SKYWARD

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Welcome to Civil Air Patrol Texas Wing – Aerospace Education Newsletter– Summer 2015

Tiger Team Presentation is a Star Attraction of the Texas Wing Conference

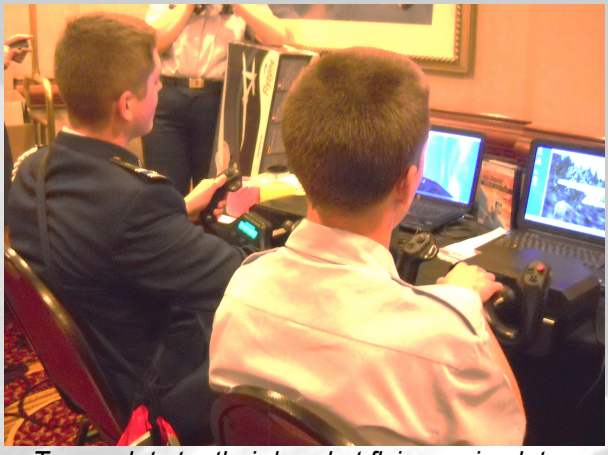
by: Capt Audrey Morrow

FORT WORTH, Texas – On April 17th, Tiger Team, a three-part program on aerospace education, was presented by Lt. Col. Levent Vural, Texas Wing Director of Aerospace Education. This has always been a major attraction at Texas Wing Conferences, with standing room only audience and this year was no exception. The hands-on program appeals to cadets and seniors alike is aimed at nurturing a desire to learn more about space and aeronautics. Lt. Col. Vural has long been enthusiastic about teaching and encouraging science and aerospace education. He participates annually in a Space Exploration Educators' Conference (SEEC) at NASA Johnson Space Center in Houston.

Starship Grissom, was a fascinating presentation given by Major Michael W. Parkhill, Texas Wing External Aerospace Education Officer. He showed the amazed audience a video of a Lockheed-Martin X-35 STOVL (short take off vertical landing) stealth fighter jet performing a vertical landing. This is accomplished through the use of an inverted lift fan propulsion engine. Major Parkhill described the importantance of space exploration and science as an avenue to better understand the world we live in.

Capt. John Dorie illustrated the many tools used to educate today's youth. He encourages participation in the Science, Technology, Engineering and Mathematics (STEM) programs. This program is fast becoming an integral part of our public school systems. The four skill levels that can be attained are astronomy, flight simulation, robotics and rocketry. He explained how important it is to participate in the Aerospace Education Information Exchange. Learning by means of sharing can only bring progress.

Lt. Col. Jay Anderson's presentation discussed unmanned aerial vehicles (UAV) are coming into the foreground of civilian life as well as in military endeavors. They are invaluable in freeing personnel for other tasks and avoiding injury in dangerous areas. The word drone is not widely accepted. It implies something to be feared to some.



Two cadets try their hand at flying a simulator.

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Many were late in taking their seats at the Tiger Team sessions. 1st Lt. Richard Bonica of Houston's Thunderbird Composite Squadron, had an elaborate display set up in the hallway leading to the classroom. He thoroughly enjoys demonstrating flight simulators, robots built from kits, unmanned aerial vehicles and radio controlled model aircraft. His enthusiasm is boundless. He built much of the equipment with the use of kits. Richard actively participates in bringing the STEM program to local public schools. He is a member of the American Model Association. Capt. Jawad M. Sultan assisted 1st Lt. Bonica for the STEM presentation utilizing static displays and hands on activities.

Aerospace Education breakout sessions attracted a record number of senior members along with cadets.

If those leaving the three hour session are tempted to grab the tiger by the tail, they might find themselves on a wild ride into the exciting future of imagination and creativity through technology and science.

IACE Students Awed by Tour of NASA and Texas Wing TOP Flight Program

By Capt. Audrey Morrow

HOUSTON – On July 27, 2015, six International Air Cadet Exchange (IACE) students participated in an in-depth tour of the NASA Johnson Space Center. The tour was organized by Maj. Stuart Hagedorn, Texas Wing External Aerospace Education officer. He was joined by Maj. Wendi Lamphear, Geo W. Bush Composite Squadron Cadet Program officer and Kate Schoessler, a NASA Bio Medical Engineer, Ellington Composite Squadron *PAO, PDO and this year's IACE coordinator for Group IV*. The group of students consisted of three from Canada, two from China and one Chinese chaperone. On July 25th, the students were given Orientation Flights piloted by Mission Pilot Maj. Stuart Hagedorn.

The tour began with a walk through Rocket Park. They viewed the size of the Saturn V rocket with amazement. The group then boarded a bus with guide, Raphael Grau, *Manager of the External Integration Office of International Space Station Program (ISS)*. The first stop was the Christopher C. Kraft, Jr. Mission Control Centers. Upon entering the building, there was a large display of the elaborate front and rear instrument panels of a Space Shuttle flight deck. A few of the students enjoyed posing at the controls.

