

Congresso Nazionale ISDE Italia 2026

Costruire identità, conoscenza e coerenza nella salute ambientale

"Se non speri l'insperato non lo troverai, perché essendo sconosciuto è difficile da ricercare" (Eraclito)

23-25 Ottobre 2026

Auditorium Sede Direzionale Aboca - Loc. Aboca, 20 - 52037 Sansepolcro (AR)



La riqualificazione dell'illuminazione pubblica nel Comune di Vercelli: un modello di tutela ambientale e di contrasto all'inquinamento luminoso

2014 — 2026 PROGETTO ILLUMINOTECNICO dell'ingegnere DIEGO BONATA (CieloBuio)



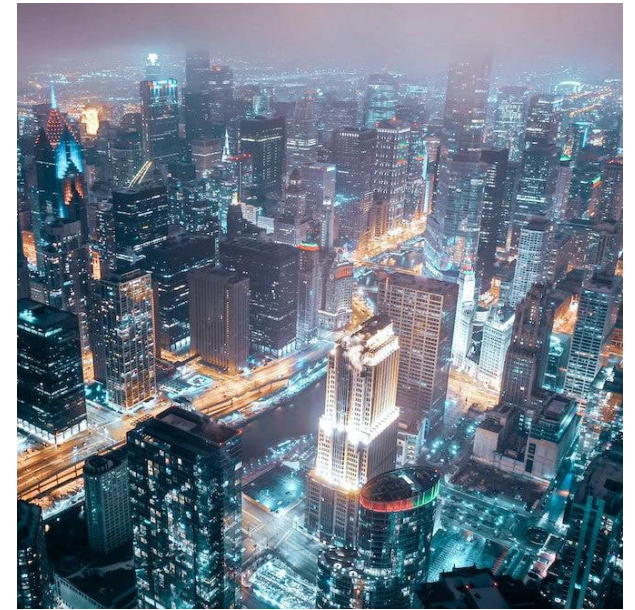
ISDE ITALIA
Medici per l'Ambiente



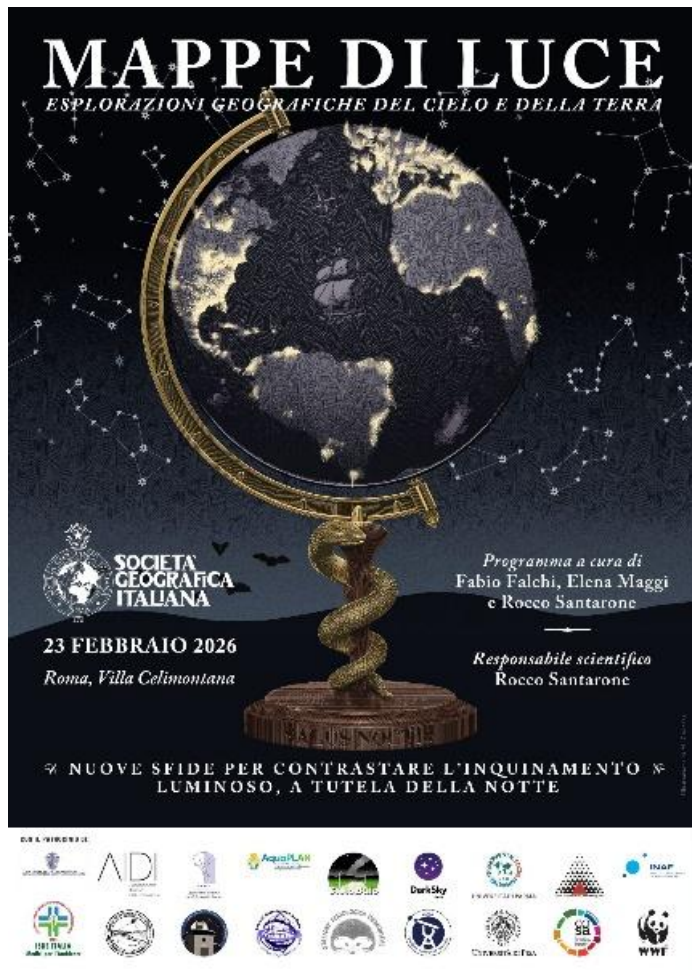
roccosnt@gmail.com Rocco Santarone, MD



ALAN ARTIFICIAL LIGHT AT NIGHT



*“ the excessive use of artificial light
that alters the natural patterns of wildlife,
contributes to increased CO₂ emissions,
disrupts human sleep
and obscures the visibility of the stars ”*



pollution

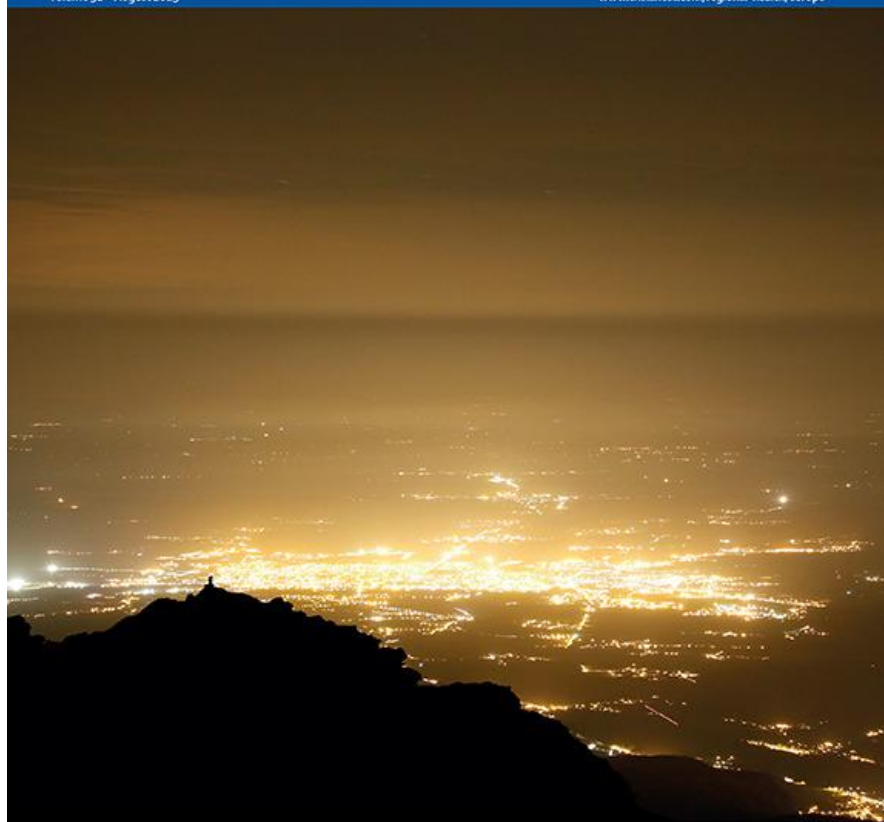
Oxford English Dictionary

3.b. Physical impurity or contamination; (now) esp. the presence in or introduction into the environment (esp. as a result of human activity) of harmful or poisonous substances, or **excessive level of light**, noise, organic waste, etc.

Light pollution is defined as the alteration of natural levels of **intensity, spectrum and polarization of light**, caused by artificial sources

Elena Maggi, ecologia - Università di Pisa
(2026)

Light pollution represents a **threat to biodiversity** and to **the functioning of terrestrial and aquatic ecosystems**; it affects **human health** and **deprives humanity of the scientific, cultural, and emotional dimension linked to the observation of the night sky**, a material and immaterial heritage of universal value



Editorial

Shedding light on light pollution

Articles

Prostatic artery embolisation versus medical treatment in patients with benign prostatic hyperplasia

