Soft Lights Foundation

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BY EMAIL

David Gomberg, Representative
Oregon State Legislature
Rep.DavidGomberg@oregonlegislature.gov

Re: Spatially Anisotropic Visible-Radiation Devices

Dear David Gomberg,

English Common Law dating back to 1663 states that a property owner has an easement to allow *light* to enter their property.[1] The word *light* referred to sunlight and starlight that could be seen by human eyes. We now know that human-visible light is the set of frequencies between approximately 380nm and 700nm on the electromagnetic spectrum. For regulatory purposes, *light* is spatially isotropic, meaning that the shape of the radiation is the same in all spherical directions.

Biological systems have a long history of evolution with *light*. The substance emitted by the sun, stars, fire, candles, and fireflies is *light* and is a fundamental component of biological life. Humans use their visual receptors to see objects using reflected light, the different wavelengths of light provide color information, and light controls circadian rhythms and mood. *Light is spatially isotropic radiation in the human visible portion of the electromagnetic spectrum*.

The substance emitted by LEDs is not *light*. Light Emitting Diodes are misnamed because they emit visible radiation, but not *light*. LEDs should more properly be named Visible Radiation Emitting Devices or VREDs. Because the substance that LEDs emit is spatially anisotropic radiation, this substance interferes with the nervous system and can cause eye damage, pain, epileptic seizures, migraines, psychiatric trauma, and thoughts of suicide and is not legally entitled to be called *light*.

Figure 1 is a diagram showing the categorization of radiation. Figure 1 shows that *light* is spatially isotropic radiation in the human visible portion of the electromagnetic spectrum and that the radiation emitted by LEDs, while visible, is not *light*.

[1] https://www.britannica.com/topic/ancient-lights

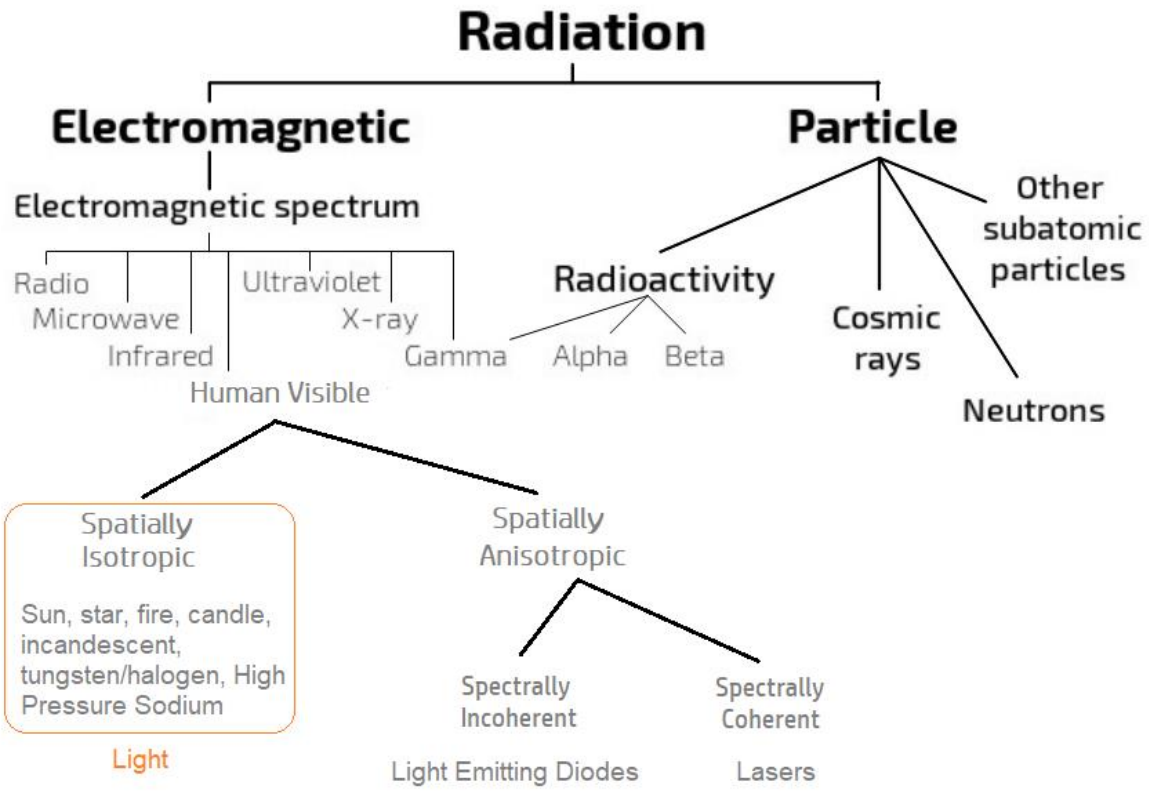

Figure 1 - Radiation Types

LEDs are not "energy efficient". To be energy efficient, a technology must provide the same quality of service and perform the same task as the previous technology[2]. The task in this situation is to provide *light* and uniform illumination while using less energy and not causing harm. Since LEDs do not emit spatially isotropic radiation, LEDs do not emit light, and the radiation that LEDs do emit is not uniform. Instead, LEDs emit spatially anisotropic visible radiation that is sending people to the hospital, causing eye damage, and violating civil rights. The claim of "energy efficiency" by the LED lighting industry is fraudulent.

To our knowledge, there are no ocular exposure standards for LEDs. In his 2009 presentation, Senior Engineer Michael Shulman of Underwriters Laboratories wrote, "Currently, neither the U.S. nor Canada have mandatory standards or regulations for ocular exposure to LEDs emitting incoherent visible light."[3] In the research article, titled Light Emitting Diode Induced Retinal Damage[4] the authors state, "*Excessive LED light exposure presents a potential hazard to retinal function.*" In other research, those in Risk Group 3 (those with epilepsy, autism, migraines, photophobia, etc.) are often purposely ignored during the research, invalidating results that might have shown that LEDs are safe.

[2] https://www.energystar.gov/about/about_energy_efficiency
[3] http://www.softlights.org/wp-content/uploads/2021/10/MichaelShulman_LEDFireElectricalSafety.pdf
[4] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5313540/

The federal Americans with Disabilities Act prohibits discrimination. Since LED radiation interferes with major life functions such as seeing, thinking, and concentrating for people with disabilities, such as those with epilepsy, autism, PTSD, migraines, bipolar disorder and others, LED radiation is discriminatory. The US Access Board has not yet developed guidelines for spatially anisotropic radiation from LEDs. Since LED radiation prevents safe access to public services such as roads, sidewalks and government facilities, LED radiation is discriminatory.

As an example of how dangerous LED radiation is, consider this warning shown in Figure 2 from the company Gear Light.

Figure 2 - LED Flashlight

Just as laser radiation is regulated, just as nuclear radiation is regulated, just as x-rays are regulated, LED radiation must be regulated. LEDs cannot be regulated as *light* because LEDs do not emit *light*. Because LED radiation is unregulated, toxic, hazardous, and discriminatory, we request legislation and regulation to protect the health and safety of the public.

Sincerely,

Mark Baker

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President
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