

Nightscape

IN THIS ISSUE

Plan a trip for International Dark Sky Week

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+ more



From the Executive Director

In 2021, we experienced many challenges, and I honor this. I am also optimistic about this new year because we are making great strides toward eradicating light pollution.

We are proud of our recent work on the effects of satellite swarms on the night sky and thrilled about the expansion of our programs. Last year, we certified 37 new International Dark Sky Places, more than any year previously. Now there are a total of 195 dark-sky places for you to visit. You can read more about how to plan a trip in this issue. I'm already planning my next trip — to the Yorkshire Dales National Park in England, where my family lives. Where will you go? Let me know!

We now have the support of members in 61 countries and have engaged more than five million people around the world. Particularly exciting is the growth in IDA-approved light fixtures in the U.K., Australia, and other places around the world, making dark-sky-friendly lighting more readily available for homeowners everywhere.

Looking ahead, I am encouraged by growing awareness of light pollution and the actions to reverse it. This year IDA will continue to focus on supporting the growing global dark-sky movement with guidance, tools, and resources, and hosting global events like International Dark Sky Week and our innovative Under One Sky conference. We look forward to sharing your successes to inspire others to get engaged.

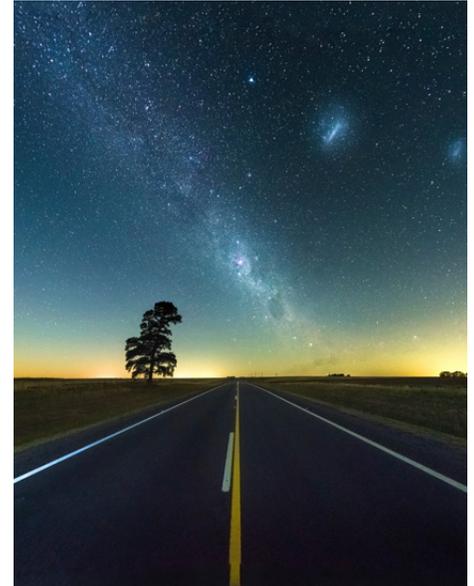
Imagine the impact and connection we all have with others worldwide, unified in a common belief in taking care of our planet.

We cannot do this without our tireless volunteer advocates, our small but mighty staff, brilliant Board of Directors, business partners, donors, and members like you. Your commitment to IDA means the world to us!



For the night,
Ruskin Hartley
ruskin@darksky.org

On the cover



“Road Less Traveled” by Dante Barreto

Nikon D7000, Rokinon 12mm, f2.8,
panorama (3 photos vertical), 20 seconds,
ISO 2000

“This photo was totally unexpected. That day we decided to travel a long distance to follow the rumor of a field of sunflowers near the city of Soriano (in Uruguay, these fields are not very common). Although the landscape with the sunflowers was incredible, the most amazing thing was the quality of the night sky in the area. In the photo you can see the Magellanic Clouds with total clarity, as well as the Carina Nebula (the brightest central area) and just below it, the Southern Cross aligning almost perfectly with the road.”

Connect with Dante:

Instagram
[instagram.com/dante_barreto_curbelo](https://www.instagram.com/dante_barreto_curbelo)

Photography Portfolio
myalbum.com/album/gURphKkcCPU6

From the Editor

It's easy to forget to stop and celebrate our wins, but I'm proud of what we have accomplished over the past year under ever-challenging circumstances. And I'm excited for another year at the helm of *Nightscape* with the support of the passionate staff at IDA. We will continue to highlight the incredible efforts of dark-sky defenders, advocates, members, donors, and supporters all over the world working to protect and restore the night.

This issue focuses on International Dark Sky Week, which runs April 22–30. I look forward to IDSW each year knowing there will be a multitude of webinars to learn from, events to attend, and stars to gaze at. I encourage anyone who is *safely* able, to get out and travel for Dark Sky Week (or anytime!). Dark-sky tourism supports the fight against light pollution, creates livelihoods for people, and is beneficial for the health and wellbeing of the traveler. In

the feature on page 6, we've offered tips on how to plan a trip to a dark location.

