

INDIA'S FOREMOST MAGAZINE ON THE LIGHTING INDUSTRY

# Lighting India

Vol. 14 No. 1

January - February 2019



## THE POSSIBLE FUTURE OF LIGHTING

Brilliant glow of paint-on semiconductors  
comes from Ornate quantum physics



### INSIDE




Smart Lighting  
in Smart Cities

How do you educate  
Lighting

Taiwan's Lighting Industry



Scan the QR Code  
to know more  
about Lighting India

Follow us on   

Now **SUBSCRIBE/RENEW Online** Just Log on to [www.lightingindia.in](http://www.lightingindia.in)

# We devote all our energy to your light.

Tridonic offers you a comprehensive, diverse range of products on a one-stop shop basis – to be individually combined, including complete solution packages for any application. We keep all your requirements – down to the smallest detail – in mind and the entire system in sight.

## LED Driver and modules



## OLED



OLED modules

## Emergency lighting units



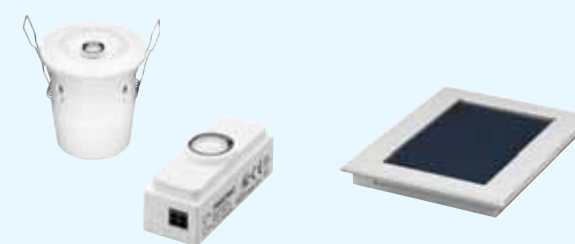
Single battery emergency systems

Batteries

## Electronic components



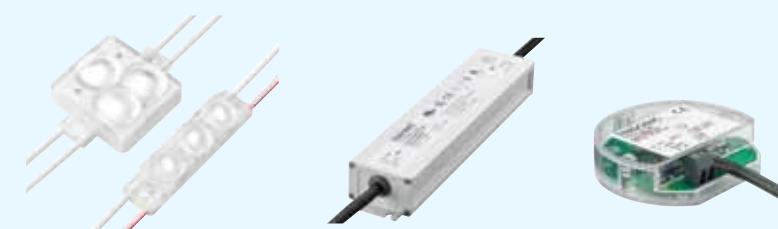
## Controls



Sensors

Touchpanels

## Signage



TALEXchain

TALEXdriver

TALEXcontrol



## PUBLISHER'S LETTER

**S**mart lighting is a foundation for any smart city. It helps cities save energy, lower costs, and reduce maintenance. In addition, smart lighting can play an important role in the areas of safety, mobility, environment and energy thereby empowering local bodies or municipal authorities. Architect-cum-Urban Planner Ashish Batra explains the benefits of smart lighting in smart cities.

The practice of lighting requires an understanding of the physical characteristics of light, how light works in space, and how it can be controlled optically and predicted and measured photometrically. Though lots of innovation happening in the field of lighting technology, lighting designing remains a neglected subject especially in India, thanks to lack of formal education programme. Renowned lighting designer and educator Anil Valia reminds us the need of architectural lighting design workshop for skill development.

"Light has that immense power and as lighting designers we have the ability to shape people's experiences and perceptions," avers Nivedita Sehrawat, Creative Director, Design Matrix while narrating her journey in the field of lighting. She said, "Mankind has always been fascinated with light especially because we don't fully understand how it works." She also talks about what it takes to successfully lighting a space.

In line with the trend towards using smart lighting solutions, more than 135 companies from across the globe are all set to showcase their state-of-the-art products at the Taiwan International Lighting Show (TILS), to be held from May 8 to 10 at the Taipei Nangang Exhibition Centre in Taiwan. After visiting manufacturing facilities of some of the key participants of 2019 TILS, Subhajit Roy delves into details of what lies ahead for visitors.

In May, India will also witness the lighting industry extravaganza – LED Expo Mumbai 2019, which will run from May 9 to 11. Lighting India, being the media partner of this event, will come out with a LED-special issue which will be displayed and distributed during the event. We invite your participation in this mega issue.

Do send in your comments to me at [miyer@charypublications.in](mailto:miyer@charypublications.in)

*Mahadevan Iyer*

**Publisher & Editor-In-Chief**

Single Issue: ₹ 125 / Annual Subscription: ₹ 750

### Disclaimer

Lighting India does not take responsibility for claims made by advertisers relating to ownership, patents, and use of trademarks, copyrights and such other rights. While all efforts have been made to ensure the accuracy of the information in this magazine, opinions expressed and images are those of the authors, and do not necessarily reflect the views/ collection of the owner, publisher, editor or the editorial team. Lighting India shall not be held responsible/ liable for any consequences; in the event, such claims are found - not to be true. All objections, disputes, differences, claims & proceedings are subject to Mumbai jurisdiction only.

Printed, Published and owned by Mahadevan Iyer from 906, The Corporate Park, Plot 14 & 15, Sector 18, Vashi, Navi Mumbai 400703 and Printed at Print Tech., C-18, Royal Indl Estate, Naigaum Cross Road, Wadala, Mumbai - 400 031. **Editor: Mahadevan Iyer**

### Directors

Pravita Iyer  
Mahadevan Iyer

### Publisher & Editor-In-Chief

Mahadevan Iyer  
[miyer@charypublications.in](mailto:miyer@charypublications.in)

### Group Editor

Subhajit Roy  
[subhajit@charypublications.in](mailto:subhajit@charypublications.in)

### Editorial Co-ordinator

Nafisa Kaisar  
[nafisa@charypublications.in](mailto:nafisa@charypublications.in)

### Director - Advertisement

Pravita Iyer  
[pravita@charypublications.in](mailto:pravita@charypublications.in)

### Advertising Manager

Nafisa Kaisar  
[nafisa@charypublications.in](mailto:nafisa@charypublications.in)

### Design

Nilesh Nimkar  
Jebas Thangadurai  
[charydesign@charypublications.in](mailto:charydesign@charypublications.in)

### Subscription Department

Priyanka Alugade  
[sub@charypublications.in](mailto:sub@charypublications.in)

### Accounts Department

Dattakumar Barge  
Bhakti Thakkar  
[accounts@charypublications.in](mailto:accounts@charypublications.in)

### Digital Department

Ronak Parekh  
[dgmarketing@charypublications.in](mailto:dgmarketing@charypublications.in)

Lighting India is also available online on [www.lightingindia.in](http://www.lightingindia.in). For online enquiries contact at: [dgmarketing@charypublications.in](mailto:dgmarketing@charypublications.in)







# YSD POWER SUPPLY

## Hot Sale

### TRIAC/0-10V/PWM Dimmable

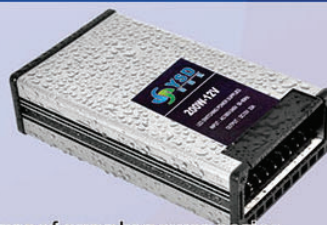


## FEATURES

- TRIAC/0-10V/PWM Dimmable
- 3 years warranty.
- Passed CE, RoHS, BIS CB, GS, UL certification.
- Very slim size and light weight.
- Short circuit/Overload/Overtemperature Protection.



Slim IP20 series  
Slim IP20 Dimmable series



Rainproof supply power series

IS 15885(Part2/Sec13)



R-41065080  
[www.bis.gov.in](http://www.bis.gov.in)



0-10V/Traic  
Dimmable

**60W-400W**



Slim IP67 series



Slim IP67 Dimmable series



**Shenzhen Yanshuoda Technology Co., Ltd**

Whatsapp/Mobile: 0086-13613008086 Fax: 0086-755 27552853- 802

Email: [info@szyswps.com](mailto:info@szyswps.com)

Add : Building 4 floor A,Sha Pu Wei-Dadi road No. 8 , Songgang Baoan District ,Shenzhen China

Http : [www.ysdwps.com](http://www.ysdwps.com)

# contents



## 16 The Possible Future of Lighting

Brilliant glow of paint-on semiconductors comes from Ornate quantum physics

### Skill Development

20 How do you educate for lighting?  
– Anil Valia

### Urban Lighting

24 Smart Lighting in Smart Cities  
– Ashish Batra

### Inspirational Story

28 Give light where it's desired  
– Nivedita Sehwari

### Workplace Lighting

32 Europeans want better workplace lighting: Survey

### Lighting Festival

36 Tartu in Light 2018  
– Dr. Amardeep M. Dugar

### Curtain Raiser

40 A view from the inside:  
Taiwan's Lighting Industry  
– Subhjit Roy

### Event Preview

44 HKTDC Hong Kong International  
Lighting Fair (Spring Edition)

### Product Profile

46 K-Lite's Smart City Pole

## Regulars

Publisher's Letter .....	2
News .....	6
Appointments .....	12
Awards .....	14
Index to Advertisers .....	47
Event Calendar .....	47

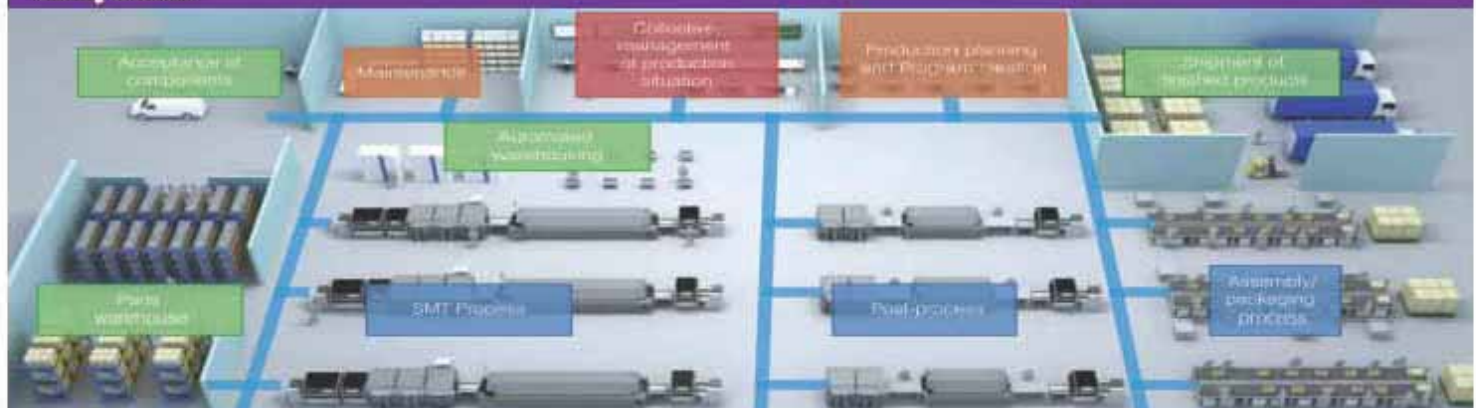


# Advanced Innovation

Innovative production efficiency Improvement in your entire factory.

## JUKI Global Smart Solutions

### Factory Solution



Complete Line Solution- SCALABLE PLATFORM Mic's Single Line/ Dual Line

Example of : ~250,000 CPH rated capacity line



Super-High productivity

High Quality

Super Slim Design

Total Line Solution

### NEW PRODUCTS



Rated  
42,000  
CPH<sup>1</sup>

- \* All In One Mounter
- \* Max PCB: 1200x370mm
- \* Comp. Size: 0201 ~ 74mm Sq/30x150mm
- \* 8 Nozzles- NEW HEAD DESIGN

- \* Two In one-3D SPI/2DACH
- \* 3D ACH
- \* 3D Projectors in 4 direction (No Mir)
- \* 2D High Speed Color Camera 160 FPS
- \* White LED 3 Stage ring light
- \* New DLP Projector
- \* High Speed Image processing
- \* Filter Shape Calculation - Patent pending

High-Speed  
0.14sec<sup>2</sup>



RX-1

RX-2

RX-2-3D

### RS-1- Fast Smart Modular Mounter

### PWB Visual Inspection (SPI/AOI)-RV-2/RV-2-3D



Rated  
32,000  
CPH

- \* Preferred Chip Mounter for LED lighting
- \* Max PCB: 1500x360mm (OY), 1200x360mm (Std.)
- \* On Fly LASER alignment
- \* Comp. Size: 0201 ~ 33.5mm Sq.
- \* High-precision placement of Diffusion Lenses

- \* Automatic supply of components for electronics assy
- \* Improved production efficiency and material control
- \* Component Protection
- \* Humidity Control
- \* Reduce Storage space
- \* No component delivery error
- \* Interface with Production MIS/Inventory & Scheduling

### PROVEN BEST IN CLASS

ISM2000

ISM1100

ISM500



### JX-380 Long Board Support

### ISM-Intelligent Storage Manager

Contact Our Sales for Semi-Automatic Printer, Reflow Oven & Handling Conveyors System

**JUKI**  
JUKI INDIA PVT. LTD

Bangalore: 9801822887, 7349786556 • New Delhi: 9871368921, 9323931832, 9910409337, 9910448300

Mumbai: 9323618510 • Email: [smt@jukindia.com](mailto:smt@jukindia.com), [preveen@jukindia.com](mailto:preveen@jukindia.com)

LOWEST COST OF OWNERSHIP

[www.smtjukindia.com](http://www.smtjukindia.com)

## Legrand India launches IoT program Eliot




**L**egrand India provides a new dimension for connecting lives with their roll out of IoT programme - Eliot. Eliot which stands for Electricity + Internet of Things is a programme that aims to inject the power of communications, advances in connectivity and intelligence in the building environment and enhances value of the connected products to improve user experiences. Eliot also supports the development of suitable digital infrastructures for buildings and provides interoperability.

In India the Eliot product offerings are – Residential: Arteor With Netatmo, My Home Up, Classe 300 IP Door Phones, Nuvo for Audio Systems; Hospitality: Neat for Integrated Assisted Living, Flex Commercial: Power Distribution Unit, Energy Distribution.

Legrand India through their IoT Eliot programmes aims to deliver additional benefits for all private and professional users, whether they are end users or installers. The products are interconnected in such a manner that they are able to talk to each other and interact when the user wishes too.

The Eliot IoT programme is based on three cornerstones: Connected solutions, Interoperability, and sustainable digital and electrical infrastructure for buildings.

Legrand is joined by partners Amazon Echo, Samsung and Google Play, Renault, Marriott in launching Eliot, which offers a purpose-built Cloud, gateways for installed legacy offerings, an array of natively connected new products, and innovative solutions comprising connected, intelligent technologies and services. 

## Eaton to spin off its lighting business


**O**n the 1st March 2019, Eaton announced its intent to pursue a spin-off of its Lighting business, creating an independent, publicly traded company – a transaction expected to be completed by the end of this year.

Included in the spin-off is Eaton's lighting business – UK brands Zero 88, iLight and Greengate which are part of the Lighting Division – plus its global Airport Lighting business and Mains Lighting and Intrusion Systems operations that operate primarily in Europe and the Middle East.

The Crouse-Hinds Industrial Lighting business and Life Safety Division's Emergency Lighting product lines in Europe, the Middle East and Africa will remain with Eaton.

"The Lighting business had sales of \$1.7 billion in 2018 and employs over 5,000 people, so it will be one of the largest global lighting businesses," the company said issuing a statement.


"Eaton is excited about this announcement for several reasons," said Simon Sparrow, Managing Director of Eaton Lighting Systems. "It better positions the Lighting Business to respond to evolving industry and customer needs, it enables Lighting to compete more effectively across its diverse end-markets, and it enhances Eaton's ability to focus investments in its core businesses."

The company statement adds: "Over the next few months, Eaton will be working to finalise the spin-off and ensure a seamless transition for employees, customers and valued business partners... Zero 88 continues to focus on developing the entertainment market bringing dynamic, innovative, affordable and intuitive lighting control products to the fore as it has done for over 45 years." 

## China's Inventronics expands controls-ready LED Drivers range

**I**nventronics has announced the expansion of the ESD family of Controls-Ready, high input voltage LED drivers to include models delivering a full 480W at a wide output current range between 1.5-10.0 A. The new ESD-480SxxxDT series operates over a 249-528Vac input range making it ideal for a multitude of projects in varying geographical locations. It provides absolute cost savings with full-load efficiency up to 95 per cent and eliminates the need for a step-down transformer within the lighting fixture.

The ESD-480SxxxDT drivers are equipped with controls-ready features which provide a 12V/200mA auxiliary output and dim-to-off capability with  $\leq 0.5W$  standby power consumption. The benefits of these features to OEMs and lighting designers are decreased installation space and reduced fixture costs by eliminating the need for a secondary power supply and an AC switch or relay to turn the drivers on/off. For more energy savings, they provide dimming functionalities such as 0-10V, PWM and 3 timer modes, making them more versatile than traditional LED drivers and allowing easy integration into smart lighting applications.

