CONFERENCE **PREVIEW**

AREA CONFERENCE ON SCIENCE EDUCATION

DECEMBER 3-5, 2015

RAISING THE STAKES IN SCIENCE

















REGISTER EARLY AND SAVE \$5 WWW.NSTA.ORG/KANSASCITY



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KANSAS CITY

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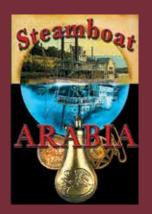
Cover photos courtesy of Jacob Slaton.

SPECIAL OFFER FROM ARABIA STEAMBOAT MUSEUM



NSTA and Arabia Steamboat Museum invite you to Kansas City.

Kansas City conference attendees—show your NSTA badge



to receive a 10% discount on admission to the Arabia Steamboat Museum. You'll marvel at the story of five local adventurers who unearthed 200 tons of buried treasure from a steamboat that sank in the Missouri River. The steamboat Arabia was headed to frontier settlements when it struck a tree snag and sank to the river bottom in 1856. Incredibly, the boat was excavated from beneath a Kansas cornfield 132 years later! Don't miss the chance to see beautifully preserved cargo—including fine china, clothing, and even pickles and perfume from before the Civil War.

Visit 1856.com for more information.



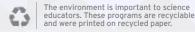
"I want to geek out with my science teacher friends from around the country!"

"As a department chair and coordinator of a medical STEM program at an urban girls school I am always searching for resources on a budget. The NSTA conference is a treasure trove of ideas, resources, and contacts."

"I love the exhibit hall swag but mostly I need more confidence with NGSS."

"I am the only science teacher in my district attending this year. It's my responsibility to bring back great ideas and best practices to share with my district."

"I am really excited to learn about flipped classrooms, STEM, and implementing NGSS in my classroom!"



KANSAS CITY SPEAKERS

KEYNOTE SPEAKER

From Farm to Flesh-How We Transform Soil into Civilization



Jerry Glover @jerry_d_glover
Agricultural Ecologist and National Geographic Emerging
Explorer, USAID, Washington, D.C.

Humans have harnessed vast swaths of the planet, replacing whole ecosystems with plants that take much more than they give to crucial natural systems—billions of acres of annual grain crops. Agriculture is now the largest ecosystem in the world, with its soils providing nearly all the nutrients that sustain our growing population. Recognized as one of "five crop researchers who could change the world" by the journal *Nature*, join Jerry as he shares how crops of the future could be farmed with less effort, more nutritional

value, and at the high yields we'll need to feed a planet of seven to nine billion hungry people.

Speaker is sponsored by National Geographic Learning/Cengage Learning.

FEATURED PRESENTATION

A Vision and Plan for Science Teaching and Learning

Follow your favorite speaker on Twitter! See our featured speakers' Twitter handles on these pages or search on #NSTA15.



Brett D. Moulding

Director, Utah Partnership for Effective Science Teaching and Learning, Ogden

Brett Moulding will outline a set of instructional strategies to effectively implement instruction that meets the *Framework* and *NGSS*. Discussion centers on insights into ways to utilize an organizational schema to effectively bring the three dimensions, described in the *Framework* and *NGSS*, into classroom teaching and learning. Brett is a member of the *NGSS* leadership team that developed the *Next Generation Science Standards*, as well as coauthor of *A Vision and Plan for Science Teaching and Learning*, a book providing educators

with insights into classroom instruction consistent with the *Framework* and *NGSS*. He is also a consultant for Achieve, Inc. and director of the Council of State Science Supervisors' Building Capacity for State Science Education (BCSSE) initiative.

Check out more than 300 sessions and other events with the Kansas City Session Browser/Personal Scheduler (www.nsta.org/kcbrowser).

FEATURED PRESENTATION

Teaching for Conceptual Understanding in Science: Building a Bridge Between Students' (and Teachers') Ideas and the *NGSS* Core Ideas



Page Keeley @CTSKeeley

2008–2009 NSTA President and Author, Speaker, and Science Education Consultant, The Keeley Group, Fort Myers, Fla.

