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So Long, Starry Night

Local Activists Raise Awareness About Light Pollution, Effects On Night Sky

Story by SARAH STACY

An unlikely collaboration between a scientist and an English professor has sparked a week-long campaign addressing light pollution — the first in the world of its kind.

James Madison University faculty members Dr. Shanil Virani, who lectures in the department of physics and astronomy and directs the John C. Wells Planetarium, and Dr. Paul Bogard, English professor and author of “The End of Night: Searching for Natural Darkness in an Age of Artificial Light,” have teamed up to present Starry Nights Harrisonburg, a series of events intended to raise awareness about light pollution starting March 24.

According to the official press release, light pollution is “the overuse and misuse of artificial light at night,” something that has risen dramatically during the past 50 years with increased industrialization.

However, light pollution “is almost entirely unnecessary,” reads the release.

Many individuals may not be aware of the immense light that is wasted by street



Chesapeake Hall (left) and the UREC Turf field (back, center) light up the night sky March 4 on the James Madison University campus.

lights, billboards and parking lots, and others may not realize the consequences of light pollution, including the elimination of a dark sky.

And so, the creators of the campaign hope to pose a poignant question: “What do we lose when we lose the night?”

Star Light

As an astronomer, Vi-

rani says this is a question with which he struggles regularly.

The importance of being able to view the nighttime sky is immeasurable for scientists, but that’s becoming increasingly rare as light pollution leads to the loss of darkness.

According to the award-winning documentary, “The City

Dark,” light pollution is caused by over-illumination, as light is misdirected upward or outward into the sky, which reflects off dust and moisture in the air and creates a glow that eliminates nighttime.

“[Light pollution] kind of looks like that yellowish haze above the city,” Virani explained. “You’ve seen it on a cloudy night

when that light gets reflected back down.

“When you see that haze, that’s what light pollution is and what that’s doing to us is erasing the nighttime sky.”

Light pollution carries other consequences, as well.

The International Dark-Sky Association estimates that \$110 billion dollars is wasted annually worldwide in producing unnecessary light.

“That’s enough light to power eight million homes in the United States every year, and that’s just the light we waste,” Virani said. “Light pollution represents an enormous waste of money, an enormous waste of resources.”

It’s also detrimental to nature. The baby turtles who hatch from the eggs laid on the coast of Florida instinctively know to go toward the brightest horizon, which was the ocean as moonlight was reflected off of it.

However, the brightest horizon in the last several decades is the land, which leads the turtles astray

from the water — the place they need to go for survival.

“Baby turtles are dying

“We’ve taken what was one of the most common human experiences, which is walking out at night and seeing the universe, and we’ve made it one of the most rare human experiences.”

— DR. PAUL BOGARD,

PROFESSOR OF ENGLISH AT JAMES MADISON UNIVERSITY

Professors, City To Discuss Light Pollution Solutions, Reclaiming Night Sky

Light

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in huge numbers ... because they're going the wrong way," Virani explained.

Birds are also dying in increasing numbers after becoming disoriented in the bright lights of cities. The National Audubon Society estimates that up to a billion birds die in the U.S. each year during the migration season due to light pollution.

Other nocturnal species are also becoming endangered because they need the night for survival — one approaching extinction itself.

Jeff Storey, a junior physics major at JMU and undergraduate planetarium operator, has spent years studying the migratory paths of certain species, and he's witnessed the effects light pollution has on these animals.

"Species are disappearing, and every species that disappears has a huge ripple effect through the ecosystem," he explained.

Light pollution also directly affects humans.

The World Health Organization now includes shift work as a possible carcinogen, since excessive light disrupts an individual's circadian rhythm. WHO has found that women who work night shift have a 1 ½ to 2 times the rate of breast cancer, the same correlation being true for men and prostate cancer.

"So, why should we care about light pollution?" Virani asks. "Because it's harming us."

Star Bright

Bogard's interest in the sky originated from a different source. He remembers the impact the stars had on him at an early age, a love that found its way into his writing.

Several years ago, Bogard began working on a written work that would capture the loss of night. Titled "The End of Night: Searching for Natural Darkness in an Age of Artificial Light," the book, which was published last July, documents Bogard's travels across the country and his discoveries regarding light pollution.

"It's a work of creative non-fiction, so it's full of stories of me looking for darkness," Bogard explained.

"I think it came originally from just a love of nighttime," Bogard explained of the book's origins. "I've always loved night; I grew up in Northern Minnesota, where the nights were still really dark when I was there. So, I got to see the Milky Way every night and that really made an impression on me."

However, more than 98 percent of the American population can no longer see the Milky Way due to light pollution, and even those who are able to catch a glimpse of the spectacular sight no longer do so in the way it's meant to be seen.

"We've taken what was one of the most common human experiences, which is walking out at night and seeing the universe, and we've made it one of the most rare human experiences," Bogard said.

