

# **The role of lighting in the built environment**

Randy Burkett, FIALD, FIES

29 April, 2019

The logo for the Illuminating Engineering Society of North America (IESNA) and the International Association of Lighting Designers (IALD). It consists of a vertical yellow line on the left and the letters "IALD" in a bold, black, sans-serif font on the right.

**IALD**

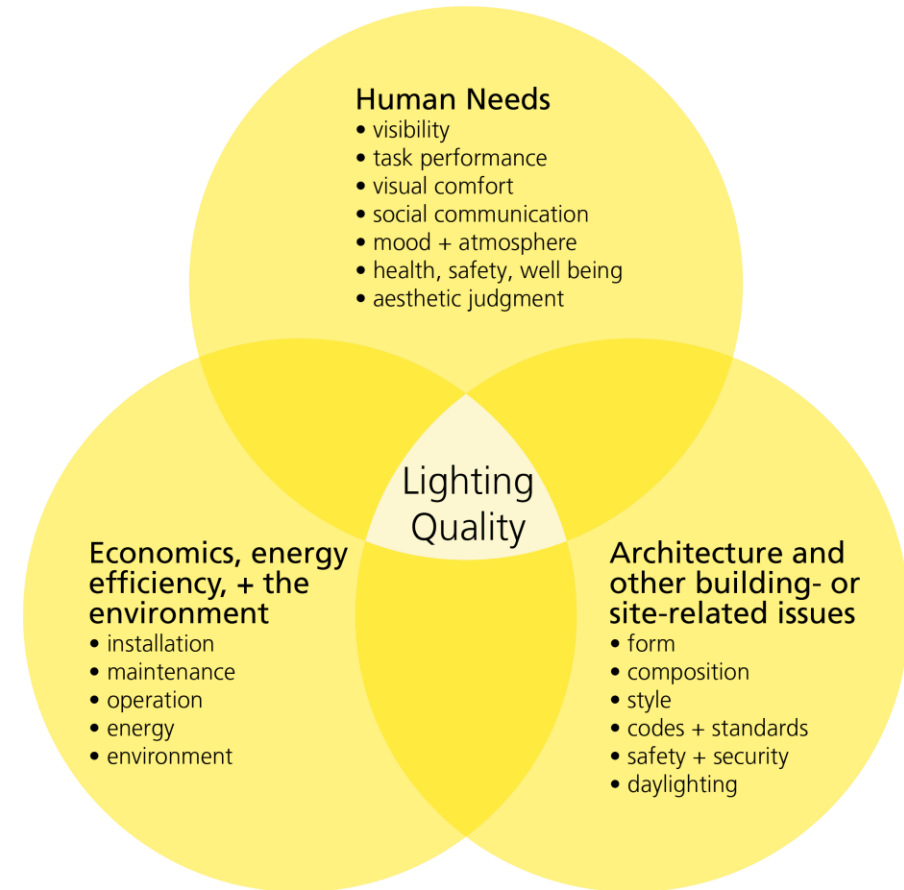
## Lighting design

Quality of light affects people

- Increase satisfaction & productivity
- Heighten user performance
- Enhance mood & desirability of space
- Contribute to sense of well-being
- Provide psychological reinforcement

Contributing issues

- Architectural integration and revelation
- Daylighting
- Energy and sustainability
- Operations and maintenance
- Codes and standards



## Lighting design

Quality of light affects people

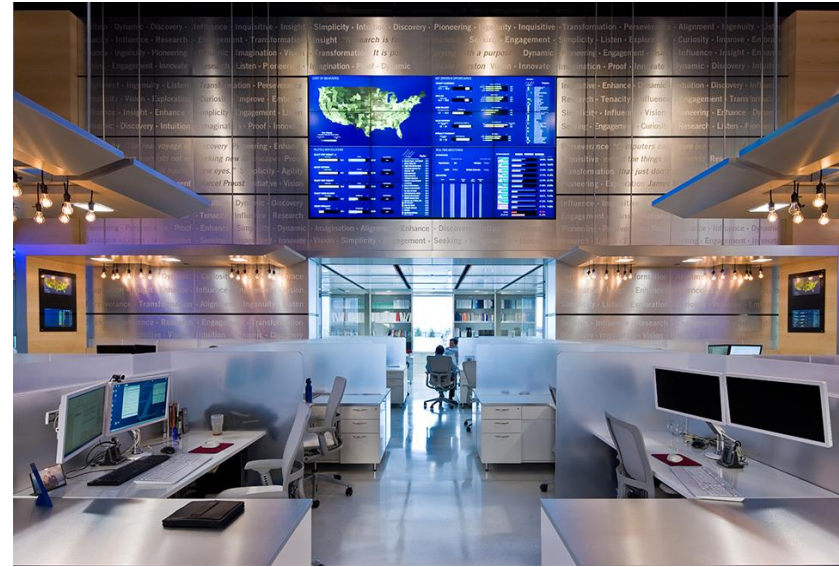
- **Increase satisfaction & productivity**
- Heighten user performance
- Enhance mood & desirability of space
- Contribute to sense of well-being
- Provide psychological reinforcement



