



# LIGHT

the official

# NEWSLETTER

of the indian society of lighting engineers

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## FROM THE PRESIDENT'S DESK

As I anticipated in my last column we had a very busy and productive quarter.

The highlight was of course the Lii2013 International Exhibition and Conference in Chennai in September. It was a pleasure for me to be present at this important event. From the report on Lii2013 carried in this issue it will be seen that the event attracted a large number of leaders from the industry from both India as well as overseas. The event was inaugurated by Dr. K. Rosaiah the Governor of Tamil Nadu and received extensive media coverage.

The Exhibition, though somewhat smaller than the previous edition was extremely successful, drawing over 16,000 business visitors and leaving the exhibitors very satisfied with the business outcome of their participation.

The Conference over the four days covered a number of target groups that apart from the usual conference attendees included contractors, electricians and even students. From the report it can be seen that a lot of effort and care went into tailoring each segment for the target audience and in putting together a high level national and international faculty.

September also saw the holding of an outstanding two day course on solid state lighting by the Lighting Research Centre with 4 faculty members travelling from the US to Bangalore and Delhi. Details are elsewhere in this issue.

This was followed in October by the course on Frontiers of Lighting and Human Factors conducted at KIIT University in Bhubaneswar by Prof. Wout van Bommel, former CIE President who will also be conducting further courses in Kolkata in November.

Apart from these events there were the programmes that are being conducted on a regular basis by the State Centres including the Photon 2013 exhibition in Indore.



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It is my hope that the momentum generated by these activities will lead to more high quality programmes in the coming months.

Gulshan Aghi  
President  
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## EDITORIAL

The festive season in India has always been a season of light and this year the ISLE calendar has been full of lighting related activity. This is reflected in the newsletter that you are holding in your hands.

From the report and photographs you will get a good idea of the successful Lii2013 conducted in Chennai. This just goes to show that lighting has come to occupy an ever increasing space in the consciousness of people; lay persons, professionals and government agencies. In spite of the crowded calendar of lighting exhibitions and conferences, there is room for multiple events in multiple venues with the growing interest in lighting products, technologies and concepts. The report on Photon2013 reinforces this argument. The only requirement for optimum benefit to all concerned would be careful coordination to avoid clashing dates and interests and exhibition fatigue.

It is very heartening to find that lighting education continues to strike a chord with all our constituencies. From the reports on the courses conducted at Bangalore and Delhi by LRC, you will see the wide cross section of interests that have participated in a paid training course. The report on Prof. van Bommel's teaching programme will give an idea of the enthusiasm for lighting both among the students and faculty of our technical institutions in India.

While this is a very positive phenomenon, I would like to remind members that these things do not happen by themselves. They are made to happen by the sustained effort on the part of lighting professionals to expand the awareness of lighting. And this of course is the reason that we as a Society came into being.

I would like to appeal to members to take an active interest in ISLE programmes at all levels, whether

organised by the GB or the State and Local Centres. Those of you with advanced technical knowledge should send us articles for publication in the newsletter for sharing with our readers. And I would like to see our members once again taking active part in the technical work of the CIE. You will find that the CIE Conference on Lighting Quality and Energy Efficiency is being held in Kuala Lumpur in April next year. It has been a long time now since ISLE papers found a place in CIE conferences.

The WebWatch section carries three items, two on LEDs and one on plasma lighting that makes for interesting reading.

H.S. Mamak  
Editor

## ISLE ACTIVITY



September 13-16, 2013

India's prestigious lighting event Light India International 2013 was successfully organised by ISLE Chennai State Centre at the Chennai Trade Centre in Chennai from September 13-16, 2013.

The event which drew participation by 120 leaders of industry included 30 from 10 overseas countries, attracted as many as 16,000 business visitors from all over India and neighbouring countries. The Business visitors included lighting professionals, architects, consultants, interior designers, builders, contractors, officials from government departments and industrial buyers.

Among the leaders of industry who participated in the Fair were Trilux, BJB, Klite, Venture Lighting, Havells, GE, BAG Electronics, Narava, Neo Neon, Edison, Ledlink, Ledionopto, Meanwell, Citizen, Hybec, Prolite, Samson, Polycab, Syska LED, Pasolite, Sterling Sign, Digiopoto, Delta Electronics, Truelite, Perfect Engineering, V-four Lighting, Vanjax, Super Lite, Anooraa Illumination, Maklites, Swan Electricals, Marvelo India, Luxon and many more.