Visiting the actual Mission Control room was a fascinating experience. Sitting in seats behind a glass panel gave all a bird's eye view of the actual working staff that were supporting and guiding the current ISS missions. At the time, the staff was monitoring logistics of the International Space Station and its crew. Mr. Grau was delighted by all the interest and questions from the students. One observer noticed the reading on a screen indicating a low battery. The batteries, which go into maintaining the space station, are solar powered. The orbit chart indicated the vehicle was on the dark side of earth at the time of the reading. He explained the functions of personnel at the numerous computer stations. Kate Schoessler usually manned the Bio Medical Engineer position in that room.

A fun time was had by all at the next stop - Historic Mission Control Center - with its dial up phone panels and pneumatic tubes for sending messages. The students enjoyed exploring the computer stations. They sat at the huge bulky computer displays and had a great time imagining what it might have been like to be a flight controller in the 70's. The room was imbedded with the wondrous history of pioneer space exploration. The days of Alan Shepherd, John Glenn, Neil Armstrong and Apollo 13 are not to be forgotten.

As the group arrived at the Space Vehicle Mockup Facility, Maj. Hagedorn told of his exciting career in astronaut training. He worked at this facility during the time of the jetpack extra vehicular activities (EVA's) outside the space capsules. There was much to see in this building.

The robotics display showed a human form robot merged with a land rover. A universal docking device was displayed as well as space suits, weighing 300 lbs., showed gold faceplates. A mockup of the Orion spacecraft gave everyone an opportunity to see how closely contained the astronauts were. Many different modules of the space station were visible. Mr. Grau described the function of each one and the students had many questions.

As the tour concluded, Maj. Hagedorn gave each student a certificate for his or her participation in the O-Flights that occurred the day before. Good-byes were said and they expressed how much they enjoyed this experience. Perhaps they will remember NASA as a highlight in their visit to the United States, and possibly some may be inspired to follow careers in space exploration.

**photos provided by Maj Lamphear*

Breaking Barriers – CAP Senior Member, Eric Boe

Congratualtions to CAP Senior Member and Astronaut Eric Boe for being chosen to be part of the first crew to fly into space aboard a commercial spacecraft. NASA made this announcement in early July, days before the 46th anniversary of Apollo 11's historic flight.

The 4-person crew includes Eric Boe, Douglas Hurley, Robert Behnken, and Sunitia Williams. All have traveld to orbit at least once and will be working with both Boeing and Space X. These are the companies who are leading the privitazation of space travel. Boeing has been designing and developing their spacecraft, the Commercial Space Transportation capsule (CST-100) and Space X is working on the Dragon capsule. Both will fly to low-Earth orbit to the International Space Station.

Col. Boe began his quest to become an astronaut as a cadet with Civil Air Patrol. He graduated from Henderson High School in Chamblee, Georgia in 1983 and continued his education at the United States Air Force Academy where he graduated with a Bachelor of Science in Astronautical Engineering in 1987. He earned his Master of Science in Electrical Engineering from Georgia Institute of Technology in 1997. He has logged over 6,000 flight hours in over 50 different aircraft and even serving as a T-38 instructor pilot, fighter pilot, and test pilot. He began his career at NASA in July 2000 at the Johnson Space Center and served as a pilot on STS-126 and STS-133 logging more than 28 days in space.

It is obvious Col. Boe is well-deserving to be chosen for this historic endeavor. His experience will further human spaceflight and break the barrier for commercial spaceflight.

**Biography and photo provided by NASA*

Resources YOU can use for the AEX Rocketry

How Rockets Work -- An overview of rocketry that includes an explanation of Newton's Laws of Motion, which support the basic principles of rocketry. http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/How_Rockets_Work.html

A Pictorial History of Rockets -- From Archytas, a mathematician in 400 B.C., to privately owned rockets of the 21st century, this timeline of rocket history includes pictures, dates and descriptions of key events and people. http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/A_Pictorial_History_of_Rockets.html

Adventures in Rocket Science Educator Guide –This guide contains 25 activities designed for informal education venues. Participants learn about the history and principles of rocketry and NASA's newest rockets. While doing these hands-on activities, participants learn about Hero Engines, parachutes and surface area, altitude tracking, and Newton's Laws of Motion. Learners also can build four types of rockets and two types of egg drops. http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Adventures_in_Rocket_Science.html

Advanced High-Power Paper Rockets – Cadets select a flight mission (what they want the rocket to do) and design and construct a high-power paper rocket that will achieve the mission. They construct their rocket, predict its performance, fly the rocket, and file a post-flight mission report. Missions include achieving high-altitude records, landing on a "planetary" target, carrying payloads, testing a rocket recovery system, and more. http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Advanced_High_Power_Paper_Rockets.html

