

# ALAN Research Studies

By Soft Lights

This document lists research studies on the impacts of Artificial Light at Night.

## Humans

### Eyes

1. "light has a cumulative effect" – National Institutes of Health (2016) - [Effects of Blue Light on the Circadian System and Eye Physiology](#)
2. "At the molecular level, analyses revealed an increase of oxidative stress followed by cell death" – National Institutes of Health (2016) - [Effects of white light-emitting diode \(LED\) exposure on retinal pigment epithelium in vivo](#)
3. "Exposure to blue LED light for 3 days induced retinal damage" – National Institutes of Health (2018) - [Exposure to Excessive Blue LED Light Damages Retinal Pigment Epithelium and Photoreceptors of Pigmented Mice](#)
4. "LED blue-light exposure poses a great risk of retinal injury in awake, task-oriented rod-dominant animals." – National Institutes of Health (2018) - [Light-emitting-diode induced retinal damage and its wavelength dependency in vivo](#)
5. "LED light caused a state of suffering of the retina with oxidative damage and retinal injury." – National Institutes of Health (2015) - [Retinal Damage Induced by Commercial Light Emitting Diodes \(LEDs\)](#)
6. "blue-light induced photochemical injury of the retina." – National Institutes of Health (2014) - [White Light-Emitting Diodes \(LEDs\) at Domestic Lighting Levels and Retinal Injury in a Rat Model](#)
7. "retinal damage by intermittent light exposure promotes an irreversible damage" – Nature (2015) - [Light pollution: the possible consequences of excessive illumination on retina](#)

### Health

1. "light at night negatively affects mood" – National Institutes of Health (2017) – [Timing of light exposure affects mood and brain circuits](#)
2. "LAN levels were associated with higher incidence of breast cancer" – National Institutes of Health (2010) – [LIGHT POLLUTION: Light at Night and Breast Cancer Risk Worldwide](#)
3. "Just like sunset, the light source (1900 K) is an "artificial light of harmony" which promote the secretion of melatonin, resulting in an improved sleeping quality" – Nature (2019) – [Several biological benefits of the low color temperature light-emitting diodes based normal indoor lighting source](#)
4. "The human circadian system is exquisitely sensitive to the spectrum of light visible to the eye, especially blue wavelengths" - German-Spanish Astronomical Centre (2018) - [Including an index measuring the weighted content of blue light in lamp](#)

5. “LAN acts through estrogen receptor signaling-mediated pathways to increase breast cancer risk” – Environmental Health Perspectives (2017) - [Outdoor Light at Night and Breast Cancer Incidence in the Nurses’ Health Study II](#)
6. “Melatonin Inhibits Angiogenesis in Breast, Prostate, and Ovarian Cancers” – International Journal of Endocrinology (2018) - [Melatonin: An Anti-Tumor Agent in Hormone-Dependent Cancers](#)
7. “exposure to blue light from white LEDs under an LDPP suppresses melatonin secretion” – Animal Science Journal (2020) - [Exposure to blue LED light before the onset of darkness under a long-day photoperiod alters melatonin secretion, feeding behaviour and growth in female dairy calve](#)
8. “Adolescents in areas with greater levels of nighttime light also had higher prevalence of past-year mood and anxiety disorders.” – Jama Psychiatry (2020) - <https://jamanetwork.com/journals/jamapsychiatry/fullarticle/2767698>
9. Risk of Colon Cancer increase 60% - <https://www.usnews.com/news/health-news/articles/2020-07-31/how-streetlights-might-affect-your-colon-cancer-risk>
10. Damien McNamara’s Autistic Son - <https://www.stuff.co.nz/national/116865102/effects-of-led-streetlights-on-autistic-son-led-damien-mcnamara-on-dark-sky-campaign>

## Safety

1. “We found no convincing evidence for associations between street lighting reductions and road traffic injuries.” – National Institute for Health Research (2015) - [The effect of reduced street lighting on crime and road traffic injuries at night in England and Wales: a controlled interrupted time series analysis](#)
2. (Same study as above) “an association between dimming and reductions in crime, particularly for violent crime.” – Journal of Epidemiology and Community Health (2015) - [The effect of reduced street lighting on crime and road traffic injuries at night in England and Wales: a controlled interrupted time series analysis](#)
3. (Article) “evidence is mounting that nighttime brightness may do little to stop crime, and in some cases may make it worse.” – Washington Post (2017) - [What actually happens to crime ‘when the lights are on,’ as Rick Perry suggests](#)
4. (Article) “It may make us feel safer, but has not been shown to make us safer” – International Dark Sky Association (2020) - [Lighting, Crime and Safety](#)
5. (Article) “Spaces with warmer colour temperatures are perceived as safer places.” – The Conversation (2019) - [More lighting alone does not create safer cities.](#)