The Exhibition showcased a wide range of products covering Residential, Commercial and Retail lighting;

### NEW MAILING ADDRESS

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### Errata

*On page 1 of the July issue of the Newsletter in paragraph 5 line 2/3 "Bangalore and Chennai" should read "Bangalore and Delhi"*

*On page 4 of the same issue the caption for the photograph says "August 30" instead of "July 30".*

*These errors are regretted.*





H.E Dr. K. Rosaiah inaugurating Lii 2013 flanked by Mr. Dilip Kumbhat and Mr. Gulshan Aghi

Industrial lighting; Street lighting; Security lighting; Environmental/Landscape lighting; City beautification; Architectural lighting; Railway/Metro lighting; Airport and Runway lighting; Refinery/Mine lighting; LED lighting; Intelligent lighting; Lighting with non conventional energy; Specialty lighting; Lighting accessories and controls; Publications and Consultancy services relating to the lighting industry. In tune with the need of the hour Lii2013 focused on Green Lighting and energy saving solutions.

Lii2013 was inaugurated on September 13 by His Excellency The Governor of Tamil Nadu, Dr. K. Rosaiah with a key note address by Chair, Lux Pacifica, Prof. Warren Julian. In the course of his inaugural speech, it was suggested that "such important events should be organised annually so that the message of energy conservation and the ways of achieving it are repeatedly conveyed". After the inaugural session, the Governor went round the exhibition and visited some of the stalls.

On the first day (September 13) in the afternoon there was a special meet of the Electrical Installation Engineers Association - A Grade, with a technical seminar on Green Lighting Concepts. It was inaugurated by the Chief Electrical Inspector to the Government followed by technical lectures by Prof. Warren Julian, Architect Pramod Chowgule and Mr. Prashant Chopra DGM, Ashlok.

The second day of the event, September 14 featured an International Conference on "Emerging Trends in

Lighting Concepts for a Greener World". This full day conference was inaugurated by Mr. V.K. Gupta, Director General CPWD. The conference, tailored in a very professional way by the most respected green visionary of India, Dr. Prem C. Jain turned out to be a programme rated par excellence. The faculty and panelists were drawn from both the national and international level. The two panel discussions, one in the morning session on "LED Lighting for Modern Work Spaces" with Prof. Warren Julian (Convenor), Mr. K. Balasubramanian, Mr. Ravi A.V., Mr. Pramod Chaugle and Dr. Amardeep Dugar (Panelists) and the second one in the afternoon session on "LEDs for Public Thoroughfare Lighting" with Dr. Sandeep Garg (Convenor), Dr. Paresh Paluskar, Mr. K.K. Peshin, Mr. Himamshu Prasad, Mr. R. Ramakrishnan and Mr. M.S. Ramesh (Panelists) were true to international standards and simply the best.

This was followed by the lectures indicated below:

- Towards Net Zero Energy Buildings in India Lighting by Mr. Ashish Rakheja
- LEDs and New Possibilities in Product Design by Mr. Manfred Jander
- Is LED ready to Replace Conventional Lighting by Mr. S. Chakraborty
- Induction Lighting by Mr. Adam Karbaf
- Light-Light Integration - The Coming Age by Dr. B. Ghosh
- LED Standards and Perspectives by Mr. Gautam Brahmbhatt

The conference was attended by consultants, architects, interior designers, landscape architects, government officials, electrical contractors, exhibition participants and above all, faculty and students in the architecture and electrical branches of leading engineering institutions. The technical programme was sponsored by Vel Tech University.

The third day was special for the electricians from the whole of Tamil Nadu who gathered in large numbers and had technical lectures and discussions on Solar and LEDs.



The session was conducted in Tamil. These electricians are the field staff to propagate the concepts of green lighting and were very much appreciative of the special focus given to them in Lii2013. The cultural programme on the third night was conducted by Vel Tech University students and was applauded.

The fourth and last day had a students meet with a competition for the best paper award on "Green Lighting". Two faculty members and thirty students came all the way from Jadavpur University, Kolkata to visit the exhibition, attend the international conference on September 14 and participate in the students meet on September 16. The papers for the conference were submitted from Jadavpur University, Calcutta University, Vel Tech University and TJS Engineering College. There were 30 papers. A panel of judges with Mr. Kamal Sethia, Mr. Mukherjee and Mr. Pinaki Roy screened the papers for presentation to the audience and also chose the best paper award. The programme was sponsored by GE Lighting.

