

Portal to the Cosmos

Total solar eclipse brings the universe to the Smokies

SMOKY MOUNTAIN LIVING STAFF

Once in a lifetime. That's the motto for millions of Americans who will journey to the path of totality when the Great American Eclipse sweeps over the Smoky Mountains on August 21.

PHOTO BY TIM BARNWELL
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“The thing we are chasing is that two-and-a-half minutes of totality. That is where the magic is going to happen,” explains Dominic Lesnar, president of the Asheville Astronomy Club.

Witnessing a solar eclipse lasts forever. You remember where you were, who you were with, how you got there, what it felt like.

Despite the crowds that will press into the path of totality on the big day, there's nowhere in the universe Lesnar would rather be.

“It is going to be a logistical nightmare, but it's hard to have totality come so tantalizingly close and not go to it,” Lesnar says.

Just ask Bernard Arghiere, an astronomer in Asheville, North Carolina.

Ten years ago, he flew halfway around the world to see a total eclipse from a chartered boat in the Mediterranean Sea.

“There are people who are rather nuts about it, who will travel thousands of miles to odd continents,” says Enrique Gomez, an astronomy professor at Western Carolina University.

Gomez saw his first total eclipse from a rooftop while visiting Mexico City as a teenager.

“I got to see planets and stars in the middle of the day,” Gomez recalls. “And the chickens came into the coop very dutifully a few minutes before totality.”

It's impossible to fly at the speed of an eclipse—the moon's shadow moves across the earth at more than 1,500 miles an hour. But chartered eclipse planes will chase it as long as they can.

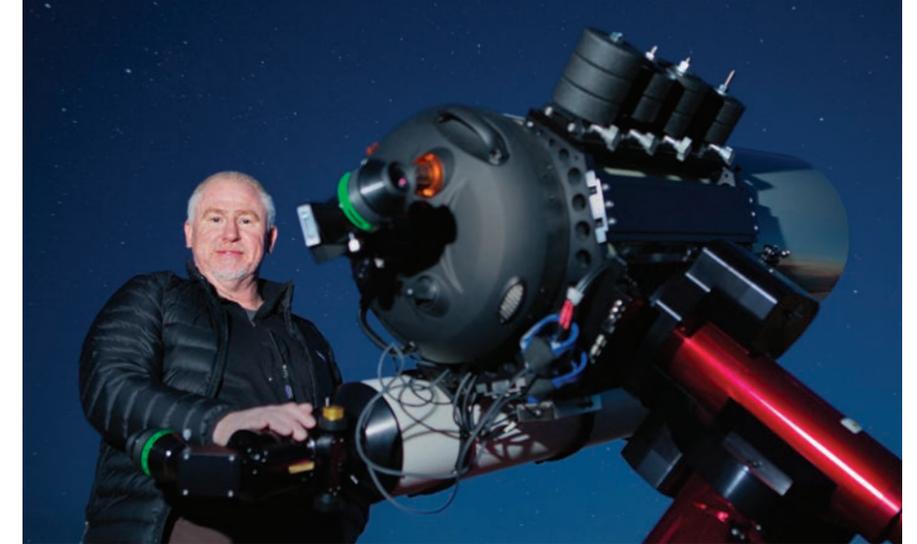
“Just to spend a few more seconds under the shadow of the moon,” Gomez says.

An eclipse is rare, but not as rare as people think. One happens somewhere on earth every 18 months and change.

The last one was in Indonesia. The next one will be in Chile.

But they can just as easily touch down in rural Mongolia, the middle of the Pacific Ocean or Antarctica.

The chance of a total eclipse coming to your corner of the globe in your lifetime?



Dominic Lesnar, president of the Asheville Astronomy Club, mans one of the club's giant telescopes at Look-out Mountain Observatory during a public star-gazing session. Interest in astronomy has surged as the eclipse draws near. PHOTO BY TIM BARNWELL - WWW.BARNWELLPHOTO.COM

Eclipse terms

- **First contact:** first moment the moon's shadow touches the edge of the sun.
- **Partial stages:** the diminishing crescent phases of the sun as the moon slides over it.
- **Totality:** the brief period when the moon completely covers the sun, visible only along a 70-mile swath within the moon's umbra.
- **Baily's Beads:** right before totality, the sun's last light creates brilliant shafts around the moon's edge.
- **Corona:** Spanish for "crown" and visible only during totality, the sun's outer atmosphere appears like a streaming halo
- **Inside totality:** basking in the shadow of the moon

“That's the rare part. What's rare is that they come near to you,” says Arghiere.

The last eclipse to grace the Smokies was 1506. The next one is 2153.

The Great American Eclipse got its name for good reason. The path of totality will traverse the country from coast to coast—

passing over 12 states from Oregon to South Carolina. That hasn't happened since 1918.

The last total solar eclipse to touch U.S. soil skirted through Oregon in 1979. Arghiere was there, camping out in the desert.

The last one before that slid along the Gulf Coast in 1970. And yes, Arghiere was there, too, barely out of college but an astronomy buff already.

Today, the internet makes it infinitely easier to develop your eclipse game plan. Interactive maps tell you exactly when the eclipse will start, peak and end at any given GPS coordinate on earth.

But back then, Arghiere just pointed his car toward the eclipse path and stopped along the side of the highway as the moon's shadow bore down.

Everyone in America will witness a partial eclipse on August 21. But a word to the wise: don't settle.

“People may think ‘I'll be where it's 99 percent and that's good enough, but that's not good enough,’” says Knox Warde, an astronomer who lives in Nantahala, North Carolina.

The swath of totality will be 70 miles wide. The outside edges will experience totality for just 90 seconds or less, while the center of the swath will get about two-and-a-half minutes.

View the SML Eclipse Guide:

A comprehensive guide on the total solar eclipse in the Smokies can be found at smliv.com/eclipseguide. There you'll find listings of eclipse festivals, events, and programs, along with designated viewing sites, eclipse travel resources and more.

Inside Totality: Eyewitness to the Eclipse

Die-hard eclipse chasers circle the globe to relive the rare phenomenon of totality. Some are lucky enough to have an eclipse come to them. But most will never see one.

The whole eclipse takes a few hours, but totality lasts only 90 to 150 seconds depending on where you are in the umbra's path, so know what to expect and be ready to enjoy the show.



