



2020 Flagstaff Festival of Science Program

visit SciFest.org for videos, downloadable activities and event registration



Christa Sadler
W. L. Gore & Associates Keynote Speaker

Ongoing Events during the Flagstaff Festival of Science!

Take Home STEM Kits - PLANETS

See Festival website: Scifest.org

Pick up your *PLANETS* STEM kits! These fun space-oriented education kits, for 5-8th graders, are available online at <https://planets-stem.org/planets-at-home> and are available for free at the following locations:

- Flagstaff Downtown Library
 - Monday, Sept. 21 to Friday, Sept. 25, 10 a.m. to 4 p.m.
- East Flagstaff Community Library
 - Monday, Sept. 21 and Wednesday, Sept. 23, 2 p.m. to 5 p.m.
 - Friday, Sept. 25 and Saturday, Sept. 26, 10 a.m. to 2 p.m.
- For more curbside pickup details, visit <https://www.flagstaffpubliclibrary.org/CurbsidePickup.pdf>; note that you do not need a library card to pick up free Flagstaff Festival of Science *PLANETS* STEM kits.

Junior Paleontologist 10-Day Program

Download activities at Festival website: Scifest.org

During each day of the festival, a new set of fun activities (including puzzles and art) that teach about the amazing diversity of dinosaurs will be available for download on Scifest.org. Featured dinosaurs include the Earth Shaker, Seismosaurus and the Giant Predator from Tuba City, Dilophosaurus. The program is designed for K to 6th-grade students, but can be enjoyed by all curious learners!

Tynkertopia STEAM Kits: Think Like an Engineer

See Festival website: Scifest.org

Tynkertopia is distributing free STEAM Kits, designed for K-5th grade students, with materials and directions (in English and Spanish) needed to create four different bridges. The video that accompanies the kits will be available on September 19 at Scifest.org. The STEAM Kits are available for pick-up at the following locations:

- Killip Elementary School:
 - Friday, Sept 18: 9 AM - 1 PM
 - Monday: 9 -11 AM
 - Tuesday: 9 -11 AM
 - Wednesday: 9 -11 AM
 - Thursday: 9 -11 AM
 - Friday: 9 -11 AM
- Fort Tuthill: Extreme Course Parking Lot
 - Saturday, Sept 19: 9 AM - 4 PM
 - Saturday, Sept 26: 9 AM - 4 PM

Self-Guided Hike

Picture Canyon Natural and Cultural Preserve

Take a walk along a 2.5-mile forest path supported with digital guides! Pick up a map with the new QR Codes at the trailhead or download it from: <http://bit.ly/pictureCanyonMap>

Parched: The Art of Water in the Southwest

SEPT. 18 - 27

11 a.m. to 6 p.m.

Coconino Center for the Arts (CCA)

Parched: The Art of Water in the Southwest explores the complexity of water in the face of climate change and increasing populations. The works hosted at CCA reflect insight into our relationship with water in our natural, cultural and political landscapes. Reservations required. Register at <https://bit.ly/ParchedCCA>.

Star Party - Night Skies through Artists' Eyes

Downtown galleries and businesses (full list on FlagstaffStarParty.org) are featuring the night skies in artwork and literature through September and October. Stop in at these shops for a Celebration of the Night!

Pre-Festival BONUS EVENTS

WEDNESDAY, SEPT. 16

Science Book Discussion

7 p.m. Online meeting via Flagstaff Public Library Zoom event

"The Alchemy of Us" by scientist and science writer Ainissa Ramirez was chosen by the Flagstaff community for discussion at the Festival of Science Book Discussion! Email flagstaffpubliclibrary@gmail.com for the Zoom link instructions and to acquire a copy of the book!

THURSDAY, SEPT. 17

Star Party - Sunset Shadows and Circles

Brian Skiff, Lowell Observatory

5 p.m. See FlagstaffStarParty.org

Take an insightful virtual tour of the subtle transition from sunset into twilight. See crepuscular rays, the Earth-shadow and Belt of Venus, plus layered pastel colors over the Sun in the West. Pre-recorded Flagstaff Star Party event!

