 54)
9:30–10:30 AM	K–12	Palm Beach, Gaylord Palms	Urban STEM-ification (p. 57)
11:00 AM–12 Noon	K–C	Emerald 7, Gaylord Palms	Defining and Transitioning into a STEM School (p. 61)
1:30–2:30 PM	P–C	Osceola A, Gaylord Palms	Administrators' Workshop: Design Thinking: A Hands-On Workshop for Navigating Challenges in Your Class, School, and Life (p. 64)
3:00–4:00 PM	K–12	Emerald 7, Gaylord Palms	Transforming K–12 STEM Education Through Leader and Teacher Development (p. 68)

A
Abshire, Tiffany 69
Adcock, Barbara 70
Allen, Lauren 23
Allen, Sarah 45
Ansberry, Karen 37, 62
Apraiz, Kristen 44
Armstrong, Kathy 29, 35
Arriola, Sheryl 66
Autry, Candice 70
Ayres, Drew 33, 43, 47

B
Bailey, Allison 57
Baker, Richard 39
Balmer, Alden 45
Barch, Fred 61
Bartels, Daniel 43
Barton, Chris 37
Basalari, Jennifer 32
Bell, Karen 44
Ben-Ur, Ela 64
Bertino, Anthony 44
Bertino, Patricia Nolan 44
Bigelow, Caitlin 63
Biggs, Debbie 44
Blackstock, Erica 48
Bomani, Monica 60
Bonner, Jonathan 33
Boykin, Karen 33
Brady, Emily 60
Brady, Matt 61
Brady, Shari 61
Breil, Brenda 70
Bremekamp, Shari 61
Brennan, Heidi 38
Briars, Diane 38
Brkich, Katie 28
Bruhn, Christine 65
Brush, Bonnie 68
Bryant, Kelly 45
Bulleri, Robin 46
Burns, Amsler 65
Burns, David 27, 53
Bush, Sarah 28, 37
Butler, Susan 48, 61

C
Caldwell, Christine 60
Carraway, Michael 40
Carter, David 35, 42
Chapman, Cash'e 69
Childs, Linda 65
Christensen, Rhonda 39
Christian, Jenny 43
Clark, Leisa 54
Cloran, Kimberly 65
Colson, Mary 57
Colson, Russell 57
Comer, Michael 70
Cook, Kristin 28, 37
Cooper, Miriam 40
Cooper, Susan 58, 66
Cornell, Kevin 49, 57
Corwin, Jarred 24
Counsell, Shelly L. 37
Cox, Dave 55
Cox, Richard Jr. 28, 37
Craighead, D'Yanna 53
Creel, Sally 44, 57
Crowther, David T. 51
Crupi, Samuel 54
Curran, Evan 23

D
Dahl, Lindsey 34
Danger, Christine Angel 28
Davis, Amy 65
Deck, Anita 69
Dilbert, Annmare 61
Dixon, Crystal 59
Dodder, Rebecca 59
Duncan, Kimberly 40, 45, 58
Dunroe, Erin 58
Dykes, Jeff 33

E
Ehlers, Barbara 37
Ehresman, Matt 39
Engelmann, Carol 61
Eurich, Robin 44
Evans, Ashley 62
Evans, Gayle 44
Evans, Kelly Gaier 24

F
Feder, Michael 27, 53
Feldman, Allan 40
Feng, Yaohua 65
Fischione, April 55, 59, 67, 70
Flanagan, Tracy 40
Ford, Michael 23
Fotsch, Fred 47, 64
Foy, Alicia 64
Fraysure, Meredith 63
Froschauer, Linda 37, 56

G
Galindo, Jennifer 61
Gallagher, Matt 25
Gallion, Rebecca 68
Gantt, Thomas 67
Garcia, Jacque 46
Gardner, Cynthia 66
Gardner, Grant 62
Garringer, David 49
Gende, Dolores 33, 62, 66
Gerding, Lindsey 64
Giasi, Trudy 54
Gillman, Joan 37, 49
Giunta, Margaret 67
Gonzalez, Candice 48
Goodwin, Annie 64
Green, Erica 47
Groome, Meghan 43
Guerra, Adriana 71
Gumpert, Mindy 69
Gutierrez, Itzel 66
Guzey, Selcen 43, 47

