

# SEEC

Space Exploration Educators Conference

## OUR DESTINATION BEYOND

FEATURING



THURSDAY SESSION BOOKLET 2018

SPACE  
CENTER  
HOUSTON

## SEEC 2018 GENERAL AGENDA

### Wednesday, Jan. 31

2 – 5 p.m. Early bird check-in  
Tour the Destination Moon exhibit

### Thursday, Feb. 1

7:15 a.m. Check-in begins at Space Center Houston  
7:30 a.m. SEEC 101 (A must for all new attendees to SEEC) in the Mission Briefing Center  
8:15 a.m. Welcome address and keynote speaker in Space Center - TBA  
9:45 – 11:15 a.m. First session (90 min)  
11:15 a.m. – 12:15 p.m. Lunch 1 buffet in Astronaut Gallery / NASA and vendor booths in Events Building/Les Johnson book signing at SpaceTrader  
11:30 a.m. – 12:15 p.m. \* Space Exploration Educator Crews Harmony and Quest overview (45 min)  
12:15 – 1:15 p.m. Lunch 2 buffet in Astronaut Gallery / NASA and vendor booths in Events Building  
12:30 – 1:15 p.m. \* Space Exploration Educator Crew Tranquility overview (45 min)  
1:30 – 3 p.m. Second session (90 min)  
3:30 – 5 p.m. Third session (90 min)  
5:30 – 6:30 p.m. Afternoon Keynote - TBA  
6:15 p.m. Dismiss (bus runs begin to hotels)

### Friday, Feb. 2

7:30 a.m. Doors open for conference  
8 – 9 a.m. Keynote – TBA  
9:30-11 a.m. First session (90 min)  
11 a.m. – 12 p.m. Lunch 1 buffet in Astronaut Gallery / NASA and vendor booths in Events Building  
11:15 a.m. – 12 p.m. \* Space Exploration Educator Crews Destiny and Starliner overview (45 min)  
12 – 1 p.m. Lunch 2 buffet in Astronaut Gallery / NASA and vendor booths in Events Building  
12:15 – 1 p.m. Space Exploration Educator Crew Unity overview (45 min)  
1:15 – 2:45 p.m. Second session (90 min)  
3:15 – 4:45 p.m. Third session (90 min)  
4:45 p.m. Dismiss (bus run begins)  
7 – 11 p.m. Banquet, includes dinner and dancing to a live band

### Saturday, Feb. 3

7:30 a.m. Doors open for conference  
8:00 – 9:30 a.m. First session (90 min)  
10 – 11:30 p.m. Second session (90 min)  
11:30 a.m. – 12:30 p.m. Lunch 1 buffet in Astronaut Gallery  
12:30 – 1:30 p.m. Lunch 2 buffet in Astronaut Gallery  
1:45 – 3:15 p.m. Third session (90 min)  
3:30 – 4:30 p.m. Feature Keynote in Space Center Theater – Gene Kranz  
4:30 p.m. Dismiss, pick up certificates in Zero-G Diner  
5:00 p.m. Conference Help Desk closes  
7 p.m. Space Center Houston closes

**Times and events subject to change**

**\* See Crew page for information on presentation and regions**



## Session Selection

All attendees need to select sessions no later than one week prior to SEEC.

Sessions may be selected from the listings in the conference booklet. NASA tours as well as the hands-on sessions are included in the listings for selection. Please note that the tours fill up quickly. Also, **closed toe shoes are required on all tours!** Session cards will be issued and must be presented to gain access to all sessions. Sign up for sessions at: [spacecenterprogs.org/seec/seecLogin.aspx](http://spacecenterprogs.org/seec/seecLogin.aspx)

If a session is full, check with the Conference Help Desk when you arrive to see if there are openings. You can also check session "swap" board located next to the Conference Help Desk for the session ticket.

If you have any questions, please contact us at [SEEC@spacecenter.org](mailto:SEEC@spacecenter.org).

Tips for session success:

- Bring your own device (laptop or tablet) – many sessions use technology for the session.
- Get to your session on time.
- If your session is at the Gilruth or requires you to take a bus to get to it, make sure you arrive at the bus loading area 10 minutes prior to the session start time.
- Bring a light jacket. Many of our rooms get a little chilly.

### Tour Information

**Important! Please read carefully.**

Your visit to NASA Johnson Space Center is a special event. You will enter working facilities subject to strict safety and security policies. Please follow the direction of your host escort at all times.

It is essential that all members of the group stay together and not venture away from their NASA escort. Wandering into restricted areas constitutes a security violation and could result in the termination of your visit.

Your visit will require walking and standing for extended periods and may involve climbing several flights of stairs. Guests should wear comfortable, flat, fully enclosed shoes (**no high heels, sandals, flip-flops, slides, mules, Crocs, etc.**) during their visit. We also recommend that guests wear slacks (instead of shorts or skirts) as an additional safety precaution.

Cameras are welcome in all facilities unless instructed otherwise. However, flash photography or photography of individuals is not permitted.

### Attention all non-U.S. citizens

If you are not a U.S. citizen, you must fill out a NASA JSC Security Form in order to attend the NASA tours. Please go to the [SEEC website](http://SEEC website) for more information and to download the form.