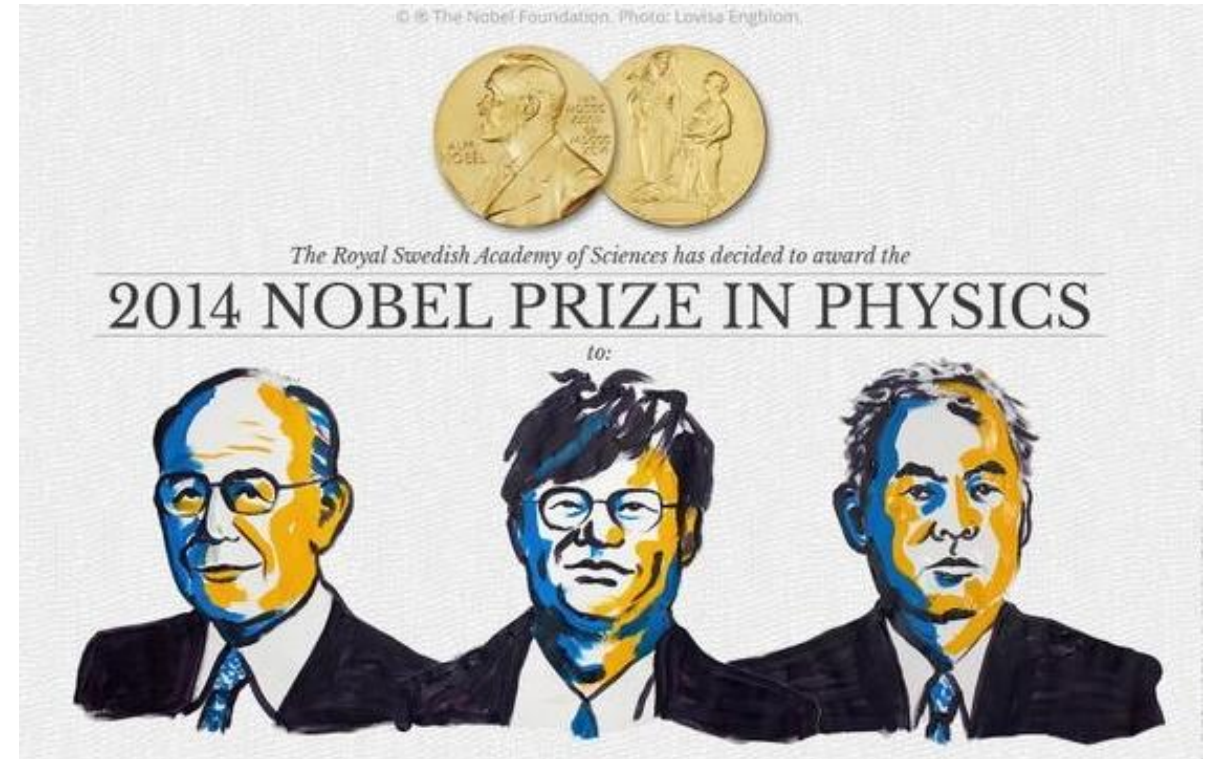
Articles

Minimally invasive versus open distal pancreatectomy for resectable pancreatic cancer



Shedding light on light pollution Editorial

However, light pollution—excessive or misdirected artificial light at night (ALAN)—which impacts at least 80% of the world's population and more than 99% of Europeans, was not part of the discussion, and therefore no specific actions were proposed to tackle it. As traditional lighting technology is replaced by light emitting diodes (LEDs) in an attempt to reduce energy consumption, carbon emissions, and energy costs, the artificially lit surface of the Earth at night continues to increase in brightness and extent. This increased use of LEDs as a result of their lower cost has increased light pollution by 49% between 1992 and 2017. Thus, it is imperative that light pollution is viewed and treated with the same importance as other types of environmental pollution.



2014 PHYSICS “for the invention of efficient **BLUE LIGHT** bright and energy-saving **emitting diodes** which has enabled **white light sources**”

Benefits of LED lighting



Color Variety



Durability

*...what is the planetary health
real cost of artificial light?*



Longer Life Span



50 times
longer than
incandescent

LED lights can be
switched on and
off instantaneously

Reaction Time



It is easy to
dispose

Environmental Safety

LED's emit at
least 20-50% less
heat compared

Temperature



Artificial light at night as a new threat to pollination

“Here we show that artificial light at night disrupts nocturnal pollination networks and has negative consequences for plant reproductive success.



In artificially illuminated plant–pollinator communities, nocturnal visits to plants were reduced by 62% compared to dark areas”

nature 548, 206–209 (2017)

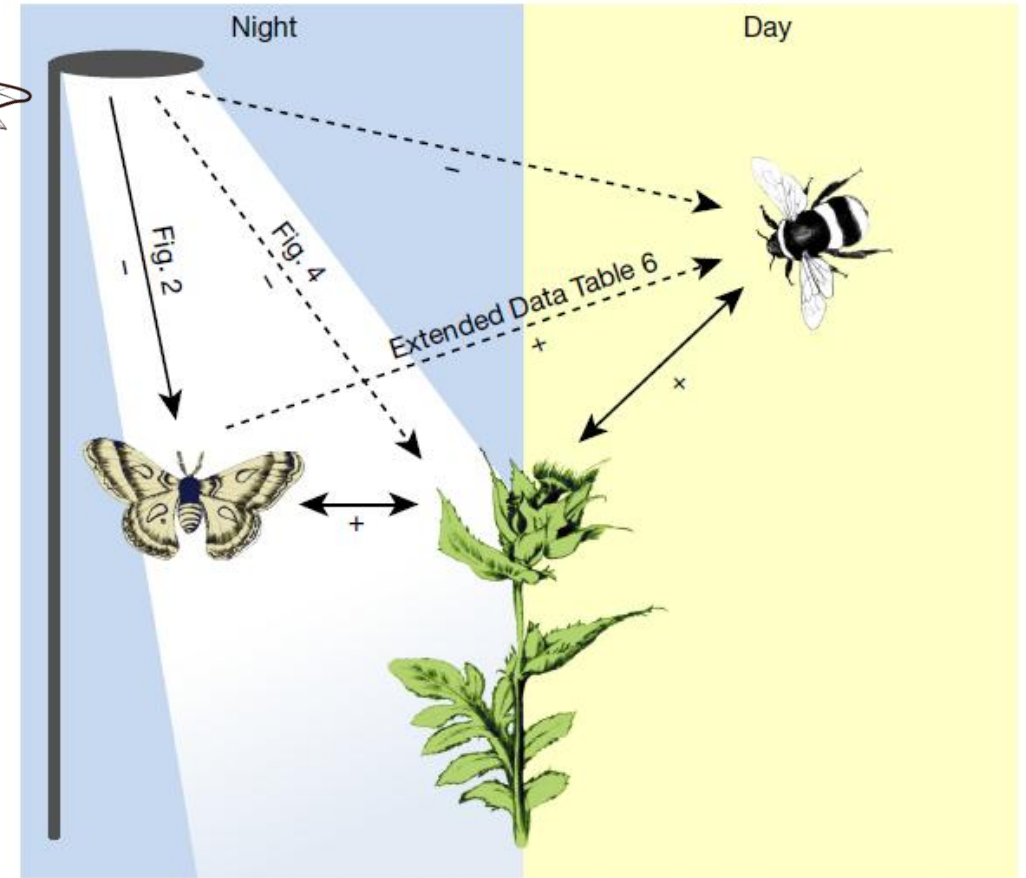


Figure 1 | Interaction web showing the pathway by which artificial light at night affects plant reproduction and diurnal pollinator communities.

Brighter nights and darker days predict higher mortality risk: A prospective analysis of personal light exposure in >88,000 individuals

October 15, 2024

“Circadian rhythm disruption accompanies a wide range of adverse health outcomes that contribute to premature mortality

While night light disrupts circadian rhythms

...higher risk of premature mortality was predicted by brighter nights, darker days, suppressed circadian amplitude, and early or late circadian phase”



Tellas

Light Exposure at Night and Cardiovascular Disease Incidence

JAMA Netw Open

Published Online: October 23, 2025

JAMA
Network | Open™

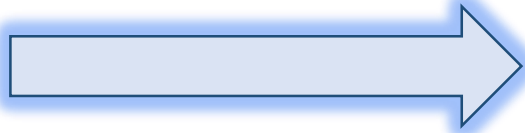
Conclusions and Relevance In this cohort study, night light exposure was a significant risk factor for developing cardiovascular diseases among adults older than 40 years. These findings suggest that, in addition to current preventive measures, avoiding light at night may be a useful strategy for reducing risks of cardiovascular diseases.

“...88 905 adults aged older than 40 years

...prospective cohort study analyzed cardiovascular disease records across 9.5 years (June 2013 to November 2022) from UK Biobank participants who wore light sensors in a naturalistic setting.

