NSTA National Conference on Science Education

SUN • SURF

Science

LOS ANGELES

March 30–April 2

2017

VOLUME 1

#NSTA17
Authentic, Practical Resources for Teachers

Visit Heinemann at Booth 2324 for special discounts.
Why are bumpers important?

Resist the impulse to underestimate their function in accidents.

In car accidents, the first point of impact is often the bumper. Show students how beneficial a bumper is to lessening the severity of an accident by minimizing the force on the car.

Wireless Smart Cart $159

Attend the free workshop to collect data and see how changes to a bumper design can decrease the force of an impact.

11:00am - 12:00pm
STEM Activities: Crash Barrier Design and Engineering Challenge

Free Standards-Based Workshops: Thursday, March 30, 2017
Free giveaways in every workshop!

Room #405

8:00–9:00  True Colors: Spectrometry to Investigate Lights and Colors
9:30–10:30  Exploring Misconceptions: What is pH?
11–Noon  Essential Chemistry: Stoichiometry and Limiting Reactants with Gas Laws
12:30–1:30  Understanding Photosynthesis: A Lab-based Approach
2:00–3:00  Chemical Formulas: Subscripts and Coefficients Made Easy!
3:30–4:30  Exploring and Modeling Climate Change

Room #407

8:00–9:00  STEM Activities: Easy-to-Teach Robotics
9:30–10:30  From DNA to Protein: A Modeling Approach
11–Noon  STEM Activities: Crash Barrier Design and Engineering Challenge
12:30–1:30  Shockingly Good Electrochemistry: Making and Using Batteries
2:00–3:00  STEM Activities: Untangling Electric Circuits
3:30–4:30  Exploring Misconceptions: Motion Graphs

Booth #1639
see the full workshop descriptions pasco.com/nsta17
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*Los Angeles, California • March 30–April 2, 2017*
Although advertisers work hard to follow strict safety procedures, guidelines are constantly evolving. It is important to note that all ad images are simulations, not actual experiments — any safety lapses are extremely unlikely to endanger the participants, who are models rather than actual teachers and students. Therefore, NSTA assumes no responsibility for nor guarantees the accuracy of safety information presented in ads.

**Volume 2**  Fri., March 31
Science in the Community Featured Presentation (Panel)
Elementary Extravaganza
Meet Me in the Middle Day
NGSS@NSTA Forum
Featured Presentation: Laura Henriques
Featured Presentation: Jacqueline Barber
Featured Panel: The National Academies of Sciences, Engineering, and Medicine
AGU Lecture: Lucy Jones
Science in the Community Session
Science in the Community Share-a-Thon
“Meet and Greet” the Presidents and Board/Council
Science in the Community Forum
Robert H. Carleton Lecture: LaMoine Motz
NSTA Teacher Awards Gala (M-2)
Friday Daily Program

**Volume 3**  Sat., April 1 /Sun., April 2
NGSS@NSTA Share-a-Thon
Featured Presentation: Veerabhadran Ramanathan
Paul F-Brandwein Lecture: Emma Marris
NSTA/ASE Honors Exchange Lecture: Chris Colclough
Hydrogen Horizon Automotive Challenge
Science in the Community Session
Featured Presentation: Roni Ellington
Featured Presentation: Louie Lopez
Saturday Daily Program
Sunday Daily Program

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The environment is important to science educators. These programs are recyclable and were printed on recycled paper.
Sponsors and Contributors to the Los Angeles National Conference

NSTA and the Los Angeles Planning Committee are extremely grateful to the following companies and associations for their generous contributions to the NSTA Los Angeles National Conference on Science Education.

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Contributors
Association for Science Education (ASE)
Brandwein Institute
NESTA (National Earth Science Teachers Association)
The Planetary Society

We at NSTA wish to express our heartfelt thanks to the members of the California Science Teachers Association (CSTA) for the many hours of time they volunteered in planning this conference.
Welcome to Los Angeles, California, the land of sun, surf, and the site of the 2017 National Conference on Science Education. This event, which attracts science educators across the U.S. and around the world, will enhance professional learning experiences and provide collaborative opportunities among the attendees in promoting excellence and innovation in science teaching and learning for all.

The Keynote Speaker for this conference is Andy Weir, a software engineer and the author of the book, *The Martian*. An attendee might even want to continue with space adventures and the innovations of technology with a visit to the California Science Center. Or an educational trip to the Columbia Memorial Space Center might also capture your imagination.

The first of the four strands focuses on NGSS, the Next Generation of Science Teaching. Science educators will examine the structure of NGSS and investigate strategies to construct and implement a coherent program to include classroom practice skills with formative and summative assessments.

2017: A STEM Odyssey is another strand with workshops and several short courses that engage diverse learners along with career pathways in STEM-related fields.

The third stand explores Science & Literacy Reloaded, emphasizing science with mathematics and language arts. Elementary science will be a vital core discipline when it is seen as an opportunity for authentic language learning to be implemented and integrated with the language arts and mathematics curriculum.

The fourth strand, Mission Possible: Equity for Universal Access, demonstrates that access of science is the right for ALL students of all abilities, genders, languages, socioeconomic status, and geographic locations.

I encourage you to attend as many sessions, short courses, and educational trips that meet your needs. Explore the exciting Exhibit Hall to find new products and services for your classroom. NSTA is providing you with the opportunity to CONNECT, and now you must find the time to COLLABORATE with others. We sincerely hope that you will CELEBRATE your time at this conference. My themes for the year are—Connect, Collaborate, and Celebrate—because you—TEACHERS—ARE THE KEY.

Mary Gromko
2016–2017 NSTA President
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 #818!

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

In partnership with the United States Patent and Trademark Office
Welcome to Los Angeles: Sun, Surf & Science

Welcome to the “City of Angels” 2017 National Science Teachers Association Conference on Science Education.

A fantastic array of events, activities, workshops, and learning opportunities awaits you! Whether this is your first or 100th visit to Southern California, we have it all for you—great people, exciting things to do and see, and gorgeous weather…and most of all, what we hope will be the greatest professional development experience of your career.

The Los Angeles Conference Committee has put together a spectacular program to truly reflect NSTA's emphasis on ways we can help each other grow as science educators. The committee members have worked hard to provide sessions that will highlight emerging issues, build advocacy, link resources to your needs, and renew our professional learning community within the context of high-quality science education. In the workshop sessions, discover new ways to incorporate the Next Generation Science Standards into your curriculum by delving into engineering practices and three-dimensional learning. Find out what is next for science assessment and accountability. See what your colleagues are doing to incorporate STEM into their classrooms.

All of this and more are offered in the following four strands during this conference:

- NGSS: The Next Generation of Science Teaching
- 2017: A STEM Odyssey
- Science & Literacy Reloaded
- Mission Possible: Equity for Universal Access

But, as with any NSTA conference, the main focus is to give you an opportunity to learn from science teaching colleagues from across the nation and around the world! The conference committee is confident that they have brought you the best of the best!

So, the Sun is shining bright and the sand is warm between your toes! Learn and network with your colleagues, enjoy the glorious opportunities that Los Angeles and Southern California have to offer, and make your experience at NSTA’s 2017 Los Angeles Conference on Science Education one to remember. Surf’s up!

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NSTA Conferences 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 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:

Conference Previews
Gone are the days of bulky, newspaper-style advance programs. Our conference preview is a smaller size and our preview for the area conferences includes highlights for our three area conferences. As an added bonus, this new preview is more environmentally friendly, as it dramatically reduces both our print and mailing requirements.

Online Conference Information and Personal Scheduler
Most of your conference arrangements can now be accomplished online (www.nsta.org/conferences). 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 Conference Programs by E-Mail/Conference App
All conference pre-registrants are sent an electronic version (PDF) of the final conference program by e-mail approximately one week prior to the conference, further reducing print and shipping requirements. Also, attendees are encouraged to use the NSTA Conference app, which provides all the tools necessary for a successful conference experience.

Recycled Paper and Sustainable Print Services
Conference previews and final conference programs are printed on recycled paper whenever possible. In addition, Freeport Press, the printer for our conference 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 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.

Green Initiatives at the Los Angeles Convention Center
The Los Angeles Convention Center’s commitment to environmental stewardship has been recognized by numerous organizations, including the U.S. Environmental Protection Agency and the United States Green Building Council. Their recertification as a LEED® Gold certified building in 2015 made them the largest convention center in the U.S. to receive LEED EB:O+M Gold recertification! Current green initiatives include:

- **Energy Conservation and Renewable Energy.** The Convention Center is 36% more energy efficient than the median building in the Entertainment Building–use category. Energy conservation measures include a “cool roof” to keep heat away from the building and LED/CFL lighting.
- **Recycling.** In 2016, the Convention Center had a 75% overall waste diversion rate. Glass, plastic, paper, aluminum, pallets, scrap metal/steel, toner/ink cartridges, wood, and cardboard are among the items recycled. More than 1 million pounds of waste was diverted from the landfill between September 2014 to September 2015 alone.
- **Water.** Some water-conservation measures at the Convention Center include replacing 710 toilets with low GPF units, installing drought-tolerant landscaping, and using water-efficient dishwashers.

“Go Green” at the Los Angeles Conference!
- Recycle your conference 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.
- In advance of the conference, presenters are encouraged to post their presentations and handouts on the Session Browser/Personal Scheduler.
- If you prefer to bring handouts to your session, use doublesided printing and/or recycled paper.
- Walk or use public transportation when possible at the conference.
- Bring your own refillable water bottle to the conference.
- Evaluate sessions attended online.

Environmentally Friendly Exhibition Practices
Our conference partner, Hargrove, Inc., offers many green product options and services in the production of our conference exhibitions, including 100% recyclable carpet and padding, recycled exhibit structures, a “reclaimer” that recycles 92% of all scrap metal/steel, toner/ink cartridges, wood, and cardboard are among the items recycled. More than 1 million pounds of waste was diverted from the landfill between September 2014 to September 2015 alone.

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Meeting Location and Times

The conference headquarters hotel is the JW Marriott Los Angeles at L.A. LIVE. Conference registration, the exhibits, and the NSTA Science Store will be located at the Los Angeles Convention Center. Most sessions will be held at the Convention Center and the JW Marriott. The majority of short courses will be held at The Westin Bonaventure Hotel & Suites (SC-1 will be held at the JW Marriott).

The conference will begin on Thursday, March 30, at 8:00 AM and end on Sunday, April 2, at 12 Noon (*Bill Nye to give preconference session on Wednesday evening at 6:00 PM).

Registration

Registration is required for participation in all conference 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 conference activities except those for which a separate fee is stated (e.g., short courses, educational trips, networking events, etc.).

The NSTA Registration Area, located in Hall H/J of the Convention Center, will be open during the following hours:

- Wed., March 29: 5:00–8:00 PM
- Thu., March 30: 7:00 AM–6:00 PM
- Fri., March 31: 7:00 AM–5:00 PM
- Sat., April 1: 7:00 AM–5:00 PM
- Sun., April 2: 7:30 AM–12 Noon

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.

Purchasing Ticketed Events

The Los Angeles Conference Committee has scheduled a variety of ticketed events (e.g., professional learning institutes, short courses, educational trips, and networking events). Each of these events requires a separate fee and ticket. You may purchase tickets, space permitting, in the NSTA Registration Area. See the Conference Program section (starting on page 52) for details. Note that some events may have required advance registration.

Conference Hotels/Housing Bureau

See pages 12–13 for a list of hotels and a map of the downtown area. A Housing Bureau representative will be available at the Information Desk located in Hall H/J during registration hours on Wednesday evening through Saturday to assist with housing questions. You can also reach a Housing Bureau representative by phone at 877-352-6710 or by e-mail at help@orchideventssolutions.com.

Airlines/Amtrak

NSTA has made arrangements with several major airlines and Amtrak to offer discounted fares to the Los Angeles conference attendees. Visit www.nsta.org/LAtravel for details.

Discounted Rental Cars

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

Enterprise 800-593-0505 16AH230

Or go to www.enterprise.com and use “16AH230” in the “Optional: Coupon, Customer, or Corporate Number” box. Click on “search” and enter PIN “NST.”
Ground Transportation to/from Airport

Los Angeles International Airport (LAX) is approximately 18 miles from the Convention Center. Taxi fares from LAX airport are subject to a $4 surcharge. Depending on traffic, taxi fares to the Convention Center average between $61 and $92, depending on traffic.

SuperShuttle LAX (www.supershuttle.com) offers a shared-ride van to the Convention Center for $17 one way (rates subject to change). To receive SuperShuttle LAX special rates, use CL3EL in the discount code field. Check with individual hotels on whether they provide airport shuttles. For a listing of LAX ground transportation options, visit bit.ly/2jergOG.

Getting Around Town

Public transportation in the Downtown Los Angeles area is very accessible. Metro’s Blue Line Pico Station platform is located at the intersection adjacent to the Convention Center West Hall (metronet). In addition, DASH Route F travels the Financial District with stops in front of the Convention Center. Visit bit.ly/2jBdrEK for DASH schedule information and to access a map of stops.

TAP (Transit Access Pass) is a plastic card that contains smart chip technology designed to improve customers’ transit experience. While not a pass in itself, the TAP card allows you to electronically purchase and load passes and/or stored value (cash) accepted by Metro and/or participating municipal transit agencies throughout Los Angeles County. All fares can be prepaid by using a TAP card, which is $1 at TAP vending machines and onboard buses, or $2 at pass vendor locations. Visit beta.metro.net for Metro fare details.

NSTA Shuttle

Shuttle service will be provided to the majority of official NSTA hotels that are not within walking distance of the Convention Center. See facing page for Shuttle Schedule.

Lyft Special Offer

Lyft is offering $15 IN FREE RIDES to attendees of the NSTA Los Angeles National Conference who are new to Lyft! Visit www.lyft.com/i/15BONUS to download the free Lyft app and enter the credit code “15BONUS” in the payment section before requesting a Lyft to claim $15 IN FREE RIDES! *Valid for new accounts, $5 off three rides.

Parking

Parking is easy to find at the Convention Center. The closest and most convenient parking lots are the LACC parking garages located right underneath the building. There are two large underground parking lots with elevators and escalators that lead straight into the Convention Center lobby. Both lots charge $15 per day with no in-and-out privileges (rates subject to change).

- LACC Parking (West and South Halls)
  (visit bit.ly/2joMc4 to access map)
- L.A. LIVE Parking
  (visit www.lalive.com/parking to access map)
- Map of general downtown parking
  (visit bit.ly/2jHSr to access map)
Shuttle service is provided between the Los Angeles Convention Center and the official NSTA hotels listed on this flyer. Please refer to the sign in your hotel lobby for additional information and changes. For questions regarding the shuttle or to make an advance reservation for a wheelchair lift–equipped vehicle, please call the shuttle supervisor with Kushner & Associates at (310) 425-2443 during shuttle hours.

**Hotels and Boarding Locations**

**ROUTE 1**
The L.A. Hotel Downtown
O Hotel
The Mayfair
The Westin Bonaventure

**Shuttle Service**
At the Westin Bonaventure
Curbside on Flower St.
Curbside on 7th St.
Curbside on Figueroa St.

**ROUTE 2**
Millennium Biltmore Hotel
Sheraton Grand Los Angeles
The Standard Downtown L.A.

**Boarding Location**
Curbside on Grand Ave.
Curbside on Hope St.
At the Millennium Biltmore

**ROUTE 3**
DoubleTree by Hilton L.A. Downtown
Kawada Hotel
Omni Los Angeles Hotel at CA Plaza

**Boarding Location**
Curbside on Los Angeles Blvd.
Curbside on 2nd St.
Curbside on Olive St.

**ROUTE 4**
Hilton Los Angeles Airport
The Westin Los Angeles Airport

**Boarding Location**
West Drive
On Century Blvd., outside Daily Grill restaurant

◆ Route 4 is on a schedule. Please refer to the hotel lobby sign or Route 4 flyer for specific times.

**Walk Hotels**
The hotels listed in this section are within walking distance of the Los Angeles Convention Center.

Courtyard Los Angeles at L.A. LIVE ◆ Hotel Indigo L.A. Downtown ◆ JW Marriott Los Angeles at L.A. LIVE
Luxe City Center Hotel ◆ Residence Inn Los Angeles at L.A. LIVE

**Hours of Shuttle Operation**

Peak Service: Shuttles depart every 15–20 minutes
Off-Peak Service: Shuttles depart every 20–30 minutes

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**Wednesday, March 29**

Professional Learning Institutes Shuttle between Route Hotels and Los Angeles Convention Center
Off-Peak: 8:00 – 11:00 AM
(No shuttle service: 11:00 AM – 3:30 PM)
Conference Shuttle between Los Angeles Convention Center and Route Hotels
Off-Peak: 3:30 – 8:30 PM *

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**Thursday, March 30**

Conference Shuttle between Route Hotels and Los Angeles Convention Center
Peak: 6:30 – 10:30 AM
(No shuttle service: 10:30 AM – 4:00 PM)
Conference Shuttle between Los Angeles Convention Center and Route Hotels
Peak: 4:00 – 8:00 PM *
Short Course Shuttle between Los Angeles Convention Center and Westin Bonaventure
Off-peak: 12:30 – 4:00 PM ◆

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**Friday, March 31**

Conference Shuttle between Route Hotels and Los Angeles Convention Center
Peak: 6:30 – 10:30 AM
(No shuttle service: 10:30 AM – 4:00 PM)
Conference Shuttle between Los Angeles Convention Center and Route Hotels
Peak: 4:00 – 7:00 PM *
Short Course Shuttle between Los Angeles Convention Center and Westin Bonaventure
Off-peak: 10:30 AM – 12 Noon ◆
Off-peak: 2:30 – 4:00 PM ◆

**NSTA Teacher Awards Gala at JW Marriott**
Shuttle between Route Hotels and JW Marriott.
Off-peak: 7:00 – 9:30 PM ◆◆

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**Saturday, April 1**

Conference Shuttle between Route Hotels and Los Angeles Convention Center
Peak: 6:30 – 10:30 AM
(No shuttle service: 10:30 AM – 4:00 PM)
Conference Shuttle between Los Angeles Convention Center and Route Hotels
Peak: 4:00 – 7:00 PM *
Short Course Shuttle between Los Angeles Convention Center and Westin Bonaventure
Off-peak: 10:00 – 11:00 AM ◆
Off-peak: 2:30 – 4:00 PM ◆

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**Sunday, April 2**

Conference Shuttle between Route Hotels and Los Angeles Convention Center
Off-Peak: 7:30 AM – 12:30 PM *

* This is the time the last shuttle from Los Angeles Convention Center departs for Route Hotels.
Last shuttle from hotels depart one hour prior.
◆◆ This is the time the last Awards Gala shuttle departs from JW Marriott to Route Hotels.
Registration, Travel, and Hotels

NSTA Conference Hotels

Numbers correspond to map on facing page.

1. Courtyard Los Angeles at L.A. LIVE
   901 W. Olympic Blvd.
   213-443-9222

2. DoubleTree by Hilton Los Angeles Downtown
   120 S. Los Angeles St.
   213-629-1200

3. Hilton Los Angeles Airport
   5711 W. Century Blvd.
   310-410-4000

4. Hotel Indigo LA Downtown
   899 Francisco St.
   213-683-4855

5. JW Marriott Los Angeles at L.A. LIVE
   (Headquarters Hotel)
   900 W. Olympic Blvd.
   213-765-8600

6. Kawada Hotel
   200 S. Hill
   213-621-4455

7. The L.A. Hotel Downtown
   333 S. Figueroa St.
   213-322-0111

8. Luxe City Center Hotel
   1020 S. Figueroa St.
   213-748-1291

9. The Mayfair Hotel
   1256 W. 7th St.
   213-632-1200

10. Millennium Biltmore Hotel
    506 S. Grand Ave.
    213-624-1011

11. O Hotel
    819 S. Flower St.
    213-623-9904

12. Omni Los Angeles Hotel at California Plaza
    251 S. Olive St.
    213-617-3300

13. Residence Inn Los Angeles at L.A. LIVE
    901 W. Olympic Blvd.
    213-443-9200

14. Sheraton Grand Los Angeles
    711 S. Hope St.
    213-488-3500

15. The Standard Downtown LA
    550 S. Flower St.
    213-892-8080

16. The Westin Bonaventure Hotel & Suites
    404 S. Figueroa St.
    213-624-1000

17. The Westin Los Angeles Airport
    5400 W. Century Blvd.
    310-216-5858
Registration, Travel, and Hotels

Los Angeles Convention Center
1201 S. Figueroa St.

1. Courtyard Los Angeles at L.A. LIVE
   901 W. Olympic Blvd.

2. DoubleTree by Hilton Los Angeles Downtown
   120 S. Los Angeles St.

3. Hilton Los Angeles Airport
   5711 W. Century Blvd.

4. Hotel Indigo LA Downtown
   899 Francisco St.

5. JW Marriott Los Angeles at L.A. LIVE
   (Headquarters)
   900 W. Olympic Blvd.

6. Kawada Hotel
   200 S. Hill St.

7. The L.A. Hotel Downtown
   333 S. Figueroa St.

8. Luxe City Center Hotel
   1020 S. Figueroa St.

9. The Mayfair Hotel
   1256 W. 7th St.

10. Millennium Biltmore Hotel
    506 S. Grand Ave.

11. O Hotel
    819 S. Flower St.

12. Omni Los Angeles Hotel at California Plaza
    251 S. Olive St.

13. Residence Inn Los Angeles L.A. LIVE
    901 W. Olympic Blvd.

14. Sheraton Grand Los Angeles
    711 S. Hope St.

15. The Standard Downtown LA
    550 S. Flower St.

16. The Westin Bonaventure Hotel & Suites
    404 S. Figueroa St.

17. The Westin Los Angeles Airport
    5400 W. Century Blvd.
NSTA Exhibits

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

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 conference activities. Maps of the Exhibit Hall and other meeting rooms will be accessible via our Conference app (see pages 15 and 16). See Volume 4 for a complete list of exhibitors and contact information.

Lead Retrieval. NSTA exhibitors use lead retrieval, a paperless tracking system that allows them to receive fast, accurate information about conference 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 conference is still fresh in your mind.

Exhibitor Workshops. Exhibitor-sponsored workshops for science teachers are offered throughout the conference. These workshops give you an opportunity to use a variety of commercial instructional materials. Attendance is on a first-come, first-served basis. See Volume 4 for a complete list of exhibitor workshops. An index of exhibitor workshops scheduled on Thursday begins on page 163.

NSTA Hub

The NSTA Hub will be THE place in Los Angeles to meet and become part of the group crafting the future of science education. NSTA leaders and staff, NGSS curators, Learning Center advisors, and others will all be spending time there, and you can ask us anything! Learn how to join NSTA, ask us about presenting at a conference, find out what NGSS implementation resources we have, learn how to get published in our journals, get information about our teacher awards (earn cash or equipment for your classroom), or find out how you can get more involved with NSTA. Located in South Hall Lobby, mingle with us at the NSTA Hub during registration hours below:

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday</td>
<td>5:00–8:00 PM</td>
</tr>
<tr>
<td>Thursday</td>
<td>7:00 AM–6:00 PM</td>
</tr>
<tr>
<td>Friday</td>
<td>7:00 AM–5:00 PM</td>
</tr>
<tr>
<td>Saturday</td>
<td>7:00 AM–5:00 PM</td>
</tr>
</tbody>
</table>

NCASE and the Air & Space Education Pavilion!

NCASE, the National Coalition for Aviation and Space Education, is here for you—providing a one-stop clearinghouse with an incredible range of resources and information to inspire and challenge your students, leading them to superior achievement in all the STEAM subjects and related careers.

NCASE is a membership organization formed by national aerospace associations, firms, educational groups, and agencies, including the FAA and NASA. Enjoy the website, newsletter, and NCASE GUIDE—the single, most comprehensive source of information regarding the wealth of educational materials for educators and students available from more than 50 aviation and space member organizations.

For more information about NCASE’s organizational or free educator memberships, visit www.aviationeducation.org. See Volume 4 for a listing of participating organizations at the Air & Space Education Pavilion in the Exhibit Hall.

Hydrogen Horizon Automotive Challenge

Look for Horizon Educational in the exhibit hall! They’ll be hosting their Hydrogen Horizon Automotive Challenge. This Toyota-funded after-school STEM program has high school students design, build, and race their own 1:10 scale hydrogen-powered RC cars. Twenty teams will battle head-to-head in a four-hour endurance race on Saturday from 9:30 AM to 1:30 PM. Stop by their booth on Thursday and Friday to test-drive a car and learn more about their program and hydrogen fuel cell vehicles in California. Attendees with the best lap times will have an opportunity to win science equipment from Horizon Educational.
**Conference Resources**

**The Martian Astronaut and Cargo Drop Challenge**

Put your thinking and creative hat and get HANDS ON with a design-challenge inspired by *The Martian*. Participants will use common household items to create, build, and test their own landing mechanism (e.g. parachute and crate) to drop astronauts or supplies to Mars!

Make it your mission to stop by Booth #2159 in the Exhibit Hall at the hours below:

- **Thursday** 11:00 AM–4:00 PM
- **Friday** 10:00 AM–3:00 PM
- **Saturday** 10:00 AM–1:00 PM

**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 science content with sound teaching strategies for science 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 conference. *Note: Free shipping is not offered to international addresses or for NSTA gear purchases.*

We’ve lined up a number of unique opportunities for conference-goers:

- Exclusive author signings and meet-and-greet opportunities
- Our latest books—including *Problem-Based Learning in the Earth and Space Science Classroom, K–12*;
- *Big Data, Small Devices: Investigating the Natural World Using Real-Time Data*;
- 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.

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**CONFERENCE APP**

**Connect. Share. Engage.**

Download our conference app for a social experience you don’t want to miss.

- Search sessions, exhibitors, and speakers to build a schedule of your favorites
- Access maps with pinpoint locations
- Take notes within app
- Bookmark an interesting speaker
- Share the play-by-play with social media channels
- Tweet a memorable quote from a session
- Access conference FAQs

*Available for download on* iPhone + iPad Android

*Powered by: NSTA National Science Teachers Association*
Conference Resources

NSTA International Lounge
The Atrium 1 room at JW Marriott has been reserved as an international lounge. All international guests are welcome to use this lounge as a place to meet or just simply relax while here at the NSTA conference. The lounge will be open Thursday, Friday, and Saturday, 9:00 AM–5:00 PM.

CSTA Booth
The California Science Teachers Association (CSTA) booth (#634) is located in Hall H/J of the Convention Center and will be open during exhibit hours. As the advocate for quality science education in California for more than 50 years, the California Science Teachers Association offers networking, professional development, and representation to assure state policies and legislation support you in inspiring your students. Stop by to network, learn about resources for implementing NGSS, and to join CSTA.

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.

Lost and Found
All lost-and-found items at the Convention Center will be turned in at the Exhibitor Registration counter. Lost-and-found items at other facilities will be turned in at the facilities’ security offices.

NSTA Coordinating Center for People with Special Needs
NSTA makes an effort to provide convenience and accessibility for all persons attending conferences. A Center for Services for People with Special Needs, staffed by local committee volunteers, is located in the NSTA Registration Area. If you need assistance, visit this table during registration hours. NSTA cannot guarantee services for requests not made in advance of the conference.

Wi-Fi at the Convention Center
Free wireless internet intended for light web browsing is available in the lobbies. To access, connect to “Free Internet”; no password is required. Visit bit.ly/2le4CJN for information on other wireless options.

First Aid Services/Lactation Room
The First Aid Room is located in South Hall Lobby at the Convention Center. Attendees in need of first aid can use any beige house phone to dial 5136 or call 213-765-4605 to notify the Security Command Center. In addition, this room is available as a lactation room for nursing mothers.

The HHMI Night at the Movies: Sneak Preview of Amazon Adventure 3D
Join HHMI BioInteractive in Los Angeles on Thursday, March 30, for a special sneak preview of Amazon Adventure 3D, a new IMAX feature film. Witness the epic true story of Henry Walter Bates, who risked his life exploring the Amazon in the 1850s on a burning quest to determine if species change—and ultimately provided “beautiful proof” for Darwin’s new theory of the origin of species by natural selection by unraveling the phenomenon of mimicry. See page 161 for details (two screenings).

Graduate Credit Opportunity
Los Angeles conference attendees can earn one or two graduate-level credit/s in professional development through Dominican University of California (dominicancaonline.com).

Participants must attend the conference, 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/2kjning. Deadline is April 17, 2017.

NSTA Conference App
Navigate the conference from the palm of your hand! The NSTA Conference app provides all the tools necessary for a successful conference experience. Features include the ability to view session and workshop listings by time and presenter; maps of the Convention Center, hotels, and the Exhibit Hall; social media plugins; and a note-taking tool. Visit www.nsta.org/conferenceapp 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.

Friday “Meet and Greet”
Be sure to stop by Friday from 12:45 PM to 1:30 PM at the entrance to Exhibit Hall at Hall H/J of the Convention Center for a special session. Come “meet and greet” with your elected NSTA officers on your way to the exhibits. The President, President-Elect, and Retiring President along with your Board and Council members are looking forward to talking with you at the conference!
NSTA TV

The National Science Teachers Association (NSTA) is partnering with the international film and broadcasting company, WebsEdge, to bring NSTA TV to this year’s National Conference on Science Education in Los Angeles.

NSTA TV is an on-site conference television channel featuring a new episode daily, screened around the Convention Center, as well as on a dedicated television channel in selected guest hotel rooms and online.

The TV segments will profile prominent science educators and scientists, highlight the hard work of teachers and organizations committed to elevating the quality of science education in the U.S., and provide an opportunity to learn about new teaching strategies and techniques, and innovative programs and initiatives that are helping to transform science education and learning.

You can access NSTA TV at the following hotels:
The L.A. Hotel Downtown channel 14
Millennium Biltmore Hotel channel 87
JW Marriott Los Angeles channel 72

You can also watch NSTA TV online at www.websedge.com/videos/nsta_tv on social media or the NSTA website.

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 March 29–April 13, 2017, while the session is fresh in your mind! During the conference, session evaluations can be completed on the computers at the Presenters/Presiders booth in the Registration Area. And this year, we’re giving away an Apple iPad mini 2 Wi-Fi tablet to two lucky attendees who complete 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 conference 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 page 32 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 April 25, 2017, an attendee can view his or her transcript at the NSTA Learning Center (learningcenter.nsta.org) by first logging on and then clicking “My Profile” under the Welcome. Here you’ll find a “My Certificates” tab, which you can use to access your transcript. Attendees can also document credit for activities that are not being evaluated (e.g., Exhibit Hall visits, etc.). In addition, the NSTA Learning Center offers professional development experiences (online and face to face) for your long-term growth and professionalism.

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 conference. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee’s individual profile.
Advice for First-Time Conference Attendees

- Wear comfortable shoes. You’ll be doing a lot of walking!
- If you like to collect posters, bring a cardboard tube.
- Leave plenty of empty space in your suitcase...in fact, bring an extra large one. You will collect pounds and pounds of literature and stuff.
- If you read through the schedule for the day, plan on one or two backups. Sometimes a presenter does not show (for me, it averaged one per conference...not bad) or a room is full or the topic was not really what I needed. Having another one to go to allows you to walk out of a session with a sense of purpose. And when you read the schedule, look around. Ask the people next to you, “Who’s a great presenter?”
- Give yourself plenty of time to visit the exhibits, but unless you want to stand in a crowd, don’t go just as it opens. There will be plenty of handouts to go around. You won’t miss anything by going a bit later.
- Bring cash or credit cards. You’ll end up buying things from some of the vendors.
- If you like to network, bring business cards and collect those of presenters and sales reps you want to stay in contact with.
- Avoid large lines. Eat lunch at an “odd” hour.
- Spoil yourself. Plan at least one great dinner. If you have an extra day before or after, tour the city.
- Keep all receipts. Remember—this is tax deductible.
- Keep the pages from the daily schedules for those workshops you attended. If you have to give a report when you get back to school, you will have all the information. But you might find you have a question, and the presenters’ e-mail addresses are listed.
- Before you leave, go online to find your state science teachers association, and then contact them to see if they plan to host a hospitality party. It is a nice way to end the day, meet people in your state, get a free munchie or two, and to network.

(Submitted by William Peltz)
A new free app for iPad® from HHMI BioInteractive

Descriptions for every major biome on each continent

Biodiversity data for more than 16,000 species of reptiles, amphibians, and mammals

Gridded historical climate data for the entire planet

BioInteractive.org/BiomeViewer
Steps from L.A. LIVE, STAPLES Center and Microsoft Theater, the Los Angeles Convention Center is at the heart of a dynamic urban lifestyle and the city’s vibrant commercial center.
Los Angeles Convention Center

Kentia Hall (Lower Level)
NSTA Los Angeles National Conference on Science Education

Diamond Ballroom (Third Floor)

Platinum Ballroom (Second Floor)

Gold Ballroom (First Floor)

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Michelle Butler, Executive Administrator and Manager

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Shawn Crowder, Administrative Coordinator

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

LEARNING CENTER
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Amanda Wolfe, eLearning Engagement Specialist

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Sharlene Steward, Program Coordinator

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

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Valynda Mayes, Managing Editor

Science Scope
Inez Fugate Lifig, Field Editor
Ken Roberts, Assistant Executive Director, Journals

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Scott Stuckey, Managing Editor

Journal of College Science Teaching
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28 NSTA Los Angeles National Conference on Science Education
NSTA Mission Statement

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

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Bob Sotak, NSELA Affiliate Representative
Brian Shmaefsky, SCST Affiliate Representative
Conference Resources • Future Conferences

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

6th Annual STEM Forum & Expo, hosted by NSTA
Gaylord Palms Resort/Kissimmee/Orlando—July 12–14, 2017

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
Inspire Students

Spark Innovation

Visit Booth #2343

Inspire your students and spark innovation with K-12 programs that make science real and relevant. With exciting hands-on activities, inquiry-based learning, and engaging tech-enhanced resources, our programs help teachers excel at delivering NGSS* instruction that empowers future science innovators.

Explore our K-12 science programs and NSTA conference activities at mheonline.com/NSTA2017

*Next Generation Science Standards (NGSS) is a registered trademark of Achieve. Neither Achieve nor the lead states and partners that developed NGSS endorse or are involved in the production of McGraw-Hill Education products.
National Science Teachers Association

**Robert H. Carleton Award**

*for National Leadership in the Field of Science Education*

- Edward P. Ortleb
  - 1978–1979 NSTA President
  - Consultant/Author
  - St. Louis, Mo.

**Presidential Citation**

- Marie Sullivan
  - Retired Science Educator
  - Colorado Springs, Colo.

**Angela Award**

- Catherine Tomasello
  - Science Student
  - Homeschool
  - Land O’ Lakes, Fla.

**Sylvia Shugrue Award for Elementary School Teachers**

- Gary Koppelman
  - Elementary Science Teacher
  - Blissfield Elementary School
  - Blissfield, Mich.

National Science Teachers Association

**Distinguished Teaching Award**

- Micah Lauer
  - Science Teacher
  - Heritage Middle School
  - Meridian, Idaho

- Jean Tushie
  - Science Teacher
  - Eden Prairie High School
  - Eden Prairie, Minn.

**Distinguished Informal Science Education Award**

- Elizabeth Mulkerrin
  - Director of Education
  - Omaha’s Henry Doorly Zoo & Aquarium
  - Omaha, Neb.

- Jerry D. Valadez
  - Executive Director
  - SAM Academy and Sanger Community Science Workshop
  - Fresno, Calif.

- Janet Yamaguchi
  - Vice President of Education
  - Discovery Cube
  - Santa Ana, Calif.
All attendees can evaluate concurrent teacher and exhibitor sessions online while simultaneously tracking professional learning certification (based on clock hours). Use this form to keep track of all sessions/events attended during the LA conference. Sessions/events such as exhibit hall visits may not be available for online evaluation. However, these events still qualify for professional learning.

Beginning April 25, 2017, LA transcripts can be accessed at the NSTA Learning Center (learningcenter.nsta.org) by logging on with your LA Badge ID# and 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 LA transcript. Completed transcripts can be printed from this website and presented to an administrator who requires documentation of participation in the conference. 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 conference session browser: www.nsta.org/LAbrowser. You will need your badge number to evaluate sessions. See page 17 of the Vol. 1 conference program for instructions. 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. And don’t forget, the more sessions you attend and evaluate, the more chances you have to win an Apple iPad mini 2!

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 science 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:
I=Strongly Agree   2=Agree   3=Neutral   4=Disagree   5=Strongly Disagree

Wednesday, March 29  8:00 AM–8:00 PM

<table>
<thead>
<tr>
<th>Start Time</th>
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Thursday, March 30  8:00 AM–10:45 PM

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We’re giving an Apple iPad mini 2 to two lucky attendees who evaluate sessions that they attend. The more sessions you attend and evaluate, the more chances you have to win!
**Friday, March 31, 8:00 AM–8:45 PM**

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**Saturday, April 1, 8:00 AM–6:00 PM**

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**Sunday, April 2 8:00 AM–12 Noon**

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</table>
National Science Teachers Association

Distinguished Service to Science Award

Cherry Brewton
Executive Director
Evans County Community Center
Statesboro, Ga.

Susan Koba
Science Education Consultant
Omaha, Neb.

Norman G. Lederman
Distinguished Professor
Illinois Institute of Technology
Chicago, Ill.

Patricia Simmons
2011–2012 NSTA President Policy Fellow
AAAS S&T
Arlington, Va.

Morton Sternheim
Professor
UMass Amherst
Amherst, Mass.

P. John Whitsett
2007–2008 NSTA President Science Education Consultant
Fond du Lac, Wis.

Fellow Award

Kathleen B. Horstmeyer
President
SEPA
Chester, Conn.

Fellow Award

Julie A. Luft
Athletic Association Professor of Mathematics and Science Education
University of Georgia
Athens, Ga.

Fellow Award

Victor Sampson
Associate Professor of STEM Education
Director, Center for STEM Education
The University of Texas at Austin
Austin, Tex.

The Maitland P. Simmons Memorial Award for New Teachers

Courtney Asaro
Kristen N. Austion
Kristen Barnes
Stephanie Bender
Genevieve Bjorn
Alexis Daniels
Kristen Fleury
Carrie Fong
Hannah Hannah
Rachel M. Hess
Brooke Holloway
Robert A. Jackson
Jayne Kerner
Catherine Krygeris
Katie Lee
Vanessa Logan
DeAndra Meshell
Fortenberry

Cori Nelson
Cindy Ok
Paul Orbe
Jennifer Parr
Brianna Reilly
Alexandra N. Schoessler
Allycia Uhrhan
Sabrine Zahran
NSTA Teacher Awards Gala
ALL of the teacher awards will be presented in one grand evening. See page 131 for details about this ticketed event.

Wendell G. Mohling Outstanding Aerospace Educator Award
Gary Garber
Science Instructor
Boston University Academy
Boston, Mass.

Ron Mardigian Memorial Biotechnology Explorer Award
Sponsored by Bio-Rad Laboratories
Ben Johnston
Science Teacher
Bob Jones High School
Athens, Ala.

Robert E. Yager Excellence in Teaching Award

Yager Scholar
NSTA District XII
(IL, IA, WI)
Kristin Rademaker
Science Teacher
Harlem High School
Machesney Park, Ill.

NSTA District I
(CT, MA, RI)
Steven Autieri
Science Teacher
Suffield Public Schools
Suffield, Conn.

NSTA District VI
(NC, SC, TN)
Covey Denton
Science Teacher
Greenfield School
Wilson, N.C.

Sponsored by Northrop Grumman Foundation
Mariel Kolker
Science Teacher
Morristown High School
Morristown, N.J.

NSTA District VII
(AZ, LA, MS)
Kristen Sumrall
Science Teacher
Lafayette Middle School
Lafayette, Miss.

NSTA District XIII
(NM, OK, TX)
George Hademenos
Physics Teacher
Richardson High School
Richardson, Tex.

NSTA District XVIII
(CANADA)
Ruggiero Racca
Science Teacher
Toronto School District
Toronto, Ont., Canada

Northrop Grumman Foundation Excellence in Engineering Education Award
Sponsored by Northrop Grumman Foundation

NSTA Award Winners

NSTA Los Angeles National Conference on Science Education
DuPont Pioneer Excellence in Agricultural Science Education Awards

Middle School Level

Heather Grabarski
Science Teacher
Adams-Friendship Elementary School
Friendship, Wis.

High School Level

Vincent Newman
Agricultural Science Teacher
McArthur High School
Hollywood, Fla.

2016 DuPont Challenge Science Essay Teacher Awardees

Elementary Division

Grand-Prize Winner
Rebecca Kurson
Elementary Teacher
Golda Och Academy
West Orange, N.J.

Grand-Prize Winner
Sarah Pucci
First-Grade Teacher
Lordship Elementary School
Stratford, Conn.

Grand-Prize Winner
Jennifer Domo
SCOPES Academy Director
Uniozo Elementary School
Chillicothe, Ohio

Co-applicant
Jaimee Jenkins
Preservice Teacher
Ohio University/Uniozo Elementary School
Chillicothe, Ohio

Middle Division

Grand-Prize Winner
Kelli Iannacone
Grades 7 and 8 Pre-Engineering Teacher
Timberlane Middle School
Pennington, N.J.

Senior Division

Grand-Prize Winner
Jennifer Seavey
Teacher
Thomas Jefferson High School for Science Technology
Alexandria, Va.
Faraday Science Communicator Award

Paul Adams
Director of FHSU Science and Mathematics Education Institute
Fort Hayes State University
Hayes, Kans.

NSTA Award Winners

PASCO STEM Educator Awards
Sponsored by PASCO scientific

Middle Level
Brian Soash
Science Teacher and STEM Program Coordinator
Lee County Middle School
West
Leesburg, Ga.

High School
Shannon Sahabi
Science Teacher
Tom C. Clark High School
San Antonio, Tex.

Vernier Technology Awards
Sponsored by Vernier Software & Technology

Elementary Level
Kathryn Eyolfson
STEM Teacher
Coyote Hills Elementary School
Aurora, Colo.

Middle Level
Carrie Herndon
Science Teacher
Metro East Montessori School
Granite City, Ill.

Terra McMillan
Science Teacher
Thomson Middle School
Centerville, Ga.

High School Level
Rene Corrales
Science Teacher
STAR Academic Center
Tucson, Ariz.

Hannah Erickson
Science Teacher
Boston Day and Evening Academy
Roxbury, Mass.

Amy Melby
Science Instructor
Yuma High School
Yuma, Colo.

College Level
Donald Carpenetti
Chemistry Instructor
Craven Community College
Winterville, N.C.
Shell Science Teaching Award
Sponsored by Shell

Awardee

Joel Truesdell
Chemistry Teacher
Kamehameha Schools
Hawaii Campus
Keaau, Hawaii

John Gensic
Biology Teacher
Penn High School
Mishawaka, Ind.

Ryan Monger
Biology and Sustainable Design Teacher
Sultan High School
Sultan, Wash.

Finalist

Shell Urban Science Educators Development Award
Sponsored by Shell

Awardee

Melissa Collins
Science Teacher
Shelby County Schools
Memphis, Tenn.

Karis Jackson
Science Teacher
Hazelwood Central Middle School
St. Louis, Mo.

Julio Mendez
Science Teacher
Perspectives Charter School
Chicago, Ill.

Finalist

Sarah Tazghini
Science Teacher
Khalil Gibran International Academy
Brooklyn, N.Y.

Alexandra Valdes
Science Teacher
LEAD Public Schools
Nashville, Tenn.

Crystal Velez
Science Teacher
John F. Kennedy High School
Waterbury, Conn.

SeaWorld Parks & Entertainment Environmental Educator of the Year

Marguerite Murphy
Science Teacher
Camden Hills Regional High School
Rockport, Maine
The Shell Science Lab Challenge, sponsored by Shell and administered by NSTA, encourages teachers (grades 6–12) in the U.S. and Canada, who have found innovative ways to deliver quality lab experiences with limited school and laboratory resources, to share their approaches for a chance to win prizes, including a grand prize school science lab makeover.

To learn how to win a Shell Science Lab Makeover at your school, see Volume 3 for the “Do You Need a New Science Lab?” and “The Shell Science Teaching Award: Fueling Success with Students” sessions.

In Memory of Al Guenther
1936–2016

Please contact Nancy Guenther at nguenther13@gmail.com for information on classroom materials that he wished to donate to teachers and schools.

2017 Shell Science Lab Challenge District Winners

**National Finalist**

_District VII_

(AR, LA, MS)

**Kassie Cusachs**

Kenner Discovery Health Sciences Academy

Metairie, La.

_District VIII_

(KY, VA, WV)

**Susan Booth**

Jones Middle School

Hampton, Va.

_District IX_

(MN, ND, SD)

**Dorothy Marie Story**

Whittier Middle School

Sioux Falls, S.D.

**District X**

(IN, MI, OH)

**Leah LaCrosse**

McCormick Junior High School

Huron, Ohio

**District XI**

(KS, MO, NE)

**Ruth Hutson**

Blue Valley Middle/High School

Randolph, Kans.

**District XII**

(IL, IA, WI)

**Mauree Haage**

Twin Cedars Junior/Senior High School

Bussey, Iowa

**District XIII**

(NM, OK, TX)

**Sabrine Zahran**

Garland High School

Garland, Texas

**National Finalist**

_District XIV_

(AZ, CO, UT)

**L. Rene Corrales**

STAR Academic Center

Tucson, Ariz.

_District XV_

(ID, MT, WY)

**Jayda Fillmore**

Cassia High School

Burley, Idaho

_District XVI_  

(CA, HI, NV, Samoa, GU, Terr. of Pacific Islands)

**Linda Preminger**

Washington Manor Middle School

San Leandro, Calif.

_District: XVII_  

(AK, OR, WA)

**Nicholas Krissie**

Lincoln Middle School

Oakland, Ore.

**National Finalist**

_District XVIII_  

(CANADA)

**Nicole Anthony**

John Polanyi Collegiate Institute

Toronto, Ont.

Canada
Through AEOP, the Army continues its long tradition and strong commitment to the advancement of STEM education and literacy. Leveraging its most valuable assets—world-class scientists and engineers and research facilities—AEOP offers our nation’s youth and teachers a collaborative, cohesive portfolio of opportunities that effectively engage future workforce generations in meaningful, real-world STEM experiences, competitions and paid internships.

**Friday, March 31 Workshops**

**Location:** Los Angeles Convention Center - 150 AB

Gains in the Education of Mathematics and Science: What Can GEMS Do For You?
8:00 – 9:00am

AEOP RESET: Learning Through the Legacy Cycle
9:30 – 11:00am

Group Work: Using Student Collaboration in the Middle School Science Classroom
11:30am – 1:00pm

What’s the Problem? Integrating Engineering into the Science Classroom without Rockets and Bridges
1:30 – 3:00pm

**Friday, March 31 Session**

**Location:** JW Marriott Los Angeles, LA Live - Gold Ballroom Salon 4

How to Implement STEM and NGSS into Your Classroom through the Use of NSTA Competitions
9:30 – 10:30am

**Saturday, April 1 Featured Presentation**

**Location:** Los Angeles Convention Center - Theater (Room 411)

Engaging ALL in STEM
Speaker: Louie Lopez
3:30 – 4:30pm
### Wednesday, March 29 (Volume 1)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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| 9:00 AM–4:00 PM | NSTA Professional Learning Institutes (check in between 8:00 and 9:00 AM)  
                  | 52–54                                                               |
| 12 Noon–5:30 PM | Global Conversations in Science Education Conference (M-1) 
                  | 82–83                                                               |
| 6:00–8:00 PM   | The Planetary Society Lecture: Bill Nye  
                  | 84                                                                  |

**The Planetary Society Lecture**

**Wednesday, March 29, 6:00–8:00 PM**

**Bill Nye**
CEO, The Planetary Society

**Everything All at Once**
Based on his upcoming book *Everything All at Once: How Nerds Solve Problems*, Bill will probe the nerd mind-set—solving problems through 
dogged effort, creativity, and trial and error.

*Sponsored by The Planetary Society*

(See page 84 for details.)