Star Party - Live Telescope Viewing

7:30 - 8:15 p.m. See FlagstaffStarParty.org

Spend an hour live-streaming at the telescope with a local astronomer guiding you through spectacular star clusters, nebulae and many other wonders of Flagstaff's starry skies, made possible through the annual Flagstaff Star Party and Lowell Observatory's telescopes!

Program of Events: 2020 Flagstaff Festival of Science

Unless otherwise noted, all virtual events are pre-recorded, and will be made available on the Festival website ([Scifest.org](https://scifest.org)) on the day and time indicated.

FRIDAY, SEPT. 18

Star Party - Native Skies with Modern Eyes

David Koerner

6 p.m. See FlagstaffStarParty.org

Sky watching is enriched by understanding different perspectives of indigenous communities. Native relationships to Earth and Sky suggest a reciprocal relationship with a living Universe, illustrated by sky stories.

The Caped Crusaders of Science Ballet

6:45 p.m. Festival website: [Scifest.org](https://scifest.org)

Continuing the time-honored Flagstaff tradition, the Superpowers of Science will be joined by dancing Superheroes in tights, capes and masks in this year's annual Festival of Science Ballet featuring the NAU Community Music and Dance Academy. Choreographed by ballet master Andrew Needhammer.

W. L. Gore & Associates Keynote Presentation: Earth Scientist Christa Sadler

Tapping into the Superpowers of Science

7 p.m. Festival website (live Q+A): [Scifest.org](https://scifest.org)

Christa Sadler has been playing in the dirt and investigating the environment around her since she was a child. Join this river-running Earth scientist as she shares her world of exploration and discovery in search of dinosaurs, past civilizations and clues about the future of our planet. Learn how science works and how you can get involved in the adventure. Participate in a live, remote question and answer session following the presentation!

Picture a Scientist: Movie

Available from September 18 at 8:30 p.m. through September 20

Request access via <https://tinyurl.com/y2mk3jug>

NAU's Department of Astronomy and Planetary Science proudly presents PICTURE A SCIENTIST, an official selection of the 2020 Tribeca Film Festival, chronicles the groundswell of researchers who are writing a new chapter for women scientists. Three scientists lead viewers on a journey deep into their own experiences in the sciences. Along the way, viewers encounter scientific luminaries - including social scientists, neuroscientists, and psychologists - who provide new perspectives on how to make science itself more diverse, equitable, and open to all. A panel of Flagstaff scientists will lead a discussion with the community on September 20th at 6PM through the Festival website scifest.org.

SATURDAY, SEPT. 19

Geocaching at Fort Tuthill

9 a.m. – 3:45 p.m. Fort Tuthill County Park

Tynkertopia invites your family to experience geocaching at Fort Tuthill! Use your smartphones to locate hidden containers called geocaches. Each cache will contain a STEAM challenge. The final cache will contain a small prize for each family that locates all the caches. Start times from 9 a.m. to 3:45 p.m. Reservations at <http://bit.ly/2Zm7QJS>. Instructions emailed after the reservation is made.

Cloud Walk in Buffalo Park

10 a.m. - 4 p.m. Buffalo Park

Join Brian Klimowski (National Weather Service Meteorologist) for a 45-minute walk near Buffalo Park. We'll talk weather science, severe storms and of course, all about the clouds we see! Email brian.klimowski@noaa.gov for a reservation. Masks required.

The Importance of Non-Exceptional Female Role Models in STEM

10 a.m. Festival website (live Q+A) [Scifest.org](https://www.scifest.org)

Pamela Metivier, co-creator of the STEAMTeam book series, shares her personal experience to illustrate why it's important to provide young girls with relatable female role models so that they understand that they don't have to be "exceptional" to have a career in STEM.

Pioneer Museum Virtual Open House

1 p.m. Festival website: [Scifest.org](https://www.scifest.org)

The Pioneer Museum will release three videos about historic technology: the iron lung, blacksmithing and the Baldwin #12 Locomotive. These three pieces of technology helped shape Flagstaff's past and help us think about a sustainable future.

