

Light Pollution: Responsible Lighting Practices and Success Stories in NJ

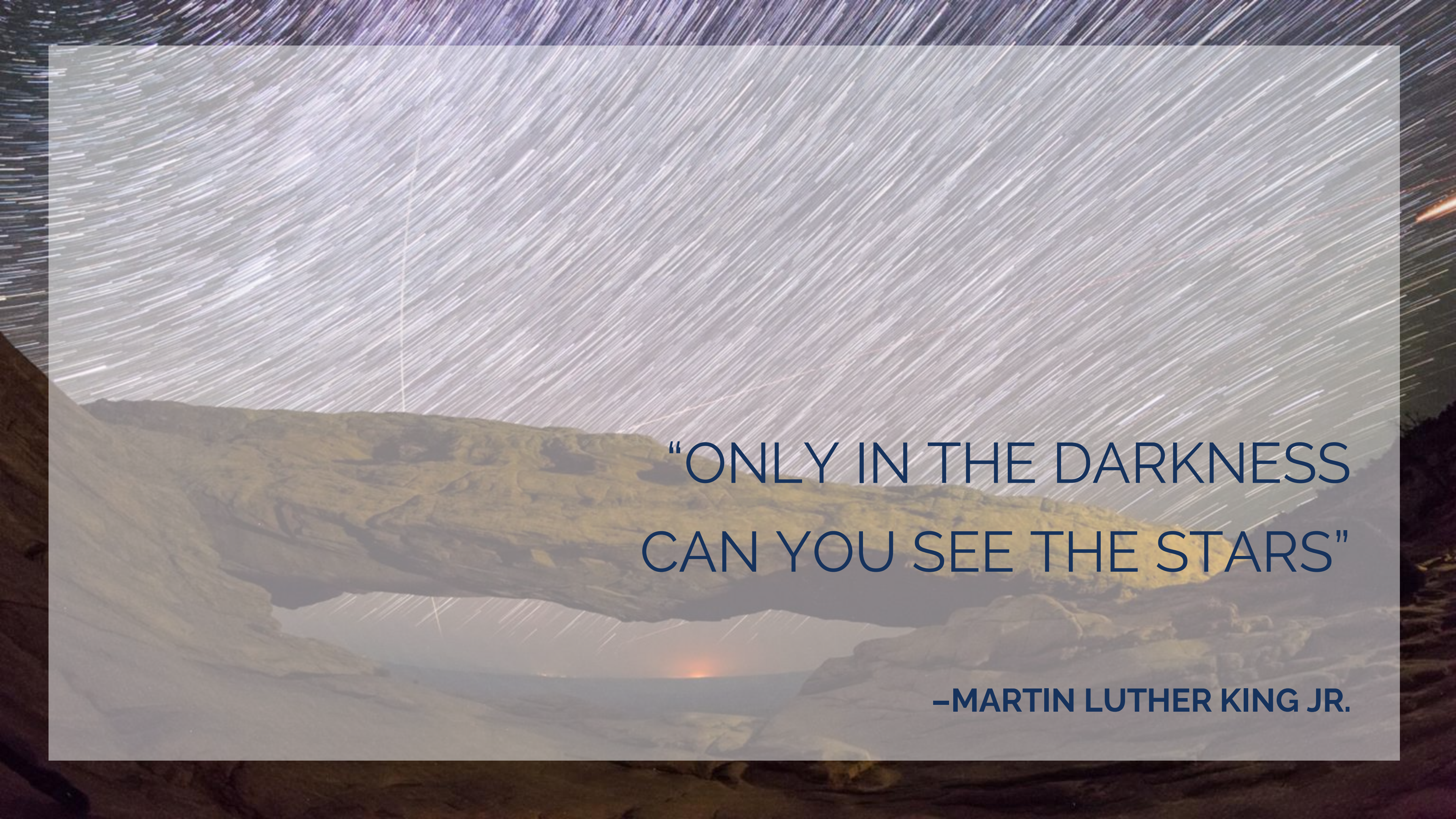


Steve Mariconda, MPH

Delegate: DarkSky New Jersey Chapter

Chair: Saddle Brook Green Team



A long-exposure photograph of a night sky over a rocky, mountainous landscape. The sky is filled with numerous white, diagonal streaks representing star trails, indicating the Earth's rotation. The foreground shows dark, rugged rock formations. The text is overlaid on the right side of the image.

