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Light Pollution

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I. LIGHT – A VITAL ENERGY FOR LIFE

Light is one of the most essential forms of energy that sustains life on Mother Earth. Plants and trees utilise light to produce food through the process of photosynthesis, which not only supports their own growth but also sustains all other living beings. Without light, vision—the most powerful sense of humans and many animals—would not be possible.

The Sun and the Moon serve as the two primary natural sources of light. However, over time, humans have developed numerous artificial sources of light to illuminate their surroundings and extend productive hours beyond daylight.

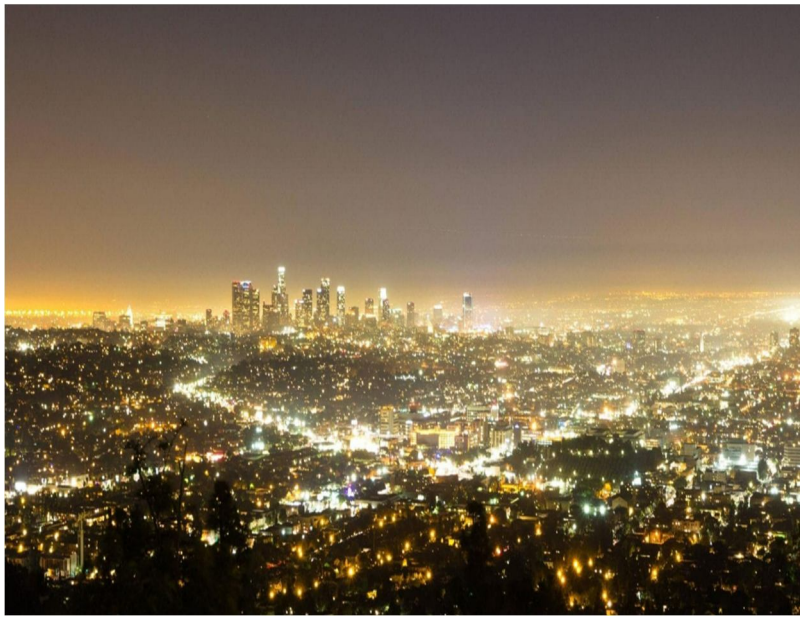
The mysteries of light have always fascinated humankind. Questions such as *Why is the sky blue?* or *How do rainbows, polar lights, or bioluminescence occur?* have inspired scientific curiosity for centuries. Eventually, science revealed that light is a form of electromagnetic radiation, characterised by its wavelength. The visible spectrum—commonly remembered by the acronym VIBGYOR (Violet, Indigo, Blue, Green, Yellow, Orange, Red)—represents the range of light perceptible to the human eye.

Various theories have been proposed to explain the properties of light over time, including the Particle Theory, Wave Theory, Electromagnetic Theory, and Quantum Theory—each contributing to our evolving understanding of this remarkable phenomenon.

A major milestone in the history of light was achieved by Thomas Alva Edison, who, after nearly 10,000 failed attempts, successfully invented the electric incandescent lamp. This invention revolutionised human life by replacing oil and gas lamps, marking one of the greatest innovations in history.

However, the very source of comfort and progress has also become a growing concern. The uncontrolled and excessive use of artificial light has led to light pollution, disrupting natural ecosystems, affecting wildlife, and even impacting human health. Thus, while light continues to illuminate our world, it reminds us of the need for balance between technological progress and environmental harmony.