## Lighting design

Quality of light affects people

- Increase satisfaction & productivity
- **Heighten user performance**
- Enhance mood & desirability of space
- Contribute to sense of well-being
- Provide psychological reinforcement



## Lighting design

Quality of light affects people

- Increase satisfaction & productivity
- Heighten user performance
- **Enhance mood & desirability of space**
- Contribute to sense of well-being
- Provide psychological reinforcement



## Lighting design

### Quality of light affects people

- Increase satisfaction & productivity
- Heighten user performance
- Enhance mood & desirability of space
- **Contribute to sense of well-being**
- Provide psychological reinforcement



## Lighting design

Quality of light affects people

- Increase satisfaction & productivity
- Heighten user performance
- Enhance mood & desirability of space
- Contribute to sense of well-being
- **Provide psychological reinforcement**



## Lighting design - Outdoors

Quality of light affects people

- Provide functional lighting
- Use surfaces as light sources
- Heighten awareness of safety & security
- Enhance wayfinding & orientation
- Establish mood & desirability
- Create a sense of place

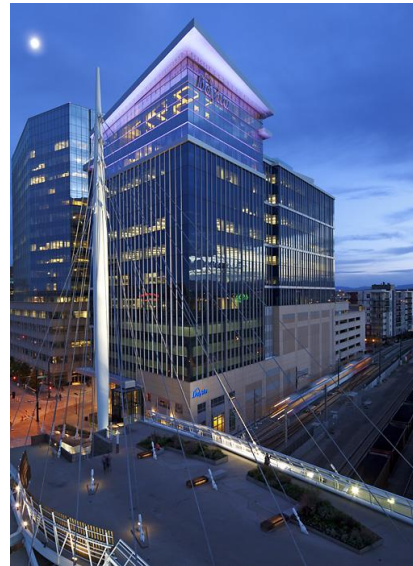




## Lighting design - Outdoors

Quality of light affects people

- Provide functional lighting
- Use surfaces as light sources
- Heighten awareness of safety & security
- Enhance wayfinding & orientation
- Establish mood & desirability
- Create a sense of place





## SOLID-STATE LIGHTING



# Leading our nation's efforts to drive innovative solid-state lighting R&D

[Research & Development](#)[Resources](#)[SSL Manufacturing in America](#)

The DOE [Solid-State Lighting Program](#) leads our nation's efforts to drive research and development of innovative [LED](#) and [OLED](#) technologies. [Find out](#) how DOE and partners are sparking a lighting revolution and positioning American companies for global success.

Lighting

IALD



## SOLID-STATE LIGHTING



## DOE SSL PROGRAM

The DOE SSL program supports research and development of promising SSL technologies through annual competitive solicitations that cover three areas:

- **Core Technology Research**, focusing on applied research for technology development, with particular emphasis on meeting efficiency, performance, and cost targets. This research fills technology gaps to overcome technical barriers.
- **Product Development**, using the knowledge gained from basic or applied research to develop or improve commercially viable materials, devices, or systems.
- **Manufacturing Support**, aimed at accelerating SSL technology adoption and encouraging a role for U.S.-based production through manufacturing improvements that reduce costs and enhance product quality.

The DOE [Solid-State Lighting Program](#) leads our nation's efforts to drive research and development of innovative [LED](#) and [OLED](#) technologies. [Find out](#) how DOE and partners are sparking a lighting revolution and positioning American companies for global success.

# Energy Department Announces \$42 Million in Project Selections for Innovative Buildings Research

JANUARY 29, 2019

**Title:** Improved Light Extraction By Engineering Molecular Properties of Square Planar Phosphorescent Emissive Materials