Nature Writing Workshop

6 p.m. Flagstaff Public Library Zoom event

Pick up your Nature Writing Kit at the Downtown or Eastside Library before Saturday, September 19th. Get to a favorite spot outside to write about the natural world. We will meet on Zoom to discuss and share our writing. Register via email at flagstaffpubliclibrary@gmail.com or call 928 213-2348.

Star Party - Navajo Constellations and Their Meaning

Bryan Bates, Flagstaff Star Party

6 p.m. [FlagstaffStarParty.org](https://www.flagstaffstarparty.org)

Bryan Bates will discuss how Native people watched the movement of the sun, moon and stars, and how they were celebrated through ceremony. The Navajo did not have a consistent horizon to use as a reference for their observations. Find out how they used constellations as their guide!

Adult Science Trivia Challenge

7 p.m. Flagstaff Public Library Zoom event

Join us for a night of virtual scientific pub trivia, for the virtual scientist in all of us. Join us online with a team or alone, and we will help you team up! Register by emailing flagstaffpubliclibrary@gmail.com.

SUNDAY, SEPT. 20

Paleontology Collections and Lab Tour

11 a.m. Festival website: [Scifest.org](https://scifest.org)

This recorded virtual tour will focus on fossil vertebrates including dinosaurs, plesiosaurs and other prehistoric reptiles not typically on display to the public. This is an excellent opportunity to learn more about local fossils and the paleontology program at the Museum of Northern Arizona.

Picture a Scientist: Panel Discussion

4 p.m. Festival website (live): [Scifest.org](https://scifest.org)

A panel of active Flagstaff scientists, with diverse backgrounds and fields of study at a variety of career stages, will share their experiences and discuss some unique aspects to getting started and having success in a STEM discipline. After brief self-introductions, the panel will respond to questions submitted through the Festival of Science website (scifest.org) during the event.

Star Party - Night Walk

6:30 – 8 p.m. Buffalo Park

Sign up for a socially distanced walk in one of Flagstaff's best night sky locales. Enjoy conversations on fascinating night sky topics. Flagstaff Star Party souvenir flashlights will be provided. Face masks required. Make reservations at FlagstaffStarParty.org

MONDAY, SEPT. 21

NAU VPR Innovation Lecture Series

Vaccination: A New Approach to the Opioid Epidemic

8:30 a.m. Festival website: [Scifest.org](https://scifest.org)

In this presentation, Dr. Naomi Lee will highlight the fascinating aspects of opioid vaccine design and current results from animal studies.

Science in Anime!

3:15 p.m. YouTube and Facebook

Check our YouTube (youtube.com/user/FlagstaffLibrary1) and Facebook (facebook.com/flaqlib) channels for this talk on Science in Anime.

Tynkertopia - Create a Creature!

4 p.m. Zoom: Join at <https://zoom.us/j/96827695994>

Recycling is important and building something from recycled materials is both fun and helpful to our planet. In this online workshop, you will create a creature from recyclable materials around your house. Before the workshop, gather together some tape, glue, and scissors. All other materials will be gathered during the workshop. When done, take a photo of your creature and email it to info@tynkertopia.org and we'll post it on our website. Alternatively to participating via Zoom, you can follow along at [Scifest.org](https://scifest.org).

Ancestral Hopi Calendar Wall at Wupatki

5 p.m. Festival website (live): [Scifest.org](https://www.scifest.org)

Wupatki National Monument was an enclave of different Puebloan people, with the Crack'N Rock settlement directly related to the Hopi. Bryan Bates will share how Hopi ancestors developed a solar calendar and how it ties to their culture.

Flagstaff: The Lake Mary Fault and Earthquakes

6:30 p.m. Festival website: [Scifest.org](https://www.scifest.org)

Join us to hear David S. Brumbaugh, Professor Emeritus at NAU, hosting a talk on the Lake Mary fault and earthquakes in Flagstaff. This event was coordinated by the Flagstaff Public Library and will be hosted on [Scifest.org](https://www.scifest.org).

TUESDAY, SEPT. 22

MOCAF: Lights, Camera, Anachronism!