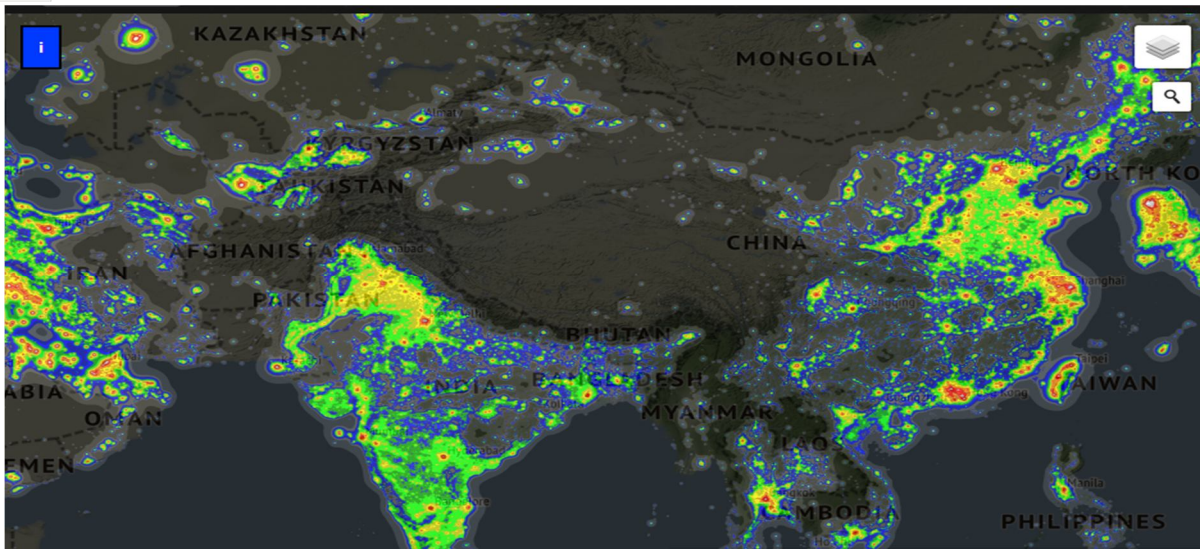
Many inventions that once made human life easier are now posing serious threats to our own existence. One such example is the artificial sources of light, which have become major contributors to light pollution. The main sources include outdoor lighting, streetlights, advertisement boards, and vehicle headlights—especially along highways.



Excessive and misdirected lighting not only wastes energy but also disrupts the natural rhythm of wildlife. Birds, insects, and animals become disoriented by continuous illumination, disturbing their feeding, migration, and breeding patterns. For humans, prolonged exposure to artificial light at night interferes with sleep cycles, leading to reduced mindfulness, fatigue, and other health-related issues.

The uncontrolled glow that once symbolised progress is now a silent form of pollution, reminding us that even the brightest inventions can cast a shadow if not used wisely.

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Map showing the Light pollution from artificial Light from www.astrophotographyindia.com.

II. LIGHT POLLUTION – HUMAN IMPACT AND THE NEED FOR AWARENESS

Recognising the growing threat posed by artificial lighting, UNESCO declared the year 2015 as the International Year of Light to raise global awareness about the importance of light and its responsible use. This initiative also aimed to highlight the harmful effects of anthropogenic (human-made) light pollution on both nature and human health.

In humans, a hormone called Melatonin—naturally produced by the pineal gland—plays a vital role in regulating the sleep–wake cycle and other metabolic functions. It is often referred to as the "Dracula hormone" because it is secreted only in darkness. However, excessive exposure to artificial light at night suppresses melatonin production, confusing the body's internal clock. As a result, many people experience sleep disturbances, headaches, anxiety, and other health problems.