“ONLY IN THE DARKNESS
CAN YOU SEE THE STARS”

—MARTIN LUTHER KING JR.

NJ Light Pollution Mitigation Coalition



DarkSky



**SIERRA
CLUB**

DarkSky International, formerly the International Dark Sky Association (IDA), protects the night from light pollution and promotes responsible outdoor lighting.

<https://darksky.org/>

Quoted from Sierra Club NJ Website: Light Pollution

“NJ communities are drowning in light pollution. We’re increasingly flooded with 24/7 bright light in urban, suburban, and even rural areas. Too much light is harmful: bad for our health and bad for wildlife. Aggressively bright light is also a social justice issue affecting communities of color. Join us to help bring back our night skies.”

<https://www.sierraclub.org/new-jersey/light-pollution>



Quoted from the National Audubon Society Website: Lights Out Program

"The strategy is simple: by convincing building owners and managers to turn off excess lighting during the months migrating birds are flying overhead, we help to provide them safe passage between their nesting and wintering grounds."

<https://www.audubon.org/our-work/cities-and-towns/lights-out>



Quoted from Native Plant Society of NJ News Updates

Webpage:

Action: Contact your Assembly Members and Assembly Speaker Craig Coughlin.

Dark Sky (S1610/A2196)

Reduces harmful light pollution, benefiting native plants, pollinators, and insects.

Passed Assembly unanimously; now before Senate Budget Committee.

Bill details [here](#).

<https://npsnj.org/news/>



Quoted from ANJEC Light Pollution Pamphlet:

"Artificial light at night = sleep disorders, depression, metabolic issues in humans + disorients migratory birds, pollutes insect life, affects sea turtles & amphibians"

"Natural darkness is restorative and essential for all living things."

"Advocate: discuss with neighbors, local officials; support state and municipal dark sky legislation"

WHAT IS LIGHT POLLUTION?

“Light pollution is excessive, misdirected, or obstructive artificial light at night that washes out starlight in the night sky, disrupts ecosystems, has adverse health effects, and wastes energy and money”

4 main forms of light pollution

- Circadian Rhythm Disruption
 - Glare
 - Light Trespass
 - Skyglow

1
Excellent
Dark Sky
Site

2
Dark Sky
Site

3
Rural
Sky

4
Suburban/Rural
Transition

5
Suburban
Sky

6
Bright
Suburban
Site

7
City/Suburbia
Transition

8/9
City/Inner
City Sky

Why care about light pollution ?

Take your pick.