The ESD-480SxxxDT supplies 6kV line-to-line and 10kV line-to-earth surge protection which provides a stable and reliable performance, regardless of the environmental factors. They are IP67 rated, TYPE HL drivers making them a rugged option for harsh indoor and outdoor lighting applications including sports arena, horticultural, port and high mast lighting. 







Brightness that lasts on and on | illuminating every corner of your life.



**When it comes to LED lighting technology, there is no better alternative than HPL.  
The most elegant range of LEDs: low on power consumption,  
low on maintenance and with customer satisfaction.**

#### **FEATURES:**

SMD LED's for good quality illumination and longer life. | Constant current drivers. Highly efficient metal core PCB.  
Superior quality diffuser for glare free distribution. Extruded aluminium heat sinks with specially designed fins.

#### **OTHER LIGHTING PRODUCTS**



**LED Bulbs & Tubes**



**LED Downlighter**



**LED Panel**



**LED Highbay**



**LED Street Light**



long life



eco light solution



maintenance free



compact & sleek design



LOW HEAT generation



energy saver

**HPL Electric & Power Ltd**

Ph.: +91-120-4656300 | Customer Care No. 1800 419 0198

hpl@hplindia.com, enquiry@hplindia.com

**www.hplindia.com**



## Amazon to Join Zigbee Alliance Board of Directors



The Zigbee Alliance, an organisation of hundreds of companies creating, maintaining, and delivering open, global standards for the Internet of Things (IoT), announced that Amazon will join its Board of Directors. As IoT growth continues to accelerate, prominent companies in the tech industry are collaborating within the Zigbee Alliance to shape the direction of standards, ecosystems, and devices to offer users easy and enjoyable experiences they'll want to build upon within their homes and personal spaces.

"The decision by Amazon to join the Zigbee Alliance at the Board level is a strong message that the industry is focused on simplifying and adding convenience to the growing range of IoT devices available to customers," an official statement said.

"Customers tell us they want smart home experiences that are simple to setup, easy to control, and add convenience to the tasks they do every day," said Christian Taubman, Director, Alexa Smart Home at Amazon. "Voice control with Alexa is helping remove the complexity of smart home, and there are even more ways we can help customers by ensuring their smart devices connect and work together seamlessly."

With voice services like Amazon Alexa and products such as the Amazon Echo family — which serves as the 'brain' or hub of choice in smart homes across the world — consumers can intuitively connect lights, locks, sensors, and more to broaden the conveniences around them.

## Spacio unveils collection from CVL Luminaries

Spacio, a leading luxury boutique store chain for interior and decor accessories in India, unveils one of the most popular collections of CVL Luminaires, lights from the Loire Valley situated in France. Arborecence, the collection here is a complete range of lights in a variety of sizes and finishes. As a flexible concept, it can be customized into a bespoke product. Each light fitting is entirely handmade making it a very unique interior accent.

Unveiling the Arborecence collection, Praveen Kanodia, Managing Director, Spacio, says, "Spacio is a place to celebrate rarity of materials be it lighting or anything related to interiors we try to achieve the best for our customers. CVL Luminaries the lighting honcho situated in Loire Valley brings over 50 years of experience with them for the discerning Indian palate who always wanted something different and unique for their interiors."

Spacio stores are located in Surat, Kolkata and Mumbai.



## STMicroelectronics reveals new lighting controller for greater energy savings

STMicroelectronics has combined its LED-control know-how with advanced power technologies in a new all-in-one LED control chip that enables future luminaires to save more energy and deliver better user experiences.

The HVLED001B controller simplifies designing LED-lighting modules, maximises energy efficiency at all dimming levels, and ensures smoother brightness control. Lighting innovator TCI of Italy, a lead customer, has already designed forthcoming products containing the new chip to increase energy savings, safety, and usability.

Explaining that to create mid- and high-power LED luminaires to satisfy the latest lighting regulations and market demands is no easy challenge, a technical spokesperson for TCI said, "ST's new LED driver enabled us to achieve our high performance targets, leveraging built-in features that simplify design and reduce the bill of materials. LED power-up is extremely fast, taking less than 0.4 seconds, and efficiency remains very high even at the lower dimming levels where conventional drivers can lose their edge."

Matteo Lo Presti, Executive Vice President, Analog Sub-Group General Manager in ST's Analog, MEMS and Sensors Group, added, "The latest luminaires must support smart-grid management and power quality by increasing power factor and reducing harmonic distortion. The HVLED001B makes these targets achievable, at the same time as supporting improved start-up performance and dimming accuracy."

All-in-one LED control chip  
energy-efficient, user-convenient





**DOLLAR**  
LUMINAIRES

# For Every Situation, **One** Lighting Control Solution



In every field of endeavor, someone has to light the way. And for Dollar luminaires, leading is a way of life. For commercial, industrial & outdoor lighting, Dollar offers decision makers innovative designs, outstanding performance & easy installation for virtually every product on your project blueprint. When it comes to quality lighting, you can't find a better source.



## **DOLLAR ELECTRICAL INDUSTRIES**

1802, ELECTRICAL MARKET, BHAGIRATH PALACE, DELHI - 110006  
TEL. : 23865355, 23869563, FAX : 91-11-23865860 (R) 22166168  
e-mail : dollarelect@gmail.com

**DOLLAR** ... *Lighting solutions for today's environment*  
*For those who value quality*

Authorised Dealers :



**VENTURE**  
LIGHTING



## Chinese LED package industry witnessing price declines: LEDinside

**M**ainstream high- and mid-power LED package products in the Chinese market witnessed price declines in December, according to the latest report from LEDinside, a division of TrendForce.

"LED manufacturers have continued to clear their inventories in December due to the weak demand at the year end, which lowered the prices in the general lighting market", says LEDinside analyst Terri Wang. "The average prices of high- and mid-power LED package products slid 2 per cent~4 per cent and 1 per cent~8 per cent respectively."

According to the study, faced with the sluggish demand, LED packaging companies continue to explore niche markets, with horticultural lighting, human centric lighting, and connected lighting being the focus. For instance, Lumileds has released the LUXEON SunPlus 2835 LED series for horticultural lighting, with eight colour options and customized spectrum available. Samsung has also launched a new product series for horticultural lighting, including full-spectrum packages and modules. Blue light, red light, and infrared LEDs are available, and the products have been mass produced.

For the future, Samsung plans to integrate smart sensing or connected solutions to horticultural lighting LED products. Nichia introduces COB, a new human centric lighting product series, which can be used for commercial lighting like retailing stores. The colour temperature can change according to the features of products displayed, or according to users' biological clock when used for home lighting.



## Tata Power-DDL distributes 1 Mn LEDs

**T**ata Power Delhi Distribution Limited (TATA Power-DDL) attained a major milestone by distributing one million LED products to its customer at its customer care centre, Civil Lines, Delhi.

Tata Power-DDL is running the discount scheme for promotion of LED bulbs in association with EESL (Energy Efficiency Services Limited) under UJALA program by the Ministry of Power. Under the scheme, customers can purchase any number of branded 9W LED bulbs at Rs. 70/- per piece; 20W Energy Efficient LED Tube lights at Rs. 220/- per piece; BEE 5-Star rates Ceiling Fans at Rs. 1,110/- per piece (all-inclusive of GST).

Besides this, the company is also promoting other LED and energy efficient products like tubelights and 5-Star ceiling fans in association with Crompton Greaves. Any domestic, commercial, industrial and other customers of Tata Power-DDL can avail this scheme by presenting latest electricity bill or authorised ID proof (Aadhar Card, Voter ID Card, Driving License, Passport or PAN card).

While giving the one millionth LED Product, Sanjay Banga, CEO, Tata Power-DDL, said, "Tata Power-DDL is a frontrunner in promoting energy efficient solutions among its consumers. Use of these products not only results in reduced consumption but also contribute towards creation of a clean and green environment."



Sanjay Banga, CEO, Tata Power-DDL presenting the one-millionth LED bulb to consumer at New Delhi.

## Inspira picks up significant stake in iRAM

**I**nspira Enterprise, a global IT solution provider, announced its partnership with iRAM Technologies, specialised in smart street lighting and parking solutions based on Internet of Things to develop convergent solutions for India's smart cities.

Apart from infusing fund in the company, the stake sale will give iRAM access to Inspira Enterprise's sales force and established relation with government verticals in the smart city space. iRAM will use this investment for new product development, feature enhancement in existing products, build on their R&D and hire new talent. Also, Vishal Jain, Director, Inspira Enterprise, will join the board of iRAM.

"Inspira is on a mission to help its clients with their digital transformation. Since every expertise cannot be home grown, we collaborate with best talents and complement each other's strengths to offer the best to our clients. We are very excited to formalize our relationship with iRAM. We strongly believe our collaboration with iRAM will open new doors of innovation and opportunity. Inspira will leverage products, solutions and capabilities of iRAM to deliver cost-effective and efficient citizen services to urban and rural communities," says Manoj Kanodia, CEO, Inspira Enterprise.

Udaya Bhaskar Rao Abburu, CEO & Managing Director, iRAM Technologies, said, "This investment is significant for iRAM Technologies, as besides infusing fresh funds in the company it will give us access to Inspira's well entrenched sales team and their existing relations with government agencies. This is a strategic move that will give fillip to the growth strategies of iRAM and help us emerge as a key player in the smart city solutions space."

Compact Size . Optimum Performance



Path Finders



India's Lighting Company



## Apollo-backed Lumileds appoints new CEO



Dr. Jonathan Rich

**L**ighting solutions company Lumileds, which is backed by Apollo Global Management, announced the appointment of Dr. Jonathan Rich as Chief Executive Officer.

Dr. Rich most recently served as Chairman and CEO of Berry Global, Inc., a Fortune 500 specialty materials and consumer packaging company, from 2010 to 2018. Dr. Rich succeeds Mark Adams, who is stepping down as CEO and from the board of directors but will remain in an advisory role to the company.

"I am very pleased to be joining Lumileds and am looking forward to building on the company's differentiated lighting technology foundation to increase the value we can deliver to customers across a broad set of industries," said Dr. Rich. "The opportunity for lighting innovation to make a positive impact on safety and sustainability is tremendous."

Before Dr. Rich held the position of Chairman and CEO of Berry Global, he was president and

CEO at Momentive, a specialty chemical company headquartered in Albany, New York. Prior to that, he held positions with Goodyear Tire & Rubber Company, first as President of the Global Chemicals business and subsequently as President of Goodyear's North American Tire Division. Dr. Rich spent his formative years at General Electric, first as a research scientist at GE Global Research and then in a series of management positions with GE Plastics.

"Mark Adams has made significant contributions to Lumileds during his tenure, leading the transition to an independent company and cultivating a culture of innovation and customer focus," said Rob Seminara, a senior partner at Apollo and chairman of the board of Lumileds. "We are very excited Jon will be joining Lumileds to drive the next phase of innovation and growth and we look forward to working with him again."



## Green Hippo appoints new sales and marketing head



David March

**G**reen Hippo has announced the appointment of David March as Head of Sales and Marketing. Effective 25th February.

March's appointment comes at a time when the developer and manufacturer of Media Servers, renowned for its flagship Hippotizer product line, looks to continue to build on its 2018 acquisition by tvONE-owning Spitfire Creative Technologies, by growing further and faster. March will report directly to Green Hippo's Business Unit Director, Emma Marlow. He will take responsibility for

Green Hippo's Sales and Marketing strategy in EMEA and Asia.

March comes to Green Hippo from VER where he most recently served as Head of VER Lighting Europe & Aurora Lighting. He began his career as a rental assistant at Vari-Lite Europe ultimately becoming General Manager at Vari-Lite Production Services. Since then he has held a number of leadership positions in the lighting and live events sector, including roles at Philips Entertainment, PRG Distribution and AED Distribution UK Limited.



Print



Digital

**PRINT & DIGITAL**  
Advertise in our magazine which is available in both print as well as digital medium



**WEBSITE**

Advertise and get more visibility (hyperlink to your website), increasing hits on your website

### **E-NEWSLETTER**

Advertise to avail the fortnightly digital blast, being on TOP OF THE MIND of your prospective customers is always a manufacturers desire

**One Media,  
Many Platforms**

**Lighting India**

India's foremost magazine on the Lighting Industry

For Package Deals contact, Ad Department at +91 22 27777170 /71 / Nafisa +91 22 27777199

**inter  
solar**

connecting solar business

| **INDIA WEST**

**BE PART OF INTERSOLAR INDIA WEST!  
MUMBAI, BOMBAY EXHIBITION CENTRE**

**APR  
04-05  
2019**

[www.intersolar.in](http://www.intersolar.in)



**Get the best of the western solar markets:**

- Get first-hand information on the latest products and solutions from 75+ international exhibitors.
- Network with more than 5,000 business professionals from the western solar states and pan India.
- Listen to high-quality sessions on solar financing, mini & micro-grids, O&M and India's PV Market at the accompanied 1-Day solar conference.

**Save the Date for India's Key Solar Event:  
Intersolar India, Bangalore, November 27-29, 2019**



## Jaquar's Rajesh Mehra Wins EY 'Entrepreneur of the Year' Award

**R**ajesh Mehra, Director and Promoter of Jaquar Group has been conferred upon the 'EY Entrepreneur of the Year 2018' Award under the 'Consumer Products & Retail' category for delivering luxurious experiences. The award was presented by Maharashtra Chief Minister Devendra Fadnavis.

Under the visionary leadership of Mehra, Jaquar Group created a distinct identity for itself by transforming the sanitaryware industry with a line-up of world-class products. Over the years, the company has rapidly grown from a faucet brand to a diversified 'complete bathroom and lighting solutions' brand.

On receiving the prestigious award,



Mehra said, "As we get recognized for our work by the prestigious EY Entrepreneur of the Year' award, it is truly a memorable day for our company. When I started more than 60 years ago, the industry was at a nascent stage and since then it's been an incredible journey for us at Jaquar Group as we today emerge as the market leader with 60 per cent market share."

Jaquar Group has become one of the fastest growing multi-diversified 'complete bathroom and lighting solution' brands in the world with a turnover of Rs 3,123 crore in 2017-18. The Group has presence in over 45 countries across Europe, Middle East, Asia-Pacific, Africa and the SAARC region.



## Fulham New EliteControl PoE Driver Bags 2019 Sapphire Award

**F**ulham Co., Inc., a supplier of lighting components and electronics for commercial and specialty applications, announced that its new EliteControl PoE 2-Channel LED Driver has received this year's Sapphire's Award for innovation in LED drivers from LEDs Magazine. The awards were presented at Strategies in Light in Las Vegas February 28.

The Sapphire Awards are judged by a panel of industry experts using various criteria, including innovation, user value, sustainability, impact, and meeting a defined need. The new Power over Ethernet (PoE) driver fills a void in the solid-state lighting market and was developed to meet the growing demand of Fulham customers for a PoE lighting solution. Fulham first demonstrated prototypes of its new PoE drivers at LightFair 2018 in May 2018.

Russ Sharer, Vice President of Global Marketing and Business Development for Fulham, said, "More of our customers are looking for luminaire control options and new ways to harness solid-state lighting as a platform for building automation. In fact, we have received a number of



requests for a Power over Ethernet driver, and with this new EliteControl driver we offer both PoE and wireless Bluetooth mesh access. It's part of Fulham's commitment to continued innovation and anticipation of our customers' needs."



## Visibility defines a long term impression

Media does the first entry to opening your door in the mind of your clients

Advertise in **Lighting India**

Contact Nafisa at +91 22 27777 7199 / +91 9870884159



# LED expo

## MUMBAI

Book your booth  
**NOW!**

India's only exhibition covering the  
entire value chain of the LED industry

**9 – 11 May 2019**

Hall No. 4, Bombay Exhibition Center, Mumbai

[www.ledexpo-mumbai.com](http://www.ledexpo-mumbai.com)

### GROW YOUR BUSINESS WITH US!



**20<sup>th</sup>**  
Edition



**250+**  
brand products



**9000+**  
Visitors



LED Lights



Chips



Drivers



Mounted PCBs



Circuit Boards



Diodes

### For bookings contact:

**Deepika Jeet Kaur**

M: +91 97177 70404

E: [deepika.kaur](mailto:deepika.kaur@india.messefrankfurt.com)

[@india.messefrankfurt.com](mailto:@india.messefrankfurt.com)

**Vaibhav Bhamare**

M: +91 98211 33442

E: [vaibhav.bhamare](mailto:vaibhav.bhamare@india.messefrankfurt.com)

[@india.messefrankfurt.com](mailto:@india.messefrankfurt.com)

**Himanshu Joshi**

M: +91 85869 26107


E: [himanshu.joshi](mailto:himanshu.joshi@india.messefrankfurt.com)

[@india.messefrankfurt.com](mailto:@india.messefrankfurt.com)



messe frankfurt





Laser light in the visible range is processed for use in the testing of quantum properties in materials in Carlos Silva's lab at Georgia Tech.  
Credit: Georgia Tech / Rob Felt

# The Possible Future of Lighting

Brilliant glow of paint-on  
semiconductors comes from  
Ornate quantum physics

**LED** lights and monitors, and quality solar panels were born of a revolution in semiconductors that efficiently convert energy to light or vice versa. Now, next-generation semiconducting materials are on the horizon, and in a new study, researchers have uncovered eccentric physics behind their potential to transform lighting technology and photovoltaics yet again.