## Wildlife

1. “we advocate warm color temperature white light as nighttime illumination” - Health and Human Services USA (2018) – [Light at night disrupts nocturnal rest and elevates glucocorticoids at cool color temperatures](#)
2. “Alters detection of day and night” - Exeter University (2013) – [Measuring biological light pollution and uncovering its ecological effects](#)

3. "the significant impact that even low levels of nighttime light pollution can have" - Cambridge University (2013) - [The ecological impacts of nighttime light pollution: a mechanistic appraisal](#)
4. "managers should avoid lights that have ultraviolet or blue light (shorter wavelengths)" - National Park Service (2017) - [Artificial Night Lighting and Protected Lands](#)
5. "if the tendency to light more when light is cheaper can be overcome" - Luger Research (2018) - [Hazard or Hope? LEDs and Wildlife](#)
6. "use lamps with the lowest CCT, melanopic response, or M/P value possible to achieve the goals of the lighting project." - Illuminating Engineering Society (2020) - [On the Use of Summary Metrics of Light Spectral Characteristics to Assess Effects of Artificial Light at Night on Wildlife](#)
7. "exacerbate existing domestic, e.g., midge swarms and industrial infestations of sanitary and phytosanitary pests" - Ecological Society of America (2014) - [LED lighting increases the ecological impact of light pollution irrespective of color temperature](#)
8. "Anthropogenic lighting drastically alters nocturnal environments, threatening a wide range of species" - Colorado State University (2018) - [Anthropogenic light disrupts natural light cycles in critical conservation areas](#)
9. "bombarded with numerous novel stimuli in their environment that could lead to grave consequences." - Journal of Ecology (2018) - [Connecting spectral radiometry of anthropogenic light sources to the visual ecology of organisms](#)
10. "ALAN reduces habitat suitability" - El Sevier (2020) - [Effects of artificial light at night on the foraging behavior of an endangered nocturnal mammal](#)
11. "Light pollution can have significant conservation consequences for a threatened bat species" - Current Biology (2009) - [Street Lighting Disturbs Commuting Bats](#)
12. "Technological innovations and changes in lighting strategies should consider benefits for reductions in greenhouse gases and energy consumption in parallel with their potential ecological impacts" - Global Change Biology (2012) - [Conserving energy at a cost to biodiversity? Impacts of LED lighting on bats](#)
13. "The most immediate threat from anthropogenic noise and light is the loss of species" - Trends in Ecology & Evolution (2015) - [A framework to assess evolutionary responses to anthropogenic light and sound](#)
14. "When the installation was illuminated, birds aggregated in high densities, decreased flight speeds, followed circular flight paths, and vocalized frequently" - Proceedings of the National Academy of Sciences (2017) - [High-intensity urban light installation dramatically alters nocturnal bird migration](#)

## Public Policy

1. "Glare from nighttime lighting can create hazards ranging from discomfort to frank visual disability" - American Medical Association (2012) - [Light Pollution: Adverse Health Effects of Nighttime Lighting](#)

2. "3000K or lower lighting for outdoor installations such as roadways" - American Medical Association (2016) - [Human and Environmental Effects of Light Emitting Diode \(LED\) Community Lighting](#)
3. "limit their exposure to blue-rich lighting" - French Agency for Food, Environmental and Occupational Health & Safety (2019) – [Effects on human health and the environment \(fauna and flora\) of systems using light-emitting diodes \(LEDs\)](#)
4. "Start with natural darkness and only add light for specific purposes" - Australia Department of Agriculture, Water and the Environment (2020) – [National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds](#)
5. "CCT threshold at 2700K for the "built environment" of towns and villages, and 2400K otherwise" – French Government (2019) - [French Light Pollution Law](#)
6. BirdLife Malta <https://timesofmalta.com/articles/view/birdlife-issues-guidelines-for-ecologically-responsible-lighting.808578>

## Examples

### Unacceptable



Acceptable