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### Thursday, March 30 (Volume 1)

<table>
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<tr>
<th>Time</th>
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| 8:00–9:00 AM  | First-Timer Conference Attendees’ Orientation  
                  | Is This Your First NSTA Conference?  
                  | 90                                                                  |
| 8:00–9:00 AM  | Mary C. McCurdy Lecture: Kathy DiRanna  
                  | 88                                                                  |
| 8:30 AM–4:30 PM | Teacher Researcher Day  
                  | 51                                                                  |
                  | 101                                                                 |
| 11:00–11:05 AM | Ribbon-Cutting Ceremony/Exhibits Opening  
                  | 109                                                                 |
| 11:00 AM–6:00 PM | Exhibits  
                  | 111                                                                 |
| 12:30–1:30 PM | Featured Presentation: Heidi Schweingruber, sponsored by Shell  
                  | 117                                                                 |
| 3:30–4:30 PM  | Featured Presentation: Jennifer Long  
                  | 143                                                                 |
| 3:30–5:30 PM  | Science in the Community Session: Creativity Forum  
                  | 150                                                                 |
| 5:30–7:30 PM  | NGSS Live Chat  
                  | 161                                                                 |

**See Conference Highlights, Volume 2, for page numbers.**

### Friday, March 31 (Volume 2)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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| 8:00–10:00 AM | Elementary Extravaganza  
                  | 89                                                                  |
| 8:00–10:00 AM | Science in the Community Session: Models of Intersections...  
                  | 102                                                                 |
| 8:00 AM–4:30 PM | NGSS@NSTA Forum  
                  | 111                                                                 |
| 9:00 AM–5:00 PM | Exhibits  
                  | 112                                                                 |
| 10:15 AM–4:30 PM | Meet Me in the Middle Day  
                  | 113                                                                 |
| 11:00 AM–12 Noon | Featured Presentation: Laura Henriques  
                  | 114                                                                 |
| 12:30–1:30 PM | Science in the Community Featured Presentation (Panel): 
                  | Moderator: Angela Calabrese Barton  
                  | 115                                                                 |
| 12:30–1:30 PM | Featured Presentation: Jacqueline Barber  
                  | 116                                                                 |
| 12:45–1:30 PM | “Meet and Greet” the NSTA Presidents and Board/Council  
                  | 117                                                                 |
| 2:00–3:00 PM  | Featured Panel: The National Academies of Sciences, 
                  | Engineering, and Medicine  
                  | 118                                                                 |
| 2:00–3:00 PM  | AGU Lecture: Lucy Jones  
                  | 119                                                                 |
| 2:00–4:00 PM  | Science in the Community Share-a-Thon  
                  | 120                                                                 |
| 3:30–4:30 PM  | Robert H. Carleton Lecture: LaMoine Motz  
                  | 121                                                                 |
| 6:00–8:45 PM  | NSTA Teacher Awards Gala (M-2)  
                  | 122                                                                 |

**Ribbon-Cutting Ceremony**

An opening ceremony is scheduled on Thursday at 11:00 AM in the NSTA Exhibits entrance, Hall H of the Convention Center. Musical entertainment is provided by the Crescenta Valley High School Jazz Combo, under the direction of Mathew Schick, Instrumental Music Director.

---

**Is This Your First NSTA Conference?**

Yes, you say? Then you are invited to attend a Thursday morning session specifically intended for first-time conference attendees. This session will help you make the most of your first-time conference experience.

See page 89–90 for details.
General Session
Thursday, March 30, 9:15–10:30 AM

Andy Weir
Author of *The Martian*
*The Martian: The Story Behind the Story*
Andy discusses how he went from computer programmer to bestselling author. *Spoiler:* He did it mostly by mistake.

Also, the first 250 people in line for Andy’s session will receive a free classroom-edition copy of *The Martian*, which Andy will personally autograph shortly after his talk.

*Speaker sponsored by Penguin Random House.*
(See page 101 for details.)

Saturday, April 1 (Volume 3)

See Conference Highlights, Volume 3, for page numbers.

<table>
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<tr>
<th>Time</th>
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<tr>
<td>9:00 AM–3:00 PM</td>
<td>Exhibits</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>Featured Presentation: Veerabhadran Ramanathan</td>
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<tr>
<td>9:30–11:00 AM</td>
<td>NGSS@NSTA Share-a-Thon</td>
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<tr>
<td>9:30 AM–1:30 PM</td>
<td>Hydrogen Horizon Automotive Challenge at the Horizon Educational booth in the Exhibit Hall</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>Paul F-Brandwein Lecture: Emma Marris</td>
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<tr>
<td>11:00 AM–12:30 PM</td>
<td>High School Hands-On Hodge-Podge Share-a-Thon</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>Featured Presentation: Roni Ellington, sponsored by Shell</td>
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<tr>
<td>12:30–2:30 PM</td>
<td>Multicultural/Equity Share-a-Thon</td>
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<tr>
<td>12:30–2:30 PM</td>
<td>Science in the Community Forum: Using Informal Science</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>NSTA/ASE Honors Lecture: Chris Colclough, sponsored by Association for Science Education</td>
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<tr>
<td>3:30–4:30 PM</td>
<td>Award-Winning Share-a-Thon: Featuring NSTA Distinguished Teachers</td>
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<tr>
<td>3:30–4:30 PM</td>
<td>Featured Presentation: Louie Lopez</td>
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Why do we sweat?

Because sweating is our superpower. It keeps us cool, even in warm temperatures. Help your students understand this superpower is actually evaporative cooling at work.

Save time and money in your science lab with PASCO Wireless Solutions. See how our sensors can help you meet science and engineering practice standards in our free workshops, or come see us in our booth!

See our free workshop schedule at pasco.com/nsta17

Booth #1639

$39
Wireless Temperature

Because sweating is our superpower. It keeps us cool, even in warm temperatures. Help your students understand this superpower is actually evaporative cooling at work.

Save time and money in your science lab with PASCO Wireless Solutions. See how our sensors can help you meet science and engineering practice standards in our free workshops, or come see us in our booth!

See our free workshop schedule at pasco.com/nsta17

Booth #1639

Wireless Temperature
The Los Angeles Conference Committee has planned the conference around these four strands, enabling you to focus on a specific area of interest or need. Strand events are identified by icons throughout the daily program.

See the following pages for a list of sessions and events for each strand.

**NGSS: The Next Generation of Science Teaching**

Celebrate the vision of three-dimensional teaching and learning in the NRC Framework and Next Generation Science Standards (NGSS). This strand provides engaging and collaborative examination of the NGSS architecture to allow teachers to implement the changes necessary to construct a coherent program, including classroom practice and instructional sequence, as well as to build student skills. Bundling performance expectations connects the three key dimensions within a progression. This strand will focus on providing opportunities for students to collaborate as they develop and use science and engineering practices, communicate evidence of core scientific understanding, and apply real-world contexts. Alignment of assessments connecting core concepts, science and engineering practices, and crosscutting concepts is essential.

**2017: A STEM Odyssey**

Students’ science learning has changed dramatically from learning in the past. In a STEM environment, students’ understanding of the world around them is facilitated through the intentional connections between the four disciplines of science, technology, engineering, and mathematics. STEM curriculum provides research-based instructional strategies that engage diverse learners and highlight career pathways in STEM-related fields. More importantly, STEM provides opportunities for all students to place themselves in a 21st-century world. In this strand, participants will connect and collaborate to increase their understanding and ability to teach STEM-based lessons and instructional sequences.

**Science & Literacy Reloaded**

With the continued emphasis on mathematics and language arts, elementary teachers have not been encouraged or given opportunities to teach science. This strand will support these teachers in seeing the connections between science and literacy. Elementary science will be re-envisioned as an opportunity for authentic language learning and not just one more thing to squeeze into the curriculum. As students investigate natural phenomena, they collect data to then make claims from their evidence and explain their reasoning, arguing from their evidence. Teachers can then support their students’ language and literacy through science notebooks, technical writing, interactive journals, and e-portfolios. This strand will allow teachers to become advocates of literacy in science, blending oral and written communication skills within the science curriculum.

**Mission Possible: Equity for Universal Access**

Access to science education is not a privilege; it is a right for students of all abilities, genders, languages, socioeconomic status, and geographic locations. A quality science education is essential in closing the skills gap in our current workforce. Science learning must start in early childhood and be sustained through postsecondary education to keep our nation as a leader in innovation. Current challenges provide opportunities for equitable access to science education. Some issues include maximizing student achievement for exceptional students while respecting cultural and linguistic diversity in order to celebrate those differences. The sessions in this strand will focus on pedagogical best practices to enhance learning for ALL.
## Conference Program • Conference Strands

### NGSS: The Next Generation of Science Teaching

#### Thursday, March 30

<table>
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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>3-2-1 Lift-Off! NASA's Beginning Engineering Science and Technology (BEST) Curriculum</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>Using the Environment as a Springboard to Real-World 3D Learning</td>
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<tr>
<td>3:00–6:00 PM</td>
<td>Short Course: Lessons Learned: The California NGSS K–8 Early Implementation Initiative (By Ticket: SC-2)</td>
</tr>
<tr>
<td>3:00–6:00 PM</td>
<td>Short Course: A Short Course on Analyzing and Adapting Three-Dimensional Assessment Tasks (By Ticket: SC-3)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>Analyzing and Interpreting Ice Sheet Data to Determine the Effects of Human Activities on Climate</td>
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#### Friday, March 31

<table>
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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>Scaffolding to Support Complex Student-Created Explanations of Real-World Phenomena (Secondary Science Classrooms)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>Starting with the End in Mind: Building an Instructional Unit from NGSS Performance Expectations</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>NGSS and 3D Implementation: Tools for Elementary Teachers</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Phenomena-Questions-Model</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>Using Phenomena to Level the Playing Field in the Elementary Classroom</td>
</tr>
<tr>
<td>3:00–6:00 PM</td>
<td>Short Course: NGSS : Three Dimensions in Action in a California Early Implementer Classroom (By Ticket: SC-9)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>Designing Classroom Assessments to Address NGSS Performance Expectations</td>
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#### Saturday, April 1

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>Creating Inquiry Lessons Using NGSS</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>Yes, Humans Really Do Cause Earthquakes: Hydraulic Fracturing, Wastewater Injection, and Earthquakes</td>
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<td>11:00 AM–12 Noon</td>
<td>Analyzing and Adapting Curriculum Materials to Better Support Three-Dimensional Teaching and Learning</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>NGSS 3D Implementation: Tools for Middle School and High School Teachers</td>
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<td>2:00–3:00 PM</td>
<td>Using Scientific Phenomena to Understand the Three Dimensions of the NGSS</td>
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<td>3:30–4:30 PM</td>
<td>The Essentials of High-Quality NGSS Implementation for All Students</td>
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<tr>
<td>5:00–6:00 PM</td>
<td>Developing Tools for 3-Dimensional Classroom Assessment</td>
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#### Sunday, April 2

<table>
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<tr>
<th>Time</th>
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<tr>
<td>8:00–9:00 AM</td>
<td>Creating Life Science Assessment Tasks that Integrate Three-Dimensional Learning of the NGSS</td>
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<tr>
<td>9:30–10:00 AM</td>
<td>EQuIP Rubric: A Formative Assessment Tool in Creating NGSS Lessons</td>
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</tbody>
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Thursday, March 30
8:00–9:00 AM
The “How Tos” of an X-STREAM Family Night
12:30–1:30 PM
Zombies in the Neighborhood? No Worries. STEM Them!
2:00–3:00 PM
Using PBLs to Teach High School Science
3:30–4:30 PM
Making the Case for STEM Career Pathways in Public Health (Centers for Disease Control and Prevention)
Featured Presentation: Creating Learning Ecologies: Integrating Formal and Informal Spaces (Speaker: Jennifer Long)

Friday, March 31
9:30–10:30 AM
STEM in the Real World: Hands On with NASA Aeronautics
9:45 AM–5:45 PM
Short Course: Stretch Your Legs for Science: An Outdoor STEM Adventure (By Ticket: SC-7)
11:00 AM–12 Noon
Engineering and Literacy: A Path to Integrated STEM

Saturday, April 1
8:00–9:00 AM
The Science Collective: Project-Based Learning as a Multi-Science Teacher
9:30–10:30 AM
STEAMING Along with DaVinci: Integrating Science and Engineering with the Arts in an Elementary Classroom
11:00 AM–12 Noon
Using Robots to Teach Science, Math, Art, and Language Arts
12:30–1:30 PM
Engaging Multilingual Students and Their Families in STEM
2:00–3:00 PM
How to Create a Network and Supply Chain to Support Collaborative Biotechnology Education

3:30–4:30 PM
NASA Is with You When You Fly: Flying with Bernoulli
5:00–6:00 PM
Social Studies, ELA, and STEM: Oh My, Integrating It All!

Sunday, April 2
9:30–10:00 AM
Using 3D Printers in Your Science Classroom
10:00–10:30 AM
Using 3D Printers in K–3 Boost Student Engagement and Learning
11:00 AM–12 Noon
Early Elementary STEM Curriculum

3:00–6:00 PM
Short Course: Kids Love Rocks, So Will You: Introducing Physical Science BIG IDEAS (By Ticket: SC-15)
3:30–4:30 PM
Inquiry—Without Reinventing the Wheel
5:00–5:30 PM
A STEM Approach to Integrate Drones as a Teaching and Technology Tool

2017: A STEM Odyssey
Thursday, March 30

8:00–9:00 AM
Charts, Graphs, and Diagrams, Oh My! The World of Visual Learners

12:30–1:30 PM
High-Tech and Low-Tech Strategies for Science and Literacy

2:00–3:00 PM
Rebooting the Connection and Full Integration of Science with the Language Arts: A Natural Pairing Across the Curriculum

3:30–4:30 PM
Fairy Tales, Folk Tales, and Fables Engineering

5:00–6:00 PM
Let’s Give Them Something to Talk About: Discourse in the NGSS Science Classroom

Friday, March 31

8:00–9:00 AM
Interactive Word Walls: Enhancing Students’ Ability to Speak, Read, and Write About Science Experiences

8:00–11:00 AM
Short Course: Writing in Science: A Research-Based Approach That Enhances Learning in Both Domains (By Ticket: SC-6)

9:30–10:30 AM
Using Science Practices to Support Student Sense-Making of Phenomena

10:30 AM–4:00 PM
Short Course: NSTA Press® Short Course: Phenomenon-Based Learning: Fun, Hands-On, Cooperative Learning of Both Science and Language Arts (By Ticket: SC-8)

11:00 AM–12 Noon
Developing Graphing Skills for All

12:30–1:30 PM
Get Energized: Problem-Based Learning EQUALS Success in Science and Literacy

2:00–3:00 PM
Screencasting in Science

3:30–4:30 PM
Using Lab Notebooks in the Preschool and Elementary Classroom

Saturday, April 1

8:00–9:00 AM
Got Science? Get Literacy!

8:00–11:00 AM
Short Course: Fostering a Science-Driven Language and Literacy Learning Environment (By Ticket: SC-11)

9:30–10:30 AM
Urban-Based Partnerships to Support the K–6 Foundations of CCSS ELA and NGSS

Sunday, April 2

8:00–9:00 AM
Removing Literacy Barriers to Rigorous STEM Units

9:30–10:30 AM
Where Will Yoni the Chickadee Raise His Family?

11:00–11:30 AM
Growing a Garden of Science and Literacy

11:30 AM–12 Noon
Science Notebooks Reloaded

Science & Literacy Reloaded

10:30 AM–4:00 PM
Promoting Elementary Science Literacy in Three Dimensions with the 2017 U.S. Total Solar Eclipse

12:30–1:30 PM
Engaging All Learners in Inquiry Through A Model of Shared Language

4:00–4:30 PM
A Response to Intervention Model for Argument-Based Inquiry: The Importance of Using Student Writing to Find Out What They Really Know

5:00–5:30 PM
Poetry for Young Investigators
Mission Possible: Equity for Universal Access

Thursday, March 30

8:00–9:00 AM
Lessons that Create Equitable Opportunities for All Students

2:00–3:00 PM
Reach ALL Students by Supporting ALL Teachers

3:30–4:30 PM
Using I-Engineering Teacher Tools to Promote Positive Engineering Identity Formation

5:00–6:00 PM
Host a Rockstar Family STEM Event

Friday, March 31

8:00–9:00 AM
Metacognition in Science Classrooms: Improving Student Outcomes by Engaging Them in Their Own Work

9:30–10:30 AM
Environmental Literacy: All About Access!

11:00 AM–12 Noon
Incorporating Global STEM Collaboration into Your Classroom!

12:30–1:30 PM
Shifting Toward Student-Designed Experiments

2:00–3:00 PM
Interactive Science Notebooks: Low-Tech Creations for Higher Level Thinking

3:00–6:00 PM
Short Course: Reaching Extremes! Blending Climate Science and Mathematics to Reach all Learners (By Ticket: SC-10)

3:30–4:30 PM
Bilingual Engineering Adventures for the Whole Family

5:00–6:00 PM
Support Students Who Receive Special Education Services in STEM Education through Engagement in Engineering Challenges

Saturday, April 1

8:00–9:00 AM
Support English Language Learners in STEM Education through Engagement in Engineering Challenges

9:30–10:30 AM
Science Coding: Combining Science and Computational Thinking

11:00 AM–12 Noon
How Engineering Practices Differentiate for Students with Learning Disabilities

12:30–1:30 PM
Equity, Leadership, and Change

2:00–3:00 PM
How and Why STEM Career Interest Changes in High School

3:00–6:00 PM
Short Course: Hands-On Mathematics in Science Education (By Ticket: SC-16)

3:30–4:30 PM
Bilingual Engineering Adventures for the Whole Family

5:00–6:00 PM
Support Students Who Receive Special Education Services in STEM Education through Engagement in Engineering Challenges

Sunday, April 2

8:00–9:00 AM
Coding Curriculum for K–6 Students

9:30–10:00 AM
Differentiating for the Differentiated: Lab Experiences for General Level Life Science Students

10:00–10:30 AM
STEM for ALL: Dream IT, Design IT, Develop IT
NSTA has planned an afternoon dedicated to sharing science education from an international perspective. This mini-conference begins and ends with plenary talks by distinguished international scholars and includes roundtable discussions on specific topics relevant to the international science educator community and poster presentations providing opportunities for networking and idea exchange. During this event, there will be numerous opportunities for international visitors to network with science educators from various cultures. For an agenda on Global Conversations Conference events, see pages 82–83.

Wednesday, March 29
7:00–10:50 AM  W-1 Educational Trip: Middle School (off-site)
7:30–10:45 AM  W-2 Educational Trip: High School (off-site)
12 Noon–5:30 PM  Global Conversations Conference (M-1)

Plenary Talks
Interactive Panels
Roundtable Discussions
Poster Session
Closing Remarks: Mary Gromko
NSTA President

Meet Me in the Middle Day
Friday, March 31, 10:15 AM–4:30 PM
Diamond Ballroom Salons
JW Marriott at L.A. LIVE

Calling all middle school science teachers! Meet Me in the Middle Day is designed just for you. The day will include sessions geared toward middle school, and a share-a-thon with a room full of activities that you can take back to your classroom. Join us and re-energize your teaching. You may even be the lucky winner of an iPad mini or other door prizes. Meet Me in the Middle Day is organized by the National Middle Level Science Teachers Association (NMLSTA) and sponsored by AquaPhoenix Scientific (Kemtec); Carolina Biological Supply Co.; Flinn Scientific; Lab-Aids, Inc.; PASCO scientific; and Shape of Life.

An agenda follows. Meet Me in the Middle Day events are described throughout Volume 2.

10:00–10:15 AM  Registration and Welcome
10:15–10:45 AM  Concurrent Sessions
11:00–11:30 AM  Concurrent Sessions
1:00–1:30 PM  Concurrent Sessions
1:45–2:15 PM  Concurrent Sessions
2:30–4:30 PM  Middle Level Share-a-Thon
## Conference Program • Special Programs

**NGSS@NSTA Forum**  
151, Convention Center

The NGSS@NSTA Forum explores resources you can use to implement three-dimensional instruction. Participate in one or more presentations.

**NGSS Live Chat**  
Thursday, March 30, 5:30–7:30 PM  
Diamond Ballroom Salon 9, JW Marriott

Come to the NGSS Live Chat, presented by Ted Willard, Tricia Shelton, and others as they discuss the NGSS. Join in live or via Twitter...#NGSSchat.

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### NGSS@NSTA Share-a-Thon

**NGSS@NSTA Share-a-Thon**  
Saturday, April 1, 9:30–11:00 AM  
151, Convention Center

At the NGSS@NSTA Share-a-Thon, get even more tips and tools to implement three-dimensional standards from NSTA’s NGSS Curators, NGSS writers, and other education experts. Leave with plenty of handouts and ideas you can use in your classroom right away! See Vol. 3 for details.

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### Science in the Community Events

The Science in the Community Forums and events build awareness of the abundance of existing high-quality out-of-school (informal) science education methods, resources, and opportunities available to enhance science teaching and learning. Both out-of-school and in-school science educators meet and interact to share best practices in informal science, learn about exciting collaborations happening among informal and formal science organizations, network with colleagues, and dialogue around ideas and innovations. Informal organizations participating in the Science in the Community Forums include zoos, museums, media, after-school programs, universities outreach, and others that provide or support out-of-school science education.

**Thursday, March 30**

- 3:30–5:30 PM Creativity Forum: A Serious and Fun Aspect of Science

**Friday, March 31** (See Vol. 2 for details)

- 8:00–10:00 AM Models of Intersections That Connect Informal Institutions with Schools, Students, and Teachers to Support STEM Learning Outside the Classroom
- 12:30–1:30 PM Featured Presentation (Panel): The Development of a Positive STEM Identity  
  (Moderator: Angela Calabrese Barton)
- 2:00–4:00 PM Science in the Community Share-a-Thon

**Saturday, April 1** (See Vol. 3 for details)

- 12:30–2:30 PM Using Informal Science Experiences to Explore Environmental Issues
NGSS@NSTA Forum

The Best Place to Explore Assessments and the NEXT GENERATION SCIENCE STANDARDS

Friday, March 31, 2017
Los Angeles Convention Center, 151

Take a deep dive with a special event FREE to all conference attendees!
Join leading national experts as they discuss issues around classroom and large-scale assessments in the context of three-dimensional instruction. Participate in one or more presentations.

8:00 AM–9:00 AM
Designing and Using Classroom Assessments to Support Meaningful NGSS Investigations
Philip Bell, Shelley Stromholt, Deb Morrison

9:30 AM–10:30 AM
Next Generation Science Assessments (NGSA) Project
Joseph Krajcik, Christopher Harris

11:00 AM–12 PM
How Do You Know If an Assessment Is Measuring Three-Dimensional Reasoning?
Jill Wertheim, Cathy Zozakiewicz

12:30 PM–1:30 PM
How Do We Grade Students in a Three-Dimensional Classroom?
James Clark, Samantha Johnson

2:00 PM–3:00 PM
Developing a Coherent Assessment System From the Classroom to the Year-End Exam
Stephen Pruitt

3:30 PM–4:30 PM
The Next Generation of Statewide Assessments
Michelle Center, Peter McLaren, Stephen Pruitt

SHARE-A-THON

Saturday, April 1, 2017
9:30–11:00 AM
Los Angeles Convention Center, 151

Get tips and tools to implement three-dimensional standards from NSTA’s NGSS Curators, NGSS writers, and other national education experts. Leave with plenty of resources and ideas you can use in your classroom right away!
Conference Program • Special Programs

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, March 30

8:00–9:00 AM
Argumentation in the Earth and Space Science Classroom

Argument-Driven Inquiry in Biology, Chemistry, and Physics—Lab Investigations for Grades 9–12

12:30–1:30 PM
Uncovering Elementary Students’ Ideas About Science Through Literacy Capacities

2:00–3:00 PM
Uncovering K–12 Students’ (and Teachers’) Ideas About Matter and Energy in the NGSS

3:30–4:30 PM
Diving into the NGSS Disciplinary Core Ideas: How and Why They Are Important for Teaching and Learning

5:00–5:30 PM
Teaching Energy Across the Sciences

Friday, March 31 (Volume 2)

8:00–9:00 AM
Teaching for Conceptual Understanding in Science: Building a Bridge Between Student Ideas and Scientific Knowledge

9:30–10:30 AM
Problem-Based Learning in the Classroom, K–12

11:00 AM–12 Noon
Picture-Perfect STEM Lessons: Using Children’s Books to Teach Science, Technology, Engineering, and Mathematics

2:00–3:00 PM
Learning to Read the Earth and Sky, Explorations Supporting the NGSS

3:30–4:30 PM
How Scientific Learning Communities Promote Equity and Access through Whole-Class Inquiry

5:00–5:30 PM
Big Data, Small Devices

Saturday, April 1 (Volume 3)

8:00–9:00 AM
Planning Three-Dimensional Formative Assessments with the Feedback Loop

9:30–10:30 AM
Solar Science = NGSS-Focused Solar Astronomy Experiences + Preparation for the All American Total Solar Eclipse

11:00 AM–12 Noon
Outdoor Science: A Practical Guide

12:30–1:30 PM
Bringing the S-T-E-M Together in Early Childhood Using Science and Engineering Practices

2:00–3:00 PM
Inside or Out: The Perfect Place for Connecting Outdoor Science and Children’s Tradebooks

3:30–4:30 PM
Everyday Engineering

Sunday, April 2 (Volume 3)

8:00–9:00 AM
Problem-Based Learning in the Classroom, K–12

9:30–10:30 AM
Helping Your Students (and You!) Achieve Basic Data Literacy

NSTA Los Angeles National Conference on Science Education
Teacher Researchers Day

Thursday, March 30, 8:30 AM–4:30 PM

Platinum D, JW Marriott at L.A. LIVE

Teacher researchers are curious about their students’ learning and ask questions to try to better understand what is happening in their classrooms. They also share their findings with colleagues in their schools and elsewhere. Teacher Researcher Day is for both new and experienced teacher researchers. The full day of activities includes a poster session and presentations on topical issues. These sessions provide opportunities to meet teacher researchers and learn about their studies in a wide variety of contexts. An agenda follows.

Teacher Researcher Day events are described throughout the daily program.

8:30–9:30 AM  Poster Session for Teacher Researchers
9:30–11:00 AM  Panel Discussion: *Young Scientists*
11:00 AM–12 Noon  Concurrent Sessions
12 Noon–12:30 PM  Come Be a Part of the Science Inquiry Group Network
12:30–1:30 PM  Concurrent Sessions
1:30–2:00 PM  Informal Conversations about Teacher Research
2:00–3:00 PM  Concurrent Sessions
3:00–3:30 PM  Informal Conversations about Teacher Research
3:30–4:30 PM  Collaborative Leadership Planning Meeting

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**ELEMENTARY EXTRAVAGANZA**

Friday, March 31, 2017
8:00–10:00 AM • West Hall B-1
Los Angeles Convention Center

- Hands-on activities
- Preview science trade books
- Learn about award and grant programs
- Walk away full of ideas and arms filled with materials
- Door prizes and refreshments—Win an iPad!
- 100+ presenters

Sponsored by: CAROLINA, Delta Education, Educational Innovations, and PLTW.

NSTA Professional Learning Institutes

Wednesday, March 29
9:00 AM–4:00 PM

Professional Learning Institutes (PLIs) are focused, content-based programs that explore key topics in significant depth. PLIs are presented by experts in science/STEM education, professional learning, standards implementation, assessment, curriculum, and resources/materials development. Institutes require conference registration. Check in between 8:30 and 9:00 AM.

Disciplinary Core Ideas: Reshaping Teaching and Learning (PLI-1)
Joseph Krajcik, CREATE for STEM Institute, Michigan State University, East Lansing
Ravit Golan Duncan, Rutgers Graduate School of Education, New Brunswick, N.J.
Ann Rivet, Teachers College, Columbia University, New York, N.Y.
Level: K–12
Science Focus: GEN, NGSS
Location: Platinum Blrm. Salon A
JW Marriott

Like all enthusiastic teachers, you want your students to see the connections between important sciences concepts so they can grasp how the world works now—and maybe even make it work better in the future. But how exactly do you help them learn and apply these core ideas? Attendees will explore ways to reshape their approach to teaching and their students’ way of learning. Building on the foundation provided by A Framework for K–12 Science Education, which informed the development of the Next Generation Science Standards, we will discuss the core ideas across the four disciplines of NGSS through the exploration of diverse phenomena.

Helping Students Make Sense of the World Using Next Generation Science and Engineering Practices (PLI-2)
Brian Reiser, Northwestern University, Evanston, Ill.
Christina Schwarz, Michigan State University, East Lansing
Cynthia Passmore, University of California at Davis
Level: K–12
Science Focus: GEN, NGSS
Location: Platinum Blrm. Salon B
JW Marriott

This session focuses on the role of science and engineering practices in the key shifts that underlie NGSS, transforming classrooms from places in which students “learn about” science ideas to ones where students “figure out” how phenomena work in order to build science knowledge. We will work with three-dimensional NGSS activities and experience science and engineering practices as learners. Then we will analyze examples of student work and video cases of teachers and students engaged in these same activities to see the practices in action in classrooms. Attendees
will explore how storylines can be structured to elicit student questions about phenomena that elicit science and engineering practices in sensemaking, and how teachers support students' practices through classroom discourse by examining multiple examples drawn from elementary, middle school, and high school NGSS classrooms. A copy of the new NSTA Press® book Helping Students Make Sense of the World Using Next Generation Science and Engineering Practices will be included.

Uncovering Students’ and Teachers’ Ideas with Three-Dimensional Formative Assessment Probes and Techniques (PLI-3)

Page Keeley, 2008–2009 NSTA President and The Keeley Group, Fort Myers, Fla.
Joyce Tugel, Maine Mathematics and Science Alliance, Augusta
Level: Grades K–12
Science Focus: GEN, NGSS
Location: Platinum Blrm. Salon C
JW Marriott

Using K–12 examples from life, physical, and earth and space sciences, learn how to use formative assessment to support three-dimensional learning in the classroom or professional learning setting. This session will take participants through a process using the Uncovering Student Ideas in Science formative assessment probes and formative assessment classroom techniques (FACTs) to elicit students’ (and teachers’) ideas and use science practices and crosscutting concepts to support their thinking. Participants will also develop their own probe using a feedback cycle. A copy of the new NSTA Press® book Uncovering Student Ideas in Earth and Environmental Science: 32 New Formative Assessment Probes will be included.

Argument-Driven Inquiry: Transforming Laboratory Experiences so Students Can Use Core ideas, Crosscutting Concepts, and Science Practices to Make sense of Natural Phenomena (PLI-4)

Victor Sampson and Ashley Murphy, The University of Texas at Austin
Level: 6–12
Science Focus: GEN, NGSS
Location: Platinum Blrm. Salon D
JW Marriott

This session is an introduction to a new approach to lab instruction called Argument-Driven Inquiry (ADI). ADI is an innovative instructional model that is based on current research about how people learn science and is designed to foster the development of science proficiency. ADI gives students an opportunity to learn how to use the core ideas, science practices, and crosscutting concepts of science to make sense of natural phenomena. As part of the session, participants will receive an NSTA Press® book about ADI. The book includes information about ADI, instructional materials (including reproducible lab handout and checkout questions for students) and teacher notes.

Moving Standards into Practice: Five Tools and Processes for Translating the NGSS into Instruction and Classroom Assessment (PLI-5)

Jody Bintz and Brooke Bourdélat-Parks, BSCS, Colorado Springs, Colo.
Dora Kastel, American Museum of Natural History, New York, N.Y.
Kathy DiRanna, K–12 Alliance/WestEd, Los Alamitos, Calif.
Jo Topps, K–12 Alliance/WestEd, San Francisco, Calif.
Level: Grades K–12
Science Focus: GEN, NGSS
Location: Platinum Blrm. Salon F
JW Marriott

The Next Generation Science Standards (NGSS) challenge teachers to think deeply about learning and teaching with the goal of developing a clear vision of science education that is coherent, focused, and rigorous. This PLI will share a set of tools and processes that can help deepen teachers’ knowledge and enable them to translate the NGSS into instructional sequences that engage students in using science and engineering practices and that highlight the crosscutting concepts. The Five Tools and Processes are designed to help professional development leaders work with science teachers on curriculum, instruction, and assessment as they achieve this vision.

NGSS Pathway Sessions

All sessions are located in Platinum Blrm. Salon G. See daily program for Thursday sessions and Volume 2 for details on Friday sessions.

Thursday, March 30
8:00–11:00 AM
Using the NGSS to Plan a Unit of Instruction
12:30–2:30 PM
Using Performance Expectations to Plan for Classroom Assessments

Friday, March 31
8:00–10:00 AM
Using the 5E Instructional Model to Develop a Conceptual Flow
11:00 AM–12 Noon
Using the 5E Instructional Model to Design Learning Sequences
12:30–1:30 PM
Using Evidence of Learning Specifications to Develop Performance Tasks
District-Level Administrators: You Are Not Alone in the NGSS Universe! (PLI-6)

Eric Brunsell, University of Wisconsin Oshkosh
David Crowther, NSTA President-Elect, 2016–2017 and University of Nevada, Reno
Kelly Price-Colley, Forsyth County Schools, Cumming, Ga.

When facing paradigm shifts in STEM education policy, district-level administrators often face challenges in providing professional development, aligning curriculum, and implementing new science standards. NSTA empathizes with your needs and has developed this PLI especially for you. Come share solutions with your peers while walking away with tangible resources, tools, and ideas from leading NSTA authors and experts.

Equity in Science Education (PLI-7)

Jerry Valadez, SAM Academy, Inc., Sanger, Calif.
Gary Nakagiri, Alameda County Office of Education, Hayward, Calif.

This session will address key principles of equity and diversity in STEM education, including Appendix D of the NGSS: “All Standards, All Students: Making the Next Generation Science Standards Accessible to All Students.” Participants will learn about many of the assumptions, values, and practices that hinder the learning of students of color, and use proven strategies to enhance their own cultural competency, diversity awareness, and perspectives on racism and prejudice. Be prepared to share, learn, and meet other “equity-minded” colleagues as we develop supportive alliances and tools to assist us in providing a more equitable—and effective—STEM educational system. Participants will receive a copy of Ripples of Hope: Building Relationships for Educational Change by Julian Weissglass.

Picture-Perfect STEM Lessons, K–5: Using Children’s Books to Inspire STEM Learning (PLI-8)

Karen Ansberry and Emily Morgan, Picture-Perfect Science, West Chester, Ohio

Authors and former elementary teachers Karen Ansberry and Emily Morgan know teachers are short on time...so they’ve integrated STEM and reading in a natural way to help you teach both subjects at once. In this interactive workshop, participants will take part in several model lessons, learn the benefits and cautions of using children’s picture books in STEM, become familiar with the BSCS 5E learning model, and learn how to incorporate literacy into standards-based science lessons. A copy of the new NSTA Press® book Picture-Perfect STEM Lessons will be provided to each attendee.
Incorporate STEM into your classroom with eCYBERMISSION!

eCYBERMISSION is a national web-based STEM competition, free to students in grades 6–9. Teams compete for awards up to $9,000 per student in U.S. Savings Bonds.

Teachers can APPLY for MINI-GRANTS to support implementation of student projects.

Visit booth #850 for more information on eCYBERMISSION and mini-grant applications.
Admission to NSTA short courses is by ticket only. Tickets, if still available, can be purchased at the Ticket Sales Counter in the NSTA Registration Area.

For the majority of short courses, except for SC-1, SC-7, and SC-14, it is recommended that you take a shuttle to the Westin Bonaventure hotel (11 blocks from the Convention Center). Please check the shuttle schedule on page 11 for times. Shuttles will depart from the Figueroa Drive entrance of the Convention Center.

The Instructional Leader’s Guide to NGSS (SC-1)

Joyce Tugel (jtugel@gmail.com), Maine Mathematics and Science Alliance, Augusta

Peter McLaren (@PeterJMcLaren; mclarenpeterj@gmail.com), Next Gen Education, LLC, North Kingstown, R.I.

Science Focus: GEN, NGSS
Level: K–12
Date/Time: Thursday, March 30, 12:30–4:30 PM
Location: Gold Ballroom Salad 4, JW Marriott
Ticket Price: $32

The Next Generation Science Standards (NGSS) are changing how science is taught. Instructional leaders (whether department chairs, content coaches, principals, or curriculum coordinators) are essential to the success of teachers as they make this important shift. This comprehensive four-hour short course provides an overview of the NGSS, the fundamentals of three-dimensional instruction, and a view of what an NGSS-based classroom looks like. Participants will also receive a copy of NSTA’s Quick-Reference Guide to the NGSS, K–12. With these tools in hand, instructional leaders will be able to guide their teachers on a path toward successful implementation of the new standards.

JW Marriott Los Angeles at L.A. LIVE, 900 W. Olympic Blvd., is two blocks from the Los Angeles Convention Center.

NGSS Lessons Learned: The California NGSS K–8 Early Implementation Initiative (SC-2)

Kathy DiRanna (kdirann@wested.org), K–12 Alliance/WestEd, Los Alamitos, Calif.
Science Focus: GEN, NGSS
Level: Grades K–8
Date/Time: Thursday, March 30, 3:00–6:00 PM
Location: San Gabriel A, Westin
Ticket Price: $31

Leading NGSS implementation? This short course is for you! The California NGSS K–8 Early Implementation Initiative is an Alliance@WestEd project working with eight districts and two charter organizations to implement NGSS district/charter-wide in grades K–8. This short course is designed for teacher leaders, administrators, and professional development providers to share lessons learned from the Initiative. Administrators and teachers leaders from the Initiative will tell their story of their journey toward full implementation districtwide.

A Short Course on Analyzing and Adapting Three-Dimensional Assessment Tasks (SC-3)

Katie Van Horne (@dizzvh; katie.vanhorne@colorado.edu), University of Colorado Boulder
Science Focus: GEN, NGSS
Level: Grades 1–12
Date/Time: Thursday, March 30, 3:00–6:00 PM
Location: Santa Anita B, Westin
Ticket Price: $33

In this short course, we will consider how assessment can be used to support three-dimensional teaching and learning. Participants will be guided through an analysis of com-
mon assessment tasks to identify components and qualities of these tasks that support assessment of practices, crosscutting concepts, and core ideas. Tasks will be adapted to assess a bundle of performance expectations, such as defining what you will assess, brainstorming scenarios to elicit student understanding, using task formats to develop multicomponent tasks, and imagining a range of possible student responses to develop rubrics. Finally, we will support participants in planning a cycle of implementation, analysis, and revision to refine their tasks and in planning how they will incorporate tasks effectively into their instruction. While not required, a laptop/tablet is recommended. *Note: No Wi-Fi service provided.

**A PEEC into Evaluating NGSS Instructional Materials Programs (SC-4)**

**Matthew Krehbiel** (@kscienceguy; mkrehbiel@achieve.org), Achieve, Inc., Washington, D.C.

Science Focus: GEN, NGSS

Level: Grades K–12

Date/Time: Friday, March 31, 8:00–11:00 AM

Location: San Gabriel A, Westin

Ticket Price: $28

Are you selecting instructional materials for your classroom, building, or district? If you’re looking for materials designed for the NGSS, the Primary Evaluation of Essential Criteria (PEEC) is the tool for you. Lots of materials make claims about the degree to which they are “aligned” to NGSS, but the new version of PEEC uses the criteria of the EQuIP Rubric for Science to dig deep in evaluating whether or not materials are really designed for the innovations of the NGSS. This short course will familiarize you with PEEC and how to use it for evaluating claims of NGSS alignment. Please bring a laptop/tablet with PEEC and NGSS appendices downloaded. Visit bit.ly/2gSNlfj for links to supporting documents.

**Ocean Plastic Pollution: Issues and Solutions (SC-5)**

**Mary Whaley** (mwhaley@mbayaq.org), Monterey Bay Aquarium, Monterey, Calif.

Science Focus: ESS3, PS1.A, CCC2, CCC6

Level: Grades 6–8

Date/Time: Friday, March 31, 8:00–11:00 AM

Location: Santa Anita A, Westin

Ticket Price: $43

Enrich your classroom with NGSS-based activities surrounding plastic pollution issues and solutions. Activities will highlight plastic’s physical and chemical properties including density and buoyancy. Emphasis will be not just looking at the impacts of prolific plastic use but also exploring solutions to plastic pollution, alternatives to single-use plastics, and empowering students to tackle environmental problems without experiencing ecofatigue. This short course will include strategies to encourage critical thinking about environmental issues and methods to help students gain awareness and examination of everyday resources and uses. Empower your students to become part of the plastic pollution solution! Door prizes and resources!
Writing in Science: A Research-Based Approach That Enhances Learning in Both Domains (SC-6)

Betsy Rupp Fulwiler (bruppfulwiler@comcast.net), Educational Consultant, Seattle, Wash.

Science Focus: GEN, NGSS

Level: Grades K–6

Date/Time: Friday, March 31, 8:00–11:00 AM

Location: Santa Anita C, Westin

Ticket Price: $32

Explore research-based strategies for using scaffolding to increase diverse elementary students’ achievement in science and writing, as described in NGSS and CCSS ELA. Learn how to use word banks, graphic organizers, and writing frames so that students learn how to think, talk, and write (e.g., scientific observations, comparisons, data interpretation, explanations) as scientists do. This approach has been found to be highly effective with all students, including those who are learning English or have special needs. We will engage in discussions, modeling, shared mini lessons, and view a video of an actual classroom. Handout with blackline masters and annotated student notebook entries for grades K–6 students included. For more information, visit www.writinginscience.com.

Stretch Your Legs for Science: An Outdoor STEM Adventure (SC-7)

Jennifer Fee (jms327@cornell.edu), The Cornell Lab of Ornithology, Ithaca, N.Y.

Science Focus: LS, INF, CCC, SEP

Level: Grades 4–8

Date/Time: Friday, March 31, 9:45 AM–5:45 PM

Location: Off-site: Madrona Marsh Preserve, 40 minute bus ride

Ticket Price: $108

This short course will include basic information and hands-on activities to help build bird identification skills through the eBird global citizen-science project. We’ll offer participants the unique opportunity to see birds up close (everyone’s new binoculars will bring wild birds closer) at a wonderful reserve. We will take a 60–90 minute bird walk within Madrona Marsh, described as “an island of wilderness in the city” and the last remaining vernal marsh in LA County. We’ll submit and explore eBird data, creating educators who understand how to use citizen science to engage students in authentic STEM learning. Take home materials (a BirdSleuth “Most Wanted Birds” kit, a pair of high-quality binoculars, bird feeder, and several apps)—all of which will help you easily implement citizen-science projects in your classroom.

Note: Be sure to dress for the weather. Lunch included. For more information, visit www.birdsleuth.org.

This short course trip will depart from the Pico Drive entrance of the Los Angeles Convention Center. Please arrive 15 minutes prior to the departure time.

NSTA Press® Short Course: Phenomenon-Based Learning: Fun, Hands-On, Cooperative Learning of Both Science and Language Arts (SC-8)

Matt Bobrowsky (@DrMattB; expert_education@rocketmail.com), Delaware State University, Dover


Level: Grades 3–12

Date/Time: Friday, March 31, 10:30 AM–4:00 PM

Location: Santa Anita B, Westin

Ticket Price: $100

Experience the kind of learning that propelled Finland to international leadership in education—not by memorizing facts but by using scientific exploration, discovery, and literacy. Phenomenon-Based Learning (PBL) promotes both science practices and content knowledge, while also developing literacy skills. With PBL, you teach broader concepts and useful thinking and performance skills (as with the NGSS and CCSS) rather than asking students to simply memorize facts and formulas. Participants will engage in hands-on activities and will leave with a copy of one of the NSTA Press® PBL books along with one or two of the fascinating gizmos that go with the book.

NGSS: Three Dimensions in Action in a California Early Implementer Classroom (SC-9)

Karen Cerwin (kcerwin@wested.org), K–12 Alliance/WestEd, San Francisco, Calif.

Christina Miramontes, (cmiramontes@psusd.us), and Alyssa Nemecekova Fairfield, Palm Springs Unified District Offices, Palm Springs, Calif.

Science Focus: GEN, NGSS

Level: Grades 3–5

Date/Time: Friday, March 31, 3:00–6:00 PM

Location: Santa Anita A, Westin

Ticket Price: $55

In this short course, experience a hands-on upper elementary “learning sequence” that bundles performance expectations in a conceptual flow designed to provide a framework for linking science and CCSS ELA. The integrations are being practiced by California Early Implementer NGSS teachers. This sample conceptual flow uses bundled performance expectations.
providing a model for how an upper elementary teacher (grades 3–5) can build the learning sequence for three dimensional science and use the science as a context for reading, writing, listening, and speaking. In addition to the in-depth experience with matter (grade 5), sequences for conceptual flows in physical science for grade 3 (forces) and grade 4 (energy and waves) will be shared as starting points for upper elementary grades.

**Reaching Extremes! Blending Climate Science and Mathematics to Reach All Learners (SC-10)**

*Teri Cox and Dennis C. Pevey, eSTEM Public Charter School, Little Rock, Ark.*

**Science Focus:** ESS2.D  
**Level:** Grades 3–8  
**Date/Time:** Friday, March 31, 3:00–6:00 PM  
**Location:** Santa Anita C, Westin  
**Ticket Price:** $98

Come explore the connections between climate science and mathematics! In this short course, participants will engage in STEM projects using coding, microcontrollers, sensor technology, and more to engage all students. Get practical tools for meeting the needs of SPED, ELL, gifted, and economically or culturally diverse learners. No previous coding experience required. Bring a laptop to connect to the internet.

**Fostering a Science-Driven Language and Literacy Learning Environment (SC-11)**

*Diana Velez (dvelez@berkeley.edu), The Lawrence Hall of Science, Berkeley, Calif.*  
*Claudio Vargas (claudio.vargas@ousd.org), Oakland Unified School District, Oakland, Calif.*

**Science Focus:** PS1.A, PS3.A, CCC2, CCC5, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8  
**Level:** Grades 3–8  
**Date/Time:** Saturday, April 1, 8:00–11:00 AM  
**Location:** San Gabriel A, Westin  
**Ticket Price:** $31

Authentic communication is the best way to learn language and content. In this short course, learn to strategically include integrated and designated language acquisition instruction into three-dimensional science lessons. Engage in a hands-on science and language learning experience, and receive a toolkit for developing science/language acquisition lessons that meet the rigors of the NGSS, the National Framework for English Language Proficiency Standards, and the California ELD standards.
Hands-On/Minds-On STEM: An Integrated Engineering Design Challenge (SC-12)

Christie Pearce (cpearce@ocde.us) and Kristin Thomsen (kthomsen@ocde.us), and Leslie Corbett, Orange County Dept. of Education, Costa Mesa, Calif.
Science Focus: ETS, SEP
Level: Grades K–8
Date/Time: Saturday, April 1, 8:00–11:00 AM
Location: Santa Anita A, Westin
Ticket Price: $55

This is an introductory short course for those educators interested in moving toward an integrative STEM approach to learning. Experience an engaging and academic hands-on engineering design challenge, effortlessly applying the 5 C’s (creativity, critical thinking, communication, collaboration, and citizenship), as well as understanding how hands-on engineering design challenges address the CCSS and NGSS. In teams, participants will build their version of a fun zip line with provided materials. Follow-up activities include incorporating science and math concepts in their zip line descriptions and filming their zip line in action. Technology will be embedded throughout this short course in a variety of ways to scaffold learning, communicate ideas, as well as create and share each team’s recording. To conclude, facilitators will break down the challenge by engaging participants in a conversation about how STEM teaching allows all learners to be successful. Bring your laptop/tablet to connect to the internet.

Elementary Curriculum Development for the NGSS: How to Integrate the Three Dimensions of Learning into an Elementary Classroom (SC-13)

David Jacob (djacob@pnwboces.org), Putnam/Northern Westchester BOCES, Yorktown Heights, N.Y.
Science Focus: GEN, NGSS
Level: Grades K–5
Date/Time: Saturday, April 1, 8:00–11:00 AM
Location: Santa Anita B, Westin
Ticket Price: $58

This short course is a practical guide to unpacking the three dimensions of learning intended by the NGSS. We will explore the Understanding by Design model as an approach to curriculum development for elementary classrooms by using the performance expectations to inform assessment development. Then we will organize lessons that support those assessments, using a unit organization plan. This short course is designed to engage teachers who are actively involved in the curriculum development process to implement the NGSS in their classrooms. Participants will review grade-specific NGSS documents and NSTA resources to ensure that the content, the practices, and the crosscutting concepts are fused together into student learning opportunities appropriate for the science concepts. Participants will develop practical performance assessment outlines and lessons to help achieve specific PEs. Not required but recommended that you bring a copy of the NGSS, the K–12 Framework, and a laptop/tablet connected to the internet. For more information, visit www.pnwboces.org/Science21.

NGSS Meets the Outdoors: Teaching Elementary Science Outside (SC-14)

Kara Haas (@KaraHaaSciEd; karahaas@msu.edu), W.K. Kellogg Biological Station, Michigan State University, Hickory Corners

Renee Bayer (rbayer@msu.edu), CREATE for STEM Institute, Michigan State University, East Lansing

Science Focus: GEN, NGSS
Level: Grades 1–5
Date/Time: Saturday, April 1, 8:00–11:00 AM
Location: Off-site, Grand Hope Park
Ticket Price: $13

Join us as we walk to Grand Hope Park, a roughly 20-minute walk. In the outdoors, students can practice science in a variety of ways, such as observe, raise questions, and collect data through hands-on activities. They can get to know their environment, appreciate it, and develop responsibility and commitment to protect it. However, teachers face many challenges in this area due to insufficient content knowledge and inadequate pedagogical content knowledge that develops through accumulating experiences in teaching in informal settings. In this short course, participants will practice inquiry-based learning in a local urban park in collaborative, place-based, technology-rich investigations. They will explore the Heads-on, Hands-on, Hearts-on framework in instruction. Small and large group discussions will explore applications, challenges, and ideas for schoolyard improvements in the school setting. Note: Be sure to wear good walking shoes along with having water and sunscreen as we will be walking to a nearby park. It is helpful, but not required, that you bring a smartphone/tablet and binoculars. Visit bit.ly/2h3ACjk for more details.

Meet your short course trip leader for the walk at the Pico Drive entrance of the Los Angeles Convention Center. Please arrive 15 minutes prior to 8:00 AM.
Kids Love Rocks and So Will You: Introducing Physical Science BIG IDEAS (SC-15)

Bob Williams, Consultant, Belmont, Tex.
Mary Hobbs, (maryhobbs@utexas.edu), The University of Texas at Austin

Science Focus: GEN
Level: PreK–K
Date/Time: Saturday, April 1, 3:00–6:00 PM
Location: San Gabriel A, Westin
Ticket Price: $58

Rocks and other natural objects are wonderful resources to teach children observation, sorting, measuring, and communication skills in the context of Science BIG IDEAS. Three of those BIG IDEAS—properties of matter, properties of Earth materials, and characteristics of organisms—are the major science topics addressed in this short course. This short course is designed for those who work with young learners or who provide professional development to preK–K teachers. Activities and assessments to be presented were designed during four years of NSF-funded research looking at what young children know and can do in science. Participants will receive materials including sorting sets, books, and equipment appropriate to the teaching of the lessons.

