

Light POLLUTION – Disturbing the DARK

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Can you imagine going out of your apartment or on your rooftop and seeing the magnificent Milky Way and stars glowing above your head?

Unfortunately, it's impossible if you live in a big city or in a Metro city.

...and the reason is Light Pollution.

“For my part I know nothing with any certainty, but the sight of the stars makes me dream.” – Vincent van Gogh

Dear reader,
when was the last time you experienced a night sky filled with stars? Where was it? How did it make you feel?

While there is growing research supporting the important role night plays in preserving critical wildlife habitats and safeguarding

human health, some aspects of the night, such as the awe it inspires, are harder to quantify.

Award-winning science journalist Jo Marchant captures this importance in her book, *The Human Cosmos: Civilization and the Stars*.

"For most of human history we have led not just an earthly existence but a cosmic one. Our innate relationship with the stars shaped who we are – our religious beliefs, our culture and customs, power structures, scientific advances and even our biology. But over the last few centuries we have separated ourselves from the universe that surrounds us. And that disconnect comes at a cost."

LIGHT POLLUTION???

The issue of light pollution was firstly recognised in the 1970s, when astronomers began to see the impact of the rapid increase in artificial light on their work. At this time, the sky is estimated to have been becoming brighter by between three and six percent every year.

Light pollution is a type of pollution. It is defined as "any adverse (or bad) effect as a result of man-made lights." Usually, this means too much light. Several species, including plants and humans, are badly affected by light pollution. Most people have never heard of light pollution, and those who have usually don't care, or do anything about it. Light pollution costs billions of dollars globally every year.

It is the presence of any unwanted, inappropriate, or excessive artificial lighting. In a descriptive sense, the term light pollution refers to the effects of any

poorly implemented lighting sources, during the day or night. Light pollution can be understood not only as a phenomenon resulting from a specific source or kind of pollution, but also as a contributor to the wider, collective impact of various sources of pollution.

Light pollution, or artificial light at night, is the excessive or poor use of artificial outdoor light, and it disrupts the natural patterns of wildlife, contributes to the increase in carbon dioxide (CO₂) in the atmosphere, disrupts human sleep, and obscures the stars in the night sky.

It is the human-made alteration of outdoor light levels from those occurring naturally. When we over-light, fail to use timers and sensors, or use the wrong colour of light, we can negatively affect many parts of our world, including migratory birds, pollinators, sea turtles, and mammals, including humans.

Light pollution is the presence of excessive artificial light. It is most common in large cities and Metro Cities where it's produced by streetlights, billboards, shopping malls, and exterior lights on buildings and poles. Astronomers are specifically concerned about light pollution because it prevents them from observing the night sky. However, environmentalists, health workers, and economists also insist on reducing light pollution.



Types of LIGHT POLLUTION

There are multiple types of light pollution. Let's briefly consider those that can directly affect observational astronomy -

- Sky glow – Yellow or orange halo in the night sky.
- Glares – Bright light from passing cars or streetlamps.
- Light trespass – Streetlight shining into your room.
- Satellite glow – Brightening of the sky by artificial satellites.

The first type of light pollution reduces our ability to view celestial objects. The second and third types ruin our night vision. The fourth type has emerged relatively recently. Many experts think that satellite constellations, such as Starlink, pose a real threat to ground-based astronomy. Due to increasing numbers of satellites, our skies might be crawling with bright dots of artificial light in the nearest future.

How to Measure LIGHT POLLUTION?

To measure different types of LIGHT POLLUTION Bortle Scale is used.



Bortle Scale

Astronomers often use the Bortle scale to measure the night sky's brightness. This scale ranges from Class 1 (perfectly dark sky) to Class 9 (most light-polluted city sky).

There are also other scales for measuring light pollution. We can also measure light pollution in our location by determining the faintest stars we can see. Astronomers call

this the "Naked Eye Limiting Magnitude" or NELM.

Effects of LIGHT POLLUTION

People who are not interested in observing the night sky usually don't care much about light pollution. But if you think it impacts only astronomy lovers, you're wrong — Light Pollution is harmful to most living creatures and to the environment.

★ Health effects

Humans are used to a particular day-night cycle, which acts as an internal clock for our bodies. This cycle is controlled by the amount of light around us. Excessive artificial light during the night can disrupt this cycle and cause sleep disorders, depression, and weakening of the immune system.

★ Effects on animals

Light also controls animals' behaviour, such as reproduction, sleep, and protection from predators. Excessive artificial light negatively affects animals in many ways: migratory birds get disoriented, baby turtles are drawn away from the ocean into the cities, populations of insects' decline, etc.

★ Energy waste

Unnecessary lighting costs billions of dollars every year and harms the ecology. According to the International Dark-Sky Association, 35% of all outdoor lighting is wasted because of poorly designed light fixtures. The total cost of this waste amounts to around three billion dollars every year in just the United States. Also, millions of tons of carbon dioxide are emitted to power this lighting, which results in immense damage to the environment.



Night Sky Without Light Pollution at Benital – India's First Astro-Village

How to reduce light pollution?

Local authorities can fight light pollution by adjusting street lighting and improving the design of light fixtures. There are three main steps that should be taken:

- >Using warm yellow light instead of blue light.
- >Dimming all unnecessarily bright light sources.
- >Shielding light fixtures so that no light escapes into the sky.

There are also things that you personally can do to minimize light pollution — especially if you live in a house.

Turn off lights when you don't need them. Use warm-coloured light bulbs

Switch to LEDs — they waste less electricity. Replace outdoor lights with shielded light fixtures. Install motion sensors on outdoor lamps.

“Keep in mind that even small steps in reducing light pollution are worthwhile.”

We all must take Oath to reducing Light POLLUTION.

“If we Disturb The DARK, It will Disturb EMBARK”

★Test Your Knowledge: -

- Which country has the highest light pollution?
- Which country has the least amount of light pollution?
- How much has light pollution increased?
- How many stars can you see with light pollution?

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