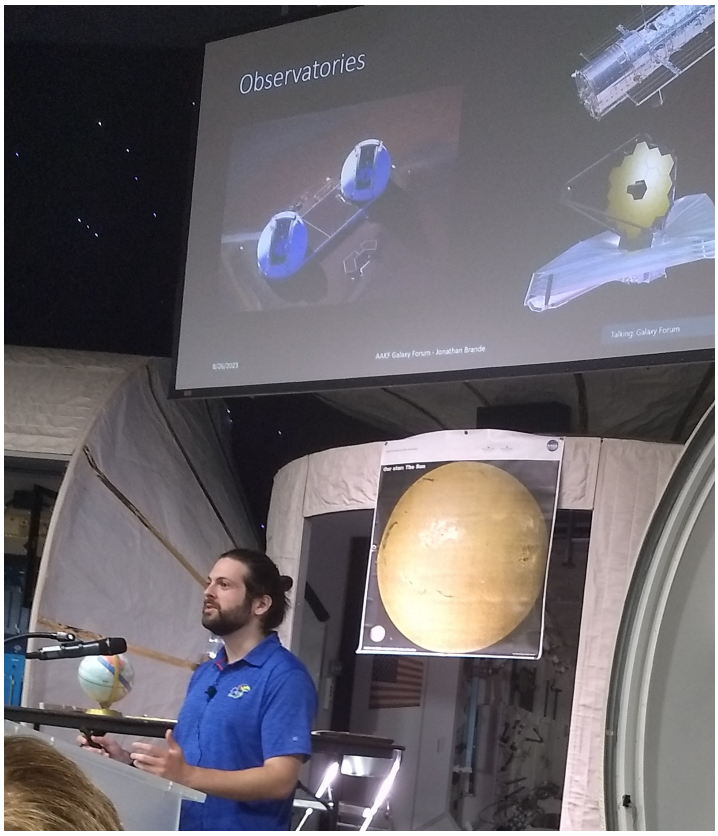
We had our Galaxy Forum

Here are some Fast Exo-planet Facts...



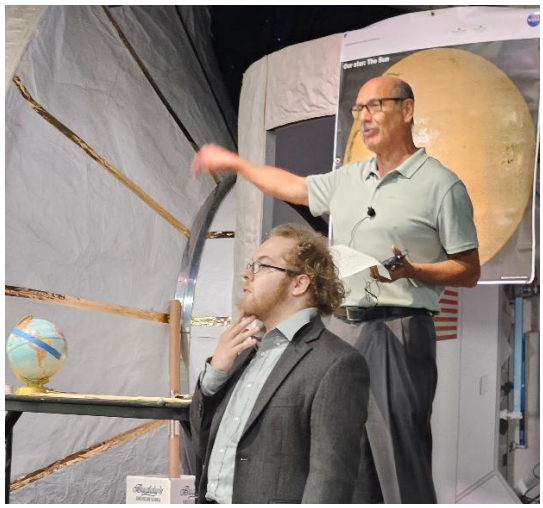
- From Jonathan Brande
- An exo-planet is a planet that orbits around a star other than our Sun.
- Though Clyde Tombaugh found Pluto by comparing photos taken of a single starfield six days apart, other stars in the galaxy are too far away and faint for that kind of detection.
- The most common and successful method of finding exoplanets is the transit method. When a planet passes between a star and its observer, the resulting dimming of its light can be seen in the light curves—a graph showing light received over a period of time. The Kepler spacecraft used the transit method.
- Easy to find, but rare, are the large “hot Jupiter” exoplanets, with masses from 1-100x that of Jupiter. The length of their year can be like one week on earth, or tens of thousands of days, depending on the distance from their host stars.

- Exo-planets between the sizes of Earth and Neptune are the most common in the universe.
- Scientists are most interested in the rocky terrestrial ones, like Earth. So far none have been found that match our solar system. Does that mean we don't yet have the capability to find them? Or that our solar system is rare? If rare, maybe that affects prospects for finding life in the rest of the galaxy.

