



## 2021 GALAXY FORUM

- **Sat. August 21**
  - **At The Cosmosphere**  
1100 N. Plum  
Hutchinson
  - **1-3 p.m.**
  - **Free**
  - **Open to teachers, students, astronomers of all kinds and the interested public**
  - **Seating limited / for questions or to register [click here](#)**
- Or**
- **Watch live on our [Facebook](#) page**

### INSIDE THIS ISSUE:

- Closer and closer to the Sun** 2
- Science reporting at NASA is a dream job for Kansan** 3
- Daglen Observatory enables Benedictine to offer astronomy major** 3

## JWST headlines 2021 Galaxy Forum

He's done a 10,000 mile worldwide bicycle tour to give over 75 lectures about the soon-to-be-launched James Webb Space Telescope. (Currently set for late 2021).

And now he's coming to Kansas.

Dr. Scott Acton, scientist at Ball Aerospace and Technologies in Boulder, Colo., where part of the JWST was built, will be presenting at the Ad Astra Kansas Foundation's 13th annual Galaxy Forum on August 21 at the Cosmosphere in Hutchinson.

It is entitled: **"The Webb Telescope: An Observatory beyond the Moon."** According to Acton, "It's a talk about the telescope, its design, construction and testing. (I can't really talk about the science of JWST because, well, it hasn't done any yet.) It's heavy on pictures and animations. I talk about the beauty of the cosmos, and how our natural attraction to that beauty motivates us to study it."

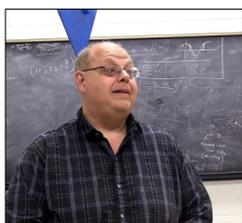
Acton has worked on JWST since 1998, joining Ball Aerospace in 2001. He is currently the Wave-front Sensing and Control



Cont. "JWST" page 2

All images on this page are courtesy photos

### ALSO



#### INVITED: "Space Radiation and Astrophysics"

Wichita State University physicist Dr. Nick Solomey says, "I would like to talk about space radiation and astrophysics to describe how we use different types of particles to look into places in space we cannot see directly with light..."

"This includes things like neutrinos from the sun's core or

"Invited" cont. page 2



#### "Plucky Perseverance—on the job"

Sarah Lamm, K-State master student in geology, will update us on what that intrepid rover has been up to—what new answers (and questions) it has given us.

Plus, hear about some of her current research which will have implications for future Mars rovers. She recently interned at NASA JPL, where she worked with lasers to

"Plucky" cont. page 2



#### Kansas Interstellar University initiative update

AAKF has been working and networking with an idea to provide a new opportunity for college students statewide to learn about "Interstellar 101."

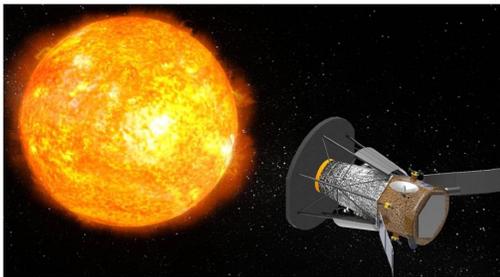
Find out how that is going and more from AAKF board member Steve Durst.

# Getting ...closer and closer to the Sun

**By Jodi Spindler**

**WICHITA**—Dr. Nick Solomey, Wichita State University professor of physics, has been awarded a \$2 million grant from NASA to continue working on a neutrino detector that will work in space and close to the sun.

This is one of the five grants NASA announced earlier this month from the NASA Innovative Advanced Concepts (NIAC) program.



**To keep the neutrino spacecraft from burning up, it will have a ceramic shield (like the space shuttle tiles) which will make a shadow for the craft.** *Illustration credit: NASA MSFC Advanced Concept Office*

According to NASA, neutrinos are one of the most abundant particles in the universe but are challenging to study. Solomey's detector will have the ability to go closer to the sun and increase the density of neutrinos, which is an alternative approach to the usual Earth-based neutrino detectors.

His project is named Cube-sat Space, will take about two to two and half years to complete and help us understand the sun better. "The cube-sat test flight will allow us to prove the technology can work in space and that we can measure the deep space rates of the various backgrounds and their signature," Solomey said. "Understanding the core of our sun in an important goal for NASA."

This is not the first NIAC grant Solomey has received from NASA. His Phase II grant was focused on showing the technology could work in space. With the Phase III grant, Solomey will prepare a flight-ready detector that could be tested on a Cube-sat.