## Session Descriptions Thursday, Feb. 1, 2018

### Thursday 9:45 – 11:15 a.m.

#### **Aviation STEM: A Look into the Lone Star Flight Museum**

*Kenneth Morris: Lone Star Flight Museum*

*Veronica Leija: Lone Star Flight Museum*

Exclusive educator tour of the new Lone Star Flight Museum at Ellington Airport! Come fly simulators while learning how science, technology, engineering and mathematics (STEM) have evolved and affected travel and humanity. Experience the Aviation Learning Center, only the second like it in the world! All classes are aligned with TEKS and designed to provide interactive and engaging comprehensive STEM learning.

*Grade level: K-12*

*Subjects: Science, Math, Technology, Language Arts, Social Studies*

#### **Build Your Own Telescope**

*Keith Barger: Space Foundation*

*Carah Barbarick: Space Foundation*

In this activity for secondary educators, the attendees construct a refracting telescope, pick out lenses and calculate diameter, focal length, magnification and field of view of their telescopes. The end goal is to learn how telescopes work and how the measurements of a telescope are calculated. Attendees will also get to keep their finished telescope! Finally, learn how to create and orchestrate your own star party within your own school.

*Grade level: 6-12*

*Subjects: Math, Science*

#### **Design of Spacecraft for Human Space Flight**

*Gary Kitmacher: NASA JSC*

Based on a recently completed chapter the presenter wrote for the Naval Post Graduate School Handbook for Astronautics, this presentation looks at the design of spacecraft for human space flight, identifying specific systems common across spacecraft and describing how some of these have changed from the first U.S. and Russian spacecraft to today's International Space Station. The presenter has been directly involved in the design, development and science on the International Space Station, Mir Orbital Station, Space Shuttle and Skylab during his 37 years at NASA.

*Grade level: K-12*

*Subjects: Science, Technology, Social Studies, PE*

#### **Flights of Fancy**

*Karla Wright: Middle Tennessee University*

*Phyl Taylor: Middle Tennessee University*

What child doesn't love airplanes? Come and learn how to teach even the youngest children all about airplanes and how they fly. Learn songs and finger plays to reinforce airplane vocabulary and explain the forces of flight. Make several activities to take home and use with your children Monday morning. Get some strategies for using airplanes to teach across your curriculum including science, math, engineering, music, history and social studies. Find a novel approach to classroom management using an airplane analogy and plastic airplanes. Take a flight of fancy, and you may inspire a child to fly.

*Grade level: K-2*

*Subjects: Science, Math, Technology, Language Arts, Social Studies, History*

#### **Mars Rovers in Any Classroom!**

*Katie Lake: Southwestern Indian Polytechnic Institute*

*Nader Vadiee DR: Southwestern Indian Polytechnic Institute*

The Southwestern Indian Polytechnic Institute has made Mars exploration come alive for middle and high school students, come learn how! Teachers will get free remote access to our Mars Yard, a free Arduino powered mini rover and access to the complete NASA Technologies curriculum to use within their classrooms.

*Grade level: 6-12*

*Subjects: Science, Math, Technology*

#### **Microgravity's Impact on the Human Eye, Digestive System and Flames**

*Craig Wilson*

This is an energetic session with simple hands-on, minds-on activities to engage all of your students' senses to allow them to make sense of the human eye, cellular respiration, digestive system, states of matter and flames—all related to space or lack thereof.

*Grade level: K-12*

*Subjects: Science, Math, Language Arts*



**Thursday 9:45 – 11:15 a.m. Cont.**

**Author and NASA Physicist Les Johnson**

Les is a physicist, a science and science fiction author, and a NASA technologist. His science fiction books include *Back to the Moon*, *Rescue Mode*, and his latest, *Mission to Methone*. His popular science books include *Solar Sails - A Novel Approach to Interplanetary Travel* and the newly-released *Graphene: The Superstrong, Superthin, and Superversatile Material That Will Revolutionize the World*. In his "day job" he works in the Science and Technology Office at the NASA George C. Marshall Space Flight Center in Huntsville, Alabama where he serves as the Solar Sail Principal Investigator for NASA's first interplanetary solar sail mission, the Near Earth Asteroid Scout. Hear him discuss his experiences as a space technologist and author and his latest books. Book signing will follow session at Space Traders gift Shop.

*Grade: K-12*

*Subjects: Science, Language Arts*

**Near Earth Objects: Asteroids, Comets, Meteoroids, Oh My!**

*Margaret Baguio: Texas Space Grant Consortium & UT Center for Space Research*

Participants will cook up a comet, learn how to track an asteroid, and show effects of cratering. Where are NEO's located in layers of the atmosphere? How do scientists spot an asteroid? This session offers good, hands-on, exciting activities that you may replicate in your classroom. Giveaways!

*Grade level: 6-12*

*Subjects: Science, Math*

**Now Departing: Your Journey to Deep Space**

*Patricia Moore: NASA Exploration Systems Development Division*

*Brandon Hargis: NASA Office of STEM Engagement*

NASA is leading our nation and the world on a journey in which humans will travel deeper into the solar system and to the surface of Mars. Inspire and engage the Mars generation with a series of monthly units exploring upcoming missions, new technology, science, engineering and the people who make human spaceflight possible. Walk away with access to a continually updated virtual bank of digital resources and engaging activities perfect for classrooms, museums, after-school programs and libraries.