Comparing the quantum properties of these emerging so-called hybrid semiconductors with those of their established predecessors is about like comparing the Bolshoi Ballet to jumping jacks. Twirling troupes of quantum particles undulate through the emerging materials, creating, with ease, highly desirable optoelectronic (light-electronic) properties, according to a team of physical chemists led by researchers at the Georgia Institute of Technology.

These same properties are impractical to achieve in established semiconductors.

The particles moving through these new materials also engage the material itself in the quantum action, akin to dancers enticing the floor to dance with them. The researchers

were able to measure patterns in the material caused by the dancing and relate them to the emerging material's quantum properties and to energy introduced into the material.

These insights could help engineers work productively with the new class of semiconductors.

### Unusually flexible semiconductors

The emerging material's ability to house diverse, eccentric quantum particle movements, analogous to the dancers, is directly related to its unusual flexibility on a molecular level, analogous to the dancefloor that joins in the dances. By contrast, established semiconductors have rigid, straight-laced molecular structures that leave the dancing to quantum particles.

The class of hybrid semiconductors the researchers examined is called halide organic-inorganic perovskite (HOIP), which will be explained in more detail at bottom along with the "hybrid" semiconductor designation, which combines a crystal lattice -- common in semiconductors -- with a layer of innovatively flexing material.

Beyond their promise of unique radiance and energy-efficiency, HOIPs are easy to produce and apply.

### Paint them on

"One compelling advantage is that HOIPs are made using low temperatures and processed in solution," said Carlos Silva, a professor in Georgia Tech's School of Chemistry and Biochemistry. "It takes much less energy to make them, and you can make big batches." Silva co-led the study alongside Ajay Ram Srimath Kandada from Georgia Tech and the Istituto Italiano di Tecnologia.

It takes high temperatures to make most semiconductors in small quantities, and they are rigid to apply to surfaces, but HOIPs could be painted on to make LEDs, lasers or even window glass that could glow in any colour from aquamarine to fuchsia. Lighting with HOIPs may require very little energy, and solar panel makers could boost photovoltaics' efficiency and slash production costs.

The team led by Georgia Tech included researchers from the Université de Mons in Belgium and the Istituto Italiano di Tecnologia. The results were published on January 14, 2019, in the journal *Nature Materials*. The work was funded by the U.S. National Science Foundation, EU Horizon 2020, the Natural Sciences and Engineering Research Council of Canada, the Fond Québécois pour la Recherche, and the Belgian Federal Science Policy Office.

### Quantum jumping jacks

Semiconductors in optoelectronic devices can either



Carlos Silva (l.) in his lab at Georgia Tech with graduate research assistant Félix Thouin examining a setup to process laser light in the visible range for the testing of quantum properties in a halide organic-inorganic perovskite. Credit: Georgia Tech / Rob Felt

convert light into electricity or electricity into light. The researchers concentrated on processes connected to the latter: light emission.

The trick to getting a material to emit light is, broadly speaking, to apply energy to electrons in the material, so that they take a quantum leap up from their orbits around atoms then emit that energy as light when they hop back down to the orbits they had vacated. Established semiconductors can trap electrons in areas of the material that strictly limit the electrons' range of motion then apply energy to those areas to make electrons do quantum leaps in unison to emit useful light when they hop back down in unison.

"These are quantum wells, two-dimensional parts of the material that confine these quantum properties to create these particular light emission properties," Silva said.

### Imaginary particle excitement

There is a potentially more attractive way to produce the light, and it is a core strength of the new hybrid semiconductors.

An electron has a negative charge, and an orbit it vacates after having been excited by energy is a positive charge called an electron hole. The electron and the hole can gyrate around each other forming a kind of imaginary particle, or quasiparticle, called an exciton.

"The positive-negative attraction in an exciton is called binding energy, and it's a very high-energy phenomenon, which makes it great for light emitting," Silva said.

When the electron and the hole reunite, that releases the binding energy to make light. But usually, excitons are very hard to maintain in a semiconductor.

"The excitonic properties in

conventional semiconductors are only stable at extremely cold temperatures," Silva said. "But in HOIPs the excitonic properties are very stable at room temperature."

### Ornate quasiparticle twirling

Excitons get freed up from their atoms and move around the material. In addition, excitons in an HOIP can whirl around other excitons, forming quasiparticles called biexcitons. And there's more.

Excitons also spin around atoms in the material lattice. Much the way an electron and an electron hole create an exciton, this whirl of the exciton around an atomic nucleus gives rise to yet another quasiparticle called a polaron. All that action can result in excitons transitioning to polarons back. One can even speak of some excitons taking on a "polaronic" nuance.



Compounding all those dynamics is the fact that HOIPs are full of positively and negatively charged ions. The ornateness of these quantum dances has an overarching effect on the material itself.

### Wave patterns resonate

The uncommon participation of atoms of the material in these dances with electrons, excitons, biexcitons and polarons creates repetitive nanoscale indentations in the material that are observable as wave patterns and that shift and flux with the amount of energy added to the material.

"In a ground state, these wave patterns would look a certain way, but with added energy, the excitons do things differently. That changes the wave patterns, and that's what we measure," Silva said. "The key

observation in the study is that the wave pattern varies with different types of excitons (exciton, biexciton, polaronic/less polaronic)."

The indentations also grip the excitons, slowing their mobility through the material, and all these ornate dynamics may affect the quality of light emission.

### Rubber band sandwich

The material, a halide organic-inorganic perovskite, is a sandwich of two inorganic crystal lattice layers with some organic material in between them – making HOIPs an organic-inorganic hybrid material. The quantum action happens in the crystal lattices.

The organic layer in between is like a sheet of rubber bands that makes the crystal lattices into a wobbly but stable dancefloor. Also, HOIPs are put together

with many non-covalent bonds, making the material soft.

Individual units of the crystal take a form called perovskite, which is a very even diamond shape, with a metal in the center and halogens such as chlorine or iodine at the points, thus "halide." For this study, the researchers used a 2D prototype with the formula (PEA)2PbI4.

### Acknowledgement

The study was co-authored by Félix Thouin (co-first author), David A. Valverde-Chávez (co-first author), and Ilaria Bargigia, all of Georgia Tech; Claudio Quarti and David Beljonne of the Université de Mons in Belgium; Daniele Cortecchia and Annamaria Petrozza of the Istituto Italiano di Tecnologia.





**An ISO 9001:2015 Company**

## LARGEST RANGE OF TEST AND MEASURING INSTRUMENTS



**DIGITAL SOLAR POWER METER**  
MODEL - KM-SPM-530  
Range : 0 ~ 2000W/m2  
(0 ~ 634 BTU (ft2 \* h))



**DIGITAL LUX METER**  
MODEL - KM-LUX-99 / KM-LUX-200K  
Range : 1 - 1,00,000 Lux / 1 - 2,00,000 Lux



**DIGITAL BTU SOLAR POWER METER**  
MODEL - KM-SPM-11  
Range : 1999W/m2, 634 BTU (ft2\*h)



**MICROPROCESSOR DC MULTIFUNCTION POWER METER**  
MODEL - DMDPW



**BATTERY QUALITY ANALYZER**  
MODEL - KM 900

Useful for Telecommunication Companies at Tower Installation Sites & LED Testing

Useful for Analyzing All Types Of Batteries

Bluetooth

WIFI



**An ISO 9001:2015 Company**

G-17, Bharat Industrial Estate, T. J. Road, Sewree (W), Mumbai - 400015. India.  
Direct. : 022-24156638, 27754546 Tel.: 24181649, 24124540, 27750292, 27750662  
E-mail : sales@kusam-meco.co.in

[www.kusamelectrical.com](http://www.kusamelectrical.com)

# HOW DO YOU EDUCATE FOR LIGHTING



Renowned lighting designer and educator Anil Valia elucidates the need of architectural lighting design workshop for skill development.

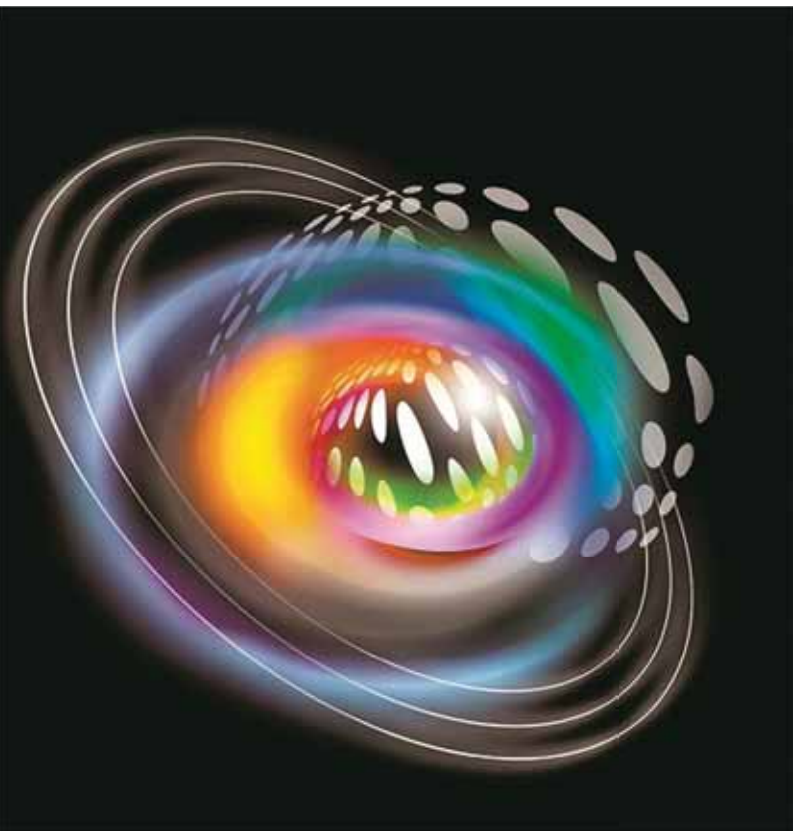
When one looks at the syllabus, lighting is the most neglected subject in Degree or Diploma Course in Architecture and Interior Design, or Electrical Engineering course. Lighting is just a small portion of syllabus in degree or diploma course of electrical engineering, and in Architecture or Interior Design Course this topic is covered under the broad subject titled Services. It is interesting to note that in developed countries, architectural colleges have taken the lead to introduce lighting in academic courses while in developing countries it is engineering colleges, which have taken lead. In India, the Academic Lighting Education leading to Masters of Science in Illumination Engineering exists in colleges which can be counted on fingers. Illumination Engineering is an elective subject (approximately 60 hours) for final year students of Electrical Engineering Degree Course in University of Mumbai, where the author had assisted in syllabus development, was paper setter and external examiner too. Now understand that they have revised the syllabus considering LEDs as one of the light sources. The author's books titled "Designing With Light - A

Lighting Handbook" and "LED Lighting Systems - All You Need to Know" are recommended as text books for this course. Now the initiative is also being taken by some Lighting Designers to introduce Masters Course in Architectural Lighting through some colleges in India.

## LEDification & DIGitalization

Within a period of just a few years the LED has become the dominant artificial light source and has taken over in nearly all fields of lighting applications. The LED has won and pushed other light sources in niche market. In less than a decade LEDification and Digitalization have completely changed the way we work, live and play!

LEDification involves selecting right type of LED and associated luminaire for any application which is the top driver for energy efficiency. DIGitalization involves the trend to provide solutions with use of daylight and sensors, use of presence detectors, sensible control of lighting, intelligent consideration of hours and use of complex digital systems with right type of LEDs and luminaires that control and manage light as required for human health and well-being.



### Continuing Education

With LEDfication and DIGItisation the dynamics of architectural lighting design is changing and there is a need to redefine the design metrics and provide required skills and train the designers. This workshop has to be tailored to provide background knowledge and hands-on experiences for solving practical lighting design problems.

Considering above scenario, it is recommended that without waiting for academic education to commence, thrust should be given to continuing education. This can be imparted through short term or practical oriented modular courses, seminars and workshops.

With more than 45 years of experience in lighting field including lighting education, the author proposes Skill Development for Architectural Lighting Design Workshop. It should also be based on (Eight Credit) credit system for benefit of participants and can be conducted part time by any college/institute/professional body and association who believe in and want to promote good lighting design practices.

### Credit System

In developing countries, the teaching of the subject is in number of hours but in developed countries it is termed as Credit Course. One Credit means 10 hours of teaching time. This includes lecture / tutorial / laboratory work (3 hrs) / studio work / seminar / workshop / consultation, mini project, etc. It is understood that a student also spends 10 hours of time for self-study.

### Lighting Designers & Design Process

Lighting is a field that involves many areas of study. A lighting designer should have a clear understanding of the knowledge - technical awareness as well as a deep understanding of human physiology and psychology in addition to social, cultural, historical, and philosophical references. A lighting designer needs to have an understanding of all of these varied areas to provide a design that will meet the needs of the client.

Lighting design is a process of informed decision making. Successful lighting designers work on a variety of projects that have different budgets, timelines, space types, team members, and visual objectives. Every project is a custom project. First step is to define the problem. Then apply a method for developing solutions that address the project-specific criteria, challenges, opportunities, constraints, and client expectations.

It is known that lighting designers come from different backgrounds, including theatre, interior design, architecture, and engineering. Each discipline will vary in the specifics of the design process, but there is one characteristic shared by all - a good process encourages exploration of design alternatives by emphasising divergent thinking and creative solutions.

### Syllabus Base

The practice of lighting requires an understanding of the physical characteristics of light, how light works in space, and how it can be controlled optically and predicted and measured photometrically. Lighting designers also must understand technology, how lighting technology operates, how lighting systems are engineered, and the interaction of the various electrical and mechanical components that make up a lighting system. Today the control is part of the system which includes not only dimming but scene setting, CCT variation, RF control, Bluetooth Mesh, Internet of Things (IoT) and so on.

To design lighting that meets the needs of people, a lighting designer must understand human vision, how the visual system operates, and the interaction of lighting and a variety of human factor considerations. Beyond this, lighting designers today must understand the interaction of lighting and human health: how lighting can impact mood, alertness, well-being, sleep quality, circadian regulation, and other aspects of human health.

Lighting designers also must understand architecture and the art and process of design, including the integration of daylighting and electric lighting in the built environment. Finally, a designer must understand the application of lighting, the lighting specification process, and the process through which lighting is integrated into a building, a landscape, or other environment.

To evaluate the architectural lighting design alternatives, one needs different tools like use of mock-ups, computer models and calculations by design programs like Dialux, sketching with pencil and paper, use of Photoshop, 2D and 3D rendering and so on. These are all valid ways to gather information, make informed decisions, and work toward a



solution. All of these methods lead to construction documents and product specifications.

A good process, supported by the formal education and skill to make sound decisions, reduces the uncertainty in lighting design solutions and is the most likely path to repeated success. The demand for lighting design specialists is blossoming because a series of issues surrounding light and lighting as explained above cannot be appropriately addressed by generalised practitioners – Architects, MEP Engineers, Interior Designers or Landscape Architects.

From above one can see that Lighting Design Syllabus must address all of these disciplines involved in lighting—physics, engineering, design, technology, architecture, human behaviour, health and so on for academic education.

### Guide Syllabus

For the purpose of Eight Credit Certificate Course in skill development for architectural lighting design a guide syllabus has been designed as per Annexure A attached herewith.

### Colleges/Institute/Professional Bodies

It is recommended that design colleges, lighting societies like ISLE, independent institutes, professional bodies like IIID, associations like that of builders and promoters and so on to take lead in conducting Eight Credit Certificate Workshop in skill development for architectural lighting design. This can be part-time or weekend course for the benefit of working professionals.