H
Haas, Karlheinz 58
Hagaman, Melody 66
Hagler, Gayle 59
Hall, J. Wesley 23
Hall-David, Shanna 48
Hamilton, Frances 29
Haroldson, Rachelle 37, 65
Harris, Casey 32
Hartley, Jenna 60, 68
Hartman, Matthew 60
Hayes, LuAnn 68
Haynes, Kelly 56
Hays, Karen 30
Hayward, Doreen 62
Hefty, Lukas 33, 37
Hemmingway, Angela 24
Herman, Kristine 35, 63
Herman, Tim 50, 55, 59
Hernandez, Maria 47, 56
Hess, Mary 34
Higgins, Kristen 47
Hoekenga, Janet 36
Holian, Andrij 67
Holland, Mary 36, 63
Hollins, Tara Beth 56
Hotaling, Liesl 32, 66
Howell, Mandy 38
Hrdina, Vickei 67
Huffman, Tanner 64
Huitt, Tiffany 43, 71
Hutchinson, Kate 37, 47
Hyer, Mark 50

J
Jackson, Emily 55
Jackson, Laura 46, 59
Jacobi, Julie 69
Jagielski, Donna 66
Janack, Sandra 38
Jarrett, Chenita 58
Jinks, Sandra 61
Johnson, Larry 23, 27, 53
Johnson, Stephanie 23
Johnson-Green, Elissa 28
Jones, Chandra 38
Jones, Cynthia 30
Jones, Paulette 67

K
Kaldor, Tamara 32
Kao, Shannon 54
Keeley, Page 44
Keeling, Laura 34
Keith, Brianne 43
Keller, Shana 37
Kellermann, Sandra 71
Kelly, Valecia 62
Kempton, Matt 40
Kim, Danny 46
Kim, Justine 48
King, Kaeri 62
Kirk, Elizabeth 70
Kirkley, Lesley 55
Kirsche, Steve 32
Klein, Chi 48, 55
Knezek, Gerald 39
Knoell, Donna 54, 61
Knudson, Rachel 49
Kozdras, Deborah 28

L
Laabs, Bonnie 32
Lamar, Mary 34
Lamb, Tamra 28
Lambertsen, Sophia 35, 59, 63
Lammlein, Stephanie 23
Lampley, Sandra 29
Launius, J. Carrie 37, 60
Lee, Christopher 65
Lester, Erin 25, 42
Lockett, David 34
Lopez, Ada Lynne 57
Love, Tyler 43
Lucido, Kat 40
Lukens, Jeffrey 40, 50, 56
Lutzow-Felling, Candace 44

M
MacDonald, Katie 67
MacDonald, Rita 32
Madison, Leah 40
Manivilovski, Kristen 60
Mansouri, Ed 50
Marchetti, April 47
Marshall, Kassidy 25

Index of Participants

Mason, Garrett 64, 71
Mathews, Kara 32
Matz, Joan 68
McCubbins, Sara 64
McGhee, Raymond 56
McGilvary, Lynda 62
McGough, Julie V. 37, 44, 63
McKie, Kenyatta 50
Melendez, Alejandro 39
Meza, Delia 27, 53
Miller, India 25
Mills, Kat 42
Milo, Heather 67
Mirabello, Matthew 48
Mitchell, Jessica 48
Morales, Lester 68
Morgan, Dewayne 56
Morgan, Emily 37, 62
Motz, LaMoine 33, 40
Muller, Derek 51
Mullins, Cathie 68

N

Nadler, Orly 29
Nixon, Brenda 27, 53, 71
Nolan, Clay 57, 60
Norton, Heather 30
Norton-Meier, Lori 37
Nyberg, Lisa 37, 44, 63

O

Ogle, Brian 57
O'Shaughnessy, Michael 49
Osowiecki, Aaron 29
Ostlund, Karen 45, 70

P

Pachuta, Tania 62
Parks, Melissa 37, 55
Patterson, Robert 47
Pauch, Sarah 47
Payne, Betsy 69
Pearce, Kalynda 34
Peat, Felicia 37
Peterson, Mackenzie 40
Phillips, Jarod 30
Phillips, Marianne 57
Phillips, Seun 30
Pierce, Eddie 43
Pisseri, Michael 56
Poster, Emily 67
Price, Angel 27
Prudhomme, Leslie 50
Pruiett, Reo 27, 53
Pyke, Curtis 23

R

Raffety, Charles 67
Rampersad, Nylah 70
Ramsey, Susan 58, 70
Reid-Griffin, Angelia 60
Reijmer, Amy 30, 35, 55, 59
Ribblett, Heather 68
Rios, Oscar 49
Rivera, Nicole 48
Roark, Karen 57, 66
Roberts, Lisa 43
Robinson, Sharica 57
Rollo, Becky 62
Romano, Carissa 35, 59, 63
Romero, Angela 46, 63
Rosario, Ruben 45, 49
Rosen, Craig 40
Rosen, Jeffrey 38
Ross-Kleinmann, Julianne 62
Royce, Christine Anne 37
Rubino, Ann 37
Rubio, Alex 25
Rukes, Sherri 38
Runfola, Kyle 56
Ruso, Geraldina 33
Ruud, Ruth 44, 58
Ruzycki, Nancy 60