In tune with the theme of the event, "For a brighter future in a greener world", the event highlighted LEDs, energy saving solutions etc.

The feedback received the participants indicated that more than 80 per cent of the participants were very happy with the fair arrangements, the profile of business visitors and the business outcome of their participation...all indicators of the success of the event. Some of the comments are reproduced below.

A Consultant from Tata Consultancy Services said "I was wondering whether the travel from Pune for the Lii2013 is worth it. Thank God, I would have missed a lot of the important information, updation and specially the conference lectures by the specialists".

Chair, Lux Pacifica, Professor Warren Julian wrote, "thanks for the hospitality during Lii and to congratulate the organisers on the huge effort put into the event. It was appreciated by those who attended".

Lii2013 was fortunate to get sponsorship support from many institutions and companies. Our thanks are due to Indiamart.com, BAG Electronics, Samson, Hybec, Vel Tech University, K-Lite, Trilux, GE, Ashlok for extending sponsorship support.

For Virtual Exhibition of this event please visit the event website [www.lii.co.in](http://www.lii.co.in)

**ISLE LRC Course on Solid State Lighting  
Bangalore** September 23 and 24  
**Delhi** September 26 and 27

The primary objective of ISLE is to promote good lighting practice in India. This is particularly urgent in

view of the need to conserve energy in lighting which consumes 18% of the energy consumed in India.

The coming of age of LEDs has provided a technology change that offers a unique opportunity to take advantage of this tiny light source for furthering energy conservation, flexibility, adaptability and high lumen packages. This technology is also environment friendly. As with any change in technology it is important for all practitioners of lighting to be fully aware of the different facets and consequences of the change. This is particularly relevant to large users where decisions need to be based on an understanding not only of the technology but also of the design requirements.



Messrs M.S.N. Swamy, Russ Leslie, David Frering, J.N. Bhavani Prasad and Riaz Kagalwala as Mr. Himamshu Prasad lights the inaugural lamp in Bangalore

To this end ISLE organised a 2 two day intensive courses on Solid State Lighting at Bangalore and New Delhi in September 2013 by the world's premier lighting institution, the Lighting Research Center, Rensselaer Polytechnic Institute, USA.

The faculty consisted of the following:

N. Narendran, PhD, FIES - Professor and Director of Research at LRC and pioneering researcher and educationist in the field of solid state lighting;

Russel Leslie AIA, FIES, LC - Associate Director LRC, practicing architect and expert in energy-efficient lighting design;



Mr. Bhavani Prasad addressing the gathering

Daniel Frering LC, - Manager Education at LRC where he directs the education programs including teaching and curriculum development; and

Jean Paul Freyssinier, MS, LC - Research Scientist at LRC whose work includes the design and evaluation lighting applications and demonstrations and he also conducts research projects in the area of solid-state lighting technologies.

The two day course was comprised of the following sessions.

- Terminology: Lighting and LED Devices and Systems
- Vision and Photometry
- Colour Science and Colorimetry
- Solid State Lighting Technology Overview
- New Lighting Metrics
- Lighting Design and Applications
- LED Products Performance
- Discussion on LED Products/Performance Needs

The course was supported by the Bureau of Energy Efficiency (BEE) and U.S. Department of Energy (DOE) through the U.S.-India Joint Center for Building Energy Research and Development (CBERD).



*Session in Progress in Bangalore*

The Bangalore course was inaugurated by Mr. Himamshu Prasad, President and CEO of GE Lighting and Mr. Bhavani Prasad, former Director General CPWD and Director Education and Training on the ISLE Governing Body presided over the inaugural function. Mr. M.S.N. Swamy, Chairman of the Karnataka State Centre gave the welcome address. Mr. M.G. Sathyendra, Secretary Karnataka State Centre gave the vote of thanks.

The course in Delhi was inaugurated by Mr. Saurabh Kumar of Energy Efficiency Services Limited (EESL). The welcome address was made by Mr. N. Nagarajan, Chairman, Delhi State Centre and the vote of thanks given by Mr. B.M. Bhatia, Secretary ISLE DSC.