### Studio

The institute or college who would like to promote this course must have well-equipped studio with architectural material, finishes, models, LED lamps, chips, modules, etc., thermal and optical components, electrical and electronics accessories sensors, luminaires, and so on, for hand on experience. Should be equipped with small measuring equipment, to demonstrate various parameters like Colour CCT, CRI, new metrics as per TM30, Beam Angles and its effect on design, and so on. The studio also must have high-speed WiFi network for all students to work simultaneously on their laptops.

### Faculty

Faculty for Certificate Course should be a Lighting Designer who have acquired knowledge through Academic Lighting Education and or through practicing lighting design. Architect or interior design with lighting education, knowledge of CAD, lighting software, Photoshop etc. should be preferred. But most important quality requirement flair to teach.

### Course Material & Teaching Aid

The expert faculties can prepare and distribute the course material handouts to participants. Teaching aids must be the visuals in form of PowerPoint. Study books for further reading and references should be suggested.

### Examinations and Assessments

A project-based assessment pattern to be adopted for the applications modules in addition to the written papers and oral examinations.

### Certificate

Proficiency Certificate to be issued by the institute duly signed

by Course Director along with the institute /college / professional body office bearer.

### Course Fees

The recommended course fees per participant for Skill Development for Architectural Lighting Design Workshop, including course material should be Rs 120,000.00 (One lac twenty thousand only)

### Who Should Attend

This workshop is highly recommended for:

- The Architects, Interior Designers and Landscape Designers who would like to do value addition to their design and enhance the material /features used by providing right type of lighting.
- Lighting Designers who want more depth in developing strong design concepts.
- CAD operators in design firms who want to learn the Design Process.
- Entrepreneurs in lighting business who want to promote their business through design.
- The representatives of lighting companies and dealers who want to grasp how designers incorporate new technology into their designs and like to promote or market their products on product quality and not just on (low) price.
- The specifiers, electrical or MEP consultants who would also like to incorporate lighting design in their projects with the similar technological and architectural thrust.
- Fresh Graduates and Diploma Holders in design field who would like to want to develop added enhancing their resume for job.
- Teachers of various design faculties who would like to enhance their knowledge for teaching.
- Design representatives from Builders and Developers who would like to improve their skills to interact with their own team, lighting designers as well as suppliers.
- Anyone interested in Lighting Design.

### Why One Should Attend

Ten reasons to undertake this workshop

- Gain a deeper understanding of the design process
- Be able to describe the aesthetic qualities of light
- Translate desired aesthetic qualities into design concepts
- Sharpen skills in developing and communicating cohesive lighting concepts
- Practice presenting and defending your concepts to a group
- Acquire hands-on experience with different lighting products and materials
- Experiment with different ways to solve practical lighting challenges
- Learn the latest about led luminaires, controls, and other emerging lighting technologies
- Gain new ideas for applying daylighting into architectural interiors
- Practice applying technical information such as tm-30 colour metrics, product cut sheets etc. to one's designs.

## Annextre A - Syllabus for Skill Development for Architectural Lighting Design Workshop

Topics	Credits
<b>Basics of human vision and its relationship to design:</b> Evolution of Light, Light & Vision, Language of Light & Lighting, Characterizing light, light and colour, light and health, Influence of Light on Human Health, Physiological & Psychological Effect of Light.	0.5
<b>Introduction to LED Lighting:</b> LED – A Light Source, White LEDs - Colour Characteristics & Binning, Optical Management - Different types of light distribution, Understanding Of Photometric Data of Lamps & Luminaires, Thermal Management, Electrical & Electronics Management, Drivers, Basic lighting controls, LED Standards & Measurement Overview, Evaluation of LED lamps, Luminaires & Accessories, Opportunities, Do's & Don'ts	1.0
<b>Basics of Interior Lighting Design:</b> Quantity and Quality of Lighting, Interior Lighting Design Standards - IS 3646, National Lighting Code, LEDs for Conventional Indoor Lighting Applications, Selection Criteria of (LED) Light source lamp in Design, Selection Criteria of (LED) Luminaire in Design, Interior Lighting Design by Lumen Method, Point by point method of calculation for Lighting Design (Basis of CALD).	0.5
<b>Approach to Creative Indoor Lighting Design:</b> Interior Lighting Design Lighting Criteria and Techniques like Ambient, Focal, Play of Brilliance etc., The Visual Field and Human Factors, Daylighting, various Indoor Applications like Home, Retail, Office, Industry, etc., Architectural Lighting Case Studies, Latest Industry Trends – Human Centric Lighting, Lighting for well being, Introduction to new age connected Lighting Systems, Emergency lighting, Cost Comparison	2.0
<b>Approach to Technical &amp; Creative Outdoor Lighting Design:</b> Outdoor Lighting Design Lighting Techniques & parameters for various Outdoor Applications like Internal Roads, Facades, Landscape, Public Buildings, etc. IS 1944 for Secondary Roads only & National Lighting Code, LEDs for outdoor lighting applications, RGB LEDs & Dynamic Lighting, Emergency lighting, Cost Comparison.	1.0
<b>From Concepts to Reality :</b> Perception of Light and Lighting Design Process, Balance in Mixed Use Design Development, Architectural Lighting Design Case Studies	0.5
<b>Introduction to the various features and the parameters of Dialux software:</b> DIALux interface, Basic Settings and importing CAD drawings, Creating a simple building, Integrating doors, Windows & Skylight, Constructing a roof, Working with extrusion volumes, Positioning of furniture and objects	0.5
<b>How to model simple spaces and understand the basic arrangements of lighting equipment:</b> Using luminaire catalogue, Inserting and arranging luminaires, Copying along reference lines, Using copy and arrange tool, Using colors, textures and importing images, Modifying textures by move, scale and rotate option, Applying Reflection and Reflective coating to materials, Aiming luminaires for effects, Managing light scenes and control groups, Creating 3D models, False colour rendering, Reading Calculation Results and 3D Rendering, Basic output and documentation	0.5
<b>Individual Practice Project:</b> Dialux Workshop Introduction on Indoor & Outdoor Architectural Lighting, Complete lighting calculation for a sample design project Indoor Lighting – Office Lighting, Home Lighting, Retail Lighting, Industrial Lighting Outdoor- Landscape Lighting, Façade Lighting, Area lighting Street lighting.	1.0
<b>Group Presentations for Project design Evaluation:</b> Exposure to expert tips to save time and enhance quality of the output. One to One Guidance on selected individual projects post the program, Configuration of Individual Documentation. Communicating lighting design concepts to client.	0.5
<b>Closure &amp; Certificates</b>	
* AutoCAD & Dialux to be pre-installed before start of training	

### Conclusion

With advancement of lighting technology and its applications in built environment for people, skill development for architectural lighting design workshop will be the most appropriate for practicing people in the field to remain updated for implementing latest products and features in their designs.



### Anil Valia

Lighting Designer & Educator  
Educator - IALD (USA);  
Founder & Ex-Vice President ISLE  
Founder & Fellow Member CEEAMA  
Course Director – International Lighting Academy



# SMART LIGHTING IN SMART CITIES

Today, new technologies are transforming light fixtures into multifunctional interactive systems that can communicate with their environment.

Urbanisation is on the increase worldwide. In India, our municipalities and cities are facing major challenges in this regard. Digitalisation, IT boom and new technologies also raise different expectations in citizens, local and regional authorities, grid operators and other related companies.

Street lighting on municipal roads is being digitalised and is now becoming part of a smart city approach. Thanks to the Smart Cities Mission by Government of India. Due to Smart Cities Mission first time in India; lighting, health, safety, energy and mobility are linked together for the optimal use of our existing public and private spaces.

### Smart Street Lighting

The primary purpose of smart street lighting was energy efficiency by adjusting the light intensity based on a number



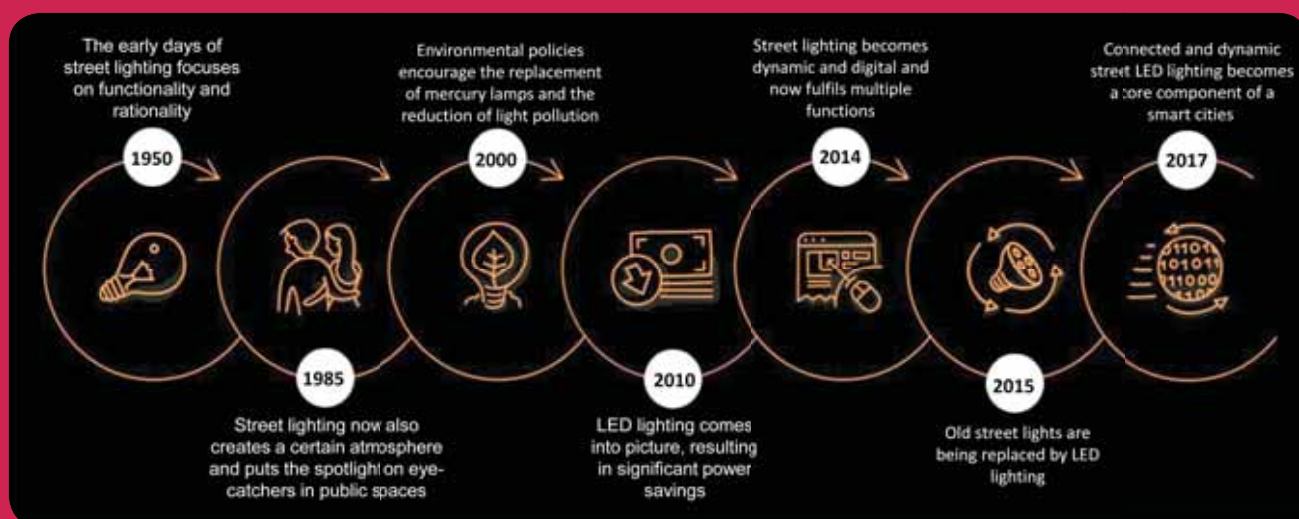


Figure 1: A Journey of Street Lighting (Source: Agoria Lighting Company, Belgium)

of parameters. Today, new technologies are transforming light fixtures into multifunctional interactive systems that can communicate with their environment. This creates masses of data, which provide fertile soil for innovative services and solutions that are paving the way to smart urban development.

### What Makes Lighting Smart?

A smart, connected lighting system is part of a local, wireless, decentralised network with a local intelligence. It is connected to the internet (IoT) and to a central data and management platform in the cloud. It is equipped with smart sensors, integrated devices and cameras to respond to its environment dynamically and interactively.

Refer figure 2 for conceptual smart lighting poles with key possible functions.

### Benefits of Smart Lighting in the cities

There are multiple benefits of smart lighting as given below:

#### For Municipalities and Cities

Below given are the key benefits for local municipalities and cities as a whole:

- Adjust dimming schedules to save more or reduce light pollution;
- Accurate actual power consumption;
- Control light level remotely in case of events or incidents; and
- Ready for future smart city applications.

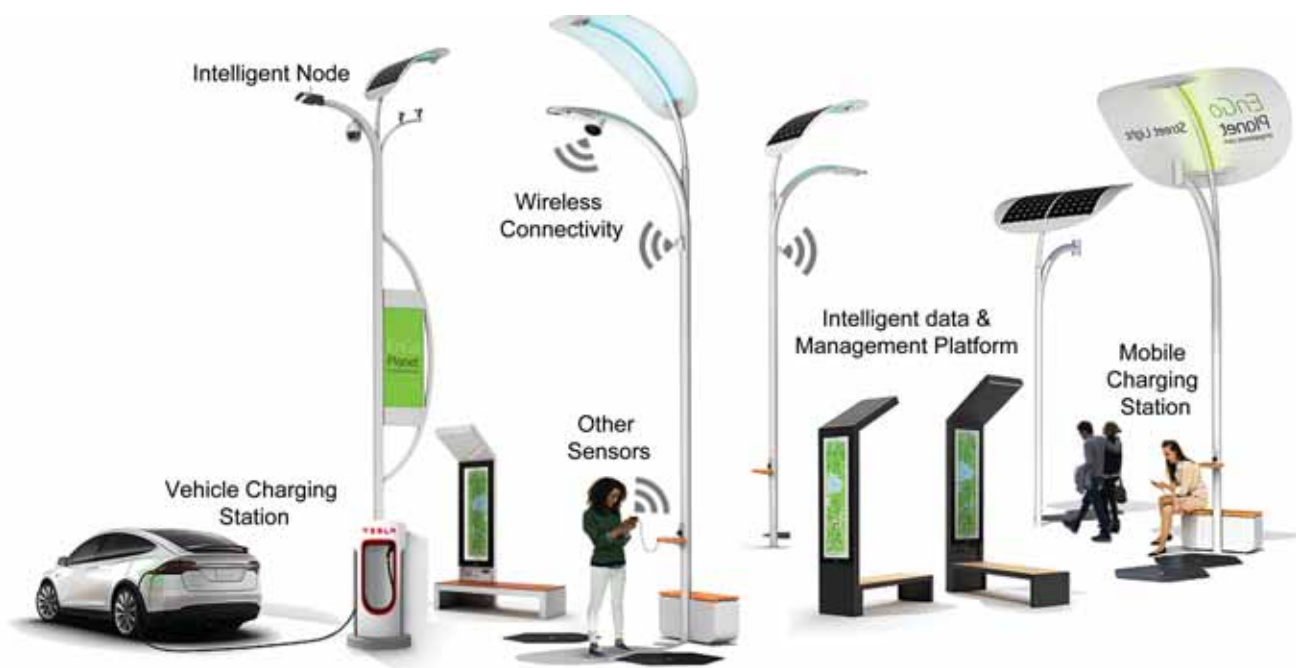


Figure 2: Conceptual Picture of Smart Lighting

### For Grid Operators or Private Partners

Below given are the key benefits for Grid operators or private partners:

- More efficient maintenance, because smart light fixtures automatically report any malfunctions;
- Constant information on the actual power consumption; and
- Automatic asset management with lower error rates.

Indian cities like Delhi, Bombay, Bangalore, Pune etc. are one of the most urbanised cities in the world. More and more people are moving to the cities and Peri-urbanisation is on the rise in India. Smart LED lighting can play an important role in resolving challenges local authorities or municipalities are facing in terms of safety, mobility, environment and energy.

### From Lighting to Smart LED Lighting in Smart City conditions

Maximum of street lighting on municipal roads still uses conventional technology or few changed to LED in recent years. Technically, the street lights simply switch on and off at a fixed time and light intensity remains the same throughout the night. LED lighting, however, can respond more dynamically to the needs of road users. They can be based on a flexible “dimming schedule” that is programmed to adjust the light intensity at certain times. Another option is a self-managing lighting system that dynamically adjusts its dimming setting based on what is happening in the local environment.

There are three possible interventions/scenarios for switching to Smart LED lighting. The chosen option may vary in the local context based on the needs of the road users and local residents, the ambitions of the local government and the objectives of their smart city plans. In the below given image are the three scenarios and the probable benefits/outcomes.



Figure 3: Possible interventions (3 Scenarios)

### Recommendations for Local and Regional authorities

Below given are the category wise key general recommendations for local and regional authorities:

#### For Local Authorities or Municipalities

Below given are the recommendations for local authorities or municipalities:

- Consider street lighting as part of a smart city concept.
- Open up street lighting to intelligent applications to make its use more comprehensive in the future.
- Involve private players, who want to be a value-added partner of municipalities and smart cities.
- The smart lighting can be rolled out in phases. The start can be an intelligent basic module to which new applications are added in the future with software updates or additional sensors.
- Make arrangements with regard to the interoperability within the lighting infrastructure, the intelligent systems (cameras, sensors) from various suppliers, data management, data ownership, personal data protection and cybersecurity.

#### For Regional authorities

The recommendations for regional authorities are as follows:

- A broader vision is required for grid operators; more than just replacing light fixtures;
- The grid operators' focus should be on facilitating the rollout of a smart lighting network on the grid side up to the connection point as smart street lighting requires power 24/7.
- Links (Data) with the energy platform of the distribution grid operator and other stakeholders are important.
- The smart lighting network must be developed as a modular platform that keeps cities and municipalities in control and capable of deciding for themselves.
- Municipalities must have the opportunity to look for an external partner for their street lighting themselves to set up external or a PPP structure.
- To achieve the appropriate economies of scale, it is best to work with areas of municipalities/cities, for which one integrator is chosen.



Ashish Batra, M. Tech

Architect-cum-Urban Planner  
LEA Associates South Asia private limited  
(LASA), Muscat, Oman

Let people not Forget you, Standout from the Crowd

Attract More Business  
by advertising in

Lighting India

Call Nafisa at +91 9870884159

# Wireless Lighting Control

basicDIM Wireless module integrated directly in the driver



The three different versions of the drivers with integrated basicDIM Wireless module cover a broad spectrum of applications in a wide range of luminaire types.