**PROF. ENRIQUE GOMEZ,
WESTERN CAROLINA
UNIVERSITY**

"You are going to see the world in a way that you have never experienced it before. The shadows are going to be all wrong and the landscape will look very unique.

You will get the feeling there is something big coming your way. If

you are on one of the balds you will see the shadow of the moon sweeping toward you. The wind will start picking up, the temperature will drop quite noticeably, the animals will start acting like it is nighttime.

On the ground, pinhole shadows will produce tiny images of partially occulted suns. Just set your phone aside or you are going to miss a lot. There is nothing you can record that will do justice to the experience."



**JOHN INNES, PARTNERS OF
THE CHEROKEE NATIONAL
FOREST**

"It's a primordial experience. It happens in way that tells your whole brain and wiring and emotions and everything else that something amazing is happening. You knew this was going to happen but you get this building realization that this is

finally here. Then totality descends and day turns into night and all of sudden the blue sky is now black and you see stars. The birds will land and stop singing and nest like its nighttime.

There's a stillness and wonder. It is pleasantly surreal.

It is all going to happen fairly quickly. Just as you think 'what is going on,' the sun starts to come back and inevitably people will start applauding as if you are watching the world being created all over again."



**BERNARD ARGHIERE,
ASHEVILLE ASTRONOMY CLUB**

"The first one is all surprise, seeing the constellations and a few planets in the middle of the day, and seeing the sun's corona splashed all around it.

This is an event you don't need to be an astrophysicist to appreciate. I will be mixing up binoculars and the naked eye,

because much of it is a whole-sky experience.

There is a lot of conservation while you're waiting, but then as totality comes, people don't say much because it is so awe inspiring. Let everyone take it in. It is going to seem like a few seconds and as it lifts you think 'Wow it can't be over. It just started!' You don't want it to be over yet."

For Arghiere, astronomy is more than a hobby.

"It is a way for me to stop the everyday world and try to connect with who I am, where I am and why I'm here. It helps me figure out my place on this earth and in this universe," Arghiere said. "Do I find all the answers? No, but I get a better sense of how I fit into this picture."

During his first life in San Francisco, Arghiere had to cart his telescope out of the city to get his night sky fix. After moving to Western North Carolina, he has his own personal observatory just out his back door.

Arghiere is a walking arsenal of profound astronomy trivia. To him, earth is a space ship, hurtling along at 66,000 miles per hour.

"We end up with a 580 million mile journey around the sun every year and it's free," Arghiere said.



While the eclipse happens by day, it is still astronomy.

"You are looking at the closest star to us," Warde says.

It's easy to forget that the sun is in fact a star.

"You can go out on a starry night and see a couple hundred stars, but we've got one really

close up," says Lesnar.

By a cosmic stroke of luck, America will witness another great eclipse in 2024—once again making a trajectory across the country, this time from Texas to New York.

The best part about the coming eclipse? It's reminded people that outer space exists.

It's what Gomez calls the "cosmic perspective."

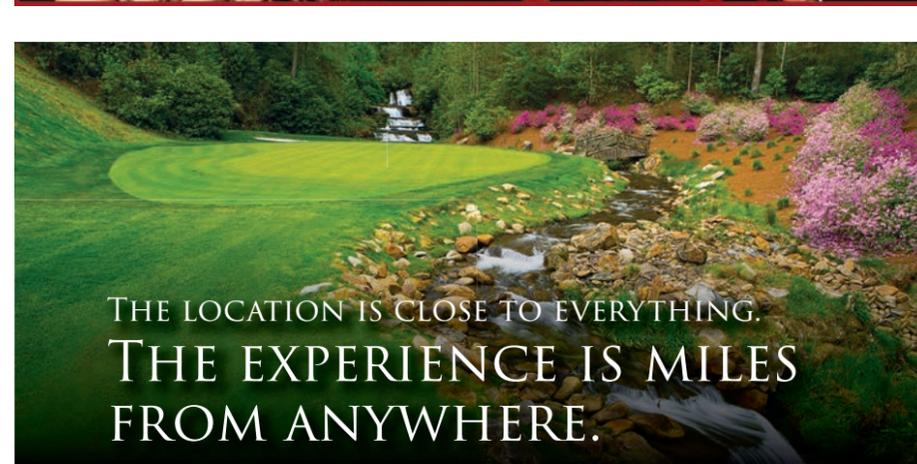
"I want people to get a sense of what it means to be on a planet rotating on its axis and revolving around a star," Gomez says.

Our own sun is just a spec, one of 200 billion stars in the Milky Way alone, out of 100 billion galaxies in the universe.

"That's how vast the universe is," Gomez says. "From this little corner in the middle of nowhere, we've been able to figure it out by making observations. We've been able to piece together a picture of the universe."



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Ed Land rocks a pair of eclipse glasses custom printed for the eclipse festival at his agritourism destination, Chattooga Belle Farm in upstate South Carolina, which has also rolled out a commemorative "Dark Sky" vodka label.

eclipse mania, but only in the weeks leading up to the eclipse," said Clay Jordan, the Smokies associate superintendent.

But when the park went live with tickets to a special Clingman's Dome viewing event, the 1,325 slots sold out in just four minutes. It was a harbinger of what might happen once the eclipse rises to national consciousness.



"It is sort of like the Power Ball. Most people don't follow it until it gets up to about \$400 million," said Nick Breedlove, director of the tourism authority in Jackson County, North Carolina, one of the lucky communities in the path of totality.

For mountain tourist towns that lie in the path totality, the Great American Eclipse is a gift from the heavens.

"I said 'Thank you God to let this come to Rabun County,'" said Teka Earnhardt, tourism director in Rabun County, Georgia.

The trick now is leveraging the eclipse trippers into repeat visitors for years to come.

"There are going to be little towns just loving this influx," said John Innes, director of the Partners of Cherokee National Forest Interpretive Association in Tennessee. "It will be a really big boon to them and a chance for to make an impression."

That's exactly what the tourism communities in the Smokies are hoping for.

"People are coming for the eclipse but we want them to experience what we have to offer here—the waterfalls, the hikes, the craft breweries, farm to table restaurants—and we think they'll fall in love with the area," Breedlove said. "I think the economic impact will be huge for Jackson County."

By late March, 25 percent of the overnight lodging was already booked for eclipse weekend, he said.