The attendance in Bangalore was 52 and in Delhi 47. The participants represented a cross section of interests; large users like CPWD, PWD, Airport Authority, Ministry of Defence, DDA, HAL, BESCO etc from the Government sector and CEPT, Infosys, Metro Valley from the private sector. There were also several participants from companies in the lighting industry as well as from academic institutions. In addition there were consultants, architects, lighting designers and specifiers. The attendance was dominated by the presence of engineers (42.911.7%) Educators (11.7%) and Manufacturers (11.7%). On average the participants had 12.4 years of experience in lighting with 2.3 years of these in working with LEDs.

Nearly 80% of the participants felt that LED lighting was ready for application in India, though only 35% felt that it was affordable. The majority of participants (94.8%) felt that for LEDs to gain widespread use in India the price increase over traditional lighting systems would need to drop to less than 25%.

Roadway lighting was listed by the largest number of participants (50.6%) as the LED lighting application that was felt to provide the greatest benefits, followed by exterior and façade lighting (27.3%), Commercial (23.4%), Residential (19.5%), Interiors (18.2%) and office (8%).

81.8% Participants indicated that they had used or specified LED lighting professionally or at home. Downlights were the most popular applications (19%) followed by office lighting and roadway lighting (17.5%). The next most specified applications were exterior and façade lighting (15.9%) and residential lighting (14.3%). For those who had not done so the overriding reason was the high initial cost. 73% of those who had used LEDs indicated that they were satisfied.

Among the good features of LEDs 73% of participants listed energy efficiency and 13% as longer life, while high initial cost (28%) and premature failure (27.3%) were the most undesirable features.

Given below is a summary of the discussions in Bangalore and Delhi.

### ***Bangalore, September 24, 2013***

The discussion session on day two of the seminar in Bangalore was moderated by Professor Russ Leslie of the LRC. He began the session by asking participants:

*What is needed to increase the penetration of LED lighting products in India?*

Responses included:

- Standardisation of lamp and fixture wattages along with other factors such as CCT (correlated color temperature) and CRI (color rendering index)



— Note: discussion ensued about the most prevalent CCTs used in India. Many participants commented that 3500K (kelvin) was most prevalent for residential applications while 5000K and 6500K were most prevalent for commercial applications. Two persons said that in their experience the 840-series (CRI>80, 4000 K) linear fluorescent lamp is a popular choice. Some participants expressed interest in a study to determine the most widely used CCTs in India.

- More efficient optics (diffusers and reflectors)



Mr. N. Nagarajan and Mr. Saurabh Kumar

- Application-dependent temperature (thermal) ratings to help designers and specifiers bridge the gap between manufacturer specifications and actual performance. A request was made so that ISLE help organise lighting standards development and incorporation into the National Lighting Code.
- Clearer specifications for LED products including for life, efficacy, and standardised output (i.e. lumen output of different temperature conditions)
- Independent testing of products

Professor Leslie then asked the group:

*What types of LED lighting products would you like to see on the market in India?*

Responses included:

- Robust lamps and fixtures for rural areas with poor power conditions
- LED lighting products for residential applications (e.g., downlights)
- LED retrofit products - as a follow up, a number of people mentioned needing guidance to select LED products for retrofit applications. The idea of developing an LED experience and demonstration center was well received as a way to showcase and promote good applications of LEDs and increase consumer confidence. Such a center could start with residential vignettes at the point of purchase. A follow-



Delhi Course in Progress

up point was made to have more manufacturers showcase their products as opposed to only distributing literature.

- Control-integrated lighting fixtures with occupancy centers built into each fixture
- Fixtures for extreme environments
- High-bay fixtures for industrial applications
- Replacement lamps with improved optics to better match existing fixtures

### **New Delhi, September 27, 2013**

The discussion session on day two of the seminar in New Delhi was also moderated by Professor Leslie. At this session, Professor Leslie asked what would be needed to increase the acceptance of LED lighting products in India.

Responses included:

- More accurate information about the life of LED lighting products
- Lower cost - costs are currently 6 to 7 times higher than traditional lighting products
- Longer product warranties - warranties are currently only one year
- Fewer premature failures of LED lighting products
- Products with up to 10 kilovolt (KV) surge protection needed for outdoor applications
  - Some participants recommended that the Bureau of Indian Standards set higher requirement for surge protection for outdoor fixtures so that manufacturers have a standard to meet
- The establishment of a website for discussion and answers to questions about LEDs
- Build insurance into the cost of the product so that customers can receive replacements if a products fails
- Improved product-to-product colour consistency both at the beginning of product life as well as over time
- Price point for replacement lamps needs to be competitive with compact fluorescent lamps (CFLs)



Dr. N. Narendran, Mr. Dan Frering and Prof. Russ Leslie

- Some participants commented that there was a concern about theft of LED lamps from public and commercial spaces due to their high cost
- Some participants commented that larger commercial customers with long hours of use, such as hotels, were already replacing halogen and incandescent lamps with LEDs
- Participants also commented that dimmability of retrofit lamps for hospitality applications was a problem in India.

