



**Program**  
**March 1<sup>st</sup> -3<sup>rd</sup>, 2019**



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**DOWNLOAD OUR FESTIVAL APP AT:**



**After you download, search to find our schedule:  
DAHLONEGA SCI & LIT FESTIVALS**

# Welcome!

We are glad you chose to attend the second annual Dahlonega Science Festival. The idea for this festival came out of the Dahlonega Science Café, which has been operating since May 2016. The first festival was held in 2018 and we are pleased to return for our second festival this year.

The Dahlonega Science Festival wants to thank the Dahlonega Literary Festival for partnering with us again this year. By working together, we are able to provide more choices for the community and both festivals are strengthened.

In honor of this year's 50<sup>th</sup> anniversary of the Apollo Moon landing mission, our theme this year is ***Exploration!*** And we have plenty to explore! In addition to speakers, planetarium shows and panels, we have a Crime Scene, Forensics Lab, Escape Room, Discovery Center, Makers' Fair and more.

If you have questions, stop by the Naturally Georgia Tasting Room on the Dahlonega Square. Volunteers will be on duty all day Saturday to answer your questions. Please be sure to take our survey this weekend to provide feedback that will help us build a bigger, better festival in coming years.

Don't forget the Dahlonega Science Council also operates the Dahlonega Science Café, holding monthly evening presentations by local scientists for the community.

Thank you for supporting Science in Dahlonega!

***-The Dahlonega Science Council***

[www.dahlongascience.org](http://www.dahlongascience.org)

*Find us on Facebook and @NorthGAScience on Twitter!*

# Dahlonge Science Council



## Board of Directors:

Jeff Branyon

Amanda Carter

Gina Childers

Nancy Dalman

Ed Erickson

Megan Foley

Donna Gessell

Greta Giles

Donna Governor

John Indergaard

Sonny Mantry

Abby Meyer

Winnie Nanatovu

Ali Nelson

Kevin Nelson

Jack Rogers

Lesley Simanton-Coogan

Mark Spraker

Alex Tremblay

Kelli York

## With Additional Support From:

Murray Lamb

Demi McCloy

JB Sharma

Anne Marie Underwood

Denise Webb

Phi Sigma Pi, Epsilon Chi chapter

UNG Psi Chi honor society

UNG NSTA Student chapter

Dahlonge Old Jail

Society of Chemistry Students

Society of Physics Students

UNG Astronomy Club

UNG Gainesville Physics Club

UNG Psychology Club

UNG Rotaract Club

UNG Sports Clubs




Denmark H.S. Forensics Students

***The Dahlonge Science Council is a non-profit 501(c)3 organization.  
Please consider being a sponsor for next year's event!***

# Festival Sponsors

*The Dahlonega Science Festival is proud to recognize our partners for this event. These organizations and businesses have helped by providing facilities, assistance, and financial support! We look forward to growing our partnership with these businesses and organizations as we look ahead to the festival in coming years!*

	<p><b>Bourbon Street Grille</b> has hosted the Dahlonega Science Cafe since its inception in May 2016, and we are proud to have them host our guest speakers for the festival for the second year in a row.</p>
	<p>We appreciate <b>Naturally Georgia</b> hosting our Information Station this year and our bi-monthly fundraising events. Stop by to grab a print program, ask questions and check out the wines and art.</p>
	<p>The <b>Dahlonega Literary Festival</b> has been our partner since the first Dahlonega Science Festival. Be sure to spend some time at their events. The combined weekend festivals mean twice as much to do!</p>
	<p><b>Shenanigans Irish Pub</b> has joined our team for the Science Festival this year and is hosting the scientist panels.</p>
	<p><b>The North Forsyth High School Science Ambassadors</b> have generously provided support for our Hands-On Family Science Activities on Saturday morning.</p>
	<p>We are proud to have <b>Lily Creek Lodge</b> as an official sponsor this year. This cozy mountain lodge is the perfect setting for a get-a-way retreat or romantic weekend.</p>

	<p><b>The Lumpkin Coalition</b> has joined our team this year as a festival sponsor. This group is a nonprofit organization that hosts the Hemlock Festival, held annually to increase public awareness of eastern and Carolina hemlock tree problems.</p>
	<p>We are grateful to <b>Woodmen Life Chapter #1374</b> for providing the space for our children's hands on activities. For information about Woodmen Life contact Brandon Branson: 706-525-9047 email: <a href="mailto:BFBranson@woodmen.org">BFBranson@woodmen.org</a></p>
	<p><b>The University of North Georgia</b> hosts several of the festival activities. Be sure to see a planetarium show or stop by the Makers' Faire to see some of these facilities.</p>

### **We'd also like to recognize our individual donors:**

- Glenda Pender
- Teresa Gay
- Ed Erickson
- Donna Gessell
- Brian Sullivan
- Jimmy O'Neill
- Buz Eckler
- Steve Wright
- Jack Wynn
- John Segars
- Donna Sullivan

***In order to continue to grow and offer even more events and activities in the future, the Dahlonega Science Festival needs you to return in 2020. Please consider making a tax-deductible contribution to the Dahlonega Science Council, a 501(c)3 charitable organization, to help make this festival an annual event! Become a sponsor in 2020! Contact: [dahlongescience@gmail.com](mailto:dahlongescience@gmail.com) for more information.***

# General Event Information:

**Naturally Georgia Tasting Room** (on the square) is the site of our information booth. Need information or programs? Stop by and talk to one of our volunteers for help.

**Science Festival Preview: Thursday February 28, 8:00 pm**

**Shenanigans Irish Pub** (87 North Chestatee Street) will be the site of a special Science-Trivia night to preview the festival! Come out and see how ready you are!

## Friday March 1: OPENING EVENT!

Come out to the UNG Health and Natural Science Building for our kick-off! Have some family fun with hands-on science activities, learn about space flight with Trina Ray, and enjoy a planetarium show!

- 5:30 pm: Doors Open; Welcome!
- 6:00 pm: Early Bird Planetarium show:  
*"Faster Than Light: The Dream of Interstellar Flight"*
- 7:00 pm: Trina Ray (Keynote Speaker), NASA JPL scientist presents  
*"Exploring the Ocean Moons of the Outer Solar System"* (HNS auditorium)  
(See page 15 for presentation description)
- 8:00 pm: Planetarium Show:  
*"Faster Than Light: The Dream of Interstellar Flight"*

## Saturday March 2: MAIN EVENTS!

Join us for several events ranging from family activities to panels, talks and planetarium shows. (See Saturday schedule on page 11 for more information.)