K–12 students (and teachers) hold strongly held ideas about the natural world as they actively try to make sense of their everyday and instructional experiences. Teaching for conceptual understanding begins with identifying the ideas students bring to their learning and using these ideas to build a bridge between where the student is and the scientific ideas we want students (and teachers) to know and be able to use. Join Page Keeley, award-winning author and recognized expert in the areas of science, mathematics, and

STEM diagnostic and formative assessment, to explore what this means in a standards-based system where test scores are often equated with student learning.

STRAND Achieving Success with the NGSS

Effective science instruction integrates the three dimensions of the *NGSS* in curriculum, instruction, and assessment. This shifts the focus in the science classroom to an environment where students are asking questions, carrying out investigations, developing models, and constructing explanations to explain phenomena and solve problems in ways that build their understanding of core ideas. This strand is intended to provide educators with strategies to move students beyond the traditional classroom and prepare them to thrive in a global economy.

FEATURED PRESENTATION

Fostering an Insatiable Curiosity: Planning for the Future



Wendy Saul

Allen B. and Helen S. Shopmaker Professor of Education, University of Missouri–St. Louis

How might we inspire and enable students to connect what they learn to their lives? What does research and best practice tell us about engaging young people as thinking and caring individuals, community members, and global citizens? Author/editor of a number of books about the science-literacy connection, Wendy Saul teaches graduate courses in teacher research and literacy at University of Missouri–St. Louis. Her most recent book, Front-Page Science: Engaging Teens in Science Literacy, has

been listed as an NSTA best seller.

STRAND The Art and Craftsmanship of Teaching

Examining all aspects of effective instruction, the art and craftsmanship strand will combine pedagogy, assessment, best practices, and informational feedback to increase students' ability to reason, communicate, think critically, and appreciate science in our ever-changing global society. This strand will concentrate on the processes and skills of high-quality science instruction.

FEATURED PRESENTATION

Agriculture: Traditional Science Taught in an Unexpected Applied Way



Corey Flournoy

Vice President and Associate Director, Global Talent Development, FCB Global, Chicago, Ill.

The field of agriculture is one of the most misunderstood, underestimated, and undervalued industries in our country. Modern agriculture extends well beyond the traditional production of food for humans and animals. Through applied agricultural sciences, students can better understand biology and chemistry principles through plant and animal production or see physics and geology in soil science and agricultural engineering. Join Corey Flournoy for a thoughtful conversation on how you can change how the world of science is viewed and

used in your classroom. Recently, Corey was the director of the Illinois Center for Urban Agricultural Education for the University of Illinois at Urbana—Champaign. He holds a BS in Agricultural and Consumer Economics from the University of Illinois at Urbana—Champaign and a master's degree in Agricultural and Extension Education from Michigan State University.

STRAND Combining Science with Agriculture

The U.S. is a world leader in agriculture and this success is grounded in scientific research, technology innovations, engineering development, and mathematical modeling. Agriculture is a transdisciplinary field that requires the ability to use all STEM disciplines as evidenced by the areas of community gardening efforts, precision farming, climate change, food safety, water cycle and usage, and invasive species to mention only a few connections. This strand will increase participants' understanding of the importance of agriculture in the U.S. and provide them with relevant and meaningful applications for the classroom.

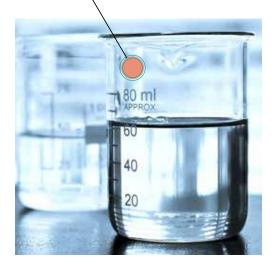


-Photo of the Scout statue courtesy of Visit KC

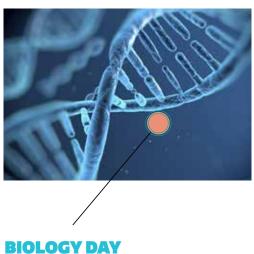
KANSAS CITY SPECIAL EVENTS

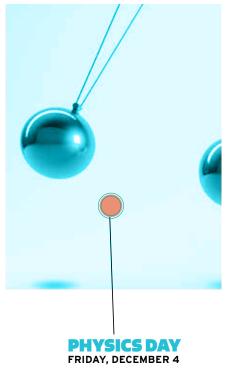
CHEMISTRY DAY

FRIDAY, DECEMBER 4









the Kansas City conference...