Lights, Camera, Eclipse

IT'S THE GREATEST SHOW ON EARTH, AND EVERYONE WANTS A FRONT-ROW SEAT

Clark Lovelace was a little skeptical when a package with a pair of cardboard eclipse glasses showed up in his mailbox two years ago. He put them on, but couldn't see a thing through the opaque black film, so off they came. Inside the envelope, he found a cryptic letter offering discounts on bulk orders of eclipse glasses.

"It said 'You may not be aware but you are in the path of totality,'" recalled Lovelace, the head of the Transylvania County Tourism Authority in Brevard, North Carolina.

An eclipse, he thought. Cool. And he

tucked the envelope away in his desk. But the eclipse started making cameos nearly everywhere Lovelace went.

"At a tourism conference someone says 'Hey man have you heard about this eclipse thing?' and then someone else chimes in and says 'Yeah, I heard to was going to be huge,'" Lovelace said.

And so unfolded a series of epiphanies that the tourism stars had aligned over his corner of the Smokies, placing Brevard at ground zero for the event of the century.

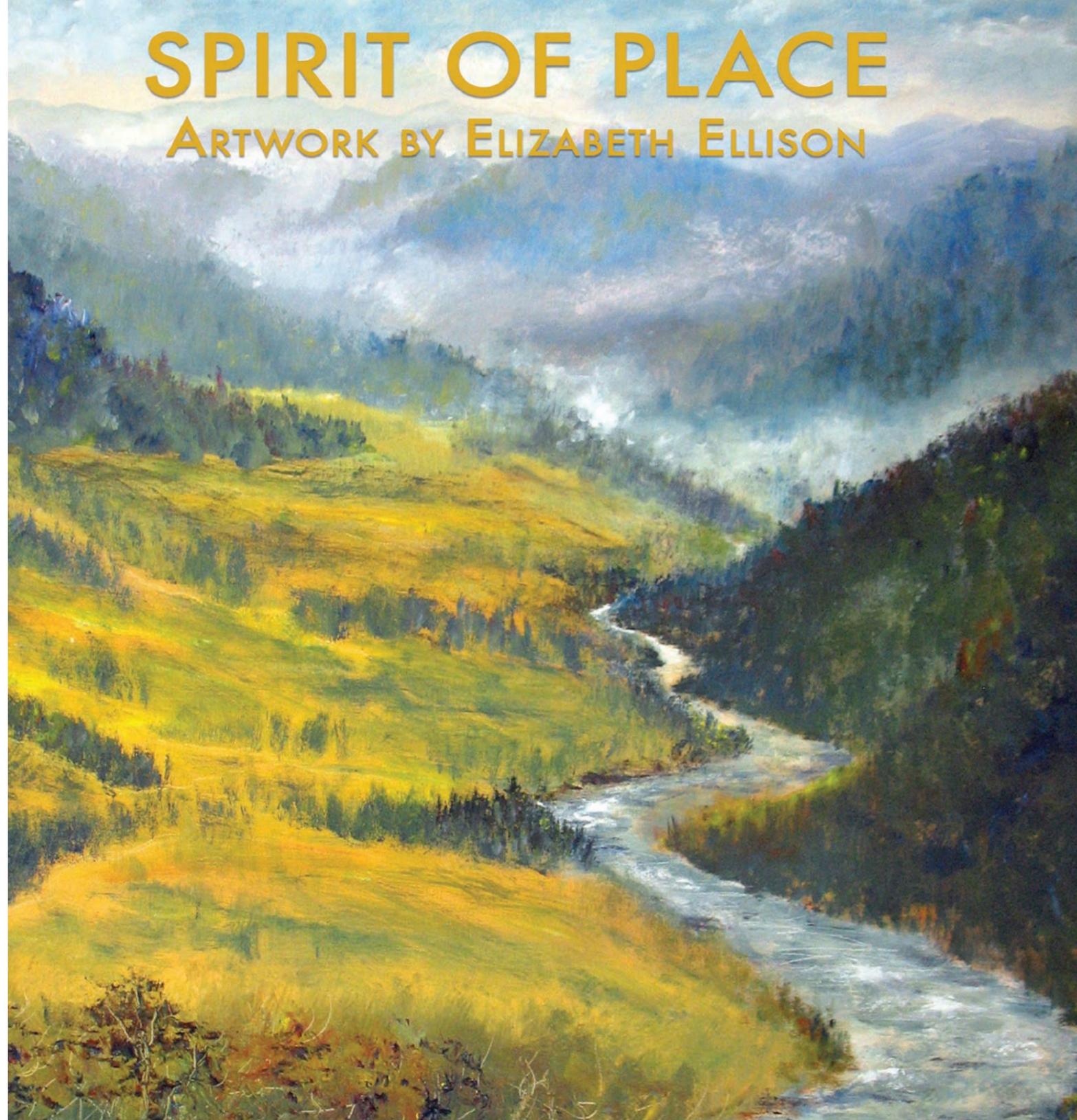
"Every time, how big it is going to be has grown in my mind," Lovelace said.

Meanwhile, rangers in the Great Smoky Mountains National Park were having a similar revelation. A little Googling last year revealed the park was being billed as a top viewing venue in the nation.

"I assumed the country would go into

SPIRIT OF PLACE

ARTWORK BY ELIZABETH ELLISON



On Display: May 27 - September 4, 2017



Exhibit support provided in part by:

SMOKY MOUNTAIN Living



Crowds line-up for a view of the sun through a solar telescope at a public outreach day hosted by the Asheville Astronomy Club, with club member Tim Barnwell (left) narrating the view of earth's very own star.

"We don't have enough hotel rooms in Jackson County to accommodate everyone. They are booking up like crazy," Breedlove said.

In North Georgia, state park campgrounds and cabins sold out a year in advance.

"They started selling out before they realized the event was even coming," said Candace Lee, president of the Towns County Chamber of Commerce.

REACHING FOR THE STARS

While millions of Americans will journey to totality, the 70-mile-wide path passes over a lot of territory—12 states to be exact—to catch the sky action. But with some creative event planning and clever marketing, mountain towns across the Smokies have jockeyed their way to the top of national eclipse destinations.

"It's just rolling," said Earnhardt, who's leading the 'OutASight' eclipse travel campaign in Rabun County. "It is a once-in-a-lifetime thing for most people, and we are trying to make this a memory for people who come experience it with us."