Also within:

- > An example of good lighting at a residence in Texas, U.S.
- > Meet IDA advocate Tim Brothers, who worked on a streetlight retrofit in his community
- > A roundup of new light-pollution research over the last six months
- > Advocate highlights from around the planet

Got something to say or have a beautiful photograph that you'd love to see in print? Send a Letter to the Editor or submit a photo for consideration to my email address below and we may publish it in a future issue of *Nightscape*.



Megan Eaves
nightscape@darksky.org



Did you know, many employers match your donations?

Ask your employer if they match charitable donations. To set up a matching gift to IDA contact Susan: susan@darksky.org
+1 520-347-6360

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Nightscape

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EDITOR: Megan Eaves

COMMUNICATIONS ASSOCIATE: Lauren Scorzafava

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GOOD LIGHTING

Twin Texas homes shine without overshining



- > useful
- > targeted
- > appropriate
- > controllable
- > warm-colored



Photo: Stephen Hummel/McDonald Observatory. Camera: Nikon Z7ii. Lens: Nikon Z 20mm 1.8s 30 second exposure at F/1.8 and ISO400

This section highlights examples of good lighting and best practice. Shown here are the private residences of Jim Martinez and Jim Fissell, located in Marfa, Texas, U.S., not far from McDonald Observatory.

These two guesthouses are illuminated with shielded, dimmable 2700K LED lights. The fixtures provide enough illumination to see safely, but their proper shielding prevents light from being wasted or producing glare. Even with the lights on, the Milky Way is clearly visible above in this single 30-second exposure.

Each of the Five Principles for Responsible Outdoor Lighting are addressed in this image:

- > the light is useful where it is placed,
- > it is targeted to where needed,
- > at a level appropriate for the situation,
- > controllable by dimming,
- > and using warm-colored sources.

The photo was shot by Stephen Hummel, Dark Skies Specialist at McDonald Observatory.

“Jim Martinez and I are the owners and designers of the casitas [guest-

houses] on our property. Jim designed the lighting and picked the light fixtures on the casitas and our main house. He has a long career in landscape design and construction and has always used similar systems of downward-directed lighting to eliminate excessive light pollution on his residential projects. The shields block the direct source of the light. He has also been a proponent of mimicking natural night skies/moonlight by always directing any exterior lights down, whether on buildings or in the landscape. All the fixtures (cast aluminum bullets in bronze tones) were made locally in Texas for minimal cost (\$30/each) and maximum lighting effect.” ★

– Jim Fissell

Discover the Night

Discover the Night this April 22–30

It may seem harmless, but light pollution has far-reaching consequences that are detrimental to all living things.

Effective outdoor lighting reduces light pollution, leading to a better quality of life for all. The dark-sky movement is working to bring better lighting to communities around the world so that all life can thrive.

Held April 22–30, International Dark Sky Week 2022 is a week of nighttime events and opportunities to connect over our shared goal to protect the

night from light pollution. Whether you're an International Dark Sky Place, IDA chapter, delegate, supporter, or a casual follower, there are plenty of ways to get involved.

Join us this year for International Dark Sky Week to learn more about the movement, and *discover the night* where you live. Learn more and find an event near you at idsw.darksky.org. ★



Travel the world virtually for
International Dark Sky Week

Globe at Night

April 22–May 1 · Everywhere

Light Pollution & the Environment

April 25 · Virtual event (on Zoom)

Cosmic Tribe Presents Exodus CL Sit

April 25 · Virtual event (Cosmic Tribe YouTube channel)

Dark Sky Pakistan Network

April 26 · Virtual event (Cosmic Tribe YouTube channel)

Astrophotography Basics

April 26 · Dr. Lawless International Dark Sky Park Michigan, U.S.

