

NIGHTSCAPE

FALL 2020 | ISSUE #103
2019 ANNUAL REPORT



INTERNATIONAL DARK-SKY ASSOCIATION

FROM THE EXECUTIVE DIRECTOR

Over the past months, many members have shared how the night sky is their sanctuary in a chaotic world. Like many of you, I watched in alarm as everyday life crashed to a halt as the global pandemic hit, in horror as places I love in California burned under climate-driven wildfires, and in anger as blatant racial injustice boiled over across the U.S. and worldwide.

Among all this disruption, why should anyone care about light pollution? Aren't there more significant issues to tackle? I have been thinking a lot about this, and I'm convinced that our work to protect the night from light pollution is more important than ever before.

Surprisingly, as the economy skidded to a halt, the skies cleared. A significant reduction in air pollution and light pollution meant that more stars were visible to millions of people worldwide – even from city centers. People felt a sense of connection to each other and to the grandeur of the universe. But something else happened: the realization that artificial light at night is a pollutant like any other.

A recent study from the University of Utah examined light-pollution inequities in the United States. Its authors found a familiar pattern: Neighborhoods with a higher proportion of Blacks, Hispanics, Asians, or renter-occupants see more light pollution when they look up at night. Other public-health studies demonstrate that high levels of artificial light at night correlate with poor health outcomes.

Wasted light is also wasted energy. We estimate that light pollution in the U.S. alone costs the economy \$3 billion every year. Offsetting the carbon emissions would require 875 million trees to be planted annually.

As you'll read in this issue, we are partnering

with the National Audubon Society to reduce light pollution's effect on bird mortality during their annual migrations. Reducing light pollution is also essential to halting the catastrophic decline in insects – the base of our food chain.

Addressing light pollution is no longer a nice thing to do. It's not just about seeing the stars. Rather, it is central to building a just and equitable community where people and wildlife thrive. Reducing light pollution saves money, reduces energy consumption, protects wildlife, and promotes healthy communities. Unlike other social and environmental issues, we understand the technical solutions, and when these are implemented, light pollution disappears immediately.

This edition of *Nightscape* offers hope in IDA members' words and actions, from Kozushima, Japan, to St. Louis, Missouri, in the United States. I find these stories inspiring, and I hope you do too. The article about the new threat from satellite mega-constellations illustrates that we must remain vigilant. New challenges to the night sky emerge rapidly and are increasingly complex and global in scope. Now, more than ever, we need a strong global dark-sky movement.

With your support, I look forward to building a future where the benefits of starry skies and responsible lighting are available to all.

Never stop looking up,

Ruskin Hartley
ruskin@darksky.org



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RECOGNITION





A night sky photograph showing the Milky Way galaxy in a desert landscape. The galaxy is visible as a bright, colorful band of stars stretching across the sky. In the foreground, there is a dark, silhouetted rock formation on the left and a river winding through the valley. The overall scene is dark and atmospheric.

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“Don’t feel lonely, the entire
universe is inside you.”

—Rumi



Kyota Mukunoki, Panasonic Engineer, Panasonic Corporation

STRONG GLOBAL MOVEMENT

Dark-Sky Advocacy in the Land of the Rising Sun

Kozushima is a small island, just over 7 square miles, in the Izu Islands chain. Though a 45-minute flight from Tokyo, Kozushima is part of the Tokyo Metropolis, the world's most populous metropolitan area. It has become a popular destination for tourists seeking to escape Tokyo's bustle and to enjoy its pristine beaches and challenging hiking trails. The economy relies on fishing and tourism. Over the past few years, the island's tourism bureau realized astro-tourism would be a natural addition to lure more visitors to the island and help offset the loss of sea life that has been disappearing from its shores.

Enter Nobuaki Ochi, associate professor at Toyo University in Japan and a 10-year IDA member, current IDA advocate, and president of Tokyo's IDA chapter. Dr. Ochi had previously worked on Iriomote-Ishigaki National Park's successful certification as the first International Dark-Sky Place in Japan. The country's southernmost national park, this cluster of five isles to Kozushima's northwest is often referred to as the "Hawaiian Islands of Japan." John Barentine, IDA's Director of Public Policy, is quick to praise Dr. Ochi's work as an

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““This was a wonderful collaboration. We’re not about no light; we’re about better light. There are smart ways to do it and foolish ways. Let’s do it the smart way.”