From diners and campgrounds to B&Bs and golf resorts, the community has piled on with a slew of events, specials and packages.

"We said 'If all these people are going to be here all weekend, we need to give them things to do centered around the eclipse.' It has definitely taken on a life of its own," said Earnhardt.



Earnhardt spent \$10,000 on 10,000 pairs of eclipse glasses, and she's now hoping it will be enough.

Across the mountains in Sweetwater, Tennessee, the eclipse spirit has also been contagious.

Merchants are gearing up to sell Moonpies, Blue Moon Beer, Mars Bars and Eclipse chewing gum. Eclipse banners hang from the downtown lampposts and an eclipse festival is in the works.

"It has ballooned into this enormous thing," said Jessica Morgan, the Sweetwater town clerk. "But we still say the star of the show is the eclipse."

While the path of totality will just miss Dahlonega, Georgia, the community is rolling out the welcome mat to catch the eclipse overflow.

"They are having fun with it and starting to think up fun packages, like 'The Day the Lights Went Out in Georgia' package," said David Zunker, tourism director of the

Dahlonega-Lumpkin Chamber of Commerce.

After Zunker's own eclipse awakening last year, he relished spreading the news that Dahlonega was "on the cusp of the path of totality." It had a foreboding ring to it, so he sometimes declared it in an ominous tone just for fun, before explaining that it is a very good thing.

"We are a charming, lovely, delightful town, so we're telling folks to escape Atlanta and make a weekend out of it," Zunker said.

A clincher that really makes Dahlonega an eclipse contender is a pre-game astronomy day hosted by the University of Georgia's Coleman Planetarium—including planetarium shows, eclipse science, history talks and solar telescope viewing.

"So it's not just having popcorn and snacks and watching the moon blot out the sun, but it is a legitimate educational experience," said Zunker.

There's a big demand for professional and amateur astronomers to serve as resident eclipse experts, from festivals billing astronomy talks to resorts promising star-gazing sessions as part of their packages.

Members of the Atlanta Astronomy Club have been tapped to appear at an eclipse tailgating party at the Georgia Mountain Fairgrounds in Hiwassee.

The Great Smoky Mountains National Park is training their own legion of college interns to serve as eclipse ambassadors in the park, and the Pisgah Astronomical Research Center has conducted eclipse workshops for teachers in the region.

More tourist attractions have jumped on the moon shadow bandwagon.

The Great Smoky Mountains Railroad will run an eclipse viewing train. Adventures Unlimited will lead an eclipse rafting trip down the Ocoee River. And Chattooga Belle Farms will turn its rolling fields into a ticketed eclipse party in Long Creek, South Carolina.

"Last summer we had some visitors from England and they said 'We will see you next August for the big eclipse,'" recalled Libby Imbody, the marketing director for Chattooga Belle.

It was the first they heard of it, but they wasted no time. They quickly scored the web page "solareclipsefest2017" and began planning an on-farm eclipse party.

The agri-tourism site has an orchard distillery, so they rolled out a commemorative Dark Sky Vodka label, commissioned hundreds of eclipse-branded "Shot in the Dark" shot glasses and ordered 5,000 pairs of eclipse glasses.

Saving the Sun: A Cherokee Eclipse Tradition

When the total eclipse descends on Cherokee, North Carolina, this August, a tradition reaching back thousands of years will live on.

A great ruckus of shouting and drumming will rise up into the sky to scare away the giant frog that's eating the sun, or so goes the Cherokee mythology surrounding an eclipse.

It's astounding that something as rare as an eclipse was imprinted in Cherokee culture, but that's the power of oral traditions, explains Barbara Duncan with the Museum of the Cherokee Indian.

"Even if people didn't see it in their own lifetime, the knowledge was taken very seriously—'we know about this, we know it is not the end of the world, we know it is going to pass and here's what we do to make that happen,'" Duncan says. "And that knowledge gets passed down because it always worked."

An eclipse was an elusive and disconcerting phenomenon in earlier times, and cultures all over the world had similar mythology to explain it.

The eclipse weekend calendar is loaded in Jackson County, North Carolina. Aside from two signature eclipse festivals at public parks, there's a two-mile Moonlight run and talks by astronomy professors, alongside the outdoor concerts, craft fairs and other events that would normally fill summer weekends in the mountains anyway.

Local microbreweries are coming out with a keepsake eclipse beer. Downtown shops will hold moonlight madness shopping hours. Restaurants will offer specials topped with "sunny side down" eggs. And space-themed movies will play.

Eclipse counters—ticking off the days, hours, minutes and seconds to totality—have popped up on mountain travel web sites everywhere, along with how-to guides for viewing the eclipse.

The top advice: make your plans early. Despite the best efforts of travel promoters, hapless families who wake up on August 21 and point their car toward the eclipse path could be out of luck. As the clock approaches totality, expect a standstill to set in.

"I am sure that day there will people stopped all over the side of the road," said

Knox Warde, a member of the Asheville Astronomy Club.

Avoid giant Walmart parking lots at all costs, Warde said.

"Once it becomes total eclipse, the huge dawn-to-dusk lights are going to pop on and you won't see anything," Warde said.

Warde nearly hopped on a plane to Indonesia to see the last solar eclipse in March 2016.

"If you are lucky you might see it once in a lifetime, but there are people who live for that. They fly all over the world," Warde said.

With an eclipse on American soil, Warde isn't taking any chances. Even though his home in Nantahala, North Carolina, lies in totality—he could simply step outside to see the eclipse—he's heading to the Oregon desert where there's no risk of rain or clouds.

"It is a crap shoot," Warde said of the weather here at home.

While the threat of clouds on eclipse day is a taboo subject in these hills, Breedlove looked at the positive side.

"The eclipse will happen rain or shine," Breedlove said. There's just no stopping it.

"In China, it is a dragon eating the sun. And in Northern Europe and Scandinavia, it is a wolf," says Duncan.

Making noise to scare away the animal in the sky was also common across many cultures.

"Acting as a group is a way of relieving anxiety," Duncan says.

The sun and moon were one and the same celestial body to the Cherokee, and the call to action was the same for both a solar and lunar eclipse, as witnessed in the 1730s by a white trader living among the Cherokee.