Approximately 13 million hours of light exposure data, tracked by wrist-worn light sensors (1 week each)”





2013

Abraham Haim · Boris A. Portnov

Light Pollution as a New Risk Factor for Human Breast and Prostate Cancers

 Springer



Streetlight Fight in Rome: Golden Glow vs. Harsh LED – The New York Times, 2017

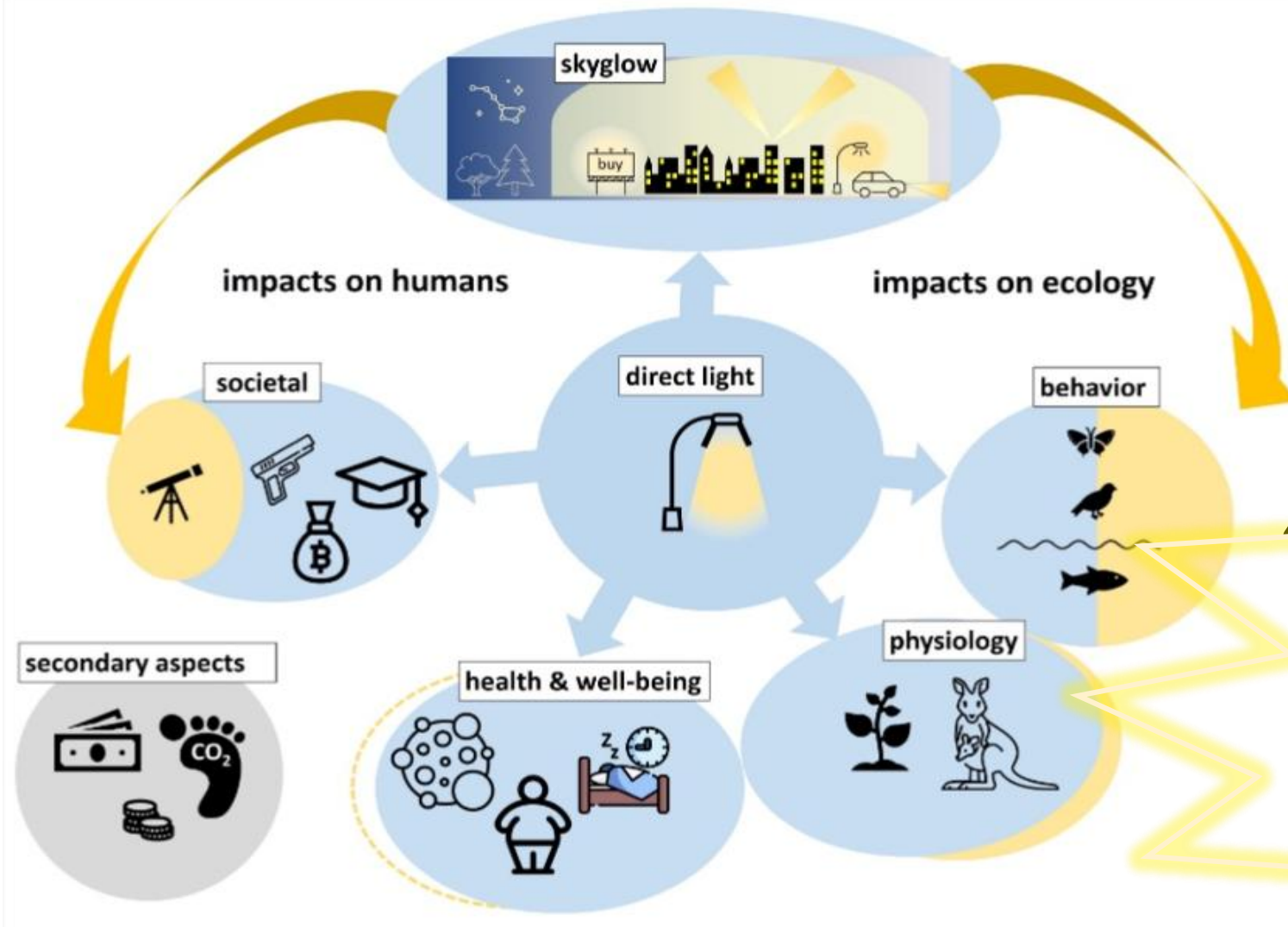
**“Transition to blue-shifted LED bulbs - Image of Milan, Italy taken in 2015
from the International Space Station after the transition to LED bulbs in the city center”**

Samantha Cristoforetti/NASA/ESA



Timing of light exposure affects mood and brain circuits - NATURE Translational Psychiatry, 2017

Monitoring, trends and impacts of light pollution



**“lighting (indoor and outdoor)
20% of global
electricity consumption
and 6% of CO₂ emissions”**

Light Pollution is
WASTED LIGHT



99% of outdoor light is **WASTED**
ONLY 1% of outdoor light serves a useful purpose
a visual function

Source: U.S. Department of Energy, 2022
<https://www.energy.gov/eere/ssl/articles/doe-publishes-2022-solid-state-lighting-rd-opportunities>

International Dark-Sky Association
www.DarkSky.org



Excessive
Lighting
is **Wasteful**

30%

outdoor lighting in the U.S. wasted by lights that aren't shielded

\$3.3B

Cost of lighting in the U.S. wasted by lights that aren't shielded

21M

tons of carbon dioxide per year

875M

Number of trees planted annually to offset all that carbon dioxide



Vercelli

IL PIANO DELLA LUCE NEL TERRITORIO DEL COMUNE DI VERCELLI

2014

Piano della Luce

Censimento integrale, classificazione illuminotecnica del territorio, linee guida vincolanti sulla qualità della luce.

49,7% ÷ 52,7%

risparmio previsto

2018

Riqualificazione

6.880 corpi illuminanti a LED,
pari al 75,4% del parco.
Centro storico interamente a 2200 K.

58,5%

risparmio conseguito

2026

Adattiva e smart city

1.535 punti luce in regolazione adattiva
FULL ADAPTIVE INSTALLATION (FAI),
685 apparecchi sostituiti,
servizi urbani integrati.

655.974

kWh/anno aggiuntivi

TRE FASI DI PROGETTAZIONE ILLUMINOTECNICA IN CONTINUITÀ - ogni fase cumulativa anziché sostitutiva

Legge Regionale Piemonte 31/2000 e 3/2018

L.R. 24 marzo 2000, n. 31

Disposizioni per la prevenzione e lotta all'inquinamento luminoso e per il corretto impiego delle risorse energetiche

Art. 6 c.1 — i comuni oltre 30.000 abitanti approvano il piano dell'illuminazione. Vercelli, con 46.218 abitanti, vi è tenuta: il Piano della Luce è adempimento di legge, non scelta facoltativa.

L.R. 9 febbraio 2018, n. 3

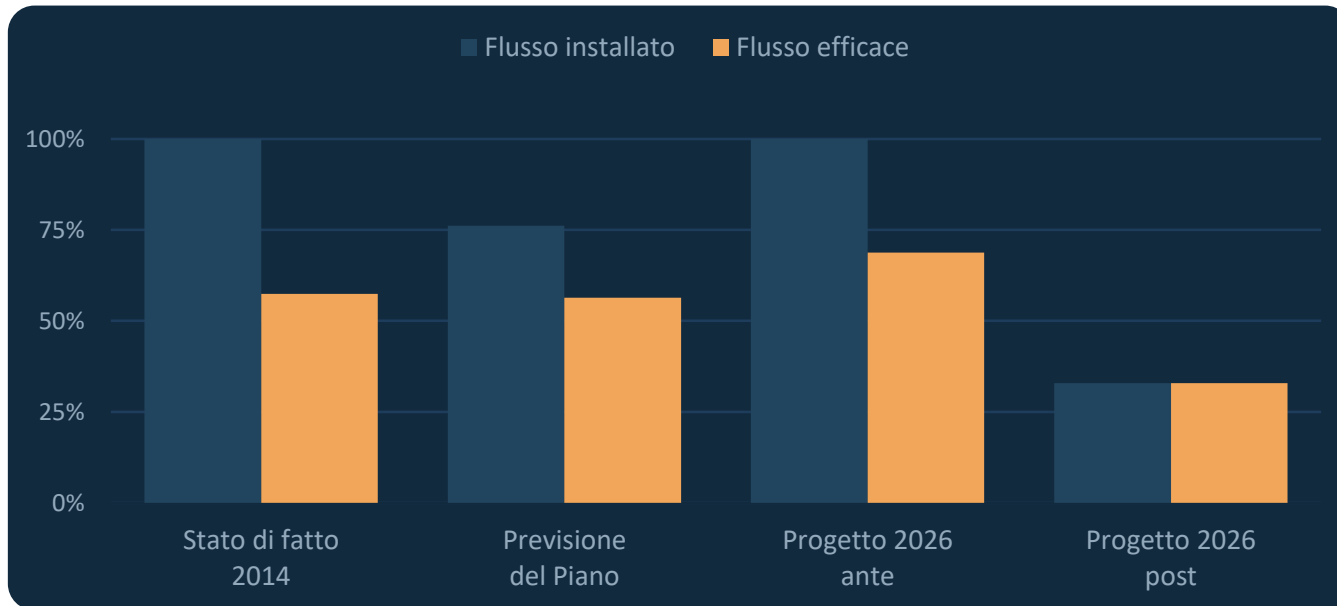
Modifiche alla l.r. 31/2000 — in vigore dal 2 marzo 2018. Introduce l'Allegato A con i requisiti tecnici minimi vincolanti.