–Pete Strasser, IDA Technical Director

advocate in Japan and how the Tokyo chapter’s innovative activities attract media coverage — for both the projects and the IDA message.

Ochi had a big idea. “An area of Tokyo receiving IDA recognition would have a huge impact globally,” he says. Last year he approached Adam Dalton, IDA’s Dark-Sky Place Program Manager, to start the process of certifying Kozushima.

First and foremost, the island’s light fixtures must meet IDA’s stringent requirements. Last October, Ochi reached out to IDA Technical

Director, Pete Strasser, to explore whether IDA could work with Panasonic to modify the company’s light fixtures for the project. Strasser worked closely with Panasonic engineers, and in January 2020, they received the IDA Dark-Sky Fixture Seal of Approval for their new product. “This was a wonderful collaboration,” Strasser notes, “We’re not about no light; we’re about better light. There are smart ways to do it and foolish ways. Let’s do it the smart way.” It was the first time a Japanese company had used IDA’s technical expertise to create the desired lighting.

Once Kozushima receives its certification, it will motivate other places in Japan, Asia, and worldwide to follow. “In 2015, we had 54 Dark-Sky Places. Right now, we have 150 certified sites with another 150 in the pipeline,” says Dalton. “Kozushima will exemplify, to its inhabitants and visitors, how the IDA principles can succeed in the real world. It will show tourists that they too can protect and preserve the night sky in their communities.”



Bisei District of Ibara, Okayama Prefecture, Panasonic Corporation



Middle Creek Wildlife Management Area, Stevens, USA, Photo by Barth Bailey on Unsplash

PARTNERING TO PROTECT DARK SKIES

SAVING MIGRATING BIRDS

with the National Audubon Society

One of IDA's core strategies to raise the profile of light pollution is to forge relationships with nonprofits and other agencies with national and international reach. Often these relationships are built at many levels simultaneously, as is the case with our recently announced collaboration with the National Audubon Society.

More Than Half Of All North American Birds Migrate At Night

Mary Coolidge, BirdSafe Campaign Coordinator at Audubon's chapter in Portland, Oregon, says that the new collaboration on the society's Lights Out effort during migration seasons broadens the importance of reducing

light pollution. A self-described "bird nerd," Coolidge also knows that working with IDA will help Audubon reach new audiences. Coolidge relies on IDA for technical support for this program, but, she adds, "The spirit of the partnership goes beyond the technical expertise." The partnership educates Audubon members about how Lights Out programs benefit not only birds but also astronomers, other wildlife, and the ecosystem as a whole.

The collaboration between IDA and Audubon is now gaining traction in the U.S. heartland, where IDA Missouri president Don Ficken uses his organizational skills to leverage the power of collaboration.



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“The new collaboration on the Audubon society’s Lights Out effort during migration seasons broadens the importance of reducing light pollution.”
–Mary Coolidge, BirdSafe Campaign Coordinator at Portland Audubon

A retired CFO and business professional, Ficken understands that the key to making big things happen is finding a way for everyone to win. He has expanded the Lights Out program in St. Louis by hosting events in association with Gateway Arch National Park. Ficken says, “When you put everyone together, you start getting some leverage.” Ficken knows that working with Audubon helps reach new people who may not realize that light pollution is a pressing environmental issue that’s readily solved.

Joint Principles for Responsible Outdoor Lighting

John Barentine, IDA’s Director of Public Policy, says that collaborations help keep organizations accountable to each other and encourage good-faith dialog and interaction. Such is the case with IDA’s new partnership with the Illuminating Engineering Society (IES), a widely recognized authority on illumination that establishes lighting standards followed across North America. Barentine describes the IDA-IES



A study by the Field Museum in Chicago found that turning off the lights at one downtown high-rise reduced migratory bird deaths there by

80%

relationship as “a constructive series of push and pull” that forces both organizations to do a better job over time. Following the joint adoption of Five Principles for Responsible Outdoor Lighting earlier this year, Barentine presented at the IES’s Light for Life collaboration, sharing IDA’s approach to reducing light pollution with a global audience of IES members.