*Grade level: K-12*

*Subjects: Science, Math, Technology, History*

**One Small Step: A Journey to the Moon & Mars**

*Sharon Eggleston: Maine Space Grant Consortium*

*Diane Bowen: Maine Space Grant Consortium*

Forty-eight years have passed since the United States first landed on the moon. Today, NASA has set its sights on landing on Mars! This session will recap the challenges NASA engineers faced to get us to the moon and what new challenges NASA faces before astronauts can set foot on Mars!

*Grade level: 3-8*

*Subjects: Science, Math, Technology, History*

**Space Exploration Runs on Code**

*Dylan Bennett: Delphian Schools*

*Stirling Hepburn: Delphian Schools*

It takes thousands of gallons of fuel to get to space, but it takes millions of lines of code. Yet there's a gap between intro-to-coding tutorials and the real-world coding skills needed for STEM careers. Learn to bridge that gap. Attendees receive a site-wide software license and printed educational materials.

*Grade level: 6-12*

*Subjects: Science, Math, Technology*

**Space Themed Quilts: Hands-On, No-Sew STEAM Education!**

*Adrienne Provenzano*

Experience no-sew quilting that takes you and your students out of this world! Discover the many uses of textiles in space exploration—past, present and future. Explore telescope imagery with classroom quilt projects. Learn to teach STEM concepts and space exploration history with inspiring space-themed paper and fabric quilts.

*Grade level: K-8*

*Subjects: Science, Math, Technology, Language Arts, Fine Arts, Social Studies, History*

**Solar System Mystery**

*Diane Buxkemper: GW Carver Middle School, Waco ISD*

*Dulcie Schasteen: Axtell High School, Axtell ISD*

Participants will explore the relative sizes and distances of objects in the solar system. Students create two "mystery objects" out of Play-Doh to learn about scale



### **Thursday 9:45 – 11:15 a.m. Cont.**

models of size and distance. Groups will report patterns of scale they notice. Groups will then setup and create an eclipse.

*Grade level: 6-8*

*Subjects: Science, Math*

#### **Students in Microgravity: Taking Ideas to Launch**

*Kathleen Fredette: iLEAD Schools Development*

*Carie Lemack: DreamUp*

This session provides educators with tools and confidence needed to launch a student-authored experiment to space. Participants will explore a framework, rubrics and activities that can be adapted for the needs of each educator's group of young people, with the end goal of inspiring and empowering the next generation of explorers.

*Grade level: K-12*

*Subjects: Science, Language Arts*

#### **Train like An Astronaut**

*Amanda Blough*

*Amy Fetterhoff*

This exciting, hands-on lesson will engage participants by allowing them to train like an astronaut through several hands-on tasks and activities. Some tasks will be completed in a limited amount of time wearing "astronaut space gloves." Teachers will be able to take resources into classrooms and implement them into grades 3-5.

*Grade level: 3-5*

*Subjects: Science, Technology, History*

#### **Using the Engineering Design Process to Address Authentic Space Exploration Challenges**

*Katie Livingood: NASA JSC*

NASA is currently working on systems to take humans beyond low Earth orbit to explore the solar system. Of particular interest to scientists is the geological history of celestial bodies. Tools will need to be developed that can enable astronauts to take samples and return them to Earth. This workshop is an adaptation of Micro-g Neutral Buoyancy Experimental Design Teams, or Micro-g NExT, that will give educators ideas for using the engineering design process to engage students.

*Grade level: 9-12*

*Subjects: Science, Math, Technology*

#### **What's Out There? Exploring Space Exploration**

*Karen Kingrea: Space Exploration Educator Crew*

Throughout history, mankind has observed the heavens and wondered what was beyond that which we could see. This

activity, adapted from a NASA lesson, gives students the opportunity to experience exploration from telescope to fly-by and from lander to rover. The presenter will share methods for preparation and implementation as well as ideas for assessment.

*Grade level: 3-5*

*Subjects: Science, Technology*

#### **Tours**

**Tours take place in working NASA facilities and are subject to change or cancellation at any time.**

#### **Neutral Buoyancy Lab— observation deck**

Take a trip to the pool where astronauts practice for their spacewalks—the NBL. This facility is the underwater training facility for astronauts and your chance to see state-of-the-art training—the next best thing to space! *Participants will be taken onto the floor area of the pool.*

#### **Neutral Buoyancy Lab— visitors' gallery**

Take a trip to the pool where astronauts practice for their spacewalks—the NBL. View the facility from above the pool area where you will get a good scope of the size. This facility is the underwater training facility for the astronauts. Your chance to see state-of-the-art training—the next best thing to space!

### **Thursday 11:30 – 12:15**

#### **SEEC Crew Overview: Harmony Crew**

*Crew Members: Adlena Jacobs, Spencer Kiper, Lauren Parker, Nancy Sills, Amy Tinnell*

Team Harmony summarizes their year as "many small steps, and a few giant leaps." Enacting major changes can be difficult, but over time, even the small things contribute to the overall scope of education. Team members will each share how they made their steps and leaps in their classrooms, schools and communities across Texas, Louisiana and Georgia. A group PowerPoint will be developed with contributions from all Harmony crew members to share the individual things they have



### Thursday 11:30 – 12:15 Cont.

done. They will also share how they have been able to collaborate and support each other digitally, even while geographically separated.

