LIGHTFAIR INTERNATIONAL 2018 POSTGAME SHOW

Presented by the LDL Staff
June 5, 2018
Welcome

Trends from LFI

Highlighting Award Winners

Some of Our Favorite Things

The Lighting Design Lab does not recommend or endorse any specific product or brand and any reference to products or brands is purely for demonstrative purposes.
Staff from the LDL were on the lookout for...

**Major Market Trends:**
Controls – Light & Health – Commodity Products – Horticultural Products

**Engagement with Industry**
Educating on LDL Services
Representing Utility Needs
Opportunities to Partner
What the LDL Heard ...

Support from Industry

Desire to Partner with the LDL

Affirmation of the need for *LDL Core Services*
Focus on Controls
LEADING THE WAY TO A CONNECTED FUTURE

Lighting Controls
- Institute Classes
- Seminars
- Workshops
- Exhibitors

- Connected Future
## LIGHTING CONTROLS CLASSES

- IOT
- SOO
- Specifications
- DMX / Dali / 0-10
- Install and Startup
- Artificial Intelligence
- Smart Lights
- BMS / Automation
- Commissioning
- Emergency Lighting
- Tunable White
- Net Zero
- Intelligent Buildings
- Retrofits
- Demand Response
- Connected Networks
- Security
- Boon or Bust
- LiFi
- Smart Cities
- Data
- Circadian
- Wireless
- Implementation

### TUESDAY, MAY 8

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 1</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td></td>
<td>Introducing Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>9:00</td>
<td></td>
<td>Introduction to Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>10:00</td>
<td></td>
<td>Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>11:00</td>
<td></td>
<td>Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td>Artificial Intelligence in Lighting Systems</td>
</tr>
</tbody>
</table>

### WEDNESDAY, MAY 9

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 2</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td></td>
<td>Understanding Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>9:00</td>
<td></td>
<td>Understanding Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>10:00</td>
<td></td>
<td>Understanding Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>11:00</td>
<td></td>
<td>Understanding Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td>Understanding Artificial Intelligence in Lighting Systems</td>
</tr>
</tbody>
</table>

### TUESDAY, MAY 10

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 3</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td></td>
<td>Implementing Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>9:00</td>
<td></td>
<td>Implementing Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>10:00</td>
<td></td>
<td>Implementing Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>11:00</td>
<td></td>
<td>Implementing Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td>Implementing Artificial Intelligence in Lighting Systems</td>
</tr>
</tbody>
</table>

### WEDNESDAY, MAY 11

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 4</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td></td>
<td>Advanced Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>9:00</td>
<td></td>
<td>Advanced Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>10:00</td>
<td></td>
<td>Advanced Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>11:00</td>
<td></td>
<td>Advanced Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td>Advanced Artificial Intelligence in Lighting Systems</td>
</tr>
</tbody>
</table>

### THURSDAY, MAY 12

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 5</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td></td>
<td>Case Studies in Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>9:00</td>
<td></td>
<td>Case Studies in Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>10:00</td>
<td></td>
<td>Case Studies in Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>11:00</td>
<td></td>
<td>Case Studies in Artificial Intelligence in Lighting Systems</td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td>Case Studies in Artificial Intelligence in Lighting Systems</td>
</tr>
</tbody>
</table>

- [Lighting Design Lab](https://www.lightingdesignlab.com)
TRENDS

• Data
• Tunable White
• Circadian
• Interconnectivity
• Parts and Pieces
• Wireless
• Digital Talkback
• IOT
• Lighting / Controls as a Platform
• Data
NOTABLE

Crestron Solar Sync
- Exterior Sensor
- Correlated Color Temperature (CCT)
- Relative available light level
NOTABLE

Casambi
- Bluetooth
- Open
- Interoperable
- Platform
NOTABLE

Silvair
- Bluetooth
- Open
- Interoperable
- Platform
- Ecosystem
Lutron Enterprise Vue

- Data Aggregation
- Large Area Management
- Interoperable
- Full Building Components
- Parts and pieces room controllers
NOTABLE

LiFi

- Pulsed light communication
- One way?
- Two Way?
- Augmentation for Wifi?
- More Secure
Sequence of Operations