Conserving Nature, Globally

The International Union for Conservation of Nature (IUCN) is the global authority on the natural world’s status and the measures to safeguard it. Recently, the IUCN staff reached out to IDA to collaborate on a best-practices guide to dark-sky conservation. To be published in 2021, this project is “bigger than either of us could have done alone,” says Barentine, one of the report’s authors.

By partnering with like-minded groups like these, IDA increases its impact and elevates the profile of light pollution — and thus protects more of what brings us all together: dark skies.

MOST BIRDS IN NORTH AMERICA ARE MIGRATORY



70%

of terrestrial recurring birds are migratory.

80%

of those birds migrate at night.



BY DEAN
REGAS

Photo by NASA

CROWDING OUT THE STARS

One night in 2019, a train of strange lights appeared to slowly cross the night sky. As obvious as the brighter stars in view, they came like a string of pearls, one after another. They were beautiful. They were spooky. What the heck were they?

They were the first fleet of Starlink satellites launched by SpaceX to create what will eventually be a “mega-constellation” circling Earth. Their goal: to bring broadband internet access to everyone on Earth. SpaceX launches them in batches of 60, and when these satellites enter orbit, they string out in a line—a bright and ominous line of night lights.

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Dean is staff astronomer for the Cincinnati Observatory and author of the book *100 Things to See in the Night Sky* and the podcast *Looking Up*.

Eerie and Unsettling

When I lead a star gaze, my guests are always excited and inspired to see the International Space Station fly overhead. This infrequent but welcome guest always evokes a “Whoa!” from the crowd.

Witnessing a procession of Starlinks, however, is different. One stargazer described them as eerie and unsettling. It looks like an invasion. Whereas observers look upon a single bright satellite with wonder, with Starlink they see a seemingly unending train of satellites as more than annoying, more than distracting — it is blatant pollution.

SpaceX has received approval to launch 12,000 satellites for this project, and it has filed paperwork to raise the total to perhaps 42,000. I thought, “How did ‘they’ let SpaceX unleash this plague upon the night sky?” And more importantly, who is “they?”

Listening to the IDA

From the very beginning, IDA addressed this new form of night-sky pollution. Its staff lobbied with SpaceX as well as the Federal Communications Commission (FCC) and the Federal Aviation Administration (FAA) — the “they” who regulate access to and use of space for the United States. IDA advocated for satellite standards that include:

1. Maintained brightness below the threshold for detection by the unaided eye.
2. Visibility is an unusual occurrence.
3. Industry transparency as to launch

schedules and orbital parameters.

4. Industry commitment to shared stewardship of the star-filled night sky.

After direct meetings with the IDA and other astronomy organizations (as well as in reaction to extremely negative publicity for its invasion of outer space), SpaceX has accepted a new engineering challenge. The company is voluntarily working to darken the exteriors of the craft, add visors to keep sunlight off their most reflective parts, and orient the solar panels edge-on to the Sun to minimize their surface brightness. SpaceX aims to dim future Starlinks to below 7th magnitude — a level invisible to the naked eye.

Setting a Real Standard

Is SpaceX setting a new standard for other planned satellite constellations to meet or exceed? Will we see a difference? Preliminary observations show mixed results — one report indicates a slight dimming from previous fleets, while another shows no significant difference.

Companies such as OneWeb and Amazon Kuiper are also exploring similar satellite projects. Will they voluntarily create dim satellites or merely throw up as many spacecraft as possible? What would stop other nations from launching fleets of their own? Right now, there are five United Nations treaties governing the use of outer space. None of them, however, limit how many satellites a country, or company, can place in orbit.

This threat to a pure night sky is just beginning. What will the starry view overhead look like when occupied by tens of thousands, or hundreds of thousands of satellites?

IDA is taking a leading role at this crucial moment and bringing a voice to this issue at the highest levels. We must continue to urge governments, and the United Nations, to protect space and set strict standards to protect the night sky — not as mere suggestions, but as actual laws. A horde of satellites would become an ever-moving, ever-growing series of mega-constellations. We want to make sure that these are not the only constellations our descendants will know.