Stargazing



Human Health



Neighbors



Visibility



Animals



Birds



Insects



Marine Life



Plants



Astronomy



The Planet



Money





Circadian Rhythm Disruption





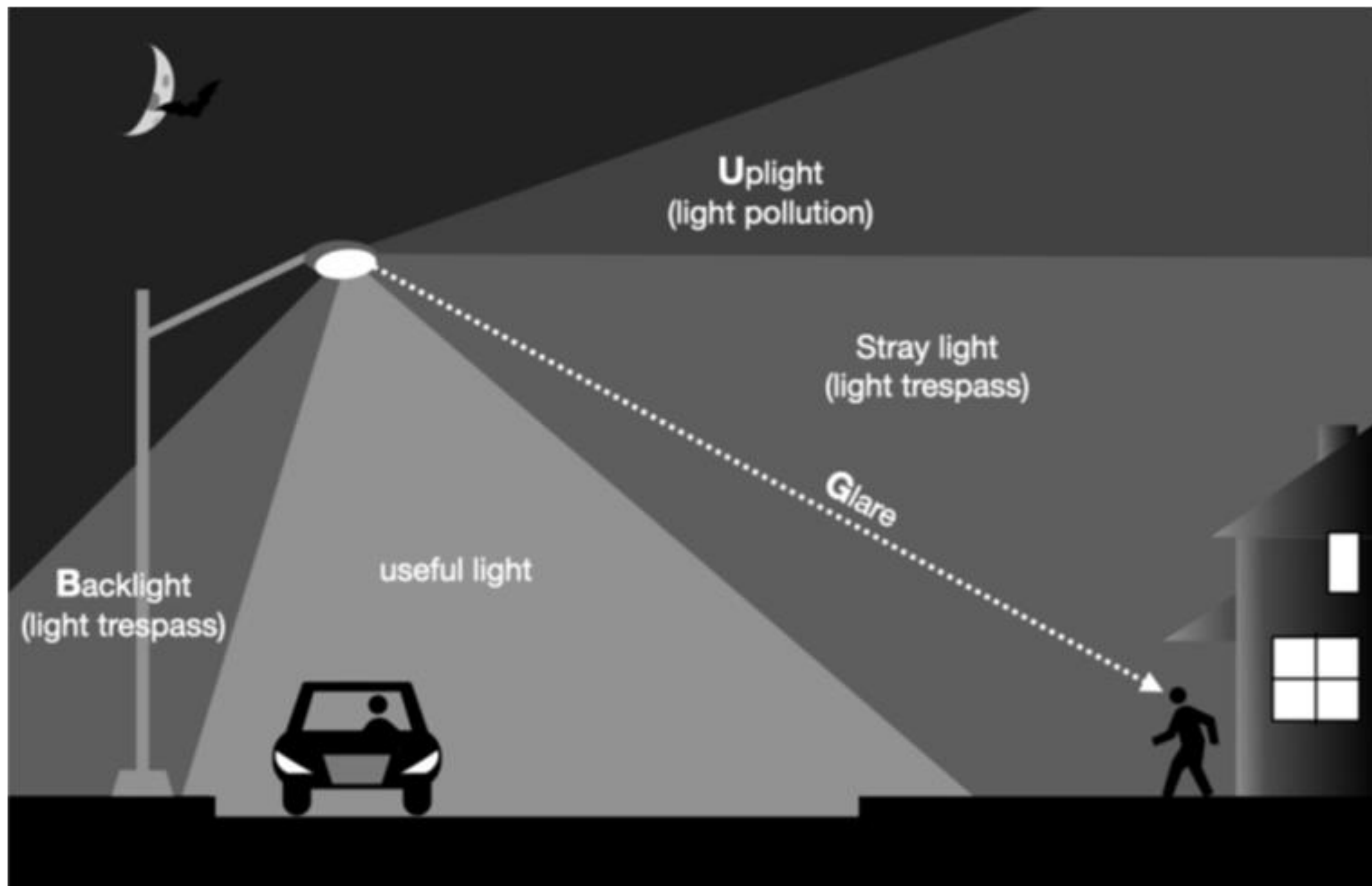
GLARE

LIGHT TRESPASS



SKYGLOW