Hands-On Mathematics in Science Education (SC-16)

Johannes Strobel (@DefiantSTEM; strobelj@missouri.edu), University of Missouri, Columbia
Olivia Hua (olivia.hua@mail.mcgill.ca), McGill University, Montreal, Que., Canada

Science Focus: ETS, LS, PS, CCC1, CCC3, SEP1, SEP2, SEP3, SEP4, SEP5
Level: Grades 1–5
Date/Time: Saturday, April 1, 3:00–6:00 PM
Location: Santa Anita B, Westin
Ticket Price: $30

This short course focuses on four modules that showcase an integrated STEM process in which mathematics takes central stage. The modules follow a similar frame and rhythm and fully meet the NGSS and CCSS Mathematics. The mathematics is necessary to construct a design decision and check how well the proposed solutions meet criteria and constraints. Collaborative aspects between math and science will be discussed, and participants will leave with a pathway to incorporate mathematics into other STEM units.
For information and to register, visit www.nsta.org/stemforum

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
Tickets for educational trips can be purchased (space permitting) at the Ticket Sales Counter in the NSTA Registration Area. Meet your trip leader at the Pico Drive entrance of the Convention Center at least 15 minutes prior to departure time (except for W-1 and W-2).

**Global Conversations, Welcome to My Classroom: Middle School**  
$35; by preregistration only

W-1  Wednesday, March 29  7:00–11:50 AM
Welcome to My Classroom is a program sponsored by the International Advisory Board intended primarily for our international participants to view a science classroom. This year’s program is cosponsored by Alfred B. Nobel Charter Middle School, located in Northridge, and Francisco Bravo Senior High Medical Magnet School, located in Los Angeles. Participants have the option of visiting the middle school (W-1) or the high school (W-2).

W-1 participants will tour Alfred B. Nobel Charter Middle School, which is a Science Technology Math Magnet Center providing instruction in all academic areas, promoting learning and enrichment in the fields of math, science, and technology—fields foundational to all future learning.

**Global Conversations, Welcome to My Classroom: High School**  
$35; by preregistration only

W-2  Wednesday, March 29  7:30–11:45 AM
Welcome to My Classroom is a program sponsored by the International Advisory Board intended primarily for our international participants to view a science classroom. This year’s program is cosponsored by Alfred B. Nobel Charter Middle School, located in Northridge, and Francisco Bravo Senior High Medical Magnet School, located in Los Angeles. Participants have the option of visiting the middle school (W-1) or the high school (W-2).

W-2 participants will tour the Francisco Bravo Senior High Medical Magnet School. The high school works in partnership with USC Health Sciences Campus to offer students a variety of opportunities to explore the health professions and provide educational resources within the medical and allied health communities.

**NASA Jet Propulsion Laboratory Tours**  
$35; by preregistration only

T-1  Thursday, March 30  8:30 AM–12:45 PM  
T-3  Thursday, March 30  12 Noon–4:15 PM
The Jet Propulsion Laboratory is a place where science, technology, and engineering intermix in unique ways: to produce iconic robotic space explorers sent to every corner of the solar system, to peer deep into the Milky Way galaxy and beyond, and to keep a watchful eye on our home planet. Tour participants will receive an overview of the Laboratory’s activities and accomplishments by watching “Journey to the Planets and Beyond.” There will also be opportunities to visit the von Karman Visitor Center, the Space Flight Operations Facility, and the Spacecraft Assembly Facility. See how scientists at JPL conduct research and help develop instruments and missions to characterize and understand the atmosphere, land, and oceans on our home planet to make better predictions of future changes. **Note:** The tour involves a considerable amount of walking so wear comfortable shoes.

**Special Note:** JPL requires that all U.S. citizens, 18 years of age or older, present official, government issued photo identification (driver’s license or passport) before being allowed entry. All non-U.S. Citizens 18 years of age or older must present a passport or resident visa (green card) before being allowed entry.
LA’s Teaching Aquarium: Cabrillo Marine Aquarium

$40
T-2 Thursday, March 30  11:30 AM–6:15 PM

Come tour one of the most requested school field trips in the Los Angeles area. Located just steps from the ocean, Cabrillo Marine Aquarium is part of the City of Los Angeles Recreation and Parks Department. Join Cabrillo Marine Aquarium staff educators as they share “LA’s Teaching Aquarium’s” most popular programs for schools and see why CMA is a trusted resource that inspires exploration, respect, and conservation of southern California marine life. Our tour includes the Exploration Center, Aquatic Nursery and Research Lab, and Cabrillo Beach tide pools. Be sure to dress casual and in layers (could be cool at the beach!), bring sunscreen, and a hat for our tour of the Cabrillo Coastal Park ocean habitats within easy walking distance. Wear pants and closed-toed shoes appropriate for tide pooling. Don’t forget to bring your camera. Note: This trip is for adults only.

More Than Just a Fish Tank—Aquarium of the Pacific

$33
T-4 Thursday, March 30  12:15–5:00 PM

More than just a Fish Tank—the Aquarium of the Pacific is a think tank! This guided tour includes behind-the-scenes access, conversations about data and Earth systems science, as well as opportunities to explore the Aquarium on your own. Learn about educator resources, discuss complex topics, and experience the wonder of the Pacific Ocean. We will check out the Aquarium’s Ocean Science Center and NOAA’s Science On a Sphere®, a six-foot spherical display presenting images about Earth in a unique and captivating way. From sea surface temperature, satellite tracks, ocean currents, primary productivity, and more, the Science on a Sphere data sets connect Aquarium guests to larger systems beyond the animal collection. Through a facilitated discussion, participants will consider how we know what we know about the planet, and how to connect an animal collection to big stories about our world. Aquarium staff will guide participants through a behind-the-scenes tour of our facility to share how habitats are maintained, how food is prepared, and how 12,000 animals live in the Aquarium of the Pacific.
Conference Program • Educational Trips

Get Hands On at Discovery Cube Los Angeles $33
T-5 Thursday, March 30 1:45–4:45 PM
Discovery Cube’s mission is to inspire and educate young minds through engaging science-based programs and exhibits to create a meaningful impact on the communities we serve. Plan for hands-on experiences at the unique, innovative, and award-winning exhibits developed by and on display at Discovery Cube L.A. Explore the multimedia role-playing exhibits, such as the Discovery Market, which uses computers, scanning guns, animated characters, and self-selected shopping lists to learn about nutrition and eco-friendly behaviors. Investigate the 1,000 square-foot house using electronic tablets, a GPS system, and mechanical devices, to learn how to save water and power. Become a member of the LA Kings hockey team while learning the physics and math behind this incredibly fast sport… and much more! Other amenities include Bean Sprouts restaurant and a gift shop. Be sure to wear comfortable shoes. For more information about Discovery Cube Los Angeles, visit www.discoverycube.org/la.

Griffith Observatory: Gateway to the Cosmos $40
T-6 Thursday, March 30 6:00–10:45 PM
When Griffith Observatory opened in 1935, it was one of the first institutions in the U.S. dedicated to public science and possessed the third planetarium in the U.S. Today, visitors can look through telescopes, explore exhibits, see live shows in the Samuel Oschin Planetarium, and enjoy spectacular views of Los Angeles and the Hollywood Sign. The observatory is split up into six sections: The Wilder Hall of the Eye, the Ahmanson Hall of the Sky, the W.M. Keck Foundation Central Rotunda, the Cosmic Connection, the Gunther Depths of Space Hall, and the Edge of Space Mezzanine. In addition, a complimentary 24-minute film narrated by Leonard Nimoy typically runs at the beginning of every hour. There is also a gift shop open daily until 9:00 PM.
On our trip, we will explore the Observatory, star gaze, as well as watch the 8:30 PM Centered in the Universe show (which is included in the ticket price). While the Observatory does have a café, it will not be able to accommodate the volume of people participating on the trip. It is recommended that you eat before departing on the trip. You may not bring food and drinks to the Observatory as they are not allowed in the building and there are no picnic facilities.

NSTA wishes to thank the National Earth Science Teachers Association (NESTA) for sponsoring, in part, this educational trip.

Science and Endeavour Up Close at California Science Center $34
F-1 Friday, March 31 9:00 AM–1:15 PM
Experiencethe excitement of the California Science Center, the most attended museum in the nation outside of New York and Washington, D.C. From the moving tranquility of our 188,000-gallon kelp forest exhibit to the wonder inspired by the travels of the Space Shuttle Endeavour, our world-class exhibits are helping educators inspire the next generation of scientists, innovators, and explorers. Come enjoy a guided tour by Science Center education staff and then have free time to explore the exhibits. Meals are not included, however a food court is located on-site.

The Columbia Memorial Space Center: Exploring 21st-Century STEM at a Historic NASA Site $36
F-2 Friday, March 31 9:30 AM–1:30 PM
Experience STEM learning at a site where NASA sent humans to the moon! The Columbia Memorial Space Center’s mission is to ignite a community of creative and critical thinkers. We are located on the site where NASA designed and developed the Apollo missions to the moon and all of the space shuttles. Our space-age facility houses Southern California’s only Challenger Learning Center and LA’s only public Robotics Lab. This educational trip will walk you through the history of the site and give you hands-on experience in how the Space Center is transforming its history as a spring board into 21st-century STEM learning for all ages.
Tuesday, March 28
NSELA Board of Directors Meeting
By Invitation Only, visit www.NSELA.org
   Olympic 1, JW Marriott ................. 8:00 AM–6:00 PM

Wednesday, March 29
NSELA Leadership Summit Breakfast
By Invitation Only, visit www.NSELA.org
   Georgia 1/2, JW Marriott .................. 7:30–8:30 AM
Discover the NGSS Train-the-Trainer Workshop 1
By Separate Registration Only
   Gold Blrm. Salon 2, JW Marriott ........ 8:00 AM–5:00 PM
Discover the NGSS Train-the-Trainer Workshop 2
By Separate Registration Only
   Gold Blrm. Salon 3, JW Marriott ........ 8:00 AM–5:00 PM
NSELA Leadership Summit
By Registration Through NSELA, www.NSELA.org
   Plaza 1/2, JW Marriott ................. 8:00 AM–5:45 PM
Science Education for Students with Disabilities Preconference Meeting
By Registration Through SESD
   Plaza 3, JW Marriott .................... 9:00 AM–4:00 PM
NSELA Leadership Summit Luncheon
Visit www.NSELA.org for more information.
   Georgia 1/2, JW Marriott ............... 11:30 AM–1:30 PM
12th Annual NSTA Global Conversations in Science Education Conference
By Preregistration Only (Ticket Required: M-1)
   Diamond Blrm. Salon 4, JW Marriott.... 12 Noon–5:30 PM
Science Education for Students with Disabilities (SESD) Board Meeting
   Plaza 3, JW Marriott ....................... 4:00–6:00 PM
Uncontrolled Variables: A Science Fair Story World Documentary Film Premiere
   Petree Hall C, Conv. Center .............. 4:30–5:30 PM
NSTA New Science Teacher Academy Reception
By Invitation Only
   Atrium 3, JW Marriott ..................... 4:30–6:30 PM
NSELA/CSSS Reception
By Invitation Only, visit www.NSELA.org
   Diamond Blrm. Salon 3, JW Marriott ......... 6:00–8:00 PM
International Advisory Board Meeting
   Atrium 1, JW Marriott ...................... 7:30–8:30 PM

Disney Youth Programs Presents Disneynature Born in China
By separate registration, visit bit.ly/2kF1i3e
   Off-site, Regal LA Live ................. 8:30–10:00 PM

Thursday, March 30
NSELA Membership Breakfast
By Invitation Only, visit www.NSELA.org
   Diamond Blrm. Salon 6, JW Marriott ........ 7:30–8:30 AM
Discover the NGSS Train-the-Trainer Workshop 1
By Separate Registration Only
   Gold Blrm. Salon 2, JW Marriott ........ 8:00 AM–5:00 PM
Discover the NGSS Train-the-Trainer Workshop 2
By Separate Registration Only
   Gold Blrm. Salon 3, JW Marriott ........ 8:00 AM–5:00 PM
NSELA Annual Membership Meeting
By Invitation Only
   Diamond Blrm. Salon 6, JW Marriott .... 8:30–10:00 AM
Science Safety Advisory Board Meeting
   Studio 1, JW Marriott ...................... 8:30–11:00 AM
NSTA International Lounge
   Atrium 1, JW Marriott ..................... 9:00 AM–5:00 PM
Awards and Recognitions Committee Meeting
   Olympic 2, JW Marriott .................... 12:30–2:30 PM
Coordination and Supervision of Science Teaching Committee Meeting
   Diamond Blrm. Salon 4/5/Group 9, JW ....... 12:30–2:30 PM
Informal Science Education Committee Meeting
   Diamond Blrm. Salon 4/5/Group 10, JW ... 12:30–2:30 PM
Journal of College Science Teaching Advisory Board Meeting
   Diamond Blrm. Salon 4/5/Group 4, JW ....... 12:30–2:30 PM
Multicultural/Equity in Science Education Committee Meeting
   Diamond Blrm. Salon 4/5/Group 8, JW ...... 12:30–2:30 PM
NSTA Reports Advisory Board Meeting
Preservice Teacher Preparation Committee Meeting
Professional Development in Science Education Committee Meeting
   Diamond Blrm. Salon 4/5/Group 6, JW ....... 12:30–2:30 PM
Science & Children Advisory Board Meeting
   Diamond Blrm. Salon 4/5/Group 1, JW ....... 12:30–2:30 PM
NSTA Los Angeles National Conference on Science Education

Conference Program • Meetings and Social Functions

Science Scope Advisory Board Meeting
Diamond Blrm. Salon 4/5/Group 2, JW … … … 12:30–2:30 PM

The Science Teacher Advisory Board Meeting

Aerospace Programs Advisory Board Meeting
Diamond Blrm. Salon 4/5/Group 11, JW … … … 1:00–2:30 PM

Urban Science Education Informal Meet Up
Diamond Blrm. Salon 9, JW Marriott……… … 2:00–4:00 PM

College Science Teaching Committee Meeting
Diamond Blrm. Salon 4/5/Group 4, JW … … 3:00–4:30 PM

High School Science Teaching Committee Meeting
Diamond Blrm. Salon 4/5/Group 3, JW … … 3:00–4:30 PM

Middle Level Science Teaching Committee Meeting
Diamond Blrm. Salon 4/5/Group 2, JW … … 3:00–4:30 PM

NGSS Advisory Board Meeting
Diamond Blrm. Salon 4/5/Group 9, JW … … 3:00–4:30 PM

Nominations Committee Meeting
Olympic 2, JW Marriott………………….. … 3:00–4:30 PM

Preschool–Elementary Science Teaching Committee Meeting
Diamond Blrm. Salon 4/5/Group 1, JW … … 3:00–4:30 PM

Research in Science Teaching Committee Meeting
Diamond Blrm. Salon 4/5/Group 5, JW … … 3:00–4:30 PM

Retired Members Advisory Board Meeting
Diamond Blrm. Salon 4/5/Group 6, JW … … 3:00–4:30 PM

Science Matters Advisory Board Meeting
Diamond Blrm. Salon 4/5/Group 10, JW … 3:00–4:30 PM

Special Needs Advisory Board Meeting
Diamond Blrm. Salon 4/5/Group 7, JW … … 3:00–4:30 PM

Technology Advisory Board Meeting
Diamond Blrm. Salon 4/5/Group 8, JW … … 3:00–4:30 PM

AMSE Board of Directors Meeting
By Invitation Only, Visit amsek16.org.
Atrium 2, JW Marriott …………………… … 3:00–6:00 PM

CESI Board Meeting
By Invitation Only
508C (Boardroom), Conv. Center ……… 3:00–6:00 PM

APAST Board of Directors Meeting
By Invitation Only
401, Conv. Center………………………. … 4:00–6:00 PM

Outstanding Science Trade Books Committee Meeting
By Invitation Only
Studio 1, JW Marriott…………………… … 4:30–5:30 PM

NSTA Board and Council Meet & Greet
By Invitation Only
Atrium 3, JW Marriott …………………… … 4:30–6:00 PM

NSTA Young Professional and New Teacher Reception
Diamond Blrm. Salon 6, JW Marriott … … 4:30–6:00 PM

STEM Outstanding Trade Books Meeting
By Invitation Only
Olympic 2, JW Marriott………………….. … 4:45–5:45 PM

Alliance of Affiliates Networking Social
By Invitation Only
Platinum Blrm. Salon H, JW Marriott … … 5:00–6:00 PM

NMLSTA Board Meeting
By Invitation Only
Atrium 1, JW Marriott………………….. … 5:15–6:45 PM

Teaming Up for STEM Sharing Session
By Invitation Only
Platinum Blrm. Salon G, JW Marriott … … 5:30–6:30 PM

CESI Dinner and Membership Meeting
By Ticket through CESI, preregistration only (www.cesiscience.org)
Off-site, Miro Restaurant…………………. … 5:30–7:30 PM

NGSS Live Chat
Participate in person or via Twitter using #NGSSchat
Diamond Blrm. Salon 9, JW Marriott……… … 5:30–7:30 PM

HHMI Night at the Movies: Sneak Preview of Amazon Adventure 3D by HHMI BioInteractive
Separate registration (6 p.m. and 8 p.m. screenings)
Off-site, Regal LA Live……… 6:00–7:30 PM/8:00–9:30 PM

Friday, March 31

AMSE Alice J. Moses Annual Breakfast
By Invitation Only, visit www.amsek16.org.
Platinum Blrm. Salon C, JW Marriott………… … 7:30–9:30 AM

Development Advisory Board Meeting
By Invitation Only
Olympic 2, JW Marriott………………….. … 9:30–10:30 AM

NSTA International Lounge
Atrium 1, JW Marriott………………….. … 9:00 AM–5:00 PM

Urban Science Education Advisory Board Meeting
Studio 2, JW Marriott………………….. … 10:30 AM–12 Noon
AMSE General Membership Meeting  
Visit amsek16.org for additional information.  
Platinum Blrm. Salon C, JW Marriott … 10:30 AM–12:30 PM

NMLSTA Board and Membership Meeting  
By Invitation Only  
Diamond Blrm. Salon 8, JW Marriott….. 11:45 AM–12:15 PM

Society of Elementary Presidential Awardees (SEPA) Luncheon  
By Invitation Only, visit www.sepamembers.weebly.com.  
Atrium 3, JW Marriott………………… 12 Noon–2:00 PM

“Meet and Greet” the NSTA Presidents and Board/Council  
Entrance to Exhibit Hall, Hall H …………… 12:45–1:30 PM

Society of Elementary Presidential Awardees (SEPA) Meeting  
By Invitation Only, visit www.sepamembers.weebly.com.  
Studio 2, JW Marriott………………….. 2:00–3:30 PM

Chapter and Associated Group Leader Roundtable  
Atrium 3, JW Marriott …………………… 3:00–4:00 PM

SCST Business Meeting  
Georgia 1, JW Marriott………………… 3:30–5:00 PM

APAST Members Social  
By Invitation Only  
Georgia 2, JW Marriott………………… 4:00–6:00 PM

NSTA Recommends Meeting  
Studio 1, JW Marriott………………….. 4:30–5:30 PM

Shell Reception  
By Invitation Only  
Gold Blrm. Salon 1, JW Marriott………… 5:00–5:45 PM

Teaming Up for STEM Sharing Session  
By Invitation Only  
Platinum Blrm. Salon F, JW Marriott…….. 5:30–6:30 PM

Learning Center Reception  
By Invitation Only  
Gold Blrm. Salon 4, JW Marriott………… 5:30–7:00 PM

NSTA Teacher Awards Gala  
(Ticket required: M-2)  
Gold Blrm. Salon 2/3, JW Marriott……….. 6:00–8:45 PM

NESTA Friends of Earth Science Reception  
Platinum Blrm. Salon C, JW Marriott……….. 6:30–8:00 PM

SCST Poster Session and Dessert Social  
Platinum Blrm. Salon I/J, JW Marriott……….. 7:00–9:00 PM

Saturday, April 1

APAST Breakfast/Business Meeting  
By Invitation Only  
Diamond Blrm. Salon 1, JW Marriott……….. 7:00—9:00 AM

NSTA Past Presidents’ Breakfast  
By Invitation Only  
Gold Blrm. Salon 4, JW Marriott…………… 7:30–8:15 AM

Teaming Up for STEM: Team Discussion and Planning Meeting  
By Invitation Only  
Diamond Blrm. Salon 4, JW Marriott……….. 8:00–10:00 AM

Past Presidents Advisory Board Meeting  
Gold Blrm. Salon 4, JW Marriott…………….. 8:15–9:15 AM

Shell Panel Meeting  
By Invitation Only  
Georgia 1, JW Marriott………………….. 8:30–10:30 AM

Elementary Science Teaching Methods Meeting—ASTE  
For details, visit farwestaste.wordpress.com.  
Olympic 2, JW Marriott………………… 9:00–10:00 AM

NSTA International Lounge  
Atrium 1, JW Marriott………………… 9:00 AM–5:00 PM

NSTA Standing Committee, Advisory Board and Panel Chairs Meeting  
By Invitation Only  
Olympic 2, JW Marriott………………… 1:00–2:00 PM

NSTA Council Roundtable  
By Invitation Only  
Atrium 2, JW Marriott………………… 2:00–4:00 PM

Sunday, April 2

Life Members’ Morning Social  
By Invitation Only  
Olympic 1, JW Marriott………………… 7:30–8:30 AM
The NSTA Alliance of Affiliates (AoA) includes nine science education organizations working together with NSTA to advance their mutual missions by providing advice and recommendations on science education policy, creating public position statements on key legislative issues, and designing programs and professional development for members (both affiliate and NSTA). The AoA facilitates communication and collaboration among affiliates by working with the NSTA Board and Council and other NSTA-related units, including Division Committees and Chapters and Associated Groups.

**Alliance of Affiliates**

**Thursday, March 30**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>5:00–6:00 PM</td>
<td>Alliance of Affiliates Networking Social By Invitation Only</td>
<td>Platinum Blrm. Salon H, JW Marriott</td>
</tr>
</tbody>
</table>

**Friday, March 31**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30–10:30 AM</td>
<td>Becoming a Science Teacher Leader</td>
<td>Atrium 3, JW Marriott</td>
</tr>
</tbody>
</table>

**Association for Multicultural Science Education (AMSE)**

*President: Sharon Delesbore*

**Thursday, March 30**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>Engineering Through Aquaculture Technology for Women</td>
<td>Platinum Blrm. Salon A, JW Marriott</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Opening the Gateway to Success Using Case Studies to Help Implement Scientific Concepts for Diverse Learners</td>
<td>Platinum Blrm. Salon A, JW Marriott</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Empowering and Rewarding Educators of the Economically Disadvantaged Students</td>
<td>Platinum Blrm. Salon A, JW Marriott</td>
</tr>
<tr>
<td>3:00–6:00 PM</td>
<td>AMSE Board of Directors Meeting By Invitation Only</td>
<td>Atrium 2, JW Marriott</td>
</tr>
</tbody>
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**Friday, March 31**

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>7:30–9:30 AM</td>
<td>AMSE Alice J. Moses Breakfast By Invitation Only</td>
<td>Platinum Blrm. Salon C, JW Marriott</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Science Teachers Promoting Culturally Relevant Education: A Panel Discussion</td>
<td>Platinum Blrm. Salon A, JW Marriott</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>The NGSS and Student Collaboration—Structures and for Equitable Access to Academic Conversations</td>
<td>Diamond Blrm. Salon 9, JW Marriott</td>
</tr>
</tbody>
</table>
## Association for Multicultural Science Education (AMSE), continued

### Saturday, April 1

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>Moving Equity Forward in Science Classrooms: Strategies for Developing Justice-Centered Science Teacher Learning Communities</td>
<td>Platinum Blrm. Salon A, JW Marriott</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Unpacking the Wonders of a Tropical Excursion in Belize: An Educator’s Perspective</td>
<td>Platinum Blrm. Salon A, JW Marriott</td>
</tr>
</tbody>
</table>

## Association for Science Teacher Education (ASTE)

President: Malcolm Butler

### Thursday, March 30

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>Three-Dimensional Science Instruction Using the Learning Cycle Approach</td>
<td>Georgia 2, JW Marriott</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Engaging Students with Dynamic Models: Peruvian Food Chain Jenga</td>
<td>Georgia 2, JW Marriott</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Crafting Coherent Conceptual Storylines: Lessons in Designing Lessons</td>
<td>Georgia 2, JW Marriott</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>NGSS Activities for Middle School Teachers</td>
<td>Georgia 2, JW Marriott</td>
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### Friday, March 31

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
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</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>Introducing Nanotechnology into the Chemistry Classroom</td>
<td>Atrium 2, JW Marriott</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>What Can I Do and How Do I Get There? Trajectories of Science Teacher Learning</td>
<td>Olympic 1, JW Marriott</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Bridging Policy and Practice—Science Teacher Education for the Next Generation</td>
<td>Olympic 1, JW Marriott</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Using Web GIS and Google Earth to Investigate Environmental Issues</td>
<td>Platinum Blrm. Salon A, JW Marriott</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>Science Investigations with Read Alouds</td>
<td>Olympic 1, JW Marriott</td>
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### Saturday, April 1

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<tr>
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<tbody>
<tr>
<td>9:00–10:00 AM</td>
<td>Elementary Science Teaching Methods Meeting—ASTE</td>
<td>Olympic 2, JW Marriott</td>
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Visit [farwestaste.wordpress.com](http://farwestaste.wordpress.com)
### Association of Science-Technology Centers (ASTC)

**President:** Anthony Rock

#### Thursday, March 30

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>Linking In-School and Out-of-School STEM Learning: Examples of Programs Featured in Connected Science Learning</td>
<td>Atrium 3, JW Marriott</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Collaborations! Professional Development Connecting Local Resources with Teachers</td>
<td>Atrium 3, JW Marriott</td>
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#### Saturday, April 1

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<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>Integrating Real-World Science, NGSS Three Dimensions of Learning, Technology To Promote Critical Thinking, Collaboration, and Communication</td>
<td>Olympic 3, JW Marriott</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>Neuroscience and Society: Conversations Connecting Brain Development and Social Constructs</td>
<td>Olympic 3, JW Marriott</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Telling the Stories of Science / Historias de la Ciencia</td>
<td>Olympic 3, JW Marriott</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Mobile MAIA Science Lab: Using Dinosaurs and Cattle to Engage in Science and Math Concepts</td>
<td>Olympic 3, JW Marriott</td>
</tr>
</tbody>
</table>

### Council for Elementary Science International (CESI)

**President:** James T. McDonald

#### Thursday, March 30

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>12:30–2:30 PM</td>
<td>Using Toys to Teach Physics Share-a-thon</td>
<td>151, Conv. Center</td>
</tr>
<tr>
<td>3:00–6:00 PM</td>
<td>CESI Board Meeting (By Invitation Only)</td>
<td>508C (Boardroom), Conv. Center</td>
</tr>
<tr>
<td>5:30–7:30 PM</td>
<td>CESI Dinner and Membership Meeting By Ticket Through CESI (<a href="http://www.cesiscience.org">www.cesiscience.org</a>) by preregistration.only.</td>
<td>Off-site, Miro Restaurant</td>
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#### Friday, March 31

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<tr>
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<tbody>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Write to Do It: Jazzing Up Literacy with Science Olympiad</td>
<td>West Hall B-2, Conv. Center</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Using Fictional Picture Books to Do Science: How Is It Possible?</td>
<td>West Hall B-2, Conv. Center</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Classifying Objects: How Scientists and Other People Classify Things</td>
<td>West Hall B-2, Conv. Center</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>Web 2.0 Tools for Science Teaching</td>
<td>West Hall B-2, Conv. Center</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>Modeling Evidence Circles and Formative Assessment to Develop Three Dimensional Learning</td>
<td>Kentia Hall H, Conv. Center</td>
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#### Saturday, April 1

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<thead>
<tr>
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<tbody>
<tr>
<td>8:00–10:00 AM</td>
<td>Using Toys to Teach Physics Share-a-thon</td>
<td>152, Conv. Center</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Combining Science with Art to Understand How We See Color—Using Negative Art for a Positive Effect</td>
<td>West Hall B-2, Conv. Center</td>
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</tbody>
</table>
Council of State Science Supervisors (CSSS)

President: Ellen Ebert

Wednesday, March 29

6:00–8:00 PM  NSELA/CSSS Reception  Diamond Blrm. Salon 3, JW Marriott
By Invitation Only, visit www.NSELA.org

Thursday, March 30

8:00–9:00 AM  We’ve Adopted NGSS, How Do We Know It’s Making a Difference?  Olympic 3, JW Marriott
12:30–1:30 PM  Using the Crosscutting Concepts as the Basis for Competency-Based Learning  Olympic 3, JW Marriott
2:00–3:00 PM  Three-Dimensional Lessons Based in Simple Natural Phenomena  Atrium 3, JW Marriott
3:30–4:30 PM  Communication for Science Education Leaders (Yes, That Means You!)  Olympic 3, JW Marriott
3:30–5:30 PM  Having Classroom Instruction and Formative Assessment Meet the NGSS Performance Expectations  Platinum Blrm. Salon F, JW Marriott
5:00–6:00 PM  Creating STEM Mentor Networks to Increase STEM Teacher Retention  Platinum Blrm. Salon A, JW Marriott

Friday, March 31

2:00–4:00 PM  NGSS for State Science Supervisors  Olympic 1, JW Marriott

National Association for Research In Science Teaching (NARST)

President: Mei-Hung Chiu

Thursday, March 30

8:00–9:00 AM  Do Practitioners and Researchers Agree on the Issues? A Critical Perspective on the Practice-Research Gap in Science Education  Atrium 2, JW Marriott
2:00–3:00 PM  Science, Education, and Ability: The Exclusion We Co-Create  Olympic 3, JW Marriott
4:00–4:30 PM  Engaging Students with Primary Literature Improves Nature of Science Conceptions and Confidence in Reading Science  Platinum Blrm. Salon A, JW Marriott

Friday, March 31

8:00–9:00 AM  Shifting Conceptions: Identifying and Understanding Teachers’ Conceptual Models of Integrated STEM Education  Platinum Blrm. Salon A, JW Marriott
9:30–10:30 AM  Making Science Real—Supporting English Language Learners in Argumentation and Explanation through Authentic Tasks  Atrium 2, JW Marriott
11:00 AM–12 Noon  Promoting Student Participation in Science Practices: Strategies for Formative Assessment and Science Classroom Talk  Atrium 2, JW Marriott
### Conference Program • Affiliate Sessions

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>2:00–3:00 PM</td>
<td>Making Sense of STEM Education in K–12 Contexts and the Implications for Professional Development</td>
<td>Atrium 2, JW Marriott</td>
</tr>
<tr>
<td>5:30–6:00 PM</td>
<td>Opportunities to Learn Science: A Case Study of Science Classrooms in Successful/Diverse Texas High Schools</td>
<td>Georgia 1, JW Marriott</td>
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</table>

### National Middle Level Science Teachers Association (NMLSTA)

*President: Mary Lou Lipscomb*

#### Thursday, March 30

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>5:15–6:45 PM</td>
<td>NMLSTA Board Meeting By Invitation Only</td>
<td>Atrium 1, JW Marriott</td>
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#### Friday, March 31

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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>10:15 AM–4:30 PM</td>
<td>Meet Me in the Middle Day See page 47, as well as Vol. 2</td>
<td>Diamond Blrm. Salons, JW Marriott</td>
</tr>
<tr>
<td>11:45 AM–12:15 PM</td>
<td>NMLSTA Board and Membership Meeting By Invitation Only</td>
<td>Diamond Blrm. Salon 8, JW Marriott</td>
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</tbody>
</table>

### National Science Education Leadership Association (NSELA)

*President: Keri Randolph*

#### Tuesday, March 28

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 AM–6:00 PM</td>
<td>NSELA Board of Directors Meeting By Invitation Only, visit <a href="http://www.NSELA.org">www.NSELA.org</a></td>
<td>Olympic 1, JW Marriott</td>
</tr>
</tbody>
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#### Wednesday, March 29

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30–8:30 AM</td>
<td>NSELA Leadership Summit Breakfast By Invitation Only, visit <a href="http://www.NSELA.org">www.NSELA.org</a></td>
<td>Georgia 1/2, JW Marriott</td>
</tr>
<tr>
<td>8:00 AM–5:45 PM</td>
<td>NSELA Leadership Summit By Registration Through NSELA</td>
<td>Plaza 1/2, JW Marriott</td>
</tr>
<tr>
<td>11:30 AM–1:30 PM</td>
<td>NSELA Leadership Summit Luncheon By Invitation Only, visit <a href="http://www.NSELA.org">www.NSELA.org</a></td>
<td>Georgia 1/2, JW Marriott</td>
</tr>
<tr>
<td>6:00–8:00 PM</td>
<td>NSELA/CSSS Reception By Invitation Only, visit <a href="http://www.NSELA.org">www.NSELA.org</a></td>
<td>Diamond Blrm. Salon 3, JW Marriott</td>
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#### Thursday, March 30

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<tr>
<td>7:30–8:30 AM</td>
<td>NSELA Membership Breakfast By Invitation Only, visit <a href="http://www.NSELA.org">www.NSELA.org</a></td>
<td>Diamond Blrm. Salon 6, JW Marriott</td>
</tr>
<tr>
<td>8:30–10:00 AM</td>
<td>NSELA Annual Membership Meeting By Invitation Only</td>
<td>Diamond Blrm. Salon 6, JW Marriott</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Tools for Science Leaders</td>
<td>Diamond Blrm. Salon 6, JW Marriott</td>
</tr>
</tbody>
</table>
Conference Program • Affiliate Sessions

National Science Education Leadership Association (NSELA), continued

Friday, March 31

8:00–9:00 AM  STEM Lesson Guideposts: Mapping STEM Lessons into Your Curriculum  Diamond Blrm. Salon 2, JW Marriott
9:30–10:30 AM  Introducing Teachers and Administrators to the NGSS  Diamond Blrm. Salon 2, JW Marriott
11:00 AM–12 Noon  Professional Development Tips and Strategies to Optimize Student STEM Learning  Diamond Blrm. Salon 2, JW Marriott
2:00–3:00 PM  Making Sense of Science: A System for Systems Thinking  Diamond Blrm. Salon 2, JW Marriott
3:30–4:30 PM  Teaching a Culturally Responsive Pedagogy in Science  Diamond Blrm. Salon 2, JW Marriott

Saturday, April 1

8:00–9:00 AM  Engineering Cafe  Atrium 3, JW Marriott
11:00 AM–12 Noon  Leadership Strategies for Ensuring Each Student Has a STEM Future  Atrium 3, JW Marriott
3:30–4:30 PM  Uncovering Teacher Misconceptions Through the Use of Formative Assessment Strategies  Plaza 3, JW Marriott

Society for College Science Teachers (SCST)
President: Tarren Shaw

Thursday, March 30

8:00–9:00 AM  How Are We Implementing Vision and Change in the College Science Classroom?  Georgia 1, JW Marriott
12:30–1:00 PM  Changes in Students’ Perceptions and Motivation During Course-Embedded Freshman Research Experiences  Georgia 1, JW Marriott
1:00–1:30 PM  Research Experiences Throughout the Curriculum: A High-Impact Practice for Enhancing Student Success  Georgia 1, JW Marriott
2:00–2:30 PM  Exploring Genetic Ancestry and Personal Identity in U.S. Ethnic Minority College Biology Students  Georgia 1, JW Marriott
2:30–3:00 PM  “I Don’t Fit In Here”  Georgia 1, JW Marriott
3:30–4:00 PM  Testing the Testing Effect: Modifying Summative Assessment to Enhance Student Learning  Georgia 1, JW Marriott
4:00–4:30 PM  Examining the Progression of Student-Developed Hypotheses in an Inquiry Biology Laboratory Course (IBLC)  Georgia 1, JW Marriott
5:00–5:30 PM  Using Museums to Broaden the Science Practices and Increase Engagement  Georgia 1, JW Marriott
5:30–6:00 PM  A Science Sales Pitch: Increase Student Buy-In to Increase Classroom Engagement  Georgia 1, JW Marriott
<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
<th>Location</th>
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<tbody>
<tr>
<td>8:00–8:30 AM</td>
<td>Go Online to Teach College Science!</td>
<td>Georgia 1, JW Marriott</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>The Merit Fellows Program: Lessons Learned from an NSF S-STEM Project</td>
<td>Georgia 1, JW Marriott</td>
</tr>
<tr>
<td>9:30–10:00 AM</td>
<td>Can the History of Science Facilitate Climate Change Education and Climate Literacy? Lessons from Glacial Theory?</td>
<td>Georgia 1, JW Marriott</td>
</tr>
<tr>
<td>10:00–10:30 AM</td>
<td>How Do We Know What to Teach? Working Backward to Build a Stronger Curriculum</td>
<td>Georgia 1, JW Marriott</td>
</tr>
<tr>
<td>11:00–11:30 AM</td>
<td>The University of Findlay Learning Bus: Bringing NGSS to You!</td>
<td>Georgia 1, JW Marriott</td>
</tr>
<tr>
<td>11:30 AM–12 Noon</td>
<td>Introducing STEAM into the College Science Curriculum</td>
<td>Georgia 1, JW Marriott</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Outstanding Undergraduate Science Teacher Award 2015 Presentation</td>
<td>Georgia 1, JW Marriott</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Outstanding Undergraduate Science Teacher Award 2016 Presentation</td>
<td>Georgia 1, JW Marriott</td>
</tr>
<tr>
<td>3:30–5:00 PM</td>
<td>SCST Business Meeting</td>
<td>Georgia 1, JW Marriott</td>
</tr>
<tr>
<td>7:00–9:00 PM</td>
<td>SCST Poster Session and Dessert Social</td>
<td>Platinum Blrm. Salon I/J, JW Marriott</td>
</tr>
</tbody>
</table>
Three Dimensions of the Next Generation Science Standards (NGSS)

### Science and Engineering Practices

**SEP1** Asking Questions and Defining Problems
**SEP2** Developing and Using Models
**SEP3** Planning and Carrying Out Investigations
**SEP4** Analyzing and Interpreting Data
**SEP5** Using Mathematics and Computational Thinking
**SEP6** Constructing Explanations and Designing Solutions
**SEP7** Engaging in Argument from Evidence
**SEP8** Obtaining, Evaluating, and Communicating Information

### Crosscutting Concepts

**CCC1** Patterns
**CCC2** Cause and Effect: Mechanism and Explanation
**CCC3** Scale, Proportion, and Quantity
**CCC4** Systems and System Models
**CCC5** Energy and Matter: Flows, Cycles, and Conservation
**CCC6** Structure and Function
**CCC7** Stability and Change

### Disciplinary Core Ideas

#### Disciplinary Core Ideas in Physical Science

**PS1:** Matter and Its Interactions
- PS1.B: Chemical Reactions
- PS1.C: Nuclear Processes

**PS2:** Motion and Stability: Forces and Interactions
- PS2.A: Forces and Motion
- PS2.B: Types of Interactions
- PS2.C: Stability and Instability in Physical Systems

**PS3:** Energy
- PS3.A: Definitions of Energy
- PS3.B: Conservation of Energy and Energy Transfer
- PS3.C: Relationship Between Energy and Forces
- PS3.D: Energy in Chemical Processes and Everyday Life

**PS4:** Waves and Their Applications in Technologies for Information Transfer
- PS4.A: Wave Properties
- PS4.B: Electromagnetic Radiation
- PS4.C: Information Technologies and Instrumentation

#### Disciplinary Core Ideas in Life Science

**LS1:** From Molecules to Organisms: Structures and Processes
- LS1.A: Structure and Function
- LS1.B: Growth and Development of Organisms
- LS1.D: Information Processing

**LS2:** Ecosystems: Interactions, Energy, and Dynamics
- LS2.A: Interdependent Relationships in Ecosystems
- LS2.B: Cycles of Matter and Energy Transfer in Ecosystems
- LS2.C: Ecosystem Dynamics, Functioning, and Resilience
- LS2.D: Social Interactions and Group Behavior

**LS3:** Heredity: Inheritance and Variation of Traits
- LS3.A: Inheritance of Traits
- LS3.B: Variation of Traits

**LS4:** Biological Evolution: Unity and Diversity
- LS4.B: Natural Selection
- LS4.C: Adaptation
- LS4.D: Biodiversity and Humans

#### Disciplinary Core Ideas in Earth and Space Science

**ESS1:** Earth’s Place in the Universe
- ESS1.A: The Universe and Its Stars
- ESS1.B: Earth and the Solar System
- ESS1.C: The History of Planet Earth

**ESS2:** Earth’s Systems
- ESS2.A: Earth Materials and Systems
- ESS2.B: Plate Tectonics and Large-Scale System Interactions
- ESS2.C: The Roles of Water in Earth’s Surface Processes
- ESS2.D: Weather and Climate
- ESS2.E: Biogeology

**ESS3:** Earth and Human Activity
- ESS3.A: Natural Resources
- ESS3.B: Natural Hazards
- ESS3.C: Human Impacts on Earth Systems
- ESS3.D: Global Climate Change

#### Disciplinary Core Ideas in Engineering, Technology, and the Application of Science

**ETS1:** Engineering Design
- ETS1.A: Defining and Delimiting an Engineering Problem
- ETS1.B: Developing Possible Solutions
- ETS1.C: Optimizing the Design Solution

**ETS2:** Links Among Engineering, Technology, Science, and Society
- ETS2.A: Interdependence of Science, Engineering, and Technology
- ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World

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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
This spacesuit is one of the many unique artifacts about air and space to discover at the California Science Center.
Wednesday, March 29

7:30–8:30 AM  Networking Opportunity
NSELA Leadership Summit Breakfast
(By Invitation Only)  Georgia 1/2, JW Marriott
Visit www.NSELA.org for more information.

8:00 AM–5:00 PM  Meetings
Discover the NGSS Train-the-Trainer Workshop 1
(By Separate Registration Only)  Gold Blrm. Salon 2, JW Marriott

Discover the NGSS Train-the-Trainer Workshop 2
(By Separate Registration Only)  Gold Blrm. Salon 3, JW Marriott

8:00 AM–5:45 PM  Meeting
NSELA Leadership Summit
(By Registration Through NSELA)  Plaza 1/2, JW Marriott
The NSELA Leadership Institute (NLI) offers a rich array of experiences that focus on key topics in leadership and science education. Join us and network with other national, regional, and district leaders for an informative day. The Leadership Summit is followed by an evening of connecting with your colleagues at the NSELA/CSSS Reception. Visit www.NSELA.org for more information on registering.

9:00 AM–4:00 PM  Professional Learning Institutes
Picture-Perfect STEM Lessons, K–5: Using Children’s Books to Inspire STEM Learning (PLI-8)
(Grades K–5)  Diamond Ballroom Salon 9/10, JW Marriott
Science Focus: GEN
By Preregistration Only
Karen Ansberry and Emily Morgan, Picture-Perfect Science, West Chester, Ohio
For description, see page 54.

Disciplinary Core Ideas: Reshaping Teaching and Learning (PLI-1)
(Grades K–12)  Platinum Ballroom Salon A, JW Marriott
Science Focus: GEN, NGSS
By Preregistration Only
Joseph Krajcik, CREATE for STEM Institute, Michigan State University, East Lansing
Ravit Golan Duncan, Rutgers University, New Brunswick, N.J.
Ann Rivet, Teachers College, Columbia University, New York, N.Y.
For description, see page 52.

The ideas and opinions expressed in the conference 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.

Science Area
A science area category is associated with each session. These categories are abbreviated on the Science Focus line for each session listing. On page 170, you will find the conference sessions grouped according to their assigned science area category.

The science areas and their abbreviations are:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS</td>
<td>Life Science</td>
</tr>
<tr>
<td>PS</td>
<td>Physical Science</td>
</tr>
<tr>
<td>ESS</td>
<td>Earth and Space Science</td>
</tr>
<tr>
<td>ETS</td>
<td>Engineering, Technology, and the Application of Science</td>
</tr>
<tr>
<td>GEN</td>
<td>General Science Education</td>
</tr>
<tr>
<td>INF</td>
<td>Informal Science Education</td>
</tr>
</tbody>
</table>

NGSS
See page 76 for a complete list of the NGSS codes used in this program.

Strands
The Los Angeles Conference Committee has planned the conference around the following four 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 42.

NGSS  NGSS: The Next Generation of Science Teaching

2017: A STEM Odyssey

Science & Literacy Reloaded

Mission Possible: Equity for Universal Access

The following icons will be used throughout this program.

NSTA Press® Sessions

PLI  Professional Learning Institutes

INF  Sessions highlighting STEM learning experiences that occur in out-of-school environments.
Helping Students Make Sense of the World Using Next Generation Science and Engineering Practices (PLI-2)
(Grades K–12) Platinum Ballroom Salon B, JW Marriott
Science Focus: GEN, SEP
By Preregistration Only
Brian Reiser, Northwestern University, Evanston, Ill.
Christina Schwarz, Michigan State University, East Lansing
Cynthia Passmore, University of California, Davis
For description, see page 52.

Uncovering Students’ and Teachers’ Ideas with Three-Dimensional Formative Assessment Probes and Techniques (PLI-3)
(Grades K–12) Platinum Ballroom Salon C, JW Marriott
Science Focus: GEN, NGSS
By Preregistration Only
Page Keeley, 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.
Joyce Tugel, Maine Mathematics and Science Alliance, Augusta
For description, see page 53.

Argument-Driven Inquiry: Transforming Laboratory Experiences so Students Can Use Core Ideas, Crosscutting Concepts, and Science Practices to Make Sense of Natural Phenomena (PLI-4)
(Grades 6–12) Platinum Ballroom Salon D, JW Marriott
Science Focus: GEN, NGSS
By Preregistration Only
Victor Sampson and Ashley Murphy, The University of Texas at Austin
For description, see page 53.

Moving Standards into Practice: Five Tools and Processes for Translating the NGSS into Instruction and Classroom Assessment (PLI-5)
(Grades K–12) Platinum Ballroom Salon F, JW Marriott
Science Focus: GEN, NGSS
By Preregistration Only
Jody Bintz and Brooke Bourdèlat-Parks, BSCS, Colorado Springs, Colo.
Dora Kastel, American Museum of Natural History, New York, N.Y.
Kathy DiRanna, K–12 Alliance/WestEd, Los Alamitos, Calif.
Jo Topps, K–12 Alliance/WestEd, San Francisco, Calif.
For description, see page 53.

District-Level Administrators: You Are Not Alone in the NGSS Universe! (PLI-6)
(Grades K–12) Platinum Ballroom Salon G, JW Marriott
Science Focus: GEN, NGSS
By Preregistration Only
Eric Brunsell, NSTA Director, Professional Development in Science Education, and University of Wisconsin Oshkosh
David Crowther, NSTA President-Elect and University of Nevada, Reno
Kelly Price-Colley, Forsyth County Schools, Cumming, Ga.
John Putnam, Assistant Executive Director, Professional Programs, NSTA, Arlington, Va.
Ted Willard, Program Director, NGSS@NSTA, NSTA, Arlington, Va.
Flavio Mendes, Assistant Executive Director, Learning Center, NSTA, Arlington, Va.
For description, see page 54.

Equity in Science Education (PLI-7)
(General) Platinum Ballroom Salon J, JW Marriott
Science Focus: GEN, NGSS
By Preregistration Only
Jerry Valadez, NSTA Director, Multicultural/Equity in Science Education, and SAM Academy, Sanger, Calif.
Gary Nakagiri, Alameda County Office of Education, Hayward, Calif.
For description, see page 54.

9:00 AM–4:00 PM Meeting
Science Education for Students with Disabilities Preconference Meeting
(By Registration Through SESD) Plaza 3, JW Marriott
Science educators, special education teachers, parents, and administrators—come learn and share information and strategies on teaching science to students with disabilities. For more information, please contact Rachel Zimmerman-Brachman at rache.zimmerman-brachman@jpl.nasa.gov or visit www.nsta.org/disabilities.

11:30 AM–1:30 PM Networking Opportunity
NSELA Leadership Summit Luncheon
(By Invitation Only) Georgia 1/2, JW Marriott
Visit www.NSELA.org for more information.
National Earth Science Teachers Association Events at the 2017 NSTA National Conference in Los Angeles

We have a number of exciting sessions! To find our sessions, enter NESTA as the keyword when searching events online at NSTA’s session browser for the conference. On Friday, March 31 and Saturday, April 1, we have a series of sessions all in Petree Hall D of the Los Angeles Convention Center. Don’t miss out on our Share-a-Thons and the events below!

www.nestanet.org

Friday, March 31

2:00 – 3:00 p.m.  American Geophysical Union (AGU) Lecture: The Fault Lies Not in Our Stars. Speaker: Dr. Lucy Jones

Seismology shows us that on human time scales, the timing of big earthquakes is random and the best way to manage the risk is to consider it probabilistically. Most people do not really believe in randomness—trying to find patterns even when they don’t exist and then expecting scientists to find the real cause and remove randomness from the equation. Dr. Jones will probe how science education can do a better job of empowering everyone to understand and use hazards information.