*Representing: Southeast Louisiana, Texas, Georgia*

#### **SEEC Crew Overview: Quest Crew**

*Becky Busby, Stacie Pottenger, Katrina Roddenberry, Valeria Rodriguez, Jessica Strauss, and Mary Vaughn*

The Quest crew has truly been on a QUEST for spreading STEM education and resources throughout the Georgia and Florida region. Each member has accomplished amazing recognitions, presentations and learning opportunities to help spread NASA and Boeing resources. The partnership between South Georgia and Florida has demonstrated a desire for embracing STEM education and helping teachers, students and families understand the importance of space education. Some of the Quest crew's accomplishments include presenting at state-organized conferences in Florida, co-authoring a lesson that is set to be published by NASA, participating in survival training in the Neutral Buoyancy Lab and presenting on a national level at the National Science Teachers Association conference in March. Quest team members are excited about the future of their crew and the opportunities that are going to catapult their QUEST for spreading STEM education!

*Representing: Southeast Georgia, Florida*

### Thursday 12:30 – 1:15 p.m.

#### **SEEC Crew Overview: Tranquility Crew**

*Leesa Hubbard, Ashley Smith, Alex Hill, Julie Farmer, Jill Gifford, Katie Conrad*

Each member of the team will show slides that include photographs of event/activities they have done with other teachers and students during their "Year in Space." If it is an activity that has a specific lesson, presenters will provide an electronic version of the activity. Tranquility crew members also have a website they will share with many resources! Their main purpose will be to create enthusiasm around the SEEC Crew program and demonstrate how working with a team has strengthened them all!

*Representing: Midwest, Missouri, Indiana, Tennessee, Michigan*

### Thursday 1:30 – 3 p.m.

#### **Amazing Race: Mars - Using Robotics and Space Science to Boost Learning Beyond the Basics**

*Amy Tinnell, West Jackson Elementary School*

*Kathy Venable, West Jackson Elementary School*

"Mars mission"... It's on! And so is "The Amazing Race: Mars!" In this session, participants will see how robotics can be used as a way to engage students in higher order thinking, problem solving and let's just face it... FUN! Come prepared for some hands-on learning with RoboroBo Robots.

*Grade level: 3-8*

*Subjects: Science, Math, Technology*

#### **Astronaut Dive Training (Dive Session) *Double session***

*Craig Shannon, NBL Dive Master*

Train like astronauts in this exciting session! You will participate in underwater training exercises using SCUBA gear in a local indoor pool. No previous experience necessary. Bring a swimsuit and towel. (T-shirts not required but helpful.)

Additional \$40 charge for this session. NOTE: This is a double session! (If registering for this session, pay online first.)

*Grades K-12 Subjects: All*

**NOTE: This is a double session. You will need to sign up for it for the next time slot also.**

#### **Aviation STEM: A look into the NEW Lone Star Flight Museum**

*Kenneth Morris: Lone Star Flight Museum*

Exclusive educator tour of the new Lone Star Flight Museum at Ellington Airport! Come fly simulators while learning how science, technology, engineering and mathematics have evolved and affected travel and humanity. Experience the Aviation Learning Center, only the second like it in the world! All classes are aligned with TEKS and designed to provide interactive and engaging comprehensive STEM learning.

*Grade level: K-12*

*Subjects: Science, Math, Technology, Language Arts, Social Studies*

**Thursday 1:30 – 3 p.m. Cont.**

**Classroom Lasers Part 1**

*David Temple: Longview High School*

*Bryce Standridge: Longview High School*

Classroom Lasers Part 1 will focus on basic information on lasers and utilize computer simulations, videos and websites on lasers.

*Grade level: 9-12*

*Subjects: Science*

**Civil Air Patrol Flights over Houston Double session**

*Susan Mallett: Civil Air Patrol National HQ*

*Debbie Dahl: Civil Air Patrol*

Civil Air Patrol TX Wing Pilots and Flight Team.

Come fly with Civil Air Patrol on a flight over Houston in a prop airplane. Any K-12 educators who are U.S. Citizens can take this flight. Bring your camera and enjoy the flight! You must contact [ae@capnhq.gov](mailto:ae@capnhq.gov) to register membership with CAP after you register with SEEC for this double session.

*Grade level: K-12*

*Subjects: Science, Math, Technology*

**NOTE: This is a double session. You will need to sign up for it for the next time slot also.**

**Drones in the Classroom**

*Jason Fontaine: San Jacinto College Aerospace Academy*

*Javier Montiel: Brazosport ISD*

Safely and securely bring drone education into the classroom. Learn best practices when delivering drone instruction. Experience the possibilities drones can bring to teaching and discover the engagement it brings to the classroom.

*Grade level: 6-8*

*Subjects: Science, Technology*

**Duck! Wild and Crazy Flying Objects Aloft! Or Not.**

*Pamala Knab: Texas Space Grant Consortium and NASA Network of States*

*Mary Ruggles: Humble ISD: Elm Grove Elementary, 4<sup>th</sup> grade*

*Diane Smith: 5<sup>th</sup> grade math and science, Katherine G.*

*Johnson STEM Academy, Greenville ISD*

Come have fun playing with balloons, racing blimps, "shooting" off rockets and more! Using NASA activities, explore how fun activities can stimulate the imagination of your budding engineers and trigger a deeper

understanding of force and motion, mass, density, buoyancy and gravity and their connections.