- Bourbon Street Grille: Featured Speakers
- Dahlonaga Community House: Discovery Center
- Dahlonaga Old Jail: Forensics Lab, Crime Scene, and Escape Room
- Naturally Georgia: Info center and informal discussion with speakers
- Shenanigans Irish Pub: Panels
- UNG Makerbot Innovation Center: Makers' Fair
- UNG HNS Building: Planetarium shows and Science of the Circus
- Woodmen of the World: Hands-on family activities

## Sunday March 3: FESTIVAL WRAP-UP

**Our festival wraps up with a special Brunch talk:** NASA JPL Scientist Trina Ray presents *"The Voyager Spacecraft - Exiting the Solar System - A Milestone for Mankind"* at the Bourbon Street Grille. Socialize and order your brunch @ 10:00 am Talk begins promptly at 11:00 am. Seats are first come, first served.



**LUMPKIN COALITION**  
is proud to support  
**Dahlonega Science Festival 2019**



**HEMLOCKFEST  
BENEFIT EVENT**



**AMERICAN CHESTNUT  
RESTORATION**



**ANNUAL RIVER  
CLEAN-UP**



**LOGAN TURNPIKE  
TRAIL MAINTENANCE**

Lumpkin Coalition is a 100% volunteer non-profit 501(c)3 charitable organization formed to facilitate projects that benefit North Georgia, Lumpkin County, its residents and visitors. We are dedicated to preserving quality of life for all those who share it. To this end, we support the preservation of a clean and healthy environment, responsible living, and responsible growth.

**[www.HemlockFest.org](http://www.HemlockFest.org)**

## SATURDAY'S FESTIVAL SCHEDULE: SESSION SCHEDULE

*These activities are scheduled for specific times at various locations around Dahlenega. For events at Shenanigans and Bourbon Street, please arrive early to order food and/or a beverage to enjoy during the event. Supporting our festival hosts supports us!*

<b>Time</b>	<b>Science Talks @ Bourbon Street Grille</b>	<b>Science Panels @ Shenanigans Irish Pub</b>	<b>UNG HNS Building</b>	<b>Community Activities</b>
<b>10:00</b>	<b>Marianne Shockley:</b> <i>Insects as Food: They are Delicious and Nutritious!</i>	<i>Our Blue Planet: Living and Non-living System Interactions</i>		<b>Science &amp; Food:</b> <i>The Chemistry of Confections</i> Paul Thomas Chocolates
<b>11:15</b>	<b>Marshall Shepherd:</b> <i>Zombies, Sports, &amp; Cola: Implications for Communicating Weather &amp; Climate Change</i>	<i>The Science of Space Exploration</i>	<b>Planetarium:</b> <i>Exploring Exoplanets</i>	
<b>12:30</b>	<b>Kim Steadman:</b> <i>Roving Mars</i>	<i>What's Lurking in Your Genome?</i>	<b>Planetarium:</b> <i>Harry Potter Astronomy</i>	<b>Science &amp; Food:</b> <i>The Chemistry of Confections</i> Paul Thomas Chocolates
<b>1:45</b>	<b>John Wise:</b> <i>Computing the Origins of Galaxies</i>	<i>Exploring the Energy Frontier</i>	<b>Planetarium:</b> <i>Exploring Exoplanets</i>	<b>Science &amp; Art:</b> <i>The Science of Color: Human Visual Perception</i> Canvas & Cork
<b>3:00</b>	<b>Larry Young:</b> <i>The Neurobiology of Love: Lessons from the Prairie Voles</i>	<i>The Story of Our Universe: From the Big Bang to Stars and Planet</i>	<b>Planetarium:</b> <i>Harry Potter Astronomy</i>	
<b>4:15</b>	<b>Russell Cutts:</b> <i>Primitive or Sophisticated? Human ingenuity through an ancient lens.</i>	<i>Tales from NASA JPL Spacecraft Operations</i>	<b>Auditorium:</b> <i>Science of the Circus!</i>	
	<b>See program pages 10-12 for more</b>	<b>See pages 14 - 16 for more</b>	<b>See pages 17 &amp; 19 for more</b>	<b>See program page 16 for more</b>

	<i>information</i>	<i>information</i>	<i>information</i>	<i>information</i>
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### SATURDAY'S FESTIVAL SCHEDULE: ONGOING ACTIVITIES

*These activities are ongoing and, unless noted, do not start at specific times. Attendees are welcome to come and go anytime while they are open. Please note that parents must accompany children at all events; unsupervised children should never be dropped off and left alone for any of these activities.*

Time	Dahlongega Community House		MakerBot Innovation Center	Dahlongega Old Jail		Woodmen Life
10:00			Makers Fair  Noon - 5 exciting science, engineering and DIY activities			Hands-on Science Children's activities
11:15						
12:00	Tea Party with the Scientists  Left Hall Noon - 5	Discovery Center  Right Hall Noon - 5		Forensics Lab & Crime Scene  Down Stairs Noon - 5	Escape Room  Upstairs Times: 12:30 1:45 3:00 4:15	
1:45						
3:00						
4:15						
See program pages 18 - 19 for more information						

**Be sure to check out the Dahlongega Literary Festival**



<https://literaryfestival.org/>

The Dahlongega Science Festival is proud to partner with the Dahlongega Literary Festival again this year. Be sure to spend some time at their events. The combined weekend festivals mean twice as much to do!

You'll find all the info for their activities alongside ours in the festival app!

# 2019 Guest Speaker Talks

**FRIDAY, MARCH 1 @ UNG HEALTH & SCIENCES BUILDING @ 7:00 pm**

***Trina Ray: Exploring the Ocean Moons of the Outer Solar System***

From the Voyager to the Cassini spacecraft missions, Trina Ray has been an integral part of NASA JPL missions to explore the planets and moons of the outer solar system. When the Voyager spacecraft flew by the planets of the outer solar system, one of the most dramatic discoveries was the surprising diversity of planetary moons. The Cassini spacecraft's 13 year-long mission orbiting Saturn revealed that Titan and Enceladus are two of the solar system's most exciting moons, and NASA is currently preparing new missions to explore Jupiter's moon Europa. Come hear all about exploring the Ocean Moons of the Outer Solar System from our NASA/JPL Keynote Speaker!

