



## NASA Design Build Fly exhibit to take off

A \$1.25 million award last summer from NASA to Exploration Place, Wichita, is enabling the building of a NASA Design Build Fly exhibit which will open in December 2017.

According to the award abstract, Design Build Fly will be a 5100 square foot aviation exhibit with 15 associated education programs for engaging, immersive and hands-on experiences that emulate aviation careers in areas such as design, engineering, manufacturing and flight.

It will feature a factory setting, three exhibit icons, dozens of interactive stations and activities for all ages. The exhibit icon features a deconstructed full-sized plane, a lab modeled after the real-world process of plane design and manufacturing and a fuselage theater—a section of a commercial fuselage with behind-the-scenes footage from local companies.

Among the project objectives are:

1)to inspire interest in STEM for underrepresented and at-risk youth by providing science and educational

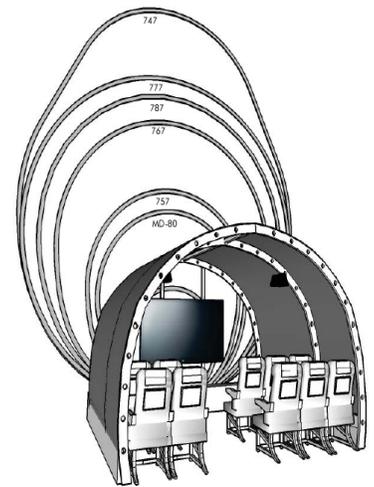
experiences through partnerships with youth-serving organizations.

2)to build partnerships with educational, business and social entities in Kansas to support learner experiences and engagement both in and out of classrooms.

3)to offer exhibit components and education programs that use evidence-based educational strategies.

4)to promote workforce development and encourage the next generation, advance community pride and affirm region's status as the Air Capital of the World.

According to the award abstract, partners include: Wichita State University Aerospace Engineering Department, Kansas NASA Office, National Institute for Aviation Research, the National Center for Aviation Training, representatives of local major aviation companies, the Wichita Council of Engineering Societies and the Wichita Manufacturers Association.



*As part of the DBF theater, colorful rings, representing full-scale sections of various plane models will illustrate the massive scales and variety of plane models, plus interpretive graphics are keyed to each ring. Illustration courtesy of Exploration Place.*



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## University of Kansas graduate spends internship at NASA Ames

Last summer Air Force 2<sup>nd</sup> Lt. Robert LaRue spent ten weeks at NASA Ames in California, under the sponsorship of the Kansas Space Grant Consortium.

LaRue earned his undergrad degree in aerospace engineering at KU in May 2016 and, now stationed at Wright-Patterson Air Force Base in Dayton, Ohio, is in grad school studying astronautical engineering, which has an added space component.

Ames is a multi-disciplinary NASA center focused on both space and aeronautics.

LaRue worked at the National Full-Scale Aerodynamics Complex (NFAC) there. It has the world's largest wind tunnel, which is 120 x 80 feet and can get wind speeds of up to 100 knots. Another tunnel, a 40 x 80 foot one, can get up to 300 knots.

LaRue's work was primarily in the 40 x 80-foot test section and dealt with testing helicopter rotors—using different wind conditions and rotor angles to see how the rotor and helicopter structures responds to different stressors.



*The NASA Ames Wind Tunnel Complex includes the world's largest wind tunnel. Photo credit: NASA*

## The Ad Astra Kansas Space Celebration was fun



Above: Model planes displayed by the Foundation for Aeronautic Education are always a hit.



Left: Parents taking photos made for some great souvenirs for kids.



Upper right: A volunteer helps a student fold her prize at the Sky-Q booth.



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LaRue assisted NFAC test engineers in analyzing data and preparing test reports.

One thing surprising to LaRue is that the way engineering is done professionally is different than in a classroom. "They have so many more resources, rely more on real data, analyzing real test data versus having to solve equations as in the classroom," he said. One challenging aspect for him was learning to work with a discipline (helicopters) with which he was not familiar.

LaRue, who grew up in Kansas City, Kansas, and graduated from Olathe Northwest, recommends applying for a NASA internship. Besides the engineering, the atmosphere and opportunities to meet other interns nationwide made for a great growing experience.

The sponsoring Kansas Space Grant Consortium is one of 52 space grant consortia funded by NASA. The KSGC channels NASA support, mainly through universities, to develop initiatives supporting NASA's vision for aviation and space education, research and industry.

Left: Kids enjoyed learning about light and how it reacts when it passes through a prism. Photo credit: Nick Solomey

### Space Celebration science museum ticket winners



Thanks to the generosity of three science museums, the fun continues for a number of Space Celebration attendees.

Many thanks to the Kansas Children's Discovery Center, Topeka, for their donations of two sets of admission passes for two.

Winners were Abi Menkveld and Julia Adkins, both of Topeka.

Also, supporting our event with two-all day admission passes was the Kansas Cosmosphere and Space Center, Hutchinson. The winner of those passes was Robert Abbey, Topeka.

This year, Science City at Union Station in Kansas City contributed two sets each of adult and children's passes to Science City and to the Gottlieb Planetarium.

Those winners were Zachery Sivertson and Tanya Chestnut, both of Topeka.

## Space exploration brings evolving questions

In going where no man has gone before, there are considerations to be weighed, according to the recently published book, "The Ethics of Space Exploration."

"Do we take our same views, our value scales, our views of our ecosystem with us? Or do we need to be open to how space might influence ethical thinking?" asks book contributor and co-editor Dr. James Schwartz, a professor of philosophy at Wichita State University.

For example, "do there need to be changes in international law to accomplish the exploration of space and the increased existence of long term missions? If so, what kind?" asks Schwartz.

His chapter "On Methodology of Space Ethics" deals not with the pros or cons of space exploration. Rather it

looks at these activities and plumbs deeper questions. The space environment being foreign to us, without the usual measurements of values we find on earth, how do we value space? From what point(s) of view?

He argues that we should be broadly tolerant of reasons for environmental preservation in space. Just as ethical considerations influence the progress of science, so too does scientific progress influence ethics. The same interdependence holds, Schwartz thinks, for the relationship between ethics and science in space.

In other chapters, space law expert Frans von der Dunk wonders whether existing space law is adequate for human interaction with extraterrestrial life, should we discover any.

Philosopher Gonzalo Munevar defends the use of space habitats for improving the human condition. And geologist Sean McMahon describes "Martian beauty" while raising aesthetic objections to terraforming Mars.

Other experts weighing in the book's 17 chapters include NASA scientist Mark Lupisella, astrobiologist Charles Cockell, and science fiction author Stephan Baxter. Published by Springer International Publishing.

The book hopes to promote open and informed discussion as we address value questions, according to Schwartz. "Not only will our actions in space guide how we think about space ethics—space ethics will guide decisions about what we do in space," states Schwartz in his chapter.

### INTERSTELLAR R & D

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