Los Angeles Convention Center, Petree Hall C

6:30 – 8:00 p.m.  NESTA Friends of Earth Science Reception
JW Marriot Hotel L.A., Platinum Ballroom Salon C

Saturday, April 1

5:00 – 6:00 p.m.  NESTA’s exciting Rock, Mineral, and Fossil Raffle!
Los Angeles Convention Center, Petree Hall D

NESTA gratefully acknowledges the following organizations as sponsors:
### 12 Noon–5:30 PM

**12th Annual NSTA Global Conversations in Science Education Conference**

**Enhancing Global Workforce Skills Through Literacy, STEM, and Equity**

*Diamond Ballroom Salon 4, JW Marriott*

**By Preregistration Only**

NSTA has planned an afternoon dedicated to sharing science education from an international perspective. This mini-conference begins and ends with plenary talks by distinguished international scholars and includes roundtable discussions on specific topics relevant to the international science educator community and poster presentations providing opportunities for networking and idea exchange.

*NSTA is extremely grateful to Northrop Grumman Foundation and Council of Elementary Science International for their generous support and contributions to this event.*

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 Noon</td>
<td><strong>Lunch</strong></td>
</tr>
<tr>
<td>12:10 PM</td>
<td><strong>Welcome and Introductions</strong></td>
</tr>
<tr>
<td></td>
<td>Mary Gromko, NSTA President, Colorado Springs, Colo., U.S.</td>
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<tr>
<td></td>
<td>Antoinette Schlobohm, 2016–2017 NSTA International Advisory Board Chair, and Ardenwood Elementary School, Fremont, Calif., U.S.</td>
</tr>
<tr>
<td>12:25 PM</td>
<td><strong>Opening Speaker</strong></td>
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<td></td>
<td><em>New Global Approaches to Literacy</em></td>
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<tr>
<td></td>
<td>Speaker: Jim McDonald, CESI President, and Central Michigan University, Mount Pleasant, U.S.</td>
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<tr>
<td></td>
<td>This plenary session will discuss reading/literacy strategies that allow teachers to provide better support for their students. The strategies will include explanations in science, asking better questions, and using argumentation to connect evidence with scientific data. Handouts will be provided, and we will go through at least one of the strategies.</td>
</tr>
<tr>
<td>12:45 PM</td>
<td><strong>Presentation Session 1</strong></td>
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<td></td>
<td><em>A New Look at Science Education in Early Childhood: The Most Critical Stage in Learning</em></td>
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<td>Speaker: Sue Dale Tunnicliffe, ICASE, CASTME, and University College of London, U.K.</td>
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<td></td>
<td><em>Converting Research Papers into Children’s Books</em></td>
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<td>Speaker: Stuart Fleischer, The Walworth Barbour American International School in Israel, Even Yehuda</td>
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<tr>
<td></td>
<td><em>Questioning Science with Fictional Picture Books</em></td>
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<tr>
<td></td>
<td>Speakers: Sue Dale Tunnicliffe, University College of London, U.K., and Catherine Bru guiere, University of Lyon, France</td>
</tr>
<tr>
<td>1:30 PM</td>
<td><strong>Participant Break and Roundtable Discussion 1</strong></td>
</tr>
<tr>
<td>1:45 PM</td>
<td><strong>Presentation Session 2</strong></td>
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<tr>
<td></td>
<td><em>Using Student Research Projects to Create Scientific and Cultural Collaborations</em></td>
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<tr>
<td></td>
<td>Speaker: George Wolfe, Loudoun Academy of Science, Sterling, Va., U.S.</td>
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<tr>
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<td><em>Toward an Understanding of Indigenous Perspectives Through The Eyes of Preservice Science Education Students</em></td>
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<td>Speaker: Gregory Smith, Charles Darwin University, Casuarina, Australia</td>
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<tr>
<td></td>
<td><em>Improving Science Education by Introducing “Core Science Teachers” to Local Cities in Japan</em></td>
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<tr>
<td></td>
<td>Speaker: Yasushi Ogura, Saitama University, Saitama City, Saitama, Japan</td>
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<tr>
<td></td>
<td><em>Evaluating Scenarios That Promote Student Science-Related Career Awareness in the MultiCo Project</em></td>
</tr>
<tr>
<td></td>
<td>Speakers: Miia Rannikmäe, Regina Soobard, and Jack Holbrook, University of Tartu, Estonia; and Tuula Keinonen, University of Eastern Finland, Joensuu</td>
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<tr>
<td></td>
<td><em>Including Integrated Science and Mathematics Activities in Olympiad Events with Increased Parental Involvement</em></td>
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<tr>
<td></td>
<td>Speakers: Xiaoxin Lyu and MinJung Lee, Teachers College, Columbia University, New York, N.Y., U.S.</td>
</tr>
<tr>
<td>3:15 PM</td>
<td><strong>Poster Presentations and Participant Break</strong></td>
</tr>
</tbody>
</table>
12 Noon–5:30 PM 12th Annual NSTA Global Conversations in Science Education Conference, cont.

3:45 PM  Presentation Session 3
Enhancing Gender Awareness in STEM Education
Speaker: Gultekin Cakmakci, Hacettepe University, Ankara, Turkey
Pedagogy-Adopting Drama Techniques: Enabling Children to Aspire to a Career in a STEM Context
Speaker: Deb McGregor, Oxford Brookes University, Oxford, U.K.
Using STEM Projects to Foster Global Collaboration

Science Club: A Collective Impact Model for Building STEM Skills and Identity in After-School Programs
Speaker: Michael Kennedy, Northwestern University, Evanston, Ill., U.S.
Igniting Student Interest and Creative Thinking Skills with Episodes from Harry Potter
Speaker: Alan McCormack, 2010–2011 NSTA President, and Professor Emeritus, San Diego State University, San Diego, Calif., U.S.

5:00 PM  Roundtable Discussion 2

5:15 PM  Closing Remarks
Mary Gromko, NSTA President, Colorado Springs, Colo., U.S.

Global Conversations in Science Education Conference Poster Sessions

3:15 PM
Apply and Evaluate a Global Collaborative Research on Ocean Trash
Qing Gao and Rebecca Hite, Texas Tech University, Lubbock, U.S.

Development Studies in Science Education Related to Equity and Gender: International Perspectives and Recommendations
Teresa J. Kennedy, The University of Texas at Tyler, U.S.
Cheryl Sundberg, ICASE and Ronin Institute, Montclair, N.J., U.S.

Effect of International Trips on Students’ Academic Achievement in Basic High School Chemistry in Monterrey, Mexico
Rosa L. Tinajero, Americaasias, Mexico
Martha P. Pérez, Universidad de Monterrey, Mexico

Enhancing Middle School Science Learning Through Exploration Curriculum and Service Learning
Chih-Che Tai, East Tennessee State University, Johnson City, U.S.
Mao-Cheng Lin, Guang Wu Junior High School, Taiwan

The University of Texas at Tyler Innovation Academy Instructional Coaching Model for STEM Learning
Michael R.L. Odell and Teresa J. Kennedy, The University of Texas at Tyler, U.S.

Making Cultural Connections Through Global Collaboration and STEM Projects
Susan Paulsen, Morgan Hill (Calif.) Unified School District, U.S.
Heather Wygant, Santa Clara (Calif.) United School District, U.S.
Yujiro Fujiwara, Christian Academy in Japan, Tokyo

Preparing K–12 Leaders for Global STEM Education
Walter Smith, Carol Cao, and Heather Wygant, Texas Tech University, Lubbock, U.S.

Present Status and Issues of Korean Science Gifted Education: Evaluation of Second Plan for Discovery and Development of the Science Gifted
Bongwoo Lee, Dankook University, Yongin-si, Gyeonggi-do, South Korea
Heekyong Kim, Kangwon University, Chuncheon-si, Gangwon-do, South Korea

Science Club: A Collective Impact Model for Building STEM Skills and Identity in After-School Programs
Speaker: Michael Kennedy, Northwestern University, Evanston, Ill., U.S.
Igniting Student Interest and Creative Thinking Skills with Episodes from Harry Potter
Speaker: Alan McCormack, 2010–2011 NSTA President, and Professor Emeritus, San Diego State University, San Diego, Calif., U.S.

Public Engagement with Science at Science Centers in Turkey
Gultekin Cakmakci, Hacettepe University, Ankara, Turkey
Uyyar Kanli and Fitnat Koseoglu, Gazi University, Ankara, Turkey

Summer STEAM at Sakya: Multi-Age Bilingual Science Enrichment in Southern India
Shauneen Giudice, Delmar Middle and Senior High School, Delmar, Del., U.S.

The Development of Turkish Science Teachers’ Inquiry-Based Teaching Skills: Experiences from PROFILES and The Ark of Inquiry (AoI) Projects
Bulent Cavas, Dokuz Eylul University, Izmir, Turkey

Use of Creative Activities in Teaching High School Chemistry
Martha P. Pérez and Oralia Ramírez, Universidad de Monterrey, Mexico

Using Concept Mapping for Teaching and Assessment in Science Classroom
Priit Reiska and Aet Möllits, Tallinn University, Tallinn, Estonia
Wednesday, 4:00–6:00 PM

4:00–6:00 PM  Meeting
Science Education for Students with Disabilities (SESD) Board Meeting

Plaza 3, JW Marriott

The annual business meeting of Science Education for Students with Disabilities, an associated group with NSTA, is open to everyone—please join us! For additional information, please visit www.nsta.org/disabilities.

4:30–5:30 PM  Film Screening
Uncontrolled Variables: A Science Fair Story World Documentary Film Premiere

Petree Hall C, Convention Center

Join us for the world premiere of Uncontrolled Variables: A Science Fair Story, a film by Dale Carpenter and Bill McComas. It’s an inspiring and informative new film documenting the lives of students and teachers as they prepare for and compete in the science fair.

4:30–6:30 PM  Networking Opportunity
NSTA New Science Teacher Academy Reception
(By Invitation Only)  Atrium 3, JW Marriott

6:00–8:00 PM  Networking Opportunity
NSELA/CSSL Reception
(By Invitation Only)  Diamond Ballroom Salon 3, JW Marriott

Visit www.NSELA.org for more information.

6:00–8:00 PM  The Planetary Society Lecture
The Planetary Society Lecture: Everything All at Once
(General)  West Hall B, Convention Center

Science Focus: GEN

Sponsored by The Planetary Society


Based on his upcoming book Everything All at Once: How Nerds Solve Problems, Bill Nye will probe the nerd mind-set—solving problems through dogged effort, creativity, and trial and error.

Scientist, comedian, teacher, and author, Bill Nye became a household name with his innovative, fast-paced television series, Bill Nye the Science Guy. His mission for many years is to turn on the general public, and kids in particular, to the “way cool” wonders of science.

Bill is currently CEO of The Planetary Society. As a student at Cornell University, Bill was introduced to the wonders of astronomy in a class taught by Carl Sagan himself, one of the original founders of The Planetary Society. So for Bill it was like coming full circle.

His most recent publications, the New York Times—bestselling Undeniable: The Science of Creation, and Unstoppable: Harnessing Science to Change the World, are Bill’s efforts to continue his mission of changing the world through science education.

7:30–8:30 PM  Meeting
International Advisory Board Meeting

Atrium 1, JW Marriott

8:30–10:00 PM  Film Screening
Disney Youth Programs Presents Disneynature Born in China

Regal LA Live (off-site)

Join Disney Youth Programs for an exclusive screening of Disneynature’s new film Born in China, narrated by John Krasinski. Take an epic journey into the wilds of China and follow the adventures of three animal families—the majestic panda, the savvy golden monkey, and the elusive snow leopard.

Screening is complimentary and seating is limited (first come, first served). Visit bit.ly/2kF1i3e to register for this event.

Note: Regal LA Live is located at 1000 West Olympic Boulevard. Transportation is on your own to the theater, which is located fairly close to both the Convention Center and main conference hotels.
Visit NSTA’s SCIENCE STORE
South Lobby

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

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Download the conference app or follow #NSTA17 for special giveaways, contests, and more throughout the conference!

Visit www.nsta.org/store to make a purchase today, or call 800-277-5300.
Students and teachers need to get excited about learning.

The brain is like a muscle! #GreekMnemonics

Science lights the world.

I love seeing my student in lab! RHS

We can spark student interest.

—I love making cheesy science jokes.

Kids say Science Geeks.
7:30–8:30 AM  Networking Opportunity
NSELA Membership Breakfast
(By Invitation Only)  Diamond Ballroom Salon 6, JW Marriott
Visit www.NSELA.org for more information.

8:00–8:30 AM  Presentations
Using Memes, Puns, Jokes, and Comics in the Science Classroom
(Grades 6–College)  Diamond Ballroom Salon 8, JW Marriott
Science Focus: GEN
Emily Doty (edoty@mcpss.com) and Ashlee Kimpel (akimpel@mcpss.com), Citronelle High School, Citronelle, Ala.
LOL! Find out how and why to incorporate memes, puns, jokes, and comics into your science classroom.

Can You Explain? / ¿Puedes Explicar?
(Grades 2–10)  Platinum Ballroom Salon H, JW Marriott
Science Focus: GEN, SEP1, SEP3, SEP4, SEP7
Susan Levin (susanlevin@wpcs.k12.ny.us), Eastview Middle School, White Plains, N.Y.
Nena Restrepo Gil (nenacllo@gmail.com), George Washington Elementary School, White Plains, N.Y.
How does teaching science through Teaching Scientific Inquiry Model and the Socratic Seminar impact the ability of emergent bilinguals to express conceptual ideas? Join us and find out.

Exploring the World as a Scientist with AMS DataStreme Courses
(General)  Platinum Ballroom Salon I, JW Marriott
Science Focus: ESS, SEP
Wendy Abshire (@AMSeducation; wabshire@ametsoc.org), American Meteorological Society, Washington, D.C.
Learn how to bring your science lesson to life with real-world data. The American Meteorological Society has been doing it for 25 years!

Problem-Posing SSI (Socio-Scientific Issues): Making Science Personal for Diverse Learners
(Grades 9–12)  Plaza 1, JW Marriott
S. Taylor Wichmanowski (stw7278@gmail.com), Chung-Ang University, Dongjak-gu, Seoul, South Korea
Discussion centers on action research using socio-scientific issues (SSI) in urban science classrooms to improve student engagement and develop critical thinking and scientific reasoning skills.

Science Area
A science area category is associated with each session. These categories are abbreviated on the Science Focus line for each session listing. On page 170, you will find the conference sessions grouped according to their assigned science area category.

The science areas and their abbreviations are:
- LS = Life Science
- PS = Physical Science
- ESS = Earth and Space Science
- ETS = Engineering, Technology, and the Application of Science
- GEN = General Science Education
- INF = Informal Science Education

NGSS
See page 76 for a complete list of the NGSS codes used in this program.

Strands
The Los Angeles Conference Committee has planned the conference around the following four 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 42.

NGSS  NGSS: The Next Generation of Science Teaching

2017: A STEM Odyssey

Science & Literacy Reloaded

Mission Possible: Equity for Universal Access

The following icons will be used throughout this program.

NSTA Press® Sessions

PLI  Professional Learning Institutes

INF  Sessions highlighting STEM learning experiences that occur in out-of-school environments.
They come asking why. Our job is to continue to promote their questions and wonder about their world. Elementary teachers are key to keeping the joy of discovery and learning open and available to each and every student. Celebrate your role in facilitating their education!

Kathy DiRanna has helped shape California’s science reform efforts for the past 30 years and she continues to be an advocate for the reform efforts by actively serving on state committees for the implementation of NGSS and through the California Mathematics and Science Partnership Program. Nationally, she has also served as the mentor coordinator for the National Academy of Science and Mathematics Education, as well as on a variety of advisory boards.

Currently, Kathy is the statewide director of WestEd’s K–12 Alliance, a professional development organization focused on improving science education in grades K–12 through content, instructional strategies, assessment, and leadership. She is director of the CA NGSS K–8 Early Implementation Initiative and has co-authored several publications, including Assessment-Centered Teaching: A Reflective Practice and The Data Coach’s Field Guide: Unleashing the Power of Collaborative Inquiry.

ASTC-Sponsored Session: Linking In-School and Out-of-School STEM Learning: Examples of Programs Featured in Connected Science Learning
(Grades 4–12) Atrium 3, JW Marriott
Science Focus: GEN, INF

Dennis Schatz (schatz@pacsci.org), NSTA Director, Informal Science, and Pacific Science Center, Seattle, Wash.
The peer-reviewed journal Connected Science Learning highlights programs that bridge in-school and out-of-school STEM learning. Come learn about the programs featured in the new journal.

Coaching Teachers from 1D to 3D Learning
(Grades 1–12) Diamond Ballroom Salon 1, JW Marriott
Science Focus: ETS, SEP3, SEP4, SEP6, SEP7, SEP8

Holly Rosa (hrosa@bostonpublicschools.org), Boston (Mass.) Public Schools

Hillary Paul Metcalf (paulh@chelseaschools.com), Chelsea High School, Chelsea, Mass.
Join us as we share our approach to helping teachers transform 1D content-driven units into 3D project-based units!

STEaM: Combining Physical Science with the Arts and Literature
(General) Diamond Ballroom Salon 2, JW Marriott
Science Focus: PS2, PS3, PS4, SEP8

Arthur Eisenkraft (arthur.eisenkraft@umb.edu), 2000–2001 NSTA President, and UMass Boston, Dorchester, Mass.
Quantoons combines intricate cartoons of physics phenomenon by MAD magazine and Garbage Pail Kids artist Tomas Bunk with literary quotes and physics descriptions. The arts and science for all.
<table>
<thead>
<tr>
<th>Time</th>
<th>Featured Speakers</th>
<th>Special Events</th>
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| 8:00 AM| **Mary C. McCurdy Lecture** 8:00–9:00 AM  
Theatre (411), Conv. Center  
Speaker: Kathy DiRanna  
sponsored by Penguin Random House  
book signing to immediately follow talk for those with ticket |
| 9:00 AM| **General Session** 9:15–10:30 AM  
West Hall B, Conv. Center  
Speaker: Andy Weir  
sponsored by Penguin Random House |
| 10:00 AM| **Featured Presentation** 12:30–1:30 PM  
Petree Hall C, Conv. Center  
Speaker: Heidi Schweingruber  
Sponsored by Shell |
| 11:00 AM| **Science in the Community Session:** 3:30–5:30 PM  
Creativity Forum: A Serious and Fun Aspect of Science |
| 12 Noon| **First-Timers’ Session** 8:00–9:00 AM  
151, Conv. Center |
| 1:00 PM| **Teacher Researcher Day** 8:30 AM–4:30 PM  
Platinum D, JW Marriott |
| 2:00 PM| **Mary C. McCurdy Lecture** 8:00–9:00 AM  
Theatre (411), Conv. Center  
Speaker: Kathy DiRanna  
sponsored by Penguin Random House  
book signing to immediately follow talk for those with ticket |
| 3:00 PM| **Featured Presentation** 3:30–4:30 PM  
Theatre (411), Conv. Center  
Speaker: Jennifer Long |
| 4:00 PM| **Science in the Community Session:** 3:30–5:30 PM  
Creativity Forum: A Serious and Fun Aspect of Science |
| 5:00 PM| **Teacher Researcher Day** 8:30 AM–4:30 PM  
Platinum D, JW Marriott |
| 6:00 PM| **Teacher Researcher Day** 8:30 AM–4:30 PM  
Platinum D, JW Marriott |
| 7:00 PM| **Teacher Researcher Day** 8:30 AM–4:30 PM  
Platinum D, JW Marriott |
| 8:00 PM| **Teacher Researcher Day** 8:30 AM–4:30 PM  
Platinum D, JW Marriott |
| 9:00 PM| **Teacher Researcher Day** 8:30 AM–4:30 PM  
Platinum D, JW Marriott |
SCST-Sponsored Session: How Are We Implementing Vision and Change in the College Science Classroom?
(Grades 9–College) Georgia 1, JW Marriott
Science Focus: GEN, NGSS
Tarren Shaw (tjshaw@ou.edu), The University of Oklahoma, Norman
Kerry Cheesman (kcheesma@capital.edu), Capital University, Columbus, Ohio
Donald French (dfrench@okstate.edu), Oklahoma State University, Stillwater
Join us for a moderated discussion of best practices in college science teaching.

CSSS-Sponsored Session: We’ve Adopted NGSS; How Do We Know It’s Making a Difference?
(Grades K–12) Olympic 3, JW Marriott
Science Focus: GEN, SEP
Kevin Anderson (@wisdpiscience; mrkja@yahoo.com; Wisconsin Dept. of Public Instruction, Madison
Hear about a system of assessments (formative, survey, interim, summative) to support educators in evaluating whether their NGSS implementation is reaching their goals and vision for science education.

AMSE-Sponsored Session: Engineering Through Aquaculture Technology for Women
(Grades 6–College) Platinum Ballroom Salon A, JW Marriott
Science Focus: ETS
Lovelle Ruggiero (lovelleruggiero@mac.com), Consultant/Content Specialist, New Rochelle, N.Y.
Recirculating aquaculture (fish farming) could be an indirect way to introduce engineering to women and underserved populations, while addressing science concepts and engineering practices.

Using Statistical Analysis of the PTC Gene as a Means to Study Mendelian Principles and Evolutionary Trends
(Grades 9–College) Platinum Ballroom Salon J, JW Marriott
Science Focus: LS, SEP
Steven Oszust (steveoszust@mybihs.org), The Brooklyn International High School, Brooklyn, N.Y.
Through hands-on investigation of the PTC gene, students will develop a deeper understanding of Mendelian genetics and evolutionary trends in human populations.

First-timers, Preservice Teachers and New Teacher Session

Are you an experienced teacher attending your very first NSTA conference? Or a new (or preservice) teacher anxious about the vast number of sessions and would like some guidance? Join us for this interactive session with opportunities to win prizes.

Is This Your First NSTA Conference?
First-Timer Conference Attendees’ Orientation
Thursday, March 30
8:00–9:00 AM
Los Angeles Convention Center, 151
Students’ Views on the Nature of Science: Can Philosophy of Science Help Us?
(Grades 9–College) Plaza 2, JW Marriott
Science Focus: ETS2.B, SEP
Marcel Grdinic (mgrdinic@glenbrook225.org), Glenbrook North High School, Northbrook, Ill.
Incorporate readings and discussions in the philosophy of science to improve students’ views of the nature of science.

Is This Your First NSTA Conference? First-Timer Conference Attendees’ Orientation
(General) 151, Convention Center
Science Focus: GEN

NSTA Board and Council
Feeling overwhelmed by all there is to see and do at an NSTA conference on science education? Join us for an interactive exploration through the program, the conference app, and NSTA’s social media. By the end of the session, you will know just how to get the most from your conference experience in addition to building new networks with science colleagues.

Snapshot of a Perfectly Integrated Curriculum in K–4
(Grades K–4) 501C, Convention Center
Science Focus: GEN, NGSS
Tami Eggensperger (@tamiegs; tami.eggensperger@cps.k12.ar.us), Cabot (Ark.) Public Schools
Leave with strategies to implement the NGSS practices and student-led inquiry through notebooking that is worth more than a thousand words. For student engagement and lasting understanding, we are using NSTA Press® Picture Perfect Science as the foundation for our curriculum.

Teachers Helping Teachers: Teaching Socially Contentious Scientific Topics
(Grades 6–12) 506, Convention Center
Science Focus: ESS3.D, LS
Claire Adrian-Tucci (@NCSEteach; claire.adrian.tucci@gmail.com), National Center for Science Education, Oakland, Calif.
In this session, teachers will share how they approach socially contentious scientific topics such as climate change and evolution to avoid challenges, tension, and misconceptions.

Disciplinary Literacy and Reading in the Content Area of Science: Yes! You Can Do Both as an Elementary Teacher!
(Grades 1–5) 513, Convention Center
Science Focus: GEN, NGSS
Michele Hollingsworth Koomen (mkoomen@gac.edu), Gustavus Adolphus College, Saint Peter, Minn.
Build your foundation in understanding of what we mean by both reading in a content area like science and disciplinary literacy in science for elementary classrooms.

Enhancing Science Through Culturally Responsive Teaching
(Grades K–8) Kentia Hall L, Convention Center
Science Focus: GEN, SEP1, SEP3, SEP7
Kianga Thomas (kthomas@nsu.edu) and Arthur Bowman (awbowman@nsu.edu), Norfolk State University, Norfolk, Va.
Emphasis will be placed on strategies to enhance culturally responsive teaching science classrooms. Attention will be given to creating an inquiry environment to maximize learning for diverse populations.

Engaging At-Risk Students in Chemistry: Project-Based Learning Closes the Gap
(Grades 9–12) Kentia Hall O, Convention Center
Science Focus: PS, SEP1, SEP2, SEP3, SEP8
Julie Lockhart (@TeacherSync; jlockha1@houstonisd.org), Energy Institute High School, Houston, Tex.
An inner-city high school chemistry teacher discusses using Project-Based Learning as a vehicle for engaging at-risk students with complex, abstract concepts.

Bring the Ocean into Your Classroom with National Marine Sanctuaries
(Grades 6–12) Kentia Hall P, Convention Center
Science Focus: ESS3.A
Claire Fackler (@sanctuaries; claire.fackler@noaa.gov), NOAA Office of National Marine Sanctuaries, Santa Barbara, Calif.
Learn about free STEM educational resources and hands-on field experiences to increase ocean and climate literacy with your students. Receive free materials!
8:00–9:00 AM  Hands-On Workshops

NSTA Press® Session: Argumentation in the Earth and Space Science Classroom
(Grades 5–12)  Diamond Ballroom Salon 3, JW Marriott
Science Focus: ESS, SEP7
Sharon Schleigh (sharonpschleigh@gmail.com), East Carolina University, Greenville, N.C.
Come learn how to engage in scientific argumentation to support teaching in your classroom. Sample activities from the leading NSTA books provided.

Engineering: Blow the Roof Off!
(Grades 3–8)  Diamond Ballroom Salon 7, JW Marriott
Science Focus: ESS3.B, ETS1, CCC2, SEP7
Karen Ostlund (@karen_ostlund; klostlund@utexas.edu), 2012–2013 NSTA President, and The University of Texas at Austin
Strong winds generated by hurricanes and tornados can lift the roof off a house. Use a model for the engineering design process that integrates the NGSS 3 Ds to design a better roof.

Using a Free Online Tool to Support Students in Developing Models
(Grades 6–12)  Diamond Ballroom Salon 10, JW Marriott
Science Focus: GEN, CCC2, CCC4, SEP2, SEP4
Tom Bielik (tbielik@msu.edu) and Li Ke (@LiKe_MSU; keli1@msu.edu), Michigan State University, East Lansing
Daniel Damelin (@dandamelin; ddamelin@concord.org), The Concord Consortium, Concord, Mass.
Joseph Krajcik (@krajcjkjoe; krajcik@msu.edu), CREATE for STEM Institute, Michigan State University, East Lansing
Learn about and use a new student-focused tool that supports students in constructing, testing, and revising dynamic system models to make sense of phenomena.

ASTE-Sponsored Session: Three-Dimensional Science Instruction Using the Learning Cycle Approach
(Grades 5–12)  Georgia 2, JW Marriott
Science Focus: GEN, SEP
Pradeep Dass (@PradeepMDass; pradeep.dass@nau.edu), Northern Arizona University, Flagstaff
Engage in a learning experience to understand the usefulness of the learning cycle approach for three-dimensional science instruction.

STEM Infographic Use, Analysis, and Production for Higher Scientific Literacy in the Classroom
(Grades 4–12)  Gold Ballroom Salon 1, JW Marriott
Science Focus: GEN, CCC, SEP2, SEP4, SEP5, SEP8
Rob Lamb (@lambchop1198; rob@clstl.org), Pattonville High School, Maryland Heights, Mo.
Experience how to incorporate infographics into the science classroom as a way of increasing scientific literacy. Several lessons will be discussed along with takeaway resources.

Finding Your Voice Without Shouting: Seeking Successful Support for Science Education
(Grades K–12)  Olympic 1, JW Marriott
Science Focus: GEN
Rebecca Hite (@Sciencebecca; rebecca.hite@ttu.edu), Texas Tech University, Lubbock
Pat Shane (pshane@unc.edu), 2009–2010 NSTA President and Educational Consultant, Chapel Hill, N.C.
Carla Billups (@cmbillups; cmbillups12@gmail.com), Buncombe County Schools, Asheville, N.C.
Have your voice heard—this session includes how to frame issues, use data to support positions, craft short “elevator speeches,” leverage social media, and use effective communication strategies when you want to be heard.

Successful STEM-Rich Making Practices That Benefit Underserved Students
(General)  Platinum Ballroom Salon B, JW Marriott
Science Focus: ETS
Jerry Valadez (jdvscience@yahoo.com), NSTA Director, Multicultural/Equity in Science Education, and SAM Academy, Sanger, Calif.
Ana López (anaglopez4@gmail.com), Central Valley Science Project, Sanger, Calif.
Jean Pennycook (jean.pennycook@gmail.com), Penguin Science.com, Fresno, Calif.
Experience STEM and MAKING activities and learn how the California Community Science Workshops’ successful program model creates STEM and environmental learning environments accessible to all kids.
Silent Labs: Movie Making in a Science Classroom  
(Grades 1–12)  
Platinum Ballroom Salon E, JW Marriott  
Science Focus: GEN, SEP1, SEP2, SEP4, SEP6, SEP8  
Maggie Mabery (@MaggieMabery; mabery.maggie@tusd.org), Hickory Elementary School, Torrance, Calif.  
Design authentic science assessments where students use iPad and iMovie to problem solve. Explore a variety of ideas for how to integrate original video into everyday science classes. Engage in a sample performance activity using iMovie.

NSTA Press® Session: Argument-Driven Inquiry in Biology, Chemistry, and Physics—Lab Investigations for Grades 9–12  
(Grades 9–12)  
Platinum Ballroom Salon F, JW Marriott  
Science Focus: LS, PS1, PS2, PS3, CCC, SEP  
Victor Sampson (@victorsampson; victor.sampson@gmail.com), The University of Texas at Austin  
Jonathon Grooms (@djrgrooms; jgrooms@gwu.edu), The George Washington University, Washington, D.C.  
Come discover Argument-Driven Inquiry and how it can help students learn how to use the three dimensions of the NGSS—crosscutting concepts, disciplinary core ideas, and science and engineering practices—to explain natural phenomena. In this session, participants will learn about the stages of the ADI instructional model, how it was designed to address the shortcomings of current laboratory experiences, and how it supports the NGSS.

From Activity to Inquiry—Analytical Approach to Inquiry-Based Learning from the Students’ Perspective  
(Grades 9–12)  
Plaza 3, JW Marriott  
Science Focus: PS  
Mindy Chappell (@femme_instruite; mindyjc2@gmail.com), North Grand High School, Chicago, Ill.  
Estefania Espinosa (estefania3spino315@gmail.com), Dominican University, River Forest, Ill.  
Elizabeth Herrera (@eliza13521; eliza13521@gmail.com), The University of Illinois at Chicago  
Learn from us in this hands-on workshop as we share with you how a group of high school AP chemistry students in a predominately Latino public school in the near Westside suburbs of Chicago developed a simple lab activity into a cross-curricular, inquiry-based experiment on their own.

Charts, Graphs, and Diagrams, Oh My! The World of Visual Learners  
(Grades P–12)  
502A, Convention Center  
Science Focus: GEN, SEP1, SEP2, SEP4, SEP7, SEP8  
Samantha Bradbury (@R10science; samantha.bradbury@region10.org), Texas Regional Collaborative and Region 10 ESC, Richardson  
Susan Sayen (sayen@wisd.org), Texas Regional Collaborative and Howard Junior High School, Waxahachie  
Find out how students can use visuals to work through text and assessment for success in the science classroom.

Lessons That Create Equitable Opportunities for All Students  
(Grades 6–12)  
502B, Convention Center  
Science Focus: GEN  
Glenn Melero (@glennmelero; gmelero@guhsd.net), El Cajon Valley High School, El Cajon, Calif.  
Creating equity in a science classroom is a challenge. But through careful consideration of teaching strategies, lesson planning, technology integration, and reflection, teachers can do it.

NGSS 3-2-1 Liftoff! NASA’s Beginning Engineering Science and Technology (BEST) Curriculum  
(Grades K–12)  
515A, Convention Center  
Barbara Buckner (@bbuckner; barbie.buckner@nasa.gov), NASA Armstrong Flight Research Center, Palmdale, Calif.  
Use each stage of the Engineering Design Process to complete a team challenge of building and launching a satellite while making connections to NASA missions.

The “How Tos” of an X-STREAM Family Night  
(Grades P–5)  
515B, Convention Center  
Science Focus: INF  
Susan Collins (scollis48@kennesaw.edu) and Gregory Patterson (gpatter7@students.kennesaw.edu), Kennesaw State University, Kennesaw, Ga.  
Plan an X-STREAM (Science, Technology, Reading, Engineering, Art, Math) Family Night from start to finish. Leave with strategies and samples that will get all school stakeholders involved in a fun-filled science for the family.
Hands-On 5E Lessons from a Platinum-Designated STEM Elementary School  
(Grades 1—4) Kentia Hall H, Convention Center  
Science Focus: GEN, SEP  
Stacey McGinnis (@stacymcginnis5; stacey.mcginnis@washk12.org), Pamela Orton (pamela.orton@washk12.org), and Tiffany Porter (@tiffporter23; tiffany.porter@washk12.org), Crimson View Elementary School, Saint George, Utah. True STEM schools get in their engineering and science lessons all in one week. Come learn how one school does it while getting motivated with project ideas to change your regular classroom into a STEM classroom. Bonus: Come share your PBL ideas at our end-of-class STEM smash!

Gravity Models: The Plight of Wile E. Coyote  
(Grades 6—8) Kentia Hall M, Convention Center  
Science Focus: ESS1, ESS2, PS2, SEP2, SEP7, SEP8  
Jennifer Janzen (@jenniferj4242; jennifer_janzen@sccoe.org), Santa Clara County Office of Education, San Jose, Calif. Explore the NGSS practice of modeling through activities that engage around the concept of gravity. Dive deep into modeling of NGSS!

Hot Hands: Chemical Engineering in a Sandwich Bag  
(Grades 6—10) Kentia Hall N, Convention Center  
Matthew d’Alessio (@dalessioCSUIN; matthew.dalesio@csun.edu), Dorothy Nguyen-Graff (dng@csun.edu), Virginia (Gini) Oberholzer Vandergon (virginia.vandergon@csun.edu), and Brian Foley (@csunfoley; bfoley@csun.edu), California State University, Northridge. Explore chemical systems in zip bags, then with your body acting as an atom, and design the most efficient hand warmer through an engineering challenge.

Blue Marble Matches  
(Grades 6—8) Kentia Hall Q, Convention Center  
Science Focus: ESS2.C, CCC1, CCC2, CCC3, CCC4, CCC5, CCC7, SEP4, SEP6  
Veronica Leija (veronica.m.leija@nasa.gov), Learning Expert, Houston, Tex.  
Brandon Hargis (@brandon_hargis; brandon.m.hargis@nasa.gov), NASA Johnson Space Center/Texas State University, Houston, Tex.  
Connect NASA images of Earth and other planets with the evidence for geologic processes like weathering and erosion, while exploring the processes shaping our worlds.
Introducing Students to Biotechnology and Bioengineering in a Title 1 Middle School
(Grades 6–8) Kentia Hall R, Convention Center
Science Focus: ET2, LS, CCC4, CCC6, CCC7
Beatriz Perez-Sweeney (perezswe@bcm.edu), Barbara Tharp (btharp@bcm.edu), Nancy Moreno (nmoreno@bcm.edu), and Christopher Burnett (@tophb; caburnet@bcm.edu), Baylor College of Medicine, Houston, Tex.
Misty Kirkland (mkirklan@houstonisd.org) and Michael Wertz (mertz@houstonisd.org), Baylor College of Medicine Academy at Ryan, Houston, Tex.
We will share how our school organizes projects to help students understand and apply science concepts in biotechnology and bioengineering and the collaboration between the Center for Educational Outreach, Baylor College of Medicine, and Baylor College of Medicine Academy at Ryan.

Elevating Family Engagement to Empowerment: Urban Adv’15antage’s Model of Fostering Sustainable Participation in Science Learning for Middle School Families
(Grades 5–9) Kentia Hall S, Convention Center
Science Focus: GEN
Tina Glover, American Museum of Natural History, New York, N.Y.
Colleen Owen (cowen@wcs.org) and Christine DeMauro (cdemauro@wcs.org), Wildlife Conservation Society, Bronx, N.Y.
Caitlyn Coffey (coffey21@schools.nyc.gov), J.H.S. 185 Edward Bleeker, Flushing, N.Y.
Discover the social and cognitive potential in shifting middle school family engagement to empowerment by promoting deeper science learning and equity beyond the classroom.

NMEA-Sponsored Session: Whale of a Tale Share-a-Thon
(General) Petree Hall D, Convention Center
Science Focus: ESS2.C, LS2
Emily Arnold (emilyarnold@ucsd.edu), Birch Aquarium at Scripps Institution of Oceanography, La Jolla, Calif.
Kathy Fuller, Prince George’s County Public Schools, Upper Marlboro, Md.
Erin Hobbs (ehobbs@newburyport.k12.ma.us), Newburyport High School, Newburyport, Mass.
Jessica Kastler (jessiekastler@gmail.com), Gulf Coast Research Laboratory, Ocean Springs, Miss.
Mellie Lewis (mellielewis@hotmail.com), NOAA Climate Stewards Education Project, Silver Spring, Md.
Tami Lunsford (@tamiteach; tami.tunsford@gmail.com), Newark Charter School, Newark, Del.
Dale Stanley (dale.stanley@ncc.edu), Nassau Community College, Garden City, N.Y.
Carol Steingart (info@coastencounters.com), Coast Encounters, LLC, Wells, Maine
Jaime Thom (jthom@scaquarium.org), South Carolina Aquarium, Charleston
The National Marine Educators Association invites you to engage in hands-on activities and take home resources for your classroom. Discover how you can become involved in both ocean and freshwater initiatives from local and national organizations to promote ocean and climate literacy. After the share-a-thon, stay for the day for an NMEA track of sessions in the same room!
8:00–9:00 AM Exhibitor Workshops

STEM Literacy: Strategies for Making Science Text Meaningful
(Grades K–12) 150 AB, Convention Center
Science Focus: GEN, NGSS
Sponsor: STEMscopes™ from Accelerate Learning
Jan Lanse, Consultant, Los Angeles, Calif.
Join us as we learn the power of using Close Reading strategies to engage students in reading, writing, and discussing the science text in collaborative groups, which can lead to student mastery and high achievement. Build the capacity for scientific literacy success in your STEM classroom!

True Colors: Spectrometry to Investigate Lights and Colors
(Grades 9–12) 405, Convention Center
Sponsor: PASCO scientific
Tom Loschiavo (loschiavo@pasco.com), PASCO scientific, Roseville, Calif.
Jason Lee (mrlee3@att.blackberry.net), East Georgia State College–Statesboro
What can light emissions tell you about atomic structure? How can a solution’s color teach you about concentration and reaction rates? In this hands-on workshop with the Wireless Spectrometer, you will perform spectrometry experiments, including light source emission studies and colored solutions analysis.

STEM Activities: Easy-to-Teach Robotics
(Grades 6–12) 407, Convention Center
Science Focus: ETS1, PS2.A, CCC1, CCC2, CCC3, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8
Sponsor: PASCO scientific
Brett Sackett, PASCO scientific, Roseville, Calif.
Thomas Hsu, Ergopedia, Inc., Cambridge, Mass.
Feeling overwhelmed by the idea of teaching programming to tech-savvy students? We have created curricula and lesson plans just for you! We will cover teaching motion and introductory programming with classroom-scale robots and an easy-to-use interactive curriculum. You will be programming within minutes and leave with confidence to lead your own robotics lessons.

Martian Genetics: An Electrophoresis Exploration
(Grades 6–College) 410, Convention Center
Science Focus: LS
Sponsor: Edvotek, Inc.
Danielle Snowflack (info@edvotek.com), Brian Ell (info@edvotek.com), and Tom Cynkar (info@edvotek.com), Edvotek Inc., Washington, D.C.
Explore genetics with our “out of this world” workshop! Imagine being the first scientist to explore Mars and discovering extraterrestrials. How would you use biotechnology to learn about the Martians? Discover how DNA technology can be used to explore the relationship between genotype and phenotype. Fluorescent dyes simulate DNA fragments, eliminating post-electrophoresis staining and saving classroom time! Take home a free gift and entry in a LabStation™ giveaway.

Active Chemistry and Active Physics: Project-Based Inquiry Science That Engages Students
(Grades 9–12) 501 AB, Convention Center
Science Focus: PS
Sponsor: It's About Time
Andrew Uy and Lee Jackson, Loyola High School of Los Angeles, Calif.
Active Chemistry and Active Physics are NSF research-based curricula that make chemistry and physics accessible to ALL high school students. Find out how Active Chemistry and Active Physics can enhance your NGSS-focused instruction. Watch what will happen to the quality of student work when they take ownership of real-world scientific challenges that matter to them.

Machine Technology and Engineering with K’NEX Machines: Using STEM to Make Work Easier
(Grades 5–9) 510, Convention Center
Science Focus: ETS1, PS2, PS3
Sponsor: K’NEX Education
Robert Jesberg (rjesberg@knex.com), K’NEX Education, Hatfield, Pa.
Machines are not so simple after all! Build and explore STEM concepts with fully functioning models from K’NEX Exploring Machines. Test, evaluate, re-engineer, and optimize models to find how each “makes work easier.” A great way to have your program meet address NGSS crosscutting concepts. A hands-on workshop for hands-on science educators.
Thursday, 8:00–9:30 AM

**8:00–9:30 AM  Exhibitor Workshops**

**Inquiry-Based Introduction to Gel Electrophoresis**
*(Grades 7–College)  150C, Convention Center*

Science Focus: LS1, LS3, PS1, PS2, CCC1, CCC5, SEP4, SEP6

Sponsor: The MiniOne Systems

**Kristin Majda** *(info@theminione.com)*, Gold Coast Science Network, Camarillo, Calif.

Participate in a hands-on 5E lesson that meets the NGSS and learn electrophoresis to teach key principles of matter, energy, force, motion, and genetics. Use the MiniOne Electrophoresis System over an entire school year or over multiple grade levels to provide learning that engages students in skills necessary for biotech careers.

**Modeling Earth, the Sun, and Other Stars with Bring Science Alive!**
*(Grades K–5)  153A, Convention Center*

Science Focus: ESS

Sponsor: TCI

**Christy Sanders**, TCI, Mountain View, Calif.

Experience learning from a student’s perspective as you learn about the relationship between Earth, the Sun, and other stars using a powerful online learning system. The lesson was entirely built on the NGSS.

**Life Is Complicated: Flow of Genetic Information to Genomic Engineering**
*(Grades 9–College)  153B, Convention Center*


Sponsor: 3D Molecular Designs

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

Teachers face the daunting task of preparing students for careers in the rapidly developing field of genomic engineering. This workshop will first explore innovative, hands-on tools that engage students in active modeling of RNA transcription and translation/protein synthesis, and then investigate genetic mutations and gene editing technologies, including CRISPR/Cas9.

**Make Sure Your Makerspace Has Options for All Students!**
*(Grades 3–6)  301 AB, Convention Center*

Science Focus: ETS

Sponsor: Delta Education/School Specialty Science

**Derrick 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 who are curious about science the resources designed for exploring classroom concepts in a maker setting.

**Engage Students in FOSS Next Generation K–8**
*(Grades K–8)  303 AB, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Delta Education/School Specialty Science–FOSS

**Jessica Penchos** and **Brian Campbell**, The Lawrence Hall of Science, University of California, Berkeley

Join FOSS developers to learn about the FOSS Next Generation K–8 program. We will introduce the instructional design, and illustrate how the system incorporates science-centered language development, notebooks, digital resources, formative assessments, and outdoor excursions into a coherent learning experience for students and teachers.

**Engineering Design and NGSS: Learning About Friction Forces**
*(Grades 6–12)  304 AB, Convention Center*

Science Focus: ETS, PS2

Sponsor: CPO Science/School Specialty Science

**Erik Benton**, CPO Science/School Specialty Science, Nashua, N.H.

**Kat Mills**, School Specialty Science, Rosharon, Tex.

Take the classic car and ramp experiment, explore friction forces, and combine them with technology to create a SAIL car. Extend the investigation with an engineering design problem and you build a basis for understanding NGSS and dynamics of friction for vehicle-related incidents. Door prizes. Free STEM resources provided.
Hands-On Science with Classroom Critters
(Grades K–12) 306 AB, Convention Center
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
**Carolina Teaching Partner**
Add action and excitement to your science class with live organisms! Discover fun, simple hands-on activities with pill/sow bugs, termites, bessbugs, and butterflies that you can use in your labs. Learn about care and handling, as well as easy ways to introduce inquiry. Additional resources available online.

Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher
(Grades 9–12) 308 AB, Convention Center
Science Focus: PS
Sponsor: Carolina Biological Supply Co.
**Carolina Teaching Partner**
Looking for lab activities that work every time, not just periodically? Explore easy, engaging, safe chemistry activities that are sure to produce a reaction in your students. Whether you’re new to chemistry or feeling out of your element, you will learn new ways to create excitement with hands-on labs and demonstrations.

Dissecting the NGSS
(Grades K–5) 309, Convention Center
Science Focus: LS, CCC, SEP
Sponsor: Carolina Biological Supply Co.
**Carolina Teaching Partner**
Did you know a squid has three hearts? Or that it uses a beak to break down its prey? Join us in constructing an argument that plants and animals have internal and external structures to support survival, growth, and reproduction. Leave with a dissection lesson from Building Blocks of Science®.

CALLING ALL MIDDLE SCHOOL EDUCATORS

Friday, March 31, 2017 | 10:15 AM–4:30 PM
Diamond Ballroom Salons 4 & 5, JW Marriott

*Must be registered for the conference to attend*

**Join us for a special “Meet Me in the Middle Day,” designed just for middle school educators, at NSTA’s 2017 National Conference in LA!**

The day’s events will include a networking session, more than a dozen presentations specifically for middle school educators, and an afternoon share-a-thon featuring more than 100 presenters. You’ll walk away with ideas you can put to use in your classroom next week!

Organized by the National Middle Level Science Teachers Association (NMLSTA)

Attend for a chance to win an iPad mini and other door prizes!

#NSTA17
www.nsta.org/LA
**Integrating Chromebook with Vernier Technology**

(Grades 3—College) 402A, Convention Center
Science Focus: ETS2, PS1, PS2
Sponsor: Vernier Software & Technology
**Rick Rutland** (info@vernier.com), Five Star Education Solutions, Stockdale, Tex.

Use Vernier sensors with Chromebooks to conduct hands-on experiments such as “Graphing Your Motion” and “Grip Strength Comparison.” See a demonstration of our new Go Direct wireless and USB sensors that connect directly to Chromebooks—no interface needed. Explore our wide range of digital tools that promote understanding of science concepts.

**Flinn Scientific’s Exploring Chemistry™: Connecting Content Through Experiments**

(Grades 9–12) 403A, Convention Center
Science Focus: PS
Sponsor: Flinn Scientific, Inc.
**Jillian Saddler** (jsaddler@flinnsci.com) and **Joan Berry** (jberry@flinnsci.com), Flinn Scientific, Inc., Batavia, Ill.

Join us as we present interactive activities and demonstrations that showcase the features and benefits of our Exploring Chemistry kits! We will highlight integrated lab and learning activities for some of the major topics in your chemistry curriculum! The experiments, demos, and Process-Oriented Guided Inquiry Learning (POGIL™) activities ensure that students will really understand the concepts and get a glimpse of the underlying simplicity and beauty of chemistry! Handouts and door prizes!

**Renewable Energy with KidWind and Vernier**

(Grades 7—College) 402B, Convention Center
Science Focus: ESS3, ETS2, PS3
Sponsor: Vernier Software & Technology
**David Carter** (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.

Explore renewable energy and engineering design using KidWind kits with Vernier technology. In this engaging hands-on workshop, you will design, test, and refine a wind turbine to maximize its energy output. Activities such as this from our book, Renewable Energy with Vernier, embody the spirit of STEM education.

**Connecting Ecology Concepts from a Global Perspective**

(Grades 9–12) 403B, Convention Center
Science Focus: ESS, LS3
Sponsor: HHMI BioInteractive
**Timothy Guilfoyle**, Phillip O. Berry Academy of Technology, Charlotte, N.C.

Join us for ecology from around the globe! Travel to Gorongosa for niche partitioning. Journey to the Pacific coast—exploring keystone species. Finally, build a food web in Gorongosa. Resources are free! Participants will work through activities, learn to use them in the classroom, and connect three ecological concepts.

**Identify Patient Zero of a Zombie Apocalypse!**

(Grades 9—College) 404 AB, Convention Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
**Damon Tighe** (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.

Explore the spread of a zombie virus with this hands-on lab using the power of an ELISA assay. The specific nature of antibodies enables the testing of almost any biological molecule that elicits an immune response. Learn how an ELISA can monitor transmission and track the spread of disease!
Enzymes Made Doggone Easy: A Virtual Interactive Case Study!
(Grades 6–12) 503, Convention Center
Science Focus: LS
Sponsor: Ward’s Science
Liam Casey, VWR Science Education, Rochester, N.Y.
In this hands-on technology workshop, you will experience a standards-focused interactive case from Cogent Education on enzymes, which is proven to help students learn this challenging concept. A Great Dane is eating well, but losing weight. As veterinary technicians, students apply their learning of enzymes to help the dog recover.