**SATURDAY MARCH 2: GUEST SPEAKER TALKS @ BOURBON STREET GRILLE**

*Immediately following each talk on Saturday, the speaker will be available for questions & answers at the Naturally Georgia Tasting Room, adjacent to the Bourbon Street Grille. This will allow time between talks for ordering food and beverages.*

**10:00 am: Marianne Shockley: *Insects as Food: They are Delicious and Nutritious!***

The UGA Bug Dawgs coordinate programs with the UGA Insect Zoo promoting entomophagy and sustainable insect food production through service-learning courses, grass roots research projects, and community festivals and events often providing various sweet and savory edible insect foods. Entomophagy is being incorporated into many annual community festivals and events like Insectival and Eating Insects Athens as well as public awareness and education events such as Octoberfest and The Beers and the Bees and are a wonderful opportunity to introduce the idea of entomophagy in Western cultures.

**11:15 am: Marshall Shepherd: *Zombies, Sports, and Cola: Implications for Communicating Weather and Climate Change***

Dr. Shepherd, a leading international expert in weather and climate, presents a contemporary look at the challenges and opportunities centered around weather forecasting, extremes, and climate change. Dr. Shepherd uses current events, science, and pop culture to convey these concepts in an accessible manner.

**12:30 pm: Kim Steadman: *Roving Mars***

Curiosity is the largest and most capable rover ever sent to Mars. She landed in Gale Crater on Aug 5, 2012 and has been exploring Mars ever since. Find out how an international group of scientists and engineers come together to tell a semi-autonomous car-sized robot on Mars what to do and what challenges they have had to overcome in her over 6 years on Mars.

**1:45 pm: John Wise: *Computing the Origins of Galaxies***

Our Milky Way is a beautiful spiral galaxy and has been constantly growing since the beginning of time. How did the ancestors of the Milky Way form and look in the first billion years of the universe? Before galaxies form, isolated massive stars ignite from primordial gas composed of only hydrogen and helium. They forever changed the cosmic landscape by heating their surroundings and enriching the universe with the first heavy elements. These events spark the era of galaxy formation, where dwarf galaxies assemble first and then merge together to form larger and larger galaxies. Observations from the Hubble Space Telescope are just now uncovering these baby galaxies, and a wealth of information will come from the James Webb Space Telescope, due to launch in 2021. Supercomputer simulations of galaxy formation are vital to interpret these data and to learn about our cosmic origins.

**3:00 pm: Larry Young: *The Neurobiology of Love: Lessons from the Prairie Voles***

What are the brain mechanisms giving rise to love and social bonding? Dr. Young will discuss the neurobiology of pair bonding as revealed by studies in monogamous prairie voles. His work suggests that oxytocin and dopamine interact during pair bonding to link the neural representation of the partner into the reward system. He proposes that pair bonding is similar to an addiction to a partner. Dr. Young will also discuss the neurobiology of empathy and the consequences of loss of a partner in prairie voles. He will then suggest that similar brain mechanisms underlie love and bonding in humans.

**4:15 pm: Russell Cutts: *Primitive or Sophisticated? Human Ingenuity Seen Through an Ancient Lens.***

We often imagine our ancestors as struggling to survive, while viewing ourselves as blessed geniuses. In this exploration of ancient technologies, we will see how our ancestors, too, were operating with focused, innovative intelligence -- and how their ingenuity is foundational to our modern success. Appreciating the evolutionary significance of intelligence and technology increases our understanding of ourselves and our role in ecosystems.

**FESTIVAL FINALE:  
SPECIAL “SCIENCE CAFÉ” EVENT:  
SUNDAY MARCH 3 AT THE BOURBON STREET GRILLE**

***Trina Ray: "The Voyager Spacecraft - Exiting the Solar System - A Milestone for Mankind."***

Launched in 1977 the twin Voyager spacecraft blazed a trail of exploration through the planets of the outer solar system. But it is their final mission success that places them in the history books. Both spacecraft have exited the solar system and are transmitting data back from interstellar space (the first manmade objects to achieve that milestone). Come hear about the amazing 40 plus years of discovery by these groundbreaking spacecraft and the recent science results from Voyager 2 which joined its twin in interstellar space just a few months ago.

Socialize and order your brunch @ 10:00 am. This talk begins promptly at 11 am. Seats are first come, first served.

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***Come join us at Naturally Georgia after each speaker finishes at Bourbon Street for an informal question & answer with the scientists.***



On Dahlonega Square  
90 Public Square N., (706)864-0832

At Naturally Georgia we strive to make your wine tasting experience enjoyable and educational. Our wines are some of the finest produced in Georgia with grapes

grown at our vineyards. From dry to sweet, we have a wine for everyone. Art by the local Bleu artists, handmade jewelry and pottery. Wine accessories and gift items.



2608 Auraria Road, Dahlonega, GA

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Nestled in the picturesque Blue Ridge Mountains of North Georgia, near the Appalachian Trail. Lily Creek Lodge Bed and Breakfast is a forest-hugged mountain retreat that combines cozy, European antique furnishings and art with modern comforts and amenities. Lily Creek is the perfect setting for your romantic getaway, a friendly gathering place or just a natural environment to relax. We offer 12 unique rooms, each designed to give the feel of a particular destination on your vacation.

Email: [lilycreeklodge@windstream.net](mailto:lilycreeklodge@windstream.net) or Call: 706-864-6848

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## SPECIAL OPEN HOUSE • ONE DAY ONLY

Lumpkin County Historical Society's

### 1884 OLD JAIL MUSEUM

75 Enota Street • Saturday, March 2 • 10:00 a.m. - 4:00 p.m.

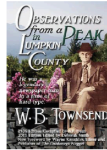
## Meet Dahlonge's First Literary Celebrity **W.B. TOWNSEND**



William Benjamin Franklin Townsend (1857-1933) was a legendary newspaper man in a time of hard type. The owner and editor of *The Dahlonge Nugget* for 36 years, his wry, cranky, and observant columns were picked up and

reprinted by metropolitan newspapers and magazines throughout the United States and Canada.

The museum's tribute to W. B. Townsend features excerpts from his writing and a large type case with examples of the cold type he would have used to set type for his newspaper, one letter at a time.



