StellarXpress

April 2021 Newsletter

Program Update

Congratulations to our winners of the StellarXplorers VIII Competition!!!

Registration for STLX VIII is now open! You can register here

Contents

STLX National Champions!

First Place, STLX VII

Africanized Killer Bees

Aurora Composite Squadron CAP

Portland, OR

Second Place, STLX VII

Purple Ducks

Francis Tuttle Tech Center

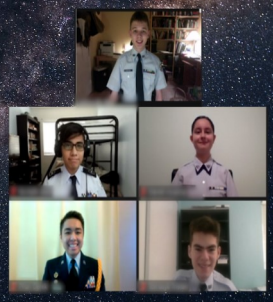
Oklahoma City, OK

Third Place, STLX VII

Team Minerva

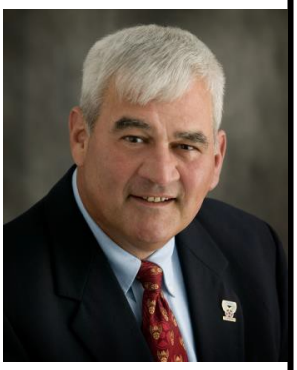
Scripps Ranch High School AFJROTC

San Diego, CA



Stellar Spotlight

David T. "Buck" Buckwalter



My role is largely administrative (e.g., taking minutes, building the finals program and some promotional material, and commenting on others' work). That does not mean that I am disappointed with what I do. On the contrary, I am proud of what this all-volunteer team has achieved, including my modest contributions. Moreover, there is a good story to be told about the origin of StellarXplorers …

In 2014, an Action Officer in SECAF's organization emailed AFA about developing a STEM Outreach Program similar to CyberPatriot but for space. I was an AFA volunteer at the time, but had served as the AFA Executive Vice President when we created CyberPatriot. My role in that program was much more central, and thus I was tasked to: "look into this."

With the assistance of Tim Tichawa, a new AEC member and space professional, I prepared a short brief for AFA's Executive Committee. Despite trying to offer a balanced view of the pros and cons, the mood in the room felt negative. In the AEC audience was AFA's 2014 Teacher of the Year, Kaci Heins. She seemed uncomfortable at this point, so I asked: "Ms. Heins, what do you think?"

Space is a complex subject and can be very expensive depending on what you do, but I've been flying instrumented weather balloons to over 100,000 feet with my sixth graders, and they love it and are even more excited about science for the experience." With that reply, the mood of the AEC brightened considerably and StellarXplorers was off and running.

I hope StellarXplorers continues to grow bigger, better, and more impactful, just as CyberPatriot has done with a full-time staff. I suppose I have had some positive influence – I asked the right person a question at the right time.

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Aerospace News

International Space Station to go on tour with VR exhibit "The Infinite"

For more than 20 years, the International Space Station has hosted crews numbering two to 13 astronauts at a time. Soon, though, it will open its hatches to a continuous stream of more than 100 people – and you can join them.

"THE INFINITE: Living Among the Stars," a new, immersive touring exhibition, will open up the space station to the public by tapping into the largest media project to ever be filmed in space.

For the past two years, Felix & Paul Studios, in collaboration with TIME Studios, has worked with eight international astronauts to film more than 200 hours of VR (virtual reality) footage on the space station. In 2020, the studios began releasing "Space Explorers: The ISS Experience," a four-part immersive series for Oculus headsets. "THE INFINITE" expands upon that project to bring the sense of being in space to more audiences.

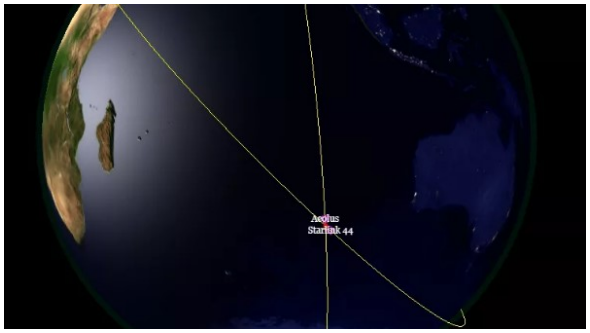
Mars' Ingenuity misses 4th takeoff

Mars helicopter Ingenuity was supposed to get its boldest workout on April 29th, but the flight didn't go exactly as planned. "Aim high, and fly, fly again. The #MarsHelicopter's ambitious fourth flight didn't get off the ground, but the team is assessing the data and will aim to try again soon.