**T**ridonic has now equipped its new LED drivers in the premium (PRE) series with the basicDIM Wireless module. Quick, convenient, space-saving wireless lighting control is now possible without the need for any additional cabling.

The new LED drivers in the premium (PRE) series with an integrated basicDIM Wireless module use Bluetooth technology to achieve wireless communication with up to 127 devices in a network. There is no longer the need for a separate wireless module to control luminaires wirelessly. All that is required for each luminaire is a driver in which the basicDIM Wireless module is already integrated. Luminaires equipped in this way can be controlled, assigned to luminaire groups and faded up and down between 1 and 100 per cent, all via Bluetooth. It is also possible to set up lighting scenes or, with suitable drivers, create tunable white applications. The output currents can be easily set via the I-SELECT 2 plug.

## Three versions for different luminaires

Three versions of this Casambi-ready driver are available, covering a wide range of luminaire types.

- The SC PRE (CC) basicDIM Wireless constant current driver comes in four

models ranging from 10 W to 45 W (150 mA – 1,400 mA). They are suitable for luminaire installation or for installation as separate drivers with optional strain relief, for example together with the SLE, CLE or DLE LED modules. Depending of the model, the output power is 10 W, 17 W, 25 W or 45 W.

- Also available in four models, from 35 W to 150 W, is the basicDIM Wireless 24 V constant voltage LED driver PRE (CV) in miniature form with strain relief. They are compatible, for example, with the LLE FLEX modules.

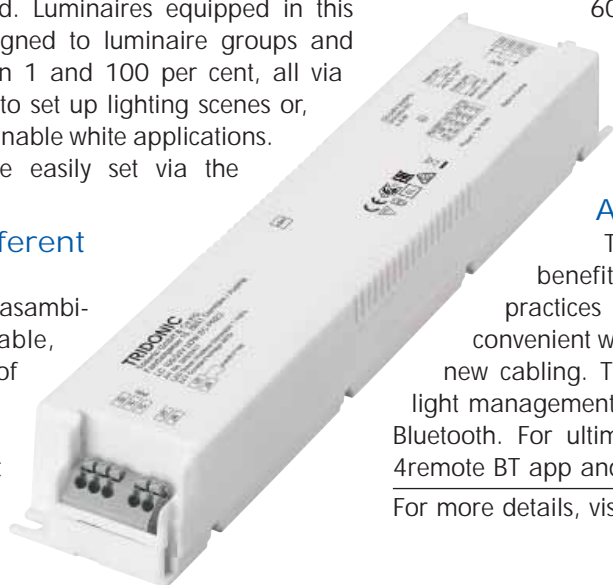
Depending of the model, the output power is 35 W, 60 W, 100 W or 150 W.

- The Tunable White PRE (TW) LC 38W 2 CH DT8 basicDIM Wireless driver is a separate two-channel constant current driver with an output power of 38 W.

## App for lighting control

The new PRE drivers will be of particular benefit to operators of offices, healthcare practices and shops looking for a quick and convenient way to modernise their lighting without any new cabling. They will then have a powerful, low-cost light management system that can be easily controlled via Bluetooth. For ultimate ease of use there is the free App 4remote BT app and optional user interface.

For more details, visit [www.tridonic.com](http://www.tridonic.com)







# Give light where it's desired

It's the biological, emotional, feel-good aspect of light that interests me and if handled adeptly, how light can drastically alter the way we live and function.

**Nivedita Sehrawat,**  
Creative Director, Design Matrix

**E**stablished in the era when the discipline of architectural lighting was still in its infancy in India, Design Matrix helped to pioneer specialist lighting design into the field of architecture. Today the firm has over 100,000 hours of specialised lighting design consultancy across 30 cities and 5 countries. Nivedita Sehrawat, Creative Director at Design Matrix sheds light on different aspects of lighting designing. Edited excerpts from her interview with Subhajit Roy:

## FASCINATION WITH LIGHT

I am always reminded of Uncle Ben's famous words from Spider Man – "with great power comes great responsibility." Light has that immense power and as lighting designers we have the ability to shape people's experiences and perceptions. Mankind has always been fascinated with light especially because we don't fully understand how it works. And as I watch my four-month-old daughter drawn towards the wall-lamps in the house, I try not to get excited about a potential lighting designer in the making, but remind myself that it's just her looking for visual stimulation. It's the biological, emotional, feel-good aspect of light that interests me and if handled adeptly, how light can drastically alter the way we live and function.

## LIGHTING DESIGN PHILOSOPHY

My philosophy is simple and may be summed up in a few words – give light where it's desired; put a light fixture where it's needed. At Design Matrix, we have always been champions of less light – not less than what is required but doing more with less; with fewer light fixtures, with lesser watts. And the rest is dependent on context and situation, on function and intent, on technique and technology, and the science and art of it all.

## SUCCESSFULLY LIGHTING A SPACE (para)

Two things, vision and collaboration. While designing, the most important consideration is visualisation and to be able to conceive what you want the space to look, and therefore feel; only then can you design for that intent. Most projects are greenfield – so you're designing on paper for the future without the luxury of seeing it come up alongside. So, without a proper and 'sound' vision, contradictory as it may seem, you're just fooling around with people's time, money, resources, efforts.

The second most important 'secret' if you may, to a successful project is collaboration. It's something we have learnt from our exposure to international projects, forums, firms but often struggle with it in our home turf. An architect who is willing to listen and go along with you and take you

along on the design journey, is more precious than a client who is vouching for you! The most successful of our projects didn't necessarily have big names from the design fraternity. But what they did have was a team that was willing to collaborate – to listen, discuss and move forward. It's very evident in one of our recent projects as it nears completion – the Max towers, at Sector 16B, Noida, part of the development known as Delhi One. Conceived by Gensler, USA and Esteva i Esteva, Spain, we came on board when concept was being translated to reality by the executive architectural firm Progressive Designs. The project not only defies the norm in terms of the simplicity of design, but stands out more importantly in the extremely well-detailed and integrated design – both interiors and façade.

#### **SAVING ENERGY**

I don't believe in today's time and age, saving energy is an option. It is the only way to go. And fortunately for lighting, newer technology has empowered us to do so. As lamp wattages drop down and light output goes up, we are better poised to do 'more with less' than ever before and why not! There's a saying in our office – "Lighting, if designed, is always green!" It's the lighting that has not been designed or thought through, that is frivolous in its usage of material and energy that we need to save ourselves from.

#### **BREAKING INTO**

The good news is that there is no reason and nothing to 'break' into. The percentage of projects that actually have a specialised lighting consultant on board is miniscule in the overall number of projects that get built and delivered. So, there's space for everyone. And at the risk of sounding very clichéd, one just needs to keep the faith and get going when the going gets tough! You just need to put yourself out there and work, work, work.

#### **SMART LIGHTING**

Technology has never really made anyone a better designer. With the advent of AutoCAD people didn't become better architects. Some would argue that capability went the other way. In the same way smart lighting is a tool in the designers' hand – it definitely gives some flexibility in terms of being able to tune the light but ultimately it needs to be composed and thought through in order to be able to apply it successfully. As lighting designers, we design and try to verify it through simulations and mock-up or back it up with experience. And technology forms the backbone of all our designs. Harmeet Issar and Sanjeev Nangia – founder partners at Design Matrix are, ahem, both engineers. Harmeet in fact studied electronics and communications and dealt with LEDs before they became

our go-to sources of light! So, at Design Matrix we are happily balanced in our aesthetic / design and technological expertise and hope that this difference and advantage is extremely evident in our design approach, our drawings and documents and execution of our projects. Vendors, manufacturers, even lighting designers who are allegedly competition have called on Harmeet to help solve their 'smart' lighting problems onsite in projects. And while it getting extremely intuitive, having an understanding of how smart lighting actually works is extremely crucial for a successful lighting designer.

#### **REMARKABLE PROJECTS**

Four of our most remarkable, successful or award-winning projects are included here and they are all memorable for varied reasons. In a sense they showcase also the width of our work and the depth of our expertise.

#### **CHALLENGING PROJECT**

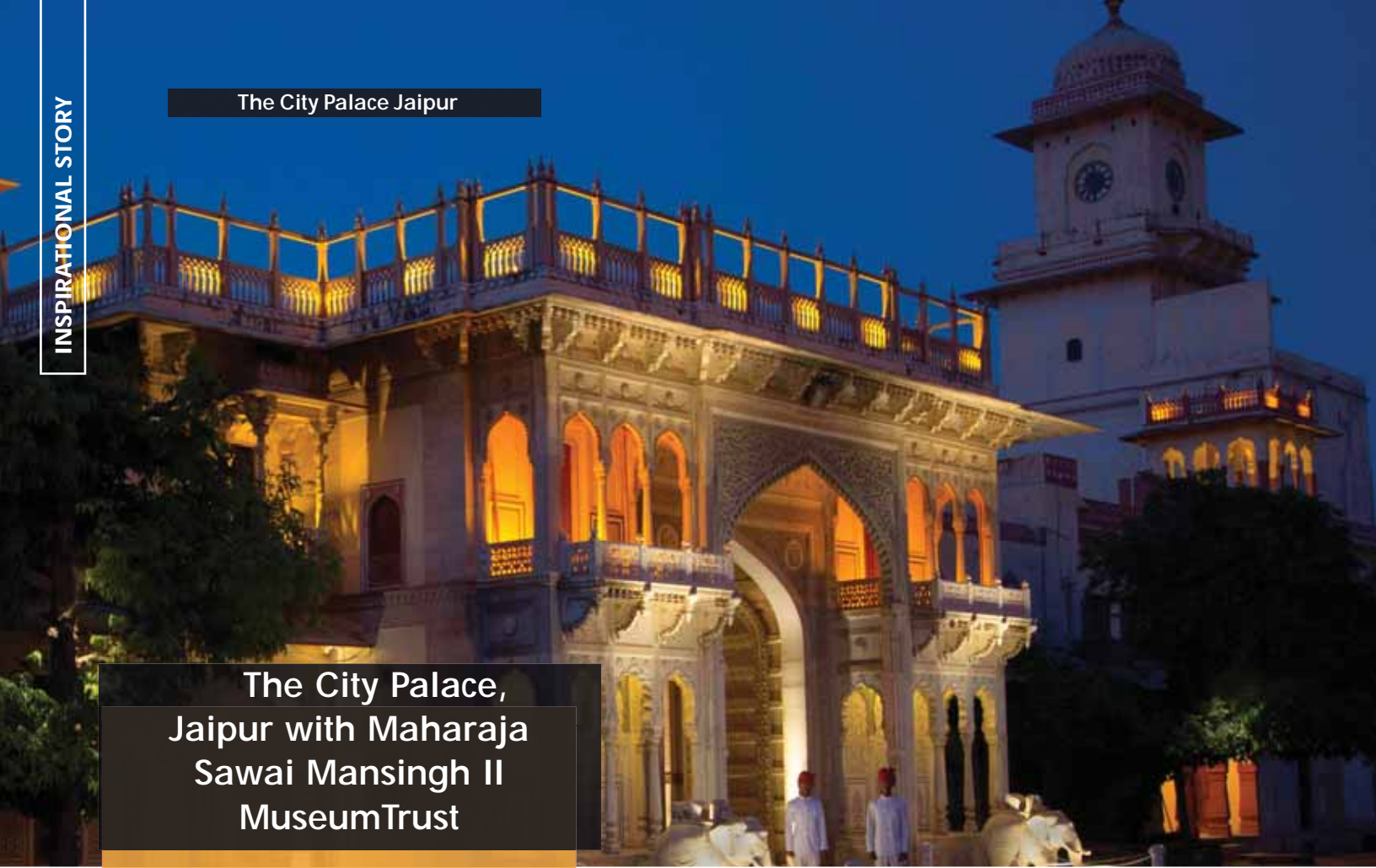
All projects come with their own set of challenges. But at this point in time, we are looking for work that's truly challenging and exciting. Such projects we understand are few and far between, and our daily bread and butter may not come from them. They may not be vast in scale – sometimes it's the small boutique projects that are most rewarding to work on. There's a lot of inspiring work happening internationally but that does not mean that we are not looking inward. But it would definitely be a project with exceptional design, a team that's willingly to push the frontiers and a client that's willing and able to spark and sustain creativity.

#### **TO BUDDING LIGHTING DESIGNERS**

The awareness of the profession is of course much more now than what it was when I started out. For the generation getting into the discipline the foundation has already been laid, the stage, as they say, is set. However, there is still a long way to go. As pioneers, not just us but the whole fraternity felt very strongly and it was, and is a conscious and collective effort to strive for the profession, its recognition, setting up professional bodies, bringing in international events, advocating the profession in design forums. And much work remains to be done. I would urge budding designers to use this base and build on it. Exposure is key. We are continually learning and relearning from our projects and also from stalwarts of the industry globally. Andre Tammes, who looks after Business Development at Design Matrix, whose personal contribution to the global emergence of architectural lighting design discipline is immense, joined us in our endeavours and in his words 'to tell the world how good it is to have well-lit environments'.



## The City Palace Jaipur



## The City Palace, Jaipur with Maharaja Sawai Mansingh II Museum Trust

Even before we were architects, Rajasthan has taught us architecture! I remember so many school projects, excursions, holiday home-works based on its rich culture and heritage. Doing the lighting for the City Palace felt almost reminiscent of being back in school and college. The project came to us after more than a yearlong shortlisting process, and of course came with its own challenges of delicately handling the heritage structure.

The intention was to revive the palace for night tourism. The buildings needed very little design, only a lot of TLC. We kept it simple – the only play is in the use of varying colour temperatures, not colour; and an attempt at places to rekindle the romance of the flickering diya but through technology.



## Intersekt Marmo

### Intersekt by Marmo, New Delhi

Intersekt is an avant garde retail format by Marmo Home, a national level player of interior finishes and fittings. It is a project that we are delighted to be a part of. Designed by architect Kapil Aggarwal of Spaces Architects@ka, the showroom was already completed, lights installed and ready to be opened when the owner decided that something was not quite right!

The lighting conceptualisation, wiring for the automation, procurement of fixtures for 30,000 sqft of retail space was reinitiated and redone. The result is a retail theatre of sorts where the merchandise on display take centre-stage and the setting and surrounds seem to recede back.





Le Meridian-Anant

## 'anant', New Delhi

'anant', is a light art installation that we did at the iconic Le Méridien in New Delhi. In a sense it was a coming back full circle. We had recently completed the façade lighting for Sunshine Towers, Mumbai with the legendary architect Raja Aederi. It is the tallest steel structure in the country at 160m. And now we were back into the building that brought him so much fame for its truly avant-garde application of curtain wall glazing and its suspended restaurant 200ft level above the lobby. The installation is inspired by the context in which it sits – the 21-storey high inward-looking atrium – the multitude of experiences which surround it, magnified by the innumerable guest rooms stacked above it. The installation seeks to blur the boundaries between architecture, art, engineering, and lighting design, as one is surrounded by myriad echoes - infinite reflections of programmed sources of light, surfaces and people.

## Antara Senoir Living



### Antara Senior Living in Purukul

Too often design for seniors has been restricted to barrier free access. But in this project several small, often surprising targeted lighting design interventions have been executed. The project stands out because of its truly holistic lighting design – the concept presentations did not just talk about horizontal and vertical illuminance but also the dangers of glossy reflective flooring, the importance of window dressings and the need for more artificial lighting during daylight hours! The project was completed in 2017, DM came on board towards the end of 2012 and was with Antara in its journey since then, even as it passed hands from different architectural and interior design firms.



A survey, conducted as part of the Repro-light project, found that 56 per cent of workers want better workplace lighting.

## Europeans want better workplace lighting: Survey

Results from a pan-European survey reveal that current lighting in the workplace is not satisfying end-users and their needs, while at the same time having a big impact on productivity and human wellbeing.

The survey, conducted as part of the Repro-light project, engaged with 1,100 workers across Germany, Spain, Italy and Austria. Participants were asked to consider their working environment's lighting and what changes they would like to see that could improve their productivity, mood, and performance.

More than half (56 per cent) of end users said they would like the better workplace lighting. A high level as workspace lighting should follow a strict lighting design code (e.g. EN. 12464-1), which guarantees, for instance, that a certain level of brightness is reached in a workplace. The survey showed, that the individual requirements for the lighting differ, showing that personalisable lighting is needed to satisfy all the users.

