



Monthly News

How to See Better at Night (and in the Daytime)



Once upon a time, calculating the vertical and horizontal footcandle levels were the tools lighting designers would use to perform a night time or daytime lighting calculation. However, with the various light properties and color temperatures of the lamp sources available today, we begin to perceive light differently with our eyesight, even though the footcandle values may be very similar. The lighting designer needs a simple way to compare illuminance values of the various lamp sources before finalizing a design.

On Thursday, November 15 we have Tom Harding of Venture Lighting International presenting *"How to See Better at Night (and in the Daytime)"* sponsored by Venture Lighting International. Tom has a Bachelor of Science in Physics from Eastern Nazarene College in Quincy, MA and a Master of Science in Physics from Case Western Reserve University in Cleveland, OH. Tom started out at GE in development of projection lamps and optics before joining Venture Lighting. Tom currently works in new product development and is involved as an industry advisor to NEMA and the California Energy Commission.

The presentation will describe the scientific reasons for choosing white, higher CCT light sources over yellow, lower CCT light sources including how the eye "sees" and why various light sources can help or hinder the eye's perception of light. Calculations using scotopic/photopic (S/P) ratios will demonstrate how to relate various light sources to the lighting environment (night or day) and how to use the IES Lighting Handbook, 10th Edition to compare illuminance values of various lamp sources.

Please join us for this very educational program and see what you may be missing in lighting calculations.

When: Thursday, Nov. 15, 2012

Lunch: 11:30 a.m.

Program: 12:00 p.m. to 1:00 p.m.

Location: Hilton Garden Inn Cleveland
1100 Carnegie Avenue
Cleveland, OH 44115

Sponsor: Venture Lighting International

Credit: 1 PDH

Cost: \$30

Student: \$20 (Must bring student ID)

Please pay by check or cash at the event or [use our PayPal Link](#) on our website. Note: If you pay by Credit Card, you don't need to RSVP Wendy unless you don't receive an e-mail or sign up two days prior to the event.

RSVP

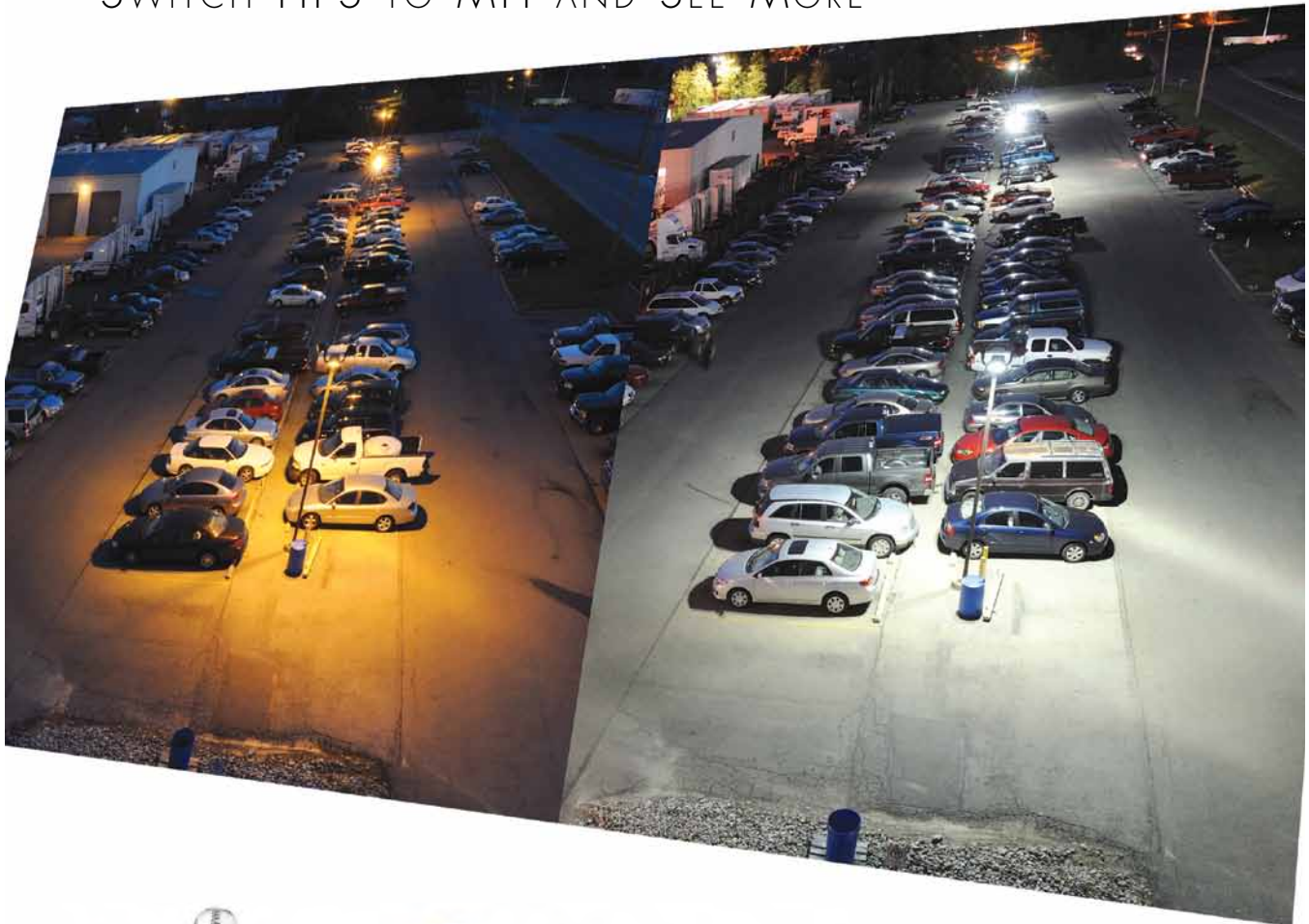
Contact Wendy Turkuc
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President's Report