LIGHT POLLUTION CONSEQUENCES

HUMAN HEALTH



MELATONIN

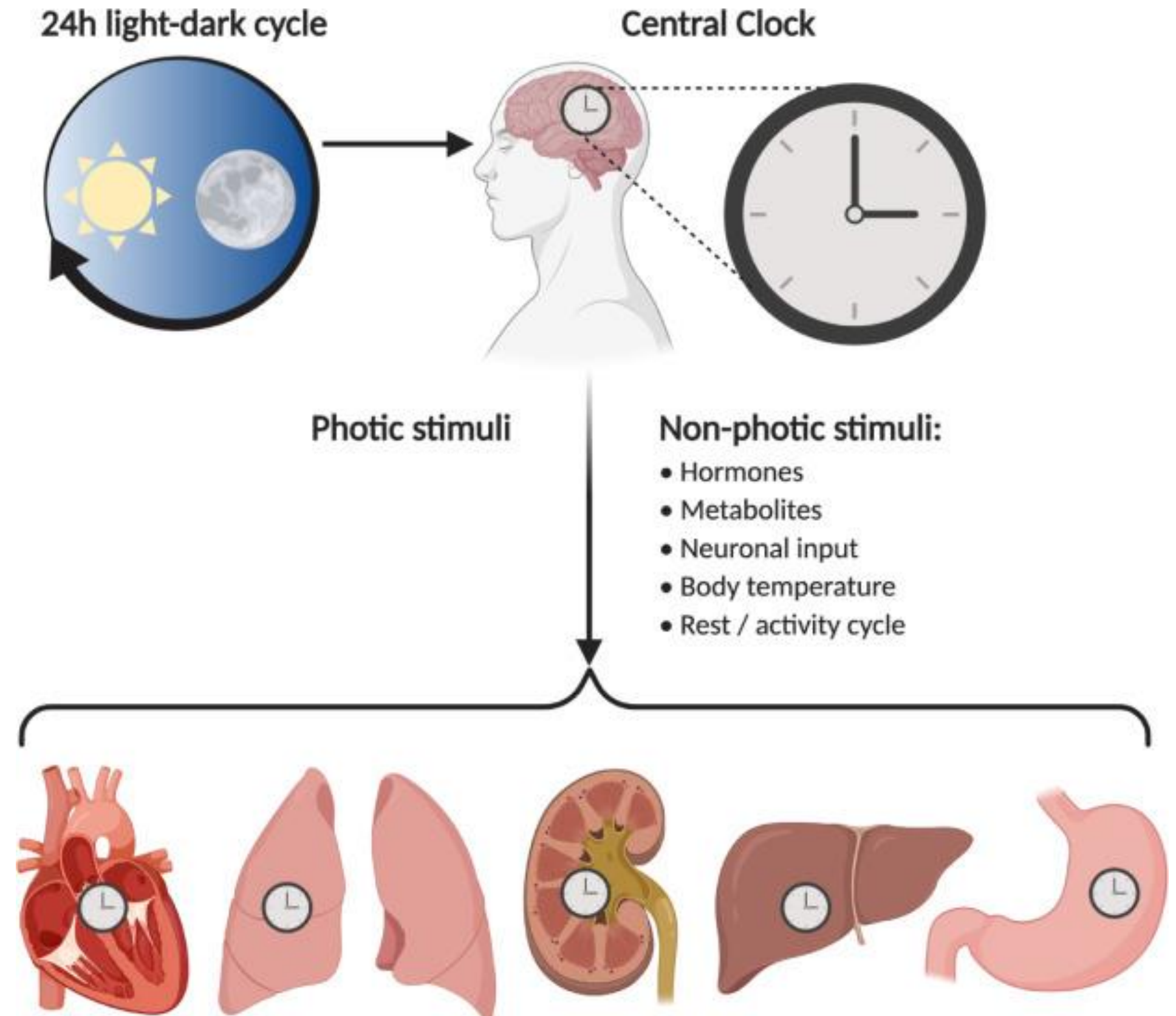
hormone that regulates sleep wake cycle
(circadian rhythm)

AMERICAN MEDICAL ASSOCIATION

Human and Environmental Effects of Light
Emitting Diode Community Lighting 2016 report