See the full Galaxy Forum

WSU astronomy students had a lot of questions for Brande.

Galaxy Forum photos by Sarah Lamm and Jodi Spindler



From Ed Bierens and Charles Rivera

Fast Eclipse Fact

- October's eclipse speed ranged from 9,000 kph in Alaska (7x the speed of sound) to 2,200 kph in the Caribbean.

More Fast Facts

From Steve Durst

Fast Interstellar U. Facts

- The Galaxy Forum program, with its theme of "21st Century Education: Understanding our Place in the Universe" has hosted 110 free public forums globally since 2008.
- The 21st century has seen an explosion of interstellar interest with a "new space" economy flourishing.
- Kansas has brilliant minds, top-rated colleges, a state motto made for the future. Its central location makes it a natural crossroads for education.
- All of which backs a long-term goal of an interstellar university in the Ad Astra state.

From Sarah Lamm

Fast Asteroid Facts

- One reason scientists study asteroids is to find water. Access to water would greatly help in space exploration.
- Asteroid Bennu is believed to be made up of compounds as old as the solar system itself because it has had no geological processes occurring since its formation.
- ALERT--Initial studies of the returned Bennu sample show evidence of high-carbon content and water.
- The metallic asteroid Psyche poses a question--What is it? A failed planet--metal core intact? The result of a crash of metal rocks and fragments that melted together? Or is it iron volcanic, spewing out liquid iron to the surface and coating it?

Did you know?

OSIRIS-Rex Kansas connection

One member of the OSIRIS-Rex successful sample return mission team has KU roots. Dr. Humberto Campins, an international expert on asteroids, earned his bachelors degree in physics and astronomy at KU in 1977. Campins is Pegasus Professor of Physics and Astronomy and head of the Planetary Science Group at the University of Central Florida. The IAU named asteroid "3327 Campins" after him. *Photo source: humbertocampins.com*

Interstellar Seminar to expand

Last spring's successful WSU Interstellar Seminar will return in Spring 2024 with two sections: undergrad and graduate credit, the latter being directed at precollege teachers.

Plus, there will be an option for those interested but not needing college credit.

Contact: mark.schneegurt@wichita.edu

SEAL

The Kansas State Library Services partners with the Solar Eclipse Activities in Libraries (SEAL) program to help Kansas libraries have access to their resources. The state library does not administer the program but serves as a conduit. With another solar eclipse coming in April '24, any public libraries interested in being involved, check into it here

SEAL is an activity of the national STAR Net Library Network

KSU senior named a Goldwater Scholar

MANHATTAN--Matthew Culbertson, senior in physics and mechanical engineering is KSU's 84th Goldwater scholar.

Last spring his proposal was selected from over 5,000 entries in various STEM disciplines who are planning research-focused careers.

His project focuses on developing a random positioning machine for use with K-State's TRIGA Mark II nuclear reactor to model the combined effects of radiation and non-Earth gravities on a cell sample without actually sending samples into orbit. *Image credit KSU press release*

Read more here.

In Memoriam

July saw the passing of Dr. Paul E. Fortin. Dedicated to aerospace Dr. Fortin spent 30 years in the USAF (Col. retired), also served in technical intelligence at the Pentagon. He was also a professor of engineering at KU, staff engineer for several aerospace companies and an author. Active in the Topeka Foundation for Aeronautical Education, he was always generous about sharing his love of flying.

In September we lost Mike Ford, a Star Trek fan and dedicated teacher who took his high school science classes to new heights, obtaining a Christa McAuliffe grant in 2000 to start Elk Creek Observatory at Holton High School, making it one of only a few high-school-owned observatories in the nation. In 2004 he helped establish Banner Creek Science Center. Known for his sense of humor, Ford taught at many levels from elementary to community college and was a NASA Solar System Educator.

Both gentlemen were friends of AAKF from the very beginning. Our condolences to their families.

