For billions of years, life on Earth evolved to a predictable rhythm of day and night. It’s encoded in the DNA of most plants and animals. But less than 100 years ago, humans began to radically disrupt this cycle by lighting up the night.

So, it is important to ask:

“What do we lose, when we lose the night?”
An Inspiring Movie Night among Stars and Fireflies

Agenda:

5:30 pm  Welcome, Introductions & Refreshments
6:00 pm  The City Dark (60 min), a documentary on light pollution
7:00 pm  Panel moderated by the International Dark-Sky Association
7:30 pm  Brilliant Darkness (12 min) & conversation with Executive Producer Dr. James Karl Fisher
8:00 pm  Draw for Prizes (must be present to win)
An Inspiring Movie Night among Stars and Fireflies

This event is free and open to the public, thanks to the generosity of the sponsors:

Broward APA
Anne Kolb Nature Center
Broward County Environmental Planning and Community Resilience Division
International Dark-Sky Association
Point of View (POV)
Zoological Lighting Institute
Geographers Catherine Rich and Travis Longcore once asked,

“What if we woke up one morning only to realize that all of the conservation planning ... only told half the story – the daytime story?”

Good question. Is our diurnal basis affecting our ability to properly plan the night in our communities?

Light pollution is steadily growing and is not just a problem for sea turtles. Light pollution is the result of ineffective outdoor lighting. NASA images depict Florida among the most light-polluted regions in America and National Park Service night sky quality images show that urban skyglow can impact many miles away.

Light pollution is an interdisciplinary problem that affects many aspects of our communities, such as biodiversity, energy, property rights and human safety. Many species, including insects, birds, plants, fish and humans, can be adversely affected by artificial light. Evidence is growing that “white” light, rich in blue/green, can disrupt the circadian rhythms of many organisms and worsen skyglow. Light glare, trespass and skyglow are signs of wasted electricity. Poorly-aimed bright lighting is a nuisance that leads to legal disputes. Disability glare affects driver and pedestrian safety. Light pollution deprives us of activities associated with the night sky. It robs children of inspiration and contributes to their nature deficit.

continued on next page
In Florida, inland light pollution is often not adequately addressed in urban planning.

The International Dark-Sky Association offers a designation incentive program that rewards communities and protected areas that proactively address light pollution. Since its inception, more than 40 places have earned a designation, including Harmony, the first Dark Sky Development of Distinction. Everglades National Park and Big Cypress National Preserve are currently taking steps to earn one too.

Let us plan for the night responsibly. To learn more, visit [www.darksky.org](http://www.darksky.org) and check out NPS night sky data at [www.nature.nps.gov/night](http://www.nature.nps.gov/night).

Diana Umpierre is a Board Director with the International Dark-Sky Association and can be reached at TierraWorld@gmail.com.

Greg Golgowski leads the IDA Central Florida chapter and served as Harmony’s Director of Conservation and Environmental Programs. He can be reached at Golgowski@gmail.com.
FINDING OUR PLACE IN THE UNIVERSE:
This Holiday Season, Give the Gift of the Stars

by Richard Louv | Dec 8, 2015 | Columns by Richard Louv, THE NEW NATURE MOVEMENT | 0 comments

About the Author

Richard Louv is Co-Founder and Chairman Emeritus of the Children & Nature Network, an organization supporting the international movement to connect children, their families and their communities to the natural world. He is the author of eight books, including "Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder" and "The Nature Principle." His ninth book, "Vitamin N," will be published in April. In 2008, he was awarded the Audubon Medal.

A few years ago, Madhu Narayan, a Girl Scout leader in San Diego told me this story: “In my first counseling job, with another organization, I took children with AIDS to the mountains who had never been out of their urban neighborhoods.

“One night, a nine-year-old woke me up,” said Narayan. “She had to go to the bathroom. We stepped outside the tent and she looked up. She gasped and grabbed my leg. She had never seen the stars before. That night, I saw the power of nature on a child. She was a changed person. “From that moment on, she saw everything, even the camouflaged lizard that everyone else skipped by. She used her senses. She was awake.”

These days, for children and adults, sky blindness is common. In the journal Environmental Health Perspectives researcher Ron Chepesiuk reports, “When a 1994 earthquake knocked out the power in Los Angeles, many anxious residents called local emergency centers to report seeing a strange ‘giant, silvery cloud’ in the dark sky. What they were really seeing — for the first time — was the Milky Way, long obliterated by the urban sky glow.”