Help NASA Study Mars -- Planet Four: Terrains Help NASA study exotic landscape features near the south pole of Mars! NASA's Mars Reconnaissance Orbiter team is working with Zooniverse to present a new citizen-science project. Volunteers will help scientists identify possible areas for even more detailed examination with the orbiter's High Resolution Imaging Science Experiment camera. HiRISE can reveal more detail than any other camera ever put into orbit around Mars. Some of Mars resembles deserts on Earth, but seasonal freezing and thawing of carbon-dioxide ice (known on Earth as "dry ice") at the Martian poles creates some unusual landscape features. There's a lot of territory to cover, so scientists need your help identifying what and where these features are. Planet Four: Terrains is on a new platform released by Zooniverse, an organization that currently hosts 30 projects that enlist people worldwide to contribute to discoveries in fields ranging from astronomy to zoology. For more information and to learn how to participate, visit the "Planet Four: Terrains" website at https://www.zooniverse.org/#/projects/mschwamb/planet-four-terrains. To learn more about the orbiter and its mission at the Red Planet, visit http://mars.nasa.gov/mro/. Please direct questions about this opportunity to Whitney Clavin at whitney.clavin@jpl.nasa.gov.

Opportunities

New Professional Development Resources Available

Engineering Enables Science Series - What's This Drought Stuff About? Audience: Home School and Informal Educators of Grades 3-8 **Event Date:** Aug. 20, 2015, at 6:30 p.m. EDT This webinar will feature NASA's "Water Filtration Design Challenge." This challenge takes a new look at the water cycle, Earth images, and weather patterns and is a great way to foster discussion about where your local water source is found. Register online to participate. https://www.etouches.com/134192

Engineering Enables Science Series: Marsbound Audience: Home School and Informal Educators of Grades 4-10 **Event Date:** Aug. 25, 2015, at 6 p.m. EDT Explore NASA's mission to the Red Planet! Look at data used to develop or refine theories about how air, water and impact events provide clues about Mars to the missions exploring it. Participants will learn about inquiry-based activities that deepen our understanding of the behavior of Earth's geologic features and how they compare to those on Mars. Register online to participate. https://www.etouches.com/137562

Engineering Enables Science Series: Integration of NASA's BEST Curriculum Audience: Home School and Informal Educators of Grades 6-8 **Event Date:** Aug. 27, 2015, at 7:30 p.m. EDT Discover NASA's Beginning Engineering, Science, and Technology, or BEST, curriculum for grades 6-8. The webinar session will focus on the engineering design process, and participants will see what it's like to investigate the moon remotely. Register online to

"Where Over the World Is Astronaut Scott Kelly?" Geography From Space Trivia Contest During his year-long stay on the International Space Station, astronaut Scott Kelly wants to test your knowledge of the world through a geography trivia game on Twitter. Traveling more than 220 miles above Earth, and at 17,500 miles per hour, he circumnavigates the globe more than a dozen times a day. This gives Kelly the opportunity to see and photograph various geographical locations on Earth. In fact, part of his job while in space is to capture images of Earth for scientific observations. Follow @StationCDRKelly on Twitter. Each Wednesday, Kelly will tweet a picture and ask the public to identify the place depicted in the photo. The first person to identify the place correctly will win an autographed copy of the picture. Kelly plans to continue posting weekly contest photos until he returns from the space station in March 2016. For more information, visit http://www.nasa.gov/feature/where-over-the-world-is-astronaut-scott-kelly

International Observe the Moon Night On **Sept. 19, 2015**, the whole world has the chance to admire and celebrate our moon on International Observe the Moon Night. And you can join in the fun! Check the map of registered observation events at http://observethemoonnight.org to see if an event is being held near you. If not, please consider registering and hosting one and inviting your community. *You don't know where to start?* This link walks you through the process of planning an event of any size. See how to host an event in six easy steps: http://observethemoonnight.org/getInvolved

What's Up? Skywatch

August 25th – Venus returns to sky before sunrise–Venus becomes visible again in the morning sky. You may see Venus rising above the eastern horizon an hour before sunrise.

August 29th – *Supermoon* –This will be the first of this year's 3 full supermoons. The full moon is near perigee.

September 13th – *New Moon* – the Moon will be directly between the Earth and the Sun and will not be visible from Earth.

September 28th – *Total Lunar Eclipse & Supermoon*– A total lunar eclipse will be visible from North America, South America, Europe, and West Asia. It will last 3 hours and 20 minutes.

The Moon will be eclipsed totally for approximatly 1 hour and 12 minutes. The moon will also be the closest Full Moon of the year.

October 8th & 9th - *Draconid meteor shower.* Draconid meteor shower is a minor one only producing about 10 meteors per hour. The shower takes place annually between October 6 to 10. The best time for viewing will be just after midnight from a dark location away from city lights. Meteors will radiate from the constellation Draco, but can appear anywhere in the sky.

October 27th – *3rd Supermoon* – this is the last supermoon of the year.