More events at idsw.darksky.org

Destination dark skies

PLAN A TRIP FOR INTERNATIONAL DARK SKY WEEK

When was the last time you saw a star-studded sky? Was it last night or long ago in childhood? Perhaps you're one of the millions who have never seen the Milky Way? This year, we encourage our members who can to get out and enjoy the night during International Dark Sky Week.

Visit idsw.darksky.org to discover all of the events taking place around the world. Here we've gathered ev-

erything you need to plan the perfect dark-sky getaway!

Finding a dark destination

To start, check out our [International Dark Sky Places \(darksky.org/places\)](https://darksky.org/places). IDA has designated 195 dark-sky places around the world, including 37 new ones in 2021. These are certified for their excellence in conserving the night through dark-sky-friendly lighting and public education.

Spot the Lyrids!

The Lyrid meteor shower is active each year from around April 15–29, this year coinciding with International Dark Sky Week. The expected peak in 2022 is overnight on April 21, with the best viewing time before the moon rises at around 2:30am on April 22. The Lyrids are visible worldwide, though the highest rates of meteors (10–20 per hour) occur in the Northern Hemisphere.

If you can't access an IDA-certified place, there may still be dark areas within reach. The [Scope Nights app](#) (iPhone/iPad) gives weather forecasts and shows dark-sky sites and observatories plotted on a light-pollution map. On the web, the lightpollutionmap.info is a detailed, interactive map of worldwide light pollution. Both can help you find dark areas and illustrate how prolific light pollution is around the world. To make new friends or meet up with others, check out the Meet Stargazers app (meetstargazers.com), created by IDA advocate Sujay Patil.

Planning your trip

With your destination decided, it's time to consider when to go. What do you hope to experience during your visit? Maybe an astronomical event or the light of a full moon? Check out Time and Date (timeanddate.com/astronomy/sights-to-see.html) for an annual calendar of astronomical events like new and full moons, meteor showers, and eclipses. Watch the weather forecast and find a time when dry conditions are likely. Before you book, check with the park or site for up-to-date information

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about hours, closures, weather, Covid restrictions, and any planned events.

Exploring the night

Attending a local dark-sky event is a great way to connect with your community and learn from astronomers or nocturnal biologists. Star-gazing events are often scheduled at new moons when the stars are most visible, though the moon itself is beautiful and easy to view. Many parks also host special events on nocturnal creatures like bats and owls.

Apps like [SkyView](#) and [Stellarium](#)

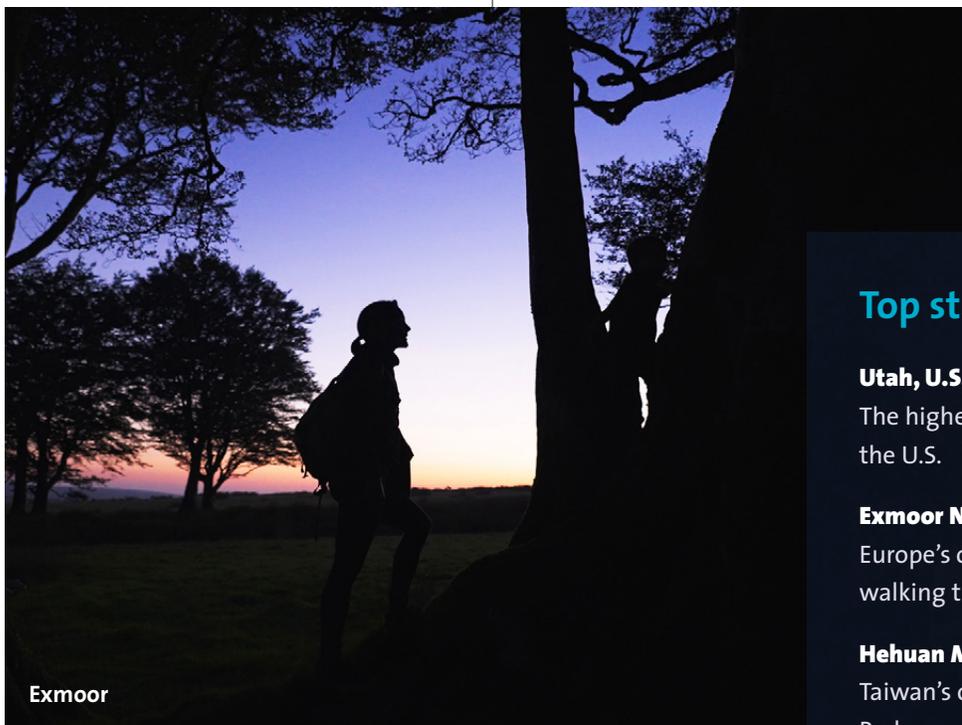
can help you explore the night sky on your own with augmented reality, letting you point your phone at the sky to find constellations and objects. Trying to spot the International Space Station flying overhead is also fun — the [ISS Finder](#) app is a handy tracker.