Zombie Apocalypse!
(Grades 6–12) 511 AB, Convention Center
Science Focus: GEN
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!

How Do Scientists Think?
(Grades 5–10) 512, Convention Center
Science Focus: PS, CCC
Sponsor: Perimeter Institute for Theoretical Physics
Damian Pope, Perimeter Institute for Theoretical Physics, Waterloo, Ont., Canada
What is so special about the way scientists think? What are the key habits of mind that scientists practice enabling them to make discoveries? Come explore the process of science and engage in hands-on inquiry activities that can encourage students to develop their problem-solving, collaboration, and creativity skills.

The Best Test Prep Book Ever for AP Chemistry
(Grades 9–12) 514, Convention Center
Science Focus: PS
Sponsor: Pearson
Ed Waterman, Retired Educator, Fort Collins, Colo.
Learn how to give students control of the required content with ample practice to master the material. This book includes thorough content summaries and hundreds of updated multiple choice and free-response questions focusing on graphical and tabular data analysis and atomic-molecular particle representations.
Thursday, 8:00–11:00 AM

8:00–11:00 AM Hands-On Workshop

NGSS Toolkit Pathway Session: Using the NGSS to Plan a Unit of Instruction
(Grades 6–12) Platinum Ballroom Salon G, JW Marriott
Science Focus: LS2, CCC, SEP

Jody Bintz (@JBintzBSCS; jbintz@bscs.org), BSCS, Colorado Springs, Colo.

Dora Kastel (@Dora_AMNH; dkastel@amnh.org), American Museum of Natural History, New York, N.Y.

Plan for instruction using a tool and NGSS card sets to deepen understanding of the three dimensions and consider what students need to know.

8:00 AM–5:00 PM Meetings

Discover the NGSS Train-the-Trainer Workshop 1
(By Separate Registration Only) Gold Blrm. Salon 2, JW Marriott

Discover the NGSS Train-the-Trainer Workshop 2
(By Separate Registration Only) Gold Blrm. Salon 3, JW Marriott

8:30–9:00 AM Presentations

Teaching the Tough Topics with Science Games
(Grades 6–12) Diamond Ballroom Salon 8, JW Marriott
Science Focus: ESS1, LS3, LS4, PS1, PS2, CCC4, CCC5, CCC6, SEP2, SEP4, SEP5

Ralph Bouquet (@rlbouquet), WGBH Education, Boston, Mass.

Explore the possibilities of using digital science games to educate and engage students in difficult science topics with NOVA.

Overview of Approaches That Help ENLs, Bilinguals, and All Students in General
(Grades 6–College) Platinum Ballroom Salon H, JW Marriott
Science Focus: GEN, SEP1, SEP4, SEP5, SEP6, SEP7, SEP8

Jannethe Pardo (jpardo@ercsd.org), Spring Valley High School, Spring Valley, N.Y.

In order to implement bilingual programs to serve our many English as a New Language students, it is crucial that strategies be integrated that will help ENL, bilingual, and all students’ succeed in our demanding high school science curriculum.

Wikiwatershed.org Toolkit of Resources and Curriculum
(Grades 4–College) Platinum Ballroom Salon I, JW Marriott
Science Focus: GEN, NGSS

Steve Kerlin (skerlin@stroudcenter.org) and Melinda Daniels (mdaniels@stroudcenter.org), Stroud Water Research Center, Avondale, Pa.

Nanette Marcum-Dietrich (ndietrich@millersville.edu), Millersville University, Millersville, Pa.

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

Delve into how you can use the new STEM community of www.Wikiwatershed.org featuring online GIS modeling, DIY environmental sensors, scientific data-gathering processes, and a watershed curriculum.

How to Be a DonorsChoose Rockstar: Using Crowdfunding to Get a Killer STEM Space!
(Grades P–12) Plaza 1, JW Marriott
Science Focus: INF

Blair Mishleau (@blairtheblur; blair.mishleau@kippdc.org) and Jennifer Ramsey (jennifer.ramsey@kippdc.org), KIPP DC Heights Academy, Washington, D.C.

In order to ensure your science or STEM program has everything it needs to be NGSS focused, stop by our session to learn how you can fill your space with the learning tools, curriculum, supplies, and more to complete your three-dimensional learning space!
8:30–9:30 AM  Presentation
Teacher Researcher Day Session: Poster Session for Teacher Researchers
(General)  Platinum Ballroom Salon D, JW Marriott
Science Focus: GEN, NGSS
Deborah Roberts-Harris (drober02@unm.edu), The University of New Mexico, Albuquerque
Find out what questions teachers and teacher educators are asking and how they are exploring these in their own classrooms.

8:30–10:00 AM  Meeting
NSELA Annual Membership Meeting
(By Invitation Only)  Diamond Ballroom Salon 6, JW Marriott
The NSELA Annual Membership Meeting offers an up-to-date glimpse of NSELA by its officers and committee chairs. The recognition of our Outstanding Leadership in Science Education Award is celebrated. Come network with other key leaders from across the country. Visit www.NSELA.org for more information.

8:30–11:00 AM  Meeting
Science Safety Advisory Board Meeting
Studio 1, JW Marriott

9:00 AM–5:00 PM  Networking Opportunity
NSTA International Lounge
Atrium 1, JW Marriott
Please stop by the NSTA International Lounge to relax or meet colleagues while you’re at the conference. The lounge is open Thursday through Saturday, 9:00 AM–5:00 PM.

9:15–10:30 AM  General Session
The Martian: The Story Behind the Story
(General)  West Hall B, Convention Center
Science Focus: GEN
Sponsored by Penguin Random House

Andy Weir (@andyweirauthor; sephalon@gmail.com), Author of The Martian, Mountain View, Calif.
Presider and Introduction of Speaker: Mary Gromko, NSTA President, Colorado Springs, Colo.
Platform Guests: Andy Weir; Mary Gromko; Carolyn Hayes, NSTA Retiring President, and Retired Educator, Greenwood, Ind.; David Crowther, NSTA President-Elect, and University of Nevada, Reno; Christine Anne Royce, NSTA President-Elect-Elect, and Shippensburg University, Shippensburg, Pa.; Jessica L. Sawko, CSTA Executive Director, Folsom, Calif.; Camille Stegman, NSTA Director, District XVI, and Storey County Schools, Virginia City, Nev.; David L. Evans, NSTA Executive Director, Arlington, Va.; Tim Williamson, Chairperson, NSTA Los Angeles National Conference, and California State University, Long Beach; Therese Shanahan, Program Coordinator, NSTA Los Angeles National Conference, and University of California, Irvine; Susan Gomez Zwiep, Local Arrangements Coordinator, NSTA Los Angeles National Conference, and California State University, Long Beach

Andy Weir discusses how he went from computer programmer to bestselling author. Spoiler: He did it mostly by mistake!

Andy Weir was first hired as a programmer for a national laboratory at age 15 and has been working as a software engineer ever since. He is also a lifelong space nerd and a devoted hobbyist of subjects such as relativistic physics, orbital mechanics, and the history of manned spaceflight.

The first 250 people in line for Andy’s session will receive a free classroom-edition copy of The Martian, which Andy will personally autograph shortly after his talk.

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Andy Weir presses the “Flesh” with Robonaut2.

Photo courtesy of James Blair and Lauren Harnett, NASA

NSTA Los Angeles National Conference on Science Education
Thursday, 9:30–10:30 AM

9:30–10:30 AM  Hands-On Workshop
NMEA-Sponsored Session: Aquaponics Toward Urban Sustainability
(Grades 6–12)  Petree Hall D, Convention Center
Science Focus: LS2.B
Linda Chilton (lchilton@usc.edu), USC Sea Grant, Los Angeles, Calif.
Lynn Whitley (lwhitley@usc.edu), University of Southern California, Los Angeles
Food for Thought Aquaponics weaves together chemistry, biology, physics, engineering, and more while addressing sustainable healthy food options in a highly urbanized, water-limited community.

9:30–10:30 AM  Exhibitor Workshops
Make Science Night Meaningful
(Grades K–2)  150 AB, Convention Center
Science Focus: GEN, INF, NGSS
Sponsor: STEMscopes™ from Accelerate Learning
Brandy Nicholson, STEMscopes from Accelerate Learning, Houston, Tex.
STEMscopes has partnered with EarthEcho International to develop Science Nights for schools that turn learning into action. Come see how you can both learn new science content and help save Earth’s most valuable resource. You will leave being able to make your campus science night an unforgettable event for students and families.

Exploring Misconceptions: What Is pH?
(Grades 6–12)  405, Convention Center
Science Focus: PS1.A, CCC1, CCC3, SEP2, SEP5
Sponsor: PASCO scientific
Tom Loschiavo (loschiavo@pasco.com), PASCO scientific, Roseville, Calif.
Paul Werner (pwerner@rocklin.k12.ca.us), Rocklin High School, Rocklin, Calif.
What is pH and why is the scale 0–14? Help students develop an understanding of the logarithmic pH scale by creating serial dilutions in this hands-on workshop. Using the Wireless pH Sensor and universal indicator, your students will be able to analyze and visualize what pH actually means and measures!

From DNA to Protein—A Modeling Approach
(Grades 8–12)  407, Convention Center
Science Focus: LS1.A, LS1.C
Sponsor: PASCO scientific
Thomas Hsu (thsu@pasco.com), Ergopedia, Inc., Cambridge, Mass.
Ryan Reardon (rreardon71@gmail.com), Shades Valley High School, Irondale, Ala.
How can students visualize and better understand a molecular-level process? We’ll use molecular models to simulate how information in DNA is expressed in the assembly of proteins from amino acids and conduct simple hands-on activities to help students grasp the fundamentals of molecular biology and protein structure.

Left at the Scene of the Crime: Introduction to Forensic Science
(Grades 9–College)  410, Convention Center
Science Focus: LS
Sponsor: Edvotek, Inc.
Danielle Snowflack (info@edvotek.com), Brian Ell (info@edvotek.com), and Tom Cynkar (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.
Thursday, 9:30–10:30 AM

9:30–11:00 AM  Presentation
Teacher Researcher Day Session: Panel Discussion: Young Scientists
(Grades P–3)  Platinum Ballroom Salon D, JW Marriott
Science Focus: GEN, NGSS
Deborah Roberts-Harris (drober02@unm.edu), The University of New Mexico, Albuquerque
This panel discussion will focus on the benefits of working with our youngest scientists from preschool to early elementary. What can we expect these students to be able to do? How much science can they actually learn? Why is it important to provide them with opportunities to explore science?

10:00–11:30 AM  Exhibitor Workshops
Who Is Baby Whale’s Father? DNA Fingerprinting Solves the Mystery!
(Grades 9–College)  150C, Convention Center
Science Focus: LS1, LS3, PS1, CCC1, SEP4
Sponsor: The MiniOne Systems
Shannon Klemann (info@theminione.com), Adolfo Camarillo High School, Camarillo, Calif.
Come learn and get hands-on experience on how to teach gel electrophoresis and DNA fingerprinting in a 90-minute classroom session. You will pour, load, and run a gel; capture a gel image; analyze the results; and deduce a probable conclusion for a whale of a forensic mystery.

Analyzing and Interpreting Data Using TCI’s Bring Science Alive!
(Grades K–5)  153A, Convention Center
Science Focus: GEN, NGSS
Sponsor: TCI
Christy Sanders, TCI, Mountain View, Calif.
Get your students to do more than just read a graph, chart, or statement. Participants will be immersed in a Bring Science Alive! classroom where students analyze and interpret data and construct an argument based on research.

Light Up STEM: Design a 50-Cent Microlight
(Grades 9–12)  501 AB, Convention Center
Science Focus: ETS
Sponsor: It’s About Time
Mihir Ravel, Olin College of Engineering, Needham, Mass.
Cary Sneider, Portland State University, Portland, Ore.
Engineering the Future is an affordable, multi-age, accessible, full-year high school engineering course that has been redesigned to deeply engage student interests while supporting their abilities to achieve NGSS performance expectations. Design your own Microlight with an LED is an example of the revised unit dealing with energy and electronics.

Bridges! Bridges! Structural Engineering at Its Best with K’NEX STEM Bridge Sets
(Grades 3–6)  510, Convention Center
Science Focus: ETS1, PS2
Sponsor: K’NEX Education
Robert Jesberg (rjesberg@knex.com), K’NEX Education, Hatfield, Pa.
Bridges fascinate students and adults alike! Build K’NEX bridge models and explore STEM concepts. Investigate bridge technology as you build, experiment with the science of bridges, and brainstorm engineering solutions to challenges. We will investigate seven major bridge designs, and discuss their limits and their advantages. An emphasis on the “STE” in STEM!
The Ins and Outs of Crossing Cell Membranes  
(Grades 6–College) 153B, Convention Center  
Science Focus: ETS1, LS1, LS2.A, LS2.B, LS2.C, PS1, PS2, CCC, SEP1, SEP2, SEP5, SEP6, SEP7, SEP8  
Sponsor: 3D Molecular Designs  
Gina Vogt (gina.vogt@3dmoleculardesigns.com), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.  
3-D models help students explore interactions between water and salt, the composition of cell membranes, and mechanisms of membrane transport. We will study polarity of water while investigating transport across hydrophobic membranes. Guide your students toward understanding phospholipid bilayer assembly. Join us as we simulate transport of water, glucose, and ions while differentiating between active and passive transport.

The Animal Kingdom Lessons with Shape of Life Resources  
(Grades 5–College) 153C, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: Shape of Life  
Nancy Burnett (burnetttna@gmail.com) and Denise Ryan (denisearyan@gmail.com), Shape of Life, Carmel Valley, Calif.  
Mark Friedman (marklewisfriedman@gmail.com), Marine Biology Educator, Redondo Beach, Calif.  
Shape of Life will bring Mark Friedman in to share his teaching experience using Shape of Life resources. For more than 13 years, Mark has inspired inner city kids through Shape of Life.

How to Argue in Science Class  
(Grades 1–6) 301 AB, Convention Center  
Science Focus: GEN, SEP7  
Sponsor: Delta Education/School Specialty Science  
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.  
Kathy Armstrong, Northside Elementary School, Midway, Ky.  
Help students develop scientific argumentation skills by making claims based on observable evidence. Put these skills into practice with lessons from Delta Science Modules, as we prove (or disprove!) fundamental science concepts. Leave with readers, equipment, and an activity you can use with your students next week.

Ten Minutes to Improving Science Achievement  
(Grades 3–8) 303 AB, Convention Center  
Science Focus: GEN  
Sponsor: Delta Education/School Specialty Science–FOSS  
Kathy Long, The Lawrence Hall of Science, University of California, Berkeley  
“Assessment” can strike fear and trepidation into the hearts of teachers and students. Join FOSS developers to learn how assessment can be transformed into an integrated teaching tool that grades 3–8 teachers and students can embrace to create a classroom culture that motivates effort and growth to improve student achievement.

CPO Science’s Link™ Learning Module: Cell Reproduction Using Crazy Chromosomes  
(Grades 6–12) 304 AB, Convention Center  
Science Focus: LS1, LS3  
Sponsor: CPO Science/School Specialty Science  
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.  
Kat Mills, School Specialty Science, Rosarhon, Tex.  
CPO Science’s Link modules for genetics use NGSS strategies in a real-time digital learning environment. Students study the differences between DNA and genes, mitosis and meiosis, traits and alleles, and phenotypes and genotypes. Cell processes come alive with hands-on strategies in a unique collaborative program. Door prizes. Free STEM resources provided.

Bring Robotics to Your Science Classroom with LEGO® MINDSTORMS® Education EV3  
(Grades 5–12) 304C, Convention Center  
Science Focus: ETS  
Sponsor: LEGO® Education  
Kelly Reddin, LEGO Education, Billund, Jylland, Denmark  
Want to prepare your students for STEM-related fields? Want to bring more engineering and Problem-Based Learning into the classroom? Come to this workshop to not only program a LEGO MINDSTORMS Education EV3 robot, but also leave with the confidence to bring robotics to your classroom for more student-centered learning.
FLINN Workshops
Hands-On Science to Motivate and Educate

MORNING OF CHEMISTRY
Friday, March 31 • 10 am – 11:30 am • Petree Hall C

Other Flinn workshops are located in Room 403A of the Los Angeles Convention Center

Thursday, March 30
8:00 a.m. – 9:30 a.m. Flinn’s Exploring Chemistry™—Connecting Content through Experiments
10:00 a.m. – 11:30 a.m. Flinn Favorite Biology Activities and Games
12:00 p.m. – 1:30 p.m. Year-Round Solutions for Success in AP* Chemistry
2:00 p.m. – 3:30 p.m. Teaching Forensics with Real Crime Scene Investigation Techniques
4:00 p.m. – 5:30 p.m. Building or Renovating a Laboratory? Get Your Questions Answered

Friday, March 31
8:00 a.m. – 9:30 a.m. Fantastic Physical Science Demonstrations
10:00 a.m. – 11:30 a.m. Flipping AP* Biology with FlinnPREP™
12:00 p.m. – 1:30 p.m. New Inquiry Investigations for AP* Physics 1 and 2
2:00 p.m. – 3:30 p.m. Green Chemistry Experiments for General and Advanced Placement* Chemistry
4:00 p.m. – 5:30 p.m. Enhance Your Science Course with POGIL™ Activities

Saturday, April 1
10:00 a.m. – 11:30 a.m. Flinn Scientific’s STEM Design Challenge™ Activities
12:00 p.m. – 1:30 p.m. Hands-On Integrated Science Activities for Middle School

*AP and Advanced Placement are registered trademarks of the College Board, which was not involved in the production of, and does not endorse, these products.
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For full workshop descriptions, go to www.flinnsci.com/workshops/nsta2017
**FIRST® Tech Challenge Proves You CAN Program a Robot**  
(Grades 7–12)  
Science Focus: ETS, SEP1, SEP2, SEP3, SEP5, SEP6  
Sponsor: FIRST  
**Thomas Eng** (teng@firstinspires.org), FIRST, Manchester, N.H.  
Using off-the-shelf Android technology in a popular Blockly programming language, be ready to “dive in” using go-at-your-own-pace instructional materials to program a robot as used in the FIRST Tech Challenge program. Once you’ve built your program, take the robot for a test-drive based on what you’ve learned. Game on!

**Physiology in Action: Explore Feedback Mechanisms and Homeostasis**  
(Grades 6–12)  
Science Focus: LS, CCC, SEP  
Sponsor: Carolina Biological Supply Co.  
**Carolina Teaching Partner**  
Investigate feedback mechanisms and how organisms maintain homeostasis with Carolina’s physiology kits. Demonstrations and fun hands-on activities keep students engaged and excited about this difficult-to-teach topic.

**Engineer Physical Science Excitement with a Carolina STEM Challenge®**  
(Grades 6–12)  
Science Focus: PS, SEP  
Sponsor: Carolina Biological Supply Co.  
**Carolina Teaching Partner**  
Rockets zoom and race cars zip through hands-on activities that engage your middle school and high school students. Apply creative problem-solving skills and engineering practices to chemistry and physical science challenges. Experience how Carolina makes it easy to incorporate STEM into your classroom.

**Science + Engineering = New Elementary Program from the Smithsonian**  
(Grades K–5)  
Science Focus: GEN, NGSS  
Sponsor: Carolina Biological Supply Co.  
**Carolina Teaching Partner**  
Be among the first to experience the exciting new Smithsonian elementary science program written from the ground up for NGSS. Engage in lesson examples to see how the program truly integrates science content with engineering and the nature of science.

**Biology with Vernier**  
(Grades 7–College)  
Science Focus: ETS2, LS1, LS2  
Sponsor: Vernier Software & Technology  
**Colleen McDaniel** (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.  
Use Vernier sensors to conduct biology experiments from our lab books in this engaging hands-on workshop. Collect and analyze data on LabQuest 2 and computers. Data sharing with mobile devices will be demonstrated. Explore our wide range of digital tools that promote student understanding of biology concepts.

**Integrating iPad with Vernier Technology**  
(Grades 3–College)  
Science Focus: ETS2, PS1, PS2  
Sponsor: Vernier Software & Technology  
**Verle Walters** (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.  
Use Vernier sensors with iPad to conduct hands-on experiments such as “Graphing Your Motion” and “Grip Strength Comparison.” See a demonstration of our new Go Direct sensors that connect wirelessly to iPad—no interface needed. Explore our wide range of digital tools that promote student understanding of science concepts.

**Flinn Favorite Biology Lab Activities and Games**  
(Grades 7–12)  
Science Focus: LS  
Sponsor: Flinn Scientific, Inc.  
**Meg Griffith** (mgriffith@flinnsci.com) and **Matt Anderson** (manderson@flinnsci.com), Flinn Scientific, Inc., Batavia, Ill.  
Students learn better and faster when they are actively involved in hands-on activities that are not only fun, but create learning opportunities along the way. We will share some inquiry-based labs, interactive demonstrations, and collaborative games you can use to motivate your students. We’ll focus on core topics like evolution, genetics, biochemistry, and more—you’re sure to find a Flinn Favorite that works for you! Handouts for all activities.
HHMI Is Phenomenal! Using BioInteractive to Create Phenomena-Based Lessons
(Grades 9–12) 403B, Convention Center
Science Focus: GEN, CCC, SEP1, SEP2, SEP6, SEP7, SEP8
Sponsor: HHMI BioInteractive
Samantha Johnson (smjohnson@slzusd.org), Arroyo High School, San Lorenzo, Calif.
James Clark (jclark@slzusd.org), San Lorenzo (Calif.) Unified School District
Struggling to find phenomena? Learn how you can use the many resources available at HHMI BioInteractive to anchor phenomena-based three-dimensional lessons. Participants will create and leave with 5E lessons that can facilitate students’ explanations of natural phenomena, as well as a mini HHMI phenomena bank.

Investigate Photosynthesis and Cellular Respiration with Algae Beads
(Grades 9–College) 404 AB, Convention Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Damon Tighe (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
Use algae beads in a colorimetric assay to study both photosynthesis and cellular respiration in authentic inquiry investigations (AP Biology Big Idea 2: Labs 5 and 6). Learn how to extend this lab to study the effects of light intensity, light color, temperature, and other organisms on these processes.

Enzymes: Technology Inspired by Nature
(Grades 9–College) 406 AB, Convention Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Leigh Brown (leigh_brown@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
With rising greenhouse gases, scientists look to nature for a biofuel solution. The star of this hands-on workshop is the cellobiase enzyme, an engine for cellulosic biofuel production. Use the inquiry-based approach to extract enzyme, test activity, and design experiments to study how pH, temperature, and concentrations affect reaction rates.

Biology for NGSS: A New Approach for a New Program
(Grades 9–12) 408A, Convention Center
Science Focus: LS
Sponsor: BIOZONE International Ltd.
Richard Allan (richard@thebiozone.com), BIOZONE International Ltd., Hamilton, New Zealand
Successfully implement the high school life science component of the NGSS approach with BIOZONE’s newest student workbook. This carefully constructed new 2016 edition is strongly focused on student inquiry and written from first principles to address all aspects of the NGSS system architecture. Attendees receive free books that support the NGSS.

Awesome Activities for an NGSS Classroom
(Grades K–8) 408B, Convention Center
Science Focus: GEN, NGSS
Sponsor: Houghton Mifflin Harcourt
Damon Smerchek (dmerchek@hmhco.com) and James Oliver, Houghton Mifflin Harcourt, Boston, Mass.
NGSS is more than starting your lesson with an activity. This hands-on workshop using selected activities from the brand-new HMH Science Dimensions curriculum will teach you how an NGSS lesson is different than the usual ways science is taught. Come experience a fun and engaging blended learning approach.

Floating Trains: Phenomena, 3D Instruction, and Amplify Science for Grades 2–5
(Grades 2–5) 409 AB, Convention Center
Science Focus: PS2
Sponsor: Amplify
Rebecca Abbott (amplifyscience@berkeley.edu) and Jennifer Garfield (amplifyscience@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley
Experience how students investigate maglev trains while figuring out principles of forces and engaging in three-dimensional learning. Participants will get a hands-on dive into Amplify Science for grades 2–5, engaging with this new K–8 NGSS-designed curriculum from The Lawrence Hall of Science.
Here Comes the Sun Power: Practical Applications and Protection
(Grades 6–12) 503, Convention Center
Science Focus: GEN
Sponsor: Ward’s Science
Patty Muscatello and Michelle Pagani, VWR Science Education, Rochester, N.Y.
Everyone loves the feel of sunshine on their skin, but what is really happening? In this workshop, you will learn to harness the Sun to work for your benefit and demonstrate the importance and effectiveness of different SPF levels in your sunscreen.

An All-American Total Eclipse of the Sun
(Grades 6–12) 511 AB, Convention Center
Science Focus: ESS1.B
Sponsor: Simulation Curriculum Corp.
Herb Koller (hkoller@simcur.com), Simulation Curriculum Corp., Minnetonka, Minn.
What causes total eclipses? Why are they so rare? What makes this one special? Come see how we can use Simulation Curriculum’s award-winning Starry Night to answer these questions and preview the circumstances of the August 2017 eclipse. Starry Night is available for all computing platforms, including Chromebooks.

Molecular-Level Visualization: Engage Your Students and Fight Misconceptions!
(Grades 7—College) 511C, Convention Center
Science Focus: PS1.A, CCC, SEP
Sponsor: Wavefunction, Inc.
Jurgen Schnitker (jurgen@wavefun.com), Wavefunction, Inc., Irvine, Calif.
Is it difficult for your students to relate the macroscopic and symbolic levels of chemistry to molecular phenomena? 3D visualization can help! ODYSSEY Molecular Explorer is a highly interactive program for high school and AP chemistry. Bring a Windows or Macintosh laptop if you can; some loaner laptops also available.

What’s New in Physics?
(Grades 8–12) 512, Convention Center
Science Focus: PS, CCC, SEP
Sponsor: Perimeter Institute for Theoretical Physics
Damian Pope, Perimeter Institute for Theoretical Physics, Waterloo, Ont., Canada
What’s new in physics? From quantum mechanics to cosmology, this workshop will explore cutting-edge physics for teachers who are looking for current real-world science connections in their classrooms. We will discuss the big breakthroughs that your students are talking about and show you how you can incorporate them into your class.

Climate and Global Change…Too Hot to Handle?
Teaching the Science with Rigor and Relevance
(Grades 9–12) 514, Convention Center
Science Focus: ESS3
Sponsor: Pearson
Joseph Levine, Author, Boston, Mass.
Human activity is the most powerful driver of change on Earth—affecting sea level, rainfall, seasonality, and ecosystem functions on which all life depends. Global change is complex, interdisciplinary—and perfect for NGSS-oriented teaching. We will explore the value of system models, relating global climate system structure to its function and underscoring the importance of time and scale in understanding stability and change in global systems.

Waves—Make an Abstract Concept Become Visible!
(Grades 6–8) 518, Convention Center
Sponsor: Lab-Aids, Inc.
Lisa Kelp, Lab-Aids, Inc., Ronkonkoma, N.Y.
Experience two exemplary NGSS-focused activities from SEPUP that build up to MS-PS4-2. Anchored in the context of health issues around various types and levels of wave exposure, these workshop 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.
11:00–11:05 AM  Exhibits Opening/Ribbon-Cutting Ceremony

NSTA Exhibits Entrance, Hall H, Convention Center
Presider: Mary Gromko, NSTA President, Colorado Springs, Colo.
Welcoming Remarks: Tim Williamson, Chairperson, NSTA Los Angeles National Conference, and California State University, Long Beach
Musical Entertainment provided by Crescenta Valley High School Jazz Combo, under the direction of Mathew Schick, Instrumental Music Director
Special Guests: Carolyn Hayes, NSTA Retiring President, and Retired Educator, Greenwood, Ind.; David Crowther, NSTA President-Elect, and University of Nevada, Reno; Christine Anne Royce, NSTA President-Elect-Elect, and Shippensburg University, Shippensburg, Pa.; Jessica L. Sawko, CSTA Executive Director, Folsom, Calif.; Camille Stegman, NSTA Director, District XVI, and Storey County Schools, Virginia City, Nev.; David L. Evans, NSTA Executive Director, Arlington, Va.; Therese Shanahan, Program Coordinator, NSTA Los Angeles National Conference, and University of California, Irvine; Susan Gomez Zwiep, Local Arrangements Coordinator, NSTA Los Angeles National Conference, and California State University, Long Beach; Jason Sheldrake, Assistant Executive Director, Sales, NSTA, Arlington, Va.

11:00–11:30 AM  Presentations

Teacher Researcher Day Session: Yes, I Will Fix Your Computer…and Much More! My Journey as a Technology Coach in a High School Science and Math Department
(Grades 9–12) Platinum Blrm. Salon D/Group 1, JW Marriott
Science Focus: GEN
Sarah English (@SChemistry; senglish@sweethomeschools.org), Sweet Home Senior High School, Buffalo, N.Y.
Gain a better understanding of the role of a technology coach and the beneficial impact on technology-enhanced learning experiences.

Teacher Researcher Day Session: Making Sense of Your Science Teaching Through Reflective Practice
(General) Platinum Ballroom Salon D/Group 2, JW Marriott
Science Focus: GEN
Jeremy Ervin (@drjervin; jervin62@gmail.com), Cedarville University, Cedarville, Ohio
Use effective inquiry-based reflection strategies to make sense of science teaching practices and student learning.

11:00 AM–12 Noon  Presentations

Teacher Researcher Day Session: Culturally Responsive Mentoring: Building Pedagogical Capacity Through Teacher Inquiry in Chicago Science Classrooms
(Grades 9–12) Platinum Blrm. Salon D/Group 4, JW Marriott
Science Focus: GEN, SEP2, SEP3, SEP8
Brezhnev Batres, Benito Juarez Community Academy, Chicago, Ill.
Mindy Chappell (@femme_instruite; mindyjc2@gmail.com), North Grand High School, Chicago, Ill.
Nina Hike (ninahike@uic.edu), Marie Sklodowska Curie Metro High School, Chicago, Ill.
Chicago science teachers share findings from their teacher inquiries related to being responsive to urban communities and NGSS practices, and mentoring science teacher candidates.

NMEA-Sponsored Session: Sharks4Kids
(General) Petree Hall D, Convention Center
Science Focus: ETS2, LS, CCC, SEP
Leann Winn (@Sharks4kids; @JrzyShark; leann@shark4kids.com), New Jersey Institute of Technology, Newark
Sharks4Kids brings together scientists, educators, conservationists, and professional videographers in creating the next generation of shark advocates through education, outreach, and adventure.
**11:00 AM–12 Noon Exhibitor Workshops**

**Argumentation in the STEM Classroom**  
(Grades K–12)  
150 AB, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: STEMscopes™ from Accelerate Learning  
Heather Wilde, STEMscopes from Accelerate Learning, Houston, Tex.  
Join us as we model successful implementation of consensus building through discourse and argumentation, which are practices at the heart of meeting the needs of diverse learners and creating a student-centered learning environment. When teachers in a STEM classroom consciously reduce teacher talk and increase the purposeful student talk, student achievement gains are noted.

**Essential Chemistry: Stoichiometry and Limiting Reactants with Gas Laws**  
(Grades 9–12)  
405, Convention Center  
Science Focus: PS1.A, PS1.B, CCC1, CCC5, SEP4, SEP5  
Sponsor: PASCO scientific  
Tom Loschiavo (loschiavo@pasco.com), PASCO scientific, Roseville, Calif.  
Jason Lee (mrlee3@att.blackberry.net), East Georgia State College–Statesboro  
How can you tell when a reaction is complete? Why doesn’t more reactant always lead to more product? Help students develop a better understanding of stoichiometry and limiting reactants through this hands-on activity using household chemicals and a wireless pressure sensor.

**STEM Activities: Crash Barrier Design and Engineering Challenge**  
(Grades 6–12)  
407, Convention Center  
Science Focus: ETS1, PS2.A, PS2.B, CCC1, CCC2, CCC3, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8  
Sponsor: PASCO scientific  
Brett Sackett (sackett@pasco.com), PASCO scientific, Roseville, Calif.  
Thomas Hsu (thsu@pasco.com), Ergopedia, Inc., Cambridge, Mass.  
Do your students struggle to understand the relationship between momentum and impact forces? Real-time measurements of collisions can drive home the difference! Help students move beyond observation by designing a crash barrier to minimize the maximum collision force of a moving cart and improve your design based on data analysis.

**Exploring the Genetics of Taste: SNP Analysis of the PTC Gene Using PCR**  
(Grades 9–College)  
410, Convention Center  
Science Focus: LS  
Sponsor: Edvotek, Inc.  
Danielle Snowflack (info@edvotek.com), Brian Ell (info@edvotek.com), and Tom Cynkar (info@edvotek.com), Edvotek Inc., Washington, D.C.  
Explore the relationship between genotype and phenotype using Phenylthiocarbamide (PTC). Some think PTC tastes bitter, while others find it tasteless. The ability to taste PTC has been linked to variations in a taste receptor gene. In this workshop, you will learn to use PCR to distinguish between PTC alleles. Receive a free gift for attending.

**Project-Based Learning + NGSS = Active Chemistry**  
(Grades 9–12)  
501 AB, Convention Center  
Science Focus: PS  
Sponsor: It’s About Time  
Develop movie special effects; design an art object for museum display; create a game to teach the periodic table. Project-Based Learning is all the rage now. It motivates students and challenges them to apply their physics knowledge. The PBL lessons can simultaneously reflect the NGSS. Active Chemistry has been incredibly successful in U.S. schools and is now being adapted overseas. Join the fun and find out how to make your curriculum even better.

**K’NEX DNA Structure, Replication, and Transcription: An Expertly Engineered Molecule in Living Things**  
(Grades 9–12)  
510, Convention Center  
Science Focus: LS1  
Sponsor: K’NEX Education  
Robert Jesberg (rjesberg@knex.com), K’NEX Education, Hatfield, Pa.  
No more gumdrops and toothpicks! Build K’NEX DNA models to explore structure, replication, and transcription. Translate mRNA strands to determine amino acid sequences. Assume the role of enzymes as you manipulate models, complete DNA processes, and explore the history of DNA’s discovery. A hands-on/minds-on standards-based STEM program.
11:05 AM–6:00 PM  Exhibits

Did you know that NSTA offers exclusive exhibit hall hours today from 11:05 AM to 12:30 PM? During these hours there are no teacher sessions scheduled and it’s a perfect time to visit the exhibits and discover all the products and services leading science education companies and organizations have to offer. You’ll discover something new and exciting in the world of science teaching. Some exhibitors will offer materials for sale.

11:30 AM–12 Noon  Presentations

Teacher Researcher Day Session: Do Novice Elementary Teachers See Scientists in Their Classroom?
(Grades K–8)  Platinum Blrm. Salon D/Group 1, JW Marriott
Science Focus: GEN
Kathryn Watkins, The University of New Mexico, Albuquerque
Novice elementary teachers in a science methods course draw pictures of a scientist and then pictures of their students.

Teacher Researcher Day Session: “Teachers Training Teachers” as a Scenario for the Integration of Research Skills into the Trainers’ Educational Practices
(Grades 9–College)  Platinum Blrm. Salon D/Group 2, JW Marriott
Science Focus: GEN
Myrna Hernández Nieves (mirnahdez@hotmail.com), Minnucette Rodríguez (mnrhmonarca@gmail.com), María Ortiz-Hernández (marialmmmC8@yahoo.com), Yamily Colón (yamilycolon@hotmail.com), and Amabel Soto (amabelsoto@yahoo.com), Center for Science and Math Research (CSMER), University of Puerto Rico at Río Piedras, and Puerto Rico Dept. of Education, San Juan
Presider: Marta Fortis (fortismarta@gmail.com), Center for Science and Math Research (CSMER), University of Puerto Rico at Río Piedras
Math and Science Master teachers present their findings on the impact of their training and mentoring to other teachers in an M and S integrated PD program.

12 Noon–1:30 PM  Exhibitor Workshops
Quick and Easy PCR in 90 Minutes
(Grades 9–College)  150C, Convention Center
Science Focus: LS1, LS3, PS1, CCC1, CCC4, SEP4
Sponsor: The MiniOne Systems
Richard Chan (info@theminione.com), The MiniOne Electrophoresis, San Diego, Calif.
Learn to conduct a PCR experiment in your classroom with the new super fast and simple-to-use MiniOne PCR System. Increase engagement and learning by providing an exciting hands-on experience where students set up PCR reactions and monitor progress in real-time via a tablet.

Riding the Wave with TCI
(Grades K–5)  153A, Convention Center
Science Focus: PS4
Sponsor: TCI
Christy Sanders, TCI, Mountain View, Calif.
With TCI’s Bring Science Alive! programs, participants will be fully immersed in a lesson learning the ideas of science by actually “doing” science rather than just memorizing facts. We will use a powerful online learning system to develop a model of waves to describe patterns in terms of amplitude and wavelength. Experience learning from a student’s perspective. After completing this workshop, you will have the tools to implement hands-on in-class investigations that work seamlessly with interactive technology.
DNA with a Data Twist: Modeling DNA Structure/Replication and Bioinformatics
(Grades 9—College) 153B, Convention Center
Sponsor: 3D Molecular Designs
Gina Vogt (gina.vogt@3dmoleculardesigns.com) and Margaret Franzen (franzen@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Engaging physical models allows students to explore DNA structure and replication and model the classic Meselson-Stahl experiment. A beta globin gene map introduces students to bioinformatics and lets them “discover” introns. These activities allow students to discover concepts, and then learn terminology in an approach that really sticks!

PEASE in Our Time: Memory Lanes of the Brain and NGSS
(Grades K—6) 301 AB, Convention Center
Science Focus: GEN, NGSS
Sponsor: Delta Education/School Specialty Science
John Cafarella, Retired Teacher/Administrator, Canadensis, Pa.

Retrieved memories are the only proof we have that learning has taken place. Where is knowledge/understanding stored in the brain? How does it get in? How does it get out? We will look at the procedural, episodic, automatic, semantic, and emotional lanes of the brain through an NGSS/Delta lens.

Model Elementary Science Implementation
(Grades K—5) 303 AB, Convention Center
Science Focus: GEN, NGSS
Sponsor: Delta Education/School Specialty Science—FOSS
Brian Campbell, The Lawrence Hall of Science, University of California, Berkeley

Hear from a panel of administrators and lead teachers about successful models for transforming instruction in elementary schools using science as the core. FOSS serves as the framework for the design of a science-centered curriculum for all students. Partnerships and professional development are part of the plan.

Solving the Mystery of STEM Using Forensic Science
(Grades 6—12) 304 AB, Convention Center
Science Focus: GEN
Sponsor: Frey Scientific/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Kat Mills, School Specialty Science, Rosharon, Tex.

Conduct STEM-focused beginning forensic activities that connect scientific investigations to analysis and investigative skills. Solve “cases” involving fingerprinting, blood spatter, and document and fabric analysis. Use a digital learning platform with simple supplies to apply basic mathematic principles. Integrate reading and writing strategies. Door prizes! Free STEM resources provided.

Make Science Come to Life Through Modeling with LEGO® Education
(Grades 1—4) 304C, Convention Center
Science Focus: ETS
Sponsor: LEGO Education
Jenny Nash, LEGO Education, Billund, Jylland, Denmark

Looking for engaging ways to model sciences and teach computational thinking? See how programming can bring modeling to life in your science classroom, while teaching NGSS requirements including engineering. During this session, you will build a science model using LEGO bricks, motors, and sensors, and program that model to complete tasks.

Carolina’s Young Scientist™ Dissections with Carolina’s Perfect Solution® Specimen
(Grades K—6) 306 AB, Convention Center
Science Focus: LS, CCC, SEP
Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner
Transform your students into young scientists when you bring these simple hands-on dissections to your classroom! We will guide you through the dissections of a squid and a frog, promoting classroom discussions of easily observable adaptations and the relationship between structure and function.
They Come in Pairs: Addressing Student Misconceptions About Chromosomes
(Grades 6–12) 308 AB, Convention Center
Science Focus: LS, CCC, SEP
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Understanding the stages of meiosis and clarifying chromosome behavior has always been a challenge for students. What if those concepts were as easy to understand as folding laundry? This workshop will help you identify and address student misconceptions by using ChromoSocks®. Presented in partnership with HudsonAlpha.

NGSS: How Do We Know It When We See It?
(Grades K–8) 309, Convention Center
Science Focus: GEN, NGSS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
How does NGSS change the instructional landscape of a science classroom? How is it different? How do principals/instructional leaders/coaches know NGSS is being implemented in their classrooms? Engage in examples of the instructional shift through NGSS-designed lessons. Leave with a tool for use by instructional leaders in classroom visits.

Chemistry with Vernier Using Chromebook
(Grades 9–College) 402A, Convention Center
Science Focus: ETS2, PS1, PS3, PS4, SEP3, SEP4,
Sponsor: Vernier Software & Technology
Nüsret Hisim (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Use Vernier sensors with Chromebooks to conduct hands-on chemistry experiments such as “Boyle’s Law” and “Beer’s Law.” See a demonstration of our new Go Direct wireless and USB sensors that connect directly to Chromebooks—no interface needed. Explore our wide range of digital tools that promote student understanding of chemistry concepts.

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Physics with Vernier  
(Grades 9—College)  402B, Convention Center  
Science Focus: ETS2, PS2, PS3, PS4  
Sponsor: Vernier Software & Technology  
Frances Poodry (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.  
Use Vernier sensors to conduct physics experiments from our lab books in this engaging hands-on workshop. Collect and analyze data on LabQuest 2 and computers. See a demonstration of our new Go Direct wireless and USB sensors that connect directly to computers, Chromebooks, and mobile devices—no interface needed.

Year-Round Solutions for Success in AP Chemistry from Flinn Scientific  
(Grades 9—College)  403A, Convention Center  
Science Focus: PS  
Sponsor: Flinn Scientific, Inc.  
Joan Berry (jberry@flinnsci.com) and Jillian Saddler (jsaddler@flinnsci.com), Flinn Scientific, Inc., Batavia, III.  
Join Flinn as we share AP Chemistry demonstrations, labs, inquiry activities, and more! Come learn about new ways to engage your advanced students. Our activities are aligned to the learning objectives and skills your students need to be successful. Also, discover the benefits of preparing students for the first day of class with FlinnPREPTM: a new online review of foundational chemistry concepts. Handouts and door prizes. AP is a registered trademark of the College Board.

HHMI BioInteractive Resources Exploring Human Skin Color and Polygenic Inheritance  
(Grades 9—College)  403B, Convention Center  
Science Focus: LS3  
Sponsor: HHMI BioInteractive  
Robert Kuhn (ucapugulator@gmail.com), Centennial High School, Roswell, Ga.  
Helen Snodgrass (helen.snodgrass@yesprep.org), YES Prep North Forest, Houston, Tex.  
Dive into an authentic example of polygenic inheritance by studying the great variation in human skin color. We will explore activities related to the short film The Biology of Skin Color that use evidence and mathematical modeling to explain how SNPs are used to study genes and phenotypes in polygenic traits.

GMOs: A Hot Topic in the Media and Classroom: Monsanto Panel Discussion and Presentation  
(General)  408A, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: Monsanto Co.  
Valerie Bayes, Leonard Herbert, and Brian Gardunia, Monsanto Co., Saint Louis, Mo.  
Monsanto Company scientists will discuss what a GMO is and isn’t, how these innovations are tested, the limitations and benefits of the technology, and where biotechnology is used outside of agriculture today. Hear how Monsanto is partnering with others in the agriculture industry to help farmers continue to grow more food for a growing population while remaining sustainable and environmentally conscious. Whether you host GMO debates in the classroom, cover biotechnology in your curriculum, or have questions—we want to make our STEM experts available to you.

Common Misconceptions About Engineering in the NGSS  
(Grades K—12)  408B, Convention Center  
Science Focus: ETS1, SEP1, SEP3, SEP6  
Sponsor: Houghton Mifflin Harcourt  
Cary Sneider (carysneider@gmail.com), Portland State University, Portland, Ore.  
Learn from a leader of the engineering team who helped develop the Framework and the NGSS to gain insights into engineering and the NGSS. He will empower you to understand the nature and application of engineering principles to more effectively engage your students in engineering activities and practices that meet the NGSS.

Space Docking Failure: Phenomena, 3D Instruction, and Amplify Science for Grades 6—8  
(Grades 6—8)  409 AB, Convention Center  
Science Focus: PS2, SEP7  
Sponsor: Amplify  
Suzanna Loper (amplifyscience@berkeley.edu) and Carissa Romano (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.
Lights, Camera, Action Potentials!
(Grades 6–12) 503, Convention Center
Science Focus: LS
Sponsor: Ward’s Science
Liam Casey, VWR Science Education, Rochester, N.Y.
Twenty percent of the world will have a neurological disorder…and there are no cures! Experience simple yet powerful neuroscience kits, popularized through engaging TED TALKS videos, and help enlist the next generation of neuroscientists. Backyard Brains’ kits show students firsthand how the brain communicates with our senses, memories, and desires.

Smart Management of Water Resources Using TI Graphing Calculators and the TI-Innovator Hub
(Grades 6–12) 511 AB, Convention Center
Science Focus: ESS, LS
Sponsor: Texas Instruments
Fred Fotsch, Texas Instruments, Dallas
In this hands-on workshop, learn how to enable your students to apply programming skills and knowledge of the water cycle and photosynthesis to solve a real-world problem. Your students will be able to design a smart water management system by programming a TI graphing calculator to control a TI-Innovator Hub with attached motors and temperature, moisture, and humidity sensors.

Environmental Science: Explore Living Landscapes
(Grades K–5) 511C, Convention Center
Science Focus: LS2
Sponsor: TurfMutt
Ted Lattis, Scholastic Inc., New York, N.Y.
Superheroes TurfMutt & the Outdoor Powers are on a mission to teach the importance of living landscapes. Learn about the Scholastic-created environmental science program for grades K–5, play a fun eco-game with us, and meet the teacher who won $10,000 for her school’s green space!

Take Your Students on a Quest! A Real-World Problem-Based Learning Project That Incorporates All Three Dimensions of NGSS
(Grades K–8) 514, Convention Center
Science Focus: GEN, NGSS
Sponsor: Pearson
Experience a real-world Problem-Based Learning project that incorporates all three dimensions of the NGSS and immerses students in an environment of inquiry.

Introducing the Lab-Master®
(Grades 9–12) 518, Convention Center
Science Focus: PS
Sponsor: Lab-Aids, Inc.
Andrew Uy, Loyola High School of Los Angeles, Calif.
Open flame is no longer allowed in many classrooms but the solution should never be to eliminate student labs! This workshop focuses on the Lab-Master, an innovative device designed to minimize safety concerns. Recently contracted for all New York City public schools, the unit safely boils up to 50 mL of water in 3–5 minutes, contains a built-in RGB spectrophotometer, and includes temperature and voltage probes. Join us for a hands-on look at the Lab-Master and sample labs featuring its use.
Thursday, 12:30–1:00 PM  

Presentations

SCST-Sponsored Session: Changes in Students’ Perceptions and Motivation During Course-Embedded Freshman Research Experiences  
(College) Georgia I, JW Marriott  
Science Focus: GEN  
Donald French (dfrench@okstate.edu), Oklahoma State University, Stillwater  
This presentation summarizes progress in combining measures of motivation and perception of research processes to predict persistence and performance in research-oriented introductory classes.

Science Education, Multimodality, and Literacy: The Creation of Science Graphic Novelettes and the Literacy Connection  
(General) Platinum Ballroom Salon H, JW Marriott  
Science Focus: GEN, NGSS  
Alex Romagnoli (aromagno@monmouth.edu), Monmouth University, West Long Branch, N.J.  
Join me as I share research concerning interdisciplinary learning and collaboration through the creation of multimodal texts.

Classroom Procedures to Support Science Notebooks  
(Grades 2–12) Platinum Ballroom Salon J, JW Marriott  
Science Focus: GEN  
Mary Newell (mary.newell@alvord.k12.ca.us), Alvord Unified School District, Riverside, Calif.  
Engage in a set of classroom structures and procedures designed to make science notebooks efficient and effective learning tools. Topics will include notebook set-up, maintenance, and assessment.

Tales from the Front: Beginning Our Science Teaching Careers in the Era of NGSS  
(Grades 9–11) Plaza 2, JW Marriott  
Science Focus: PS  
Vito Dipinto (vdipinto@nl.edu), National Louis University at Wheeling, Ill.  
Andrew Bean (apbean@cps.edu), Dever Elementary School, Chicago, Ill.  
Frank Prill (frankprilljr@gmail.com), Bolingbrook High School, Bolingbrook, Ill.  
We will share the verities, vanities, and vulgarities of becoming secondary physical science teachers in the era of NGSS.

Viewing the Practices of Scientists and Engineers Through Three Spheres of Activity: The Importance of Evidence in Teaching Science  
(Grades K–8) 507, Convention Center  
Science Focus: GEN, SEP3, SEP4, SEP6, SEP8  
Aaron Isabelle (isabella@newpaltz.edu), SUNY New Paltz, N.Y.  
The work of scientists/engineers occurs in three spheres of activity: empirical inquiry, explanation, and evaluation. This presentation highlights evidence as essential to effective science teaching.

The Living Classroom: Turning Your Curriculum into an Outdoor Adventure Through Learning Gardens with STEM  
(Grades P–4) Kentia Hall H, Convention Center  
Science Focus: GEN  
Kristen Scrivens (kscrivens@paramus.k12.nj.us), Stony Lane School, Paramus, N.J.  
Find out how to turn your current curriculum into learning opportunities in an outdoor laboratory. Promote physical activity and quality outdoor experiences while teaching students to nurture and care for other living things. Enhance connections between disciplines through outdoor learning such as science, math, reading, social studies, and writing.

