



# Continuing Education Seminar

CEU 2019

AIA Course Number: BIOSCES101

## Biologically Focused Lighting - The Truth About Circadian Lighting

Learning Units: 1AIA LU/HSW // 1 WELL AP LU

Architectural lighting is no longer just for the visual system. With growing emphasis on healthy built environments, circadian lighting is a popular topic that many designers and end-users are being asked to explore.

Within the eye we each have non-visual photoreceptors which assist in regulating our circadian rhythms. Modern architectural lighting has been designed and calibrated to meet the needs of our visual system, however it provides insufficient stimulus for the human circadian system and does not allow our bodies to properly reinforce our natural biological signals.

The lack of proper circadian stimulus and the desynchronization of our activity with the solar day has been shown to lead to a state of Social Jet-lag which has been tied to many disfunctions, such as disrupted sleep cycles.

This seminar explores the science behind the circadian system and outlines how to integrate essential spectral content in architectural lighting that helps entrain and reinforce healthy circadian rhythms.

### Learning Objectives:

1. Understand the basic science of circadian rhythms and its interaction with light.
2. Describe the design considerations needed for implementing circadian lighting.
3. Understand how color tuning addresses circadian lighting needs.
4. Understand how light spectrum addresses circadian lighting needs.

### Presenter Ken Esterly, IESNA - VP Sales

Ken has over 18 years of expertise in LED lighting. His extensive knowledge of lighting technology and application provide a unique perspective on the development and integration of quality lighting technology for today's rapidly advancing design environment.

### Who Should Attend:

Architects, Interior Designers, Lighting Designers, Engineers, Design-Build Contractors, End-Users, Owners Representatives, Facilities Managers, Operations Managers.

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## The BIOS Difference

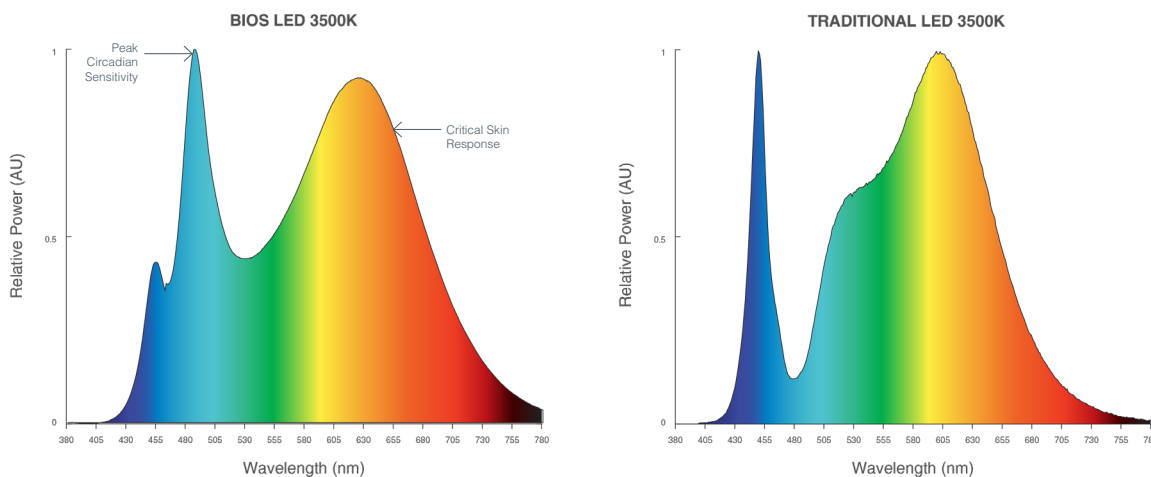
BIOS SkyBlue™ technology is designed to provide the specific circadian stimulus required to improve overall sleep quality, allowing our bodies to better recover during the night. Having an improved circadian rhythm can positively impact daytime productivity and overall feelings of well-being.

Our understanding of the eye and its various functions has grown significantly since the discovery of a new photoreceptor in the eye in 2001. Since this discovery we have learned the eye is responsible for more than just vision, it actually serves multiple purposes: Our visual photoreceptors (rods and cones) allow us to see color, contrast, motion, and detail in our surroundings, while this new non-visual photoreceptor (ipRGCs) assists in driving our core biological functions. This new photoreceptor is most sensitive to wavelengths of light in the "sky blue" region and is solely responsible for sending signals to our bodies' internal clock. These signals help our bodies delineate between day and night, allowing it to organize a myriad of biological processes while also reinforcing larger behaviors such as sleep and alertness.

Interestingly, this non-visual photoreceptor's contribution to vision is minimal, and consequently, all standard electric lighting to-date has ignored this "sky blue" wavelength, eliminating the valuable biological signal our bodies evolved around. Compounding this is the fact we spend more than 90% our time indoors under standard electric lighting, creating an environment in which our bodies are in a state of constant "twilight", where they do not receive sufficient biological stimulus during the day and too much at night, essentially confusing our day/night cycles. Symptoms of this include, but are not limited to: an inability to go to sleep in the late evening hours or an unwanted burst of energy in the early morning hours waking you sooner than you would like.

BIOS is the only company that has designed a light source which provides the natural blue sky signal our bodies and internal clocks are seeking during the daytime. This BIOS SkyBlue technology addresses and helps remedy the perpetual "twilight" our bodies currently exist in, mitigating the drowsiness during the day and the restlessness at night.

BIOS is excited to partner with lighting manufacturers and specifiers to provide biologically optimized solutions in a variety of color temperatures and form factors, enabling the light fixtures to maintain the visual appearance specifiers and end-users want, with the biological stimulus our bodies need. BIOS SkyBlue technology can be integrated into virtually any architectural light fixture and is intended for use in a variety of daytime environments, such as offices, classrooms, hospitals, etc.



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