Bogard posits that this drastic change in how people view the sky has a deep impact on humanity.

"We're losing contact with this beautiful, inspiring, moving experience of true darkness," Bogard said. "Something that's made us human forever."

Bogard references a Vincent van Gogh painting, titled "The Starry Night," which illustrates starlight reflected in water — the view Van Gogh saw from his window. But that same place where he painted this iconic image is now overtaken by light pollution, no longer revealing the sky as it was once.

"How many young Van Goghs are out there that are not being inspired?" Bogard asks, adding that contemplating darkness is important for every aspect of life, especially spiritual and mental life.

"It affects everything about being a human," Bogard says of looking at the dark sky.

"We're robbing our children of an opportunity to know an important part of life."

Addressing The Issue

Although light pollution poses serious threats, it's an issue that often goes undiscussed.

"It's something that a lot of people don't know about or haven't thought that much about," Bogard says.

But despite the immensity of the problem, it's an issue that's easily solved by reexamining how light is used — something the two creators hope to demonstrate during this week-long series that will connect James Madison University and the city of Harrisonburg.

"We're not advocating the elimination of light; we're advocating the intelligent use of light," Virani explained.

Thinking about using light more intelligently requires addressing how much light is distributed and where it's directed.

Storey describes it like this: Imagine an uncovered street lamp that directs light in every direction. Each streetlight represents an entire pie chart.

"That's 100 percent of the light, the whole pie chart," he said. "We only need maybe 40 percent of it, so we're wasting 60 percent of the light."

That's because only the light directed toward the ground is truly necessary.

"[The lights that] goes up and sideways are lights that will never be used by anybody, even if there was somebody there," Storey said.

By simply covering lights with a fixture that directs the light down, money is saved, as less light is used, and light pollution is reduced. This also provides safer paths.

Although there's a belief that more light provides more safety and security, this fallacy has been disproven, as too much light actually creates a blinding glare, in addition to light pollution.

It's also important to address the type of light that's used. LED lights, though more energy efficient, are brighter and could, therefore, worsen

light pollution if not properly used.

Turning off unnecessary lights is another way to help solve the issue.

"Fixing [light pollution] is a win, win, win" Storey said.

"It will take a little bit of will ...[but] we can correct the way we use light and energy and leave a better world for our kids."

First Of Many

Virani and Bogard say they're excited for the event, which they hope to make into an annual occurrence.

They're also thrilled that Harrisonburg and JMU are in positions to be leaders when it comes to the issue of light pollution.

"A lot of communities, now, are coming to this crossroads where they've got antiquated light structures that either have to be replaced or new ones installed," Virani said.

"I think then we have a real opportunity for Harrisonburg to be the path finder, to show how you can have a modern-sized city, light it so it's safe and secure for its citizens, and at the same time, recoup an enormous amount of savings."

"As a city tax payer, why wouldn't you want the city to do this? As a JMU student, why wouldn't you want the university to do this?" Virani asks.

Virani and Bogard hope the event will help lead a conversation about the intelligent use of light and the importance of darkness.

"Light pollution is an enormous problem but the fix is simple," Virani said. "It's one of those problems that we can solve right now."

"We just have to have the will."

Starry Nights Harrisonburg will be held March 24-29. For a detailed schedule of events, visit jmu.edu/planetarium.

For more information about Dr. Bogard and his book, visit paul-bogard.com.

Contact Sarah Stacy at 574-6292 or [sstacy@dnronline.com](mailto:ssstacy@dnronline.com).

Interested In Attending?

■ Monday, March 24: Screening of "The City Dark," followed by a panel discussion, will be held from 7-10 p.m. at Court Square Theater. A star party will follow from downtown Harrisonburg.

■ Tuesday, March 25: Bogard presents his critically-acclaimed book "The End of Night: Searching for Darkness in an Age of Artificial Light," from 7-8:30 p.m. in Miller Hall, JMU. Followed by an on-campus star party.

■ Wednesday, March 26: "What Can We Do About Light Pollution and Why Should We?" A public forum on solutions to light pollution in Harrisonburg and the Shenandoah Valley will be held at 8 p.m. in downtown Harrisonburg.

■ Thursday, March 27: Panel discussion, "The Campus at Night: Controlling Light Pollution at JMU while saving money and maintaining safety," will be held from 7-9 p.m. in Wilson Hall Auditorium, JMU.

■ Friday, March 28: City-wide celebration of the night, including night hikes, night bikes, astrophotography, planetarium shows, sidewalk telescope observing and more, beginning at 8 p.m. at the Edith J. Carrier Arboretum and other locations.

■ Saturday, March 29: Results of community-wide short film competition on light pollution in our community will be held from 6:30-7:30 p.m. at Court Square Theater. Earth Hour will be celebrated from 8-10 p.m. at the JMU Astronomy Park.