Being a good guest

When visiting a dark place, remember that there are likely to be others around you eager to experience the beauty of the night, too. Review all regulations about park access and photography before you visit.

Dark-sky etiquette tips:

- › Use a red headlamp/flashlight to preserve night vision.
- › Switch off vehicle lights.
- › Use dimmed or red campsite lighting only when necessary.
- › Ask nearby astrophotographers before using artificial light. Even tiny amounts (like phones) can interfere with photography.
- › Keep quiet. Noise pollution is as damaging to nocturnal life as light pollution is, and can disrupt the peaceful enjoyment of the night.
- › Be cognizant if visiting a place situated on ancestral or Indigenous land. Take the opportunity to learn the history of the area, respect the local culture, and abide by all regulations. ★



Exmoor

Photo courtesy Exmoor National Park Authority

Top starry spots

darksky.org/places

Utah, U.S.

The highest concentration of IDA-certified places in the U.S.

Exmoor National Park, U.K.

Europe's oldest Dark Sky Reserve has a new nighttime walking trail

Hehuan Mountain, Taiwan

Taiwan's only IDSP, in the spectacular Taroko National Park

Desengano State Park, Brazil

Brazil's only IDSP is the first Dark Sky Park in Latin America

!Ae!Hai Kalahari Heritage Park, South Africa

The first Dark Sky Sanctuary on the African continent

Warrumbungle National Park, Australia

Australia's oldest Dark Sky Park has camping, bushwalking, wildlife, and observatories

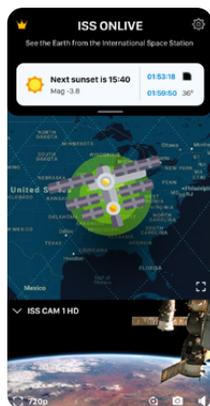


Photo by Megan Eaves



EXPLORATION IS IN OUR
NATURE. WE BEGAN AS
WANDERERS, AND WE
ARE WANDERERS STILL. WE HAVE
LINGERED LONG ENOUGH ON THE
SHORES OF THE COSMIC OCEAN.
WE ARE READY AT LAST TO SET
SAIL FOR THE STARS.

CARL SAGAN
FROM *COSMOS*

WATERTON LAKES, ALBERTA, CANADA · by Carl James

Nikon Z6 24mm sky: tracked and stacked 5x 180 seconds f2.2 ISO 1000,
stacked landscape: 240 seconds, f2.2, ISO 1000, reflection: 25 seconds,
f1.8, ISO 6400, all shot back to back at pure darkness



Research roundup

What's new in light-pollution research

IDA's new report, **"Artificial Light At Night: State Of The Science 2022"** by Dr. John Barentine, covers light pollution research over the past year. For more details, visit darksky.org/ida-publications.



Reductions in light emissions at International Dark Sky Places

Dark-sky places work! Satellite observations show reduced light emissions at International Dark Sky Places between 2012 and 2020, indicating that the IDSP program is effective in fighting light pollution.