Dark Sky advocates are working in 35 countries around the world to build the dark sky movement and protect the night from light pollution.

UNITED STATES

Dark Skies Northwest • Flagstaff Dark Skies Coalition • Geneva Lake Dark Sky • IDA Berrien County • IDA California • IDA Central Illinois • IDA Central Tennessee • IDA Chicago • IDA Colorado • IDA Connecticut • IDA Dark Sky Lake Worth • IDA Duluth, Minnesota • IDA Erie and Crawford County • IDA Florida • IDA Hawaii • IDA Massachusetts • IDA Memphis • IDA Missouri • IDA Montana • IDA New York • IDA North Carolina • IDA Ohio • IDA Oregon • IDA Pennsylvania • IDA Phoenix • IDA Pinal County, Arizona • IDA Rapid City • IDA San Bernardino County • California - High Deserts Region • IDA San Diego • IDA Santa Barbara County, California • IDA Santa Cruz • IDA South Central Kentucky • IDA South Florida • IDA Southern Arizona • IDA Texas • IDA Utah • IDA Virginia • IDA Washington, D.C. • IDA Westchester County • Northwest Illinois • Pennsylvania Outdoor Lighting Council

INTERNATIONAL

Dark Sky Cyprus • Dark Sky Greece • Dark Sky Ireland • Dark Sky Switzerland • IDA Austria • IDA Beijing, China • IDA Czech Republic • IDA Daegu Gyeongbuk, Korea, IDA Guangdong Province, China • IDA Hungary • IDA India • IDA Israel • IDA Italy • IDA Mayo, Ireland • IDA México • IDA Punjab • IDA Québec, Canada, • IDA Shanghai, China • IDA Southern Alberta, Canada • IDA Tasmania • IDA Tokyo, Japan • IDA Victoria, Australia • Light Pollution Awareness Group, Malta • The Royal Astronomical Society of Canada

DELEGATE COUNTRIES

Argentina • Bahrain • Brazil • Canada • China • Czech Republic • Egypt • England • France • Germany • Granada • Guatemala • Hong Kong • India • Iran • Kenya • Mexico • New Zealand • Scotland • Serbia • Spain • Sri Lanka • USA • Vietnam • Wales

CHAPTER HIGHLIGHTS

IDA United Kingdom



Delegate Megan Eaves hosted virtual stargazing over Twitter to bring us together during the isolation and boredom of social distancing. People participated in #starentine worldwide, and it was covered by CNN. Meanwhile, in Wales, Delegate Dani Robertson hosted dark-sky swimming in Snowdonia National Park, an International Dark Sky Place.

IDA Serbia

Delegate Dajana Bjelajac, organized a “Star Triathlon” during which 500 participants hiked at night, observed the sky through telescopes, and enjoyed a jazz performance in the woods by a fire.



IDA Chicago, USA



Delegate Rosy Lugo lead a group of teens advocating for light-pollution reduction in their primarily Mexican-American neighborhood. She emphasizes that light pollution is not just an astronomy issue — it’s an environmental justice issue that impacts habitats, economics, and public policy.

2019 IMPACT REPORT

1 **Reach:** Members in 32 Countries

Conservation

- 95,000 square kilometers of protected land
- 95 million visitors to certified International Dark Sky Places

Engagement:

- 3,700 dark-sky events reached
- 350,000 attendees

2 **Protecting Special Places**

IDA designated 28 new International Dark-Sky Places, bringing the total protected area to 98,598 square kilometers, including the first Urban Night Sky Place (Valle de Oro National Wildlife Refuge, U.S.) and the most populous Dark Sky Community (Fulda, Germany). All told, the 134 International Dark Sky Places offered 3,072 programs that reached almost 300,000 attendees. It is estimated that almost 2 million people live in an International Dark Sky Place.

3 **Empowering Chapters and Advocates**

Led by IDA Chapters and Delegates worldwide, our engagement programs reached more than 45,000 people with 600 dark-sky events. In 2019, advocates joined from Guatemala, Argentina, Wales, Egypt, China, France, and Serbia. We now have IDA advocates active in 25 countries on every inhabited continent.