"Our design study showed the spacecraft is doable and would cost

about \$327 million," he said. "This is all within the expected range of funding NASA gives to a demonstrator mission. So, if we prove operations in space and measure the various types of backgrounds and their rates, we will then go toward building the demonstrator spacecraft to fly within 7 solar radii." (Meaning the craft can fly as close as seven times the radius of the sun).

Part of this grant will help fund graduate research assistants. The hope is one student will stay on throughout the duration. Solomey anticipates lots of work ahead the team, but it will be a cooperative effort between South Dakota State University and University of Minnesota. Those universities received sub-grants as well.

"There is a large amount of work ahead, but I am looking forward to the testing phase of the project. My hope is to bring ideas and techniques to a NASA space exploration mission as a tool to look into the sun, but maybe also a new way to search for dark matter and even galactic core neutrinos," Solomey said.

## Cont. "JWST" from page 1

Scientist for the project.

Acton began his science career with internships at the Lockheed Palo Alto Research Labs (LPARL), Eventually, as a full-time employee there, he developed an "Adaptive Optics" system for use in solar astronomy. This work was the first unclassified demonstration of real-time atmospheric correction.

Acton earned a PhD in physics from Texas Tech University in 1989. Following a post doc year at the Keipenheuer-Institut für Sonnenphysik in Freiburg, Germany, Acton became the Adaptive Optics Engineer at the W. M. Keck Observatory, building and commissioning AO systems for both of the Keck Telescopes before

joining Ball Aerospace.

In 2016, Acton took a 1-year leave of absence from JWST and bicycled roughly 10,000 miles across the USA and 10 other countries, to promote the telescope.

## "Invited" cont. from page 1

galactic core or gamma rays from hidden objects like black holes and neutron stars."

Solomey earned his PH.D. at the University of Geneva in 1992. He has over 200 referred articles in physics resources.

Currently, he is working on a NASA Innovative Advance Concepts project (see above).

He also has written a science book for the public, "The Elusive Neutrino—a subatomic detective story."

## "Plucky" cont. from page 1

identify iron metastable minerals.

As a team member studying Curiosity's Chem-Cam data, she worked for 3 summers at Los Alamos National Laboratory in New Mexico.

Lamm is a 2018 Kansas State grad with degrees in chemistry, geology and geography. In 2020 she was the K-State Student Science Communications Award winner. She is also a NASA Solar System Ambassador.

## Science reporting at NASA is a dream job for Kansan

One unusual part of Katy Mersmann's job at Goddard Space Flight Center in Greenbelt, Md., is the amount of traveling she does (even for NASA).

There's constant research and equipment field testing and since her task as senior multi-media specialist is to explain the science behind it, she often goes along.

In October 2018 she accompanied researchers flying over Antarctica with Operation IceBridge. This recently completed NASA mission keeps track of changes in polar ice thickness. Coincidentally, several of the crew were from Kansas because IceBridge's radar instrument operations are done by the Center for Remote Sensing of Ice Sheets (CReSIS) at the University of Kansas. Small world.

Another fascinating flight was over the Alaskan and Canadian tundra and boreal forest in 2017.

The Arctic Boreal Vulnerability Experiment (ABOVE) is a NASA terrestrial ecology program studying the effect of climate changes on this part of North America.

Though she did spend time with researchers on the ground studying permafrost thaw, the ABOVE flights were primarily doing airborne research into carbon emissions. "In one instance, we flew a maneuver looping down in big spirals from cruising altitude to just above the ground to take air measurements in a column. How often does a person get to fly 100 feet above the tundra to take videos?" said the Olathe native.

She takes videos, absorbing the science she sees. Then, working with scientists, researchers and science writers, she and her team of about six turn the information into easily digestible videos, press

***"Getting to do Earth science and getting to do it from space—that's the dream..."***

releases, tweets, facebook and other social media posts for the public.

One thing has surprised Mersmann. "I don't think people have any idea how much of NASA's work is dedicated to the Earth. After all, the Earth has been part of NASA's charter from the beginning."

The work can be challenging. "Oh, boy! Social media is a beast that has to be fed all the time," she said. Not everything is as exciting as a trip to the Moon. Sometimes news can be depressing or complicated. Her task is to share info over social media "in ways that engage readers so they want to learn more about a subject."

Mersmann took a circuitous route to NASA. She has always loved science. When she and her brother were 12, their dad took them on a "little pilgrimage" to the CosmoSphere which really excited her.