STARTS THURSDAY
DECEMBER 3

® 8:00 AM

FRIDAY, DECEMBER 4



SATURDAY
DECEMBER 5

@ 1:30 PM

SHORT COURSES

All short courses are filled on a first-come, first-served basis, so act now! For complete descriptions and to purchase tickets, visit www.nsta.org/kcbrowser. (Tickets Required)

Idea Builders: Infusing Engineering Practices and Literature (SC-1)

Date: Friday, December 4, 8:30-11:30 AM Ticket Price: \$25 advance; \$30 on-site

In this short course, participants will solve a problem practicing engineering skills while using literature as a framework to create an idea. Participants will learn how to guide students in a student-centered engineering unit. In this project, students identify a personally relevant problem and ultimately build the solution. We introduce the use of trade books as a strategy to model science and engineering processes.

Transitioning to NGSS Instruction (SC-2)

Date: Friday, December 4, 8:30-11:30 AM Ticket Price: \$30 advance; \$35 on-site

Engage in one of two model activities from the perspective of either an elementary or a secondary-level student. Then in an effort to develop an understanding of 3-D science learning, we will reflect on and discuss aspects of good science teaching evident in the model activity by identifying the disciplinary core ideas, science and engineering practices, and crosscutting concepts. To bring closure to the short course, personal action plans will be developed to guide participants to areas where additional professional development may be needed.

Science Literature-Science Learning: The SL/SL Project (SC-3)

Date: Saturday, December 5, 8:30-11:30 AM Ticket Price: \$25 advance; \$30 on-site

In this short course, participants will develop a personal connection to a scientific topic or contributions of a scientist through a PBL project surrounding a high-quality science trade book. An overarching question of "How does this person or concept relate to my own personal experiences?" will be examined and answered.

Meeting the CCSS and NGSS Through Outdoor Studies (SC-4)

Date: Saturday, December 5, 8:30-11:30 AM Ticket Price: \$50 advance; \$55 on-site

Turn the outdoors into a hands-on laboratory...where students can learn for the rest of their lives. Emphasis in this short course will be placed on presenting science in a way that helps students learn science concepts and the inquiry process through using common organisms. The methods shared are designed to foster the type of teaching and learning proposed in STEM, as well as the *Common Core State Standards* and *Next Generation Science Standards*. A wealth of more than 150 labs, projects, and inquiry ideas using organisms common to most environments (flies, ants, dandelions, beetles, spiders, grasses, etc.) will be presented. Science reading and writing activities will be presented along with numerous resource books. Take home a CD with resources.