**"Observations from a Peak in Lumpkin County"** is a compilation of some of Townsend's most interesting writings. Out of print. A few copies are available for sale at the Open House.

The museum is a 2-minute walk from the Gold Museum and Public Square.

**Free Parking**

# 2019 Science Panels

All panels will be held upstairs at Shenanigans Irish Pub on Saturday March 2<sup>nd</sup> at the specific times indicated below. Join us for breakfast, lunch, or a snack and get ready for some great science discussions! Bring some of your own questions to be discussed or generate new questions as our science specialists discuss these topics! Please arrive to the panel discussions early to place your order for food or drinks before each panel begins. Panelists will be available on the Shenanigans patio after each panel presentation for an informal Q&A.

## *Morning Panels:*

### **10:00 am – *Our Blue Planet: Living and Non-living System Interactions***

The rocks in the earth, the plants, animals and bacteria, the oceans, and even the atmosphere and clouds in the sky: the Earth's living and nonliving systems are intimately connected. This panel will discuss the (sometimes surprising) ways that Earth's systems are interconnected, and the ways that human activities are affecting those connections.

- Dobrusia Bialonska (UNG, microbiology)
- Mattias Johansson (UNG, biology)
- Chris Seminack (UNG, geology, intense coastal storms)
- Marshall Shepard (UGA, atmospheric science)
- Nancy Dalman (UNG, biology, MODERATOR)

### **11:15 am – *The Science of Space Exploration***

Fly through the solar system with us to learn what science we pursue and discover when we explore space with humans and robots, seeking to answer the fundamental questions: Where did we come from? How did our Universe form? What other worlds exist? How do we get there? And how can humans survive in space?

- Laura Forczyk (astrophysics, space)
- Larry Gibson (UNG, biology)
- Trina Ray (NASA JPL, engineer)
- Kim Steadman (NASA JPL, engineer)
- Alison Smith (UNG, astronomy, MODERATOR)

## **Afternoon Panels:**

### **12:30 pm – *What’s Lurking in your Genome?***

These days just walking through a pharmacy or surfing the internet can make you wonder what’s lurking in your genome. If you’ve ever wondered “should I do a DNA test?!” come spend the afternoon discussing the current trends in genetics with human genetics experts! We’ll take a tour through the human genome to discuss topics including genetic evolution, human-virus gene interactions, and the current ethical considerations in the field of genetics.

- Jacob Appel (Mount Sinai School of Medicine, NYC)
- Adam Davis (UNG, evolutionary and developmental genetics)
- Alison Kanak (UNG, genetics)
- Katie Lang (CGC Cancer Genetics Program Coordinator)
- Clarke Miller (UNG, biology, MODERATOR)

### **1:45 pm – *Exploring the Energy Frontier***

It is estimated that the world energy consumption is equivalent to approximately 14 billion tons of oil equivalent (14 Btoe) per year. In order to support economic growth and reduce the impact of fossil fuels on the planet, we need to develop and deploy a variety of clean energy alternatives. The panel will explore a wide range of such alternatives including renewable sources such as solar, hydroelectric, wind, and biomass and nuclear energy from fission and ultimately fusion.

- Olu Ajala, PE, (Research Engineer, Southern Company Services)
- Paul Cunningham (Entrepreneur/Owner, Energy Systems & Design)
- Ed Erickson (Retired Executive/Consultant)
- Thomas Vogel (UNG, physics)
- Sarah Formica (UNG, physics, MODERATOR)

### **3:00 pm – *The Story of Our Universe: From the Big Bang to Stars and Planets***

Our observable universe is roughly 90 billion light years across with trillions of galaxies, each made up of hundreds of billions of stars orbiting supermassive black holes. The origin of our vast universe can be traced back to a primordial soup of elementary particles, the Big Bang, 13.8 billion years ago. Come spend the afternoon to explore the story of our universe from elementary particles to stars and planets.

- Greg Feiden (UNG, stellar structure and evolution)
- Nathan Harrison (UNG, physics)
- Allison Smith (UNG, radio astronomy)
- John Wise (GT, computational astrophysics)
- Mark Spraker (UNG, physics, MODERATOR)

#### 4:15 pm – *Tales from NASA JPL Spacecraft Operations*

Decades of working spacecraft operations, and dozens of stories: Christmas day surprises! Terror in the wee hours of the morning! Transcendent joy while crashing into Saturn! Come hear our guests discuss their varied experiences working spacecraft operations on missions exploring Mars, Saturn, and the edges of the solar system.

- Trina Ray (NASA JPL, engineer)
- Kim Steadman (NASA JPL, engineer)

## Community Sponsored Events

*We invited the Dahlonge Community to participate and host science-based activities in their businesses. While these activities are not sponsored by the festival organizers, they are an important part of a community festival. The Dahlonge Science Festival is proud to have these organizations participating in the festival by presenting science related sessions in their businesses.*

#### **SATURDAY MARCH 2:**

**1:45 pm: Canvas & Cork @ Littlefield Cottage:** *The Science of Color: Human Visual Perception* - Find out what makes color, how it is perceived and how it works with pigment to create works of art!

**10:00 a.m. and 12:30 p.m.: Paul Thomas Chocolates:** *The Chemistry of Confections* – Find out how Cocoa is grown and how the beans are processed. Learn a little History about its value in the Old World as well. Limited to first 12 people.

	<p>Canvas and Cork is located in the Stanton Storehouse, just off the square. Everything from recycled glass work, pottery, jewelry and paintings in all mediums are available for purchase in two artists' studios, and additional gallery space features the work local artists.</p>
	<p>Since 1975 Paul Thomas has been making divine chocolates. This is not just a candy store; it is an experience, as well as an opportunity to understand the complexity of chocolate and its creation.</p>

# 2019 Planetarium Shows

*Enjoy a variety of special shows at the UNG Planetarium!*

## FRIDAY MARCH 1:

### **6 pm and 8 pm: *Faster Than Light: The Dream of Interstellar Flight***

See a vision of the future technologies that may allow humanity to reach the stars and planets beyond our solar system. We'll also look at the current night sky and explore exciting recent discoveries in astronomy! We've added an early viewing this year for families with children.