## CALCUTTA STATE CENTRE

### Course on Frontiers of Lighting and Human Factors

KIIT, Bhubaneswar

Calcutta State Centre organised a six week visit by former CIE President and International lighting expert, Prof. Wout van Bommel to deliver lighting courses to engineering students at KIIT in Bhubaneswar in October and Jadavpur University in Kolkata in November. In addition Prof. Van Bommel agreed to do a workshop at the National Library in Kolkata.

The objective of the course was to introduce students to all professional lighting application fields:

- Office lighting, both from a visual and non-visual biological (lighting and health) point of view.
- Shop lighting as an example of how to deal with the emotional effects of lighting
- Road lighting, from a safety and thus visual performance point of view, from a personal security point of view (crime prevention) and from an aesthetic and city image point of view (the latter being another illustration of the emotional effects of lighting)
- At the start of the course, discussion on the properties of different light sources from an

application point of view with special emphasis on solid state light sources

- Sustainability in lighting was the key item in all lectures.

The ultimate goal was to provide students with sufficient background information to be able to specify the properties of future lighting equipment: lamps, electrical gear, luminaires and control devices to judge their suitability for use in different lighting applications and to start making lighting designs.

The start of the course in Bhubaneswar was delayed by a couple of days because of Cyclone Phalin which struck the east coast of India just then.

The course was extremely well received in Bhubaneswar. Given below are reports by two of the students who attended the course, Arnab Mitra and Umesh Kumar. Reports on the Kolkata leg of Prof. Van Bommel's visit will appear in the next issue of the newsletter.

#### Arnab Mitra

Wout van Bommel Sir, first started with the basics of light and vision where we were given a overview of the electromagnetic spectrum where visible light spectrum was given much preference. Then we moved on to Maxwell's electromagnetic theory which finally led to the quantum theory. The discussions happened on the eye with preference given on fovea centralis (bright spot) as well as rods and cones. Being a biology student in my higher secondary I knew most of it. But, the slide which appeared most endearing in the discussion of the eye was the slide describing the sensitivity of rods and cones and how the response of each cone cell can be traced to its source which is not possible in the case of rod cells. Quite interesting was that discussion!!!! Finally we moved on to the spectral eye sensitivity curve, a curve specifying that yellow light has maximum sensitivity for vision which reduces drastically for blue and maroon light.



L to T Prof. A. Dasgupta, Prof. D.K. Tripathy, Prof. P.P. Mathur, Prof. W. van Bommel, Mr. Kamal Sethia and Dr. C.K. Panigrahi





Slowly we moved on to the lighting units where sir talked about luminance, illuminance, luminous flux and a wide variety of formulas for calculating lumens for open fields and offices. We even discussed the utilisation factor table in photometric data. We discussed a lot about colour triangle and CRI finally moving on to subtractive and additive colour mixing. It was awesome to know that for paints darker and darker colour shades can be produced while for light lighter and lighter shades finally giving way to white light. Moving on we discussed age affects, like pupil clouding, decrease in the size of the pupil. Then we talked about another interesting topic directing screening and filtering of light where the discussions on refraction, absorption and interference were quite good. Finally we ended the class with the discussion of right balance between environment and lighting and a rather boring topic of lighting organisations.

Next three classes we talked about the principles of lighting, where we had long interactive sessions on thermal, gas discharge, solid state and induction lighting. Before that we discussed run time and re-ignition time, temperature sensitivity, lamp temperature, environment unfriendly material, luminance and many more qualities that are checked while making a lamp. Sir even pointed out through a graph the present market trends of different types of lights where we noticed that LEDs are leaving all behind in the race, while some forms of lighting are becoming non-existent. We even talked about induction/low pressure lamp, which has a primary and secondary winding across the metal rod. Sir even pointed out that though they are very efficient having a huge lifetime they are very costly but can be used in industries where lighting over constantly working machines are not changed for years at a go. We even talked about low pressure and high pressure gas discharge lamp, CFLs. We even discussed why high pressure sodium lamps are not to be used indoors, moving on to automatic switching which switches on/off depending on presence. Then came glare and with that unified glare ratings. Also along the way we even discussed indoor lighting.