((SAMPLE CONFERENCE SCHEDULE							
Make your own conference schedule using the Kansas City Session Browser/Personal Scheduler (www.nsta.org/ kcbrowser). Browse events by day, format, subject, grade level, conference strand, sponsor, or keyword. Please note				Earth and Space Science	Engineering and Technology	nformal Science Education	NOI	
tł D	Life Science	Physical Science	Earth and S	Engineerin	Informal Sc	PRESENTATION	WORKSHOP	
	Thu., 8:00–9:00 AM—Students' Cloud Observations On-Line: A Hands- On Science Project for the Classroom			•				•
	Thu., 12:30–1:30 PM—Taking STEM Outside					•		•
	Thu., 2:00–3:00 PM—Discover the NGSS: NSTA's New Interactive E-Book				•		•	
<u>-</u>	Thu., 3:30–4:30 PM—Science Comes Alive in Stories, Video, E-Books: Integrating STEM, Literacy, Creativity, and Media	•					•	
Elementary	Fri., 8:00–9:00 AM—Engineering Is Everywhere				•			•
Elem	Fri., 12:30–1:30 PM— From Sun to Food	•						•
	Fri., 3:30–4:30 PM—It's Elementary: Engineering, the Environment, and Literacy			•				•
	Fri., 5:00–6:00 PM—AAPT Session: An Engineering Design Process		•					•
	Sat., 8:00–9:00 AM—STEM Is EASY with GreenSchools! Program			•			•	
	Sat., 9:30–10:30 AM—Spark Students' Curiosity with Chemistry!		•				•	
	Thu., 8:00–8:30 AM—How Do You Know They Know? Developing Balanced Assessments in Middle School Science				•		•	
	Thu., 12:30–1:00 PM—It's All Matter with Matter Tag		•				•	
	Thu., 2:00–3:00 PM—Engineering with Sound Science		•				•	
_	Thu., 3:30-4:30 PM—NASA Brings You Newton's Laws of Motion			•				•
Middle Level	Fri., 8:00–9:00 AM—Investigating Pollinators in the Schoolyard	•						•
ddle	Fri., 9:30–10:30 AM—Explore Earthquakes			•				•
Ξ	Fri., 11:00 AM-12 Noon—Put the "E" in STEM!				•			•
	Fri, 5:00-6:00 PM—NABT Session: Scientific Argumentation and Wolf Management	•						•
	Sat, 8:00-9:00 AM—EXENTHUNCO: What Is That?					•		•
	Sat., 9:30–10:30 AM—Family Science Night: Creating a Successful Experience					•		•
	Thu., 8:00–8:30 AM—Simulate STEM Online Through Virtual Clinical Trials					•	•	
	Thu., 12:30–1:00 PM—In the Cracks of the Concrete			•			•	
	Thu., 2:00-3:00 PM—Is All This Burning Necessary?			•			•	
e e	Thu., 3:30–4:30 PM—An Ice Core Classroom Investigation That Connects the Three Dimensions of <i>NGSS</i> with <i>CCSS</i>				•		•	
olleg	Fri., 8:00-9:00 AM—Hot Topics Workshop: Nuclear Energy		•					•
High School-College	Fri., 9:30–10:30 AM—Students Analyze Science and Engineering Data in the Quest for Sustainable Bioenergy	•						•
h Scho	Fri., 11:00 AM-12 Noon—STEM Behind Medicine: Curing Type 1 Diabetes	•						•
Ē	Fri., 12:30-1:30 PM—50 Labs You Can Do on a Small Budget		•				•	
	Fri., 4:00–4:30 PM—Reinforce STEM with Medical Mysteries Web Adventures					•	•	
	Sat., 9:30–10:30 AM—Decoding Starlight—From Photons to Pixels to Images		•					•
	Sat., 12:30–1:00 PM—Crosscutting Concepts, Engineering Practices, and Bernoulli's Principle				•		•	

EDUCATIONAL TRIPS

From the science of art conservation to an introduction to the maker movement, the Kansas City off-site educational trips have something for everyone! For complete descriptions and to purchase tickets, visit www.nsta.org/kcbrowser. (Tickets Required)

Arabia Steamboat Museum: Interactive Preservation Workshop and Tour (T-1)

Date: Thursday, December 3, 9:15 AM-12:30 PM

Ticket Price: \$53 advance; \$58 on-site

The Arabia Steamboat Museum is home to a time capsule of frontier life you won't find anywhere else. The steamboat *Arabia* was headed up the Missouri River in 1856, loaded with merchandise for general stores, when it struck a tree snag and sank just north of Kansas City. Over 130 years later, a group of modern-day adventurers set out to unearth the boat's cargo and discovered a treasure trove of the American West—clothing, dishware, tools, and even perfume fragrant enough to smell and pickles fresh enough to eat! We'll first tour the exhibit to learn about the *Arabia*'s sinking and excavation and view its 200 tons of cargo. Then in the workshop, you will see how the artifacts were preserved by the Kansas cornfield they were buried in for 132 years and how the excavators now preserve them for posterity. Learn about the techniques for preservation of wood, metal, leather, and other artifacts as well as watch a demonstration of the freeze-drying process for wood and leather.

The Science of Art Conservation (T-2)

Date: Thursday, December 3, 1:30-4:30 PM Ticket Price: \$29 advance; \$34 on-site

Many of your students may have visited art museums, but are they aware that science and technology are essential to the preservation and display of art collections? The conservation department at the Nelson-Atkins Museum of Art has undertaken significant scientific projects, involving comprehensive diagnostic studies of works of art using sophisticated analytical techniques and equipment. Acoustic microscope scans, infrared reflectography examinations, digital photography studies, and detailed pigment analyses are ways in which the history of a work of art is revealed through scientific exploration. This trip includes a behind-the-scenes presentation by objects conservator Paul Benson along with a tour of newly restored objects. In addition, we will consider the ways in which visual art discussions and art-making activities support the *Next Generation Science Standards*. Be sure to bring your camera (no flash photography) for this rare opportunity to view art conservators at work. For more information, visit *www.nelson-atkins.org*.