Using Google My Maps to Determine Patterns of Earthquakes  
(Grades 6–12) Kentia Hall P, Convention Center  
Science Focus: ESS2.B, SEP4  
Justin Glen (jglen717@gmail.com), Apponequet Regional High School, Lakeville, Mass.  
Learn to use Google My Maps to interactively plot crustal activity, import your own datasets, discuss its strengths and limitations, and view student work samples.
12:30–1:30 PM  **Featured Presentation**  
Classroom Assessment and the NGSS  
*(General)*  
Petree Hall C, Convention Center  
Science Focus: GEN, NGSS  

Speaker sponsored by Shell  

Heidi Schweingruber  
(hschweingruber@nas.edu), Director, Board on Science Education, The National Academies of Sciences, Engineering, and Medicine, Washington, D.C.  


The NGSS and standards like them are leading to major changes in classroom instruction. A new report from The National Academies of Sciences, Engineering, and Medicine’s Board on Science Education provides guidance to teachers and professional development providers about how formative and summative classroom assessments will also need to change. Join Heidi as she highlights the key ideas in the report and explores ways that it can be used in professional development with K–12 teachers.

Heidi Schweingruber is director of the Board on Science Education at the National Research Council (NRC). She has been involved in many of the major projects of the board since it was formed in 2004. She co-directed the study that resulted in the report A Framework for K–12 Science Education. In addition, Heidi has co-authored two books that translate findings from NRC reports for a broader audience—Ready, Set, Science! Putting Research to Work in K–8 Science Classrooms and Surrounded by Science.

Prior to joining the NRC, Heidi worked as a senior research associate at the Institute of Education Sciences in the U.S. Department of Education, where she administered the preschool curriculum evaluation program and a grant program in mathematics education.

12:30–1:30 PM  **Presentations**  
ASTC-Sponsored Session: Collaborations! Professional Development Connecting Local Resources with Teachers  
*(Grades 3–12)*  
Atrium 3, JW Marriott  
Science Focus: GEN, INF, SEP  

Linda McIntosh (@MITSinc86), Brianna Wilkinson (@MITSinc86), and Sandra Ryack-Bell (sryackbell@mits.org), MITS, Inc. (Museum Institute for Teaching Science), Quincy, Mass.  

William Morton (william_morton@nps.gov), National Park Service, Lowell National Historical Park, Lowell, Mass.  

Explore models for partnerships between informal/formal educators that leverage organizations’ diverse areas of expertise and local connections to create successful inquiry-based professional development for teachers.

Science Online?! How Do You Do That?  
*(Grades 7–College)*  
Diamond Ballroom Salon 2, JW Marriott  
Science Focus: GEN, SEP8  

Amy Smith (asmith7@kaplan.edu), Annissa Furr (afurr@kaplan.edu), and Tyra Hall-Pogar (thall-pogar@kaplan.edu), Kaplan University, Houston, Tex.  

Members of the Kaplan University Science Department will discuss the integration of virtual labs, real-world problems, and multiculturalism and diversity concepts into science classes to engage learners.

NSTA Press® Session: Uncovering Elementary Students’ Ideas About Science Through Literacy Capacities  
*(Grades K–5)*  
Diamond Ballroom Salon 3, JW Marriott  
Science Focus: GEN, SEP  

Page Keeley (@CTSKeeley; pagekeely@gmail.com), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.  

Joyce Tugel (jtugel@gmail.com), Maine Mathematics and Science Alliance, Augusta  

Experience examples of formative assessment probes and techniques that uncover what students are really thinking about NGSS concepts and core ideas in science through use of the literacy capacities of speaking, listening, and language.
**NSELA-Sponsored Session: Tools for Science Leaders**  
*Grades P–12*  
Diamond Ballroom Salon 6, JW Marriott  
Science Focus: GEN  
**Keri Randolph** (@keri_randolph; @nselascience; (keri@ gmail.com), Hamilton County Dept. of Education, Chattanooga, Tenn.  
**Bob Sotak** (bobsotak@gmail.com), Science/STEM Education Consultant, Edmonds, Wash.  
Come learn about the various tools and strategies that science leaders can use to enhance teaching and learning in their outreach.

**Deep Brain Stimulation: Phenomena-Driven Instruction and Event-Based Science Linking Biomedical Engineering and Neuroscience to Teach the Nervous System**  
*Grades 7–12*  
Diamond Ballroom Salon 8, JW Marriott  
Science Focus: ETS2, LS1, CCC2, CCC6, SEP1, SEP6, SEP7, SEP8  
**Kevin Fleming** (kevin.james.fleming@gmail.com), Area Cooperative Educational Services (ACES), Hamden, Conn.  
Learn about deep brain stimulation (used to treat movement disorders) as a phenomena and Event-based Science as a way to drive student learning and integrate science and engineering in a unit on the nervous system.

**CSSS-Sponsored Session: Using the Crosscutting Concepts as the Basis for Competency-Based Learning**  
*Grades 5–12*  
Olympic 3, JW Marriott  
Science Focus: GEN, CCC  
**Joanna Bruno** (jotab12@yahoo.com), Colorado Dept. of Education, Denver  
Many Colorado school districts are creating new accountability systems using competency-based learning. Come learn how using the crosscutting concepts as the basis for competency can illuminate learning science in many engaging and dynamic ways.

**AMSE-Sponsored Session: Opening the Gateway to Success Using Case Studies to Help Implement Scientific Concepts for Diverse Learners**  
*Grades 10–12*  
Platinum Ballroom Salon A, JW Marriott  
Science Focus: GEN, NGSS  
**Chelia McCoo Dogan** (@CheliasTwins09; crmcco@ ga.aliefisd.net), Elsik High School, Houston, Tex.  
Grow in your understanding of the relevance and implementation of NGSS with the use of case studies as a powerful tool to enhance scientific instruction with diverse learners.

**Teacher Researcher Day Session: Assessing Changes in Student Understanding of the Nature of Science**  
*Grades 9–College*  
Platinum Blrm. Salon D/Group 1, JW Marriott  
Science Focus: GEN, NGSS  
**Jeff Thomas**, Central Connecticut State University, New Britain  
Hear how students complete two 12-hour science instructional units over the course of a semester to improve their understanding of the nature of science.

**Teacher Researcher Day Session: Urban Youth as Producers of Knowledge and Culture**  
*Grades 9–10*  
Platinum Blrm. Salon D/Group 3, JW Marriott  
Science Focus: GEN, NGSS  
**Alejandra Frausto** (afrausto@cps.edu), Chicago (Ill.) Public Schools  
Explore examples of how students have been engaged in building and applying critical scientific literacy to claim their power as producers of knowledge and culture.

**Teacher Researcher Day Session: Helping Preservice Teachers Understand and Use the NGSS**  
*General*  
Platinum Ballroom Salon D/Group 4, JW Marriott  
Science Focus: GEN, NGSS  
**Deborah Roberts-Harris** (drober02@unm.edu), The University of New Mexico, Albuquerque  
Discussion centers on how preservice teachers approach using the NGSS through lesson analysis and then teaching. Come with your questions and suggestions!

**Portfolios to Websites: The Ins and Outs of Showcasing Student Work**  
*Grades 9–12*  
Plaza 1, JW Marriott  
Science Focus: ETS2  
**Sarah Tierney** (sarah_tierney@brewsteracademy.org), Brewster Academy, Wolfeboro, N.H.  
Come see how to showcase student work through the use of technology by creating a website that allows students a portfolio of their work.

**The Power of Picture Books to Engage Girls in STEM**  
*Grades P–5*  
501C, Convention Center  
Science Focus: GEN, SEP8  
**Andrea Beaty** (@AndreaBeaty), Author, Naperville, Ill.  
**Ashley Spires** (@ashleyspires), Author and Illustrator, Delta, B.C., Canada  
**Fiona Robinson** (@FionaRstudio; fiona@nyc.rr.com), Author and Illustrator, Brooklyn, N.Y.  
Join us for a panel discussion with picture book authors/illustrators of Rosie Revere, Engineer; Ada Twist, Scientist; The Most Magnificent Thing; and Ada’s Ideas.
Designing Physical Science Learning Centers for Inclusive Early Childhood Classrooms
(Grades P–2) 502B, Convention Center
Science Focus: PS
Mary Donegan-Ritter, University of Northern Iowa, Cedar Falls
Early childhood educators demonstrate how to provide universal design STEM investigations that are interesting, rigorous, and developmentally appropriate. ALL children can benefit from STEM learning.

Integrating Community Partnerships to Enhance STEM and PBL
(Grades 8–12) 504, Convention Center
Science Focus: GEN
Alicia Pressel, Creekside High School, Saint Johns, Fla.
The Academy of Engineering and Environmental Sciences is a four-year STEM curriculum that integrates Project-Based Learning with community business partner involvement.

Extending the Meaning of Access in Science: Co-Designing Curriculum with Students in the Margins
(Grades 7–12) 506, Convention Center
Science Focus: LS2.A
Wardell Powell (wapowell@umass.edu) and Christina Bosch (cbosch@umass.edu), UMass Amherst, Mass.
Presider: Michael Krezmien (krezmien@gmail.com), UMass Amherst, Mass.
Learning is improved when “access to the curriculum” for exceptional students is extended to include their access and input into the curriculum development process.

NSTA YOUNG PROFESSIONAL AND NEW TEACHER RECEPTION

Preservice and new teachers are invited to attend this fun and interactive networking session. The reception will include short presentations offering tips on how to excel in the classroom from both new and preservice teachers as well as NSTA Student Chapter leaders. An overview on NSTA resources geared to preservice and new teachers will also be presented. Refreshments and hors d’oeuvres will be served as you network with your peers.

Thursday, March 30
4:30–6:00 PM
JW Marriott Hotel
Diamond Ballroom Salon 6

CANCELED
What Constitutes High-Quality Discussion in a Science Classroom?
(Grades 3–5)  513, Convention Center
Science Focus: GEN, NGSS
Emily Weiss (weisse@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley
Watch and analyze several video examples to understand what constitutes high-quality discussion in the science classroom for students in grades 3–5. Appropriate for teacher leaders, administrators, and PD designers/providers.

Enhancing Your Physics Course with POGIL: Increasing Student Understanding and Concept Retention in High School Physics
(Grades 9–12)  Kentia Hall O, Convention Center
Science Focus: PS
Julie Mills (jmills@freelake.org), Apponequet Regional High School, Lakeville, Mass.
Learn the whys and hows of the Process-Oriented Guided Inquiry Learning (POGIL) process in physics. Leave with resources to integrate POGILs in your classroom.

12:30–1:30 PM  Hands-On Workshops
Incorporating NGSS Science and Engineering Practices in the Context of 3D Learning Using the NGSS ASET Rubrics
(Grades 6–12)  Diamond Ballroom Salon 7, JW Marriott
Science Focus: GEN, SEP
Corinne Lardy (corinne.lardy@csueastbay.edu), Michelle Sinapuelas (michelle.sinapuelas@csueastbay.edu), and Michele Korb (michele.korb@csueastbay.edu), California State University, East Bay, Hayward
Explore how to unpack, target, and apply specific elements of the NGSS science and engineering practices in example 3D lessons using Next Generation Alliance for Science Educators Toolkit rubrics.

ASTE-Sponsored Session: Engaging Students with Dynamic Models: Peruvian Food Chain Jenga
(Grades 5–12)  Georgia 2, JW Marriott
Science Focus: LS2, INF, SEP2
Erin Pearce (erin.pearce@tcu.edu), Beau Hartweg (b.b.hartweg@tcu.edu), and Ummuhan Malkoc (u.malkoc@tcu.edu), Texas Christian University, Fort Worth
This Jenga© activity demonstrates how models can be used to facilitate learning. Attendees will engage in the creation and destruction of an aquatic food chain.

Exploring Chemicals from a Green Perspective
(Grades 8–College)  Gold Ballroom Salon 1, JW Marriott
Suzanne Nesmith (suzanne_nesmith@baylor.edu), Baylor University, Waco, Tex.
Participate in “green” lab activities linking chemical toxicity, safety data sheets, green label claims, and evidence-based claims.

Planning and Designing Safe and Sustainable Science Facilities That Meet the NGSS (Science Facilities 101)
(General)  Platinum Ballroom Salon B, JW Marriott
Science Focus: GEN, NGSS
Sandra West (sw04@txstate.edu), Texas State University, San Marcos
Juliana Texley (@JulianaTexley; texlej1@cmich.edu), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant
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.
Integrate Science and Technology in the Classroom
(Grades 3–12) Platinum Ballroom Salon C, JW Marriott
Science Focus: GEN, SEP
Delia Bayna (dbayna@dsdmail.net), Canyon Creek Elementary School, Farmington, Utah
Learn 10 ways to integrate science and technology in your classroom next week. This session will include iPad apps, websites, and demos. BYOD to participate.

Preparing an NGSS Implementation Action Plan
(Grades P–12) Platinum Ballroom Salon E, JW Marriott
Science Focus: GEN, NGSS
Anthony Quan (@LacoeQuan; anthony.p.quan@gmail.com), Los Angeles County Office of Education, Downey, Calif.
John Spiegel (@sdngss; john.spiegel@sdcoe.net), San Diego County Office of Education, San Diego, Calif.
Find out how to develop your school or district NGSS Implementation Action Plan with county office science coordinators. We will share how we have assisted districts, both large and small, to prepare for NGSS implementation.

More than Airplanes: Models in the NGSS
(Grades 9–12) Plaza 3, JW Marriott
Lesley Shapiro (lesley.shapiro@ppsd.org), Classical High School, Providence, R.I.
Rudolf Kraus (rkraus@ric.edu), Rhode Island College, Providence
The NGSS asks us to do more with models in both frequency and complexity. Learn what we’re doing, and adapt it to your classroom.
**Success for All, Takes Us All**  
(General) 152, Convention Center

**Science Focus:** GEN, NGSS

**Alison Thalmann** (@althalmann77; alison.nsta@gmail.com), Senior Associate, Professional Development Relationships, NSTA, Arlington, Va.

**Elida Abramyan** (exa7219@lausd.net), Hooper Avenue Elementary School, Los Angeles, Calif.

**Amy Argento** (scienceresourceteachers@tusd.org), **Tera Black** (scienceresourceteachers@tusd.org), and **Marissa Stillittano** (scienceresourceteachers@tusd.org), and Torrance (Calif.) Unified School District

**Polina Babina** (polina@opened.com), OpenEd, an ACT company, San Jose, Calif.

**Greg Beutler** (greg@techscool.org), TechsCool.org, Huntington Beach, Calif.

**Maria Cieslak** (myciesla@interact.ccsd.net), Clark County School District, Las Vegas, Nev.

**Lorenza Della Donna**, Verbun Dei High School, Los Angeles, Calif.

**David Garringer** (dag8819@lausd.net), Stanley Mosk Elementary School, Winnetka, Calif.

**Dean Gilbert** (gilbert_dean@me.com), EDU Consulting LLC, Huntington Beach, Calif.

**Josephine Golcher** (jgolcher@rosaryacademy.org), Rosary Academy, Fullerton, Calif.

**Pam Johnson** (pamjohnson@ecosinstitute.com), Emerald Cove Outdoor Science Institute, Green Valley Lake, Calif.

**Sean Kane** (skane@hlpusd.k12.ca.us), Los Altos High School, Hacienda Heights, Calif.

**Anita Kreide** (akreide@lmu.edu), Loyola Marymount University, Los Angeles, Calif.

**Lou Loftin** (lloftin@washoeschools.net), Nevada’s Northwest Regional Professional Development Program, Reno

**Morris McCormick** (morris.mccormick@armintaes.net), Arminta Street Elementary School, North Hollywood, Calif.

**Lisa Nyberg** (lryberg@csufresno.edu), California State University, Fresno

**Jessica Sawko** (jessica@cascience.org), California Science Teachers Association, Folsom

**Henri Shimojo** (henri.shimojyo@ucr.edu) and **Maria Simani** (maria.simani@ucr.edu), University of California, Riverside

**Yamileth Shimojyo** (yshimojyo@coe.us), Riverside County Office of Education, Murrieta Office, Murrieta, Calif.

**Rachel Solis** (rachel.solis@lego.com), LEGO® Education, Boston, Mass.

**Scott Spector** (sspector@sbceo.net), Santa Barbara County Education Office, Santa Barbara, Calif.

**Virginia (Gini) Oberholzer Vandergon** (virginia.vandergon@csun.edu), California State University, Northridge

**Anne Marie Wotkyns** (awotkyns@lausd.net), Kittridge Elementary School, Van Nuys, Calif.

**Sandra Yellenberg** (sandi_yellenberg@sccoe.org), Santa Clara County Office of Education, San Jose, Calif.

With pressure on teachers and districts for education improvements and implementation of the NGSS, now more than ever, teacher collaboration is needed.
High-Tech and Low-Tech Strategies for Science and Literacy
(Grades 4–College) 502A, Convention Center
Science Focus: GEN, SEP1, SEP2, SEP4, SEP8
Michelle Joyce (@awesomescience; AwesomeSTEM@gmail.com), Palmetto Ridge High School, Naples, Fla.
Have your English language learner and low achieving students successfully navigate scientific vocabulary, formal language in reporting, as well as reading complex nonfiction text. Good teaching practices for ALL students.

Zombies in the Neighborhood? No Worries. STEM Them!
(Grades 6–College) 515B, Convention Center
Science Focus: GEN
Jeffrey Lukens (jeffreylukens0613@gmail.com), Sioux Falls (S.Dak.) School District
Use the “Zombie Craze” to make STEM become “un-dead” in your science classroom! This is not only a hands-on session, but a brains-on session, as well!

Scientific Drawing with Elementary Students
(Grades P–5) Kentia Hall A, Convention Center
Science Focus: GEN, INF, SEP
Jenny Flowers (jflowers@fieldmuseum.org) and Kyla Cook (kcough@fieldmuseum.org), The Field Museum, Chicago, Ill.
Maggie Augustinsky, Northwestern University, Evanston, Ill.
Experience how to use scientific drawing as a strategy to engage elementary students in the NGSS science practices.

Using Integrated (NGSS/CCSS) Project-Based Learning to Support Modeling in Elementary Science Classrooms
(Grades 3–5) Kentia Hall B, Convention Center
Science Focus: GEN, NGSS
Deborah Peek-Brown (dpbrown@msu.edu), Joseph Krajcik (@krajcikjoe; krajcik@msu.edu), and Kellie Finnin (cumni338@su.edu), CREATE for STEM Institute, Michigan State University, East Lansing
Emily C. Miller (emilycatherine329@gmail.com), Madison (Wis.) Metropolitan School District
Explore integrated project-based units that use modeling practices to promote three-dimensional learning in elementary science integrating literacy, mathematics, and learning technologies.

Science Practices Using Math, Literature, and, YES, Even Diapers!
(Grades K–6) Kentia Hall C, Convention Center
Science Focus: GEN, SEP
Sandra Lampley (sandra.lampley@uah.edu) and Frances Hamilton (franceshamilton87@gmail.com), The University of Alabama in Huntsville
Join us for a hands-on exploration that is sure to engage you in lessons that integrate science, language arts, mathematics, and social studies.

Making Claims About Design Solutions to Mother Nature’s Wrath
(Grades 3–5) Kentia Hall D, Convention Center
Science Focus: ESS3.B, ETS1, CCC3, CCC6, SEP2, SEP4, SEP7
Rebecca McDowell (@BeTheChnge; beckymcdowell@gmail.com), Barrington (Ill.) 220 School District
Investigate structural and material properties and then plan and build a structure to minimize hail damage of an apple orchard.

Fun with Bubbles, Inquiry in the Elementary Science Classroom: Fostering Child-Led Discovery
(Grades P–6) Kentia Hall E, Convention Center
Science Focus: GEN, SEP3, SEP4, SEP5, SEP8
Leana Peltier (lpeltier42@gmail.com), Sleepy Hollow High School, Tarrytown, N.Y.
Discover how to navigate scientific investigations. An inquiry activity will highlight effective teaching and learning and the connection to NGSS.

Get Out! Strategies for Effective Outdoor Learning
(Grades P–5) Kentia Hall F, Convention Center
Science Focus: GEN, INF, NGSS
Kelly Shea (@kellyshea18; @gemsnet10; kellyshea@uri.edu) and Caroline Stabile (@gemsnet10; stokbridge@uri.edu), GEMS-Net, The University of Rhode Island, Kingston
Andrea Stein (astein@rwzoo.org), Roger Williams Park Zoo, Providence, R.I.
Erica Beck Spencer (ebspencer@berkeley.edu), University of California, Berkeley
Develop effective outdoor pedagogy by engaging in an outdoor life science lesson. Find out how informal education partners help us bring three-dimensional learning to life outside!
Teaching Crosscutting Concepts Through Inquiry and English Language Arts in Elementary Classrooms
(Grades P–5) Kentia Hall G, Convention Center
Science Focus: GEN, CCC
Judith Lederman (ledermanj@iit.edu), Norman Lederman (ledermann@iit.edu), and Selina Bartels (selina.bartels@uchicago.edu), Illinois Institute of Technology, Chicago
Engage in model lessons that integrate language arts with science content and practices to effectively teach NGSS crosscutting concepts.

Engineering Robotic Arms
(Grades 3–8) Kentia Hall J, Convention Center
Science Focus: ETS, SEP6
Kelli Mistretta (kmistret@ccisd.net) and Nicole Long (nicolelong@ccisd.net), Ed White Elementary School, El Lago, Tex.
Presider: Matthew Paulson (mpaulson@ccisd.net), Ed White Elementary School, El Lago, Tex.
Find out how to use cheap supplies to help students engineer various types of robotic arms to solve a task. Lesson plans, rubrics, and integration ideas will be shared.

More Games in Science Using CCSS and NGSS
(Grades 3–9) Kentia Hall K, Convention Center
Science Focus: GEN, INF
Judith Lucas-Odom (@Judith_Odom; judyps23@yahoo.com), Chester High School, Chester, Pa.
Help students make connections across the curriculum by designing and playing simple games!

Using a Web-Based Graphing Tool to Analyze and Interpret Local and National Weather and Climate Data for Patterns and Change
(Grades 6–9) Kentia Hall L, Convention Center
Science Focus: ESS2.C, ESS2.D, ESS3.D, CCC1, CCC2, CCC4, CCC5, CCC7, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP7
Matthew Mirabello (@MattMirabello; mmirabello@amnh.org) and Jay Holmes (@JholmesJay; jholmes@amnh.org), American Museum of Natural History, New York, N.Y.
Explore weather and climate data through an online graphing tool that simplifies data visualization so students can focus on analysis and interpretation. Local data available!

Infusing Literacy Standards into Science
(Grades 6–10) Kentia Hall N, Convention Center
Science Focus: GEN
Tammy Barnes (tamara.barnes@browardschools.com), Broward County Public Schools, Fort Lauderdale, Fla.
During this session, you will learn how to infuse student-centered literacy strategies into the science curriculum in order to increase student comprehension of science concepts.

Exploring Earth’s Energy Balance, Carbon Cycle, and Our Changing Atmosphere
(Grades 6–9) Kentia Hall Q, Convention Center
Science Focus: ESS, CCC, SEP
Lori Lambertson (llamberton@exploratorium.edu), Exploratorium, San Francisco, Calif.
Model Earth’s energy balance, explore the flows in the carbon cycle, and use NOAA data to graph changing carbon dioxide levels in the atmosphere.

Spicing Up Scientific Explanations with Authentic Animal Behavior Data from the Bronx Zoo!
(Grades 6–8) Kentia Hall R, Convention Center
Science Focus: GEN, SEP6, SEP7, SEP8
Gina Tesoriero (@STEMsuccessEdu; ginetesoriero@gmail.com), M.S. 319 Maria Teresa Mirabal School, New York, N.Y.
Paloma Krakower (@wcseducation; pkrakower@wcs.org), Wildlife Conservation Society, Bronx, N.Y.
Incorporate animal behavior data in the science classroom to engage students in stating claims that are rooted in evidence. View a rubric, too!

Bridge DATA Activity: Examining Juvenile Oyster Disease
(Grades 8–12) Kentia Hall S, Convention Center
Science Focus: LS
Celia Cackowski, Virginia Institute of Marine Science, Gloucester Point
What influences the onset of juvenile oyster disease? Using real data, determine if it’s size, timing, or temperature that puts East Coast oysters at risk.

Thursday, 12:30–1:30 PM

CANCELED
NMEA-Sponsored Session: Teach Marine Biology Instead of Biology to NGSS and CCSS
(Grades 9–College)  Petree Hall D, Convention Center
Mark Friedman (marklewisfriedman@gmail.com), Marine Biology Educator, Redondo Beach, Calif.
Linda Chilton (lchilton@usc.edu), USC Sea Grant, Los Angeles, Calif.
Claire Fackler (@sanctuaries; claire.fackler@noaa.gov), NOAA Office of National Marine Santuaries, Santa Barbara, Calif.
Natasha Fraley, Shape of Life, Carmel Valley, Calif.
Hear about a comprehensive marine biology course that teaches NGSS, CCSS, and ocean literacy standards! A panel of marine science organization representatives will share free NGSS/CCSS–focused lessons, labs, activities, videos, assessments, games, and interactive webquests. Many Spanish language resources plus Center for Dark Energy Biological Investigations materials.

12:30–1:30 PM  Exhibitor Workshops
DIVE into Engineering
(Grades K–12)  150 AB, Convention Center
Science Focus: ETS
Sponsor: STEMscopes™ from Accelerate Learning
CJ Thompson and Jason Maxwell, STEMscopes from Accelerate Learning, Houston, Tex.
Teaching students to think and work like engineers is a big movement in current science education. Join us as we DIVE in together and experience some of the common practices of engineers and share how you can bring these into your classroom.

Understanding Photosynthesis: A Lab-Based Approach
(Grades 7–11)  405, Convention Center
Sponsor: PASCO scientific
Michael Blasberg (blasberg@pasco.com), PASCO scientific, Roseville, Calif.
Ryan Reardon (rreardon71@gmail.com), Shades Valley High School, Irondale, Ala.
How can you clear up student misconceptions about respiration only occurring in the dark, or that only green light is used for photosynthesis? With data! Collect data on plant pigments, light reactions, and carbon cycling to create a better conceptual model that students can synthesize for complete understanding of photosynthesis.

Shockingly Good Electrochemistry: Making and Using Batteries
(Grades 6–12)  407, Convention Center
Science Focus: PS1.A, PS3.D, CCC2, CCC5, SEP3, SEP7
Sponsor: PASCO scientific
Tom Loschiavo (loschiavo@pasco.com), PASCO scientific, Roseville, Calif.
Paul Werner (pwner@rocklin.k12.ca.us), Rocklin High School, Rocklin, Calif.
How can metals “create” electricity? Can electricity drive a chemical reaction? Help your students understand the positives and negatives of electricity by creating batteries out of household items, measuring the voltage with a Wireless Voltage Sensor, and using electrical energy from a commercial battery to electroplate a metal.

Outbreak! Zika Testing Using the Enzyme Linked Immunosorbent Assay (ELISA)
(Grades 9–College)  410, Convention Center
Science Focus: LS
Sponsor: Edvotek, Inc.
Danielle Snowflack (info@edvotek.com), Brian Ell (info@edvotek.com), and Tom Cynkar (info@edvotek.com), Edvotek Inc., Washington, D.C.
The spread of Zika virus has led to a public health crisis in the Americas. While most infections are mild, the virus can contribute to birth defects and neurological problems. In this workshop, you will perform a quick and easy ELISA that simulates Zika testing. Free gift/raffle entry for attending!
Project-Based Inquiry Science: Blending Engineering Practices, Core Ideas, and Crosscutting Concepts in Middle School Classrooms
(Grades 6–8) 501 AB, Convention Center
Science Focus: GEN, NGSS
Sponsor: It’s About Time
Mary Starr, Michigan Mathematics and Science Centers Network, Plymouth
Blending engineering practices, core ideas, and crosscutting concepts is made easy with Project-Based Inquiry Science. Experience how students collaborate to develop core ideas as they complete projects and science investigations that blend modeling, ask questions, and incorporate other science and engineering practices. Take home an activity idea and learn how PBIS makes learning science meaningful.

12:30–2:30 PM Meetings
Science & Children Advisory Board Meeting
Diamond Ballroom Salon 4/5/Group 1, JW Marriott
Science Scope Advisory Board Meeting
Diamond Ballroom Salon 4/5/Group 2, JW Marriott
The Science Teacher Advisory Board Meeting
Diamond Ballroom Salon 4/5/Group 3, JW Marriott
Journal of College Science Teaching Advisory Board Meeting
Diamond Ballroom Salon 4/5/Group 4, JW Marriott
NSTA Reports Advisory Board Meeting
Diamond Ballroom Salon 4/5/Group 5, JW Marriott
Professional Development in Science Education Committee Meeting
Diamond Ballroom Salon 4/5/Group 6, JW Marriott
Preservice Teacher Preparation Committee Meeting
Diamond Ballroom Salon 4/5/Group 7, JW Marriott
Multicultural/Equity in Science Education Committee Meeting
Diamond Ballroom Salon 4/5/Group 8, JW Marriott
Coordination and Supervision of Science Teaching Committee Meeting
Diamond Ballroom Salon 4/5/Group 9, JW Marriott
Informal Science Education Committee Meeting
Diamond Ballroom Salon 4/5/Group 10, JW Marriott
Awards and Recognitions Committee Meeting
Olympic 2, JW Marriott

12:30–2:30 PM Hands-On Workshops

NGSS Toolkit Pathway Session: Using Performance Expectations to Plan for Classroom Assessments
(Grades 6–12) Platinum Ballroom Salon G, JW Marriott
Science Focus: GEN, NGSS
Dora Kastel (@Dora_AMNH; dkastel@amnh.org), American Museum of Natural History, New York, N.Y.
Jo Topps (jtopps@wested.org), K–12 Alliance/WestEd, San Francisco, Calif.
Use a tool to engage in a process that deepens understanding of NGSS performance expectations to consider evidence of learning and plan for classroom assessment.

CESI-Sponsored Session: Using Toys to Teach Physics Share-a-Thon
(Grades P–8) 151, Convention Center
Science Focus: PS
Karen Ostlund (@karen_ostlund; klostlund@utexas.edu), 2012–2013 NSTA President, and The University of Texas at Austin
Jim McDonald (@jimscienceguy; jim.mcdonald@cmich.edu), Central Michigan University, Mount Pleasant
Join us to gather ideas for how toys can be used to teach physics concepts in order to promote student motivation, excitement, interest, and learning.

12:30–4:30 PM Short Course
The Instructional Leader’s Guide to NGSS (SC-1)
(Grades K–12) Tickets Required; $32 Gold Blrm. 4, JW Marriott
Science Focus: GEN, NGSS
Joyce Tugel (jtugel@gmail.com), Maine Mathematics and Science Alliance, Augusta
Peter McLaren (@PeterJMcLaren; mclarenpeterj@gmail.com), Next Gen Education, LLC, North Kingstown, R.I.
For description, see page 56.
1:00–1:30 PM  Presentations
SCST-Sponsored Session: Research Experiences Throughout the Curriculum: A High-Impact Practice for Enhancing Student Success
(College)  Georgia 1, JW Marriott
Science Focus: GEN
Kerry Cheesman (kcheesma@capital.edu), Capital University, Columbus, Ohio
If we are to prepare students for careers in science, the curriculum needs to reflect how scientific knowledge is gained.

Science, Literacy, and Beyond…
(Grades K–12)  Platinum Ballroom Salon H, JW Marriott
Science Focus: GEN, NGSS
Greg Nicholas (gnicholas@roc.e.us), Riverside County Office of Education, Riverside, Calif.
This interactive presentation keeps it simple and fun by allowing participants to apply reading, writing, listening, and speaking in their science or elementary classrooms.

Interactive Notebooks Made Equitable, Engaging, and Easy
(Grades 1–12)  Platinum Ballroom Salon J, JW Marriott
Science Focus: GEN, NGSS
Katrina Scherben (katrina.scherben@hczpromise.org), Harlem Children’s Zone Promise Academy Schools, New York, N.Y.
Interactive Notebooks can empower diverse learners and promote scientific literacy. Receive classroom-ready strategies for all grades and disciplines that are manageable with any workload.

See It to Be It!
(Grades 9–College)  Plaza 2, JW Marriott
Science Focus: GEN, SEP
Alexander Surra (surra@stevenscollege.edu), Thaddeus Stevens College of Technology, Lancaster, Pa.
Nanette Marcum-Dietrich (@DrNanette; ndietrich@millersville.edu), Millersville University, Millersville, Pa.
Hear how one college is helping local high schools partner with industry to promote an understanding of STEM careers in green collar and technical fields.

Moving from Old Standards to NGSS: Bridging the Gap with Limited Time and Resources
(Grades K–5)  Kentia Hall H, Convention Center
Science Focus: GEN, NGSS
Amanda Dykstra (dykstraa@vvsd.org), Valley View School District 365U, Romeoville, Ill.
Explore strategies to build teacher awareness and support of the Next Generation Science Standards when time and resources are at a minimum.

Natural Fracturing vs. Fracking: The Human Impact on Earthquakes
(Grades 6–12)  Kentia Hall P, Convention Center
Science Focus: ESS3.B, ESS3.C, CCC1, CCC2, SEP4, SEP6, SEP7
Renee Clary (rclary@geosci.msstate.edu), Mississippi State University, Mississippi State, Miss.
Which produces more earthquakes—human activity or plate tectonic movement? Students use authentic data, map, correlate, and analyze earthquakes for the contiguous U.S.! Examples/resources provided.

1:00–2:30 PM  Meeting
Aerospace Programs Advisory Board Meeting
Diamond Ballroom Salon 4/5/Group 11, JW Marriott
2:00–2:30 PM  Presentations
SCST-Sponsored Session: Exploring Genetic Ancestry and Personal Identity in U.S. Ethnic Minority College Biology Students

(College) Georgia 1, JW Marriott
Science Focus: LS
Presenters to be announced
Hear about a classroom activity harnessing next generation sequencing results to discuss concepts in human evolutionary genetics and personal identity among U.S. ethnic minority college biology students.

Teacher Researcher Day Session: Merch It—NGSS and Standards-Based Grading

(Grades 9–10) Platinum Blrm. Salon D/Group 1, JW Marriott
Science Focus: PS
Alejandra Frausto (afrausto@cps.edu), Chicago (Ill.) Public Schools
Discussion centers on incorporating standards-based grading in high school physics and chemistry classrooms.

Teacher Researcher Day Session: Making Student Thinking Visible

(General) Platinum Ballroom Salon D/Group 4, JW Marriott
Science Focus: GEN, NGSS
Deborah Roberts-Harris (drober02@unm.edu), The University of New Mexico, Albuquerque
Understanding what students are thinking or already know is critical to facilitating effective instruction. Questioning and rich classroom discussion are key. Come join in the conversation.

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Evaluate Your Sessions Online!
This year, we’re giving away an Apple iPad mini 2 Wi-Fi tablet to two lucky attendees who complete a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win! (See page 17 for details.)

Professional Learning Communities for Supporting NGSS Implementation

(Grades K–12) Platinum Ballroom Salon I, JW Marriott
Science Focus: GEN, SEP
Peter Hillman (pch2110@tc.columbia.edu), Amanda Gunning (@agunning@mercy.edu), and Meghan Marrero (@megmarrero; mmarrero3@mercy.edu), Mercy College, Dobbs Ferry, N.Y.
Katherine Hohman (khoiman@portcheseterschools.org), Port Chester Middle School, Port Chester, N.Y.
Jenna Garguilo (@jgarguilo@portcheseterschools.org), Port Chester (N.Y.) School District
Explore the experiences of K–12 science teachers engaged in vertically aligned professional learning communities aimed at supporting NGSS implementation.

Two Growth Mind-Set Activities to Help Motivate All Students and Teach Nature of Science

(Grades 4–12) Platinum Ballroom Salon J, JW Marriott
Science Focus: LS1.D, CCC2, SEP3
John Gensic (@bioontheego; john.gensic@gmail.com), Penn High School, Mishawaka, Ind.
Struggling to motivate students? Get two research-based activities that help students discover and own a growth mind-set while working with data and nature of science.

Inspiring Young Women to Pursue STEM Careers with an Annual “Women in Science Night”!

(Grades 6–12) 504, Convention Center
Science Focus: GEN
Joseph Vincente, East Side Community High School, New York, N.Y.
See how our small public New York City school is inspiring young women of diverse backgrounds to pursue STEM careers with our annual “Women in Science Night” (now in its fourth year)!

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2:00–2:30 PM  Exhibitor Workshop
Earthquakes and Their Causes

(Grades 5–8) Booth #748, Exhibit Hall, Convention Center
Science Focus: ESS2.B
Sponsor: Science First, LLC
Helmut Albrecht (helmut.albrecht@sciencefirst.com), Science First, LLC, Yulee, Fla.
In this in-dome workshop from STARLAB®, you will learn what causes earthquakes and why they occur where they occur.
2:00–3:00 PM Presentations

Why Have All the Creatures Gone? Using the Three Dimensions to Explore Ecological Issues  
(Grades 4–9) Diamond Ballroom Salon 1, JW Marriott  
Rachel Davis (@rdavisteaches; racheldavis7@gmail.com), American School Foundation of Monterrey, Santa Catarina, N.L., Mexico  
Find out how to use games, modeling, and student-friendly data to create student-centered units that delve into ecological concepts by addressing phenomena like the decline of the monarch butterfly.

Science Experiments on High-Altitude Balloons  
(General) Diamond Ballroom Salon 2, JW Marriott  
Science Focus: ETS1.A, SEP  
Chris Schaben (chris.schaben@ops.org) and Christina Wildhagen (christina.wildhagen@ops.org), Omaha (Neb.) Public Schools  
Hear about our district’s high-altitude balloon project. We have launched over 30 balloons with hundreds of students’ experiments as payload. Join us as we share our experiences with creating and implementing this amazing STEM program.

NSTA Press® Session: Uncovering K–12 Students’ (and Teachers’) Ideas About Matter and Energy in the NGSS  
(General) Diamond Ballroom Salon 3, JW Marriott  
Science Focus: PS1, PS3, CCC5  
Page Keeley (pagekeely@gmail.com), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.  
Joel Truesdell (jotruesd@ksbe.edu), Kamehameha Schools Hawai‘i, Kea‘au  
Experience examples of diagnostic probes from the Uncovering Student Ideas series, including several new ones, that reveal what students really think about matter and energy and the connection to “3-D formative assessment.”

Leading from the Classroom  
(General) Diamond Ballroom Salon 6, JW Marriott  
Science Focus: GEN  
Douglas Hodum (@DougHodum; dhodum@mtbluersd.org), NSTA Director, District II, and Einstein Fellow, U.S. House of Representatives, Washington, D.C.  
During this session, you will have conversations and hear suggestions to help you feel empowered to either become a teacher leader or propel you further. After getting some hints from the presenter and discussing ideas with peers, you will leave the session with a plan for taking the next steps in your teacher leadership journey.

Engineering for Change  
(Grades 6–12) Diamond Ballroom Salon 8, JW Marriott  
Science Focus: ETS1.A, ETS1.B, CCC2, SEP1, SEP6, SEP8  
Andrea Aust (@KQEDAust; aaust@kqed.org) and Marie Laws (mlaws1224@yahoo.com), KQED, San Francisco, Calif.  
Bring engineering into your science classroom with a free, media-rich, project-based unit focused on sharing solutions with an online audience of peers and adults.

Virtual Reality’s Emerging Future in Science Education  
(Grades 6–8) Diamond Ballroom Salon 10, JW Marriott  
Garry Joseph (@garryjoseph; gxf9370@lausd.net), Millikan Middle School, Sherman Oaks, Calif.  
Join us for an overview and demonstration of virtual reality curricular resources and suggestions for how you can combine simulations and real-world physical activities into new forms of learning experiences.

NARST-Sponsored Session: Science, Education, and Ability: The Exclusion We Co-Create  
(General) Olympic 3, JW Marriott  
Science Focus: GEN, SEP  
Phillip Boda (pab2148@tc.columbia.edu), Teachers College, Columbia University, New York, N.Y.  
Through framing inclusion as a civic goal for all citizens, including those with disabilities, inclusion for people with disabilities in education is a human rights issue. Participants will receive a concise background of disability beyond the medicalization model within scientific research writ large to engage them toward pursuing self-studies of their practice to include all students.

AMSE-Sponsored Session: Empowering and Rewarding Educators of the Economically Disadvantaged Students  
(Grades K–12) Platinum Ballroom Salon A, JW Marriott  
Science Focus: GEN  
Alicia Conerly (@mrzjconerly25; mrz_conerly@yahoo.com), Hazlehurst (Miss.) City School District  
Motivate yourself! Be innovative for others! The rewarding begins with you!
Teacher Researcher Day Session: Teacher Stories: What Four-Year-Olds Know and Can Do in Science
(Grades P–2) Platinum Blrm. Salon D/Group 2, JW Marriott
Science Focus: GEN, INF, NGSS
Mary Hobbs (maryhobbs@utexas.edu), The University of Texas at Austin
Bob Williams, Consultant, Belmont, Tex.
Excerpts will be shared from 24 prekindergarten teachers who wrote about their experiences as teacher-researchers. Hear their stories about what young children know and can do in science.

Teacher Researcher Day Session: Preservice Teachers’ Perception of Scientists—Stereotypes, Gender Bias, or Media Influence?
(General) Platinum Blrm. Salon D/Group 3, JW Marriott
Science Focus: GEN
Tahsin Khalid (tahsinkhalid@hotmail.com), Southeast Missouri State University, Cape Girardeau
Discussion centers on what 21st-century educators can do to change the perception that girls and females cannot be scientists.

A Demo a Week Makes Science Class the Peak
(Grades 1–10) Platinum Ballroom Salon H, JW Marriott
Vinay Dulip (vdulip@yahoo.com), Foy H. Moody High School, Corpus Christi, Tex.
Thirty simple demonstrations will be performed with materials obtained locally. The selected demos will excite students’ interest and challenge them to do higher level thinking.

Nanotechnology: A Gateway to Student Engagement in NGSS
(Grades 9–12) Plaza 2, JW Marriott
Science Focus: PS
Lynn Kim John (@UCLAScienceProj; ljohn@gsis.ucla.edu), UCLA Center X, Los Angeles, Calif.
Nanotechnology can bring innovative learning experiences to the K–12 classroom. This session will showcase the partnership between the California Nanosystems Institute and UCLA. Engage in a nano experience that illustrates how the three dimensions of NGSS come together to develop understanding of chemistry concepts among learners.

Reach ALL Students by Supporting ALL Teachers
(General) 502B, Convention Center
Science Focus: GEN, NGSS
Caroline Stabile (@gemsnet10; stokbridge@uri.edu) and Sara Sweetman (@gemsnet10; sara_sweetman@uri.edu), GEMS-Net, The University of Rhode Island, Narragansett
Find out how a university-district partnership ensures equitable NGSS opportunities for all students by supporting all teachers with PD, resources, and leadership. Sustain beyond outside funding. It is possible!

Integrating E-Books into the Secondary Classroom
(Grades 6–12) 507, Convention Center
Science Focus: GEN
Leisa Clark, Assistant Executive Director, e-Products, NSTA, Arlington, Va.
Kara Pantalena, Senior Instructional Designer, e-Products, NSTA, Arlington, Va.
Engaging and Innovative—learn how interactive multimedia elements and text can enhance science learning in middle school and high school. While this workshop uses NSTA’s eBooks+ Student Editions for examples, these concepts can be applied to many types of digital content.

Engineering EXPO
(Grades K–4) 513, Convention Center
Science Focus: ETS
Arthur Williams (@PrincipalArthur; arthur.williams@winona.k12.mn.us), Jefferson Elementary STEM School, Winona, Minn.
Staff from Jefferson Elementary STEM School will share how to create an out-of-this-world Engineering EXPO for your school.

Using the Environment as a Springboard to Real-World 3D Learning
(Grades K–12) 515A, Convention Center
Science Focus: GEN, CCC, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8
Bryan Ehlers, California Dept. of Resources Recycling and Recovery, Sacramento
Gerald Lieberman (gerald@seer.org), State Education and Environment Roundtable, Poway, Calif.
Support environmental literacy and engage students in 3D exploration using the environment as an authentic, and intrinsically engaging, real-world context for learning.
Beyond the Runway: Scientific Modeling and the NGSS  
(Grades 1–8) Kentia Hall L, Convention Center  
Science Focus: GEN, NGSS  
**Randy Bell** (randy.bell@oregonstate.edu), Oregon State University, Corvallis  
Participate in engaging activities featuring scientific modeling and nature of science for elementary and middle school students. You will receive free resources and lessons.

**Wow! What on Earth Caused THAT?**  
(Grades 6–8) Kentia Hall Q, Convention Center  
**Tom Nolan** (thomas.e.nolan@jpl.nasa.gov), NASA Jet Propulsion Laboratory, Pasadena, Calif.  
**Rebecca Abrams** (abrams.rebecca@myhapa.org), Hmong American Peace Academy, Milwaukee, Wis.  
Using high-resolution images from NASA Earth-observing satellites, we will demonstrate several inquiry examples of analyzing and interpreting data. Using images of “before and after” Earth-changing events, students can compare and contrast surface changes.

**The Power of Science Literacy: A Success Story**  
(Grades 9–12) Kentia Hall R, Convention Center  
Science Focus: GEN, NGSS  
**Colleen Zenner** (czenner@barrington220.org) and **Lauren Pennock** (@lpennock_edu; lpennock@barrington220.org), Barrington High School, Barrington, Ill.  
Increase student engagement with successful literacy strategies. This dynamic session provides resources and assessments that are easy to implement and adaptable for high school science.

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**NSTA Teacher Awards Gala**

Enjoy a fabulous evening celebrating with this year’s teacher award recipients! ALL of the teacher awards will be presented in one grand evening. Join your colleagues in recognition of this year’s winners.

**Friday, March 31, 6:00–8:45 PM**  
Gold Ballroom Salon 2/3, JW Marriott at L.A. LIVE  
Cost: $80

By ticket only: #M-2 Evening/Cocktail attire requested.

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**NSTA Los Angeles National Conference on Science Education**
2:00–3:00 PM  Hands-On Workshops

**CSSS-Sponsored Session: Three-Dimensional Lessons Based in Simple Natural Phenomena**  
(Grades K–12)  
**Atrium 3, JW Marriott**

Science Focus: ESS2, LS2, PS3, CCC4, SEP6

Juan-Carlos Aguilar (jaguilar@doe.k12.ga.us), Georgia Dept. of Education, Atlanta

Brett Moulding (mouldingb@ogdensd.org), Partnership for Effective Science Teaching and Learning, Ogden, Utah

Engage in analyzing a series of three-dimensional lessons developed to support the implementation of Georgia’s new standards based on the NRC Framework. The lessons blend science core ideas, science and engineering practices, and crosscutting concepts through the study of phenomena and are built using Brett Moulding’s instructional sequence of gathering, reasoning, and communicating while emphasizing the integration of mathematics, science, and literacy.

**Read-Aloud with Rigor: Deepening Middle-Schoolers’ Science Content Knowledge Through Literacy**  
(Grades 6–8)  
**Diamond Ballroom Salon 7, JW Marriott**

Science Focus: LS2.C, SEP8

Rebecca Taylor (@r_taylor@amnh.org) and Allyson Nusser (@AllysonLiteracy; anusser@amnh.org), American Museum of Natural History, New York, N.Y.

Middle-schoolers’ understanding of complex science concepts can be deepened through interactive read-aloud of content-rich texts. Walk away with tools for implementing this powerful strategy.

**ASTE-Sponsored Session: Crafting Coherent Conceptual Storylines: Lessons in Designing Lessons**  
(General)  
**Georgia 2, JW Marriott**

Science Focus: GEN

Kelsey Lipsitz (kcgxv4@mail.missouri.edu), Deborah Hanuscin (hanuscind@missouri.edu), and Dante Cisterna, University of Missouri, Columbia

Learn research-based strategies to design lessons that are conceptually coherent by connecting and sequencing key ideas and activities in ways that support student learning.

**Crosscutting Concepts in Action**  
(Grades 3–12)  
**Gold Ballroom Salon 1, JW Marriott**

Science Focus: GEN, CCC

Peter A’Hearn (@casciencedpete; pahearn@psusd.us), Palm Springs (Calif.) Unified School District

Think the crosscutting concepts are just “one more thing”? Wrong, they are at the heart of scientific inquiry. Use them to drive rich NGSS investigations.

**Science as a Context for Literacy: Win-Win for Both**  
(Grades 1–12)  
**Olympic 1, JW Marriott**

Science Focus: GEN, NGSS

Karen Cerwin (kcerwin@wested.org), K–12 Alliance/ WestEd, Los Alamitos, CA

Experience how science is a context for CSSS ELA. Hands-on experiences build authentic arguing from evidence, explanations, and informational text.

**Planning and Designing Safe and Sustainable Science Facilities That Meet the NGSS (Science Facilities 102)**  
(General)  
**Platinum Ballroom Salon B, JW Marriott**

Science Focus: GEN, NGSS


Sandra West (sw04@txstate.edu), Texas State University, San Marcos

Juliana Texley (texleyj@cmich.edu), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant

Are you involved in your district’s planning for new science facilities? If not, you need to get involved 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 information and examples of safe, ergonomically correct, functional facilities for STEM-based science. We will cover budgeting, working with the architect, technology, and special adjacencies. Packet included.