8:30 a.m. Festival website: [Scifest.org](https://www.scifest.org)

A glimpse into the art and scientific process of tintype photography with photographer Eric Retterbush.

Crafty Corner: Science Festival Edition

3:30 p.m. Flagstaff Public Library Zoom event

Pick up a craft kit from the East Flagstaff Community Library during our service hours the week before, then join us online to craft together! Call 928-213-2348 for current service hours. A link to the Zoom event will be included in the craft bag.

Momentum Aerial: How Do They Do That? The Physics of Aerial Arts

4 p.m. Festival website (live): [Scifest.org](https://www.scifest.org)

Have you ever wondered how the aerial artists who perform at festivals around town manage to (seemingly) defy gravity? Learn about physics principles that keep the performers in the air. We suggest that you have the following items for participation: (1) something that weighs at least a pound, (2) a spinning desk chair, (3) enough space to do a plank and (4) a pair of socks.

Mars Rover Update

5 p.m. Festival website (live): [Scifest.org](https://www.scifest.org)

The Perseverance rover will land on Mars in February 2021, joining the Curiosity rover, which landed in 2012. Ken Herkenhoff and Ryan Anderson will summarize previous rover missions, give an update on Curiosity's progress and discuss plans for Perseverance and other future missions.

Beyond Earth's Edge: The Poetry of Spaceflight

6:30 p.m. Festival website (live): [Scifest.org](https://www.scifest.org)

This trailblazing anthology of poetry spans from the dawn of the space age to the imagined futures of the Universe. Co-editors Christopher Cokinos and Julie Swarstad Johnson will discuss contributions that poetry can make to our understanding of science.

WEDNESDAY, SEPT. 23

NAU VPR Innovation Lecture Series

The Simple Fool's Guide to the Pandemic

8:30 a.m. Festival website: [Scifest.org](https://scifest.org)

In this presentation, Dr. Jason Ladner will provide a primer on the ongoing COVID-19 pandemic and the causative agent of this disease. Topics include the origin of the pandemic, methods for tracking the spread of the virus and the human immune response to infection.

CCC Home Science Challenge 1 - Build a Lake Core Model and Climate Record!

4 p.m. Festival website (live): [Scifest.org](https://scifest.org)

Coconino Community College faculty member Kurt Yuengling will show you how to use common cupboard items layered into jars to build models of lake cores and examine past climate conditions from the pollen and ash in those layers. Supplies needed: one-quart mason jar (wide mouth recommended), 1-2/3 cups sugar, 3/4 cup baking cocoa, 1-1/3 cups all-purpose flour, 1/2 teaspoon baking powder, 1/4 teaspoon salt, optional extras: chocolate chips, mini-M&M's.

Can We Control the Weather?

5 p.m. Festival website (live): [Scifest.org](https://scifest.org)

Scientists have long tried to control the weather—from increasing rain and snow to preventing tornadoes and hail. Meteorologist Brian Klimowski will take a look at the rich history of weather modification (successes and epic failures) and dive into the science behind what can (and can't) be done!

Virtual Hike to Old Caves Crater Pueblo

6:30 p.m. Festival website (live): [Scifest.org](https://scifest.org)

Archaeologist Dennis Gilpin's presentation will simulate a hike to the Flagstaff Old Caves Crater. The pueblo site near the crater rim consists of a plaza and four stone buildings containing many rooms and cellars. It provides a glimpse of the last days of the Sinagua occupation.

THURSDAY, SEPT. 24

LEGO Club: Science Festival Edition

3:30 p.m. Flagstaff Public Library Zoom event

Join us for LEGO Club via Zoom! Email us at eastflagstafflibrary@gmail.com in advance for the Zoom link. Don't have LEGOs at home? Call us at 928-213-2348 and we may be able to loan you some.

Tynkertopia: Create a Paper Fort

4 p.m. Zoom: Join at <https://zoom.us/j/98272730478>

In this Zoom event Tynkertopia workshop, you will create a fort from newspaper or printer paper. Before the workshop, collect a stack of newspapers or printer paper, tape and scissors. When done, take a photo of your creature and email it to info@tynkertopia.org and we'll post it on our website. Alternatively to participating via Zoom, you can follow along at [Scifest.org](https://scifest.org).

