AD ASTRA KANSAS FOUNDATION

AD ASTRA KANSAS

Volume 17, Issue 2 Summer 2018

2018 GALAXY FORUM

- **August 11**
- **At The Cosmosphere** *1100 N. Plum Hutchinson*
- **1-3 p.m.**
- **Free**
- **Open to teachers, students, astronomers of all kinds and the interested public**

INSIDE THIS ISSUE:

Galaxy Forum travels with Juno to Jupiter, puts eyes on the Sun

Top to bottom: Stephen Houston, Dr. Thomas Cravens, Caleb Gimar / photo credits: KU and WSU physics websites

Is this giant planet the story of our solar system? Good question and part of the Juno spacecraft's mission. Two speakers will delve into that at the Ad Astra Kansas Foundation's 2018 Galaxy Forum. This free event for the public will be held Saturday, Aug. 11 at The Cosmosphere from 1-3 p.m.

"[Current theory is] that Jupiter formed behind (just after) our Sun. At one time Jupiter and the Sun were two big masses competing for dominance. The hope is that by understanding how Jupiter formed, we might better answer how the solar system formed," says Stephen Houston, one of the speakers at this year's forum.

Houston, a native of Tribune, is a fourth-year grad student in plasma physics at KU who has been working with NASA and Johns Hopkins Applied Physics Lab on data from the Juno spacecraft since it arrived at Jupiter in 2016.

Also speaking will be Dr. Thomas E. Cravens of KU, whose 30-year career in astrophysics has included work with NASA's Pioneer, Maven, Cassini and Juno missions, as well as theoretical modeling of atmospheres and ionospheres of Jupiter's and other planets' moons. Solar wind interaction with planetary bodies is another of his research specialties.

Speaking of the Sun—exploration of it will be the other topic at the Galaxy Forum. WSU physics grad student Caleb Gimar will give an overview of what we know, what we want to know and highlight two solar projects—the soon-to-be-launched Parker Solar Probe and the NASA Innovative Advanced Concept project recently awarded to WSU to design a neutrino spacecraft to study the solar interior. Gimar is part of that team.

This annual event is sponsored by the Ad Astra Kansas Foundation with the generous cooperation of The Cosmosphere.

Kansas astronaut will launch to International Space Station in October

Credits: NASA bio / official Expedition 57 logo

Born in Belleville, grew up in Hoxie—1994 Hoxie High School graduate Tyler (Nick) Hague has come a long way to his current assignment as a flight engineer on the ISS Expedition 57/58 crew which will launch October 11. The Soyuz MS-10 spacecraft will launch from the Baikonur Cosmodrome in Kazakhstan.

The six-month mission (returning April 2019) will include 300+ research experiments and technology demonstrations not possible on Earth, increasing science knowledge for humanity's benefit on Earth and to help enable future long-duration exploration into deep space.

He will also be aboard during the expected first flights of NASA's Commercial Crew Program, which will resume launches of human spaceflight from U.S. soil.

Hague, a colonel in the U.S. Air Force, earned a bachelor's in astronautical engineering from the U.S.A.F Academy in 1998 and a master's in aeronautical and astronautical engineering from M.I.T. in 2000. He was selected as one of eight members of the NASA 2013 astronaut training class. The two-year candidate training included scientific and technical briefings, intensive instruction in ISS systems, spacewalks, Russian Language training, robotics, psychological training, T-38 flight training, water and wilderness survival training. Follow Hague on social media at: https://twitter.com/AstroHague

Aerospace engineering senior Mohamed Moustafa receives his team's award from Dean Bowden. Photo courtesy of WSU

The winner of the AAKF's 2018 Ad Astra Kansas Award at the WSU College of Engineering Open House this spring, Team K.I.S.S., is the first-ever team to represent Wichita State University at NASA's Student Launch rocket competition.

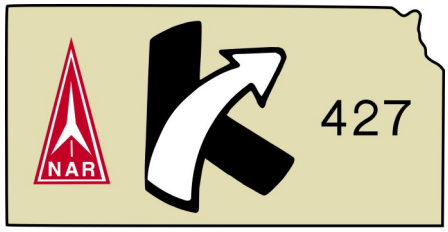
The team designed, built, tested and flew a high-powered rocket for the NASA Marshall Space Flight Center competition in Huntsville, Ala. The rocket launches to an apogee altitude of one mile above ground and uses a dual-deployment parachute system to allow for retrieval in reusable condition. After a successful landing, a custom-designed autonomous rover deploys from the rocket and moves away from the vehicle carrying a set of foldable solar panels. During the eight-month process, the team followed the NASA engineering project lifecycle, preparing reports and presentations covering the preliminary design, critical design and flight readiness phases for a panel of NASA engineers. The team advisor is Dr. L. Scott Miller.

The team also engaged K-12 students in hands-on STEM activities and model rocket launches at Minneha Elementary and Christa McAuliffe Academy in Wichita and Victoria High School in Victoria. To date more than 250 students have been impacted.