For our Thursday, November 15 Lunch time Program at the Hilton Garden Inn Downtown Cleveland, we have Tom Harding of Venture Lighting International presenting "*How to See Better at Night (and in the Daytime)*" sponsored by Venture Lighting International. The presentation will describe the scientific reasons for choosing white, higher CCT light sources over yellow, lower CCT light sources including how the eye "sees" and why various light sources can help or hinder the eye's perception of light. Calculations using scotopic/photopic (S/P) ratios will demonstrate how to relate various light sources to the lighting environment (night or day) and how to use the IES Lighting Handbook, 10th Edition to compare illuminance values of various lamp sources. Please join us for this very educational program and see what you may be missing in lighting calculations.

Kristen is working with Eye Lighting on the December Program. We will let you know about the event as details become available.

We would like to thank Dyke Riffle of Riffle & Associates with side bar comments from the talented and comical Mr. Robert Doherty from Wolff Brothers for presenting our annual clambake with seminar on the side. We would also like to thank Wolff Brothers for sponsoring our program and arranging the clambake.

For other upcoming programs and events, please see the [Calendar of Events page](#) in the Lumen Press and on our [website](#).

Do you have a story you would like to share with us or would like to do an educational article on a lighting topic you have been just waiting to write? Or, do you have a humorous story of a job site experience or a specification gone awry? Your opportunity has arrived. Please send me a one-page article to review. If your article is one of the lucky ones selected, it will be published in a future article of the Light Corner Section of the Lumen Press. So, take off the cover of that old type writer, insert a black ink cartridge, and start typing away. But beware of the editor **red** pen.

Thank you for your support of the Local Cleveland IES Section and hope to see you at future IES Cleveland Section Programs.

Richard Rutledge

IES Cleveland Section President



The Light Corner (1 of 2)

A Step Back in Time (Written by Richard Rutledge)



In our strive to move forward, once in awhile, we need to take a step back in time and see what we have learned to gain a new perspective of where we are going in the future.

I had the opportunity the other day to view a copy of *Hawkins Electrical Guide Number 9* which contains a chapter on Electric Lighting. The book was copyrighted in 1915 by Theo Audel & Co. in New York. One chapter focused on efficiency of Arc lamps and concerns of lamp longevity, which should sound quite familiar to lighting designers of today. As I turned to page 2,504, I found a definition that grabbed my attention, *Illumination*.

The definition of Illumination is *"The density of light flux projected on a surface, and by extension, it denotes the art of using artificial sources of light . . . Illumination involves the selection and arrangement of these artificial sources of light so that the objects to be lighted will show up to the best advantage and with the minimum amount of artificial light."* This philosophy sounds similar to what we are doing today to achieve the requirements of the energy codes. Also, watts per candle were used to compare lamp sources where now we use lumens per watt.