## SATURDAY MARCH 2:

### **11:15 am: *Exploring Exoplanets: Another Giant Leap for Mankind***

Almost 50 years ago on July 20, 1969 the first humans set foot on the Moon. Today, the Moon is still the furthest our species has traveled, but not the furthest we've explored. Join us to learn about the most distant planets discovered, planets outside our solar system: Exoplanets!

### **12:30 pm: *Harry Potter Astronomy***

Peer into the magical world of Harry Potter through the lens of science! We'll explore how J.K. Rowling used constellations, star names, and astronomy to add depth to the characters and enchanting classes of Hogwarts.

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# 2019 Science Festival Family Activities

## **Hands-on Science Children's activities - 10:00 am to noon**

Join us for more than a dozen Hands-on Science Activities for kids! Make an air cannon! Build a straw rocket! Explore surface tension!

Location: Woodmen Life Bldg. (over Cranberry Corners, across from Hancock Park)

## **Makers' Fair – Noon to 5:00 pm**

Explore a variety of exciting science, engineering and DIY activities! Try your hand at designing objects for 3D printing, explore some great technology applications, engage in a variety of physics kits and robotics activities. Fun for the whole family!

Location: UNG MakerBot Innovation Center (122 Choice Street)

## **Discovery Center – Noon to 5:00 pm**

Join us as we explore and learn about various scientific disciplines through fun hands-on activities! At the Discovery Center, you can learn about Astronomy, Psychology, Neuroscience, Ecology, Chemistry, Entomology, and so much more!! Afterwards, you can relax and enjoy some snacks at our tea party! Have a chat with a scientist while enjoying a hot cup of tea and a cupcake.

Thanks to the following who are participating in this event:

- Marianne Shockley – hosting the UGA “Bug Zoo”
- Georgia Southern University – “Science to Go” activities
- UNG – Ecological Protection Lab
- UNG Department of Kinesiology

Location: Dahlonega Community House (111 North Park Street)

## **Meet the Scientists – Noon to 5:00 pm**

Famous scientists from the past will be visiting Dahlonega to chat with visitors. UNG students will be in costume and character, presenting the contributions of important scientists from the past. Come, relax and enjoy some snacks at our tea party! Have a chat with a scientist while enjoying a hot cup of tea and a cookie.

Location: Dahlonega Community House (111 North Park Street)

## **Forensics Lab – Noon to 5:00 pm**

Join us for an exciting survey of Forensic Analysis Techniques. Ever wonder how they really solve all those crimes? Explore fingerprint analysis, bite mark challenges, tire track challenges, hair and fiber identification, DNA extraction, and much more with the Forensic Lab Exhibit!

Location: Dahlonega Old Jail & Museum (75 Enota Street)

### **Crime Scene – Noon to 5:00 pm**

We will set up a mock crime scene in the old jail to demonstrate and discuss the various scientific and investigative techniques utilized by CSI to locate and recover evidence. Topics will include fingerprints, DNA collection and footwear examination and anything else that comes up in conversation.

Location: Dahlongega Old Jail & Museum (75 Enota Street)

### **Escape Room – Times: 12:30, 1:45, 3:00 and 4:15**

A Thirty min to one-hour introduction for puzzle solving escape room style. An escape room is a physical adventure game in which players solve a series of puzzles and riddles using clues, hints, and strategy to complete the objectives at hand. Constitutive problem solving is an important aspect of many fields in science and challenges such as escape rooms and puzzle hunts are great ways to enjoy and practice those skills. The puzzles will be science based. Biology, Coding, Cryptology, Physics, Math and more for teams of 1 to 5 come try solving the clues to escape an actual cell at the historic Dahlongega jail. (All puzzles should be solvable without a detailed knowledge of the particular field)

Location: Dahlongega Old Jail & Museum (75 Enota Street)

## ***SPECIAL EVENT!***

### **Science of the Circus! – 4:15 pm to 6:30 pm**

Ladies and gentlemen! Boys and girls! Step right up and be a part of Circus Science! Immerse yourself in circus arts while exploring basic scientific principles that make possible these amazing feats of strength, balance, and skill. Traditional circus disciplines, demonstrated by skilled Imperial Opa Circus performers, will be scientifically dissected by UNG "Science Clowns". You'll even have the opportunity to participate in learning several circus skills to experience first-hand the science within! Participate in interactive demonstrations before and after the stage show! Stage show starts at 5:15

Location: UNG Health & Natural Sciences Building (159 Sunset Drive)



*Check out the Dahlongega Science Council's website for information on the Dahlongega Science Café! We bring you monthly science talks and fun science tweets to keep you current on all the latest science news!*

[www.dahlongegascience.org](http://www.dahlongegascience.org)

*Find us on Facebook and @NorthGAScience on Twitter!*

## 2019 Science Festival Guest Speakers



**Russell Cutts** is an archaeologist and paleo-anthropologist. He holds an M.A. (UGA'97) in Ecological Anthropology and Environmental Archaeology, was a museum director, and is a consultant to indigenous First Nations of North America. In 1999, he was made an Honorary Member of the Eastern Band of Cherokee Indians. He is a co-founder of Earthskills Rendezvous', Inc. 501(c)3, has presented for the American Museum of Science and Energy, The Culinary Institute of America (Hyde Park), WABE-National Public Radio, The State Botanical (among others) and continues to instruct widely for primitive technology events, universities and educational organizations. He is the author of *Blackbird Dreams*, *WildFire – Fire Making Art*, and (in-production) *Native America Bites Back* (with EBCI Paula M. Nelson and Chef John Matthew Wells). He is a PhD Candidate at the University of Georgia studying the human origins of technology—specifically, the control of fire—and an Anthropology Lecturer for Oxford College of Emory University.