The results go on to show that women significantly more often encouraged an improvement in workplace lighting, while workers over 50 showed a greater desire for an improvement in lighting. It is not only the need for improved light, more than 50 per cent said that the physical luminaire aesthetics were important to them, especially workers under 30. 80 per cent of those questioned would like to have workplace lighting which automatically adapts to personal needs, with over 75 per cent wanting their work light

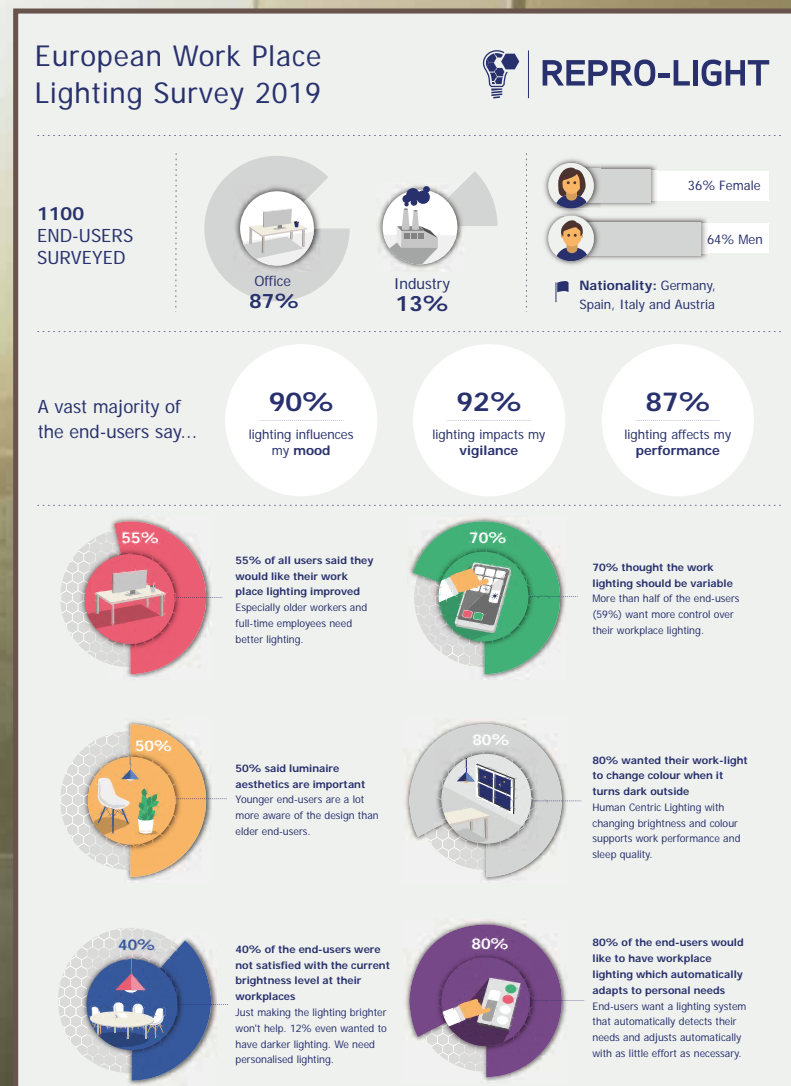
to change colour when it turns dark outside.

All of these factors play a role in the greater impact of lighting on the workforce of Europe, and not surprisingly more than 90 per cent of those asked said they believe their work lighting can impact their mood, 87 per cent said it affects their performance, and 92 per cent said it influences their vigilance in the work place.

As part of the Repro-light project's first phase, the survey, conducted by consortium members Bartenbach and Mondragon University, set out to investigate what end users really want in their workplace lighting in order to develop a user-centric lighting design solution for the future.

"The result came back to prove that change is required in the working environments, both industrial spaces and in offices, and that people are now ready for the next large steps in lighting transformation. They are demanding personalisation, automation and adjustability to match their requirement and, most importantly, to boost productivity and general wellbeing," the study reveals.

The Repro-light project, as part of the European Commission's Horizon 2020 work programme, will now be moving into the next phases of investigation and design iteration to develop a 'Luminaire of the Future' that will endeavour to meet all the user needs discovered in this recent survey.





**Electrical India**  
India's oldest magazine on power and electrical products industry

**Lighting India**

**Cooling India**  
India's foremost monthly dedicated to the growth of HVACR industry

**Medical Equipment & Automation**

## SUBSCRIPTION RATES

PERIOD	No. of Issues	Print		Digital	Print+Digital	
		By Registered Parcel	By Courier	By E-mail	By Registered Parcel	By Courier
ELECTRICAL INDIA						
1 YEAR	12	1600	1800	1000	2100	2300
2 YEARS	24	2950	3350	1750	3825	4225
3 YEARS	36	4300	4900	2500	5550	6150
5 YEARS	60	7000	8000	4000	9000	10000
COOLING INDIA						
1 YEAR	12	1600	1800	1000	2100	2300
2 YEARS	24	2950	3350	1750	3825	4225
3 YEARS	36	4300	4900	2500	5550	6150
5 YEARS	60	7000	8000	4000	9000	10000
LIGHTING INDIA						
1 YEAR	6	1050	1250	750	1425	1625
2 YEARS	12	1950	2350	1350	2625	3025
3 YEARS	18	2900	3500	2000	3900	4500
5 YEARS	30	4500	5500	3000	6000	7000
MEDICAL EQUIPMENT & AUTOMATION						
1 YEAR	6	1050	1250	750	1425	1625
2 YEARS	12	1950	2350	1350	2625	3025
3 YEARS	18	2900	3500	2000	3900	4500
5 YEARS	30	4500	5500	3000	6000	7000
ELECTRICAL INDIA-E-NEWSLETTER						
1 YEAR	52			365		
LIGHTING INDIA-E-NEWSLETTER						
1 YEAR	24			365		
COOLING INDIA-E-NEWSLETTER						
1 YEAR	24			365		



**Chary**  
Publications



SCAN QR CODE  
TO KNOW MORE  
ABOUT THE WEBSITE



# SUBSCRIPTION FORM

## **Right Information** **for** **Right Industry**



Yes, I would like to subscribe **ELECTRICAL INDIA / COOLING INDIA / LIGHTING INDIA / MEDICAL EQUIPMENT & AUTOMATION / EI E-NEWSLETTER / CI E-NEWSLETTER / LI E-NEWSLETTER** for \_\_\_\_\_ years at Rs. \_\_\_\_\_.

Payment needs to be in favour of "CHARY PUBLICATIONS PVT LTD"

Cheque/DD.No	Dated	Drawn On
--------------	-------	----------

Preferred mode will be NEFT/RTGS for which the details are as under :-

Account Name: Chary Publications Pvt.Ltd	Account Type : Current
Account Number : 000920110000322	IFSC Code: BKID0000009
Bank : Bank of India	Branch: Chembur, Mumbai-400071

Name: \_\_\_\_\_ Designation : \_\_\_\_\_

Company : \_\_\_\_\_

Address : \_\_\_\_\_

City : \_\_\_\_\_ Pin Code : \_\_\_\_\_

Email : \_\_\_\_\_ Tel.No. \_\_\_\_\_ Mob.No. \_\_\_\_\_

Signature :

Stamp :



### Chary Publications Pvt. Ltd.

905-906, The Corporate Park, Plot No. 14 & 15, Sector 18, Opp. Sanpada Railway Station, Vashi, Navi Mumbai - 400 703

Email: sub@charypublications.in • Contact : Priyanka Alugade • +91 22 27777182 / +91 8652142057 • Website: www.charypublications.in



# TARTU IN LIGHT 2018

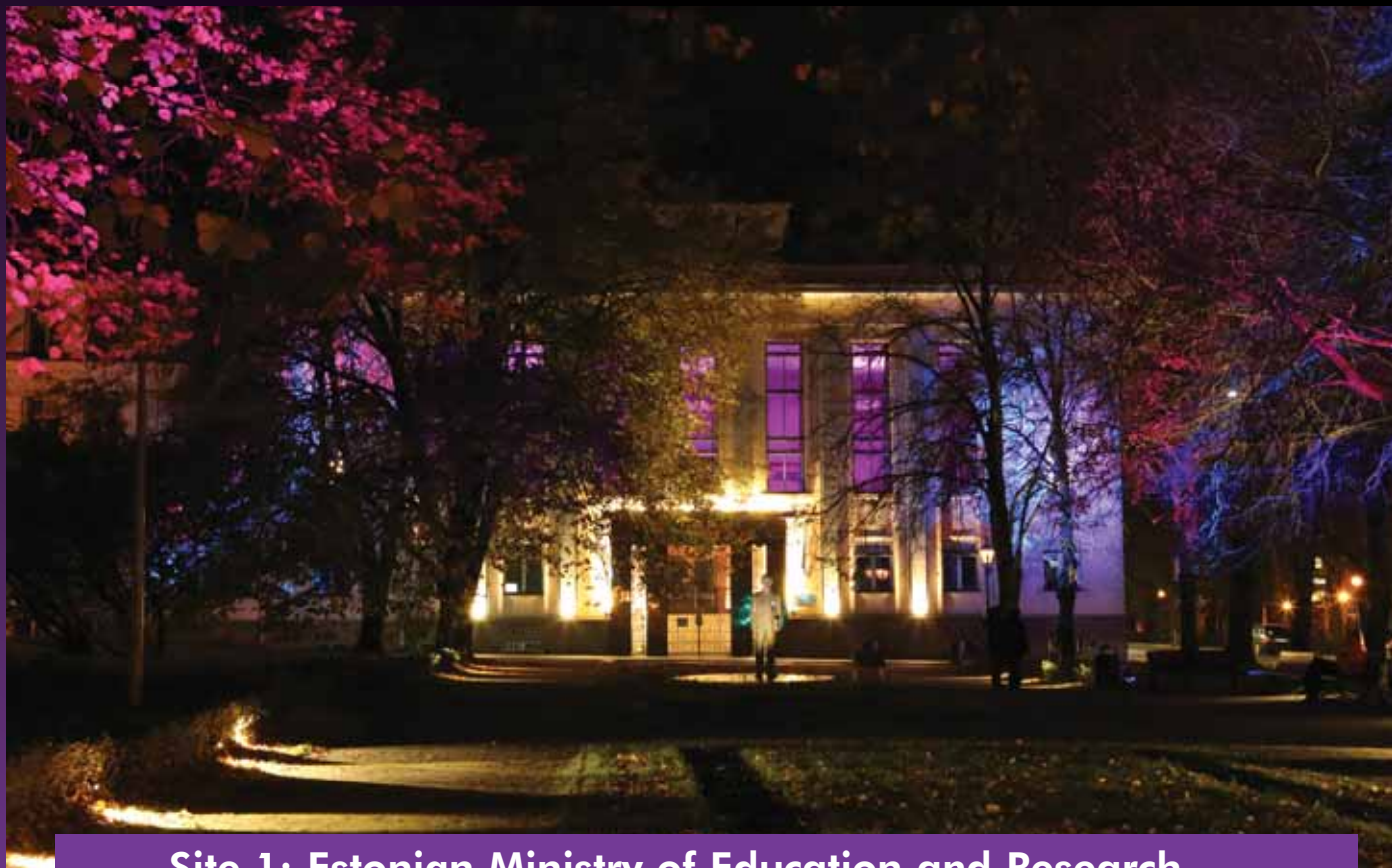
TAVA or Tartu in Light is an international interdisciplinary festival of light and lighting art that consists of workshops, outdoor installations, a conference, light fair and indoor exhibitions.

**T**artu Valgus (TAVA) or Tartu in Light is a cross-disciplinary international festival of light held every two years in the Estonian city of Tartu. The main program of the TAVA 2018 edition consisted of a workshop, conference, light fair, outdoor installations and indoor exhibitions. Additionally, smaller-scale satellite programs were organised in collaboration with cultural organisations and companies of Tartu. The entire site-specific festival lasted for 30 days taking into consideration the quiddity of Tartu.

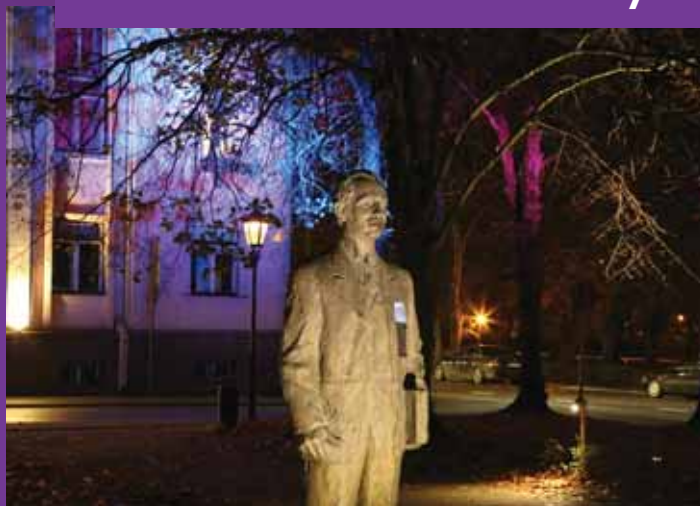
## Workshop

The aim of this workshop curated by Sabine De Schutter was to investigate and improve Tartu's current urban lighting while creating real-sized prototypes for its citizens and visitors to experience. Based on their importance and impact on the urban fabric, three sites were chosen for the workshop from the inner city of Tartu creating an Axis of Light: the Estonian Ministry of Education and Research, the St. Johns Church and the Toy Museum. Over 20 participants from Belgium, Estonia, Germany, India, Japan and the UK participated in the workshop, thereby making it a truly international event. Each of these participants was divided into three groups based on their preferred selection from these three sites. Professional lighting designers then headed each of these groups so as to arrive a lighting design concept and solution for these sites, working day and night over a span of four days. The objective was to be an experimentation ground for lighting in the public realm by improving the nocturnal presence of these three monumental sites using carefully designed lighting concepts that convert them into landmarks.





## Site 1: Estonian Ministry of Education and Research



**Workshop Head:** Johan Röklander  
**Theme:** "The Heart Within" – where education becomes lively, welcoming and playful

**Narrative:** The narrative for this former bank house was to recreate the architect's original idea of entering a temple, and show the soul of the house. Designed by architect Arnold Matteus in 1935, the house is a synthesis of arts: the dark bronze figures of a man and a woman form

a contrast with the light exterior walls. Today it is filled with importance – the heart of Estonian education and research. The house has two visible facades that required two different types of treatment: highway façade and entrance façade. The vertical elements on the highway façade are highlighted in a formal manner with warm white light. The entrance façade, the great hall and its facing landscaped park provided the scope

for lighting in a lively, welcoming and playful manner. Patterns of coloured light and shadows filtering through the trees create the perfect backdrop for festivities on the entrance façade. Low-lying luminaires on the walking track in front of the entrance create a welcoming pathway. The monument to Peeter Põld, Estonia's first Minister of Education is lighted to create a symbolic meaning of its heart within.



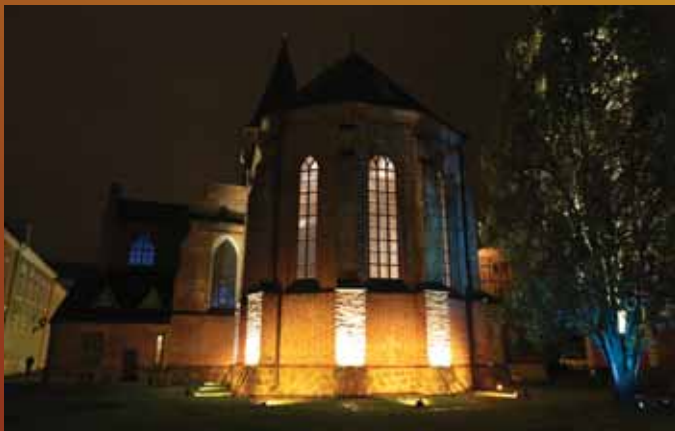


Site 2: St. John's Church

**Workshop Head:** Dr. Amardeep M. Dugar

**Theme:** "Johns' Epiphany" – what every John needs to realise about the journey of Estonia's religious faiths.

**Narrative:** The narrative for this 14th century brick gothic style church takes visitors on an experiential yet sensitive journey of the different religious faiths in Estonia through light. From ancient pre-Christian era when Estonians believed in animistic religions called faith of the earth and worshiped in forest groves, to the coming of Christianity when many Estonians converted to the new faith. The church's built-mass and its nearby oak tree were subdivided into three parts namely the grove, the sanctuary and the portal to depict the transition from an old to a new religion. The oak tree illuminated in blue-green light depicts grove worship, while the church buttresses and walls illuminated in warm white and amber tones depict Christian worship. The blue-green light emanating from the windows depict how the old religion has survived amidst the new religion through folk tales. The combination of blue-green and amber-warm light for the different elements also depicts how different faiths coexist freely with close ties among themselves in the state of Estonia. The church's unique terracotta sculptures that might have been modelled after citizens of Tartu are also highlighted with amber light thereby touting it as the 'People's Church.'