Moving on we discussed Non-visual biological effects of lighting where we had an interesting discussions on Leonardo da Vinci and his contributions to biology, in a way to lighting. He was the first man to say that the light reaches the back of the brain. He had a passion for studying human bodies and his portraits clearly specified the huge research on human body he has done. We discussed another nerve from the eye which connects to the pineal gland on the way connecting to the biological clock leading to discussions of body rhythm of 20 to 24 hours.

Finally in our last class we discussed shop lighting, a very interesting topic. Here we started the discussion with shop formula discussing what type of lighting an exclusive shop should have and what a general departmental shop should have. Gold items look most attractive when warm white light is used while silver items look best in cold white light. We were taught an interesting trick of how to view a diamond by placing it under a white piece of cloth. The conclusion we had was that the items are best viewed if the surroundings are of the same background rather than a contrasting background. We discussed accent factor. Sir showed us images of how an object looked under different colours of lighting. Sir even spoke to us about a curator in a museum in Netherlands and interpreted his speech.

And above all, the unplanned visit to the lighting park of the management campus was an awesome learning endeavour. We got to know the thought process that goes in lighting of various structures, and which part to highlight and which to hide. He clearly specified which colour of light would suit which structure thus proving that the choice of lighting that had been made was perfect.

The two weeks of our lighting journey has been a good one for me and I sincerely hope that in the remaining two days I would be able to take back a lot more about a topic I personally had scarce knowledge about. And not to forget the break discussions and the after class discussions the whole class had.

### **Umesh Kumar**

One of the best gifts that God has given to the humankind is vision and to view the things around us, light is the most essential factor. Since the advent of scientific developments light and lighting have enthralled the great thinkers. Here in this training/workshop we got to learn a lot about the past, present and future of lighting.

Firstly we learned about the functioning of the human eye and how our brain processes the light signals. Yellow

light of 555nm wavelength is most sensitive for the cells called cones and greenish blue light of 507nm is most sensitive for rods.

Using the Lumen method the concept of indoor lighting was made clear.

Lamp spectra was a really interesting topic as it explained how different types of light can have different colours. This topic was made even more appealing by the introduction of Colour Rendering Index which explained what appearance different colors can have under different kinds of light sources. The concept of colour temperature, was bit complex to understand but once understood it was very interesting.

Light and the Environment: Sustainability, this topic focused on the duty of the light manufacturers and customers to use the right sort of lighting to promote efficient use of energy and sustainable development.

Study and classification of light sources was a topic of great interest as it took me through a walk along the development of various light sources and lighting technology. Also, during this study I learned various factors (efficiency, lifetime, lumen depreciation) that govern what light source will be used in what place. I was especially interested in the working of various gas discharge lamps and amongst them CFL was my favorite. Working and design of LEDs in the recent times has been a topic of great interest for the whole of the lighting industry and green engineers and so does it interest me also. The most recent member in the LED family is OLED (Organic LEDs) which can be the future to many lighting solutions in my view.

The topic of non-visual biological effects of lighting was completely new so there was a different sort of keenness for this topic and as was expected it was very absorbing. The fact that a lot needs to be discovered in this field makes this field even more interesting. Probably there could be some day when many of the physical and psychological problems of humans could be solved by using light as a therapy. The most recent developments in dynamic lighting will one day make humans perform better not only at their



Dr. D.K. Tripathy, Pro Vice-Chancellor, KIIT University distributing Certificates

offices, but in their homes and public places as well. Usage of light to optimise the sporting performance of the Dutch swimmers at the Beijing Olympics is a good example of how light can influence the human body and brain positively.

Indoor lighting is a topic that involves a very precise study of the environment that needs to be lighted. Lighting should be apt according to the usage of the space as improper lighting can make the space look unsuitable for the desired job. As most of the office work involves visual input to the brain so visual performance should be optimum and to achieve a good visual performance the workplace should be well lit. Generally lighting levels for offices should be 500 lux. There are still many other factors that govern office and indoor lighting.

Shop lighting has not got any strict rules for lighting as it very much depends upon what's in fashion. A shop that looked appealing few years may no more look as appealing because it may be out of fashion. Still for the present scenario the shop formula works well. Accents, light incidence direction and modelling play a very important role to attract customers towards the products.