International Journal of Sustainable Lighting

<https://doi.org/10.26607/ijsl.v23i2.111>



Bright lights in cities cause spring to come early

Did you know that artificial light in cities causes trees to bud earlier in the spring and lose their leaves later in the fall?

Science

<https://www.science.org/doi/10.1126/science.abm8136>



Arctic krill use twilight to guide their daily rhythms through the polar winter

Some ocean creatures are incredibly sensitive to small amounts of light in their environment, suggesting they are especially susceptible to harm from artificial light.

PLOS Biology

<https://doi.org/10.1371/journal.pbio.3001413>



Coastal light pollution disrupts behaviors of fish and birds

For the first time, we know how much light is too much for particular fish and bird species, and the levels are as low as a half moon.

Journal of Coastal Research

<https://www.ioes.ucla.edu/article/study-identifies-how-much-artificial-light-is-too-much-for-two-coastal-species/>

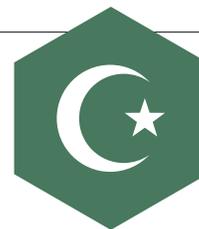


New atlas shows the impacts of artificial light on oceans

The first-ever global atlas of artificial light under the sea shows the widespread impact of light pollution in underwater habitats.

Elementa: Science of the Anthropocene

<https://doi.org/10.1525/elementa.2021.00049>



Light pollution under the Islamic legal doctrine of maqasid

One of the first studies to evaluate the legal framework of *maqasid al-shari'a* ("goals or objectives of sharia") in determining how cases involving light pollution should be adjudicated under Islamic law.

Journal of Fatwa Management and Research

<https://doi.org/10.33102/jfatwa.vol26no2.390>

Sea lions confused by waterfront lighting, Antofagasta, Chile

Photo by Farid Char / Canon EOS 6D, 24-105mm
f/4L IS USM lens, 1/6s exposure, f6.3, ISO 2500



Photo by Farid Char

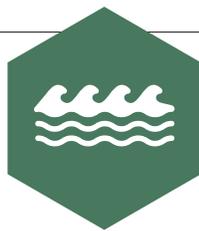


Combined impact of noise and artificial light at night

Artificial light and human-caused noise pollution are often correlated. This paper reviews the evidence of effects when both are present.

Frontiers in Ecology and Evolution

<https://doi.org/10.3389/fevo.2021.765950>

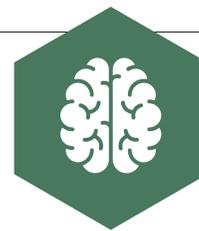


Marine artificial light at night: An empirical and technical guide

A summary of the effects of light pollution in the oceans, including practical advice and solutions that have proven useful for marine research.

Methods in Ecology and Evolution

<https://doi.org/10.1111/2041-210X.13653>



Outdoor light at night connected to autism spectrum disorder

Exposure to brighter light at night correlates with a higher risk of autism spectrum disorder among children.

Science of The Total Environment

<https://doi.org/10.1016/j.scitotenv.2021.152340>

MEET A MEMBER

Tim Brothers: Retrofit gone right



In this issue, we get to know Vice President of IDA Massachusetts, Tim Brothers — an observatory manager who successfully advocated for and helped organize a recent streetlight retrofit.

Tell us about the streetlight retrofit you were part of in Pepperell, Massachusetts, U.S.

This was an initiative to cut energy by converting streetlights to LED. Much of our success was thanks to the town

and energy firm's willingness to work with our dedicated lighting activists. From interviewing people in nearby towns, we knew public input led to better lighting and satisfied residents. We advocated for IDA-recommended

technical aspects, pushed for a public demonstration of several streetlight models, and conducted a survey to understand what people wanted. Pepperell chose fully-shielded 2200K LEDs dimmed by 50%. This cut electricity consumption by 75% and reduced uplift and harmful blue light.

How did residents respond to dark-sky-friendly lighting?