## Site 3: Toy Museum

**Workshop Heads:** Ruta Palionyte and Simas Rinkevičius  
**Theme:** "Wonderlight" – let the toys guide you through the rabbit hole to the wonderland...and free your inner child in the playground of light!

**Narrative:** The narrative inspired by fairy-tales such as Alice in Wonderland along with actual archives of the museum and puppet theatre reveals the true identity and character of the place. The rather longish site comprising street-side elevations of the toy museum, adjoining puppet theatre and administrative buildings along with the museum's backyard provided a unique palette for exploration with light. The street-side windows were treated as the 'real' black and white world of adults using shadow play. Visitors can only see shadows of the real toys and puppets used from the museum and theatre hurrying to the museum's backyard on the windows. As the administrative building did not comprise any toys, visitor can see how to make shadows of animals with hands on its windows. The backyard gate is treated as the 'rabbit hole' through which visitors can enter the 'magical' colourful world of children. Toys from the museum and theatre become alive at night and hurry to the backyard to play their magical games in an interactive, playful and sometimes creepy manner through light and colour. Simple principles of light and colour using dichroic filters and inter-reflections on water were used to create wonder light.

### Conference

The two-day conference on lighting design and light art curated by Johan Moritz and Tina Wikström was held right after the workshop week, when the lighting festival was officially opened to the public. The aim of this professional peer-to-peer event was to create a platform for knowledge exchange between professionals, industries and municipalities by combining renowned speakers with newcomers from different backgrounds whose work is connected to perception, public space or research in light.

First day of the conference was dedicated to lighting design with a more academic theme titled, 'Resilient Design in a Changing World.' The conference started with an opening keynote lecture by Dr. Amardeep M. Dugar that explored how 'Slow Design' can become the next rubric for the fast-paced world of connected lighting. Claire Tomara in her lecture discussed how people's participation is used to shape the lighting of public spaces. Emre Güneş in an entertaining lecture critically questioned whether LEDs are a miracle or a curse. Johan Rökländer in his lecture explained how integrated with overall design is the best form of light. Lina Färje described her project as a point of departure to discuss a process for including groups whose interests are not commonly taken into consideration in city planning. Darío Nuñez Salazar in his lecture challenged the newest trends in lighting design, such as #humancentric, #smart #IoT. Finally, Sabine De Schutter

shared her stories about organising lighting design workshops, which contributed towards strategies for urban lighting.

Second day of the conference was dedicated to light art that provided artists an opportunity to express their opinions in more performative manner. Influential artists such as Mischa Kuball, Immanuel Pax, Taavi Suisalu, Mónica Ruiz Loyola, Jacob Tækker, Timo Toots and Carl Michael von Hausswolff described their various unconventional explorations with light as a medium for urban and public art. Other artists such as Kristel Saan, Liisa Hirsch, Johannes Luik, Aivar Tõnso and an Unknown artist in their various performances described the artists' dimensions of creativity.

### Outcome

TAVA 2018 is a very good example for depicting fruitful collaborations can exist between lighting technologies, light art, lighting design and human interaction while keeping our focus on human beings as the inhabitants of built environments.



**Dr. Amardeep M. Dugar, IALD, MIES, MSLL**

Founder & Principal  
 Lighting Research & Design  
**Photos: Annika Haas**







A view from the inside

# Taiwan's Lighting Industry

Taiwan's lighting industry to reveal their product innovations at 2019 TILS.

Taiwanese companies have been amongst the front runners in the smart lighting and allied industry space. With the aim of driving Taiwan's lighting output value growth and set new transaction records, the lighting players of Taiwan are all set to showcase their latest products and technologies in 2019 Taiwan International Lighting Show (TILS).

The mega event is expected to attract 135 companies showcasing their state-of-the-art R&D achievements with 450 booths. More than 12,000 buyers are estimated to attend the event, with nearly a thousand international buyers from more than 40 countries. The key buyer countries include Taiwan's top 3 lighting equipment export destinations: United States, Japan and China, as well as emerging markets such as India, Philippines and Vietnam.

After visiting manufacturing facilities of some of the key participants of 2019 TILS, Subhajit Roy writes about what lies ahead for visitors.





## BLTC'S IOT-ENABLED 'SMART' LIGHTING SOLUTIONS



**Eason Lin, Sales Specialist at BLTC demonstrates the company's smart lighting solutions**

Established in March 2005 in Taiwan's Chiayi County, Beautiful Light Technology Corporation (BLTC) is one of the key players in LED lighting segment. Over the years, the company has integrated thermal management, electronics, optic design into its products, and also added Wi-Fi communication to offer smart lighting for smart home application. BLTC products conform to international standards for safety, electromagnetic compatibility testing, and environmental protection certification including BIS for Indian market.

In 2018, BLTC generated a revenue of US\$ 26 million thanks to increased demand from Japanese market and the company would like to continue its growth momentum in 2019, informs Eason Lin, Sales Specialist at BLTC. During the forthcoming Taiwan International Lighting Show, BLTC plans to showcase its Smart Home Lighting solutions that are fully compatible with Bluetooth Mesh and Zigbee 3.0. The biggest advantage of BLTC's Smart Home Lighting product line is they can be integrated with Amazon's virtual assistant, Alexa, or remote control. The products can be incorporated with Amazon Echo, Philips Hue and Osram Hub, informs Eason Lin.

## SMART POWER CONTROL SYSTEM EZCON



**David Huang, Marketing Project Manager, Team Young with EzCon**

With the aim of providing "smarter living, better life", Team Young delivers smart power control solution for different business operations. In 2018, the company introduced EzCon smart remote power controller that uses RF wireless (RF 433MHz Frequency) technology for power control and sends signals via remote control TXRC-1 to RX receivers.

Explaining the advantages of EzCon, David Huang, Marketing Project Manager, Team Young Technology Co Ltd, said, "The EzCon smart remote power control systems adopt RF wireless technologies which provide more stable and faster signals."

EzCon can integrate all the power consuming equipment including air conditioners, lamps, electric curtains, roll-up doors and electronic locks. It helps the factories, commercial buildings, hotels, schools, and residential houses to solve the issue of power management.

The visitors at the Taiwan International Lighting Show will be able to witness the power of EzCon smart remote power control system that can control up to 2,000 power switches from a distance of more than 150 metres.

Professional lighting company Chuang-Hsin Greenergy provides total lighting solution for critical environment. It offers luminaires based on customer requirement, integrate photometry, mechanical, electronics, thermodynamics, and materials science.

"Our LED lights are designed to deal with critical environment. They can operate in temperatures of (-) 60-degree to (+) 70-degree C," informs Jack Tseng, President, Chuang-Hsin Greenergy Co Ltd. The products also have highest rating IP69K that ensures protection against dust and powerful jet water, waterproof up to 20 metres, he claims.

Chuang-Hsin Greenergy's LED Freezer Lights can be used in ultra-low temperature warehouse, frozen foods factory, critical environment like snowfall whereas LED Heart Shape Waterproof Lights find application in food processing factory, surface treatment factory, wash wall light, and outdoor flooding light.

The company's partner, Top Technology Platform, deals with product promotion and customer service.

## LIGHTING SOLUTIONS FOR CRITICAL ENVIRONMENT



**Jack Tseng, President, Chuang-Hsin Greenergy Co Ltd explaining product advantages**



Kent Lin, MD, City Green Tech Corp presenting LED Light Bar

## EFFICIENT, RELIABLE LED LIGHT BAR

City Green Tech Corp., a subsidiary of Golden Way, is into the manufacturing of innovative electronic ballasts, LED drivers, lighting controllers, office and industrial lighting fixtures, downlights, track lights, shop lightings etc.

"High efficiency, increased lifespan, and easy to control colour change and dimming without affecting the lifetime and quality are the USP of LEDs offered by City Green," said Kent Lin, Managing Director, City Green Tech Corp.

Apart from showcasing its wide range of existing products, City Green will showcase its newly introduced uniquely-designed LED Light Bar. The key features of LED Light Bar are as follows:

- Modular design from 1,700 lm up to 8,000 lm per unit.
- All-in-one power supply.
- Excellent heat dissipation.
- Long-life – up to 1,00,000 hours.
- Low glare and bright
- Easy installation and replaceable.
- Luminous efficiency up to 190 lm/W.

In addition, all materials used in the City Green's LED Light Bar are RoHS compliant and meet almost all international Standards, adds Kent.

## JMLED'S MOBILE LED LIGHTS



An Engineer inspecting the finished product at Sunyeer's facility

Sunyeer is a high-power LED lighting fixture designer and manufacturer under the brand 'JMLED'. Integrating experts in the mechanical, thermal conductivity, optics and electrical fields, the company has developed a series of patented COB high power LED thermal superconducting light engine module and many efficient LED lighting products.



Heat sink is an important part of LED lighting because they provide the path for heat to travel from the LED light source to outside elements. The USP of JMLED's LED lighting is the heat sink. "We use 6063 aluminium in heat sink that is low-cost, lightweight alternative to copper heat sinks. Further, more holes in heat sink increases airflow and enhances heat dissipation efficiency," informs Lighting Lin, President, Sunyeer Technology Co Ltd/JMLED. Anodised aluminium alloy also helps to avoid corrosion and rust, he adds.

JMLED considers optical glass lens as key component for their LED lights. Their optical glass lens are designed symmetric or asymmetric to concentrate or to average light beam which leads to higher luminous efficiency than plastic lens.

JMLED recently introduced ML-03 two-stage 3W/10W magnetic portable flashlights that suit harsh environment. Primarily designed for China Steel Co., this mobile LED lights are apt for small and confined space. Its unique features include:

- Magnetic base can stick on to the metal surface
- With built-in sufficient lithium battery – 7,800 mAh (2,600 mAh/12 V) can sustain 3W dim light for hours
- Luminous Lux upto 1,100 lumens
- Keeps hands free
- Any angle - beam direction can be rotated 360-degree.

**Applications:** Camping, night fishing, night construction, emergency lighting, car repair, flashlight, and security guard.

## HOME RESOURCE'S LED PLANT GROWTH LIGHT

Horticulture is one of the biggest growth potentials for LED lighting. Taiwan's Home Resource, with more than 30 years of self-support lighting manufacturing, has optimised different wavelength and intensity of the LEDs, which are good for indoor-growing plant.

Home Resource's patented plant grow light has modern and fresh appearance. In 2019,



the company would like to focus on R&D to bring in more 'smart' solutions, said Sam Chen, President, Home Resource Industrial Co Ltd

Home Resource has over 250 accounts across 81 countries out of which 60 per cent are from Europe and 20 per cent are from America. Further, the company would like to expand footprint in developing economies like India, informs Sam Chen.



## MEAN WELL: BRINGING INNOVATION IN LED DRIVER

Founded in 1982, MEAN WELL is a world-renowned manufacturer in the field of power supply solutions. Headquartered in Taiwan's New Taipei Industrial Park, MEAN WELL has branches and sales offices at Guangzhou, Shenzhen, Suzhou in China, California USA, and Netherlands in the EU. The company has four state-of-the-art production facilities in New Taipei City (Taiwan) and Tianhe District and Huadu District in Guangzhou, Suzhou City in China.

For LED luminaires application, MEAN WELL recently released its new generation waterproof LED driver series—XLG Series. The whole XLG Series, which has been highly expected by the market, covers from 25W to 250W. It can be used for LED bay light, street light, horticulture lighting and flood light applications. XLG Series applies the constant current and constant power design which enhances the convenience of integrating model selection.

### Features

- Constant power design LED driver, offers flexibility for pairing with light fixtures.
- Universal input 100~305 VAC (Class I), suitable for all types of lighting applications.
- India version (optional) with built-in 320VAC cut-off function.
- Metal enclosure IP67, suitable for outdoor and high moist environment.
- Design with global cable, no need to change cable for different countries.
- **Surge protection:** 6kV/4kV (10kV/6kV option available).
- 3-in-1 dimming function (0-10V/PWM/Resistance).



MEAN WELL's production facility in Taipei

- Approvals: CB/ENEC EN61347-1, CE, UL8750, EAC, CCC, KC, PSE, BIS.
- 5 years warranty.

### USP

- Constant power mode design.
- Slim and compact dimensions.
- Double sided PCB design.
- Excellent price-performance ratio.
- Can provide SKD/CKD production plans.
- Compliance to latest safety requirements of IEC 61347/GB7000.1 and UL 8750 dimming circuit isolation.
- Suitable for IEC 61347 Independent control gear application.

Apart from showcasing its diverse range of power supply solutions, MEAN WELL will showcase its new range of XLG Series LED drivers at the forthcoming Taiwan International Lighting Show.

## LED LIGHTING WITH BEST OPTICS OF ILLUMINATION



Jason Cheng, Marketing Dept – VP, Shinyu Light Co Ltd with the company's high-tech LED solution

Industrial lighting manufacturer Shinyu believes incorporation of efficient thermal dissipation technology improves LED life and reliability. Therefore, by integrating in-house developed vapour chamber technology, the company has created a guaranteed product lifespan of up to 60,000 hours, claims JC Lin, CEO, Shinyu Light Co Ltd.

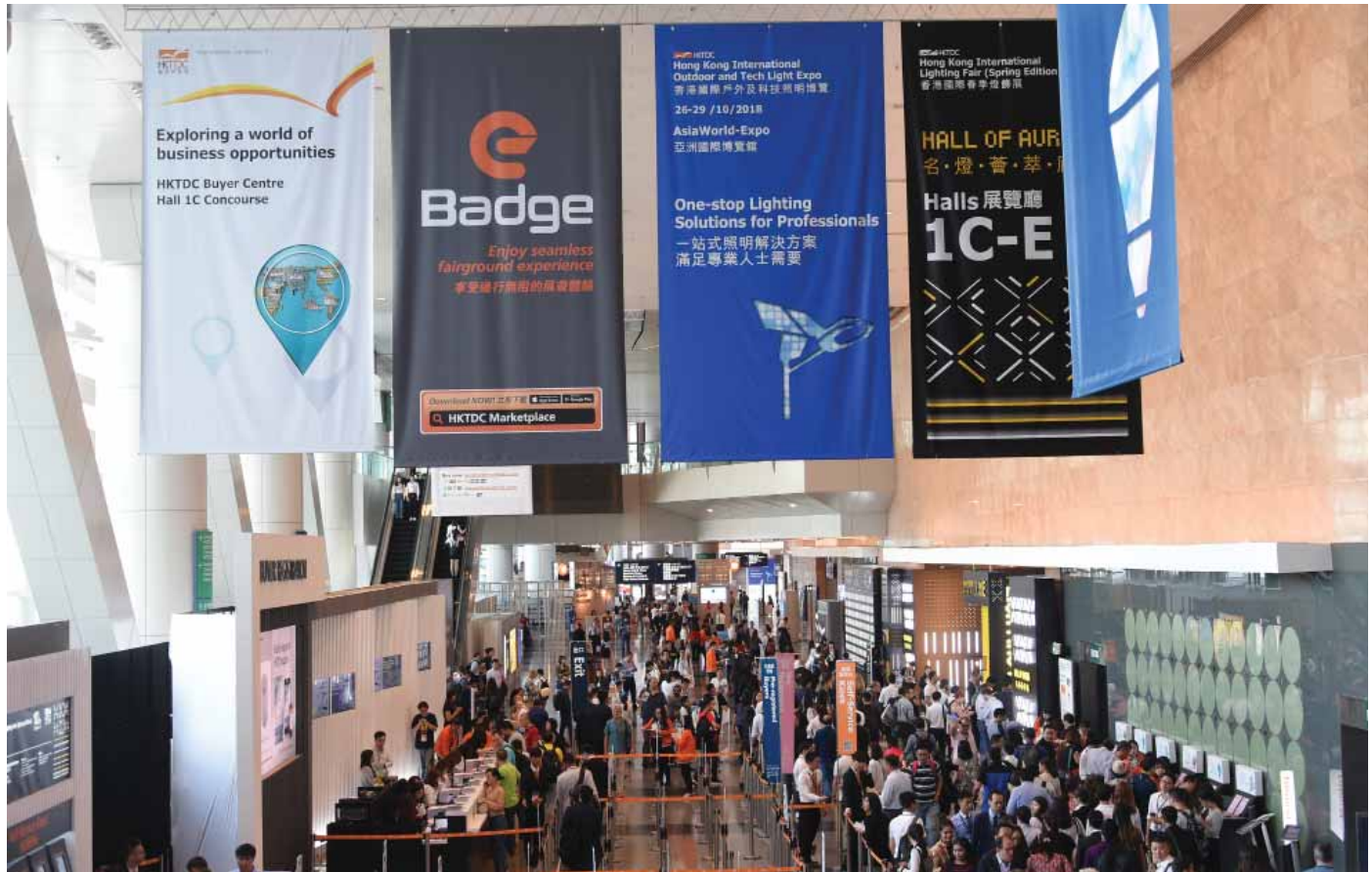
Also, Shinyu is committed to energy efficiency and environment-friendliness. According to the company, a user wants illumination, not the luminous flux because luminous flux represents only the light source whereas illumination represents the brightness of the environment. "Integration of optical lenses in our LEDs, increases energy-efficiency by more than 50 per cent compared with other brands," claims Jason Cheng, Marketing Dept – VP, Shinyu Light Co Ltd.