4 **Advancing Policy and Science**

In Mexico, IDA advocates passed a ground-breaking National Light Pollution law. Our database of dark-sky-certified light fixtures added 17 new families of products, for a total of more than 1,000. Our database of scientific literature related to the study of light at night added a record number of 375 new citations, demonstrating increased interest in the field.

The Watchman, Zion National Park, Utah, Bettymaya Foot

FROM THE PRESIDENT

One constant in our changing world is the tenacity and commitment of IDA members. With your support, 2019 was a year of record achievements for the dark-sky movement.

Our conservation program certified more International Dark Sky Places than in any other year, including the first Urban Night Sky Place. Each is a living example of dark-sky conservation. Together, they introduced millions of visitors to the benefits of natural darkness and responsible lighting and helped fuel our growing community of Dark Sky Advocates.

IDA's Board of Directors is committed to supporting this passionate, inclusive, and international community with pragmatic solutions to reduce light pollution. As we look ahead, we must focus more energy on bringing the benefits of responsible outdoor lighting to cities worldwide. With your support and passion, IDA will continue to be a trusted voice for pragmatic solutions to protect dark skies, reduce light pollution, and promote responsible outdoor lighting that is beautiful, healthy, and functional.

Thank you for your continued dedication.

Ken Kattner
IDA President

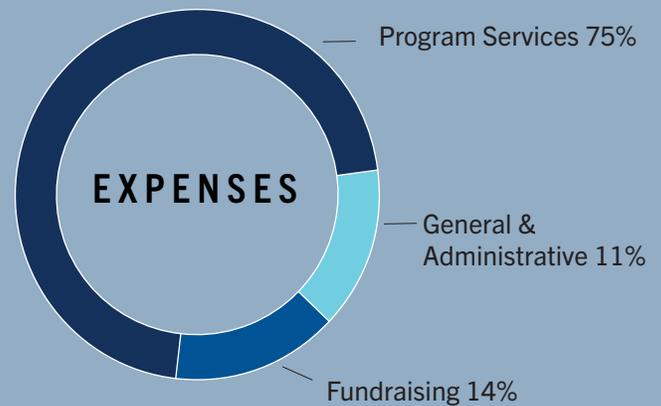
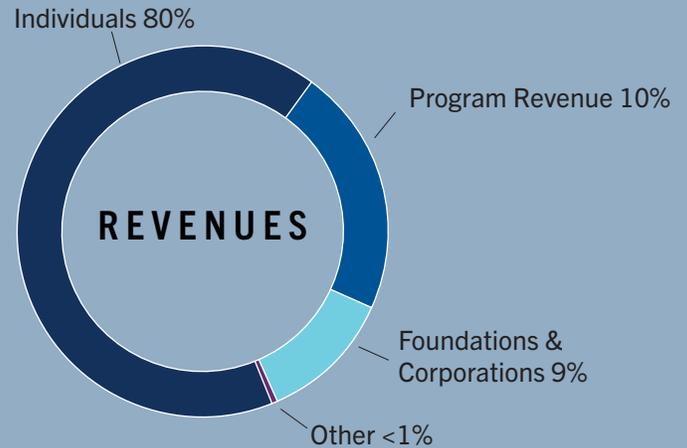


STATEMENT OF FINANCIAL ACTIVITY

FOR THE FISCAL YEAR ENDING DECEMBER 31, 2019

REVENUES & SUPPORT	\$1,168,128
Individuals	\$934,540
Foundations & Corporations	\$110,382
Program Revenue	\$116,447
Other	\$6,759

EXPENSES	\$992,365
Program Services	\$738,874
General & Administrative	\$111,629
Fundraising	\$141,862



This information is based on Reviewed Consolidated Financial Statements for the year ending December 31, 2019. For more detailed financial information, please visit darksky.org/about/funding.

SPECIAL THANKS

The International Dark-Sky Association's Brand Partners are dedicated members of the dark-sky protection community from corporate and business sectors. They support programs, outreach, education, and night-sky conservation efforts. We are grateful for their support in 2019.