The town installed what residents preferred (warmer LEDs with less glare), so I received a lot of positive sentiment and, so far, no complaints. If anything, some feel the new LEDs are still too bright, even dimmed by half. Several police officers said that nighttime visibility improved. During the outreach phase, some residents asked if streetlights they deemed unnecessary could be removed entirely!

How did you intervene before brighter/worse lighting was installed?

I offered my services before the conversion was on the table. When the first proposal came in, I had time to digest it, consult with IDA members, and make recommendations before the design meetings.

How did you educate yourself about the technical aspects of lighting to present in front of boards and councils?

I could not have gotten up to speed without IDA and the experienced activists in our state chapter. I was also a member of an environmental bylaw committee, which involved reading a lot of regulations and studying what works. Learning how local government functions was important, too. Practice your presentations. Give talks locally to understand which aspects of light pollution people care about.

Continued on page 13

Before
High pressure sodium



After
2200K LED



Continued from page 12

What are your tips for people who want to change the lighting in their own communities?

Get your foot in the door, and offer to help your town save money and achieve an outcome that residents will be happy with. Don't feel pressured to cover every light pollution topic. Stay focused — even if you miss an opportunity, I guarantee there is another glaring floodlight issue to solve.

Why is it important to protect the nighttime environment where you live?

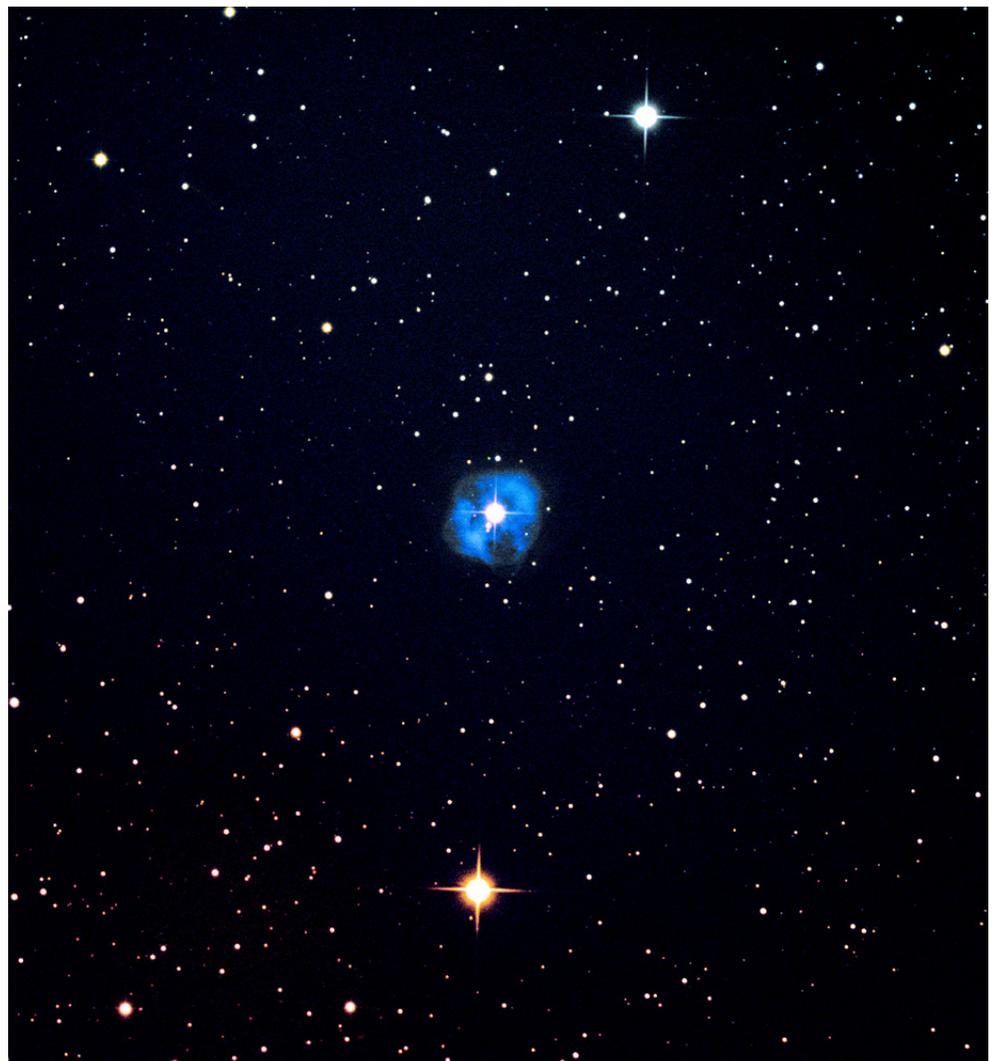
Pepperell is beyond a line of towns near Boston that have already lost the night sky. We can still see the Milky Way; the natural ambiance is one of the reasons we moved here. I think we still have time to protect it so my children grow up under a starry sky like I did. We also have endangered species to protect. And did I mention I still love stargazing? ★