Art. 9 c.6 — **gli enti che non realizzano impianti conformi all'Allegato A non possono accedere ai finanziamenti regionali, statali o comunitari in campo ambientale ed energetico.**

Allegato A, punto 1 — requisiti tecnici minimi

- a) intensità luminosa massima fra 0 e 0,49 cd per 1000 lm per angoli $\gamma \geq 90^\circ$
- b) efficienza delle sorgenti > 90 lm/W e temperatura di colore ≤ 3500 K
- c) luminanze e illuminamenti non superiori ai livelli minimi di norma
- d) interdistanza/altezza $> 3,7$ — indici IPEA e IPEI non inferiori ai CAM
- e) **riduzione del flusso $\geq 30\%$ entro le ore 24, spegnimento o sensore di movimento**
- f) per quanto non disposto dalla legge si applicano i CAM (Criteri Ambientali Minimi)

L'emissione indiretta riflessa dal suolo



Valori normalizzati al flusso installato di ciascuna situazione

Il rendimento utile

57,4%

stato di fatto 2014

74,0%

previsione del Piano

100%

impianti del 2026

Il flusso efficace è l'unica grandezza che alimenta l'emissione indiretta.

Artificial light at night: a global disruptor of the night-time environment

Salvador Bará^{1,†} and Fabio Falchi^{1,2}

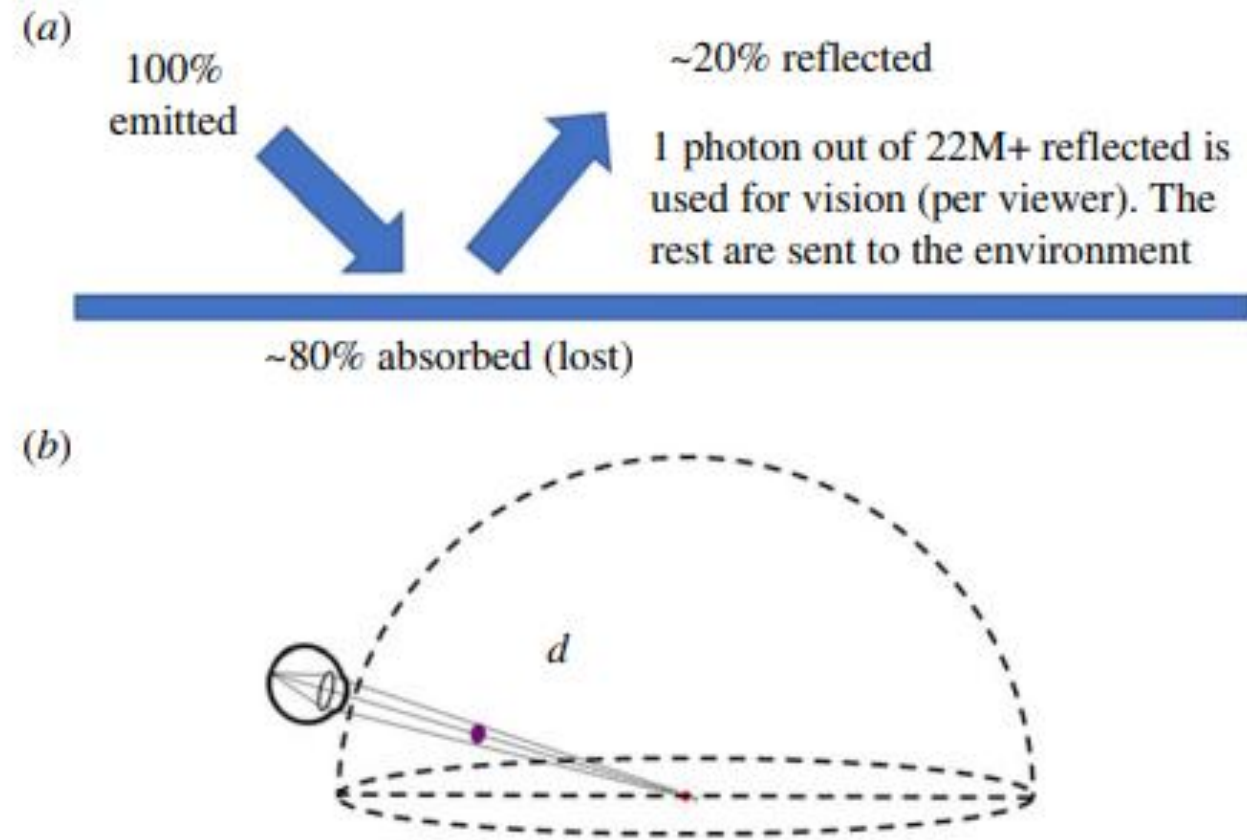
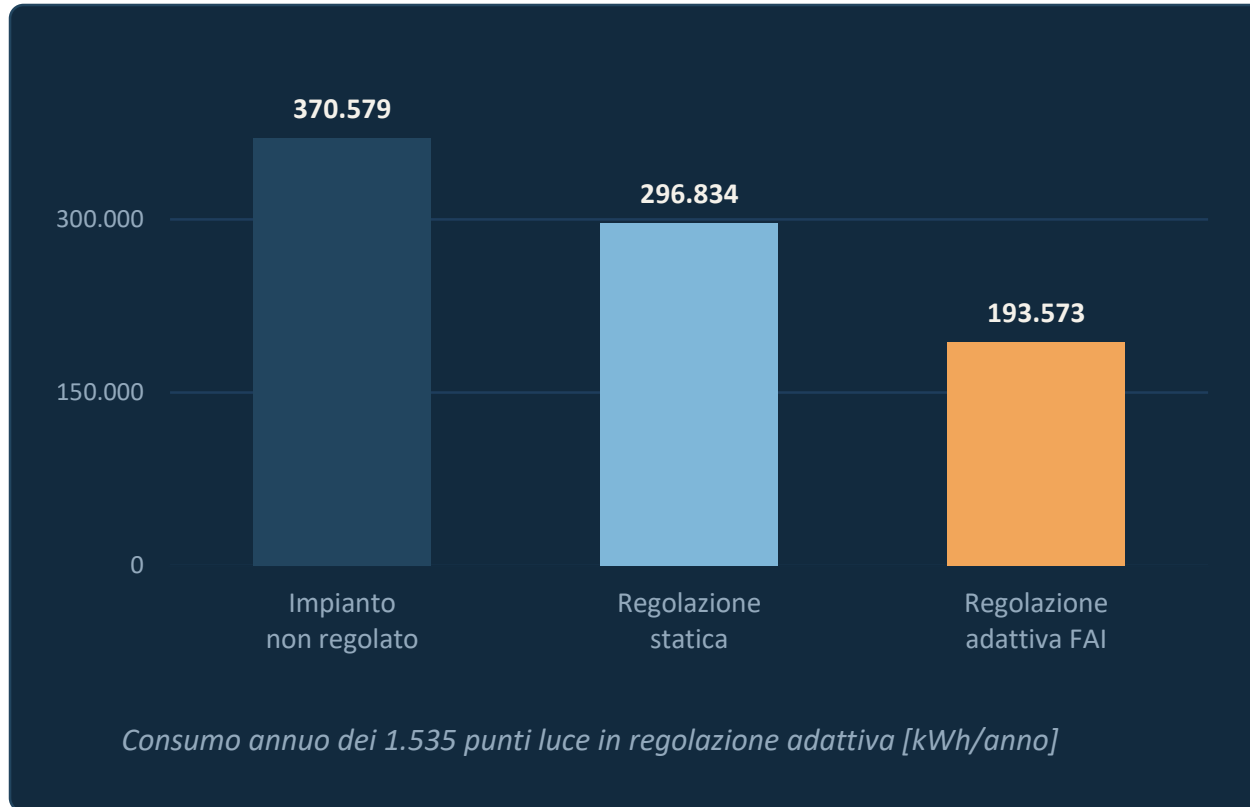


Figure 1. (a) Approximately 20% of artificial light incident on urban surfaces is reflected, but only an extremely small fraction of it is actually used for human vision, the rest is polluting or lost; (b) the eye only captures those reflected photons propagating in the cone of directions defined by the reflection point and the eye pupil rim. For isotropic reflecting materials, this is a fraction $\eta = r^2/(2d^2)$ of the total number of reflected photons, being r the eye pupil radius and d the distance to the point [73].