"They all ran wild, this way and that way...firing their guns, whooping and hallooing, beating of kettles, ringing horse bells, and making the most horrid noises that human beings possibly could," James Adair chronicled in the History of the American Indians in 1775. "This was done to assist the suffering moon."

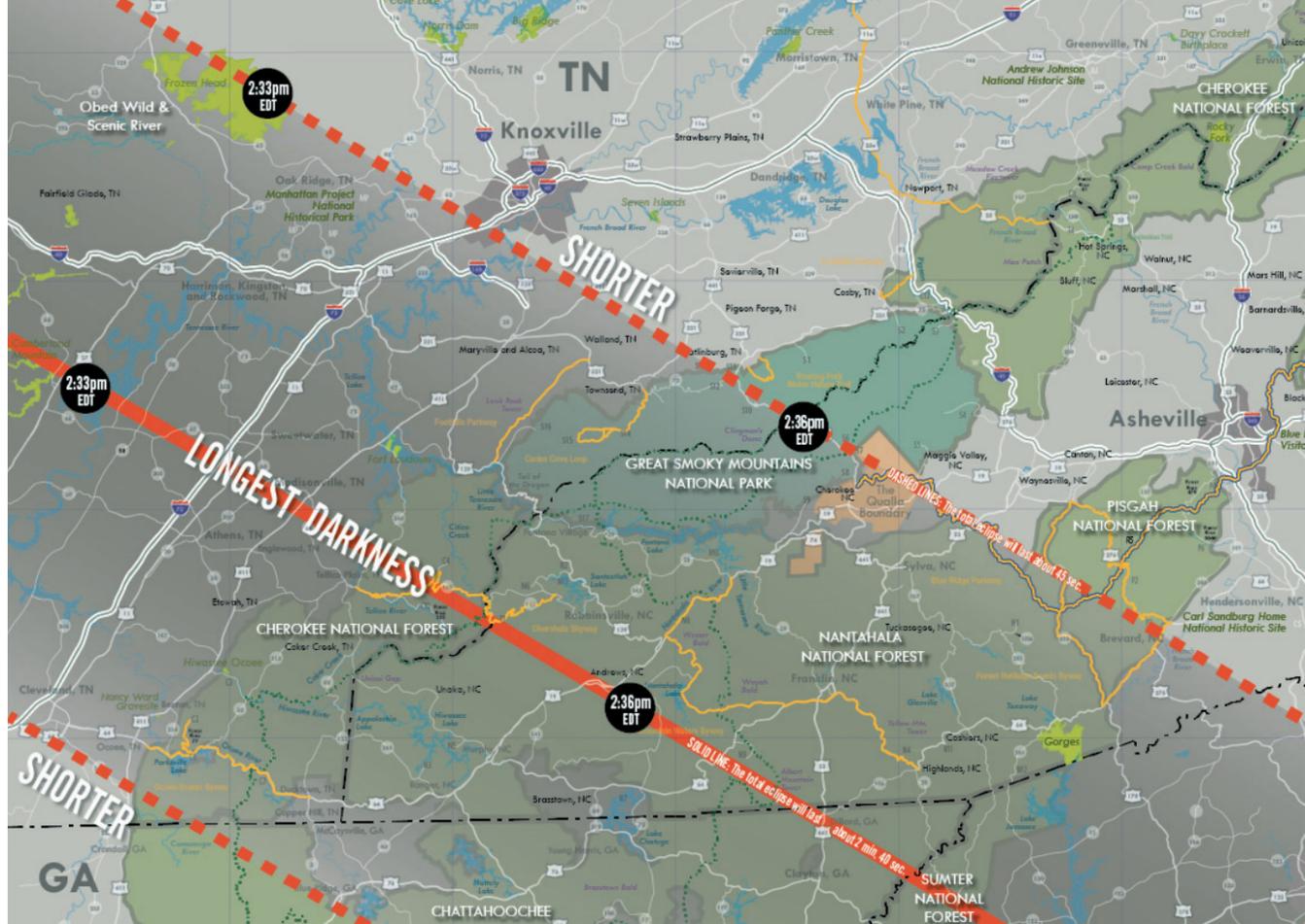
Let's hope the strategy works this time, too. You can join the tradition with an eclipse festival at the Cherokee Fairgrounds on August 21.

A Cherokee artist designed an eclipse logo (inset) based on traditional native beliefs. In the Cherokee syllabary, it says "I watched the frog swallow the sun in Cherokee, North Carolina."



Eclipse gear check list

- Eclipse glasses for everyone in your party, even if an event you're going to says they'll have them. They must be worn when looking at the sun, except during totality.
- A plan for where you're going, how you'll get there, where you'll park and a back-up plan.
- Full tank of gas, plenty of water and food.
- Fully-charged phone, on airplane mode to preserve battery in spotty coverage areas.
- Piece of paper with tiny holes punched in it, to project pinhole images of the eclipse.
- Toilet paper, sunscreen, rain gear, lawn chair.
- Copy of *Smoky Mountain Living* to read while you wait.



Moon Shadow Mania

SMOKY MOUNTAINS IN THE CROSSHAIRS OF THE GREAT AMERICAN ECLIPSE

An astronomical number of visitors will descend on the Smoky Mountains for the Great American Eclipse—an out-of-this-world, thank-your-lucky-star, universally spectacular event.

But Nick Breedlove can sum it up in just three words.

Bring. It. On.
“My perspective is you can always be over-prepared but you should never be under-prepared,” said Breedlove, the tourism director in Jackson County, North Carolina.

When Breedlove realized Jackson County would be ground zero for throngs of eclipse pilgrims, he sounded the alarm bell. The eclipse was still 18 months away then, but to Breedlove, there wasn’t a moment to spare.

Police officers needed traffic models, ambulance drivers needed contingency routes, and tourism leaders needed festival plans.

“We brought everyone to the table who might be impacted in some way,” said Breedlove.

But as monthly stakeholder meetings progressed, the to-do list only seemed to grow longer.

They needed park-and-ride lots with shuttles and legions of porta potties. There were bands to schedule, web sites to design and roadside signage to coordinate.

As luck would have it, move-in at Western Carolina University coincides with eclipse weekend, creating a traffic vortex of its own. Even the public school system was in a quandary, since kids are typically boarding afternoon buses right around the time of totality.



The worst-case scenario: a milieu on par with a Bristol NASCAR race and University of Tennessee football game at the same time.