The Human Circadian Rhythm



ECOLOGICAL IMPACTS



TURTLES

cannot find their way
to the sea



BIRDS

Get confused
in the light

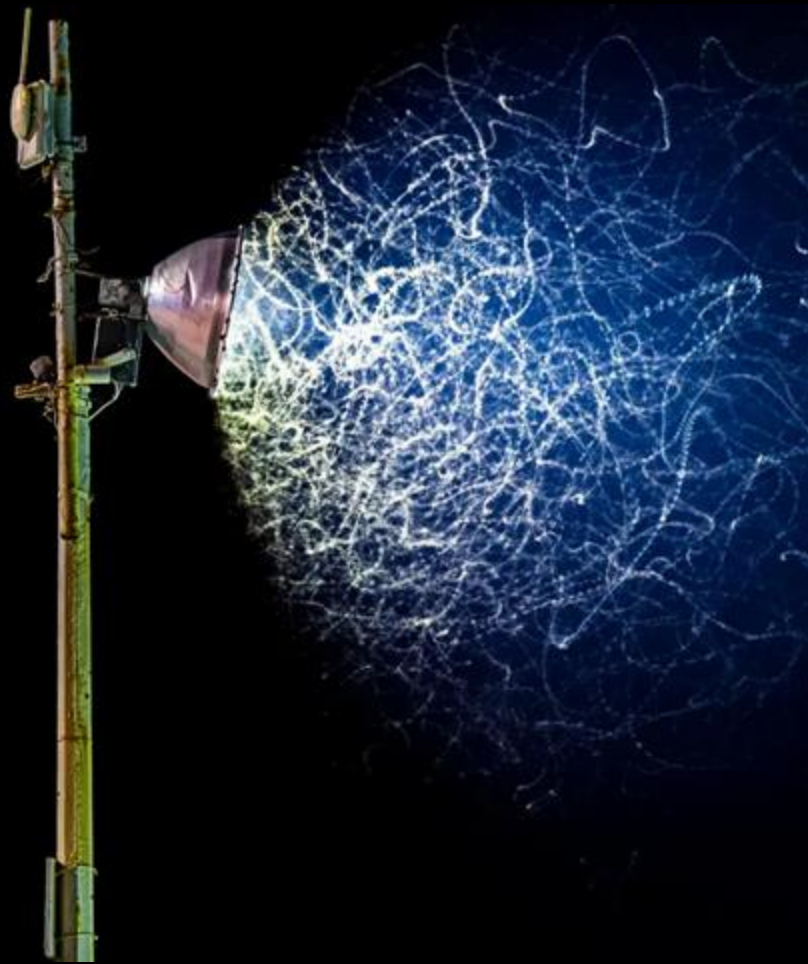




TREES

bud earlier and lose
their leaves later
under artificial light

Insects



Outdoor lighting impacts insect behavior (hunting, mating, plant pollination etc.)



ENERGY WASTE



3.3 BILLION DOLLARS (in the U.S.)

spent every year on unneeded lighting

21 MILLION TONS OF CO₂

burned by unnecessary lighting

Source: DarkSky International

<https://drive.google.com/file/d/1nG0oOQpDmudUYguveLAk6nHBLkGJrtO7/view>

ACTIVITY

<https://www.youtube.com/watch?v=XTjR4vef8JU>



FIND THE POTENTIAL STALKER





**MYTH: MORE
LIGHTING IS SAFER**



**REALITY: WELL DESIGNED
LIGHTING IS SAFER**





Light pollution is increasing at 2 % per year



ARE YOU ONE OF THE LUCKY ONES?

**ONLY 2 OUT OF 10 PEOPLE ON EARTH CAN SEE THE
MILKY WAY**

99% OF THE USA AND EUROPE

live under light polluted skies

LA EARTHQUAKE



Before



After



Before and during the 2003 Northeast blackout, a massive power outage that affected 55 million people. Photo by of Todd Carlson



WE CAN MAKE A
DIFFERENCE





The Solution to Light Pollution

Better Lighting Design, Practices, and Lighting Policies:

Follow the 5 Principles of Responsible Outdoor Lighting

Five Lighting Principles for Responsible Outdoor Lighting



Responsible outdoor lighting is

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.