Ridurre il flusso totale e nel tempo



**Meno luce emessa significa
meno energia consumata**

Il flusso mediamente emesso nell'arco dell'anno si riduce nella stessa misura del consumo, e l'attenuazione si concentra nelle ore centrali della notte: quelle più critiche sia per l'osservazione del cielo sia per la fauna notturna.

-19,9%

con la sola regolazione statica

-47,8%

con la regolazione adattiva FAI

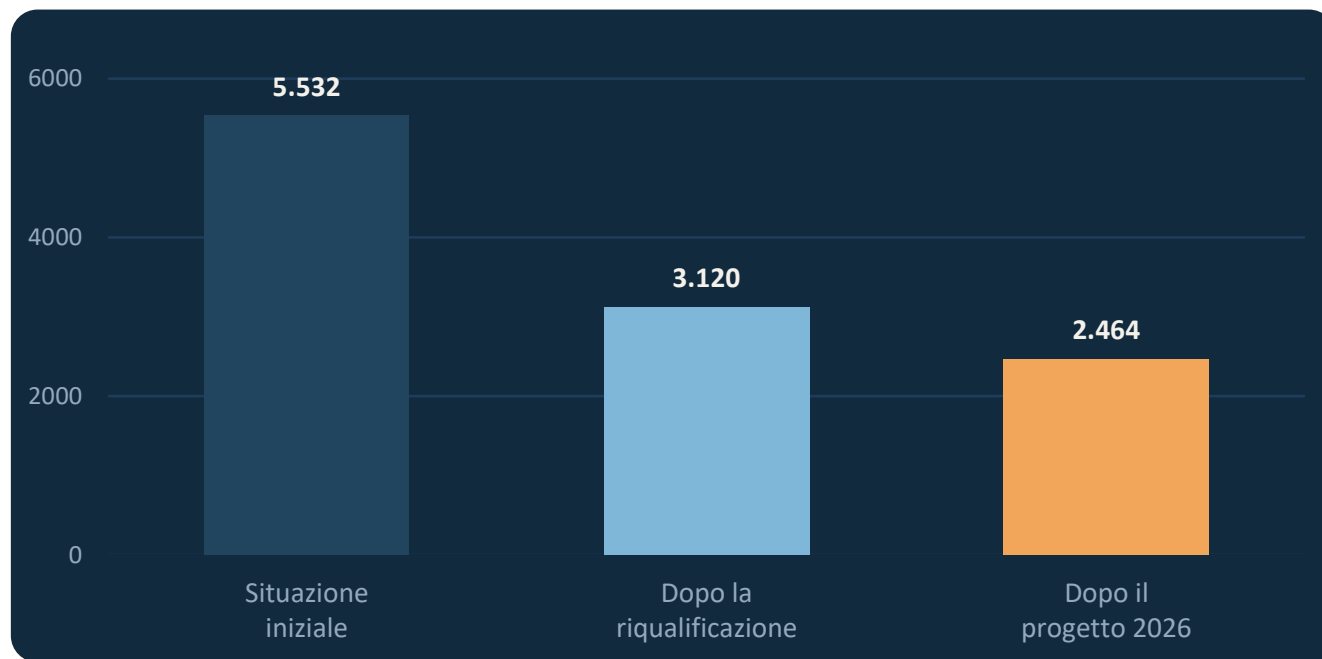
La riduzione agisce contemporaneamente su entrambe le componenti dell'inquinamento luminoso.

FULL ADAPTATIVE INSTALLATION (FAI) - ABBASSA IL FLUSSO IN FUNZIONE DEL TRAFFICO E DELLA LUMINANZA

CON SENSORI SPECIFICI INSTALLATI - 2026

Ing **DIEGO BONATA** - CieloBuio

ILLUMINAZIONE PUBBLICA - COMUNE DI VERCELLI: I RISULTATI



Consumo annuo dell'illuminazione pubblica comunale [MWh/anno]

-55,5%

di fabbisogno energetico

119,7 → 53,3

kWh per abitante all'anno

-1.181 t di CO₂ all'anno

a fattore omogeneo

Il numero di punti luce è rimasto invariato, mentre è aumentata la qualità illuminotecnica, si è azzerata la dispersione verso l'alto e si è dimezzato il flusso immesso nell'ambiente notturno.

Nel Centro Storico installati lamponi a 2200 Kelvin

Ing DIEGO BONATA - CieloBuio



Vercelli vista dall'alto by night - foto di Andrea Cherchi - 2018 – Fonte: giornale La Sesia

2018 - IL CENTRO STORICO A TEMPERATURA DI COLORE “CALDE” CCT – 2200 Kelvin

Un obiettivo che nel 2014 non era tecnicamente raggiungibile

Gli apparecchi disponibili non garantivano lumen sufficienti alle basse temperature di colore, e i limiti normativi dovevano adeguarsi alle prestazioni del mercato. Il Piano ha comunque indicato la direzione: il progresso dei cinque anni successivi ha reso realizzabile l'intero centro storico a 2200 K. Uno strumento di pianificazione che anticipa la tecnologia, invece di limitarsi a registrarla.

Lanterne classiche e apparecchi d'arredo schermati:
l'immagine storica dell'apparecchio
senza la sua emissione verso l'alto