**Trina Ray** started her career at NASA's Jet Propulsion Laboratory with a bang. Her first and still favorite experience was working on the Voyager Neptune Encounter in August of 1989. Along the way she was the Titan Orbiter Science Team co-chair where she coordinated all the Titan science opportunities for the Cassini Mission. She was the Deputy Science Planning and Sequencing Manager for Cassini, which is the group that integrates, implements, and executes the activity plans for all the instruments on Cassini. Currently she is an Investigation Scientist for the ice penetrating radar instrument on NASA's newest flagship mission "Europa Clipper" to explore Jupiter's icy moon Europa in 2020. Trina received her B.S. in Physics from California State University, Northridge, and her M.S. in Astronomy from San Diego State University, where her research specialty was Planetary Nebulae. Trina has received numerous awards, including a NASA medal for Exceptional Service, and the prestigious Bruce Murray Award for excellence in education and





**Dr. Marianne Shockley** is an Academic Professional and Undergraduate Coordinator in the Entomology Department at the University of Georgia. She is a founding member of the North American Coalition for Insects Agriculture (NACIA), a trade organization for insects as food and feed. She currently advises and mentors Entomology and Applied Biotechnology undergraduates and teaches multiple entomology classes including Forensic Entomology, Insect Outreach and Insects in Culture,

Educators Distance Education Course, and Tropical Entomology in Ecuador and the Galapagos Islands. Marianne Shockley received a B.A. in Biology from Georgia College and State University, and M.S. and Ph.D. degrees from the Department of Entomology at UGA. Her Ph.D. focused on researching and assessing science teaching and learning in higher education by introducing, integrating, and evaluating service-learning courses in entomology through stand-alone courses and as a component of existing courses by creating UGA Entomology's first and ongoing study abroad program. She has traveled with students to Costa Rica, Ecuador and the Galapagos Islands.



**Kim Steadman** received both her B.S. and M.S. in Aerospace Engineering from Georgia Tech. After graduate school, Kim started her career at NASA's Jet Propulsion Laboratory. While at JPL, she has worked on several different projects including the Mars Exploration Rover Mission, Cassini-Huygens Mission to Saturn, the Mars Science Laboratory, and the Mars 2020 rover. Currently Kim is a Tactical Uplink Lead for the Mars Science Laboratory and a Science System Engineer for the Mars 2020 Rover.

Curiosity, she is responsible for running the tactical planning shift. It is her responsibility to ensure that the tactical plan meets science objectives (as specified by the science team), conforms to flight rules and operational guidelines, respects available spacecraft resources, and is possible to implement in the tactical planning shift. As a Science System Engineer for the 2020 rover, Kim is helping to design the operations process for the rover once it lands on Mars. In 2015, Kim received the NASA Exceptional Achievement Medal for her work on the Cassini Solstice Mission.



**Dr. J. Marshall Shepherd** is a leading international expert in weather and climate and is the GA Athletic Association Distinguished Professor of Geography and Atmospheric Sciences at UGA. Dr. Shepherd was the 2013 President of American Meteorological Society (AMS), the nation's largest and oldest professional/ science society in the atmospheric and related sciences and is also the host of The Weather Channel's Award-Winning Sunday talk show Weather Geeks. Prior to UGA, Dr. Shepherd spent 12 years

as a Research Meteorologist at NASA-Goddard Space Flight Center and is frequently sought as an expert on weather, climate, and remote sensing. His TedX Atlanta Talk on "Slaying Climate Zombies" is one of the most viewed climate lectures on YouTube. Dr. Shepherd received his B.S., M.S. and Ph.D. in physical meteorology from FSU. He co-authored a children's book on weather and weather instruments called Dr. Fred's Weather Watch. He is also the co-founder of the Alcova Elementary Weather Science Chat series that introduces K-5 students to world-class scientists. Dr. Shepherd is originally from Canton, Georgia. He and his wife, Ayana, have two children, Anderson and Arissa.



**Professor John Wise** uses numerical simulations to study the formation and evolution of galaxies and their black holes. He is one of the lead developers of the community driven, open source astrophysics code Enzo and has vast experience running state-of-the-art simulations on the world's largest supercomputers. He received his B.S. in Physics from the Georgia Institute of Technology in 2001. He then studied at Stanford University, where he received his

NASA's Goddard Space Flight Center just outside of Washington D.C. as a NASA Post-doctoral Fellow. Then in 2009, he was awarded the Hubble Fellowship which he took to Princeton University before arriving at Georgia Tech, coming back home after ten years roaming the nation.



**Dr. Larry J. Young, Ph.D.** is Director of the Center for Translational Social Neuroscience and of the Silvio O. Conte Center for Oxytocin and Social Cognition at Emory Univ. in Atlanta. He is also a Professor in the Department of Psychiatry and Behavioral Sciences at the Emory School of Medicine and Chief of the Division of Behavioral Neuroscience and Psychiatric Disorders at Yerkes National Primate Research Center. He has published over 200 peer reviewed publications, including in premier journals such as *Science* and *Nature*. He earned

UGA and earned his Ph.D. from the University of Texas at Austin. Dr. Young joined the Emory faculty in 1996. Dr. Young has most recently established a new Center for Social Neural Networks at the University of Tsukuba in Japan. Dr. Young's research seeks to understand how the brain functions to regulate social relationships. Dr. Young is the author of *The Chemistry Between Us: Love, Sex, and the Science of Attraction*, which explores the latest discoveries of how brain chemistry influences all aspects of our relationships with others.



90 Public Square N.  
706-864-0086

Bourbon Street Grille is situated on the beautiful Dahlonge square. Located in the historic Hall House building, Bourbon Street Grill boasts full bars and dining areas on two unique floors. From Cajun-inspired favorites like Jambalaya or Gumbo to delicious seafood such as fresh Apalachicola Oysters or Blackened Redfish, and even that juicy Black & Blue Sirloin or Burger, we have a fantastic dish to satisfy any taste.

<http://www.thebourbonstreetgrille.com/>

## Meet Our Panelists

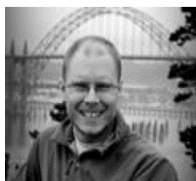
### Our Blue Planet: Living and Non-living System Interactions *Saturday 10:00 am*



**Dobrosława Bialonska, Ph.D.**, is an Assistant Professor of Environmental Microbiology at UNG. Her areas of expertise include environmental microbiology, natural products in drug development, human gut microbiota, food microbiology, quorum sensing inhibition, and antimicrobial natural



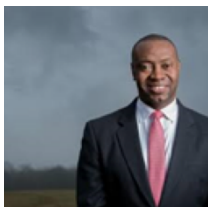
**Nancy Dalman, Ph.D.**, is a Professor of Biology at UNG, the Head of the Biology Department, and her research interests are in the broad area of environmental toxicology. She also has an interest in the scholarship of teaching and learning and, in particular, how inquiry-based classroom activities influences successful material comprehension and critical



**Mattias Johansson, Ph.D.**, is an Asst. Professor of Marine Biology at UNG Gainesville. Although Dr. Johansson's research background and training are mostly marine, he has used genetic tools to study both native and invasive species in a variety of aquatic environments. Past projects have looked at mate choice in fishes, dispersal in giant kelp, and the spread of invasive species throughout the Great Lakes.