**Classroom iPad iDeas**  
(Grades 7–College)  
**Platinum Ballroom Salon C, JW Marriott**

Science Focus: GEN, NGSS

Gregory Dodd (gbdodd@gmail.com), Retired Educator, Pennsboro, W.Va.

Experience the enormous potential of the iPad and learn how to make it an essential tool in your science classroom.

**NSTA Press® Session: It’s Debatable: Using Socioscientific Issues to Develop Scientific Literacy, K–12**  
(General)  
**Platinum Ballroom Salon E, JW Marriott**

Science Focus: GEN, NGSS

Sami Kahn (kahns@ohio.edu), Ohio University, Athens

We will model the use of controversial societal issues related to science in order to develop students’ scientific literacy during this interactive workshop.
Hit the Ground Running  
(Grades 9–12)  
Plaza 3, JW Marriott  
Science Focus: PS2.A, CCC1, SEP3, SEP4, SEP5, SEP6, SEP8  
Aaron Osowiecki (aosowiecki@bostonpublicschools.org),  
Boston Latin School, Boston, Mass.  
Help students build an understanding of measurement, units, and unit conversion with their own data obtained using measuring devices they design and build.

Rebooting the Connection and Full Integration of Science with the Language Arts: A Natural Pairing Across the Curriculum  
(Grades K–5)  
502A, Convention Center  
Science Focus: GEN, NGSS  
Judy Reinhartz (jreinhartz@utep.edu), Professor Emeritus,  
The University of Texas at El Paso  
Science presents opportunities to contextualize communication offering full integration of language arts, contributing to the linguistic fabric of the classroom. Come participate in language-rich engaging activities.

Using PBLs to Teach High School Science  
(Grades 9–12)  
515B, Convention Center  
Science Focus: GEN, NGSS  
Maria Thurmond, Peachtree Ridge High School, Lawrenceville, Ga.  
Teaching NGSS-focused science courses to high school students requires the teaching of STEM that is connected to real-world issues as well. Explore how to incorporate Project-Based Learning into your biology, chemistry, physics, and environmental science curriculum using engineering design practices.

Checkerspot Challenge: Early Childhood Engineering  
(Grades K–2)  
Kentia Hall A, Convention Center  
Science Focus: ESS3.C, LS1.C, CCC2, SEP2  
Eric Cromwell (ecromwell@bcps.org), Baltimore County Public Schools Office of Science, Towson, Md.  
Learn how observing the needs of plants and animals can be combined with engineering in this NGSS-focused session.

NGSS@NSTA: One-Stop Resource Shopping for Elementary Teachers!  
(Grades K–5)  
Kentia Hall B, Convention Center  
Science Focus: PS2.A, PS2.B, CCC2  
Karen Umeya (karen_umeda@notes.k12.hi.us), Hawaii State Dept. of Education, Pearl City  
Kathy Renfrew (@KRScienceLady; krsienceLady@gmail.com), Vermont Agency of Education, Barre  
Investigate and deepen understanding of how NSTA Hub resources can move instruction toward three-dimensional learning when the science and engineering practices, disciplinary core ideas, and crosscutting concepts of the NGSS are addressed simultaneously.

STEM Road Map Curriculum Series for Early Childhood Education  
(Grades K–2)  
Kentia Hall C, Convention Center  
Science Focus: PS4.A  
Andrea Milner (@andrearaemilner; amilner@adrian.edu)  
and Vanessa Morrison (@vmmorrison@adrian.edu), Adrian College, Adrian, Mich.  
Receive an overview of the upcoming NSTA Press® curriculum book series STEM Road Map for Early Childhood Education as we take a deep dive exploring one of the modules—1st grade: Cause and Effect: Influence of Waves: Invasion of the Waves.

Building an NGSS-Focused Curriculum with Picture Perfect Science as the Foundation  
(Grades K–5)  
Kentia Hall D, Convention Center  
Science Focus: GEN, NGSS  
Jake Beers (@jakethebeers; jbeers@sdale.org), Springdale (Ark.) Public Schools  
Engage in the process of creating a sample Understanding by Design curriculum unit by using NGSS, Picture Perfect Science, and additional resources. Bring your device to take part.

Help Happy the Horse: A Design Thinking and Engineering Challenge for Young Students  
(Grades P–2)  
Kentia Hall E, Convention Center  
Science Focus: ETS1, PS2, SEP4, SEP5, SEP6  
Lynn Reed (lreed@bullischarterschool.com) and Jessica Lara ((@msjlura; jlura@bullischarterschool.com), Bullis Charter School, Los Altos, Calif.  
We will use the Design Thinking Process to help create a new home for Happy, the LEGO® Horse. In a second activity, we will use the Engineering Process to design a wall to keep Happy safe.
Future Worlds: Storm Survival Shelters STEM Challenge  
(Grades 3–6)  Kentia Hall F, Convention Center  
Science Focus: PS1, PS2, CCC, SEP  
Debbie Myers (debbie.myers@canterbury.ac.uk), Canterbury Christ Church University, Canterbury, U.K.  
Engage in a real-life scenario requiring delegates to design, construct, and evaluate shelters against a rubric of scientific criteria to develop their application of STEM problem-solving skills.

Come Wiggle with the Bees! Learn All About Bee-behavior!  
(Grades 2–5)  Kentia Hall H, Convention Center  
Sabrina Shapiro (sshapiro@wbais.net) and Stuart Fleischer (sfleischer@wbais.net), Walworth Barbour American International School in Israel, Even Yehuda  
Students “Waggle Dance” their way to understanding the honeybee’s unique navigation and communication system, connecting NGSS to CCSS ELA Literacy and Mathematics.

STEM Applications in Transportation: The Answer to “When Will I Ever Use This in Real Life?”  
(Grades K–8)  Kentia Hall J, Convention Center  
Science Focus: ETS, PS, CCC4, CCC6, SEP1, SEP3, SEP4, SEP8  
Jennifer Richards (jennifer.richards@utk.edu), The University of Tennessee Institute of Agriculture, Knoxville  
Brianna Fisher (@GAMTTEP; brianna.fisher@knoxschools.org), Knox County Schools, Knoxville, Tenn.  
Through hands-on activities and facilitated discussions, participants will understand how to integrate transportation into their STEM curriculum using the engineering design process and habits of mind. Come see how the Garrett A. Morgan Clearinghouse program can make learning real for both you and your students.

Modeling Using STEM  
(Grades 3–9)  Kentia Hall K, Convention Center  
Science Focus: GEN, NGSS  
Judith Lucas-Odom (@Judith_Odom; jedyps23@yahoo.com), Chester High School, Chester, Pa.  
STEM comes alive using models. Simple science, math, and engineering lessons help make abstract concepts more tangible!

Beyond Naming Forms: Teaching Energy in Middle School by Modeling Energy Transfers Between Systems  
(Grades 6–8)  Kentia Hall M, Convention Center  
Science Focus: PS3  
Jeff Nordine (nordine@ipn.uni-kiel.de), Leibniz Institute for Science and Mathematics Education, Keil, Germany  
Joseph Krajcik (@krajcikjoe; krajcik@msu.edu), CREATE for STEM Institute, Michigan State University, East Lansing  
Katherine Carswell (@katherincars; carswellk@holly-academy.org), Holly Academy, Holly, Mich.  
We will present a modeling-based approach to teaching energy in middle school that emphasizes tracking energy transfers between systems as phenomena occur.

Middle School Chemistry and Engineering Design in the NGSS  
(Grades 6–8)  Kentia Hall N, Convention Center  
Science Focus: ETS1, PS  
James Kessler, American Chemical Society, Washington, D.C.  
Learn about and practice a new engineering design lesson from the free website middleschoolchemistry.com.

NGSS Chemistry and Integration of Climate Change  
(Grades 10–12)  Kentia Hall O, Convention Center  
Katrina Rotter, San Francisco (Calif.) Unified School District  
Learn and experience how ESS climate change standards can be embedded in a high school NGSS chemistry course. Activities and a course outline used in the class will be presented.

Teaching Environmental Sustainability Using a Free Place-Based Watershed Model  
(Grades 8–12)  Kentia Hall P, Convention Center  
Science Focus: LS2, CCC4, SEP  
Carolyn Staudt (cstaude@concord.org), The Concord Consortium, Concord, Mass.  
Nanette Marcum-Dietrich (@DrNanette; ndietrich@millersville.edu), Millersville University, Millersville, Pa.  
Steve Kerlin (skerlin@stroudcenter.org), Stroud Water Research Center, Avondale, Pa.  
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.
**The Martian: Lessons in Biology and Chemistry**
(Grades 9–12)  Kentia Hall S, Convention Center

**Julie Bookman** (@jbookman76; jbookman@avhsd.org), Palmdale High School, Palmdale, Calif.
Use the science of *The Martian* to engage your students in biology, chemistry, ecology, and human physiology.

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**NMEA-Sponsored Session: Discovering the World of Aquaculture with K–5 Students**
(Grades K–5)  Petree Hall D, Convention Center
Science Focus: GEN, NGSS

**Sarah Sparks** (sarah.sparks@maine.edu), University of Maine Cooperative Extension Androscoggin & Sagadahoc Counties Office, Lisbon Falls
**Laura Wilson** (laura.wilson@maine.edu), University of Maine Cooperative Extension, Orono
**Laurie Bragg** (laurie.bragg@maine.edu), Maine EPSCoR at the University of Maine, Orono

Explore hands-on, research-based activities designed to introduce elementary students to the world of aquaculture and how it connects to their everyday lives.

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**2:00–3:00 PM   Exhibitor Workshops**

**The Value of Writing Scientific Explanations in STEM with Claim-Evidence-Reasoning**
(Grades K–12)  150 AB, Convention Center
Science Focus: GEN, NGSS
Sponsor: STEMscopes™ from Accelerate Learning

**Greg Brown**, Consultant, San Jose, Calif.
By analyzing evidence to make a claim statement and using scientific reasoning to explain how the claim is connected, we learn more about the phenomenon. Engagement with real-world science followed by discourse about how observations support scientific explanations and provide insight into the need for inquiry in making science meaningful.

**Chemical Formulas: Subscripts and Coefficients Made Easy!**
(Grades 6–12)  405, Convention Center
Science Focus: PS1.A, PS1.B, CCC1, CCC5, SEP2
Sponsor: PASCO scientific

**Tom Loschiavo** (loschiavo@pasco.com), PASCO scientific, Roseville, Calif.
**Jason Lee** (mrlc3@att.blackberry.net), East Georgia State College—Statesboro
Can your students tell the difference between coefficients and subscripts? Do they know when they need more of an atom in a compound, or more of the compound itself? Help your students understand the important differences by using the Molecular Model Kit to actually build molecules and model chemical reactions!

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**STEM Activities: Untangling Electric Circuits**
(Grades 9–12)  407, Convention Center
Sponsor: PASCO scientific

**Brett Sackett** (sackett@pasco.com), PASCO scientific, Roseville, Calif.
**Thomas Hsu** (thsu@pasco.com), Ergopedia, Inc., Cambridge, Mass.

How can students understand circuits when they can’t “see” the phenomenon? And how can they move beyond the tangled wires when creating a circuit diagram? Get hands-on with new technology to discover a better way to teach circuits!

**A Bright Idea: Using GFP to Teach STEM**
(Grades 9–College)  410, Convention Center
Science Focus: LS, SEP
Sponsor: Edvotek, Inc.

**Danielle Snowflack** (info@edvotek.com), **Brian Ell** (info@edvotek.com), and **Tom Cynkar** (info@edvotek.com), Edvotek Inc., Washington, D.C.

Bring exciting STEM learning techniques into your classroom laboratory! In this hands-on workshop, we will build a size-exclusion chromatography column. The column is used to purify green fluorescent protein (GFP) from a crude bacterial extract. Proteins containing fractions are identified by fluorescence and analyzed for purity by SDS-PAGE. Free gift/raffle entry.
2:00–3:00 PM  Exhibitor Workshops

Project-Based Learning + NGSS = Active Physics
(Grades 9–12)  501 AB, Convention Center
Science Focus: PS
Sponsor: It's About Time
Arthur Eisenkraft, 2000–2001 NSTA President, and
UMass Boston, Dorchester, Mass.

Develop a sport for the moon; create a light and sound show;
design and build an improved safety device for a car. Project-Based Learning is all the rage now. It motivates students and challenges them to apply their physics knowledge. The PBL lessons can simultaneously reflect the NGSS. Active Physics has been incredibly successful in U.S. schools and is being adapted overseas. Join the fun and find out how to make your curriculum even better.

Explore Solar Energy STEM Concepts with K’NEX Models: Engineering for a Sustainable Future
(Grades 5–9)  510, Convention Center
Science Focus: ETS1, PS3
Sponsor: K’NEX Education
Robert Jesberg (rjesberg@knex.com), K’NEX Education, Hatfield, Pa.

STEM and standards rule with the K’NEX Investigating Solar Energy Set. We will build working solar models. Complete experiments to quantify solar panel efficiency. Compare model speed and distance solar panels are from a light or the wattage of bulbs. Isn’t this the way you want your students to learn renewable energy STEM concepts? Wind and water models will also be demonstrated.

2:00–3:30 PM  Exhibitor Workshops

Are You a PTC Taster? Let’s Do PCR to Find Out!
(Grades 10—College)  150C, Convention Center
Science Focus: LS1, LS3, PS1, CCC1, CCC4, SEP4
Sponsor: The MiniOne Systems
Bridget Ward (info@theminione.com), Springfield Central High School, Springfield, Mass.

PTC sensitivity is an example of Mendelian inheritance. Learn firsthand how to conduct a PCR experiment by extracting, amplifying, and digesting your own DNA—all in 90 minutes! Stay for our next session to run your DNA sample on gel electrophoresis to determine if you are a taster.

Reconceptualizing Chemistry Through Play: Acids and Bases
(Grades 7–12)  153A, Convention Center
Science Focus: PS1.A, PS1.B
Sponsor: PlayMada Games
Lindsay Plavchak (lindsayp@playmada games.com) and Edward Wang (edwardw@playmada games.com), PlayMada Games, New York, N.Y.

Discover a new way to teach fundamental chemistry ideas in a fun and engaging way! Explore Collisions™ and experience how gameplay can provide high school students with a deepened, enduring understanding of key concepts in the system of chemistry. Bring your laptop or tablet for this lively hands-on workshop!

Using Science Magazines to Incorporate the Three Dimensions of NGSS
(Grades 3–10)  153B, Convention Center
Science Focus: GEN, NGSS
Sponsor: Scholastic Inc.
Mara Grunbaum, Patricia Janes, and Andrew Klein, Scholastic Inc., New York, N.Y.

Scholastic® classroom magazine editors team up with teachers to show you how to develop lessons that incorporate the three dimensions of the NGSS with exciting scientific discoveries that are too new for textbooks.

Innovative Bioscience Classrooms with 3D Bioprinting
(Grades 9–College)  153C, Convention Center
Science Focus: LS, CCC, SEP
Sponsor: SE3D
Mayasari Lim (mlim@se3d.com) and Sarah Salameh (ssalameh@se3d.com), SE3D, Redwood City, Calif.

Desktop 3D bioprinters are highly versatile bio-lab equipment for training next generation scientists and engineers. Learn how this cutting-edge tool can benefit your science
classroom for different applications in biotechnology, green technology, and tissue engineering.

Science and Engineering Practices Made Easy
(Grades K–6) 301 AB, Convention Center
Science Focus: GEN, SEP
Sponsor: Delta Education/School Specialty Science
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Don’t throw out your favorite lesson just because it doesn’t use the science and engineering practices. Experience a Delta Science Module activity and explore ways to embed the SEPs into your favorite science lessons. Leave with readers, equipment, and strategies you can use with your students next week.

Wave Properties and Information Transfer
(Grades 6–8) 303 AB, Convention Center
Science Focus: PS4, CCC, SEP
Sponsor: Delta Education/School Specialty Science–FOSS
Virginia Reid and Jessica Penchos, The Lawrence Hall of Science, University of California, Berkeley
Engage in activities using lasers and optical fibers in the new FOSS Next Generation Waves Course for middle school. Explore properties of refraction and reflection that allow information transfer by fiber-optic technology, and identify connections to the three dimensions of the NGSS.

CPO Science’s Link™ Learning Module: Chemistry and the Periodic Table
(Grades 6–12) 304 AB, Convention Center
Science Focus: PSI
Sponsor: CPO Science/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Kat Mills, School Specialty Science, Rosharon, Tex.
CPO Science’s new Link Chemistry learning module is an NGSS approach that lets students experience innovative activities to learn about atomic structure and the periodic table. Use a digital learning environment with hands-on equipment to study bonding, isotopes, subatomic particles, ions, balancing equations, energy levels, and periodicity. Door prizes!

It’s Never Too Early to Discover STEM: FIRST® LEGO® League Jr. Encourages the Curiosity That Leads to Discovery
(Grades 1–4) 304C, Convention Center
Science Focus: ETS, INF
Sponsor: LEGO® Education and FIRST®
Jenny Nash, LEGO Education, Billund, Jylland, Denmark
Betsy Daniels, FIRST (For Inspiration and Recognition of Science and Technology), Manchester, N.H.
Young children are natural investigators and eager to explore their world. Learn how the FIRST LEGO League Jr. program challenges young children to explore real-world problems and develop important core values through building solutions using LEGO Education WeDo 2.0. This session will be hands on and guaranteed fun!

Genes in Space: Launch Your DNA Experiment into Space!
(Grades 7–12) 305, Convention Center
Science Focus: LS, CCC, SEP
Sponsor: miniPCR
Sebastian Kraves, miniPCR, Cambridge, Mass.
Genes in Space is a national science competition where teachers and students design authentic DNA research proposals. Winners have their experiments launched to the International Space Station! Engage students in integrative STEM problem solving using DNA analysis technology and you may win the miniPCR DNA Discovery System™ among other amazing awards.

Introduction to Wisconsin Fast Plants®
(Grades K–12) 306 AB, Convention Center
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Experience the versatility of Wisconsin Fast Plants. These small, quick-growing plants engage students, suit all learning levels, and let you integrate plant development, life cycle, environmental effects, genetics, and evolution into your instruction. Learn the basics for successful planting, flower dissection, and pollination.
Strawberry Milkshakes: DNA and Lactose Intolerance
(Grades 6–12) 308 AB, Convention Center
Science Focus: LS, CCC, SEP
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Introduce students to the fascinating world of molecular biology through age-appropriate hands-on activities. They’re designed to make challenging abstract concepts (including DNA, genes, and enzymes) more concrete—and to make biology fun. Presented in partnership with the DNA Learning Center.

Bring Visual Science into K–5 Classrooms: It’s a Game Changer!
(Grades K–5) 309, Convention Center
Science Focus: GEN
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Spark student interest and improve outcomes—engage science instruction using Tigtag Science real-world STEM videos, interactive content, and a hands-on activity. A blend of compelling online learning tools with hands-on fun is guaranteed to delight you and your students! Watch out! It might get messy.

Environmental Science with Vernier
(Grades 7–College) 402A, Convention Center
Science Focus: ESS, ETS2, LS2
Sponsor: Vernier Software & Technology
Colleen McDaniel (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Use Vernier sensors to conduct environmental science experiments from our lab books in this engaging hands-on workshop. Collect and analyze data on LabQuest 2. Data sharing with mobile devices and mapping on Logger Pro® will be demonstrated. Explore our wide range of tools that promote understanding of environmental science concepts.

Middle School Science with Vernier
(Grades 4–8) 402B, Convention Center
Science Focus: ETS2, PS2, PS3
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Use Vernier sensors to conduct age-appropriate experiments from our lab books in this engaging hands-on workshop. Collect and analyze data on LabQuest 2 and computers. See a demonstration of our new Go Direct wireless and USB sensors that connect directly to computers, Chromebooks, and mobile devices—no interface needed.

Teaching Forensics with Real Crime Scene Investigation Techniques from Flinn Scientific
(Grades 9–12) 403A, Convention Center
Science Focus: GEN
Sponsor: Flinn Scientific, Inc.
Meg Griffith (mgriffith@flinnsci.com) and Matt Anderson (manderson@flinnsci.com), Flinn Scientific, Inc., Batavia, Ill.
Are you looking for innovative new ways to teach forensics in your classroom? See demonstrations of a variety of products and laboratory activities that can get your students engaged in forensic science! Features professional-grade products used by real CSI teams with write-ups that make them ideal for classroom use. Handouts for all activities.

Using BioInteractive Resources to Bring Math into the Biology Lesson
(Grades 9–12) 403B, Convention Center
Science Focus: LS4, SEP4, SEP5
Sponsor: HHMI BioInteractive
Robin Bulleri (rbulleri@gmail.com), Carrboro High School, Carrboro, N.C.
Valerie May (valeriemay@me.com), Woodstock Academy, Woodstock, Conn.
Looking for engaging and authentic ways to increase quantitative analysis (yes, we mean MATH) in your high school biology lessons? We will share activities embedding concepts of ecology (Great Elephant Census) and natural selection (Galápagos finches) that expose students to computational thinking. Basic statistics will also be covered.

Effortlessly Integrate Inquiry with Glowing Bacteria
(Grades 9–College) 404 AB, Convention Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Damon Tighe (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
Learn to advance inquiry in the classroom—from guided to open inquiry—by establishing a strategy that integrates essential and real-world science practices to encourage your students to direct the scientific investigation. From generating scientifically reasonable questions to developing procedures for interpreting data, glowing pGLO™ bacteria will lead the way.
How to Use Pop Culture in Your Life Science Class
(Grades 9–College) 406 AB, Convention Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Leigh Brown (leigh_brown@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
Use popular science to engage high school and college students in your classroom. See how popular TV and movies connect to real-world discoveries and issues. Learn how to use examples like DNA fingerprinting to make gel electrophoresis the foundation of a fun hands-on lab that increases student involvement and understanding.

Which Scientist’s Work Saves 8 Million Lives a Year?
(Grades 3–College) 408A, Convention Center
Science Focus: LS, CCC, SEP
Sponsor: Vaccine Education Center
Donald Mitchell (donald@medicalhistorypictures.com), Eyeline Pictures, LLC, Flourtown, Pa.
Charlotte Moser (moser@email.chop.edu), Vaccine Education Center at Children’s Hospital of Philadelphia, Pa.
The greatest scientist of the 20th century—most don’t know his name. Come watch the documentary about Maurice R. Hilleman, a man whose goal was to eliminate childhood diseases. His story will captivate and engage your students. Meet the director, learn about supporting classroom materials, and leave inspired!

FOLD-tastic Science Notebooks via Dinah Zike’s Notebook Foldables
(General) 408B, Convention Center
Science Focus: GEN
Sponsor: Dinah.com
Bob Stremme (karlrobdz@gmail.com), Dinah.com, Plymouth Meeting, Pa.
Cut, fold, and more in this hands-on workshop as you construct Notebook Foldables that are sure to make your students’ science notebooks FOLD-tastic. Use basic classroom materials and depart with examples and ideas ready to use on Monday.

Assess the NGSS: Formative Assessment Strategies for Grades K–8
(Grades K–8) 409 AB, Convention Center
Science Focus: GEN, NGSS
Sponsor: Measured Progress
Justine Hargreaves (info@measuredprogress.org), Measured Progress, Dover, N.H.
Learn how STEM Gauge® formative assessment resources engage students and support three-dimensional teaching and learning during the transition to the NGSS. This interactive workshop provides classroom strategies that you can implement immediately, plus assessment questions, rubrics, and formative support tools. Get a free STEM Gauge item set!

LA Confidential: Investigate the Murder of the Unknown Starlet
(Grades 6–12) 503, Convention Center
Science Focus: GEN
Sponsor: Ward’s Science
Michelle Pagani, VWR Science Education, Rochester, N.Y.
Trails of blood in the classroom? YES! Learn how to safely and easily do blood typing, presumptive blood testing, and blood spatter analysis in your classroom. Using a variety of science disciplines—including biology, chemistry, and physics—teach students the applications of blood science to real life.

Five Amazing Things You Can Do with Calculators in Your Science Classroom!
(Grades 6–12) 511 AB, Convention Center
Science Focus: ETS, CCC, SEP
Sponsor: Texas Instruments
Jeffrey Lukens, Sioux Falls (S.Dak.) School District
This rapid-fire hands-on workshop goes through five great things you can do with your graphing calculators. For middle school and high school, this workshop shows you how to do data collection, analysis, argumentation from evidence, simulations, and story-based lessons using technology your school probably already has available.

Catalyst Planner: Streamline Your NGSS Curriculum Development
(Grades K–12) 511C, Convention Center
Science Focus: GEN, NGSS
Sponsor: Studio 111
Jaime Rechenberg (jrechenberg@crec.org) and Josiah Hills (jhills@crec.org), Capitol Region Education Council, Hartford, Conn.
Are you overwhelmed by the challenge of developing and coordinating your K–12 NGSS curriculum? Try the new Catalyst Planner web app! Construct coherent three-dimensional STEM instructional units driven by real-world phenomena. Catalyst Planner guides the process of designing learning sequences that engage students in using practices to deepen understanding of core science ideas while building CCSS literacy and mathematics skills. Participants will receive a free six-month user license.
**Linking Literature and STEM in the Primary Classroom**  
*Grades K–3*  
512, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: SAE International  
**Meghan Stoyanoff** (meghan.stoyanoff@sae.org), SAE International, Warrendale, Pa.  
Breathe new life into your primary classroom by incorporating literature into your STEM lessons.

**STEM and NGSS Inquiry in Chemistry—Effective, Efficient, Economical**  
*Grades 9–12*  
514, Convention Center  
Science Focus: PS  
Sponsor: Pearson  
Learn how to transition to a STEM and NGSS student-centered chemistry classroom by implementing safe, simple, easy-to-use, material-conserving, time-efficient, and effective inquiry activities in chemistry.

**Chemical Formula and Amino Acids**  
*Grades 9–12*  
518, Convention Center  
Science Focus: PS1.A, PS2.B, CCC3, SEP3, SEP4  
Sponsor: Lab-Aids, Inc.  
**Andrew Uly**, Loyola High School of Los Angeles, Calif.  
What is the difference between subscripts and coefficients? What does balancing a chemical equation mean? If a student does not fully understand the chemical formula, then moles, reactions, and stoichiometry are hopelessly confusing. Join us for some elegant, intuitive, and well-differentiated lessons that allow students of all levels to master the chemical formula and thereby move confidently into a deeper understanding of chemistry.

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**2:00–4:00 PM Meeting**  
**Urban Science Education Informal Meet-Up**  
Diamond Ballroom Salon 9, JW Marriott  
Calling all California Urban Science Educators! Come join this informal meet-up for NSTA Urban Science Educators. It's a great opportunity for networking and a chance to talk with members of the NSTA Urban Science Education Advisory Board—your voice matters!

**In Memory of Al Guenther**  
1936–2016  
Please contact Nancy Guenther at nguenter13@gmail.com for information on classroom materials that Al wished to donate to teachers and schools.

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**2:30–3:00 PM Presentations**  
**SCST-Sponsored Session: “I Don’t Fit In Here”**  
*College*  
Georgia 1, JW Marriott  
Science Focus: GEN  
**Shane Cavanaugh** (cavan1s@cmich.edu), Central Michigan University, Mount Pleasant  
Let’s discuss what science professors need to know about elementary education students’ feelings of belonging in science courses and how it affects their attitudes toward science. Attention will be paid to the importance of creating a welcoming environment for elementary education students within college science courses and suggestions for doing so.

**Teacher Researcher Day Session: Helping Preservice Teachers See the Need for Science in Their Elementary Classrooms**  
*General*  
Platinum Blrm. Salon D/Group 4, JW Marriott  
Science Focus: GEN, NGSS  
**Deborah Roberts-Harris** (drober02@unm.edu), The University of New Mexico, Albuquerque  
Preservice teachers often arrive in methods class feeling inadequate and science phobic. Persuading them to become agents of change in classrooms and schools is challenging. Join me for an interactive exchange.

**The Broader Impacts/NGSS Connection**  
*General*  
Platinum Ballroom Salon I, JW Marriott  
Science Focus: GEN, SEP  
**Teddie Phillipson-Mower**, Indiana University Bloomington  
There are unique opportunities to meet the new vision for science education (NGSS) through scientific research engagement projects that meet BI criteria. Come for examples, brainstorming, and possible collaboration.
Citizen Science: Considerations and Possibilities for K–12 Classrooms
(Grades K–12) Platinum Ballroom Salon J, JW Marriott
Theresa House (thouse@mcoe.us), Mendocino County Office of Education, Ukiah, Calif.
Citizen science activities bring together scientists and educators, connecting students to the natural world through age-appropriate, authentic investigations; data collection; and research. Learn how teachers and science researchers team up to engage students in authentic scientific research through the lens of the science and engineering practices of the NGSS.

Using Cyanogenic Clover to Teach Biology in 3 D
(Grades 9–College) Plaza 1, JW Marriott
Chuck McWilliams (chuck.mcwilliams@mrhschools.net), MRH High School, Saint Louis, Mo.
Dig deeper into the study of the genetic basis for plant diversity by having your students engage in authentic science research involving the cyanogenesis of clover plants growing in their own backyards, supported by Washington University.

Development and Use of a Secondary Observation Framework to Examine and Support Equitable Science Teaching
(Grades 6–12) 504, Convention Center
Science Focus: GEN, SEP
Imelda Nava (inava@ucla.edu), UCLA Lab School, Los Angeles, Calif.
Jarod Kawasaki (jarodkawasaki@gmail.com), UCLA Center X, Los Angeles, Calif.
Join us we share the development of a secondary science observation framework combining a subject-specific focus with a pedagogical and social emphasis on democratic and humanizing classrooms.

3:00–4:30 PM  Meetings
Preschool–Elementary Science Teaching Committee Meeting
Diamond Ballroom Salon 4/5/Group 1, JW Marriott
Middle Level Science Teaching Committee Meeting
Diamond Ballroom Salon 4/5/Group 2, JW Marriott
High School Science Teaching Committee Meeting
Diamond Ballroom Salon 4/5/Group 3, JW Marriott
College Science Teaching Committee Meeting
Diamond Ballroom Salon 4/5/Group 4, JW Marriott
Research in Science Teaching Committee Meeting
Diamond Ballroom Salon 4/5/Group 5, JW Marriott
Retired Members Advisory Board Meeting
Diamond Ballroom Salon 4/5/Group 6, JW Marriott
Special Needs Advisory Board Meeting
Diamond Ballroom Salon 4/5/Group 7, JW Marriott
Technology Advisory Board Meeting
Diamond Ballroom Salon 4/5/Group 8, JW Marriott
NGSS Advisory Board Meeting
Diamond Ballroom Salon 4/5/Group 9, JW Marriott
Science Matters Advisory Board Meeting
Diamond Ballroom Salon 4/5/Group 10, JW Marriott
Nominations Committee Meeting
Olympic 2, JW Marriott

3:00–6:00 PM  Meetings
AMSE Board of Directors Meeting
(By Invitation Only) Atrium 2, JW Marriott
For more information, please visit amsek16.org.

CESI Board Meeting
(By Invitation Only) 508C (Boardroom), Convention Center
3:00–6:00 PM  Short Courses

**NGSS Lessons Learned: The California NGSS K–8 Early Implementation Initiative (SC-2)**
(Grades K–8) Tickets Required; $31  San Gabriel A, Westin
Science Focus: GEN, NGSS
Kathy DiRanna (kdirann@wested.org), K–12 Alliance/WestEd, Los Alamitos, Calif.
For description, see page 56.

**NGSS A Short Course on Analyzing and Adapting Three-Dimensional Assessment Tasks (SC-3)**
(Grades 1–12) Tickets Required; $33  Santa Anita B, Westin
Science Focus: GEN, NGSS
Katie Van Horne (@dizzvh; katie.vanhorne@colorado.edu), University of Colorado Boulder
For description, see page 56.

3:30– 4:00 PM  Presentations

**“Making” Three-Dimensional Learning Happen: Using Makerspace Technologies to Engage the NGSS (SC-3)**
(Grades 6–12) Diamond Ballroom Salon 8, JW Marriott
Science Focus: ETS
Colby Tofel-Grehl (colby.tg@usu.edu), Utah State University, Logan
Join me as I walk you through the ways in which makerspace technology can be used to engage in the NGSS, especially students in three-dimensional learning.

**SCST-Sponsored Session: Testing the Testing Effect: Modifying Summative Assessment to Enhance Student Learning**
(College) Georgia 1, JW Marriott
Science Focus: LS
Tarren Shaw, The University of Oklahoma, Norman
Assessment strategies in a large introductory biology course were compared over several semesters. Student grade and attitude data were collected in sections using three-unit exams and sections using five-unit exams.

**NARST-Sponsored Session: Peer-Led Team Learning: Improving Achievement, Recruitment, and Retention for Underrepresented Minorities in Postsecondary Biology**
(College) Platinum Ballroom Salon A, JW Marriott
Science Focus: LS
Julia Snyder (jjseymou@syr.edu), Syracuse University, Syracuse, N.Y.
Students engaging in PLTL, particularly underrepresented minorities, had higher achievement and course retention rates as well as higher recruitment and retention in STEM fields.

—Photos courtesy of Jacob Slaton
STEAM in Action (Grades K–5) 501C, Convention Center Science Focus: ETS2.A, SEP
Jennifer O’Sullivan (@suntanslsnplans; jdavid18@fau.edu), A.D. Henderson University School, Boca Raton, Fla. Learn how our K–5 STEAM Lab has mixed a cardboard arcade with augmented reality, 3D printing with ceramics, Google Apps with worm composting, and more.

Engineering Adventure: Blazing a STEM Trail Along the Boston & Worcester Railroad (Grades 6–12) 504, Convention Center Science Focus: ETS, SEP
Kathryn Buckley (keb42@georgetown.edu), Robert H. Adams Middle School, Holliston, Mass. Check out how shovels, springs, and streams can be used to create cool outdoor STEM activities that investigate how engineering affects landscapes and people.

The Sludge Test: Using Project-Based Learning to Build Argumentation and Reasoning Skills in Chemistry (Grades 6–12) Kentia Hall N, Convention Center Science Focus: PS, SEP2, SEP8
Emily Berman (emily.berman@katf.org) and Brianna Balke, and Blackstone Academy Charter School, Pawtucket, R.I. Come learn from the successes and failures of our “Sludge Test” PBL unit that fosters risk-taking and develops NGSS science practices, particularly scientific writing!

Going Green! Middle Schoolers Out to Save the World (Grades 6–12) Kentia Hall P, Convention Center Science Focus: GEN
Heather Holm (hather_holm@universitylaboratoryschool.org) and Betty Skiles (betty_skiles@universitylaboratoryschool.org), University Laboratory School, Honolulu, Hawaii Going Green! Middle Schoolers Out to Save the World is an energy conservation project intended to promote student interest in STEM through Problem-Based Learning.

3:30–4:30 PM Featured Presentation
Creating Learning Ecologies: Integrating Formal and Informal Spaces (General) Theatre (411), Convention Center Science Focus: INF, GEN
Jennifer Long (jjlong@uci.edu), Education and Outreach Coordinator, Center for Environmental Biology, University of California, Irvine Presider: Eddie Tabata, Strand Leader, 2017: A STEM Odyssey, and Science@OC, Santa Ana, Calif.
A great deal of science learning takes place outside of school. It goes on in parks, museums, science centers, after-school programs, online, and in conversations around the dinner table. There is a growing recognition that fostering links between in school and out of school is one important way to enhance science learning. This talk explores where and how our students discover and learn science as they engage in myriad experiences, as well as examines how these experiences can be integrated to form an ecology of science learning, and considers how these ecologies can be leveraged to provide students with opportunities to engage with science all around them.

Jennifer Joan Long is the education and outreach coordinator for the Center for Environmental Biology in the University of California, Irvine’s Ayala School of Biological Sciences. Her research centers on science learning in informal environments, including museums and science centers, co-curricular and after-school programs, and wilderness areas. Specifically, Jennifer focuses on the effectiveness of designed environments in helping people learn about the natural world and reason about complex environmental issues. As part of her work, she designs and studies practical educational interventions, exploring the types of environments that afford science learning and systems thinking.

Previously, Jennifer worked as a program director and instructional designer at an informal science center, where she worked on an initiative to build effective, efficient bridges between the research and education communities, providing the research community with opportunities for outreach and the education community with programs enriched by cutting-edge science research.
3:30–4:30 PM  Presentations

ELL and Culturally Relevant STEAM Strategies for Teaching Diverse Learners
(General)  Diamond Ballroom Salon 1, JW Marriott
Science Focus: GEN
Gerry Madrazo, Jr. (gerrymadrazo@gmail.com), 1993–1994 NSTA President, and Madrazo Multicultural Science Consultancy, Elon, N.C.
Steve Showalter (steve.showalter@nau.edu) and Patricia Peterson (patricia.peterson@nau.edu), Northern Arizona University, Flagstaff
From theory to best practices—we will share STEAM/STEM instruction developed and implemented in our undergraduate and graduate teacher preparation programs for English language learners.

INF  Reflective Practitioners: Tools and Tips for Informal Science Educators
(Grades K–12)  Diamond Ballroom Salon 2, JW Marriott
Science Focus: INF
Lynn Tran (lynn.tran@berkeley.edu) and Catherine Halversen (chalver@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley
Let us introduce you to methods for reflecting on practice to informal science educators. Videos, observation instruments, and discussions are used to develop skills for reflection.

NSTA Press® Session: Diving into the NGSS Disciplinary Core Ideas: How and Why They Are Important for Teaching and Learning
(Grades K–12)  Diamond Ballroom Salon 3, JW Marriott
Science Focus: GEN, NGSS
Ann Rivet (@arivet6; ribbit216@yahoo.com), Teachers College, Columbia University, New York, N.Y.
Ravit Golan Duncan (ravit.duncan@gse.rutgers.edu), Rutgers University, New Brunswick, N.J.
Joseph Krajcik (@krajcikjoe; krajcik@msu.edu), CREATE for STEM Institute, Michigan State University, East Lansing
Book editors discuss the disciplinary core ideas across physical, life, Earth and space sciences, and engineering through rich descriptions of phenomena, learning progressions, and teaching resources.

Hook Your Students with Digital Storytelling: Introducing NOAA's Interactive Every Full Moon Video Series
(Grades 5–12)  Gold Ballroom Salon 1, JW Marriott
Kurt Mann (kurt.mann@noaa.gov), NOAA National Ocean Service, Silver Spring, Md.
Leverage the power of video! Jump-start discussion! Engage your students in hands-on activities! Head back to school with 250+ free videos from NOAA and the Smithsonian!

CSSS-Sponsored Session: Communication for Science Education Leaders (Yes, That Means You!)
(General)  Olympic 3, JW Marriott
Science Focus: GEN, NGSS
Tom Keller (tom.keller.me@gmail.com), Maine Mathematics and Science Alliance, Augusta
Science leaders—at the state, district, school, and classroom level—are the best advocates for science education, yet are often the least prepared in communication.

Innovative and Engaging Strategies for Teaching Lab Safety Concepts
(Grades K–12)  Platinum Ballroom Salon B, JW Marriott
Science Focus: GEN, INF, SEP
Kenneth Roy (@drroyalscier; royk@glastonburyus.org), Glastonbury (Conn.) Public Schools
Tyler Love (@UMES_Tech_Dept; tslove@umes.edu), University of Maryland Eastern Shore, Princess Anne
A variety of safety demonstrations involving participants will be provided to experience more engaging ways to teach NGSS science and engineering practices (STEM).

Considerations for Applying Technology in Outdoor Science Education
(Grades 4–College)  Platinum Ballroom Salon C, JW Marriott
Science Focus: ETS2, LS2, INF
Steve Kerlin (skerlin@stroudcenter.org), Stroud Water Research Center, Avondale, Pa.
Justin Hougham (@umphamwoods1941; justin.hougham@ces.uwex.edu), University of Wisconsin-Extension, Wisconsin Dells
Mobile and field technologies can enhance outdoor education for digital natives—today’s learners. Examples will include a water quality app and digital instrumentation kits.
STEM Is Not a Buzzword, It’s a Culture!
(Grades P–12) Platinum Ballroom Salon I, JW Marriott
Science Focus: GEN, NGSS
Rosemary Berson, Orange County Public Schools, Orlando, Fla.
Hear how STEM can be implemented at the class, school, district, and community levels, changing it from just a buzzword to a culture!

Learning to Integrate Science Practices in K–12 Classroom Instruction
(Grades K–12) Platinum Ballroom Salon J, JW Marriott
Science Focus: GEN, SEP
Maria Gonzalez (gonzaldx@bc.edu) and Katherine McNeill (kmcneill@bc.edu), Boston College, Chestnut Hill, Mass.
Pamela Pelletier (@BPSSciencePam; ppletier@boston-publicschools.org), Boston (Mass.) Public Schools
We will showcase a multimedia professional development resource about the eight NGSS science and engineering practices. Learn how to infuse science practices into K–12 instruction!

Positioning Students as Transformative Intellectuals in Science
(Grades 9–12) Plaza 1, JW Marriott
Science Focus: GEN, NGSS
Alejandra Frausto (afrausto@cps.edu), Chicago (Ill.) Public Schools
Daniel Morales-Doyle (moralesd@uic.edu), The University of Illinois at Chicago
We will share examples of high school science curricula developed to address local issues of environmental and social (in)justice.

DOROTHY K. CULBERT CHAPTER AND ASSOCIATED GROUPS ROUNDTABLE
Are you a Chapter or Associated Group leader with a proven track record of moving your organization forward?
Or do you struggle with issues like membership, board relations, and conference planning?
Join us for this networking opportunity to share your experience and learn from other leaders who are “in the trenches” just like you. NSTA’s Chapter Relations staff will be available to offer their expertise, and Chapters and Associated Groups celebrating special anniversaries will be recognized.
Refreshments provided.

Thursday, 3:30–4:30 PM

Friday, March 31
3:00–4:00 PM
JW Marriott Hotel
Atrium 3
Equal Access Does Not Mean Equal Experiences: Differentiating the General Education Classroom for Diverse Learners
(Grades 9–12) Plaza 2, JW Marriott
Science Focus: GEN
Laura Turngren (lturngren@barrington220.org), Barrington High School, Barrington, Ill.
Increase student access through differentiation and building-wide supports. I’ll provide instructional strategies, assessments, and ideas for schoolwide programs to facilitate growth for diverse learners.

3:30–4:30 PM Hands-On Workshops

Group Learning Routines as a Bridge to Constructing Scientific Explanations
(Grades 8–12) Diamond Ballroom Salon 7, JW Marriott
Science Focus: GEN, NGSS
Elizabeth Chatham (@EChathamNVPS; libbychat@gmail.com), New Visions for Public Schools, New York, N.Y.
Zachary White-Stellato (zwhitest23@gmail.com), Advanced Math & Science II, Bronx, N.Y.
Join us for an immersive experience exploring how to use group learning routines as a prewriting support for writers of all abilities. We will focus on constructing scientific explanations.

ASTE-Sponsored Session: NGSS Activities for Middle School Teachers
(Grades 6–8) Georgia 2, JW Marriott
Science Focus: ESS1.B, CCC1, SEP4
William Veal, College of Charleston, S.C.
Join me for two NGSS-based activities focused on performance expectations that use online calculators to collect data.

Stream Study...With or Without a Stream!
(Grades 4–College) Olympic 1, JW Marriott
Science Focus: ESS, PS, CCC1, CCC4, CCC5, CCC7
Jill Lytle (jill.lytle@sausd.us), Godinez Fundamental High School, Santa Ana, Calif.
Cheryl Ann Park (cherylann.park@sausd.us), Century High School, Santa Ana, Calif.
Make a stream study work for you and your students, no matter their age or stream access. We will also discuss obtaining funding for materials.

Essential Questions for the Next Generation Notebook
(Grades 6–12) 505, Convention Center
Science Focus: GEN, SEP1
Henri Shimojyo (henri.shimojyo@ucr.edu), University of California, Riverside
Yamileth Shimojyo (yshimojyo@rcoe.us), Riverside County Office of Education, Murrieta Office, Murrieta, Calif.
Emphasis will be placed on Essential Questions (EQs) as the driving force of curricular design. Participants will analyze several science notebooks that have used the specific strategy of EQs. Discussion includes connections to the NGSS.

High School Engineers: Build a Model Hydrogen Car
(Grades 9–12) Plaza 3, JW Marriott
Kristen Tomasicchio (@TransOptions; ktomasicchio@transoptions.org), TransOptions, Cedar Knolls, N.J.
Teach your high school students about hydrogen fuel cell technology by building a model car that uses two Mini PEM fuel cells.

NESTA Session: Outstanding Earth Science Teacher Awardee (OESTA) Share-a-Thon
(Grades K–12) 151, Convention Center
Science Focus: ESS
Cheryl Manning (@clbmanning; clbmanning@mac.com), Evergreen High School, Evergreen, Colo.
Join more than 20 OESTA winners as they share their favorite NGSS-congruent classroom activities. Lots of free handouts!

Fairy Tales, Folk Tales, and Fables Engineering
(Grades K–3) 502A, Convention Center
Science Focus: GEN, NGSS
Maria Blue (txmblue@gmail.com), Emblem Academy, Santa Clarita, Calif.
Integrate engineering and literacy through fairy tales, folk tales, and fables with practical management techniques and connections to crosscutting concepts and science and engineering practices.
Using I-Engineering Teacher Tools to Promote Positive Engineering Identity Formation  
(Grades 6–7)  
502B, Convention Center  
Science Focus: ETS, PS3, SEP1, SEP6, SEP8  
Angela Calabrese Barton (@calabresebarton; acb@msu.edu), Michigan State University, East Lansing  
Presider: Kathleen Schenkel (schenk13@msu.edu), Michigan State University, East Lansing  
I-Engineering teacher tools can help teachers forefront students’ identity work in engineering as they engage in the engineering practices of defining problems and designing solutions.

Science and Math Collision Course: Using Phenomena to Teach Matter and Math  
(Grades P–6)  
515A, Convention Center  
Science Focus: PS1.B, CCC2, SEP4  
Dawn O'Connor (@dawno_connor; dawno@acoe.org) and Leena Bakshi (leena219; leena219@gmail.com), Alameda County Office of Education, Hayward, Calif.  
Implement CCSS and NGSS simultaneously through math/science practices. Experience phenomena, discourse, and the math three-act structure (Hook, Explore, Reveal) to investigate matter and its interactions.

Making the Case for STEM Career Pathways in Public Health (Centers for Disease Control and Prevention)  
(Grades 7–College)  
515B, Convention Center  
Science Focus: GEN, NGSS  
Kelly Cordeira (scienceambassador@cdc.gov) and Andrew Fisher (scienceambassador@cdc.gov), Centers for Disease Control and Prevention, Atlanta, Ga.  
Participate in a CDC case study–based lesson plan that engages students in science, math, and health concepts and introduces students to career pathways in public health.

That’s a Good Question!  
(Grades K–5)  
Kentia Hall A, Convention Center  
Science Focus: GEN, SEP1  
Jennifer Hope (jmghope@gmail.com), McKendree University, Lebanon, Ill.  
Science begins with questions! But how does questioning begin? Engage with intriguing phenomena and consider strategies for fostering a classroom culture of questioning.

Centered on Science: Making It Seamless in the PreK–3 Classroom  
(Grades P–3)  
Kentia Hall D, Convention Center  
Science Focus: GEN, NGSS  
Barbara Tharp (btharp@bcm.edu), Greg Vogt, and Nancy Moreno (nmoreno@bcm.edu), Baylor College of Medicine, Houston, Tex.  
Reading, writing, and doing science all lead to loving science! Let literacy lead student engagement in connecting the dots that make science come alive.

Frankenstruction: Hybridizing Literacy and Science  
(Grades 7–12)  
Kentia Hall E, Convention Center  
Candyce Johnson (cjohnson@bbg.org), Brooklyn Botanic Garden, Brooklyn, N.Y.  
With a focus on plant reproduction and genetic modification, learn strategies for sharpening students’ literacy skills without sacrificing content.
Batology: An Integrated STEAM Unit on Bat Structure, Diversity, and Their Vital Role in the Ecosystem (Grades 2–4)  Kentia Hall F, Convention Center  Science Focus: LS  Wendy Wing (@Wingtweets; wwing@forsyth.k12.ga.us), Sharon Elementary School, Suwanee, Ga.  Capture your students’ attention with blood-loving vampires, giant flying fox bats, and bat poop. Fly away with a STEAM unit full of engaging activities and resources.

Starting a STEM Club in Lower School: Now What Do I Do? (Grades P–5)  Kentia Hall G, Convention Center  Science Focus: INF, NGSS  Rebecca Kurson (@beckyk326; rkurson@goldaochacademy.org), Golda Och Academy, West Orange, N.J.  Get information about how to design projects, plan curriculum, and fund a successful lower school STEM Club.

Building a Love for Science In and Out of the Classroom (Grades K–4)  Kentia Hall H, Convention Center  Science Focus: GEN  Jessica Grant, Blackstone Valley Prep Elementary School 2, Cumberland, R.I.  Prepare to engage your students with two different strategies that are sure to inspire them to think about science in their everyday lives.

STEM Engagement at a STARBASE Near You! (Grades 3–7, College)  Kentia Hall J, Convention Center  Science Focus: ETS1, PS3.A, INF, SEP  Mary Stein (stein@oakland.edu) and Betty Crowder (crowder@oakland.edu), Oakland University, Rochester, Mich.  Mark Muzzin (mmuzzin@starbaseone.org), STARBASE One, Selfridge Air National Guard Base, Mich.  At STARBASE, grade 5 students’ passion for learning is ignited. Inspire your students with inquiry-based STEM activities and learn more about this free nationally recognized program.