oltre 1000 punti luce del centro storico
realizzati a 2200 K



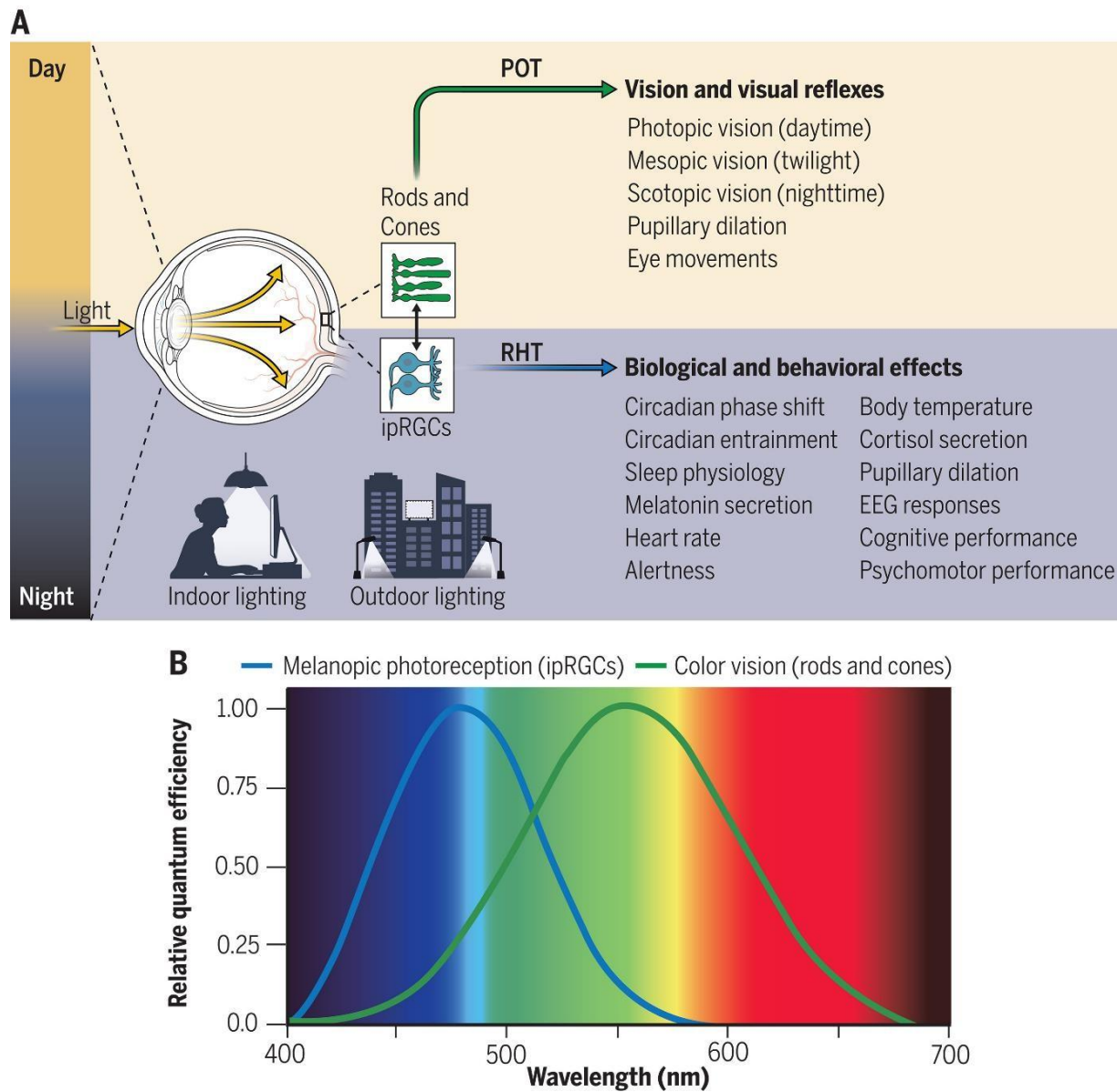
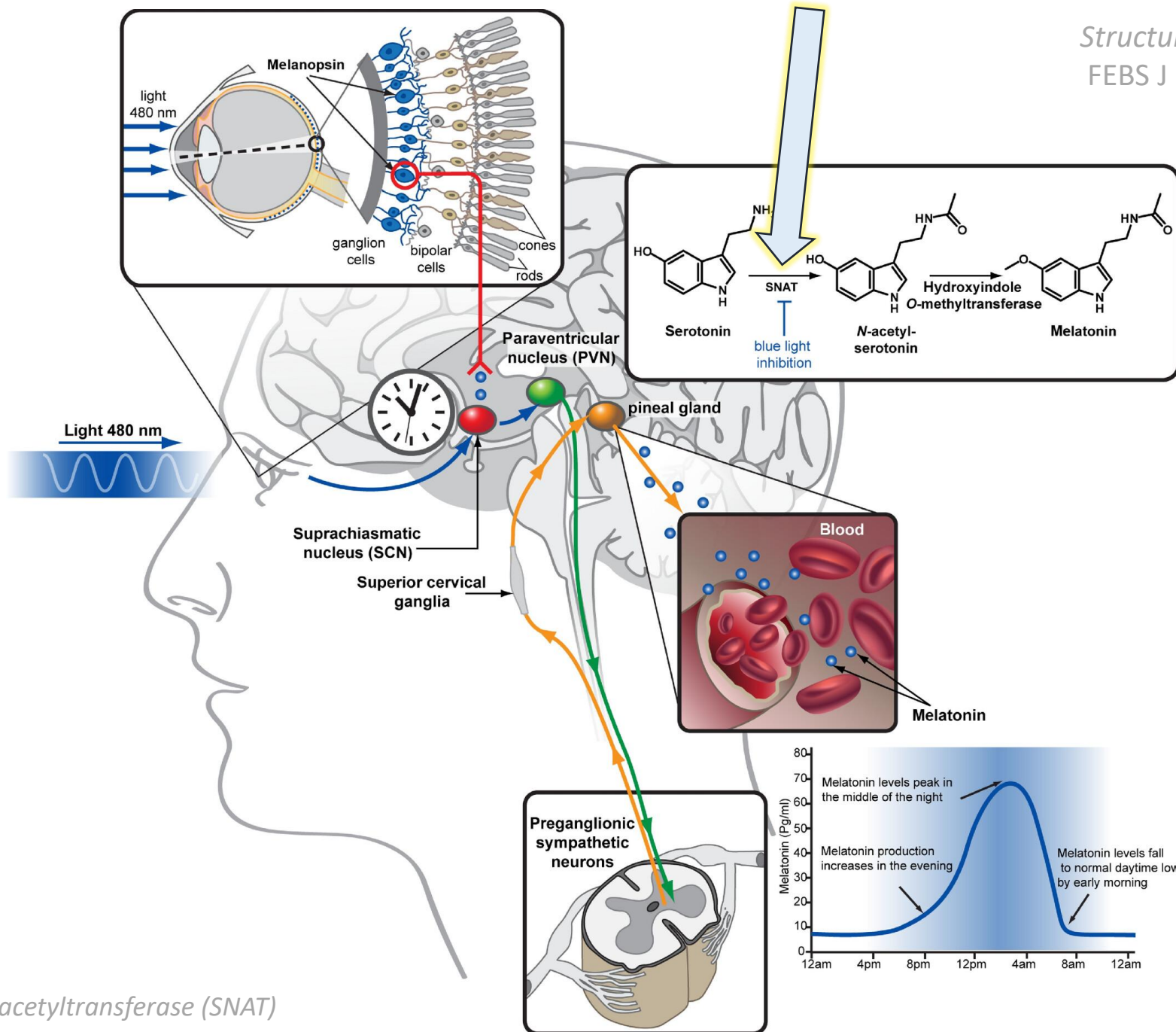
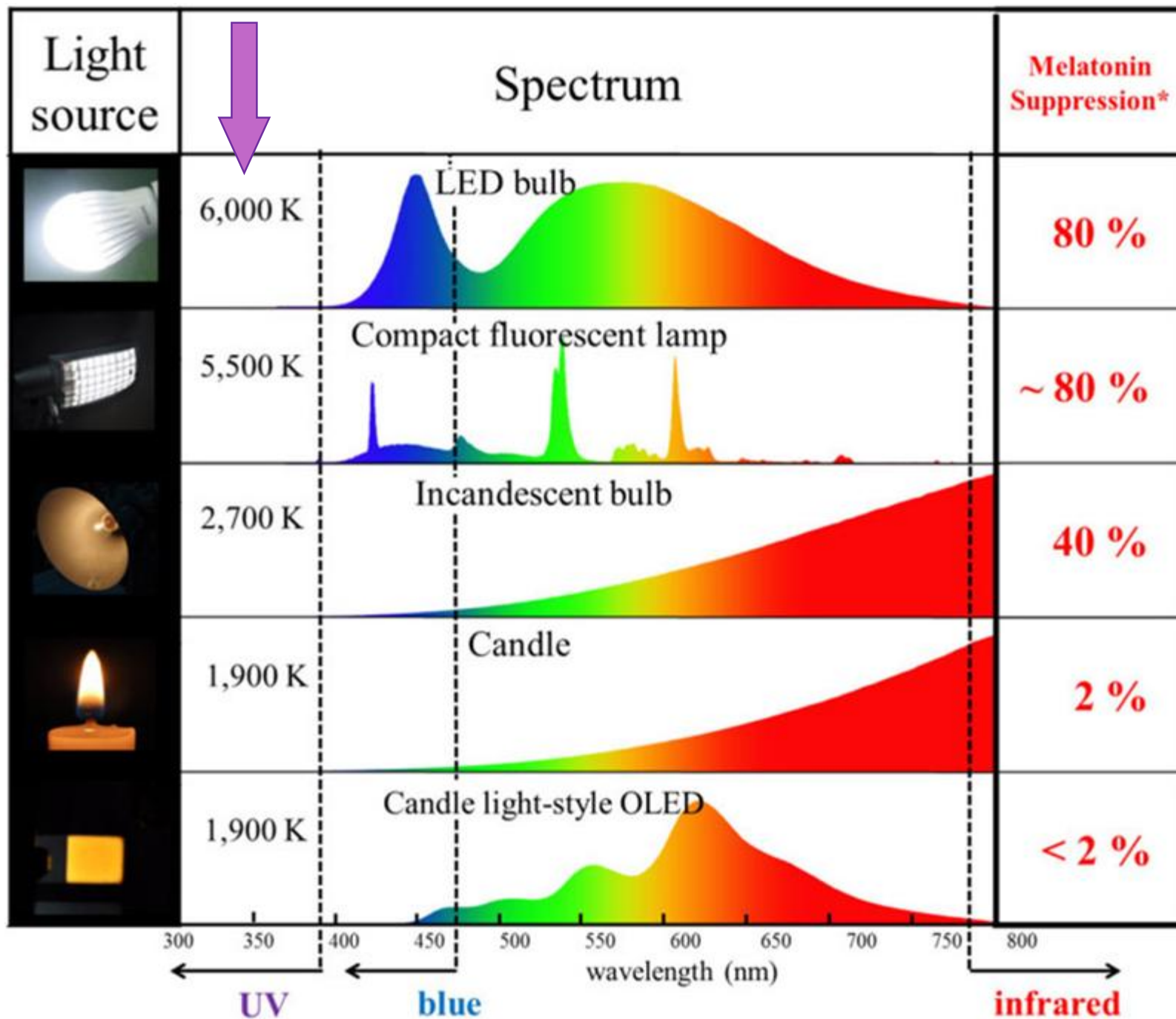