Valley Fever in Arizona: Searching for the Dust Devil

5 p.m. Festival website (live): [Scifest.org](https://www.scifest.org)

NAU research assistant Daniel Kollath talks about the fascinating ecology of the fungal disease Valley Fever, as well as other fungal diseases in Arizona. Kollath discusses how these pathogens impact wildlife populations and conservation as well as humans in Arizona.

Cave and Bat Conservation in the New Maya Forest Corridor, Belize

6:30 p.m. Festival website (live): [Scifest.org](https://www.scifest.org)

NAU scientist Jut Wynne examines the complex issue of conflicting government programs through the lens of bat and cave conservation. Dr. Wynne will unveil discoveries of the newly explored caves of Runaway Creek with jaguars, crocodiles, bats and a bizarre bevy of cave-adapted invertebrates taking center stage.

Women in STEM Networking Event

7:30 p.m. Zoom: Join at <https://zoom.us/j/84635302523>

How did women get where they are today in the world of STEM? What's their story? Life's journey is rarely a straight path forward. Participate in this live Zoom meeting event and hear fun stories from Flagstaff's professional women regarding their journeys.

FRIDAY, SEPT. 25

NAU VPR Innovation Lecture Series

Does Cheatgrass Use Bacteria to Invade the Sagebrush Ecosystem?

8:30 a.m. Festival website: [Scifest.org](https://www.scifest.org)

Cheatgrass is a widespread noxious weed in the Great Basin which causes frequent wildfires to which sagebrush is not adapted. In this recorded presentation, Dr. Egbert Schwartz explores how NAU scientists have been hunting for the elusive bacteria that might help cheatgrass invade the Great Basin.

CCC Home Science Challenge 2 – Build a Catapult Launcher!

4 p.m. Festival website (live): [Scifest.org](https://www.scifest.org)

Melinda McKinney (Coconino Community College) will guide you to build and test catapults! Supplies Needed: 3 rubber bands, 6 popsicle sticks, small marshmallows and a plastic spoon. Optional extras: ruler, more rubber bands, utensils and projectiles.

Rabbits for Dinner! Deer for Tools! The Zooarchaeology of Wupatki

5 p.m. Festival website (live): [Scifest.org](https://www.scifest.org)

Zooarchaeology students from NAU's Department of Anthropology will highlight the relationships between Pueblo peoples at Wupatki and animals: diet and subsistence strategies, use of animal bones to make tools and an examination of how animals were an important part of every day.

SCI Talks Presented by Suddenlink:

Four 15-minute presentations by Flagstaff scientists, artists, and educators!

7:30 p.m. Festival website: Scifest.org

Chad Woodruff

Empathy: It's Not About Me

Empathy is the ability to take another's perspective without confusing their perspective with your own. Known as self-other discrimination, it is key to the ability to empathize. This talk by NAU social neuroscientist Chad Woodruff will address the science and promotion of empathy in society.

Christine Sapio

The True Story of the "CocoNuts" Robotics Team and the Power of Robots to Change Lives

The CocoNuts are famous in Flagstaff for their bright red shirts, robots and success on the international FIRST Robotics stage. Coach Christine Sapio tells the story of how the team came to be and how these young people fuel movement in STEM education.

Dawn Tucker

Elevating Empathy: How Theatre Increases our Capacity for Empathy

Theatre increases empathy. In this talk, Flagstaff Shakespeare Festival Founder Dawn Tucker will discuss the critical role of mirror neurons in emotional development, how storytelling plays into increasing empathy and how empathy ensures our survival as a species.

Joe Llama

Finding Other Worlds

We are closer than ever to finding a planet like Earth outside our solar system. Lowell astronomer Joe Llama will take you on a journey through the last 20 years of exoplanet science, from the discovery of the most extreme planets to our quest to find Earth 2.0.