Using Structures to Enhance STEM Learning (Grades K–8)  Kentia Hall K, Convention Center  Science Focus: GEN  Rebecca Dyasi, Long Island University, Brooklyn, N.Y.  Find out how a practical problem requiring students to build stable and attractive structures to specifications can advance contextualized science and engineering ideas and practices.

Paired Inquiry Using Paper Chromatography (Grades 4–9)  Kentia Hall L, Convention Center  Science Focus: PS1.A, CCC1, CCC2, CCC7, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8  Kelly Moore (kellymoore@intech.edu), Tennessee Tech University, Cookeville.  Use popular candies and food dyes to teach mixtures and physical properties! We will focus on a pair of lab activities that can be used as a guided investigation (teaching skills and protocols useful for the next step) followed by a more open inquiry. NGSS compatibility will also be discussed.

Invisible Signals at the Touch of a Button (Grades 6–8)  Kentia Hall M, Convention Center  Science Focus: PS4, CCC5, SEP1  Coral Clark and Pamela Harman, SETI Institute, Mountain View, Calif.  Participants will explore energy through investigation using remote controls and their own smartphones.

Connect Chemistry to Your World with ChemClub (Grades 9–12)  Kentia Hall O, Convention Center  Science Focus: PS, INF  Karen Kaleuati (@ACSChemClubs; k_kaleuati@acs.org), American Chemical Society, Washington, D.C.  The ACS ChemClub program provides fun and educational resources—all for FREE! Learn about the program, try out some of the activities, and take home a copy of the resources.

Hypothesis Generation in the Science Classroom (Grades 3–College)  Kentia Hall Q, Convention Center  Science Focus: GEN, SEP  Paul Strode (@pkstrode; paul.strode@bvsd.org), Fairview High School, Boulder, Colo.  We will discuss student and teacher misconceptions about hypotheses and scientific reasoning as well as practice strategies for helping students effectively explore hypothesis generation in science.

Polar Ice Blast: Get Your Students Involved in Polar Sciences (Grades 4–8)  Kentia Hall R, Convention Center  Science Focus: GEN, NGSS  Louise Huffman (louise.t.huffman@dartmouth.edu), Thayer School of Engineering at Dartmouth, Hanover, N.H.  Polar activities can open the world of global change to your students far beyond penguins and polar bears.
Evolution the NGSS Way
(Grades 9–12) Kentia Hall S, Convention Center
Science Focus: LS4
Molly Malone (molly.malone@utah.edu), The University of Utah, Salt Lake City
Explore curriculum materials that integrate the NGSS three dimensions of learning with published scientific data to address core ideas in evolution such as common ancestry, heredity, natural selection, and speciation. Visit learn.genetics.utah.edu for more information.

NMEA-Sponsored Session: Tagging and Tracking Sharks: What’s Your Hypothesis?
(Grades 3–12) Petree Hall D, Convention Center
Science Focus: LS, CCC2, SEP1, SEP4
Jessica Kastler, Summer Dorcik (summer.rohe@usm.edu), and Jill Hendon (jill.hendon@usm.edu), Gulf Coast Research Laboratory, Ocean Springs, Miss.
Learn about the elusive whale shark as you consider tagging technology and shark life histories. Graph shark migration tracks and discuss hypothesis formation and testing.

3:30– 4:30 PM Exhibitor Workshops
Cooking Up Lessons with Three Dimensional Learning
(Grades 6–12) 150 AB, Convention Center
Science Focus: GEN, NGSS
Sponsor: STEMscopes™ from Accelerate Learning
Amanda McGee and Dawn Alvarez, STEMscopes from Accelerate Learning, Houston, Tex.
Three-dimensional learning has been compared to cooking a really great meal. Come explore this analogy with us as we work together to plan an effective lesson that addresses all three dimensions of the NGSS.

Exploring and Modeling Climate Change
(Grades 7–12) 405, Convention Center
Sponsor: PASCO scientific
Michael Blasberg, PASCO scientific, Roseville, Calif.
Roger Palmer, GISetc, Dallas, Tex.
How can you make a global phenomenon tangible so students can better understand the local impacts of climate change? Through hands-on, sensor-based investigations, we will monitor local CO2 levels, model ocean acidification, and use Geographic Information Systems (GIS) to explore (and create) global data sets with free classroom-ready resources.

Environmental Toxicology Using Edvotek’s New EZ-elegans
(Grades 9–College) 410, Convention Center
Science Focus: LS
Sponsor: Edvotek, Inc.
Daniele Snowflack (info@edvotek.com), Brian Ell (info@edvotek.com), and Tom Cynkar (info@edvotek.com), Edvotek Inc., Washington, D.C.
Model organisms allow scientists to investigate biological questions that cannot be studied in humans. Learn how Edvotek’s EZ-elegans simplifies culturing C. elegans in your classroom. Then, explore effects of environmental factors on C. elegans using a simple locomotion assay. Integrate STEM concepts with data collection and statistics. Freebie/raffle entry for attending!

Exploring Misconceptions: Motion Graphs
(Grades 6–12) 407, Convention Center
Science Focus: PS2.A, CCC1, SEP2, SEP3, SEP4, SEP5
Sponsor: PASCO scientific
Brett Sackett (sackett@pasco.com), PASCO scientific, Roseville, Calif.
Thomas Hsu (thsu@pasco.com), Ergopedia, Inc., Cambridge, Mass.
What’s the difference between position, speed, and velocity? By collecting data of a moving cart, we will graph distance vs. speed and position vs. velocity to help students understand the motion of moving objects and the distinction between positive and negative position and velocity.

Forces, Energy, Motion, and Engineering with K’NEX Machines: Using STEM to Make Work Easier
(Grades 5–9) 510, Convention Center
Science Focus: ETS1, PS2
Sponsor: K’NEX Education
Robert Jesberg (rjesberg@knex.com), K’NEX Education, Hatfield, Pa.
Experience STEM hands on by building gravity, rubber band, and spring-powered K’NEX racers to experiment with physical science concepts using 5E instructional strategies. Test your cars (Explore), graph and analyze results (Explain), and redesign (Extend). Investigate potential and kinetic energy, average speed, and more. Standards and STEM concepts will be our guide.
Thursday, 3:30–4:30 PM

3:30–5:30 PM Hands-On Workshops

**CSSS-Sponsored Session: Having Classroom Instruction and Formative Assessment Meet the NGSS Performance Expectations**

(General) Platinum Ballroom Salon F, JW Marriott
Science Focus: GEN, NGSS

**Brett Moulding** (mouldingb@ogdensd.org) and **Nicole Paulson** (nicole.paulson@nebo.edu), Partnership for Effective Science Teaching and Learning, Ogden, Utah

Attention will be paid on how the three dimensions of science from the Framework and NGSS work together in student science performances. We will share a useful tool to have classroom instruction and formative assessment meet the NGSS performance expectations.

4:00–4:30 PM Presentations

**Making Makerspaces Equitable and Accessible**

(Grades 6–12) Diamond Ballroom Salon 8, JW Marriott
Science Focus: ETS, PS

**Colby Tofel-Grehl** (colby.tg@usu.edu), Utah State University, Logan

This talk focuses on the ways that providing classroom students with opportunities to engage with making provides better access and equity for all groups over the traditional after-school club or camp.

**SCST-Sponsored Session: Examining the Progression of Student-Developed Hypotheses in an Inquiry Biology Laboratory Course (IBLC)**

(College) Georgia 1, JW Marriott
Science Focus: LS

**Joseph Trackey** (joseph.l.trackey@lonestar.edu), **Helen McDowell** (helen.e.mcdowell@lonestar.edu), and **Linda Crow** (lcrow@lonestar.edu), Lone Star College–Montgomery, Conroe, Tex.

Hear about the struggles students encounter and overcome in developing a testable hypothesis during an inquiry-based introductory college biology course.

**NARST-Sponsored Session: Engaging Students with Primary Literature Improves Nature of Science Conceptions and Confidence in Reading Science**

(College) Platinum Ballroom Salon A, JW Marriott
Science Focus: LS, SEP

**Jason Wiles**, Syracuse University, Syracuse, N.Y.

College biology students exposed to primary literature showed positive gains in nature of science conceptions as well as increased confidence with approaching original research.

**Science in the Community Session: Creativity Forum: A Serious and Fun Aspect of Science**

(General) 152, Convention Center
Science Focus: GEN, INF, NGSS

**Phyllis Katz** (pkatz15@gmail.com), Retired Educator, Silver Spring, Md.

This ISE Committee Science in the Community Forum focuses on creativity and the importance of patterns from neurobiology to your science class. Featuring Thomas Knaurer—quilter and mathematician.

**Phenomena and the Fed**

(Grades 1–5) 501C, Convention Center
Science Focus: GEN, NGSS

**Margaret Chmiel** (@mchmiel), Howard Hughes Medical Institute, Chevy Chase, Md.

Explore free online resources from across federal agencies that provide science educators with a starting place for identifying phenomena to drive NGSS lessons.

**Incorporating Inquiry and Problem-Based Projects in High School Chemistry Class**

(Grades 8–12) Kentia Hall N, Convention Center
Science Focus: PS, CCC4, CCC5, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8

**Jeannette Adkins** (jadkins@st.catherines.org), St. Catherine’s School, Richmond, Va.

Discussion centers on integration of problems and projects into a high school chemistry course to encourage engagement in real-world problems through NGSS while ensuring content is covered.

**Learning STEM Through Bioenergy: Lessons from the Plants**

(Grades 7–12) Kentia Hall P, Convention Center
Science Focus: LS, PS3, CCC

**Kathryn Orvis**, Purdue University, West Lafayette, Ind.

Fuel new learning in your classroom with a comprehensive curriculum focused on biofuels from plants that provides a foundation for teaching fundamental STEM concepts and making connections to a range of diverse careers.
4:00–5:30 PM  Exhibitor Workshops

Gel Electrophoresis in 90 Minutes to Deduce Genotype from Phenotype
(Grades 10–College)  150C, Convention Center
Science Focus: LS1, LS3, PS1, CCC1, SEP4
Sponsor: The MiniOne Systems
Richard Chan (sales@theminione.com), The MiniOne Electrophoresis, San Diego, Calif.
Learn and get hands-on experience teaching Mendelian genetics and genotyping by doing electrophoresis. You will pour, load, and run a gel; capture a gel image; analyze the results; and determine PTC taster genotype. If you attended our PTC Taster by PCR session, you may load and analyze your own amplified DNA.

How to Incorporate STEM Project-Based Learning in Your Classroom—Start Building!
(Grades K–12)  153A, Convention Center
Science Focus: ETS
Sponsor: Iridescent
Judith Ahumada (info@curiositymachine.org), Iridescent, Los Angeles, Calif.
Discover Curiosity Machine, our STEM PBL program! Developed in partnership with professional engineers, our design challenges are NGSS focused. Find out how you can use them with your K–12 students. Walk away with free resources. Come build with us!

Living by Chemistry: Create a Table
(Grades 9–12)  153B, Convention Center
Science Focus: PS
Sponsor: Bedford, Freeman, & Worth High School Publishers
Angelica Stacy, University of California, Berkeley
Teach rigorous chemistry through guided inquiry! In this workshop, we will explore activities that introduce the periodic table and other core chemistry concepts through a historical context. Leave with free materials to use in your class!

Hands-On Approach to Teach Electricity in Japan
(Grades 7–12)  153C, Convention Center
Sponsor: NaRiKa Corp.
Michal Marcik (global@rika.com) and Taiki Watanabe (global@rika.com), NaRiKa Corp., Tokyo, Japan
As a time-honored Japanese company, NaRiKa introduces a hands-on approach to teaching electricity, which is a topic so many teachers worldwide struggle with. Our participatory workshop provides solutions in the Japanese way for this challenge along with our handheld generator covering both static and dynamic electricity, including energy conservation and conversion.

Build Skills to Boost the Makerspace Experience for Young Scientists!
(Grades K–3)  301 AB, Convention Center
Science Focus: ETS
Sponsor: Delta Education/School Specialty Science
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Makerspaces are popping up everywhere, providing a creative space to explore questions and solve problems. But for students in grades K–3, tackling STEM-related challenges requires a foundation in science investigation. Help young scientists build the skills needed for independent exploration in their makerspaces with programs like Science in a Nutshell.

Evolutionary Evidence in the Fossil Record
(Grades 6–8)  303 AB, Convention Center
Science Focus: ESS, LS4
Sponsor: Delta Education/School Specialty Science–FOSS
Virginia Reid and Ann Moriarty, The Lawrence Hall of Science, University of California, Berkeley
What does the fossil record tell us about how life has changed over time? Explore evolutionary history through hands-on activities from the new FOSS Next Generation Heredity and Adaptation Course for middle school, and identify connections to the three dimensions of NGSS.

Wind Turbine: An NGSS Approach to Understanding Renewable Energy
(Grades 6–12)  304 AB, Convention Center
Science Focus: ETS
Sponsor: CPO Science/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Kat Mills, School Specialty Science, Rosharon, Tex.
Wind is a plentiful energy source, but is the energy transformation really clean? Investigate costs and energy efficiency using an innovative model. Participants build a wind turbine, analyze costs involved, and then compete against others to see who can get the most from their engineered design. Door prizes. Free STEM resources.
Learn to Code with LEGO® MINDSTORMS® Education EV3
(Grades 5–12) 304C, Convention Center
Science Focus: ETS
Sponsor: LEGO® Education
Kelly Reddin, LEGO Education, Billund, Jylland, Denmark
Learn how to teach your students “coding habits of mind,” which will lay the foundation for students to engage in more advanced programming. Complete hands-on lessons that leverage coding skills and are built around national standards. Not a programmer? No problem. By the end of this session, you will be eager to bring coding and robotics to your classroom.

STEM Leaders in Action: Learn About the Einstein Fellowship (AEF) Program
(Grades 5–12) 305, Convention Center
Science Focus: GEN
Sponsor: Albert Einstein Distinguished Educator Fellowship
Jill Latchana (einsteinfellows@orise.orau.gov) and Beth White (einsteinfellows@orise.orau.gov), Oak Ridge Associated Universities, Oak Ridge, Tenn.
Learn how Einstein Fellows bring their insights and experience as K–12 STEM educators to federal STEM education programs, initiatives, and policy efforts by serving in U.S. Congressional Offices, or the U.S. Department of Energy (DOE), National Science Foundation (NSF), and the National Aeronautics and Space Administration (NASA). Find out from the panel of current Fellows about their day-to-day experiences, the substantial contributions to federal-level education efforts, the unique professional and career development opportunities available to Fellows, and how to apply to the program.

Autopsy: Forensic Dissection Featuring Carolina’s Perfect Solution® Pigs
(Grades 9–12) 306 AB, Convention Center
Science Focus: LS, CCC, SEP
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Are you ready for a forensic dissection activity that is on the cutting edge? Engage students and revitalize your instruction of mammalian structure and function with a “real” classroom autopsy! Dissect a Carolina’s Perfect Solution pig by modeling the protocols of a forensic pathologist.

Clean Up Your Mess! Air and Water Pollution Remediation
(Grades 6–12) 308 AB, Convention Center
Science Focus: ESS3.C, ETS, CCC, SEP
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Pollution remediation is a messy but necessary business. Experience two hands-on environmental science activities that model the techniques used to clean up pollution—air pollution wet scrubbers and a three-step wastewater treatment process. Both activities may be used qualitatively or quantitatively, depending on instructional objectives.

Shifting to the Five Innovations: How Do We Transform Instruction?
(Grades 6–8) 309, Convention Center
Science Focus: GEN, NGSS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Experience three-dimensional learning, phenomena, the nature of science, ELA and math connections, and an in-depth progression of learning as you explore the new Smithsonian STCMS™ middle school curriculum designed to implement these five innovations. Leave with examples of supportive resources to make the transition easy and fun for students.

Chemistry with Vernier
(Grades 9—College) 402A, Convention Center
Science Focus: ETS2, PS1, PS3, PS4
Sponsor: Vernier Software & Technology
Nüsret Hisim (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Use Vernier sensors to conduct chemistry experiments from our lab books in this engaging hands-on workshop. Collect and analyze data on LabQuest 2 and computers. See a demonstration of our new Go Direct wireless and USB sensors that connect directly to computers, Chromebooks, and mobile devices—no interface needed.

STEM/Engineering Activities Using Vernier Sensors with Arduino
(Grades 7–12) 402B, Convention Center
Science Focus: ETS
Sponsor: Vernier Software & Technology
Dave Vernier (dvernier@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Attend this engaging hands-on workshop to explore how easy it is to use Vernier sensors with the inexpensive, easy-to-program Arduino RedBoard. Topics include an introduc-
tion to programming Arduino microcontrollers, calibrating sensors, and controlling outputs based on sensor readings. Learn how you can use Arduino for great STEM and engineering projects.

**Building or Renovating a Laboratory? Get Your Questions Answered**  
*(Grades 5–College)*  
*403A, Convention Center*

Science Focus: GEN  
Sponsor: Flinn Scientific, Inc.

**Greg Chyson (gchyson@flinnsi.com), Flinn Scientific, Inc., Batavia, Ill.**

Get answers to all your laboratory design questions! We will share design priority tips and safety information gathered from years of experience helping science teachers plan their laboratory construction and remodeling projects! You will learn what features to include in your laboratories and what common mistakes to avoid.

**Ecological Restoration—From a Case Study Investigation to Local Action**  
*(Grades 9–12)*  
*403B, Convention Center*

Science Focus: LS2.C, SEP3  
Sponsor: HHMI BioInteractive

**Margaret Holzer (maholzer@monmouth.com), Chatham High School, Chatham, N.J.**  
**Perri Carr (perricarr@gmail.com), Bishop Dunne Catholic School, Dallas, Tex.**

This hands-on workshop uses the ongoing Gorongosa National Park ecological restoration case study to prepare students to conduct their own ecological investigations locally. Participants will use classroom-ready resources that engage, cover complex ecological concepts, and demonstrate how to best access and generate WildCam citizen science data for classroom analysis.

**Take pGLO™ to the Next Level!**  
*(Grades 9–College)*  
*404 AB, Convention Center*

Science Focus: LS  
Sponsor: Bio-Rad Laboratories

**Leigh Brown (leigh_brown@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.**

What happens when you add jellyfish DNA to *E. coli*? pGLO green glowing bacteria! Scientists can do this by transforming bacteria with the genes for Green Fluorescent Protein (GFP). In this workshop, you will become a bio-engineer and purify GFP from transformed bacteria via a biomanufacturing process—chromatography.

**Become a GMO Investigator**  
*(Grades 9–College)*  
*406 AB, Convention Center*

Science Focus: LS  
Sponsor: Bio-Rad Laboratories

**Sherri Andrews (sherri_andrews@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.**

Regardless of where you stand in the GM debate, wouldn’t it be interesting to know which foods you eat are GM foods? This hands-on workshop teaches the basics of DNA extraction, PCR, and electrophoresis and how they are used to test grocery store food products for the presence of GM foods.

**Using Mobile Technology to Engage Students with STEM**  
*(Grades K–8)*  
*408A, Convention Center*

Science Focus: GEN, NGSS  
Sponsor: Discovery Agents

**Cynthia Rounds (cynthia_rounds@myfsd.org), Robert C. Fisler School, Fullerton, Calif.**  
**Mary Clark (mclark@discoveryagents.net), Discovery Agents, Kelowna, B.C., Canada**  
**Ashley Ukleja, Discovery Science Foundation, Los Angeles, Calif.**

Technology is the language of youth today. Discovery Agents provides educators with an innovative, easy-to-use tool that makes learning fun and engaging for students. This platform enables educators to easily publish their content to mobile, thereby turning the community into a classroom.

**Cool Tools for Light and Color**  
*(Grades 8–12)*  
*408B, Convention Center*

Science Focus: PS  
Sponsor: Arbor Scientific

**James Lincoln, Arbor Scientific, Newport Beach, Calif.**

Strip in for amazing light and color demos presented by award-winning physics teacher Buzz Putnam. These classroom-ready activities include mixing primary colors to cast shadows in cyan and magenta, graphing emission lines of gas tubes with the RSpec-Explorer, and answering his famous “mirror challenge” question! Door prizes included!
Integrating Earth Systems Investigations and Action into Curriculum
(Grades 9–12) 409 AB, Convention Center
Science Focus: ESS2, ESS3, LS2, CCC2, CCC3, CCC4, CCC7, SEP1, SEP2, SEP3, SEP6, SEP8
Sponsor: HHMI BioInteractive
Aleeza Oshry (oshrya@hhmi.org), Howard Hughes Medical Institute, Chevy Chase, Md.
Jessica Bean (jrbean@berkeley.edu), University of California Museum of Paleontology, Berkeley
Join us for an interactive workshop to learn how HHMI’s BioInteractive resources with UCMP’s Understanding Science and Global Change Frameworks can be used to create relevant, student-centered, and inquiry-based curricula that meet content standards. Whether you are developing, implementing, or supplementing curricula, the resources and methods shared in this workshop will support your efforts.

The Voice LIVE: Physics Edition
(Grades 6–12) 503, Convention Center
Science Focus: PS
Sponsor: Ward’s Science
Samantha Bonelli, VWR Science Education, Rochester, N.Y.
Have you ever wanted to perform in front of an audience? Well, it’s your time to shine! Form your own band and perform a hit single using resonance tubes! Teach concepts such as sound, transfer of energy, waves, forced vibrations, pitch, and frequency in a way students won’t soon forget.

Creating Excitement About Science Through Water Education
(Grades P–10) 511 AB, Convention Center
Science Focus: ESS, CCC, SEP
Sponsor: Project WET Foundation
Julia Beck, Project WET Foundation, Bozeman, Mont.
Project WET is the global leader in water education using hands-on science methods to train teachers to teach children. In 2017, Project WET introduces new connections to the NGSS for its award-winning and NSTA Recommends publication, the Project WET Curriculum and Activity Guide 2.0 along with launching a new guide titled Getting Little Feet Wet. Come learn how to use Project WET activities to get children of all ages excited about science and environmental education.

Bring Your Cell Biology Teaching to the Next Level with the 3D Cell Explorer!
(Grades 9–College) 511C, Convention Center
Science Focus: ETS, LS, SEP
Sponsor: Nanolive SA
Lisa Pollaro, NanoLive SA, Écublens, Vaud, Switzerland
Nanolive launches the 3D Cell Explorer for education—a revolutionary microscope that delivers live cell tomography at the push of a button. The intuitive software STEVE enables digital staining on single cells with an unlimited choice of colors and obtains its 3D reconstruction in real time. To share, interact, and explore your results, the cells data can further be printed (e.g. 3D printer or 3D holograms), or can be directly viewed on 3D beamers or in 3D animations.

Hands-On STEM in the Upper Elementary Classroom
(Grades 4–6) 512, Convention Center
Science Focus: ETS1
Sponsor: SAE International
Amy Smith (asmith@gmail.com), SAE International, Warren-dale, Pa.
Learn how to keep your upper elementary students engaged in STEM. This hands-on workshop will provide you with the tools you will need to use the engineering design experience in your classroom.

Cultivating a Culture of Argumentation in Your Classroom
(Grades K–8) 514, Convention Center
Science Focus: GEN, SEP7
Sponsor: Pearson
Zipporah Miller, Anne Arundel County Public Schools, Annapolis, Md.
Critical thinking, communication, collaboration, creativity, and innovation are skills students should possess that allow them to compete in today’s global economy. Cultivating a culture of argumentation in classrooms affords students with the opportunity to develop these skills. This session will model techniques that help encourage students to formulate explanations based on evidence, in an effort to defend their ideas or challenge a classmate’s ideas. This session will also demonstrate how argumentation allows students to challenge the status quo based on evidence.
Calling All Carbons  
(Grades 9–12)  
518, Convention Center  
Science Focus: ESS2.A, SEP2, SEP3, SEP4  
Sponsor: Lab-Aids, Inc.  
Lisa Martin-Hansen, California State University, Long Beach  
The element carbon is critical to life on Earth. All living organisms contain different and essential carbon-based molecules. Several Earth processes work together to cycle carbon from one carbon reservoir to another and to keep the amount in each reservoir stable. We will learn about and model different carbon transfer processes in this exemplary NGSS activity developed by EDC and the Oceans of Data Institute.

4:00–6:00 PM  Meeting  
APAST Board of Directors Meeting  
(By Invitation Only)  
401, Convention Center

4:30–5:30 PM  Meeting  
Outstanding Science Trade Books Committee Meeting  
(By Invitation Only)  
Studio 1, JW Marriott

4:30–6:00 PM  Meeting  
NSTA Board and Council Meet & Greet  
(By Invitation Only)  
Atrium 3, JW Marriott

4:30–6:00 PM  Networking Opportunity  
NSTA Young Professional and New Teacher Reception  
Diamond Ballroom Salon 6, JW Marriott  
Preservice and new teachers (in-service for less than five years, including career-changers) are invited to attend this fun and interactive networking reception. No ticket required.

The reception will include short presentations offering tips on how to excel in the classroom from both new and preservice teachers as well as NSTA Student Chapter leaders. An overview of NSTA resources geared to preservice and new teachers will also be presented. Refreshments and hors d’oeuvres will be served as you network with your peers.

4:45–5:45 PM  Meeting  
STEM Outstanding Trade Books Meeting  
(By Invitation Only)  
Olympic 2, JW Marriott

5:00–5:30 PM  Presentations  
NSTA Press® Session: Teaching Energy Across the Sciences  
(Grades K–12)  
Diamond Ballroom Salon 3, JW Marriott  
Science Focus: PS3, CCC5  
Jeff Nordine (nordine@ipn.uni-kiel.de), Leibniz Institute for Science and Mathematics Education, Keil, Germany  
Get introduced to the “Five Big Ideas” about energy that are critical for making energy a crosscutting concept across the sciences and everyday life.

SCST-Sponsored Session: Using Museums to Broaden the Science Practices and Increase Engagement  
(Grades 9–College)  
Georgia 1, JW Marriott  
Science Focus: LS, SEP  
Lynn Diener, Mount Mary University, Milwaukee, Wis.  
Robert Payo (robert.payo@dmns.org), Denver Museum of Nature & Science, Denver, Colo.  
Learn about often underutilized opportunities to help you teach sciences to your undergraduate science students.

Global Collaboration in the Science Classroom  
(Grades 8–12)  
Plaza 2, JW Marriott  
Science Focus: GEN, NGSS  
Jacqueline Fernandez, LEATC Career Academy, Washington, D.C.  
Find out where to find schools interested in collaboration, how to get involved with global collaborative organizations such as the Global Nomads Group, get tips on how to establish a successful partnership, and develop a framework for collaboration projects based on personal experiences with schools in Hong Kong, China, and Jordan.

Implementing Profession-Based Learning in the Science Classroom  
(Grades 9–College)  
Plaza 3, JW Marriott  
Science Focus: GEN, SEP1  
Joseph Whalen (@jpwhalen; grouper21@hotmail.com), Center for Advanced Professional Studies (CAPS), Overland Park, Kans.  
Want to provide real-world and authentic experiences for your students while maintaining a rigorous curriculum? Techniques, tips, and lessons learned using this approach will be shared.
Effective Applications of iPad Technology in the Science Classroom
(Grades 6–12) 504, Convention Center
Science Focus: ETS, CCC, SEP
Melodie Ting (@mgtchemist; mgt2130@tc.columbia.edu), The Browning School, New York, N.Y.
Attention will be paid to the application of iPad technology in a science classroom. We will explore different digital tools that can be used to enhance collaboration and three-dimensional learning.

Disaster in the Making: Implementing Dual Class System to Teach Emerging Infectious Disease in a First-Responder School
(Grades 9–12) Kentia Hall S, Convention Center
Arun Kadam (akadam@bridgeportedu.net) and Brianne Bresky (bbresky@bridgeportedu.net), Bridgeport Military Academy, Bridgeport, Conn.
Hear about a science and history course at Bridgeport Military Academy, a first-responder magnet school. We will share the course’s interdisciplinary integrations of science, social sciences, homeland security, CDC, and FDA for emergency management.

5:00–6:00 PM  Presentations
Measuring Proficiency and Growth in the Science and Engineering Practices
(Grades 7–12) Diamond Ballroom Salon 8, JW Marriott
Science Focus: GEN, SEP
Steve Wood (swood@d125.org) and Dean Barr (dbarr@d125.org), Adlai E. Stevenson High School, Lincolnshire, Ill.
Explore resources we have developed to measure student proficiency and growth in the science and engineering practices. Practical examples for lessons, rubrics, and other resources will be shared and discussed.

Elementary Science Methods: Learning to Teach Students with Learning Disabilities
(College) Olympic 1, JW Marriott
Science Focus: GEN
Lisa Brooks, University of Central Florida, Orlando
Learn about strategies and tools to guide preservice teachers to understand how to provide meaningful experiences for ALL students, including those with special needs.

5:00–6:00 PM  Networking Opportunity
Alliance of Affiliates Networking Social
(By Invitation Only) Platinum Ballroom Salon A, JW Marriott
Members of NSTA's affiliate organizations (NARST, ASTE, CESI, NSELA, AMSE, NMLSTA, CSSS, ASTC, SCST) are invited to attend this social to network with other affiliate members.

CSSS-Sponsored Session: Creating STEM Mentor Networks to Increase STEM Teacher Retention
(Grades K–8) Platinum Ballroom Salon A, JW Marriott
Science Focus: GEN
Jennifer Hicks (@DrJennyHicks; hicks12@purdue.edu), I-STEM Resource Network, West Lafayette, Ind.
Jeff Thomas (jathomas@usi.edu), University of Southern Indiana, Evansville
Deborah Vannatter (davanna1203@gmail.com), University of Evansville, Ind.
We will describe the work we are doing in Indiana to build a network of STEM mentor teachers in grades K–8.
Teachers as Edventurers: Deepening Science Inquiry with Mobile Media Devices
(Grades 6—College) Platinum Ballroom Salon I, JW Marriott
Science Focus: ETS2, LS2, INF
Justin Hougham (@uphamwoods1941; justin.hougham@ces.uwex.edu), University of Wisconsin—Extension, Madison
Chris Schaben (chris.schaben@ops.org), Omaha (Neb.) Public Schools
Elizabeth Mulkerrin (elizabethomahazoo.com), Omaha’s Henry Doorly Zoo and Aquarium, Omaha, Neb.
Tara Short (@greenedventures; tara@greenedventures.com), Green Edventures LLC, Las Vegas, Nev.
Discover a professional development model that combines international travel and mobile digital tools to quantify characteristics of a place, making relevant connections with students back home.

Relevance Is Everything: Connecting All Students to the NGSS by Engaging in Local Problems
(Grades K—5) 501C, Convention Center
Science Focus: ETS1.A, CCC7
Eric Cromwell (@GIS_Cromwell; ecromwell@bcps.org), Baltimore County Public Schools Office of Science, Towson, Md.
Why am I learning this? What will it help me to do? Answering these questions can make your instruction accessible to all students.

Culturally Responsive Science: Ensuring That the Science Classroom Reflects Every Student
(Grades 6—12) 505, Convention Center
Science Focus: GEN
Joshua Edwards (@jedwardschem; joshuedwards@gmail.com), Graded School, São Paulo, Brazil
How can we redesign our lessons to match the background and experiences of diverse learners in our classrooms? Start by viewing differences as a strength!

Useful, Relevant Interactive Reading Passages in Your Secondary Classroom
(Grades 6—12) 506, Convention Center
Science Focus: GEN, SEP4, SEP8
Jess Rowell (@STEMJourneys; learnmore@stemjourneys.org), Independent Consultant, Houston, Tex.
Journeys are NGSS-focused middle school and high school interactive reading passages integrating current scientist case studies, data analysis, graphing practice sets, engineering stories, and citizen science opportunities.

Science, Technology, and Literacy: Ideas for the Elementary Classroom
(Grades 1—6) 513, Convention Center
Science Focus: GEN, NGSS
Jane Savatski (@teachtwo; savatjkijane@aasd.k12.wi.us), Janet Berry Elementary School, Appleton, Wis.
Use Chromebooks or iPads to simultaneously teach and learn about science and literacy concepts. Most elementary classroom teachers face the challenge of teaching multiple disciplines in a limited amount of time. Walk away with ideas for using technology to internalize science and literacy concepts.

Analyzing and Interpreting Ice Sheet Data to Determine the Effects of Human Activities on Climate
(Grades 6—College) 515A, Convention Center
Science Focus: ESS3
David Randle (d.randie@amnh.org), American Museum of Natural History, New York, N.Y.
Use GRACE satellite ice sheet data with resources that incorporate data analysis and literacy strategies to teach about the causes and effects of climate change.

Solids: The Neglected “State” of Chemistry
(Grades 9—12) Kentia Hall O, Convention Center
Science Focus: PS1.A, PS1.B, CCC2, CCC6
Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.
Use solids to make chemistry more relevant for students. Hands-on STEM activities using solid materials (metals/polymer/ceramics) make concepts easier to teach/learn. NGSS correlations. Take home a CD of information.

Powerful and Free Online Simulations and Curriculum for Earth Science
(Grades 7—12) Kentia Hall P, Convention Center
Science Focus: ESS, SEP7
Amy Pallant (apallant@concord.org), The Concord Consortium, Concord, Mass.
Discover free Earth system and environmental science simulations and curricula on topics such as plate tectonics, climate change, and hydraulic fracturing.
NMEA Session: Students Study the Seas: In-Classroom STEM Oceanography Projects Inspire Global Awareness and Science Literacy

Petree Hall D, Convention Center


Richard Baldwin (dick@educationalpassages.com), Educational Passages, Belfast, Maine

Bradley Janocha (@bradjanocha; bjanocha2@washcoll.edu), Washington College, Chestertown, Md.

This international hands-on learning program uses miniature GPS-monitored sailboats on the Pacific Ocean to share incredible adventure and learning opportunities. Students will monitor their boat as it works its way towards the Orient...learning all the way.

5:00–6:00 PM Hands-On Workshops

Teaching STEM Lessons with a Multicultural Perspective (Grades 8–11) Diamond Ballroom Salon 7, JW Marriott

Science Focus: GEN, NGSS

Kathleen McKinley, Temple University, Philadelphia, Pa.

Enhance understanding of multicultural teaching; use technology, cooperative groups, total participation techniques; and orchestrate productive discourse in teaching STEM lessons.

“Don’t simply retire from something; have something to retire to.” —Harry Emerson Fosdick

The NSTA Retired Advisory Board invites you to a vibrant and useful information-sharing session. Join your fellow colleagues and share your ideas about staying active both in and out of the profession.

Before and After Retirement—Practicalities and Possibilities

Saturday, April 1
9:30–10:30 AM

Los Angeles Convention Center, 507

For more information on the Retired Members Advisory Board, contact Lloyd Barrow, Chair, at barrowl@missouri.edu.
Equal Access to Science: Universal Design and Students with Disabilities  
(Grades 2–College) Platinum Ballroom Salon B, JW Marriott  
Rachel Zimmerman Brachman (@RachelZBrachman; rachel.zimmerman-brachman@jpl.nasa.gov), NASA Jet Propulsion Laboratory, Pasadena, Calif.  
Lyla Mae Crawford (lylac@uw.edu), DO-IT, Spokane, Wash.  
Full inclusion of students with disabilities in STEM involves accommodation strategies and universal design of instruction. We will share a NASA-based example.

Let’s Give Them Something to Talk About: Discourse in the NGSS Science Classroom  
(General) 502A, Convention Center  
Science Focus: PS1.A, PS1.B, CCC2, CCC5, SEP1, SEP3, SEP6, SEP7, SEP8  
Leena Bakshi (@Leena219; leena219@gmail.com), Mena Parmar (@MenaParmar), and Dawn O’Connor (@dawno_connor; dawno@acoe.org), Alameda County Office of Education, Hayward, Calif.  
Engage in numerous talk formats and experience how discourse helps students construct explanations and argue from evidence about the scientific phenomenon of alcohol evaporation.

Host a Rockstar Family STEM Event  
(Grades K–5) 502B, Convention Center  
Science Focus: ETS, INF, SEP  
Rebecca McDowell (@BeTheChnge; beckymcdowell@gmail.com), Barrington (Ill.) 220 School District  
Creating a lasting impact starts with engaging families. Learn how to host a rockstar STEM Family Event and explore maker projects families can do together.

5 Es and Literacy?  
(Grades 4–5) Kentia Hall A, Convention Center  
Science Focus: GEN, NGSS  
Shana Tirado (shana.tirado@sdhc.k12.fl.us), Hillsborough County Public Schools, Tampa, Fla.  
Let’s put it all together with literacy and communicate like a scientist. Join us in finding natural connections in making science notebooks engaging, interactive, and meaningful for students.

Elevating Science Vocabulary and Literacy-Based 3D Learning in Early Childhood STEM  
(Grades P–3) Kentia Hall B, Convention Center  
Science Focus: GEN, NGSS  
Sylvia Goggin, Coralwood School, Decatur, Ga.  
Integrate engineering design, literacy, and rigorous science vocabulary into the early childhood/elementary curriculum. It’s STEM three-dimensional learning through a love of words and books.

Informational Text and the Integration of Science and Literacy  
(Grades 2–6) Kentia Hall C, Convention Center  
Science Focus: GEN, NGSS  
Ruth Yopp (@RuthYopp; ryopp@fullerton.edu) and Hallie Slowik (@HallieYopp; hkslowik@gmail.com), California State University, Fullerton  
Experience language-based strategies that promote science learning, engage students in science practices, and foster meaningful interactions with informational text.

Wriggle and Squirm Your Way Through Claims, Evidence, and Reasoning with Earthworm Inquiry  
(Grades 2–6) Kentia Hall D, Convention Center  
Science Focus: LS1, LS4, CCC, SEP  
Reeda Hart (harrir@nku.edu), Retired Educator, Falmouth, Ky.  
Ella Bowling (@ellabowling; bowlinge6@nku.edu), Northern Kentucky University, Highland Heights  
Explore qualitative and quantitative observations of earthworm models to scaffold claims, evidence, and reasoning. Achieve multiple NGSS performance expectations! Free CD!

Teaching Measurement to Young Children  
(Grades P–2) Kentia Hall E, Convention Center  
Science Focus: GEN, NGSS  
Mary Hobbs (maryhobbs@utexas.edu), The University of Texas at Austin  
Bob Williams, Consultant, Belmont, Tex.  
Measurement is an important science skill. Learn hands-on strategies for teaching young learners to use measurement tools, including the ruler, the balance, and the thermometer.
**INF**

**Shaping Tomorrow’s Researches with Citizen Science**  
(Grades P–6)  
*Kentia Hall F, Convention Center*  
Science Focus: GEN, INF  
**Lindsay Glasner** ([@BirdSleuth; lhg27@cornell.edu](mailto:lhg27@cornell.edu)), The Cornell Lab of Ornithology, Ithaca, N.Y.  
Whether it's counting birds during a hike through the mangroves or using numerical data to write a fictional story about a migrating species, citizen science programs bring students out of the classroom and into the worlds that they are studying. Get details about this gateway to discovery and authentic science learning for students of all ages.

**Patterns of Survival**  
(Grades K–2)  
*Kentia Hall G, Convention Center*  
Science Focus: LS, CCC1, SEP6  
**Joey Scott** ([@joeyelle; jscott@mbayaq.org](mailto:jscott@mbayaq.org)), Monterey Bay Aquarium, Monterey, Calif.  
What patterns do we see in animals that live in the rocky shore? Use free iPad applications to help primary students communicate explanations and patterns.

**Teaching Plants with STEAM: Using STEM and Art in the Classroom**  
(Grades P–5)  
*Kentia Hall H, Convention Center*  
Science Focus: LS  
**Rebecca Kurson** ([@beckyk326; rkurson@goldaochacademy.org](mailto:beckyk326@goldaochacademy.org)), Golda Och Academy, West Orange, N.J.  
Student work connects to NGSS and CCSS by using art projects to support an understanding of parts of a plant and how plants grow.

**Elementary STEM for All: Building Things That Move!**  
(Grades 3–8)  
*Kentia Hall J, Convention Center*  
Science Focus: ETS, SEP3, SEP4, SEP6  
**Sheryl Sotelo** ([@SherylSotelo; sherylsotelo@gmail.com](mailto:sherylsotelo@gmail.com)), STEM Outreach Coordinator, Fritz Creek, Alaska  
Come learn how to create, invent, and design to learn in this exciting elementary STEM activity session with three different motivating and moving projects that are engaging and applicable for students with varied instructional levels and learning needs.

**Conceptos Transversales Para Todos los Estudiantes**  
(Grades K–8)  
*Kentia Hall L, Convention Center*  
**Diana Velez** ([dvelez@berkeley.edu](mailto:dvelez@berkeley.edu)), The Lawrence Hall of Science, University of California, Berkeley  
**Claudio Vargas** ([claudio.vargas@ousd.org](mailto:claudio.vargas@ousd.org)), Oakland (Calif.) Unified School District  
For educators teaching science in Spanish: Experimenten el poder de los siete conceptos transversales de NGSS a través de investigaciones activas y discusiones académicas.

**How I Learned to Split a Molecule: Weaving a Story Line Through Scientific Phenomena**  
(Grades 5–8)  
*Kentia Hall M, Convention Center*  
Science Focus: PS1.A, PS1.B  
**Linda Preminger** ([lkpreminger@comcast.net](mailto:lkpreminger@comcast.net)), Washington Manor Middle School, San Leandro, Calif.  
Weave a story thread among several disciplinary core ideas, turn observations into investigable questions, promote student-designed investigations of manageable variables, and translate literacy into argumentation.

**Green Chemistry: A Framework and Lens for Learning, Teaching, and Investigating STEM Skill Sets**  
(Grades 7–11)  
*Kentia Hall N, Convention Center*  
Science Focus: ETS, PS1.A, CCC2, SEP1, SEP3, SEP6  
**Kathe Blue Hetter** ([@skylinehetter; kbhetter@gmail.com](mailto:sheilhetter@gmail.com)), Skyline High School, Ann Arbor, Mich.  
**Kate Anderson** ([@beyondbenign; kate_anderson@beyondbenign.org](mailto:beyondbenign@beyondbenign.org)) and **Mollie Enright** ([mollie_enright@beyondbenign.org](mailto:mollie_enright@beyondbenign.org)), Beyond Benign, Wilmington, Mass.  
Investigate and explore new innovative green chemistry technologies. Challenge students to dig deeper into solutions to environmental concerns. Focus on the science of solutions rather than the despair of environmental problems.

**Urban Field Ecology for Middle School Students**  
(Grades 6–8)  
*Kentia Hall Q, Convention Center*  
Science Focus: LS2.A, CCC1, SEP1, SEP3, SEP4  
**Wendy Jackson** ([@SEPUP_UBC; wendy.jackson@berkeley.edu](mailto:wendy.jackson@berkeley.edu)), The Lawrence Hall of Science, University of California, Berkeley  
Participate in hands-on lessons designed to engage urban middle school students in authentic ecological study of their local environment. Lessons integrate the NGSS three dimensions—designing and conducting investigations to detect ecological patterns.
Using Vectors, Mutations, and Viral Replication to Teach Evolution and Genetics in a Context-Based Setting Focused on Africa
(Grades 6–12) Kentia Hall R, Convention Center
Science Focus: LS4
Timothy Goodale (tagoodal@ncsu.edu), North Carolina State University, Raleigh
Using methods from an NSF-funded international study, this workshop will demonstrate the second of four units involving the teaching and learning of genetics and evolution through context-based methods surrounding food security issues in Africa.

5:15–6:45 PM  Meeting
NMLSTA Board of Directors Meeting
(By Invitation Only) Atrium 1, JW Marriott

5:30–6:00 PM  Presentations
SCST-Sponsored Session: A Science Sales Pitch: Increase Student Buy-In to Increase Classroom Engagement
(College) Georgia 1, JW Marriott
Science Focus: GEN
Tarren Shaw (tjshaw@ou.edu), The University of Oklahoma, Norman
Research supports the use of active-learning strategies, but do our students realize this? Methods to increase student participation and buy-in of active learning will be presented.

Literacy and Life Science
(Grades 9–12) Kentia Hall S, Convention Center
Science Focus: LS
Andrew Camp (andrewmcamp@gmail.com), Blytheville (Ark.) Public Schools
Have your students latch onto relevant and relatable texts as a mechanism to not only grow in appreciation of scientific knowledge, but also carry that appreciation into the formation of complex scientific arguments. Find out how to teach cross-curricular, argument-driven scientific inquiry with culturally responsive nonfiction texts through a combined Bio-Lit course.

5:30–6:00 PM  Meeting
Teaming Up for STEM Sharing Session
(By Invitation Only) Platinum Ballroom Salon G, JW Marriott

5:30–7:30 PM  Networking Events
NGSS Live Chat
Diamond Ballroom Salon 9, JW Marriott
Come to the NGSS Live Chat and meet Ted Willard, Tricia Shelton, and others as they discuss the NGSS. Join us live or via Twitter…#NGSSchat.

CESI Dinner and Membership Meeting
(By Ticket Through CESI) Miro Restaurant (Off-site)
Deadline to order tickets was March 10.
CESI is having a dinner and membership meeting in the Chef’s Dining Room at Miro Restaurant. Tickets cost $50 for dinner plus $15 for a one-year CESI membership if you need to renew or join for the first time. Each attendee gets three books by Karen Ostlund.
For more details, please visit bit.ly/2mhZ8XO.
Miro Restaurant is located at 888 Wilshire Boulevard, Los Angeles, CA 90017, phone 213-988-8880.

Film Screenings
The HHMI Night at the Movies: Sneak Preview of Amazon Adventure 3D
Regal LA Live, Off-site
6:00–7:30 PM (SOLD OUT)
8:00–9:30 PM
Join HHMI BioInteractive for a special sneak preview of Amazon Adventure 3D, a new IMAX feature film. Witness the epic true story of Henry Walter Bates, who risked his life exploring the Amazon in the 1850s on a burning quest to determine if species change—and ultimately provided “beautiful proof” for Darwin’s new theory of the origin of species by natural selection by unraveling the phenomenon of mimicry. Visit bit.ly/2lems7Y for details on the 6:00 PM showing and bit.ly/2lXVTUA for details on the 8:00 PM showing.
### 3D Molecular Designs (Booth #1035)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Workshop Title</th>
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<tbody>
<tr>
<td>Thursday, Mar 30</td>
<td>8:00–9:30 AM</td>
<td>153B, Conv. Center</td>
<td>Life Is Complicated: Flow of Genetic Information to Genomic Engineering (p. 96)</td>
</tr>
<tr>
<td>Thursday, Mar 30</td>
<td>10:00–11:30 AM</td>
<td>153B, Conv. Center</td>
<td>The Ins and Outs of Crossing Cell Membranes (p. 104)</td>
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<tr>
<td>Thursday, Mar 30</td>
<td>12 Noon–1:30 PM</td>
<td>153B, Conv. Center</td>
<td>DNA with a Data Twist: Modeling DNA Structure/Replication and Bioinformatics (p. 112)</td>
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### Albert Einstein Distinguished Educator Fellowship (Booth #1251)

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<tr>
<td>Thursday, Mar 30</td>
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<td>10:00–11:30 AM</td>
<td>9–12 514, Conv. Center</td>
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<td>3:30–4:30 PM</td>
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<tr>
<td>5:00–6:00 PM</td>
<td>2–C Platinum Salon B, JW Marriott</td>
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<tr>
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<td>10:00–11:30 AM</td>
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<td>5–12 304C, Conv. Center</td>
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<td>Physics with Vernier (p. 114)</td>
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<td>12 Noon–1:30 PM</td>
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4:00–5:30 PM  9–C  511C, Conv. Center  Bring Your Cell Biology Teaching to the Next Level with the 3D Cell Explorer! (p. 154)
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5:00–5:30 PM  6–12  504, Conv. Center  Effective Applications of iPad Technology in the Science Classroom (p. 156)
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<td>6–C Platinum Salon I, JW Marriott</td>
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<td>5:00–6:00 PM</td>
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<td>5:00–6:00 PM</td>
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8:00–9:00 AM  6–8  Kentia Hall M, Conv. Center  Gravity Models: The Plight of Wile E. Coyote (p. 93)

8:00–9:00 AM  9–12  Kentia Hall O, Conv. Center  Engaging Students in Chemistry: Project-Based Learning Closes the Gap (p. 90)

8:00–9:00 AM  6–10  Kentia Hall N, Conv. Center  Hot Hands: Chemical Engineering in a Sandwich Bag (p. 93)

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8:00–9:00 AM  G–K  150C, Conv. Center  3-2-1 Lift-Off! NASA’s Beginning Engineering Science and Technology (BEST) Curriculum (p. 92)

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8:00–9:00 AM  5–9  510, Conv. Center  Machine Technology and Engineering with K’NEX Machines: Using STEM to Make Work Easier (p. 95)

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12 Noon–1:30 PM  9–C  402B, Conv. Center  Physics with Vernier (p. 114)
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12 Noon–1:30 PM  9–11 Plaza 2, JW Marriott  Tales from the Front: Beginning Our Science Teaching Careers in the Era of NGSS (p. 116)
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2:00–2:30 PM  9–12  501 AB, Conv. Center  STEM Road Map Curriculum Series for Early Childhood Education (p. 133)
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2:00–2:30 PM  6–8  304AB, Conv. Center  CPO Science’s Link™ Learning Module: Chemistry and the Periodic Table (p. 137)
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<td>Introductory Engineering-Design Projects with Vernier</td>
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