LEADING PARTNERS

[Musco Lighting](#)

GUIDING PARTNERS

[Home Depot](#) • [Lumican](#) •

[Grand Canyon National Park Lodges](#) • [Your True Nature](#)

SUSTAINING PARTNERS

[Earth Sun Moon Trading Company](#)

ALLY PARTNERS

[Selux Corp](#) • [Holiday River Expeditions](#)

2020 AWARD WINNERS

Each year, the International Dark-Sky Association recognizes and celebrates the incredible achievements of individuals and groups who are committed to our mission to preserve and protect the night.

The ***Crawford-Hunter Award*** represents the highest honor that IDA bestows to individuals who, during their lifetime, have contributed an extraordinary effort to light pollution abatement.

JOHN HEARNshaw, NEW ZEALAND

The ***Hoag/Robinson Award*** is given to an individual who has been outstanding in educating governmental organizations, businesses and the public about the merits of outdoor lighting control ordinances.

BRIAN ESPEY, IRELAND

The ***Bob Gent Community Leadership Award*** is given to an IDA Advocate who demonstrates outstanding achievement at the local level in combating light pollution and fostering support for IDA's mission and programs.

ROSALIA LUGO, U.S.

The ***International Dark Sky Place of the Year Award*** recognizes a recent exceptional achievement at an International Dark Sky Place.

PIC DU MIDI DARK SKY RESERVE, FRANCE

The ***Galileo Award*** is given in recognition of outstanding achievements in research or academic work on light pollution over a multiple-year period.

KAROLINA M. ZIELINSKA-DABKOWSKA, POLAND



As leaders in their communities, the awardees play a key role in strengthening the global dark sky movement and empowering others to join the fight against light pollution.

The *Dark Sky Defender Award* is for individuals and organizations in recognition of their exceptional efforts to promote and advance the mission and programs of IDA by promoting quality outdoor lighting to reduce light pollution and its environmental impacts.

DAJANA BJELAJAC, SERBIA

ANDREA CASTILLO FLORES, CHILE

IREE WHEELER, U.S.

AUSTRALASIAN DARK SKY ALLIANCE, AUSTRALIA

SERGIO MONTÚFAR, GUATEMALA

DOUG ARION, U.S.

TYLER NORDGREN, U.S.

AL BROTHERS, U.S.

The *Rising Star Award* honors students of any grade level who demonstrate an enthusiasm for and commitment to dark sky conservation or research into natural darkness and light pollution.

EXODUS CL SIT, HONG KONG

DEEP ANAND, SAVE OUR STARS INITIATIVE, INDIA

SOPHIE MCQUILLIN AND ROISIN GRANT, IRELAND

UCHENNA “JJ” NNAWUCHI, U.S.

**GABRIELLA DAKIN, YSIDRO (GEORGE) PADRON, COLE REYNOLDS,
ELIJAH COOK, CHRISTIAN VANOVER, U.S.**

**REBECCA AND CHARLOTTE TURNER AND THEIR WEBSITE,
DARKSKIES4KIDS.ORG, U.S.**

IDA BOARD OF DIRECTORS Ken Kattner, President, USA | Kellie Pendoley, Vice President, Australia | Kim Patten, Treasurer, USA | Laurel Alyn-Forest, Co-Secretary, USA | Diane Knutson, Co-Secretary, USA | Jessica Cleeves, USA | Alejandro Sanchez Miguel, Spain | Diana Umpierre, USA
COMMITTEE CHAIRS Chad Moore, Technical Committee | Dan Oakley, International Dark Sky Places Committee | Connie Walker, Education Committee



International Dark-Sky Association
5049 E Broadway Blvd, # 105
Tucson, AZ 86711



Tucson Street Lighting, Menlo Park Neighborhood, Tucson, AZ,
USA Photo by Bettymaya Foott

LIGHT TO PROTECT THE NIGHT

IDA's Five Lighting Principles for Responsible Outdoor Lighting

1. 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 habitat.

2. DIRECT LIGHT SO IT FALLS ONLY WHERE IT IS NEEDED

Use shielding and shaping methods to target the direction of the light beam so that it does not spill beyond where it is needed.

3. USE LIGHT ONLY WHEN IT IS NEEDED

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

4. LIGHT ONLY TO THE BRIGHTNESS NEEDED

Use the least amount of light needed.

5. MINIMIZE BLUE LIGHT TO THE AMOUNT NEEDED

Whenever possible, use warm color lights at night.