Two-thirds of the U.S. population and more than one-half of the European population may have already lost the ability to see the Milky Way with the naked eye. When air pollution and urban domes of artificial light obscure our view of the night sky, our mental and physical health pay a price. Stars or no stars, natural darkness has value; our biological clocks count on it. Researchers in Israel have linked the amount of artificial nighttime light to higher rates of breast cancer.

Although some cities now require low-pressure sodium streetlights and other light-pollution controls, regulation alone won’t cure sky blindness, in daytime or night. What we need most is a perception of value: schools, sky-watcher groups, amateur meteorologists, and even technology can help. Star charts in our smartphones, for example. So can getting involved with groups that work for the sky. Three groups listed below, including the International Dark-Sky Association are dedicated to the protection of starry night skies.

“Part of my inspiration to protect the night are the memories I shared with my late father, such as watching the Geminids meteor shower over the Everglades,” says Diana Umpierre, a member of the board of directors of IDA. “No child or parent should be denied that right. No child should be left without stars.”

Ultimately, our relation to the sky is about wonder. Trevor Hancock, a professor at the University of Victoria’s School of Public Health and Social Policy, asks this question: “If we can’t see the stars, how will we know our place in the universe?” Perhaps during this holiday season, on a cold clear night, you can give your family and yourself the universe.
If you’re lucky enough to live in a place where stars are easily seen, even a bedroom can be a portal to the cosmos. Window-based stargazing or cloudspotting can be especially valuable for children and adults with illnesses disabilities that require them to stay indoors.

David Davis, a conservationist in the Chesapeake Bay watershed, has worked as a cartographer and a strategist for applied science organizations, offers some practical suggestions for stargazing in his excellent blog essay, A Dad Delivers Wilderness Nightly to His Kids —Here is How You Can Too. “You don’t need a telescope to get started. In fact, I’d advise against getting one for a while,” he writes. “Young kids have a hard time focusing on objects using a telescope… A pair of binoculars can resolve lunar craters or reveal that Venus has phases, much like our Moon. If you already own these, then by all means use them, but there’s no need to dash out to spend on them.”

He expands on the following tips: It’s OK if the kids get distracted. Look at a sky chart beforehand and have a plan for what you’re going to look at. Start with an easy target: If you’re not sure what observe first, try the Moon. Choose a sky-watching spot where you can sit or lie down, preferably away from bright lights. Check the weather and bundle up. Make sure you’ll have clear skies. Minimize flashlight use and let eyes adjust to the dark for 15 minutes. Have hot drinks when you get back inside.

Here’s another suggestion. Leave town. Go camping, or on a clear night drive beyond the dome of urban light. One of my favorite memories is of driving east with my younger son, Matthew, to watch a massive meteor shower. Along a mountain road, we found a ditch and climbed down into it, and lay on our backs for an hour watching identified flying objects streak across the sky. Stargate.org and EarthSky.org offer schedules for upcoming media showers.

One summer, my older son, Jason, then 14, and I travelled deep into the Mexican state of Baja in our old van, where we joined a group of anglers and Mexican cowboys who served as our guides. On horses and mules, we rode down into a canyon on the Rio Santo Domingo – so deep that even our radios could not hear civilization. There, we looked for the last members of an ancient genetic strain of trout, and found them. For hours, without fishing, we watched them move and flash like swirling galaxies in the deep pools.

On the last night of the trip, a few of us set up folding chairs just beyond the ring of light from the campfire. The last bats dipped and turned. One of the fly-fishermen, Peter, a likable, soft-spoken man, was an amateur astronomer. We watched the sweep of the beam of Peter’s flashlight as he pointed to the stars. He connected the dots to show us the patterns that the ancients had first seen, perhaps after collecting their fish from weirs or single lines. He located several constellations for us. We peered at them through binoculars. He pointed out three stars and told us to follow the line between the stars and then go up one star to the left and there was Andromeda, a milky spot scarcely visible.

“That is the only spiral galaxy visible to the naked eye, except of course our own,” he said. “See, look…. you can see that we are in an arm of the spiral, looking back into the Milky Way to quite literally the center of our galaxy.”
Andromeda, he added, is named for a princess from Greek mythology, chained to a rock as a sacrifice to a sea monster, and saved by Perseus, her future husband. We watched a satellite move above us, blinking. Peter turned off his flashlight and the universe grew brighter.

The others drifted back to their tents. One of the cowboys poured dirt on the campfire. He faded into the darkness and we were alone. We pushed the chairs aside. We lay down in the sand. I experienced that strange feeling of falling upward. We looked into the past. “You know,” said Peter, “when I was younger, growing up in the Midwest, I took the sky for granted.” I remember thinking: Maybe fishing is not as much about introspection, as advertised, as it is about outer inspection, a good excuse to look into water or up at stars.