*Grade level: 3-5*

*Subjects: Science, Math*

**Engineer YOUR Mars Landing**

*Karen Wilson: JSC NASA*

*Alex Gladney-Lemon: JSC NASA STEM Pathways Activities - Consortium for Education*

Join NASA Johnson Space Center's Education Specialists as they land on the Martian surface! Create a Mars lander to illustrate the engineering design process, and learn how this lesson can be adapted for use with LEGO® Mindstorms EV3 kits. In this interactive session, presenters will introduce concepts from NASA Community College Aerospace Scholars (NCAS) that have been modified for the middle and high school level.

*Grade level: 6-12*

*Subjects: Science, Math, Technology*

**Exploring Space One Ozobot at a Time**

*Barbara Gruber: National Air and Space Museum*

Learn how to scale your instruction to include multiple grade levels and integrate science and coding. Lessons start with the most basic coding practices, and the youngest learner's then scaffold up to more complex coding and logic used to program spacecraft while having fun with Ozobots.

*Grade level: K-12*

*Subjects: Science, Technology*

**Flipped Out Marshmallow Mission to Mars and Beyond**

*William Luke: Casey Memorial Library*

*Gregory Luke: Temple High School*

*Christopher Luke: Home Depot (Educational Support)*

The flipped classroom will be used to help the educators construct a marshmallow launcher (catapult) and a straw rocket. Goal is to launch a mini marshmallow to make a soft landing on Mars and launch a straw rocket into deep space. Educators will be able use the TInspire navigator system to evaluate, share and answer questions about their data and see how the system brings learning alive in the classroom.

*Grade level: 6-12*

*Subjects: Science, Math, Technology*



## **Thursday 1:30 – 3 p.m. Cont.**

### **It's a Matter of Forces**

*Isabel Borges: Ciencia Viva Portugal*

*Adelina Machado: Ciencia Viva Portugal*

Why does the Moon have craters? How high do you have to jump from a comet's surface to go to space? Why is there no liquid water in space? Take STEM activities from the European Space Agency to your classroom and plan lessons to use inquiry-based science learning with your students!

*Grade level: K-5*

*Subjects: Science, Math*

### **Lunar and Meteorite Sample Disk Certification Double session**

*Suzanne Foxworth: JACOBS @JSC NASA ARES*

*Bridget Mcinturff: JACOBS @JSC NASA ARES*

*Paige McGraff: JACOBS @JSC NASA ARES*

Teachers will participate in hands-on activities that will explore accretion, differentiation, impact and volcanism of the moon and meteorites. Teachers will be certified to borrow NASA's Lunar and Meteorite Sample Disks to use with their students.

*Grade level: K-12*

*Subjects: Science, Math, Technology, Language Arts, History*

**NOTE: This is a double session. You will need to sign up for it for the next time slot also.**

### **Moon Menagerie**

*Leesa Hubbard: Tranquility SEEC Crew*

*Katie Conrad: SEEC Crew*

This session includes a variety of activities and tools involving moon exploration! Take a virtual field trip, use a biography of Neil Armstrong to teach language arts, utilize 3-D design software to create a models, determine scale using an actual photograph of the surface of the moon... all this and more as you enjoy a little moon-themed music and art!

*Grade level: 6-12*

*Subjects: Science, Math, Technology, Language Arts*

### **PhET Simulations: New Ways to Experience Science and Math**

*Deborah Elliot: Space Educator Expedition Crew*

The University of Colorado Boulder has designed a new way to look at math and science. Using hands-on free simulations, educators and students collaborate to learn

about a variety of math and science topics. In this session, you will be fully engaged in "playing" with simulations and learn how you can incorporate them into your K-12 setting.

*Grade level: K-12*

*Subjects: Science, Math, Technology*

### **Searching for Habitable Worlds**

*Lynn Dotson: NASA Public Engagement Center KSC*

Are We Really Alone? NASA's spacecraft Cassini that had been orbiting Saturn met its doom during the grand finale on Sept. 15, 2017. In this session, you will hear about how Cassini met its doom, how NASA discovers new planets and evidence to show that it is very unlikely we are alone in the universe.

*Grade level: K-12*

*Subjects: Science, Technology*

### **Student Opportunities in Airborne Research and Weather to Fly by**

*Crystal Del Rossa: JSC Education - NASA STEM Pathways Activities - Consortium for Education*

*Brandon Hargis: JSC IPA Education Specialist*

*Dominic Del Rosso: NBL Chief Engineer*

Participants will learn about NASA's new pilot program Student Opportunities in Airborne Research (SOAR) and how NASA's unique education resources can help you teach fundamental physics and atmospheric science principles to your classes. For example, a NASA unique resource called Weather to Fly By, teaches students that weather is the state of the atmosphere with respect to wind speed and direction, temperature, moisture and pressure. A pilot must take all of these things into consideration while flying, since it has a significant impact on the ability of both the airplane and the pilot to perform properly. In this session, participants will build an anemometer using straws and cups. By measuring the number of revolutions the device makes in a given time, you will be able to measure the speed of the wind.

*Grade level: 6-12*

*Subjects: Science, Math*

### **Telescopes of All Kinds. What Good Are They Anyway?**

*David Davisson: Longfellow Middle School*

*Cyndi Shaver: Harrison Co Schools / Central Appalachian Astronomy Club*



### **Thursday 1:30 – 3 p.m. Cont.**

Join this session for a look at space exploration using different kinds of telescopes. Find out which kind would work best for you and your students to discover the cosmos. A lucky winner will go home with a free Galileo telescope.