“We just don’t know what is going to happen,” said Enrique Gomez, astronomy professor at WCU. “So much of this will be contingent on human factors.”

Gomez has had the eclipse on his own calendar for a decade or more.

“I started talking to my classes about it back in 2010,” Gomez said. “It is kind of a weird feeling right now because what I’ve been talking about to my students for years is finally here.”

Last year, he started sending emails to county officials.

2017 SCHEDULE	
REGULAR RIDES	FIRECRACKER SPECIAL
3/11-9/25	6/30*
11/13-11/22	* Date subject to change
12/1, 8, & 15	SANTA EXPRESS
12/26-31	See Website for Dates
FALL FOLIAGE	NEW YEARS EVE TRAIN
9/29-11/12	12/31
PUMPKIN EXPRESS	
10/29	

"I just wanted to give them a heads up and make sure we would have the resources on the ground to handle large amounts of traffic and people," Gomez said.

Gomez is a scientist, not a traffic engineer or emergency manager. But he plotted a few back-of-the-envelope scenarios to convey the import.

"They needed to have a sense of the scale," Gomez said.

Powers that be have taken it to heart. The N.C. Department of Transportation has done high-level traffic modeling and created ingress-and-egress patterns. Jackson County officials have conducted tabletop exercises to simulate how they'd respond to potential emergencies in the thick of the eclipse.

Meanwhile, Clark Lovelace was moving the chains in nearby Brevard, North Carolina.

"We called everyone together and said 'Let's huddle up,'" recalled Lovelace, tourism director for Transylvania County. "Step one was making sure the community knew how big this thing is. And then start that ball rolling to create a unique package of events."

From local breweries like Oscar Blues to Brevard College to Gorges State Park, Lovelace encouraged everyone to celebrate the eclipse somehow, in a way that fits them.

Breedlove's biggest message to the traveling public is to plan ahead.

"People will be stuck in traffic for a long time if they decide Monday morning to go drive and view the eclipse. We are encouraging people to come early," Breedlove said. "My goal is to manage expectations."

Breedlove has also been prepping lodging owners and merchants to gear up.

Luckily, the mountains are used to scaling up during peak tourist times.

"Everyone has some familiarity with the mode of 'OK man, things are going to be crazy,'" Lovelace said.

WHAT TO DO ABOUT THE PARK

The Great Smoky Mountains National Park will be a hotspot for viewing the eclipse.

"People love the Smokies. When they think, 'Where can we go to see this out in nature?' it's a go-to place," said Susan Sachs, an education coordinator for the Great Smoky Mountains National Park.

The park is no stranger to crowds. As the most visited national park, it sees 11 million visitors a year. But the windy two-lane roads in and out of the Smokies only have so much capacity.

"One of the tricky things is we really just

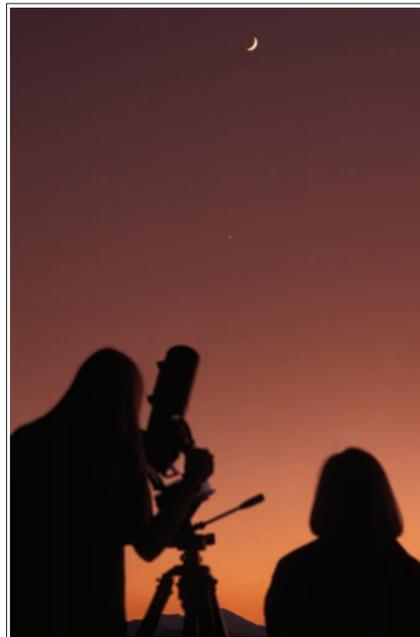


PHOTO BY TIM BARNWELL - BARNWELLPHOTO.COM



don't know how many people are going to come," said Clay Jordan, associate superintendent for the Smokies. "There's nothing to help us gauge."

The park's eclipse committee has been holding marathon-planning sessions twice a month since January to coordinate the big day.

"This is the largest single event we've ever had in the park, because it is in so many locations," Sachs said. "It's all hands on deck."

The Smokies has taken a two-fold approach. Clingman's Dome, the highest point in the park, will be closed for a ticketed-only event—the 1,350 spots sold out in just four minutes back in February. Closing Clingman's Dome was deemed a necessary evil.

"We would have had something of a nightmare on our hands that could be detrimental to the protection of resources, and potentially a really lousy visitor experience as tons of people try to flood in and then get gridlocked by traffic," Jordan said.

Not all of the park falls in the path of totality, but two areas that do have been

designated as public viewing sites—the field at Oconaluftee Visitor Center in North Carolina and Cades Cove in Tennessee

If and when the park reaches capacity, it will shut down the main entrances. Usually, park visitors stop at overlooks, take a gander, and keep moving.

"But in this case, once they settle in to a spot they will be there for the duration," Jordan said."

ON THE ROAD

Outside of the national park, there's plenty of public land in the Smoky Mountains for eclipse watching—from the Nantahala National Forest in North Carolina to the Cherokee National Forest in Tennessee.

"National forests can't close," said John Innes with the Partners of Cherokee National Forest. "People will do their level best to get to the center of totality. The path rolls right through the Cherokee National Forest, so we thought we better pay some attention to this."

Innes realized early on there would be a lot of people pressing in to the path of totality who have no idea where they're going. Especially when they lose cell signal and their map apps quit working.

To help people chart their way through eclipse territory, Innes rolled out a commemorative eclipse map of the Smoky Mountain region with a focus on public lands and outdoor recreation spots.

"This is a way to keep control of your experience and enjoyment and not miss a minute of it," Innes said.

You can order the eclipse map through the Great Smoky Mountains Associations online store.

With the eclipse bisecting Tennessee, a whopping 17 Tennessee state parks fall in the path of totality.