A Good Sequence of Operation

- Specific:
  - Number attached to action
  - Describes inputs and outputs
  - If ..., Then... Else
  - *All* the scenarios
- Can write a test procedure to test the sequence

For Warehouse occupancy sensors:
On initial detection of occupancy by the PIR sensor, turn general lighting on to 100%. Retrigger on PIR or US. When occupancy has not been detected for 20 minutes (adj), turn lights to 50%. If space remains unoccupied for 10 minutes (adj) turn lights off.
TRENDS FROM LFI 2018

Light and Health
LIGHT AND HEALTH

- Spectrum
- Blue Light
- Intensity
- Duration
- Chronotype
- Social Jet Lag
- WELL Standard
- ipRGC

- Inaccurate Metrics
- IOT
- DMX / Dali / 0-10
- Install and Startup
- Commissioning
- Tunable White
- Net Zero
- Intelligent Buildings

- Demand Response
- Connected Networks
- Security
- Circadian
- Too much light
- Too little light
- Daylight
METRICS – INSUFFICIENT FOR LED AGE

CCT
CRI
Lumen
Candela
Lux

Brightness perception
LIGHT AND HEALTH

Spectrum
- Blue Light
- Tunable Light
- Hazard?
- ipRGC peak
- Circadian
LIGHT AND HEALTH

Spectrum
- Blue Light
- Tunable Light
- Hazard?
- ipRGC peak
- Circadian

Intensity
- Amount of light
  - Night / Day
- Duration of exposure
- Hazard?
- Circadian
COLOR AND INTENSITY

If only we had an easy way to control color and intensity....
COLOR AND INTENSITY

Spectrum
  - Tuneable Spectrum...

Intensity
  - Tuneable intensity....

Advanced Lighting Controls.....
COLOR AND INTENSITY

If only we had manufacturers willing to partner together....
TRENDS FROM LFI 2018

Horticultural Lighting
• Horticultural Lighting Continues to be the wild west

• Big players are getting involved
  o Several are supplying chips

• 1 course offered – Beyond Blue and Red: Key Challenges, Considerations, and Benefits of Tunable Lighting in Horticulture

• LDL will be active at other horticultural conferences to monitor activity
Commodity Products
LIGHTING DESIGN LAB

[Images of various light bulbs and a diagram of human evolution.]

Lighting Design Lab
TRENDS IN COMMODITY PRODUCTS A-LAMPS

• Form factor has matured
• Near ubiquitous design for mid-level retail products
• Most report little trouble achieving Energy Star specs
• Consumer pricing is driving a schism in product lines

Value Engineered Mass Consumer Market
≤3 year warranty - ≤25,000 hours life ~80 CRI

Commercial Grade – Quality Market
>3 year warranty - >25,000 hours life ~90 CRI - >65 LPW

Very similar outlook for TLEDs
**Corn-cob Screw-in**

- 360 – exposed LED chip boards
- Medium and mogul base
- Customer appeal is *low cost purchase* and *low cost install*
- *Marketed as “application neutral”*
- Customer education is key
LFI Award Winners
MOST INNOVATIVE PRODUCT OF THE YEAR

Ledra Brands- Vector

• The Downlight uses breakthrough technology, allowing dynamic beam shaping through an app or wall switch from 10° to 55°. No moving parts are used. LensVector® uses molecular reorientation to produce an electronically controlled variable LCD lens.

• It integrates Human Centric Solar Spectral LED, as well as smart XIM modules with iBeacon technology and near flawless color consistency and quality. VECTOR comes compatible with Casambi as well as other control systems.

• More at ALPHABETlighting.com.
**Resilient- LumEfficient**

- **LiFi**, like WiFi, allows devices to connect wirelessly to the Internet. While WiFi uses radio signals to connect, LiFi uses light spectrum which can enable unprecedented data and bandwidth. LiFi uses the frequencies of light waves, which are 1000 times more plentiful than radio frequencies. A hacker can sit in a parking lot and gain access to data. However LiFi’s line-of-site, meaning a hacker would have to actually be in the building to penetrate the system.