Nova-C Moon lander mission has links to AAKF board member

HAWAII--One payload to be included in an upcoming Intuitive Machines (Houston) Nova-C lander mission to the Moon at year's end is the International Lunar Observatory Association's (ILOA) ILO-X imaging precursor payload, according to Steve Durst, ILOA director and AAKF board member.

The IM-1 mission flying on SpaceX Falcon 9 rocket from Cape Canaveral FL to the Moon surface is now set to launch in mid-December or early January 2024.

Milky Way Galaxy / First Light Observation with ILO-X precursor instruments (dual 3-cm lenses: wide FOV 186 degrees circular and narrow FOV rectangular) aims to capture the first robotic image of our galaxy ever from the Moon.

Image credit ILOA

Letter from the Editor:

Dear Readers,

Our state motto, "ad astra per aspera", (to the stars through difficulties) can be viewed from many angles. AAKF have always gone with a science perspective, feeling this is an area not given enough credit.

Our sesquicentennial project, "Science in Kansas--150 years and counting", highlighted 150 Kansas innovators in over 50 fields, past and present. It was hard to narrow down, so many worthy candidates, so little room. *

That was over 10 years ago. Since then Kansas STEM activity has exploded. Not only in high-profile areas like Panasonic EV batteries, the National Bio and Agro-Defense Facility or the continuing prominence of Wichita's aerospace cluster; but also in advanced manufacturing, sustainable energy, climate science, Information technology, smart ag technology. There is hardly an area of Kansas society that does not benefit from some form of STEM innovation.

Now might be the right time to recognize and celebrate our STEM potential. AAKF is submitting a resolution to the Kansas Legislature in January for an official designation of an annual Ad Astra STEM Day each April 24 to celebrate contributions made in all areas of STEM in Kansas.

Any person, group, etc. who would like to endorse/ support this effort or learn more, please reach out to us at contact@adastra-ks.org.

*Link to "Science in Kansas--150 years and counting":

Jeanette Steinert

Editor

INTERSTELLAR R & D —Fall 2023—Vol. 22 No. 3—#44

This "Interstellar R&D" forty-fourth feature in the Ad Astra Kansas News continues a 22-year enterprise to research and gather information on important developments preparatory to humanity's greatest adventure – voyaging to the stars. Now, at millennium's turn, is an appropriate time for grand vision and forward thinking, and there are strong signs of a renaissance in interstellar travel, thought and activity. This feature and newsletter, thus, now set forth to develop a 21st-century national / international / global clearing center and storehouse of knowledge and know-how for travel to the stars. Ad Astra, Galactically – Steve Durst

Observation

TRAPPIST-1 System & JWST

New astrophysical capabilities of humanity's most powerful telescope JWST are prioritizing the search for life and habitability in the beckoning TRAPPIST-1 system, about 40 LY from Sol / Earth in the Aquarius constellation.

Several of the 7 Earth-like planets of TRAPPIST-1 (named from Transiting Planets and Planetesimals Small Telescope) lie in the "habitable zone". Trappist-1e, -1f, -1g are worlds that may have temperatures that could support surface liquid water. Trappist-1e lies in the middle of the habitable zone and is of rising interest to astronomy and the interstellar community since its discovery in 2017 along with -1f, -1g and -1h. It is a rocky world slightly larger than Earth and receives a similar amount of energy from its star as does Earth from the Sun.