Watch Tim's *Under One Sky* 2021 conference presentation at conference.darksky.org

Opposite: Tim with his adopted dog, Finnegan, at work in MIT's Wallace Astrophysical Observatory.

Above: Before and after converting from high-pressure sodium to 2200K LED.

Below: The NGC 1514 Nebula, imaged by Tim at the observatory.



Advocate highlights

News snippets from our network of dark-sky advocates around the globe.

New York, U.S.

State lawmakers introduced legislation that would limit outdoor lighting to protect migrating birds. The state's **Suffolk County** also passed an amendment to lower lighting color temperature from 3000K to 2200K. Both initiatives are in no small part thanks to the tireless efforts of advocate **Susan Harder**.



South Downs, England

Advocate **Dan Oakley** and IDA Board member **Kevin Gaston** appeared on the BBC's landmark TV series, "The Sky at Night," promoting dark skies in the U.K.

Newly Certified International Dark Sky Places

New Parks

- 1 Cape Lookout National Seashore (North Carolina, U.S.)
- 2 Desengano State Park (Brazil)
- 3 West Penwith (Cornwall, U.K.)

New Community

- 4 Jelsa (Croatia)





Uruguay

Advocate and astrophotographer **Fefo Bouvier**'s stunning image "Geminids of the South" was featured as NASA's Astronomy Picture of the Day on 16 December 2021.

apod.nasa.gov/apod/ap211216.html



Yangmingshan National Park, Taiwan

Yangming Experimental Mountain House (陽明實驗山屋), in partnership with **IDA Taiwan**, is hosting a dark-sky-themed exhibition with light-pollution research and artwork by advocate **Sheng-hsien Chang** (張勝賢) until March 20.



Show your love for dark skies!

A great way to support the IDA is to purchase our customized apparel, mugs, and totes.

bonfire.com/store/idadarksky



Join the Nighthawk Monthly Giving Club!

Nighthawk members provide a predictable foundation of operating income important for our work. Monthly giving has benefits for both you and IDA. As a small thank-you, when you join the Nighthawk Monthly-Giving Club with a monthly investment of \$5 you'll receive a special Nighthawk club magnet to show your support!

darksky.org/membership



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LIGHT TO PROTECT THE NIGHT

Five Principles for Responsible Outdoor Lighting

1 Useful



Use light only if it is needed

All light should have a clear purpose. Consider how the use of light will impact the area, including wildlife and their habitats.

2 Targeted



Direct light so it falls only where it is needed

Use shielding and careful aiming to target the direction of the light beam so that it points downward and does not spill beyond where it is needed.

3 Low Level



Light should be no brighter than necessary

Use the lowest light level required. Be mindful of surface conditions, as some surfaces may reflect more light into the night sky than intended.

4 Controlled



Use light only when it is needed

Use controls such as timers or motion detectors to ensure that light is available when it is needed, dimmed when possible, and turned off when not needed.

5 Color



Use warmer color lights where possible

Limit the amount of shorter wavelength (blue-violet) light to the least amount needed.