Associated with the definition of Illumination is the "Nature of Light;" which defines light as *"a sensation received through the organs of sight and is caused by waves which are transmitted on the ether."* In other words, our sight is how we perceive light.

As I examined the book some more, I came across the "Requirements of Good Illumination" which are listed below and can be found on pages 2,519 to 2,521 in the book:

- 1. There must be sufficient illumination. Since objects are seen by means of light with which they reflect, more light must be thrown on dark objects than on light ones.**
- 2. There must not be too much illumination. Too strong a light tires the eye, partly due to the muscular effect of contracting the iris, and partly because of strong light reaching the sensitive retina.**

Continued on next page . . .



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The Light Corner (2 of 2)

3. **Intensely bright lights in the field of vision should be avoided. The iris closes somewhat in order to afford a protection from such lights and the amount of light received from illuminated objects is thereby so reduced that they cannot be seen clearly.**
4. **Flickering of lights should be avoided. Poorly regulated circuits, such as those having varying power loads, cause disagreeable flickering. However, the metal filament lamps as for instance the "Mazda" have an inherently better regulation than the carbon filament lamps . . .**
5. **Lamps should be so placed that the light is not regularly reflected into the eye.**
6. **Streaks or striations in the illumination are undesirable. Arc lights with clear globes show this phenomenon. Open reflectors having smooth interior surfaces should be used only with frosted lamps.**
7. **A satisfactory light must be of proper quality. It should have a continuous spectrum, that is, one containing every color, in order that the relative color values of objects illuminated may be the same as when seen by daylight. How many times have you seen an Architect or Interior Designer hold a sample near a window to see the color, only to have it installed under a fluorescent or LED light source?**

Point by Point calculation methods, photometric data and integrating photometer curves have not changed much over the years. There were even reflection coefficient tables for wall paper and paint colors. I also recognized a cove detail, very much like we use today, with reflectors on the lamp to push the light further into the ceiling. Amazingly, many of the things I saw are ideas that we use in today's luminaire and lamp designs.

Finally, I would like to leave you with a few horizontal footcandle levels that may surprise you:

General Offices: 3-4 fc

School Rooms: 2-3 fc

Draughting Rooms (drafting): 5-10 fc

Ware House: 1.5-2 fc

Remember to take into context that day lighting methods and work hours were very different in 1915 than they are today.

I hope a step back in time will encourage you to look into the past to see the future.



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Calendar of Events

2012

September 25 | Tuesday Lunch

Topic: An All LED Theater—Myth or Reality?
Location: Hilton Garden Inn Cleveland Downtown
Sponsor: Bright Focus Sales & Vincent Lighting Systems

October 16 | Tuesday Evening

Topic: Clambake with Seminar on the Side
Location: Albion Woods Reservation, Strongsville
Sponsor: Wolff Brothers

November 15 | Thursday Lunch

Topic: How to See Better at Night (and in the Daytime)
Location: Hilton Garden Inn Downtown Cleveland
Sponsor: Venture Lighting Systems

December ? | Evening

Topic: Light Walk
Location: Unknown
Sponsor: Eye Lighting

2013

January 17 | Thursday Lunch

Topic: Lighting Updates to NEC 2011 & Energy Codes
Location: Hilton Garden Inn Downtown Cleveland
Sponsor: IES Cleveland Section

February 21 | Thursday Lunch

Topic: Leveraging the Benefits of Daylighting with Lighting Controls
Location: Hilton Garden Inn Downtown Cleveland
Sponsor: Jack Duffy & Associates

March ? | Lunch

Topic: Unknown
Location: Hilton Garden Inn Downtown Cleveland
Sponsor: Myriad Energy Solutions

April ? | Lunch

Topic: What to look for in Computer Generated Lighting Calculations
Location: Hilton Garden Inn Downtown Cleveland
Sponsor: Lighting Dynamics

May 10 | Lunch

Topic: Unknown
Location: Unknown
Sponsor: GE Lighting

June ? | Friday Event

Topic: IES Golf Outing
Location: Pine Ridge Golf Course - Willoughby, OH
Sponsors Welcome
Sponsor: Everyone



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