-Photo courtesy of Kansas City's Science Center, Science City

Wild About Animals: Research and Learning at the Kansas City Zoo (F-1)

Date: Friday, December 4, 8:40 AM-12:35 PM Ticket Price: \$63 advance, by preregistration only

Now a 202-acre nature sanctuary, the Kansas City Zoo has invested more than \$85 million in capital projects since 2007, including the Discovery Barn, the Zoo Learning Center, river otters, trumpeter swans, an Endangered Species Carousel, Polar Bear Passage, the African Sky Safari, Tiger Terrace, and Helzberg Penguin Plaza. The Kansas City Zoo is also leading the way in research investigating native mussels, gentoo penguins, FrogWatch USA, and more! Join us to learn about research projects going on at the zoo and ways to incorporate zoo resources into the classroom. In addition, tour the zoo as well as explore with some behind-the-scenes opportunities.

Make and Take at Kansas City's Science Center, Science City (F-2)

Date: Friday, December 4, 12:45-4:30 PM Ticket Price: \$45 advance, by preregistration only

Are you curious about the maker movement and how you can incorporate it into your classroom? Don't miss this opportunity to attend a professional development workshop in our Maker Studio and learn how you can engage students with the fun, hands-on, and educational "Making" curriculum. The workshop will take place in the Maker Studio, followed by additional time to explore Science City on your own. There are daily demos and activities that are sure to spark your love of science, learning, and discovery. From "Spark!Lab" to "Every Last Drop," from "Genetics: Unlock the Code" to "The Science of Energy"—educational exhibits are around every corner! Experience engaging STEAM learning that you can take back to your classroom!



—Photo courtesy of Visit KC

GRADUATE CREDIT OPPORTUNITY

Graduate Credit Sponsored by Stephens College

Earn one graduate-level credit in professional development through Stephens College at the Kansas City conference. To obtain credit, you must be registered for the conference, complete a Stephens College Registration Form, attend a minimum of 12 hours of programs, submit a written report, and pay a fee of \$130. The registration form is available from the Stephens College website (bit.ly/1/x/5g4). An NSTA transcript is also required. Note: Credit is by pass/fail option only.

For complete information, visit bit.ly/1JxJ5g4.

KANSAS CITY CONFERENCE COMMITTEE LEADERS

Mike Szydlowski

Conference Chairperson K–12 Science Coordinator Columbia Public Schools Columbia, Mo. mszydlowski@cpsk12.org

Betsy (Elizabeth) O'Day

Program Coordinator Elementary Science Specialist Hallsville Intermediate School Hallsville, Mo. betsy.oday@gmail.com

James L. Puckett

Local Arrangements Coordinator Retired Educator Hamilton, Mo. puckettj@mac.com VISIT NSTA'S SCIENCE STORE

STORE HOURS:

Wednesday 4:00-7:00 PM

Thursday 7:30 AM-5:30 PM
Friday 7:30 AM-5:30 PM
Saturday 8:00 AM-12:30 PM

- Award-winning books filled with best practices, science content, teaching tips, and lesson plans.
- T-shirts, totes, and other science gifts to take back to your classroom.
- All attendees get member pricing—20% off all NSTA Press® products.



NSTA PRESS SESSIONS IN KANSAS CITY

NSTA Press® books offer new classroom ideas and standards-based strategies, from Earth science to nanoscience and from preK to college. Join NSTA Press authors for these sessions linked to the topics of their books. For details, visit us online at www.nsta.org/kcbrowser.





5TH ANNUAL

STEM

Forum & Expo

HOSTED BY NSTA

Denver, CO July 27–29, 2016

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

National Science Teachers Association

KANSAS CITY EXHIBITORS

Exhibitors as of press date.