Fig 1. A-B – Reducing nighttime light exposure in the urban environment to benefit human health and society
Science, 2023 - Vol 380, Issue 6650
 SPECIAL ISSUE REVIEW







AMA Journal of Ethics®

October 2024, Volume 26, Number 10: E804-810

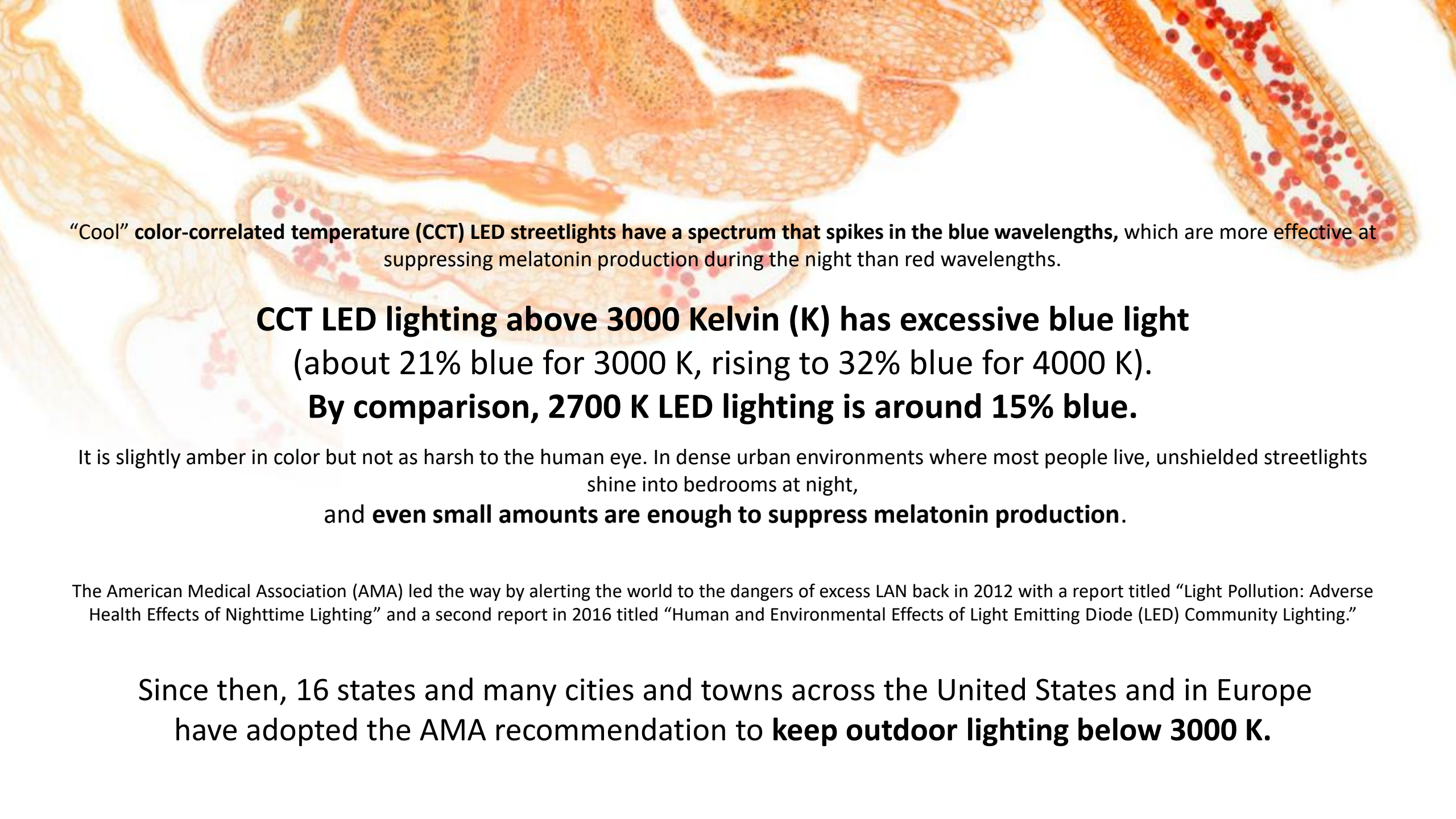
POLICY FORUM: PEER-REVIEWED ARTICLE

We're All Healthier Under a Starry Sky

Mario E. Motta, MD

Abstract

A star-filled sky has long been a source of awe and inspiration, and its loss adversely affects human, nonhuman, and environmental health. In one generation, this majestic nighttime overstory has been lost due to national and international overuse of light-emitting diodes lighting.



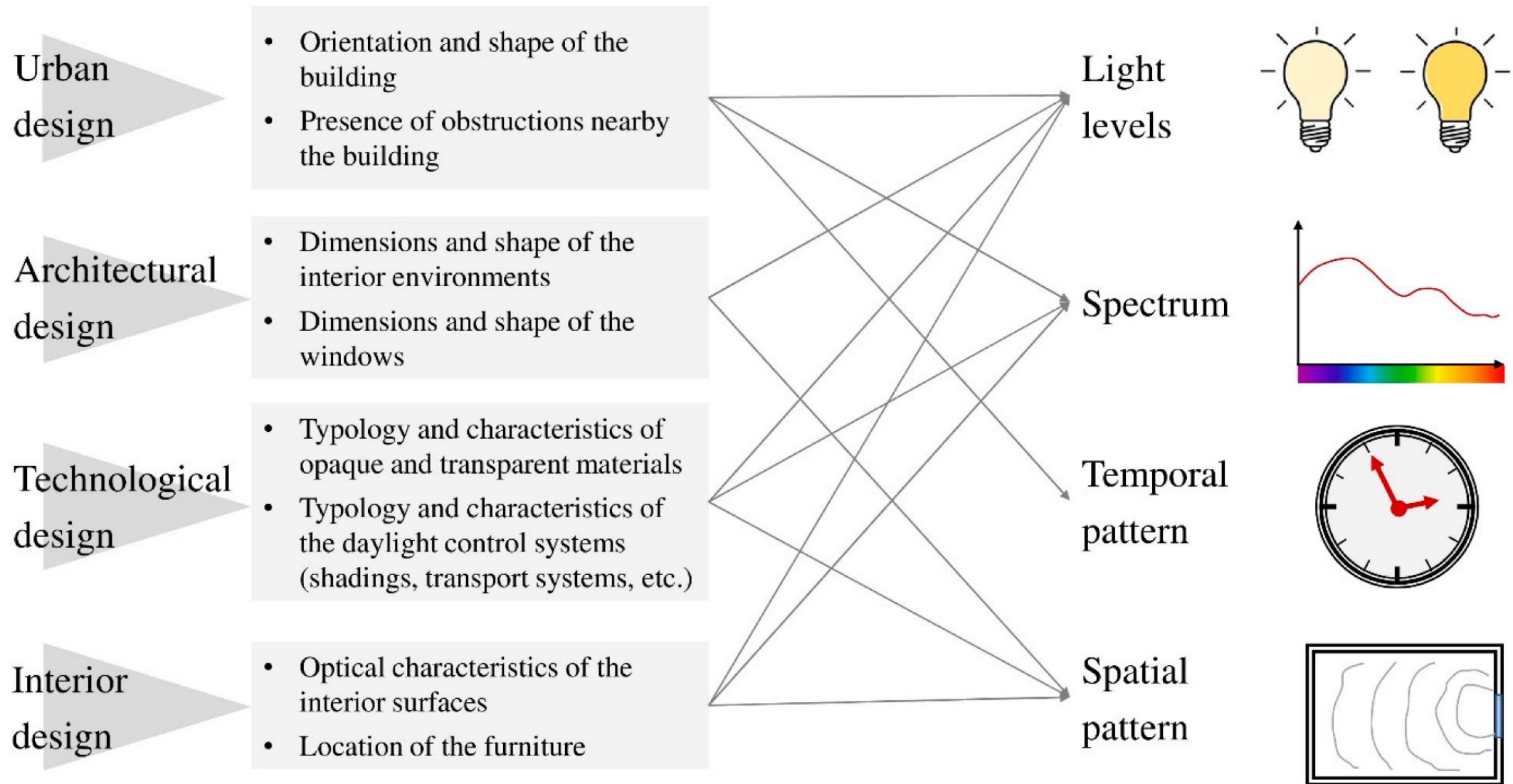
“Cool” color-correlated temperature (CCT) LED streetlights have a spectrum that spikes in the blue wavelengths, which are more effective at suppressing melatonin production during the night than red wavelengths.