*Grade level: 6-12*

*Subjects: Math, Science, Technology*

### **To Mars and Beyond: Using Engineering Design Process and Challenges in Teaching**

*Renee Gamba: Middletown Public Schools/Museum of Natural History*

Become a NASA engineer! Use the Engineering Design Process to build your own low density supersonic decelerator. Session includes how to access NASA Education resources; including NASA BEST and Mars Education at ASU. Each participant receives a sample of lunar and Mars soil simulant. Session includes a chance to take home a Martian garden kit.

*Grade level: 3-8*

*Subjects: Science, Math, Technology, Language Arts, History*

### **Tours**

**Tours take place in working NASA facilities and are subject to change or cancellation at any time.**

#### **Space Vehicle Mockup Facility (SVMF)**

Explore the training grounds for the astronauts. See full-sized mock-ups of the International Space Station and Orion spacecraft.

#### **Mission Control**

Once the manned spacecraft have launched, Houston's Mission Control takes over. Visit this secure location and see the rooms where history happened. You will see the former Mission Control room for the shuttle era, which now is the International Space Station control room.

#### **The Planetary Analog Test Site (aka Rock Yard)**

Tour the area that provides a large multi-acre test area which simulates general features of the lunar and Martian surface terrain environment consisting of various slopes, grades, simulated craters and strewn rock field.

#### **NASA Robotics in Bldg. 9**

Explore the latest Robotic designs at NASA Johnson Space Center from Robonaut 2 to Valkyrie and more.

### **Thursday 3:30 – 5 p.m.**

#### **Astrobiobound and beyond!**

*Cheri LaBelle: Northside ISD*

*Blanca Gonzales: Houston ISD*

Join us on a search for life in the solar system! In this session you and your team will use a NASA education game to create your own mission to another planet! Once your mission plan is complete, your team will use engineering design to build your space craft!

*Grade level: 6-12*

*Subjects: Math, Science*

#### **Astronaut Dive Training (Dive Session) Double session cont.**

*Craig Shannon, NBL Dive Master*

Train like astronauts in this exciting session! You will participate in underwater training exercises using SCUBA gear in a local indoor pool. No previous experience necessary. Bring a swimsuit and towel. (T-shirts not required but helpful)

Additional \$40 charge for this session. NOTE: This is a double session! (If registering for this session, pay online first.)

*Grades K-12 Subjects: All*

**NOTE: This is a double session. You will need to sign up for it for the next time slot also**

#### **Aviation STEM: A Look into the NEW Lone Star Flight Museum**

*Kenneth Morris: Lone Star Flight Museum*

Exclusive educator tour of the new Lone Star Flight Museum at Ellington Airport! Come fly simulators while learning how science, technology, engineering and mathematics have evolved and affected travel and humanity. Experience the Aviation Learning Center, only the second like it in the world! All classes are aligned with TEKS and designed to provide interactive and engaging comprehensive STEM learning.

*Grade level: K-12*

*Subjects: Science, Math, Technology, Language Arts, Social Studies*



## **Thursday 3:30-5 p.m. Cont.**

### **Civil Air Patrol Flights over Houston Double session cont.**

*Susan Mallett: Civil Air Patrol National HQ*

*Debbie Dahl: Civil Air Patrol*

Civil Air Patrol TX Wing Pilots and Flight Team.

Come fly with Civil Air Patrol on a flight over Houston in a prop airplane. Any K-12 educators who are U.S. Citizens can take this flight. Bring your camera and enjoy the flight! You must contact [ae@capnhq.gov](mailto:ae@capnhq.gov) to register membership with CAP after you register with SEEC for this double session.

*Grade level: K-12*

*Subjects: Science, Math, Technology*

**NOTE: This is a double session. You will need to sign up for it for the next time slot also.**

### **Civil Air Patrol FREE K-12 STEM Kit Program**

*Sue Mercer: Civil Air Patrol National HQ*

*Ginny Smith: Civil Air Patrol*

Come learn how YOU and your school can receive CAP's 15 FREE STEM Kits available to K-12 educators. Kits include astronomy, robotics, rocketry, Raspberry Pi, hydraulic engineering, weather, renewable energy, Snaptricity, flight simulators, RC airplanes, Quadcopter with activity guides for YOUR students' engagement in STEM fun!

*Grade level: K-12*

*Subjects: Science, Math, Technology*

### **Classroom Lasers Part 2**

*Shannon King: Longview High School*

*Scott Hartt: Longview High School*

Classroom Lasers Part 2 is the second half of a session that will focus on hands-on activities. Presenters will use simple lasers pointers of different colors to investigate refraction, diffraction and reflection and how the wavelength of light changes with these.

*Grade level: 9-12*

*Subject: Science*

### **Desmos: Tool for Connecting Math and Science**

*Stacy Karpowicz-Boring: Clear Creek ISD*

*Andrea Gautney: Clear Creek ISD*

Participants will explore and experience how the online graphing calculator tool Desmos may be used to connect math and science topics. The focus of the session will be

connecting various types of regression models with science concepts such as neutral buoyancy, projectile motion and growth and decay. Participants will complete an activity comparing height and shoe size and will use Desmos to model and to draw conclusions about their findings. Additional activities will be available for participants. Electronic devices are required.