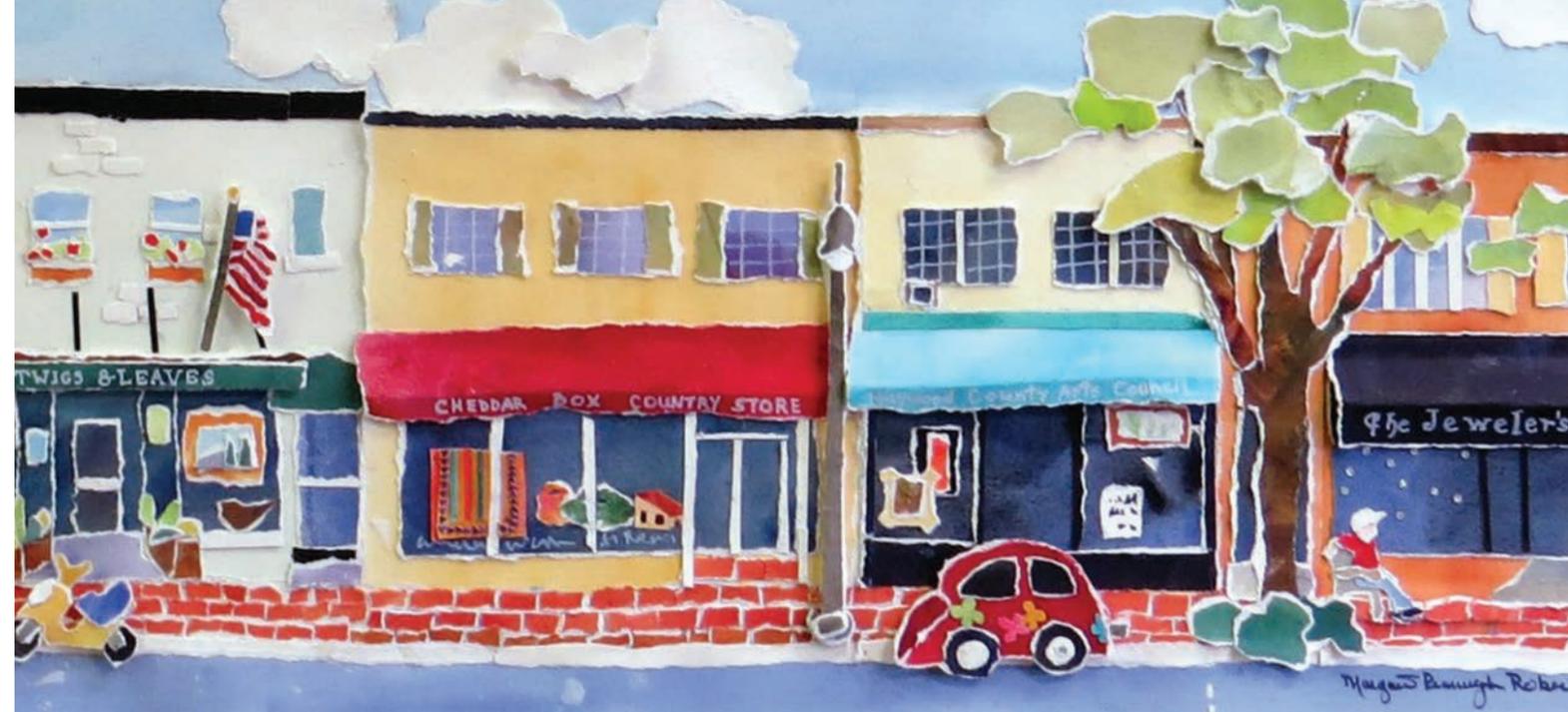
"Everybody is fascinated with this and I think it is a great opportunity to introduce the sky into our realm of consciousness," said Jeff Wells, programming director for the Tennessee State Parks system.

Communities of the Smokies have rallied to a monumental occasion, taking every measure possible to pull off the eclipse weekend without a hitch.

Unfortunately, some on the front lines won't actually see the celestial show they've worked so hard for.

Jordan has no false notion of watching the eclipse from a lawn chair.

"I will be sweating it out, hoping that a million moving parts on that day go smoothly," Jordan said.



Waynesville

NORTH CAROLINA SMOKIES

UPCOMING EVENTS

2017

- 6.2 & 7.7** **Art After Dark - Waynesville Gallery Association**
Ten downtown galleries and other businesses remain open. Artists' receptions, demonstrations, and musicians fill the galleries and sidewalks. Join us for a special evening. WaynesvilleGalleryAssociation.com
- 6.10** **Appalachian Lifestyle Celebration - Downtown Waynesville**
Protecting & preserving our historical & cultural resources through a heritage themed event. Booths line Main Street. Exhibits include educational, demonstrations, and selling handmade Appalachian art and crafts. Music lovers will enjoy tapping their toes to the music of banjos and fiddles while professional cloggers and dancers perform. DowntownWaynesville.com
- 6.23, 7.7 & 7.21** **Mountain Street Dances - Downtown Waynesville**
Enjoy cloggin' and square dancin' at an old-fashioned mountain hoe down! Live mountain music, demonstrations and instruction by local clogging teams. DowntownWaynesville.com
- 7.4** **Stars and Stripes - Downtown Waynesville**
Live music venues and entertainment. Kids on Main features a patriotic children's parade and ice cream served to parade participants! DowntownWaynesville.com
- 7.22** **Folkmoot: Parade of Nations Weekend**
Join the Folkmoot international groups in a 34-year tradition and meet the world on Main Street. The celebration begins on July 20th and runs through July 30th. Many colorful, exciting events take place at venues all over Haywood County. Folkmoot.org
- 7.29** **Folkmoot: International Festival Weekend**
The Folkmoot Festival Day (Saturday, 7/29) is a tradition, hosting artisan vendors, food and our international group performances on Main Street in Downtown Waynesville. The 10-day celebration culminates with the festival and a candle light closing ceremony. Folkmoot.org

www.ExperienceWaynesville.com

Try These Stellar Astronomy Sites in the Smokies

PISGAH ASTRONOMICAL RESEARCH STATION, BREVARD, NORTH CAROLINA Take a tour of the former NASA tracking station to learn about its role in the space program and its current research. See its massive dish telescopes, historic scientific instruments, space shuttle artifacts, and a meteorite collection including pieces of Mars and the moon. Stroll the Galaxy Walk, a scale model of the solar system. Check for regular stargazing sessions, education workshops and astronomy talks. pari.edu.