**Christopher Seminack, Ph.D.**, is Assistant Professor of Geology at UNG Gainesville. His areas of expertise include coastal geology, geomorphology, sedimentology, and stratigraphy. Dr. Seminack's research deals with analyzing the geologic framework of coastal environments, specifically the barrier islands along the U.S. Atlantic coast.



**J. Marshall Shepherd, Ph.D.**, is the Georgia Athletic Association Distinguished Professor of Atmospheric Sciences and Geography, and Director of the University of Georgia's Atmospheric Sciences Program. Dr. Shepherd is a leading international expert in weather and climate. His research focuses primarily on hydrometeorological extremes, urban climate, and the intersections of atmospheric sciences with society.

# Meet Our Panelists

## The Science of Space Exploration

***Saturday 11:15 am***



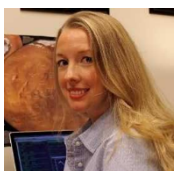
**Laura Forczyk** is the owner of Astralytical, a space consulting firm, and the Executive Director of the nonprofit Georgia Space Alliance. She holds bachelor's and master's degrees in astrophysics and conducted doctoral studies in planetary science. She is the author of upcoming book *Rise of the Space Age Millennials*.



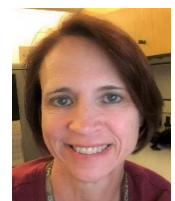
**Larry Gibson, D.C.**, has spent six years in UNG's Biology Department as a full-time lecturer in Human Anatomy and Physiology, and has 30 years of clinical experience in chiropractic, physical, and holistic medicine.



**Trina Ray** is an Investigation Scientist for the ice penetrating radar instrument on NASA's newest flagship mission, the Europa Clipper. She worked on the Cassini-Huygens Mission to Saturn (JPL/NASA) for over 20 years (specializing in Titan) and is an active public speaker, invited to give many talks around the nation.



**Alison Smith, Ph.D.**, is a radio astronomer and adjunct lecturer at UNG. She is a graduate of Agnes Scott College in Decatur, GA and received her M.Sc. and Ph.D. in Physics at the Univ. of Georgia. Allison enjoys researching the intricacies of the interstellar medium of our Galaxy with the hope of understanding how the Milky Way acquires fresh gas for star formation, and she considers sharing astronomy with others to be one of her favorite pastimes.



**Kim Steadman** is a system engineer at NASA's Jet Propulsion Laboratory. Currently she is a Tactical Uplink Lead for the Curiosity Rover and a Science System Engineer for the Mars 2020 Rover. Her job is to enable science while keeping the spacecraft safe and happy.

# Meet Our Panelists

## What's Lurking in Your Genome?

**Saturday 12:30 pm**



**Jacob Appel** is a physician, attorney and bioethicist who serves as Director of Ethics Education in Psychiatry at the Mount Sinai School of Medicine in New York City. His collection of ethical dilemmas for laypeople, "Who Says You're Dead?", is forthcoming from Algonquin in October 2019. More at: [www.jacobmappel.com](http://www.jacobmappel.com)



**Adam Davis**, Ph.D., studies how genes are regulated and expressed during embryonic development. Understanding those processes lets us understand how genes are regulated during our own development, even though we share most of the same genes as other animals. These types of studies have allowed us to understand how human genetic disorders occur but also the amazing diversity of organisms on this planet.



**Alison Kanak**, Ph.D., got her doctorate in microbial genetics from GSU, studying ways bacteria degrade petroleum. She currently studies the genes involved in the way phage infect bacteria with the goal of using phage as alternatives to antibiotic use in the treatment of bacterial infections.



**Katie Lang** received her M.S. in Biotechnology from Johns Hopkins and a M.S. in Genetic Counseling from Virginia Commonwealth University. She was awarded a fellow-ship at the Fisher Center for Familial Cancer Research and then began working as coordinator of the Hereditary Cancer Program at Northside. Katie is a founding member and president of the GA Association of Genetic Counselors.



**Clarke Miller** holds a PhD in Biochemistry from the University of Kentucky, MBA from Oglethorpe University, and has over 20 years of experience as a chemist and biochemist. Before moving to Georgia, he was a cancer researcher at the James Graham Brown Cancer Center in Louisville, Kentucky where his focus was drug discovery. Currently, he teaches Chemistry/Biochemistry on the



# Meet Our Panelists

## Exploring the Energy Frontier

***Saturday 1:45 pm***



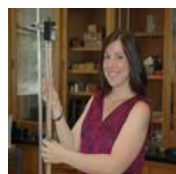
**Olu Ajala**, BS, MBA, Registered Professional Engineer, is a research engineer for the R&D organization of Southern Company. In this role, he is responsible for developing and managing a variety of projects within the renewables, storage and distributed generation program area, including projects ranging from photovoltaic solar and wind energy



**Paul Cunningham** is the owner and operator of Engineering Systems & Design (ES&D), one of the top producers of quality micro hydro energy machines. His company was started 35 years ago to create an efficient and reliable micro hydro machine. With machines all over the world, ES&D has achieved international recognition for being a leading manufacturer of efficient & reliable micro hydro machines.



**Ed Erickson**, BS, MS, MBA, has extensive experience in the management of businesses and organizations in STEM fields and as a strategy consultant in the energy and natural resources industries. He was an officer in the US Navy's nuclear propulsion program and qualified in submarines on the USS Nautilus and for operation, maintenance, and supervision of naval nuclear power plants.



**Sarah Formica**, Ph.D., is Associate Professor of Physics and holds the Fuller E. Callaway Professorial Chair at UNG where she has implemented new teaching methods for introductory physics courses and has led in the adoption of an open lab format. Her research interests include X-ray Fluorescence Spectroscopy and materials analysis.



**Thomas Vogel**, Ph.D. is Assistant Professor of Physics at UNG. He received both his Diploma in Physics and Doctorate from the University of Leipzig in Germany. His research interests include material science, algorithm development, soft-hard-matter interfaces, statistical physics, soft matter systems / biophysics, and supercomputing.