- Bidirectional line rate up to 42 Mbps
Juno- FlexConnect

- Juno FlexConnect™ featuring micrOptix™ technology is the industry’s smallest, most configurable linear optic luminaire system. Ideal for grazing, washing, and other architectural applications, Juno FlexConnect with micrOptix delivers up to 400 lumens per foot and features miniature silicone optics in 15°, 20° x 45°, and asymmetric distributions. Encapsulated in silicone, FlexConnect can be shaped to follow architectural curves. And it can be field-cut and reconnected in six inch increments for unparalleled design flexibility and field configurability. Rated for indoor or outdoor use.
The NEW SolarSync daylight sensor analyzes the color temperature of ambient light and directs indoor lighting to automatically match the detected color.

The primary example for the use of this sensor is to make people believe that they’re outside. This will give the effect of a space that’s open to the air.

This small, outdoor (IP67) rated sensor detects ambient light level and the color temperature of that light.
**Green Creative- HID LED 25W**

- The lamp runs on 120-277V universal voltage and is designed to replace 70-100W HID sources in bollard, post top and low bay applications. Emitting over 3000lm with just 25W, this enclosed-rated lamp features exceptional 136 LPW efficacy and is **available in both E26 & EX39 base types**. Its traditional A23 lamp shape provides omnidirectional lighting, allowing it to fit in a variety of installations.

- Additionally, the lamp lasts 50,000 hours and meets ENERGY STAR (E26) and DLC (EX39) requirements (certification pending).
**SLD Laser- Fiber Module**

- First white-light, high luminance, remote white laser light module. Features safe, efficient fiber delivery of light from a blue laser diode to a phosphor module producing high luminance white light. Up to 500 lumens are delivered from 300 microns for luminance of 1000 Mcd/m², an order of magnitude higher than most intense LEDs, enabling **collimated beam angles of 2 degrees** from a 1" optic diameter for 1000m range. The remote architecture enables reliable design in pole mountings or other applications where the optical module portion may be placed in areas where maintenance is challenging.
SOME OF OUR FAVORITE THINGS

Rain drops on roses and

Whiskers on Kittens...

Integrated Controls and

Color tuning, adjustable lumen, high CRI one spec fixtures...
SEAMLESS INTEGRATION OF FEATURES

*Lutron - Quantum*

- Tunable white
- Color tunable
- 0 to 10V *super smooth* dimming
- Programmable modes, pre-set options, and custom control – one product – lots of flexibility
**STAFF FAVORITE**

**Acuity- Rubik**

- Rubik® luminaires empower creativity without complexity in their ultimate palette of architectural volumetric lighting for the standard grid ceiling. New dimensions in lighting unfold in a uniquely vast array of possibilities incrementally flexible for design intent and budget. Explore light, color and control with Mainstream Dynamic™ features to move beyond a static environment.
INTERESTING FUTURE PRODUCTS

Cree- Arcadia

- A visionary approach to illumination that takes the best aspects of Cree’s intelligent lighting control and color changing capabilities, combined with leading edge driver technology and three-dimensional form factors, to deliver ground-breaking ambient light that mimics the natural progression of the sky throughout the day, from dusk to dawn.
INTERESTING DIRECTION

**Soraa- Arc**

- Designed and built around the slimmest profile die-cast heat sink in the industry. Arc is optimized for superior thermal management and features the high quality of light you've come to expect from SORAA.

- CCT 2700K, 3000K and 4000K
  CRI/R9 95/95
  CBCP 2560 - 19,240 cd
  Lm 505 - 1190 lm
  Power 11W, 18W, 20W
  Beams 9°, 10°, 15°, 25°, 36°, 60°
  Finish White, Black, Silver, Custom
GRATUITOUS COOL STUFF

I’m a designer....
MORE GRATUITOUS COOL STUFF

T Bar mounted....ready for DC...
MOST GRATUITOUS COOL STUFF
Thank You!

Q&A

LightingDesignLab@Seattle.gov

Visit staff from the Lighting Design Lab at the 36th Energy Management Congress in Seattle on June 20-21