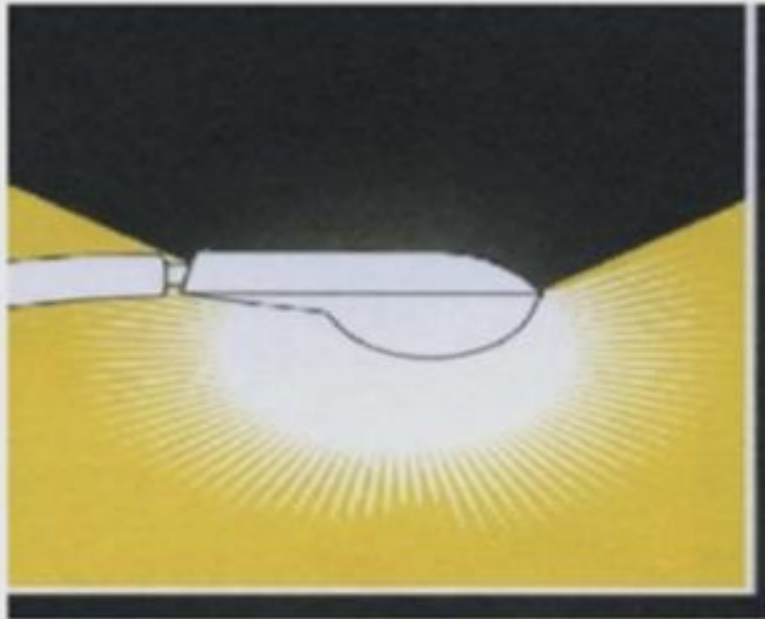
5 Warm-colored

Use warmer color lights where possible

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

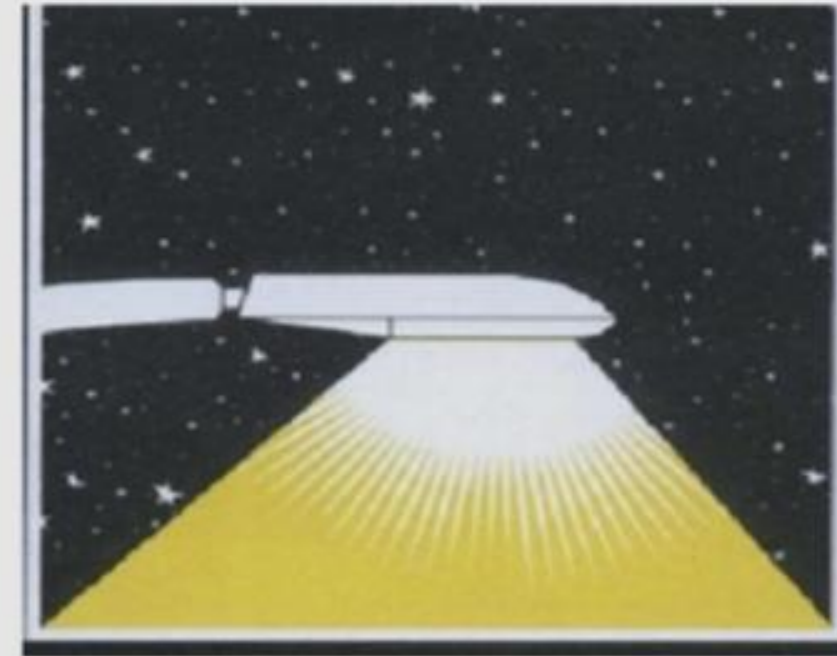


Shielded Luminaires



AIM LIGHTS DOWN

The light source should not be visible at or above the horizontal plane



LIGHT POLLUTED SKY



DarkSky



UNACCEPTABLE

Unshielded/
Poorly shielded



BAD

Partially shielded



BETTER

Fully shielded
(Light source fully covered)