SATURDAY, SEPT. 26

National Public Lands Day: Walnut Canyon National Monument - visit free

9 a.m. – 5 p.m. Walnut Canyon National Monument

In celebration of National Public Lands Day, all national parks and monuments offer free entrance to the public. Please refer to [nps.gov](https://www.nps.gov) for details and information regarding COVID-related restrictions and precautions.

National Public Lands Day: Sunset Crater Volcano - visit free

Sunrise to sunset Sunset Crater National Monument

In celebration of National Public Lands Day, all national parks and monuments offer free entrance to the public. Please refer to [nps.gov](https://www.nps.gov) for details and information regarding COVID-related restrictions and precautions.

National Public Lands Day: Wupatki National Monument - visit free

9 a.m. – 5 p.m. Wupatki National Monument

In celebration of National Public Lands Day, all national parks and monuments offer free entrance to the public. Please refer to [nps.gov](https://www.nps.gov) for details and information regarding COVID-related restrictions and precautions.

Geocaching at Fort Tuthill

9 a.m. – 3:45 p.m. Fort Tuthill County Park

Tynkertopia invites your family to experience geocaching at Fort Tuthill! Use your smartphones to locate hidden containers called geocaches. Each cache will contain a STEAM challenge. The final cache will contain a small prize for each family that locates all the caches. Start times from 9 a.m. to 3:45 p.m. Reservations required – visit <http://bit.ly/2Zm7QJS>. Instructions emailed after the reservation is made.

Superpowers of Sustainable Building Scavenger Hunt

10:00 a.m. – 4:00 p.m. Packet Available Day of Tour from 10 to 3 at the Northern Arizona Habitat for Humanity Restore

The Coconino County Sustainable Building Program is excited to host the Superpowers of Sustainable Building Scavenger Hunt this year in place of the annual Sustainable Building tour. The self-guided scavenger hunt is fun for all ages and features a variety of homes and properties, each with a highlighted sustainable building superpower attribute that participants will discover with the help of online clues or via a printed packet that will be available the day of the tour from 10am-3pm at the Northern Arizona Habitat for Humanity Restore. For more information visit www.coconino.az.gov/sustainablebuilding

Introduction to 3D Printing Workshop

4 p.m. Festival website (live): Scifest.org

This online workshop introduces the basics of 3D printing and how this growing movement is continuing to shape the fields of manufacturing, construction, healthcare, art and design. Presented by NAU's Cline Library MakerLab. Ask questions through Scifest.org.

The Impact of Pandemics on Human History

7 p.m. Festival website (live Q+A): Scifest.org

*How have pandemics shaped human societies, and how did societies cope both before and after the discovery of the responsible pathogen? Frank von Hippel, a professor of ecotoxicology at Northern Arizona University, will discuss four case studies: malaria, yellow fever, bubonic plague, and typhus. To learn more about these case studies, read Professor von Hippel's new book, *The Chemical Age*, now available in your local library.*

Star Party - Night Music

7 p.m. Pre-recorded concert: FlagstaffStarParty.org

*Take your streaming device outside, sit back and watch the Universe unfold to new arrangements of "Sunset" from Grofé's *Grand Canyon Suite* and "Jupiter" from Holst's *The Planets*. Between selections, musician/astronomer David Koerner will point out bright planets and stars as they come into view.*

SUNDAY, SEPT. 27

The Arboretum at Flagstaff Fall Open House

9 a.m. – Noon The Arboretum at Flagstaff

Bring the whole mask-wearing family for trail walking, garden viewing and educational exhibits! Find more details at Thearb.org under Events.

Scenic Science Chairlift

10 a.m. Arizona Snowbowl

See the geology of the Grand Canyon, Sedona Red Rocks and San Francisco Volcanic Field! Email customerservice@snowbowl.ski to reserve one of 50 free tickets (limit two per party). Guests will be emailed a coupon code for a free ticket on the Snowbowl website. Masks required.

Yellowstone's Newest Thermal Area

3 p.m. Festival website (live Q+A): Scifest.org

A new geologic warm spot has been killing trees in a remote part of Yellowstone for the last 20 years. Yet, it was only recently discovered. Join Dr. Greg Vaughan (USGS) to hear the story of this interesting new thermal area!

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