## Meet Our Panelists

### The Story of Our Universe: The Big Bang, Stars, and Planets

***Saturday 3:00 pm***



**Greg Feiden**, Ph.D., is an assistant professor of Astronomy and Director of the N GA Astronomical Observatory at UNG. He earned his Ph.D. from Dartmouth College and was a postdoctoral scholar in theoretical astrophysics at Uppsala University in Sweden. He studies theoretical stellar structure and evolution, with an emphasis on how magnetic fields affect the properties of stars smaller and younger than our



**Nathan Harrison**, Ph.D. is an assistant professor of physics at UNG. He has been part of a collaborative physics research project at the Jefferson National Lab in Virginia since his days as an undergraduate at Rensselaer Polytechnic Institute in 2008 and continues to research the tiniest building blocks of matter.



**Allison Smith**, Ph.D., is a radio astronomer and adjunct lecturer at UNG. She is a graduate of Agnes Scott College in Decatur, GA and received her M.Sc. and Ph.D. in Physics at the University of Georgia. Allison studies the intricacies of the interstellar medium of our galaxy with the hope of understanding aspects of the Milky Way. Sharing astronomy with others to be one of her favorite pastimes.



**Mark Spraker**, Ph.D., is a Professor of Physics at UNG and is associated faculty at Duke. His research in nuclear physics has been supported by a US DOE grant. He helped found the N GA Undergrad. Edu. Program with funding from the NSF to bolster the number/ability of STEM-prepared secondary education teachers in north Georgia.



**John Wise**, Ph.D., is an associate professor at Georgia Tech in the School of Physics and Center for Relativistic Astrophysics. He received his Ph.D. from Stanford University, and worked previously at NASA and Princeton University.



## Meet Our Panelists

### Tales from NASA JPL Spacecraft Operations *Saturday 4:15 pm*



**Trina Ray** is an Investigation Scientist for the ice penetrating radar instrument on NASA's newest flagship mission, the Europa Clipper. She worked on the Cassini-Huygens Mission to Saturn (JPL/NASA) for over 20 years (specializing in Titan) and is an active public speaker and has been invited to give many talks around the nation.



**Kim Steadman** is a system engineer at NASA's Jet Propulsion Laboratory. Currently she is a Tactical Uplink Lead for the Curiosity Rover and a Science System Engineer for the Mars 2020 Rover. Her job is to enable and pursue science while keeping the spacecraft safe and



87 North Chestatee Street

706-482-0114

Shenanigans offers traditional Irish dishes, pub fare, seafood, vegetarian and kids' options, plus the star attraction—Guinness tempura battered fish & chips with homemade slaw and tartar sauce. From the largest draft selection in town to a huge selection of bottled microbrews (featuring a rotating tap!) and signature cocktails, Shenanigans offers a wide variety of your favorite drinks, sure to please any palate!

<http://www.theshenaniganspub.com/>

## Want to help us out get the 2020 Science Festival funded?

### Join us at one of these Socials:

Wednesday April 24 Science & Sowing!	Wednesday June 26 Participate in Science Paint & Sip
Wednesday August 14 Discover the Science of Viticulture	Wednesday October 23 Cosplay your favorite scientist
Wednesday December 11 Wear your ugliest holiday sweater!	Wednesday February 5 Science of the Heart

**From 5:00 – 7:00p.m.**



At the Naturally Georgia Tasting Room on Dahlonega Square  
90 Public Square N., (706)864-0832

Interested in having your business involved in the 2020 festival? We'd love to see our community businesses and industries more involved and sharing how science applies to your work. Send an email to: [dahlongascience@gmail.com](mailto:dahlongascience@gmail.com) to talk about how to be included in next year's program!



## Take Our Survey!

Help us plan an even better event for next year by taking our survey about this year's festival!



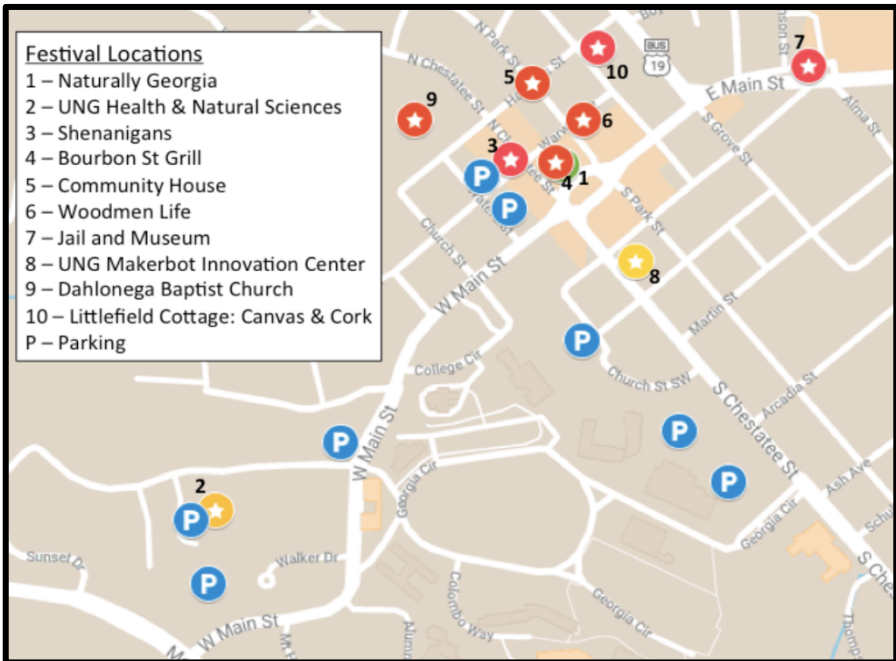
Access the survey online at: <https://tinyurl.com/DahSciFest2019>

***Stop by the information center at the Naturally Georgia Tasting Room (on the square) to pick up one of our festival t-shirts or coffee mugs! Limited availability!***



# Festival Locations

You can find activities all over Dahlonega!



## Parking Information:

In addition to regular Dahlonega parking lots, UNG student, faculty, and visitor spots are open on the weekends. Specific UNG lots include:

- L32, Walker Deck near HNS
- L14, Parking deck near lot L16 (Park Street and Church Street)
- L16, Church Street lot near downtown and the Makerbot Center
- L19, inside the main entrance of UNG
- L49, near the UNG Library