BEST

Fully shielded +
timer/motion sensor



Unshielded



Partially Shielded

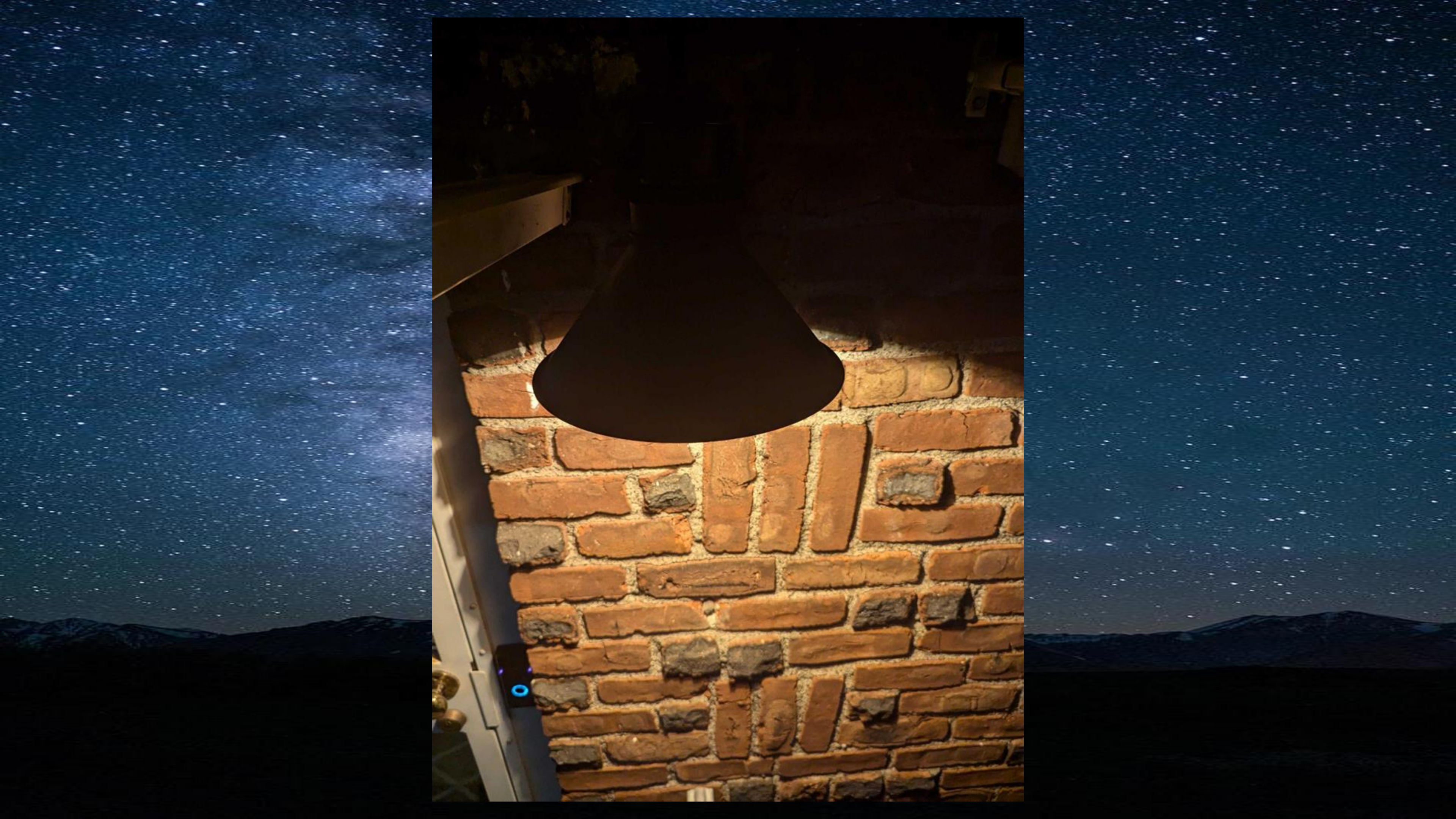


**Fully Shielded
(Ideal)**











KELVIN

(CORRELATED COLOR TEMPERATURE)