*Grade level: 6-12*

*Subjects: Science, Math, Technology*

### **If You Build It, They Will Come**

*Marie Clyett-Larson*

*Judy York*

Suit up and support the mission! During this session, teams will build work on the 5th Force -TEAM. Effective teams can problem solve using evidence, communicate, compromise, and persevere. Suit up and join your teammates on the moon to build a functioning wing of the NASA moon colony.

*Grade level: K-12*

*Subjects: Math, Science*

### **Partnering with Industry to Advance STEM Education**

*Marian Gilmore: STEAM Powered Learning*

*Dayni Alba: Boeing*

This session provides an industry and non-profit/education perspective on ways for schools/districts/educators to develop partnerships that bring real world STEM examples into the classroom. Examples will feature Boeing Space Exploration partnerships and products, including the CST-100 Starliner and work that Boeing does on the ISS and SLS. Presenters will also introduce a variety of Boeing inspired education resources and ideas for hands-on activities available free online.

*Grade level: 6-12*

*Subject: Science, Math, History*

### **Hydroponics Farm for Mars Sustainability**

*Stephen Bennett: Tays Jr. High School from Katy ISD, Katy, Texas*

Create a hydroponics farm to align curriculum. Plant life cycles for 7th grade Science, Nutrition and self-sustainability for Family and Consumer Science, design, prototyping, controls and systems for Engineering/Manufacturing, and computer coding of misting and lighting systems for Tech Apps.

*Grade level: 6-8*    *Subjects: Science, Math, Technology*



**Thursday 3:30 – 5 p.m. Cont.**

*Grade level: K-12*

*Subjects: Science, Technology*

**Lunar and Meteorite Sample Disk Certification *Double session cont.***

*Suzanne Foxworth: JACOBS @JSC NASA ARES*

*Bridget Mcinturff: JACOBS @JSC NASA ARES*

*Paige McGraff: JACOBS @JSC NASA ARES*

Teachers will participate in hands-on activities that will explore accretion, differentiation, impact and volcanism of the Moon and meteorites. Teachers will be certified to borrow NASA's Lunar and Meteorite Sample Disks to use with their students.

*Grade level: K-12*

*Subjects: Science, Math, Technology, Language Arts, History*

**NOTE: This is a double session. You will need to sign up for it for the next time slot also.**

**NOSL Astro Camp on the Road for All!**

*Maria Lott: NASA Out of School Learning (NOSL)*

*Kelly Martin-Rivers: SSC Office of Education Acting Director, NASA SSC NOSL Project Lead*

*William M. Trest, Astro Camp Performance Analyst*

NASA's out-of-school-time learning SSC Astro Camp collaborates partnerships with YSOs, schools, museums, libraries, and universities placing "Astro Camp on the Road for All" with NASA unique activities to inspire authentic STEM experiences, utilizing national aligned standards and sparking student interests in Aeronautics, Earth/Solar Systems, Technology, and ISS /Mars Missions. Join this session and learn "How to...and Where to..." Connect with the NOSL SSC Astro Camp Resources as NOSL Astro Camp presents six hands-on activities ready for educators to use in and outside of their classroom.

*Grade level: 3-8*

*Subjects: Science, Math, Technology*

**Space Is Big Enough for Everyone: Making STEM Accessible to All**

*Stephanie McMahon: Space Center Houston*

How do we include "that kid" in our STEM education? The student who cannot see, who cannot hear, who cannot sit still, who cannot use their hands, who just isn't like their peers? In this session, you will learn how STEM education can be accessible to everyone using both high and low tech solutions in an integrative and inclusive setting. You will also learn about how Space Center Houston reaches out to all populations through space STEM initiatives.

**STEAMbots - Robotics in the Elementary Classroom**

*Jeaninine Roseberry: Sheboygan Area Schools*

STEAMbots is for educators interested in infusing STEM concepts into elementary classrooms using robotics.

Engage students in problem-solving, critical thinking and engineering design! Participants will build and program robots using Lego WeDo 2.0 technology. Activities include resources to incorporate science, language arts, math and engineering in the early elementary classroom.

*Grade level: K-5*

*Subjects: Science, Math, Technology, Language Arts*

**Student Opportunities in Airborne Research and Weather to Fly By *Double session cont.***

*Crystal Del Rossa: JSC Education - NASA STEM Pathways Activities- Consortium for Education*

*Brandon Hargis: JSC IPA Education Specialist*

*Dominic Del Rosso: NBL Chief Engineer*

Participants will learn about NASA's new pilot program S.O.A.R. Student Opportunities in Airborne Research and how NASA's unique education resources can help you teach fundamental physics and atmospheric science principles to your classes. For example, a NASA unique resource called Weather to Fly by, teaches students that weather is the state of the atmosphere with respect to wind speed and direction, temperature, moisture and pressure. A pilot must take all of these things into consideration while flying, since it has a significant impact on the ability of both the airplane and the pilot to perform properly. In this session, participants will build an anemometer using straws and cups. By measuring the number of revolutions the device makes in a given time, you will be able to measure the speed of the wind.

*Grade level: 6-12*

*Subjects: Science, Math*

**Teach Space All Year!**

*Taylor Wusk: Killeen ISD*

Love space? Stuck with standards that don't let you teach space? This is the session for you! Using Texas-based standards, learn about ways you can teach space science ALL year!