Ingenuity also had a hiccup in the leadup to its first flight attempt, failing to transition to flight mode as planned. In response, the helicopter team altered the command sequence beamed from Earth – a fix that allowed Ingenuity to fly on Mars for the first time on April 19.

The helicopter has performed three flights to date, one apiece on April 19, April 22 and April 25. Those sorties have gotten increasingly ambitious, with the solar-powered chopper traveling 330 feet (100 meters) at a top speed of 4.5 mph (7.2 kph) during April 25's 80-second flight.

Artificial Intelligence is learning how to dodge space junk in orbit



An AI-driven space debris-dodging system could soon replace expert teams dealing with growing numbers of orbital collision threats in the increasingly cluttered near-Earth environment.

Every two weeks, spacecraft controllers at the European Space Operations Centre (ESOC) in Darmstadt, Germany, have to conduct avoidance maneuvers with one of their 20 low Earth orbit satellites. There are at least five times as many close encounters that the agency's teams monitor and carefully evaluate, each requesting a multi-disciplinary team to be on call 24/7 for several days.

The frequency of such situations is only expected to increase. Not all collision alerts are caused by pieces of space debris. Companies such as SpaceX, OneWeb and Amazon are building megaconstellations of thousands of satellites, lofting more spacecraft into orbit in a single month than used to be launched within an entire year only a few years ago. This increased space traffic is causing concerns among space debris experts. In fact, ESA said that nearly half of the conjunction alerts currently monitored by the agency's operators involve small satellites and constellation spacecraft.

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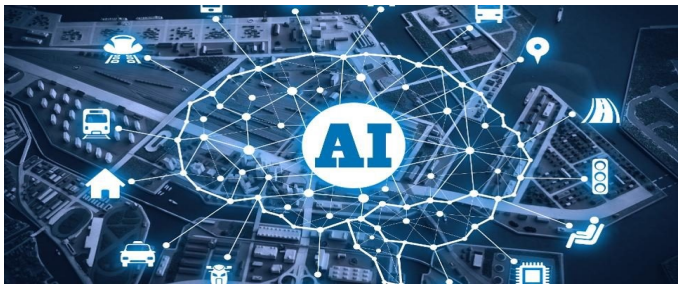
Space Careers

Artificial Intelligence / Machine Learning Engineer

An AI engineer builds AI models using machine learning algorithms and deep learning neural networks to draw business insights, which can be used to make business decisions that affect the entire organization. These engineers also create weak or strong AIs, depending on what goals they want to achieve. AI engineers have a sound understanding of programming, software engineering, and data science. They use different tools and techniques so they can process data, as well as develop and maintain AI systems.

"As an AI/ML Research Engineer at Lockheed Martin, I am responsible for developing tools that allow computers to automate processes that are typically very challenging or time consuming for a human to do. For example, I might want to instantaneously count the number of cars in a parking lot from a satellite image, or automatically monitor debris as it flies around in space and detect if an object is at risk of damaging a satellite. Most importantly, I need to be able to understand the logic and weaknesses of these tools so that they can be used and trusted for critical defense or national security problems." – Matthew Reisman, AI/ML Research Engineer, LM Space



Aerospace Opportunities!

Virtual Space in the Community is a series of videos in association with leading companies and business partners with STEM resources for students and teachers alike!

They have some truly amazing interviews and videos, spanning topics such as career paths like Opto-Mechanical Engineering and Image Science and Satellite Imaging to topics about Mars Lander Design, Mars Habitat and Life Science!