**Title:** Environmentally Robust Quantum Dot Downconverters for Highly Efficient Solid-State Lighting

**Title:** Additively Manufactured Solid-State Luminaire

**Title:** High Efficiency OLED Light Engine

**Title:** High-Luminance LED Platform for Improved Efficacy in Directional Lighting

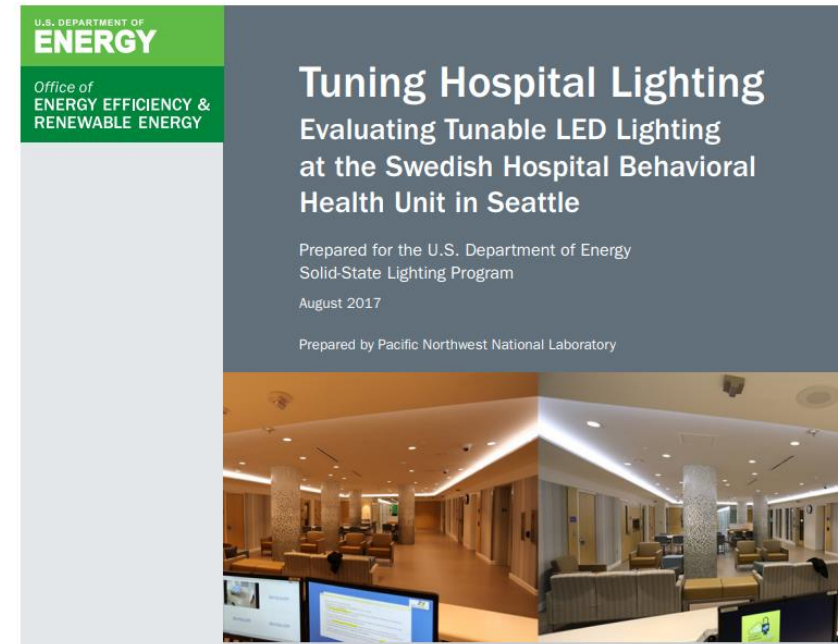
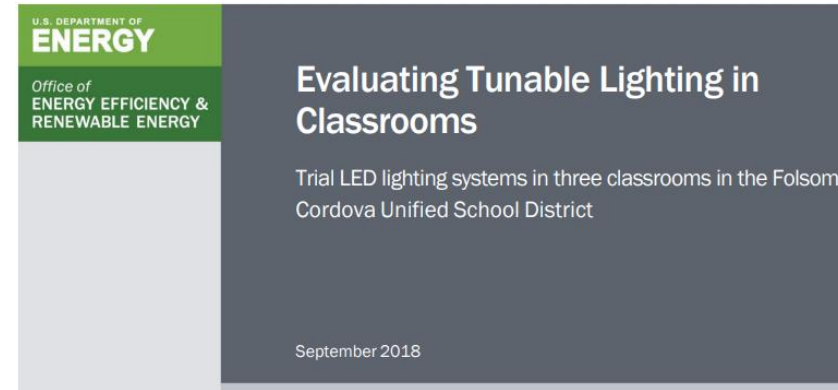
**Title:** Corrugated OLEDs for High Efficiency White OLEDs

**Title:** High Efficiency InGaN LEDs Emitting in Green, Amber and Beyond

**Title:** From Deposition to Encapsulation: Roll-to-Roll Manufacturing of Organic Light Emitting Devices for Lighting

## DOE funded lighting applications research - Gateway Program

- Circadian and Sleep Health in Shift Work Applications
- Evaluating Tunable Lighting in Classrooms (September 2018)
- LED Area Lighting Retrofit: Yuma Border Patrol (April 2018)
- Tuning the Light in Classrooms: (September 2017)
- Tuning Hospital Lighting: Evaluating Tunable LED Lighting at the Swedish Hospital Behavioral Health Unit in Seattle (August 2017)



## Interior lighting design

### Lighting influences

- Glare impacts
- Circadian influences
- Visual comfort
- Visual performance
- Daylighting and occupant satisfaction
- Hospital recovery time
- Lighting's role in senior living settings

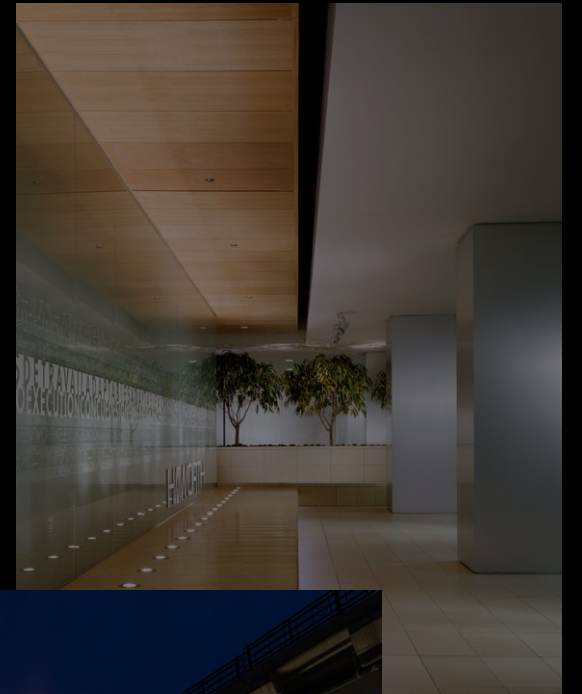


## Exterior lighting design

### Lighting influences

- Glare impacts
- Intuitive wayfinding
- Safety and security
- Enhancement of social settings
- Urban revitalization
- Environmental aspects





Thank you