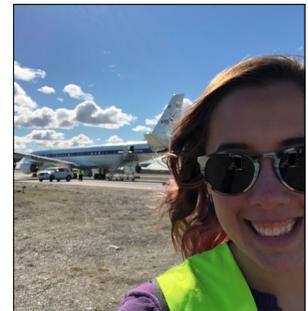
Before graduating from Olathe South High School in 2011, she

Continue "Earth" page 4



**Above: Mersmann has always loved science.**

**Below: Mersmann in front of NASA's DC-8 on the runway in Chile before Operation IceBridge survey flights over Antarctica in 2018.** Courtesy photos.



## Daglen Observatory enables Benedictine College to offer astronomy major

**By Jodi Spindler**

Nestled just off the banks of the Missouri River and just west of the campus of Benedictine College in Atchison is Daglen Observatory. This observatory was a gift to the campus fund in 2017 by Joe and Frankee Daglen, both 1969 graduates of Benedictine, to help expand the astronomy program. Their gift seems to be doing just that. According to Dr. Ryan Maderak, assistant professor of astronomy, "In recent years we have graduated two astronomy majors on average per year, but that number has been trending upward, and we have a large incoming freshman class for Fall 2021."

The observatory has two permanently-mounted 14-inch telescopes and a unique roll-off roof design that allows for multiple placements of several telescopes to give viewers multiple angles to gaze the night time sky. Also, it allows for less vibration from the telescopes.

Cont. "Outreach" on page 4

**Cont. "Earth" from page 3**

took an interest in science until reaching the higher levels. Feeling she wasn't good enough in math, she focused on convergence journalism at the University of Missouri. Convergence journalism is inclusive of all media platforms. A professor noted her interest in science, suggesting she consider being a science reporter. "I had never thought of that!" she said.

Applying for a communications internship at GSFC, "I thought I'm totally not going to get that," she said. But she did. A second internship put her in the Earth Science Communications Directorate.

There she found her passion. "Getting to do Earth science and getting to do it from space? That's

the dream," she said. She has been at NASA for about five years. As a contract employee at NASA—many employees are—she works through the space support services company KBR.

There are many ways to be involved with NASA besides as an astronaut. "I didn't think anyone who went for journalism could work for NASA."

What would you tell a student interested in science? "You don't have to be "good" at something to find a place in it. I liked science, but I didn't think I was good enough at it to make a career of it. It turns out there are lots of ways to work in science if you're interested in it,

without having to be "good at chemistry" or doing lots of math. Science needs all kinds of people, with all kinds of interests," she said.

Check out one of Mersmann's projects— an Explorers Digital Series about the cryosphere: [NASA Explorers Program- "Cryosphere-The Big thaw"](#)

**Cont. "Outreach" on page 4**

The Physics and Astronomy Department prides itself on hands-on lab experiences for students, and the observatory allowed addition of a majors-level observational astronomy lab course, plus addition of a minor in astronomy.

"We are now in our second summer of a student research internship, doing serious astronomy research on campus, getting our students an experience not possible at other liberal arts colleges. It has also benefitted our general education classes, in the range of astronomical objects that we can show them, and the experience they get in seeing a real, working observatory," Maderak said. Daglen has been accepted into the Vatican Observatory Consortium.

The priorities of the observatory when it was built were not only education to Benedictine students but also public education and outreach. "It has provided a unique opportunity for Benedictine to give back to the community with tours and viewings, and I believe it is currently the only facility at Benedictine used for regularly educational outreach. We have done many tours and viewings for schools, Scout troops, church groups, homeschooling groups, etc." Maderak said.

It has been closed to the public due to Covid, however that will change when the new school year starts. "We plan to start a public open house series this fall, every other month starting in September. We are also happy to do tours and viewings for small groups," Maderak said. If someone is interested in a small group or private tour they can call Ryan Maderak at [rmaderak@benedictine.edu](mailto:rmaderak@benedictine.edu) or give him a call at (913) 360-7527.

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230 California Ave. #108  
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Editor / Publisher: Steve Durst  
news@spaceagepub.com  
Managing Ed: Jeanette Steinert  
jeanettesteinert@att.net  
Webmaster: Ken Moun  
kenmoun@gmail.com  
Topeka Liaison: Jodi Spindler

Board of Directors  
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Reach out to us at:  
[contact@adastra-ks.org](mailto:contact@adastra-ks.org)

**INTERSTELLAR R & D will return in Fall 2021 issue**