Shinyu brings 60 to 160W COB lighting for street lighting, park, stadium, commercial building, warehouse, retail, factory, stage etc.



# Hong Kong Lighting Fair Presents

## *A Bright Future with Smart Lighting*



The HKTDC Hong Kong International Lighting Fair (Spring Edition) marks the beginning of the second decade this year and will be on stage from 6 to 9 April at the Hong Kong Convention and Exhibition Centre. It is expected that more than 1,400 exhibitors from nine countries and regions will gather at the fair, offering global buyers an exclusive sourcing platform for all finished lighting products, parts and accessories. Last year, the fair welcomed close to 21,000 buyers from 137 countries and regions.

### Distinctive Thematic Zones for Easy Sourcing

Responding to the development trend of smart living, a brand-new thematic zone, Innobuild, will be presented in the fair. It will introduce ground-breaking initiative for building technology, showcase practical construction tools, as well as smart and green building materials and hardware.

The Hall of Aurora will continue to be the spotlight of the fair, showcasing eye-catching and forward-looking quality lighting products and technology from some 200 top-notch brands around the world. Leading brands include MLS, MOSO Electronics and SKY-LIGHTING. Interior designers, lighting architects and retailers who look for high quality and trendy lighting products will revel in its ample offer.

Another highlight of the fair is the Smart Lighting & Solutions Zone, which will return to showcase advanced lighting systems, remote control and smart lighting solutions, with a special focus on "IoT Lighting Supply Chain" organised by the Shanghai Pudong Intelligent Lighting Association. The IoT Lighting Supply Chain will showcase innovative elements such as IoT platforms, artificial intelligence and smart lighting systems from renowned industry leaders such as Tuya and

Broadlink. The Horticultural Lighting Zone newly launched last year, will also return to showcase a wide range of grow lights and garden lights.

The upcoming Spring Lighting Fair will continue to present a wide assortment of smart, energy-saving lighting products, systems and accessories in different specialty zones by their applications, namely Residential Lighting, Technical Lighting and Urban & Architectural Lighting together with the Advertising Display Lighting, Avenue of Chandeliers, Commercial Lighting, Decorative Lighting, and Lighting Accessories. These thematic zones provide buyers with convenience in sourcing their targeted lighting products and meet their potential suppliers.

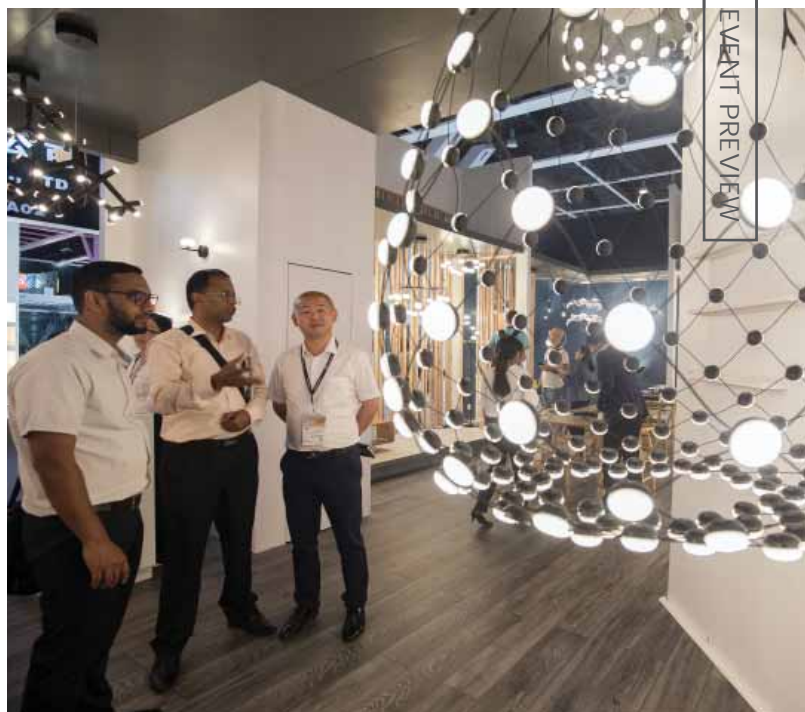
### Product Highlights

Energy efficiency being one of the significant trends in the global lighting industry, smart lighting technology with significant energy saving is always in the limelight. DIMON Technology Limited (Booth no.: 1C-F02) will introduce to the buyers their NANO lighting control system specially designed in the UK (England). This controller uses open and interoperable ZigBee standards-based technology, the NANO communicates with standards compliant sensors, switches, ballasts, and LED drivers to transform basic room controls into a complete wireless control solution with IOT OS System, delivering significant energy savings and operational improvements in a simpler, more cost-effective way.

Smart lighting systems have become popular in residential, commercial or public usage. Shanghai Shuncom Smart Technology Company Limited (Booth no.: 1C-F20) will bring their smart light pole with smart city management system to this metropolitan fair. Smart Light pole integrates smart-city functions including street lighting control system, WIFI antenna base station, video monitoring management, advertising screen broadcast control system, real-time monitoring of urban environment with applications such as emergency call systems, water level monitoring, charging pile systems and manhole cover monitoring systems, making it a one-stop big data platform.

The new zone, Innobuild, will feature innovative building materials offering alternative and creative home furniture and technology for better living style. Wedi building material from Ever Crown Engineering Limited is an example. Wedi is a revolutionary and well-known building material which is imported from Germany, 100 per cent waterproof, sturdy, lightweight and can be cut into any desirable size and shape. With its flexibility and all the above-mentioned special features, it provides quicker, lighter and more efficient solution in wet areas such as bathrooms or steam rooms.

Aluminium furniture has become a new trend to replace traditional wooden and metallic furniture. Dali Town Participation from Foshan will feature advanced, innovative and eco-friendly applications of aluminium for interior and



outdoor structures at Innobuild. Produced by Foshan PAKFEN Home Technology Co., Ltd., the New Aluminium Furniture is durable, strong fireproof, waterproof, and can be customised in different styles, colours and textures. You even can customise the aluminium furniture to look like wood!

### Enlightening Events

In addition to the broad spectrum of exhibiting lighting products, a series of events will be held during the fair period to unveil industry trends and facilitate intellectual exchange among industry players. One of the events is the Asian Lighting Forum which will be held on 6 April at The Stage of Hall 3C at the fairground. Co-organised by HKTDC, the Hong Kong Electronics & Technologies Association and The Hong Kong Institution of Engineers – Electronics Division, the Forum will cover the industry's hottest topic on connected lighting, featuring renowned speakers from OSRAM, Signify, illumination Physics, Tridonic, LEDinside and more. Since smart lighting is the industry focus, another inspirational forum on Smart Lighting: IoT and its Supply Chain will be held on 7 April at the same place. Ten speakers from the industry's leading companies such as Arm, JD Cloud, Alibaba A.I. Labs, BroadLink, Gizwits and more will share their insights. This series of informative events will present enormous business opportunities to buyers and exhibitors. In addition, onsite social events such as networking reception will be good networking platforms for making valuable business contacts.




For more details, visit  
<http://hklightingfairse.hktdc.com>

# K-Lite's Smart City Pole

The concept of smart cities came into being as a consequential development to Internet of Things (IoT), digital connectivity, global warming and the compelling necessities for energy saving. More than 50 per cent of the world's population lives in cities, a city environment, with a closely knit street light network became a natural choice for a smart city concept, hosting sensor networks and wireless communications for traffic control, smart parking, noise and air quality monitoring, incident detection, and more. Smart city lights are not standalone system. They have to be integrated with other systems under what is known as IoT. Hence the chosen smart city light poles should be able to accommodate a full range of lighting controls compatible to remote control and integral with suitable sensors for the respective application.

In fact, the smart city pole is going to be a service platform for various services for network redundancy, application areas such as mobile connectivity (WLAN), traffic control, security camera (CCTV), information transfer, public announcement with loud speakers, smart parking, environmental monitoring and even the electric charger for electric cars etc.,

CCTV	Loudspeaker	360 Degree Light	Spot Light	EV Charger	WLAN
With integration of Smart City System (SCS) referred to as "Smartification", light can be managed individually or in group with software.	To be specified by Vendor	45W LED	20W LED	To be specified by Vendor 	To be specified by Vendor
		OSRAM	Lumileds Luxeon		Environmental Monitoring with Biosensor
		360°	45°		
		Ø 166mm	Ø 166mm		
		2700-6500K	3000-5700K		
		Aluminium housing, PC diffuser, Purity aluminium heat sink	Aluminium housing, PC diffuser		

K-Lite announced the introduction of smart city poles (intelligent poles) with its modular solution, to cater to the above needs in the upcoming smart cities.

## Modules of your choice



## Salient Features of Smart City Pole

One main pole with one to five modules, smart column is a multitude of combinations. With flexible modules, the smart column is very handy and flexible for add-on. Choose your combination, add the module, connect them together and the smart column is ready to meet your requirement.

For more details, contact at [info@klite.in](mailto:info@klite.in)



**Sharmila Kumbhat**  
Director,  
K-Lite Industries



# [ Event Calendar ]

**Venue:** Bombay Exhibition Centre (BEC), Mumbai

**Date:** 4 - 5 April 2019

**Website:** [www.intersolar.in](http://www.intersolar.in)

**Intersolar  
India**

**Venue:** Hong Kong Convention and Exhibition Centre, Hong Kong

**Date:** 6 - 9 April 2019

**Website:** <http://hklightingfairse.hktdc.com>

**HKTDC  
Hong Kong  
International  
Lighting Fair  
(Spring Edition)**

**Venue:** Taipei Nangang Exhibition Centre, Taiwan

**Date:** 8 - 10 May 2019

**Website:** [www.tils.com.tw](http://www.tils.com.tw)

**Taiwan  
International  
Lighting  
Show (TILS),  
2019**

**Venue:** Bombay Exhibition Center, Mumbai

**Date:** 9 - 11 May 2019

**Website:** [www.ledexpo-mumbai.com](http://www.ledexpo-mumbai.com)

**LED Expo  
Mumbai  
2019**

**Venue:** Melbourne Convention & Exhibition Centre, Melbourne

**Date:** 23 - 24 October 2019

**Website:** [www.all-energy.com.au](http://www.all-energy.com.au)

**All-Energy  
Australia**

**Venue:** BolognaFiere, Italy

**Date:** 21 - 22 November 2019

**Website:** [www.lumiexpo.com](http://www.lumiexpo.com)

**LUMI**

## Index to Advertisers

Company Name	Page No.
Atco Controls (India) Pvt Ltd . . . . .	IFC
Crompton Greaves Consumer Electricals Limited. . . . .	48
Dollar Electrical Industries . . . . .	9
HKTDC . . . . .	BC
HPL Electric & Power Ltd . . . . .	7
InterSolar 2019 . . . . .	13
Juki India Pvt. Ltd. . . . .	5
K-LITE Industries. . . . .	11
Kusam Electricals Pvt. Ltd. . . . .	19
LED Expo 2019, Mumbai. . . . .	15
Shenzhen Yanshuoda Technology Co. Ltd. . . . .	3

**We would love your  
engagement in your  
favourite magazine!**

Lighting India invites professionals  
and industry experts to write articles  
on their areas  
of expertise and interest.

Think no further just e-mail  
your interest to

[info@charypublications.in](mailto:info@charypublications.in)

# Crompton

## POLARIS-I

24W LED Luminaire

125

Lumens/Watt

More light per watt  
delivering better ROI

Seamless look for  
better visual appeal

Robust Electronics for  
enhanced capability  
and lifespan

Replacement for  
4 x 14W T5 or 2 x 36W T8  
FTL Ceiling Tiles

**Crompton Greaves Consumer Electricals Limited**

Lighting Division. Tower 3, 1st Floor, East Wing, Equinox Business Park,  
LBS Marg, Kurla (W), Mumbai 400 070. [www.crompton.co.in](http://www.crompton.co.in)

North:  
011 23460795  
011 23460796

East:  
033 40514935

West:  
022 61132751  
022 61929402

South:  
044 42247500  
044 42247575

Commercial Lighting  
Solutions from  
Crompton



Read & Advertise

# Lighting India

India's foremost magazine on LIGHTING INDUSTRY



We travel around the world to get news, products & projects for you, to keep abreast with the rest of the world.

Come join us in the endeavour to bring the Lighting industry to you, on the most read media platform of **LIGHTING INDIA**

Follow us on



[www.facebook.com/lightingindia](http://www.facebook.com/lightingindia)



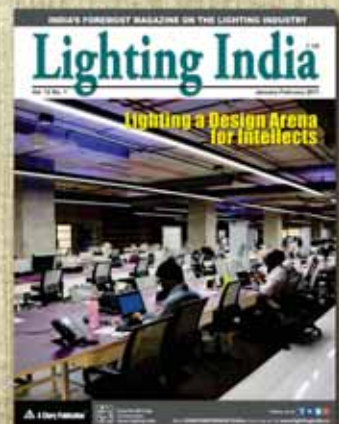
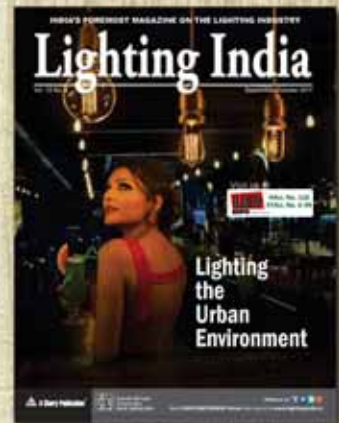
[www.linkedin.com/in/lightingindia](http://www.linkedin.com/in/lightingindia)



[www.twitter.com/lightingindia](http://www.twitter.com/lightingindia)



Scan the QR Code to know more about Lighting India



To advertise in Lighting India  
Contact: Nafisa  
(D): +91 22 2777 7199  
E-mail: [nafisa@charypublications.in](mailto:nafisa@charypublications.in)

**Chary Publications Pvt. Ltd.**

905-906, The Corporate Park Plot No. 14 & 15, Sector - 18,  
Opp. Sanpada Railway Station, Vashi, Navi Mumbai - 400 703.  
Phone: +91 22 2777 7170 • Website: [www.lightingindia.in](http://www.lightingindia.in)



# Shine a Light on Opportunity

**HKTDC Hong Kong International Lighting Fair (Spring Edition) 2019** is a strong trading platform with a global reputation. Organised by the Hong Kong Trade Development Council, the 2018 edition attracted more than 20,500 buyers from 114 countries and regions, and a record number of more than 1,350 exhibitors from 13 countries and regions.

## Fair Highlights

- Hall of Aurora
- Residential Lighting
- Technical Lighting
- Horticultural Lighting
- Smart Lighting & Solutions
- Urban & Architectural Lighting
- ...and many more

## Shining a Light on Building

Dovetailing beautifully with Spring Lighting Fair is a new zone in 2019 - **Innobuild**

## More than a Marketplace

- Asian Lighting Forum
- Seminars and forums
- Networking Reception



## Hong Kong International Lighting Fair (Spring Edition)

6-9 April 2019

Hong Kong Convention and Exhibition Centre

**Register Now for Your FREE e-Badge to Save HK\$100!**

Web: [hklightingfairse.hktdc.com/ex/12](http://hklightingfairse.hktdc.com/ex/12)

Wap: [hktdc.com/wap/lightse/T119](http://hktdc.com/wap/lightse/T119)

App: HKTDC Marketplace



**First-time overseas buyers are entitled to exclusive travel incentive.**

**Pre-registration is required.**

Please contact HKTDC Mumbai Consultant at

Tel: (91 22) 4333 6333 or

E-mail: [mumbai.consultant@hktdc.org](mailto:mumbai.consultant@hktdc.org)