3D Molecular Designs Accelerate Learning-STEMscopes Activate Learning American Chemical Society Amplify ANATOMY IN CLAY® Learning System Arbor Scientific Bio-Rad Laboratories, Inc. Carolina Biological Supply Co. Carolina Curriculum The Cornell Lab of Ornithology CPO Science/School Specialty Delta Education/School Specialty Dinah-Might Adventures, LP Educational Innovations, Inc. Edvotek Inc. ExploreLearning Fisher Science Education Flinn Scientific, Inc. Forestry Suppliers, Inc. Frey Scientific/School Specialty Howard Hughes Medical Institute It's About Time

Ken-A-Vision Mfg. Co., Inc. Kendall Hunt Publishing Co. MakerBot The Markerboard People, Inc. Minerals Education Coalition The MiniOne™ Electrophoresis Nasco National Geographic Learning/ Cengage Learning NGSS@NSTA NOAA Office of Education Nutrients for Life Foundation OHAUS Corp. PASCO scientific PEPCO Inc. Pitsco Education Project Learning Tree School Specialty Science First®/STARLAB® Shell Science Lab Challenge Simulation Curriculum Southern Science Supply Texas Instruments Vernier Software & Technology Western Governors University

With more than 150 of the leading science education companies and organizations in the world, the NSTA Exhibit Hall has the newest products to show and share with educators.

EXHIBIT HOURS

THU., DEC. 3 11:00 AM-5:00 PM FRI., DEC. 4 9:00 AM-3:00 PM SAT., DEC. 5 9:00 AM-12 NOON

EXCLUSIVE EXHIBIT HALL HOURS:

THU. 11:00 AM-12:30 PM Fri. 1:30-3:00 PM Sat. 10:30 AM-12 Noon

EXHIBIT LOCATION

The exhibits are located in Hall B of the Kansas City Convention Center.

www.nsta.org/kcvirtualshow

Preview and create your own list of Kansas City exhibitors before the conference using this link.



—Photo courtesy of Jacob Slaton

REGISTRATION AND TRAVEL





The fastest way to register 24 hours a day—register online at www.nsta.org/confreg with a credit card (see rates on next page).



Fax your registration form* with purchase order information to 703-243-3924.



Mail your registration form* and payment to:

NSTA Conference Department PO Box 90214 Washington, DC 20090-0214

* Registration form is available as a PDF at www.nsta.org/confreg. 2

HOUSING

Kansas City Housing Deadline: Nov. 4, 2015 www.nsta.org/kchousing

Make your hotel reservations now and save! NSTA has negotiated special discounted room rates with hotels near the Kansas City Convention Center.



Visit the website listed above and have your credit card and arrival/departure information ready.



Call 877-352-6710 (toll free) or 801-505-4611 (international) between 7:00 AM and 6:00 PM Mountain Time, Monday–Friday. Be prepared to provide all the information on the housing form**.



Mail CHECKS ONLY—
Download housing form** and mail with check (one form per room request) to:

Do not mail form to NSTA. Orchid Event Solutions–NSTA/Kansas City 175 South West Temple, Suite 30 Salt Lake City, UT 84101

**Housing form is available as a PDF at www.nsta.org/kchousing.





NSTA has made arrangements with several major airlines to offer discounted fares to NSTA conference attendees. For complete details on these discounts as well as the best way to get around town, visit:

www.nsta.org/kctravel

KANSAS CITY PRICE LIST

	EARLYBIRD	ADVANCE	ON-SITE
	OCT. 26	NOV. 13	After NOV. 13
FULL REGISTRATION			
NSTA Member	\$180	\$190	\$225
Affiliate members***	\$180	\$190	\$225
Nonmember	\$275	\$285	\$315
Retired NSTA Member	\$125	\$125	\$150
Full-time Student	\$90	\$100	\$120
ONE DAY ONLY (THU OR FRI)			
Nonstudent (member or nonmember)	\$160	\$165	\$185
Full-time Student	\$65	\$70	\$85
ONE DAY ONLY (SAT)			
Nonstudent (member or nonmember)	\$95	\$100	\$110
Full-time Student	\$35	\$45	\$65
NONTEACHING SPOUSE/GUEST	\$85	\$90	\$110

Save on your registration fees by taking advantage of special earlybird and advance rates! Also, become an NSTA member and save \$90-\$95 on your registration fees! For a description of the categories listed above, please visit www.nsta.org/confreg.

- AAPT Members (American Association of Physics Teachers)
- ACS Members (American Chemical Society)
- ASEE Members (American Society for Engineering Education)
- KATS Members (Kansas Association of Teachers of Science)
- NABT Members (National Association of Biology Teachers)
- STOM Members (Science Teachers of Missouri)

^{***}Affiliate members include:



FOR INFORMATION AND UPDATES, VISIT, www.nsta.org/nashville