S

Sacerdote, Chris 66
Sagen, Erron 28
Sale, Nancy 49
Sampson, Victor 61
Schmitt, Linda 40
Schoening, Lori 62
Scott, Christy 58, 70
Selznick, Stephanie 37
Semicek, Patrice 65
Sessler, John 33
Sevin, Elaine 69
Shah, Deepa 49
Sherman, Heather 23
Sherwin, Ronald 69
Shettel, Jennifer 66
Signore, Alicia 68
Siudzinski, Lee 28
Sleeper, Melissa 37
Sloane, Jeremy 65
Smith, Amy 60
Smith, Lori 47
Snowflack, Danielle 30
Snyder, Julia 65
Soja, Heather 32
Solarsh, Amanda 43, 64
Sowell, Scott 35
Stalker, Kimberly 33
Starnes, N'aignae 69
Stasny, Rebekka 44
Staudt, Carolyn 45
Stein, Gila 29
Stevenson, Anne 45
Stewart, Morgan 54
Stilwell, Kim 29
Stokes, Daniel 61
Stoyanoff, Meghan 60
Stremme, Bob 63
Stroecker, Brandi 23
Sumerfield, Sandi 28
Swanson, Jennifer 37
Szentmiklosi, Melissa 33

T

Talley, Terry 46
Taylor, Tanya 54, 62, 68
Telford, Hector 38
Tesoriero, Gina 27, 43, 48, 53, 64
Texley, Juliana 37, 58, 60
Thibodeaux, Stacy 70
Thompson, Meredith 29, 39
Tillotson, John 65
Townsend, Jeffery 34
Tucker, Deborah 62
Turley-Stoulig, Tara 38
Turner, Chelsey 65
Turner, Rebecca 64

U

Ubaha, Kelechi 46, 63

V

Vasquez, Jo Anne 70
Veldhuizen, Megan 37
Virani, Karim 43
Vogt, Gina 42, 46, 67
Vowell, Julie 57

W

Walker, Caryn 34
Wall, Jeanne 49
Wallmark, Laurie 37
Wang, Edward 67
Watkins, Sandy 27, 53
Watson, Janella 27, 53
Waxmonsky, Mark 68
Webber, Lisa 35, 42
West, DJ 56
Westbrook, Sarah 33
Westcarth, Shonnileigh 38
Wetherington, Jonathon 68
Whitaker, Reid 35, 42
White, Janet 66
Wiles, Jason 65
Williams, Anthony 28
Williams, Jennifer C. 51, 69, 71
Williams, Kenneth 71
Williams, Mary 29
Williamson, Quincey 34
Willis, Selene 38
Wilson, Chastity 56
Wilson, Frazier 27, 53
Wolfgang, Charlton 66
Wolkowicz, Terry 69
Wollberg, Nichelle 65
Wood, Darrick 29, 35

Y

Yamada, Kengo 45
Young, Donna 68

Z

Zeis, Jodi 23
Zhuang, Yilin 62
Zietlow, Suzanne 65
Zimny, Judy 29
Zygouris-Coe, Vicky 32, 58

Notes

Index of Advertisers

AEOP eCYBERMISSION and GEMS (Booth #312), *www.usaeop.com,* 866-462-9237 41

National Inventors Hall of Fame/Camp Invention (Booth #513), www.nvent.org, 800-968-4332 31

Vernier Software & Technology (Booth #401), www.vernier.com, 888-837-6437 . . . . . Cover 3

NSTA Ads

NSTA Conferences www.nsta.org/conferences . . . . . 9, 24, 36, 71, 72, Covers 2 and 4

NSTA Member Services (NSTA Hub# 319), *www.nsta.org/membership,* 800-722-6782 52

NSTA Press®, www.nsta.org/store, 800-277-5300 19

Vernier

Vernier Software & Technology
888-VERNIER (888-837-6437)
www.vernier.com

ALIGNED TO
NGSS

Science They Can Get Their Hands On

Download **FREE** experiments and find out more at
www.vernier.com/elb-solar

WINNER
TECH & LEARNING
STELLAR SERVICE AWARDS
2015

Winner of Tech & Learning's Stellar Service Award

Vernier Software & Technology is the leading worldwide innovator of real-time data-collection, graphing, and analysis tools for science education.

JOIN US

7TH ANNUAL STEM

SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS

Forum & Expo

HOSTED BY NSTA

Philadelphia, Pennsylvania

July 11–13, 2018

This dynamic event brings together educators and organizations who are actively implementing STEM programs in their schools or districts.

Come prepared to learn tactics that work, build your professional learning network, connect with effective outreach programs and partnerships, discover new resources, and build a strong curriculum.

For information and to register, visit
www.nsta.org/stemforum

#STEMforum

NSTA National Science Teachers Association