CCT LED lighting above 3000 Kelvin (K) has excessive blue light
(about 21% blue for 3000 K, rising to 32% blue for 4000 K).
By comparison, 2700 K LED lighting is around 15% blue.

It is slightly amber in color but not as harsh to the human eye. In dense urban environments where most people live, unshielded streetlights shine into bedrooms at night,
and even small amounts are enough to suppress melatonin production.

The American Medical Association (AMA) led the way by alerting the world to the dangers of excess LAN back in 2012 with a report titled “Light Pollution: Adverse Health Effects of Nighttime Lighting” and a second report in 2016 titled “Human and Environmental Effects of Light Emitting Diode (LED) Community Lighting.”

Since then, 16 states and many cities and towns across the United States and in Europe have adopted the AMA recommendation to **keep outdoor lighting below 3000 K.**



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.



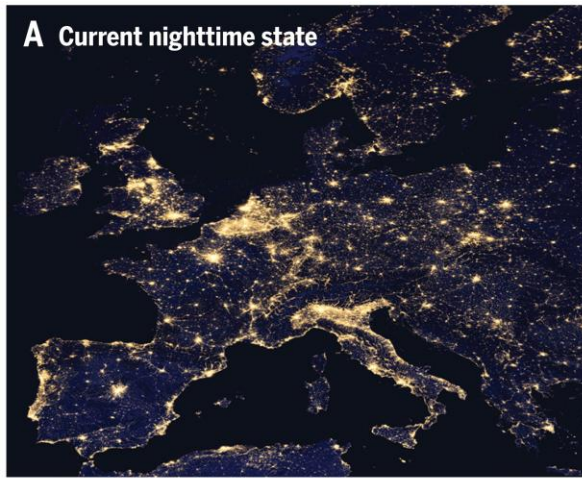
5 Warm-colored

Use warmer color lights where possible

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



Rev. 09-2023

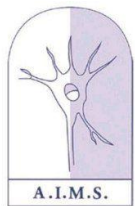


“Protecting ecosystems in urban areas can reduce humanity’s environmental footprint, improve quality of life, and provide a cultural connection to the night sky.”

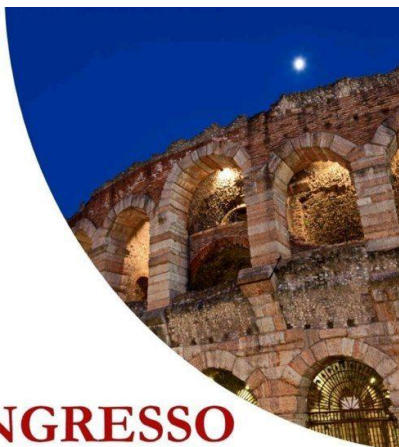
FROM HUMAN-CENTERED TO ECOCENTRIC LIGHTING



Fig 2 – *Reducing nighttime light exposure in the urban environment to benefit human health and society* Science, 2023 - Vol 380, Issue 6650
SPECIAL ISSUE REVIEW



Accademia Italiana
di Medicina del Sonno



XXXVI CONGRESSO NAZIONALE AIMS

REVOLUTIONARY ROADS, LA NUOVA ERA
DELLA MEDICINA DEL SONNO:
INNOVAZIONI "INTELLIGENTI" AL SERVIZIO
DELLA PREVENZIONE E DELLA CURA

VERONA, 27-29 NOVEMBRE 2026

Centro Congressi Camera di Commercio



XXXIV CONGRESSO NAZIONALE AIMS – VERONA, 27-29 NOVEMBRE 2026

SABATO 28 NOVEMBRE 2026

11:00 - 12:00

Simposio

**INQUINAMENTO LUMINOSO: L'IMPRONTA ANTROPICA DELLA
LUCE ARTIFICIALE E LE RIPERCUSSIONI SUI RITMI SONNO-
VEGLIA**

Moderatori: Liborio Parrino (Parma), Sergio Garbarino (Genova)

11:00 - 11:20

**Gli effetti invisibili della luce artificiale sulla salute. Definizione
ed evoluzione del fenomeno**

Rocco Santarone (Roma)

11:20 - 11:40

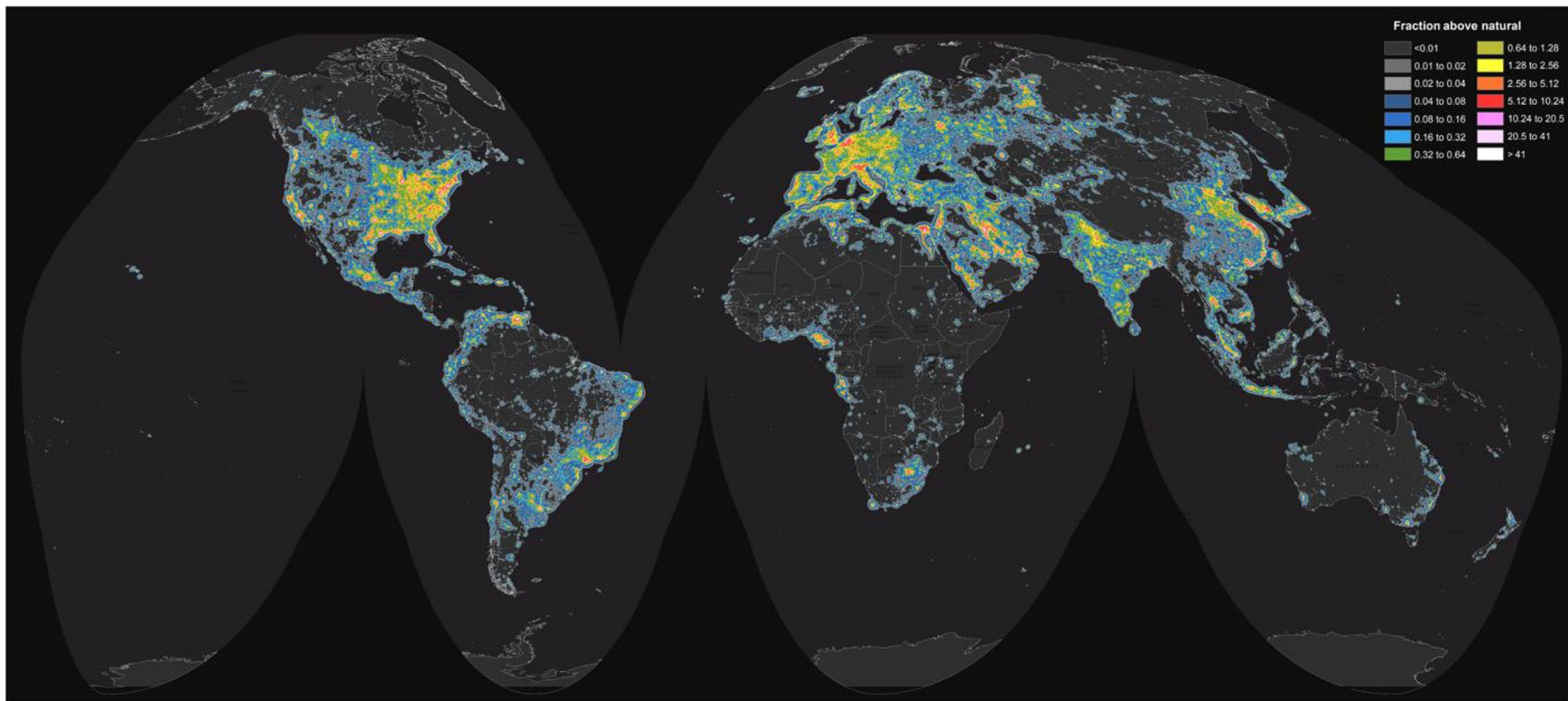
**Gufi e allodole negli ecosistemi: inquinamento luminoso e
alterazione dei ritmi biologici in natura**

Elena Maggi (Pisa)

11:40 - 12:00

**Luce artificiale notturna e telerilevamento da satelliti: un
promettente strumento per studi epidemiologici?**

Fabio Falchi (Thiene)



The new world atlas of artificial night sky brightness – Falchi F et al, Science Advances (2016) Vol 2, Issue 6



Una veduta di Roma dal Gianicolo, nelle prime ore del 28 settembre del 2003 (Franco Origlia - Getty Images)