Interested in rocketry? Check these out…

Source: KLOUDBUSTERS

KLOUDBUSTERS is a High Power Rocketry organization with a launch site near Argonia in south-central Kansas. The site is unique because of the altitude of its FAA launch waiver (up to 50,000 feet). KLOUDBUSTERS hosts monthly Fun Fly launches and three major launches a year. Tripoli Rocketry Association and National Association of Rocketry adult members are invited to participate as high power flyers; youth under 18 are allowed to launch model rockets at all launches and spectators are welcome. The next major launch will be AIRFest 24 held Aug. 31-Sept. 3. For details, launch and other info, go to www.kloudbusters.org



Courtesy of KOSMO

KOSMO (Kansas Organization for Spacemodeling): This club is open to all ages and all experience levels. It holds six to seven launches a year. Launch sites are in the Ellinwood, LaCrosse and Hutchinson areas. KOSMO is chartered with the National Association of Rocketry. For info, go to www.kosmo427.org

Teeniemunde Rocketry Club: This group offers High Power Rocketry in southeast Kansas and southwest Missouri. The club is a member of the Tripoli Rocketry Association, for more info, go to www.teeniemunde.org

Kansas Space Tech—Offered by the Kansas 4-H organization since 1996, this program includes five categories: rocketry, robotics, computers, astronomy and unmanned aerial vehicles (drones).

Currently, 2000 Kansas kids participate in the Space Tech Program, according to Deryl Waldren, the K-State 4-H specialist for Space Tech.

The program encompasses all ages (7-19) and all levels. One can get a good idea about the program at the Space Tech Exhibit which will be at 4-H Centennial Hall at the Kansas State Fair on September 7-16. "One will see about 125 rockets ranging from six inches to six feet tall there," said Waldren.

Rocketry is a fun educational project...it's a real adrenaline rush to be able to do," said Waldren, whose extension office is in Colby. For more info, go to Space Tech or e-mail dwaldren@ksu.edu

The 4-H program is open to every child aged 7-19 in every county in Kansas as part of K-State Research and Extension. Not every county may offer Space Tech, but every county has a 4-H organization. One can find out if Space Tech is offered by contacting their local extension office.

KU mini-satellite launch is on the horizon

LAWRENCE—Madison Sargent has always had an eye to the stars. And now she is reaching out to them.

The University of Kansas junior in aerospace engineering is leading an effort to put a tiny satellite from Kansas into space—part of NASA's CubeSat Launch Initiative (CLSI) that launches small payloads beyond Earth's atmosphere. The students' proposal has been selected for launch in 2019.

Sargent, who is from Prairie Village, and her team are working with KU alum Marco Villa (aerospace engineering master's in 2002 and doctorate in 2005). He is now CEO of Tyvak International, a nanosatellite company in Italy.

Villa is a good resource—while at KU he led one of the university's first efforts to launch a satellite under the CLSI program. In 2006, a KUbeSat was scheduled to be launched from Kazakhstan aboard a Russian rocket. The rocket's failure doomed the effort.

It's a big project, but the satellites are small. According to NASA, CubeSats are built in units of 10x10x10 centimeters (about 4 inches square). Payloads can be up to six units in size, weighing about 26.5 pounds.

The KU group's six-unit payload will carry four instruments: a cosmic ray detector; a device to measure South Pole ice sheet thickness, and an astrobiology project with KU biologists that will carry bacteria and fungi for further study in partnership with K-12 students. A fourth instrument, an "energetic particle detector," is sponsored by Fundamental Technologies, a Lawrence company specializing in space-related projects.

Kansas is one of the few states that does not have a satellite in space under the CLSI program.

Photo credit: KU News

This is a hard project, but the students will learn that details are what matter. "In developing a spacecraft, you can never settle for mediocrity. Space does not forgive," said Villa.

Having interned at several aerospace companies, and though she appreciates the growing commercial side of the space industry, Sargent hopes one day to work for NASA. "NASA stays true to what it is to explore space and really focus on science."

Sargent will give a presentation at the 2018 Ad Astra Kansas Space Celebration on October 13 in Topeka.

Teachers can see free educational documentaries …

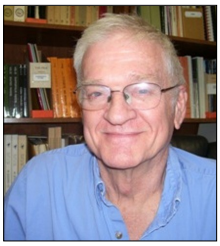
...at the Cosmosphere until Aug. 31. It's a thank-you from the Cosmosphere to teachers for all their hard work.

Topics include history, nature, technology as well as space.

For info contact helenek@cosmo.org
Other links:
Now showing
Teachers' thank-you

BRIGHT IDEA! Come see both the documentary "Space Next" and our Galaxy Forum on Aug. 11!

In Memoriam…



File photo

With sadness we relay the passing of a past president of our foundation, **Dr. Thomas P. Armstrong,** on June 2 in Lawrence.

"I am a child of the Cold War and the Space Race," he once said. "I grew up on a farm [near Atchison] with dark skies and enjoyed watching Sputnik go over, and responded to President Eisenhower's call to get interested in science and catch up with the Russians."

He certainly did that. For more than forty years, as a professor and researcher at KU and as a co-owner of Fundamental Technologies, Armstrong was on the cutting edge of space physics, space instrumentation and software. He co-designed the Voyager spacecraft in the 1970s and remained a co-investigator until his health failed in recent years. He worked with over 13 different spacecraft operating for more than 175 years in space, including Mariner, Galileo, Ulysses, Cassini and the Van Allen Probe.

He taught and mentored countless young scientists who work around the world today. He enjoyed sharing his knowledge with students of any age. And was beloved by all.

Ad Astra. Godspeed, Tom Armstrong.

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