2700K

Warm White

- 2700-3000K
- Most similar to incandescents
- Inviting, relaxing

3000K

Bright White

- 3500-4100K
- Energetic, lively
- Good for kitchens and workspaces

4500K

Daylight

- 5500-6500K
- Crisp and refreshing
- Good for reading

6500K

CORRELATED COLOR TEMPERATURE (CCT)



1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 K



WHERE TO FIND THIS LIGHTING?

Dark Sky International
FIXTURE SEAL OF
APPROVAL PROGRAM



<https://darksky.org/what-we-do/darksky-approved/>



RESPONSIBLE LIGHTING ORDINANCES

DarkSky International Model Municipal Lighting Ordinance Template:

<https://darksky.org/resources/guides-and-how-tos/model-lighting-ordinances/>

NJ Municipalities (Examples):

Harding Township, East Amwell, Tewksbury, Cape May, Hopewell Township, Mendham, Saddle Brook, Long Beach, Edison, Bloomfield, Morristown, Seaside Park (not an exhaustive list)

New Jersey Model Municipal Template is available! (will email to all interested)



New Jersey Light Pollution Statute (Pending)

(Assembly Version) <https://legiscan.com/NJ/text/A2196/id/3112709>

(Senate Version) <https://www.njleg.gov/bill-search/2024/S1610>

Hopewell Boro Lighting Replacement Project

52 E Broad St, Hopewell Village Square: Before and after lighting upgrade



Daytime



21 Mar 2025
10:30pm (parking
lot lights off)



19 Jul 2025
9:30pm (parking
lot lights on)

Shout out to David Ackerman and his DarkSky Hopewell subchapter!



Call to Action

- **Change home outdoor lights to dark sky sky-friendly light fixtures**
- **Spread the word to neighbors and everyone you know! (Including other environmental commissions and green teams).**
- **Join the DarkSky NJ Chapter (totally free)**
- **Attend mayor and council meetings to advocate for responsible outdoor lighting ordinances**

<https://darksky.org/resources/guides-and-how-tos/lighting-principles/>

<https://darksky.org/who-we-are/advocates/>

<https://darksky.org/resources/public-outreach-materials/>

THANK YOU!

Steve Mariconda

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Chapter

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Scientific Literature

- Artificial Light at Night (ALAN) State of the Science Report 2024 (DarkSky International, John Barentine PhD)
- <https://darksky.org/news/artificial-light-at-night-state-of-the-science-2024/>
- We're All Healthier Under a Starry Sky (The American Medical Association, Mario Motta MD)
- <https://journalofethics.ama-assn.org/article/were-all-healthier-under-starry-sky/2024-10#:~:text=Conclusion,a%20marker%20of%20that%20risk.>
- Ecological Light Pollution (Frontiers in Ecology and the Environment, Travis Longcore PhD GISP and Catherine Rich JD MA) (Landmark Paper from 2006)
- <https://esajournals.onlinelibrary.wiley.com/doi/full/10.1890/1540-9295%282004%29002%5B0191%3AELP%5D2.0.CO%3B2>

Other Sources

<https://www.smithsonianmag.com/smart-news/light-pollution-contributes-insect-apocalypse-180973642/>

<https://www.johncbarentine.com/skyglow.html>

<https://darksky.org/>

<https://www.axolight.us/cold-or-warm-light-which-one-to-choose/>

<https://www.youtube.com/watch?v=XTjR4vef8JU>

<https://www.sierraclub.org/new-jersey/light-pollution>

<https://darksky.org/resources/guides-and-how-tos/lighting-principles/>