After a while, Peter said goodnight and left, but my son and I remained, looking upward. The desert cold crept into our bones. We could not see each other clearly. In the dark, Jason began to talk about school – an unusual act for any teenager. An hour later, we stood, brushed the sand off and walked back to our tent. Slipping into his sleeping bag, Jason said, “Dad, did you know that dolphins have more highly evolved brains than humans? They have more wrinkles on their brains. But nobody knows what they think about.”

“No, I didn’t know that.” I turned off the flashlight, and lay there with my hands under my head. Jason settled down in his bag. We watched the universe through the netting above. A few minutes passed. He spoke again. “There’s this great scene in the The Hitchhiker at the End of the Galaxy,” he said, referring to the trilogy of novels by Douglas Adams. “At the end, the dolphins escape from Earth and they leave this message for the humans: ‘So long, and thanks for all the fish.’”

I smiled in the dark. Perhaps we both did, until we slept.

Richard Louv is chairman emeritus of the Children & Nature Network and author of THE NATURE PRINCIPLE: Reconnecting With Life in a Virtual Age and LAST CHILD IN THE WOODS: Saving Our Children from Nature-Deficit Disorder. His newest book, VITAMIN N, will be published in April. It offers 500 ways to build a nature-rich life. Follow Rich Louv on Facebook and @RichLouv on Twitter


Other reading and resources:

FOLLOWING STARS: Under the Dome of the Universe, Every Night is Father’s Day

Gazing At Stars Rather Than Screens

Stargate.org and EarthSky.org offer schedules for upcoming meteor showers

To help protect our view of the stars, see the International Dark-Sky Association, For Spacious Skies, Dark Sky Initiative
The light-emitting diode (LED) is transforming the way we light our cities and towns, offering a once-in-a-lifetime chance to radically improve how we use energy and our outdoor spaces at night. With this opportunity comes an obligation to manage these changes responsibly and sustainably. The stakes are high and the potential rewards great, but outcomes depend critically on policymakers and the public having access to reliable information. IDA developed this document to provide planners, lighting designers and public officials an overview of the most important aspects of LED lighting and the choices and challenges involved in its municipal implementation.

What is LED?
LEDs use solid-state technology to convert electricity into light. They are a variant of semiconductor devices that enable miniaturized computing devices like PCs and smartphones. Put simply, LEDs are very small light bulbs that fit into an electrical circuit. Unlike traditional incandescent bulbs, they don't have a filament that burns out and they don't get very warm.

Initially, LEDs only emitted red, yellow, or green light, but now white LEDs are widely available. Early LEDs were relatively inefficient regarding energy use and the amount of light emitted, but due to technological advances LED efficiency and light output have doubled about every three years. Because of their improved quality and lower prices, LEDs are now replacing conventional high-intensity discharge (HID) lamp types for outdoor lighting in communities around the world.

Why Adopt This Technology?
LEDs are very efficient at converting electrical energy to light. This means LED lighting can generate the same quantity of light for a fraction of the cost and energy usage compared to conventional lighting technologies. The use of LED lamps coupled with modern luminaire design allows for reduced illuminance without compromising safety. LEDs help lower carbon emissions by reducing the demand for energy, which is still largely produced by burning fossil fuels. Another benefit of LEDs is better control over the spectral content of light. There are many LED options available that provide accurate color rendition without emitting excessive amounts of potentially harmful blue light. (see below).

Relative to other commonly used outdoor lamps LEDs are thought to be extremely long-lived. Laboratory studies indicate lifetime ratings in the range of 25,000-100,000 hours of continuous operation, making them virtually maintenance-free. When turned on, LEDs are instantly at full brightness, unlike HID lamps that have a significant time delay. LEDs also have very low mini-
mum energy thresholds to produce light, meaning they can be dimmed to much lower illumination levels when less light is needed, resulting in further energy savings.

**Product Selection Considerations**

Choosing LED products for outdoor lighting applications involves a series of considerations and tradeoffs. These include:

- **Luminous Efficiency** (Watts-to-lumens): How many lumens of light are produced per input Watt of electricity? More importantly, how many lumens from the light source are meeting the task (“Fixture Lumens” vs. “Lamp Lumens”)
- **Lumen Output**: How much light is produced relative to the amount required for a particular task? When replacing existing fixtures it is important to use the only level of illumination needed, and not to adopt unneeded increases in brightness.
- **Correlated Color Temperature (CCT)**: Does the light have a "warm" or "cool" quality?
- **Color Rendering Index (CRI)**: How accurately does the light render colors to the human eye? A high CRI is not needed for all situations. The need for good color rendition should be considered relative to the lighting application in question.
- **Adaptive Control Integration**: Does the lighting make use of adaptive controls such as dimmers, timers, and/or motion sensors? These controls are the wave of the future in outdoor lighting and achieve additional energy savings, improve light source efficacy and increase visual task performance. It is important to build in the ability to make use of adaptive controls during the adoption of designs for new lighting installations, even if they will not immediately be implemented.
- **Heat Mitigation**: Is the lamp housing designed to adequately dissipate heat? Because LED efficiency decreases with rising operating temperature, controlling heat emitted by LED lamps is critical in warm climates.
- **Lumen Depreciation**: How robust is the lamp against efficiency loss over time? Manufacturers typically quote “L70,” the expected use time until a bulb reaches 70% of its initial light output.

Closely related to all these factors is expense: How much will LED replacement solutions cost? The price of commercial LED lighting products continues to drop, and capital cost recovery times for new LED street light installations, once 10 years or more, are now typically less than five years and continue to decline. As barriers to implementation fall, LED is gaining momentum as a lighting technology of choice in new outdoor installations.

**Blue Light Is Bad**

New technical capabilities often come with unanticipated challenges. White LED lighting often has significant levels of potentially hazardous blue light. IDA published a report1 in 2010 detailing the hazards of blue-rich white light sources. In the years since, scientific evidence has solidified around its conclusions.

Outdoor lighting with high blue light content is more likely to contribute to light pollution because it has a significantly larger geographic reach than lighting with less blue light. Blue-rich

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white light sources are also known to increase glare and compromise human vision, especially in the aging eye. These lights create potential road safety problems for motorists and pedestrians alike. In natural settings, blue light at night has been shown to adversely affect wildlife behavior and reproduction. This is true even in cities, which are often stopover points for migratory species.

The promise of cheaper outdoor lighting based on electricity and maintenance savings from LED conversion should be weighed against other factors, such as the blue light content of white LEDs. Blue-rich sources are the most efficient LEDs in terms of the conversion of electricity to light, and therefore have the lowest electricity cost to produce a given amount of light compared to “warmer,” less efficient white LED lamps. Every effort should be made to diminish or eliminate blue light exposure after dark.

**IDA Recommends**

There are already many white LED options now available on the outdoor lighting market and that number will only rise in the future. IDA has developed a set of recommendations for those choosing lighting systems. These suggestions will aid in the selection of lighting that is energy and cost efficient, yet ensures safety and security, protects wildlife, and promotes the goal of dark night skies. These include:

- **Always choose fully shielded fixtures** that emit no light upward
- **Use “warm-white” or filtered LEDs** (CCT < 3,000 K; S/P ratio < 1.2) to minimize blue emission
- **Look for products with adaptive controls** like dimmers, timers, and motion sensors
- **Consider dimming or turning off the lights during overnight hours**
- **Avoid the temptation to overlight** because of the higher luminous efficiency of LEDs.
- **Only light the exact space and in the amount required for particular tasks**

Learn more about outdoor lighting, blue light at night, and dark skies on the IDA website at [www.darksky.org](http://www.darksky.org).
Night Sky and Astronomy Programs, Winter 2015/2016

Join us for an evening of dark sky education and celebration! View one of the darkest night skies in the eastern United States this winter by attending ranger-led astronomy programs at Big Cypress National Preserve.

Presentations will include constellation tours and telescope viewing (weather permitting) of astronomical objects including stars, star clusters, planets, nebulae, and galaxies.

These events are free and open to the public.

Questions?
Please call (239) 695-1149

Where?
Programs will be conducted at the southern end of Seagrape Drive. The welcome center and Seagrape Drive are located along US 41, east of State Road 29, between mile marker 73 and 74.

Big Cypress Swamp Welcome Center
33000 Tamiami Trail East
Ochopee, FL 34141

Special Considerations:
Outdoor seating will not be available during the interpretive program, telescope viewing and constellation tours. Visitors are encouraged to bring lawn chairs or blankets if seating is desired. In case of inclement weather we may not be able to accommodate all participants for our alternate program opportunity inside the Welcome Center Auditorium. Be sure to check weather conditions for the Ochopee area prior to venturing to the program site.

Night temperatures can be cool and mosquitoes may be present. Visitors should be prepared for weather conditions. Presentations may be conducted in the welcome center auditorium if weather prevents night sky viewing.

Pants, long sleeve shirts or jackets and bug spray are recommended. Participants are encouraged to bring a red-light flashlight or headlamp for walking to and from the viewing area. Individuals and local astronomy societies are welcome to bring personal binoculars and telescopes to the viewing area.