*Grade level: 6-8*

*Subject: Science*



**Thursday 3:30 – 5 p.m. Cont.**

**What's the Buzz about Electricity?**

*Jean Bolte: iSpace, Inc.*

*Ashlynn Cagle: iSpace, Inc.*

Educators will learn how to "light up" students' imaginations by completing the circuit with Energy Sticks, Snap Circuits, soft dough with Squishy Circuits, LEDs, motors, and buzzers! These engaging electricity lessons will explore open and closed circuits, conductors vs. insulators, series and parallel circuits, and the transfer of energy. This workshop is valuable for teachers who desire a hands-on experience comparing educational products currently on the market used by iSPACE, the non-profit STEM Learning Place in Cincinnati, OH.

*Grade level: 3-5*

*Subjects: Science, Technology*

**Tours**

**Tours take place in working NASA facilities and are subject to change or cancellation at any time.**

**Neutral Buoyancy Lab— observation deck**

Take a trip to the pool where astronauts practice for their spacewalks—the NBL. This facility is the underwater training facility for the astronauts and your chance to see state-of-the-art training—the next best thing to space!

*Participants will be taken onto the floor area of the pool.*

**Neutral Buoyancy Lab— visitors' gallery**

Take a trip to the pool where astronauts practice for their spacewalks—the NBL. View the facility from above the pool area where you will get a good scope of the size.

This facility is the underwater training facility for the astronauts. Your chance to see state-of-the-art training—the next best thing to space!

## Session Descriptions Thursday, Feb. 1, 2018

### 8:30 – 9:30 a.m.

- Keynote –TBA

### 9:45 –11:15 a.m.

- Aviation STEM: Lone Star Flight Museum
- Build Your Own Telescope
- Design of Spacecraft for Human Space Flight
- Flights of Fancy
- Mars Rovers in Any Classroom!
- Microgravity's Impact on the Human Eye, Digestive System and Flames
- NASA Physicist and author Les Johnson
- Near Earth Objects: Asteroids, Comets, Meteoroids, Oh My!
- Now Departing: Your Journey to Deep Space
- One Small Step - A Journey to the Moon & Mars
- Space Exploration Runs on Code
- Space-Themed Quilts: Hands-On, No-Sew STEAM Education!
- Solar System Mystery
- Students in Microgravity: Taking Ideas to Launch
- Train Like An Astronaut
- Using the Engineering Design Process to Address Authentic Space Exploration Challenges
- What's Out There? Exploring Space Exploration

### **Tours**

- Neutral Buoyancy Lab – Observation Deck
- Neutral Buoyancy Lab – Visitors' Gallery

### 11:15 a.m. – 1:15 p.m.

- 11:15 – 12:15 Lunch 1
- 11:30 – 12:15 SEEC Crew overview : Harmony Crew
- 11:30 – 12:15 SEEC Crew overview: Quest Crew
- 12:15 – 1:15 Lunch 2
- 12:30 – 1:15 SEEC Crew overview: Tranquility Crew

### 1:30 – 3 p.m.

- Amazing Race: Mars – Using Robotics and Space Science to Boost Learning Beyond the Basics
- Astronaut Dive Training (Dive Session) [\*Double session\*](#)
- Aviation STEM: Lone Star Flight Museum
- Classroom Lasers Part 1
- Civil Air Patrol Flights Over Houston [\*Double session\*](#)
- Drones in the Classroom
- Duck! Wild and Crazy Flying Objects Aloft! Or Not.
- Engineer YOUR Mars Landing
- Exploring Space One Ozobot at a Time
- Flipped Out Marshmallow Mission to Mars and Beyond
- It's a Matter of Forces

- Lunar and Meteorite Sample Disk Certification [\*Double session\*](#)
- Moon Menagerie
- PhET Simulations: New Ways to Experience Science and Math
- Searching for Habitable Worlds
- Student Opportunities in Airborne Research and Weather to Fly by
- Telescopes of all Kinds. What Good Are They Anyway?
- To Mars and Beyond: Using Engineering Design Process and Challenges in Teaching

### **Tours**

- Space Vehicle Mockup Facility (SVMF)
- Mission Control
- The Planetary Analog Test Site (aka Rock Yard)
- NASA Robotics in Bldg. 9

### 3:30 – 5 p.m.

- Astrobiobound and Beyond!
- Astronaut Dive Training (Dive Session) [\*Double session cont.\*](#)
- Aviation STEM: Lone Star Flight Museum
- Civil Air Patrol Flights over Houston [\*Double session cont.\*](#)
- Civil Air Patrol FREE K-12 STEM Kit Program
- Classroom Lasers part 2
- Desmos: Tool for Connecting Math and Science
- If You Build It They Will Come
- Partnering with Industry to Advance STEM Education
- Hydroponics Farm for Mars Sustainability
- Lunar and Meteorite Sample Disk Certification [\*Double session cont.\*](#)
- NOSL Astro Camp on the Road for All!
- Space Is Big Enough for Everyone: Making STEM Accessible to All
- STEAMbots - Robotics in the Elementary Classroom
- Teach Space All Year!
- What's the Buzz about Electricity?

### **Tours**

- Neutral Buoyancy Lab– observation deck
- Neutral Buoyancy Lab– visitors' gallery

### 4:30 – 5:30 p.m.

- Keynote – TBA