- BAYS MOUNTAIN PARK, KINGSPORT, TENNESSEE** Domed planetarium theater and observatory with star gazing sessions and astronomy talks. An eclipse planetarium show "Totality" is playing through August 20. baysmountain.com.
- UNIVERSITY OF NORTH GEORGIA, DAHLONEGA, GEORGIA** Coleman Planetarium shows, astronomy talks and star-gazing sessions at the North Georgia Astronomical Observatory. ung.edu/observatory.
- ASHEVILLE ASTRONOMY CLUB, ASHEVILLE, NORTH CAROLINA** Public star-gazing sessions at Lookout Mountain Observatory and dark sky locations, plus monthly astronomy programs. www.astroasheville.org.
- UNIVERSITY OF TENNESSEE, KNOXVILLE, TENNESSEE** Public star gazing sessions from the physics roof. www.phys.utk.edu/trdc.



Shooting For the Moon

PISGAH ASTRONOMICAL RESEARCH INSTITUTE POISED TO CAPTURE ECLIPSE

By a celestial stroke of luck, the total eclipse will swoop over the colossal dish telescopes of the Pisgah Astronomical Research Institute near Brevard, North Carolina.

Once a secret NASA satellite and tracking station critical to the space race and the Cold War, PARI is now a powerhouse of astronomical research and science outreach. Its giant equipment is too big to bring to an eclipse, but the stars have aligned to bring an eclipse to it.

"There is no history of anything like that happening," says Don Cline, a philanthropist and science advocate who

rescued PARI from demolition and turned it into a non-profit research and education center.

Legions of researchers and astronomers will converge at PARI to study the eclipse and broadcast live footage. PARI's radio technology captures the electromagnetic spectrum and will work even if there's cloud cover during the eclipse—unlike normal optical telescopes.

It's a great cosmic coincidence that we have a total eclipse at all. If the moon was any smaller, or further away from earth, part of the sun would always hang out.

But the geometry is just right. The sun is 400 times bigger than the moon, but the moon is 400 times closer to earth—so it's a perfect fit.

Science on the horizon

Most of America will have their eyes on the sky when the solar eclipse sweeps the nation, but not Justin Hess.

He will have his head down, buried in the monitor of a base tracking station capturing data from 15 miles above the earth's surface.

Hess is part of research team with Southwestern Community College in Sylva, North Carolina, that will broadcast live feeds of the eclipse from a weather balloon high in the atmosphere, along with the robust data collection.

The research is funded by a \$1.4 million science education and outreach grant from NASA. The eclipse was the clincher in landing the grant.



Trial launch of SCC weather-balloon collecting atmospheric data during eclipse.

"The eclipse was a way to put yourself all the way through the door all at once," said Matt Cass, the science chair of SCC and head of the Smoky Mountain STEM Collaborative. "The eclipse is one 'big small part' of what we are doing. This is really about building a more scientifically literate public."

The eclipse has rocketed science to the forefront. Astronomy programs, eclipse stations and portable planetarium shows are regulars on the calendar of the Fontana Regional Library system, which also has a fleet of loaner telescopes to check out.

"We don't see the solar eclipse as the finish line—this is the starting point," Cass said. "We are hoping this event will be so impressive that the effects will last."



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Connecting the Dots

ASHEVILLE ASTRONOMY CLUB BRINGS THE CONSTELLATIONS WITHIN REACH

A thin beam of dimmed headlights slid around the last curve of the snaking switchbacks to Lookout Mountain Observatory, the doors of a shuttle bus swung open and a crowd of eager star gazers piled out into the night.

"Good evening! Welcome to Lookout," calls Judy Beck, a member of the Asheville Astronomy Club and physics professor at UNC-Asheville. "We've got lots of telescopes. Just walk on up and ask these folks what they are looking at and they will happily show you."

The Asheville Astronomy Club is one of the largest and most active in the nation, and club members live to share their passion for the stars.

"We are like travelers around the sky. We are good at pointing things out to people and giving them some short little trivia they can take home with them," says Dominic Lesnar, the club president.

Of course, anyone can do astronomy, any time, by simply stepping into their backyard. But having a tour guide to the constellations makes all the difference.

"I can look up and say 'ooohh, aaahh,' but it is nice to have people explaining what you were seeing," says Carolyn

Williams, who made the trip up the mountain from Asheville.

As Gabbi Mellow ponied up to the eye piece of a Celestron telescope as big as a cannon, she gasped and recoiled in amazement.

"There is so much there we don't normally see. That's the crazy part," says Mellow, whose boyfriend brought her to the star gaze on a date night.

Some in the crowd spent months on a waiting list to land one of the 300 coveted spots at Lookout Mountain—an observatory managed collaboratively by the club and UNC-Asheville—but you never know where you might encounter these astronomy hounds. Aside from special visits to schools and community groups, club members often pitch their telescopes for spontaneous night sky viewing sessions in public places.

"For anyone who drives by and wants to take a look," explains Knox Warde, an active club member. "Getting people interested in astronomy and science is a good thing."

When Warde moved to the Nantahala River in Western North Carolina, he envisioned days filled with whitewater paddling. But lately, he's found a different hobby.

If he wakes up to a sunny day with nowhere to be, he packs up his solar telescope, his folding easels and foam board eclipse displays, slips on one of his many astronomy themed T-shirts, and heads into the Great Smoky Mountains National Park, where he sets up an impromptu astronomy station outside the Oconaluftee Visitor Center. A line forms around him in no time.

"I actually have some people say the highlight of their visit to the park was

looking at the sun through a telescope," Warde said.

Thanks to the Asheville Astronomy Club, anyone with a library card in Western North Carolina can check out a telescope and view the night sky on their own. The club piloted its first telescope loaner program at the downtown Asheville library a few years ago. They quickly found one wasn't enough.

"There was a 20-month waiting list to check it out, so we got a second one, and then a third one," says Warde.



After the club donated a telescope to the library in Franklin, North Carolina, the interest was so great—spurred in part by the coming solar eclipse—that the library director landed a grant to buy seven more.

The Asheville Astronomy Club draws members from a two-hour radius who crave a support group for their hobby, like George Stephens of Clemson, South Carolina. He discovered his inner astronomer during night motorcycle rides on the Blue Ridge Parkway.

"I'd stop at an overlook and lay on my back and just scan the sky with my binoculars for an hour, and turn around and head back home," Stephens says.

When he graduated to a telescope, he looked up the club to find kindred spirits. Lesnar, a self-described "rouge astronomer" before he connected with the club, got addicted to astronomy as a boy after his parents bought him a cheap telescope.

"It was a portal to another world for me," he says. "I saw a view of Saturn and forget about it, I was hooked." SML

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