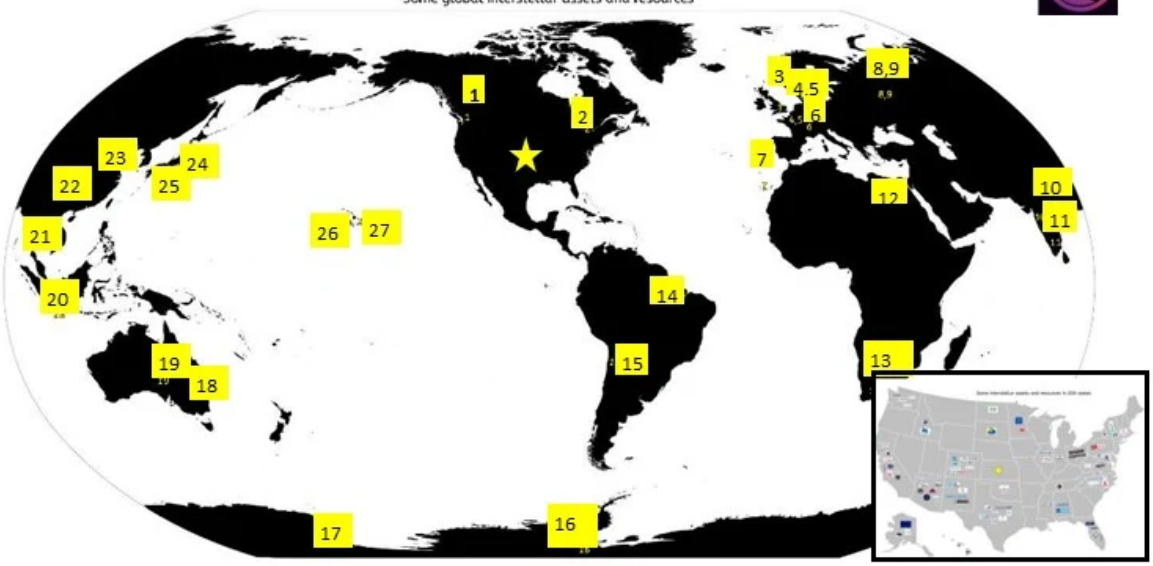
In its first year, JWST has conducted 8 investigations of the Trappist-1 system, including -1e with NIRSpec to study its atmosphere chemistry and temperature and MIRI to study -1e thermal emission and potential for life and habitability.

Technosignatures as well as biosignatures for Trappist-1, especially -1e, are considerations that are engaging such SETI and Multi-World pioneers as Jill Tarter, Buzz Aldrin and Pete Worden of Breakthrough Initiatives, who marvel at the 7 planets remarkably aligned within 0.1 degree of the system's ecliptic. An alignment, muses Tarter, enabling highly advanced solar engineering? A system made for transits, relishes Aldrin, of Apollo 11 habitation and Mars Cycler engineering. Ad Astra per Aspera.

Building on its excellent universities, and identifying and interacting with astronomy resources and centers not just nationally, but also globally, Kansas' location make it a prime site for an eventual interstellar university.

Below: Interstellar assets highlighted in reference to the central state of Kansas. These maps were created for the Interstellar Research Group (IRG) Symposiums 7 & 8, the 9th of which will be held in 2025. The non-profit IRG is a vibrant voice in the world of interstellar discussion and facilitation with biennual symposiums addressing interesting space exploration issues.

Some global interstellar assets and resources



1. TRIUMF National Particle Accelerator Centre, 2. McGill Interstellar Flight Research Group, 3. British Interplanetary Society
4. International Astronautical Federation, 5. International Astronomical Union, 6. CERN Large Hadron Collider
7. Instituto de Astrofisica de Canarias, 8. Institute for Nuclear Research, 9. Keldysh Research Center, 10. Bhabha Atomic Research Centre
11. India based Neutrino Observatory, 12. Center for Fundamental Physics at Zewail City, 13. Square Kilometre Array, 14. Alcântara Space Center
15. Extremely Large Telescope, 16. Amundsen-Scott South Pole Station, 17. McMurdo Station, 18. Parkes Observatory, 19. RAAF Woomera Range Complex
20. Indonesia Equatorial Space Launch Assets, 21. Princess Sirindhorn AstroPark, 22. Five-hundred-meter Aperture Spherical radio Telescope
23. Chinese Academy of Sciences, 24. Japan Aerospace Exploration Agency, 25. High Energy Accelerator Research Organization
26. Potential Pacific Space Access Sea Launch Platform, 27. Mauna Kea Observatories

Fullsized version here

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