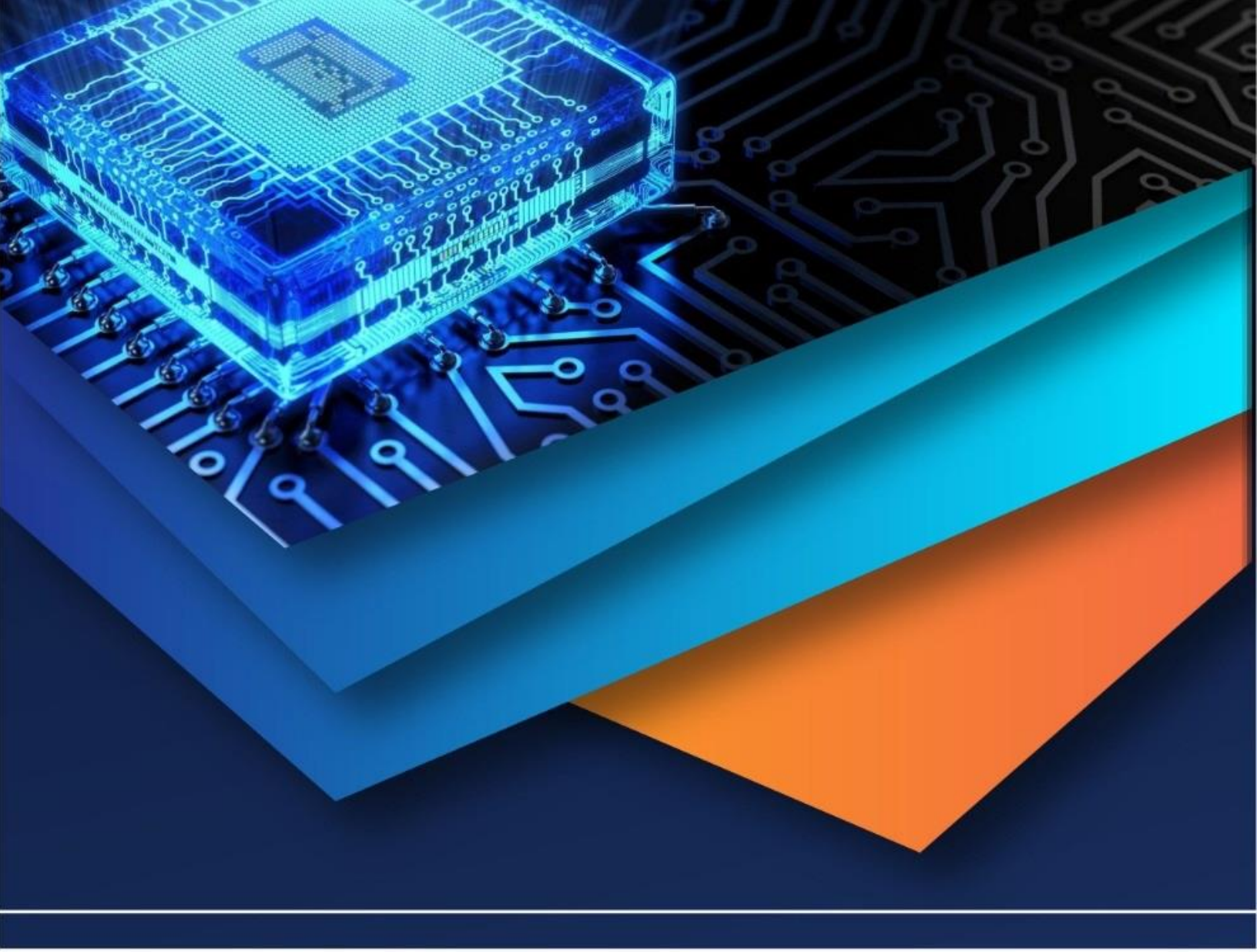
Light pollution also disrupts the behaviour of animals, birds, and insects, which rely on natural light cues for navigation, migration, and reproduction. Consequently, even the night sky—once filled with countless stars—has become faint and barely visible in many urban areas.

III. HOW CAN WE MINIMIZE LIGHT POLLUTION?

To reduce light pollution without compromising safety, the following measures can be adopted:

1) Switch off unnecessary and unimportant lights when not in use, ensuring security lighting remains unaffected.
2) Use motion sensors to automatically control lighting and reduce wastage.
3) Direct lights properly to focus illumination where it is needed and avoid scattering or upward glare.
4) Use low-wattage lights wherever possible.
5) Select warm white lights (around 2700 K) for outdoor areas to minimise blue light emissions.
6) Organise sports events and public gatherings during daylight hours.
7) Host parties or celebrations indoors instead of in open outdoor spaces at night.
8) Educate and spread awareness among people about the impacts of light pollution and the importance of responsible lighting.

By adopting these simple yet effective practices, we can restore the beauty of the night sky and protect both human health and the environment. Let us use light wisely—not just for our convenience, but for the well-being of all living beings.



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