Being part of this training program was a very great opportunity for me to broaden my view about technology application in daily life. Under the care and guidance of Wout van Bommel Sir I learned many things not only related to lighting technology but also to the world around us.

## MUMBAI STATE CENTRE

**Breakfast with Light 14**  
July 28, 2013, Mumbai

*Subject:* KNX for Lighting Controls & Energy Conservation - A Case Study of Delhi Airport

*Speaker:* Mr. Bhavesh Doshi, CEO, Entelechy Systems.

Whether in a single-family house or in an office complex, the demand for comfort and versatility in the management of air-conditioning, lighting and access control

*Continued on page 19*







## High Accuracy Array Spectroradiometer



- *Low stray light*
- *High speed and accuracy*
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- *High repeatability and stability*

### HIGH-END MEASUREMENT INSTRUMENT For LED & LIGHTING

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L to R: Mr. Venkatesh, Editor, TNEIEA; Mr. Prashant Chopra, DGM, Ashlok; Ar. Pramod Chaugule, MD, Chaugule Patil Consultant; Mr. Dilip Kumbhat, Chairman Lii 2013

**13.09.2013**



Prof. Warren Julian  
 Chairman, Lux Pacifica

Seminar on : "Green Lighting Concepts" - Tamil Nadu Electrical Installation Engineers Association 'A' Grade.

**14.09.2013**



L to R: Mr. A.K. Jain, Hon. Gen. Secretary, ISLE; Mr. Dilip Kumbhat, Chairman, Lii 2013; Mr. V. K. Gupta, Director General, CPWD; Dr. R.P. Bajpal, Chancellor, Vel Tech University; Mr. R. Balasubramanian, Chairman, ISLE Chennai State Centre

**14.09.2013**



Mr. V. K. Gupta  
 Director General, CPWD

Mr. V. K. Gupta, Director General, CPWD Inaugurated the International Conference on "Emerging trends in Lighting Concepts for a Greener World"



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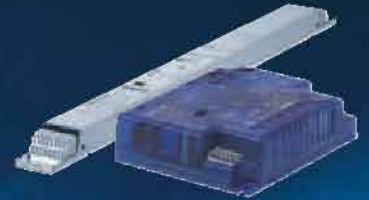
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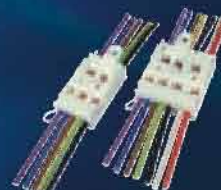
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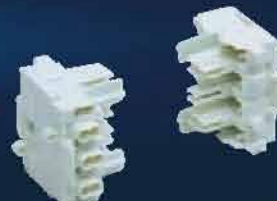
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Dr. Warren Julian, Chairman, Lux Pacifica Chairing the first panel discussion. L to R: Ar. Pramod Chaugule, MD, Chaugule Patil Consultant; Dr. Amardeep Dugar, Faculty of Architecture & Design, Victoria University of Wellington; Prof. Warren Julian; Mr. Ravi AV, General Manager, Nichia Chemical (India). Mr. Balasubramaniyan

**14.09.2013**



Panel Discussion. L to R: Mr. R. Ramakrishnan, Director; Polycab; Mr. M. S. Ramesh, Madras Electrical Consultants; Dr. Sameer Kulkarni PhD, General Manager, TCE; Mr. Himamshu Prasad, President & CEO, GE Lighting

**15.09.2013**



The Meet was Inaugrated by Dilip Kumbhat, Lii 2013 (fourth from left) and Mr. R. Balasubramanian, Chairman, ISLE, CSC

**16.09.2013**



Mr. Hari Narayanan, Director Sales & Marketing, GE Lighting India Inaugrated the Green Lighting Concepts Competition. L to R: Mr. H. Mukherjee, Mr. Tapan Kumar Ghosal, Mr. Pinaki Roy (all Fellow members ISLE Calcutta State Centre); Mr. Kamal Sethla, Chairman, ISLE Calcutta State Centre, Mr. Dilip Kumbhat, Chairman, Lii 2013; Mr. Hari Narayanan. GE was the Sponsor.

Continued from page 10

systems is growing. At the same time, the efficient use of energy is becoming increasingly important. More convenience and safety, coupled with lower energy consumption can however only be achieved by intelligent control and monitoring of all products involved. In order to transfer



Mr. Bhavesh Doshi

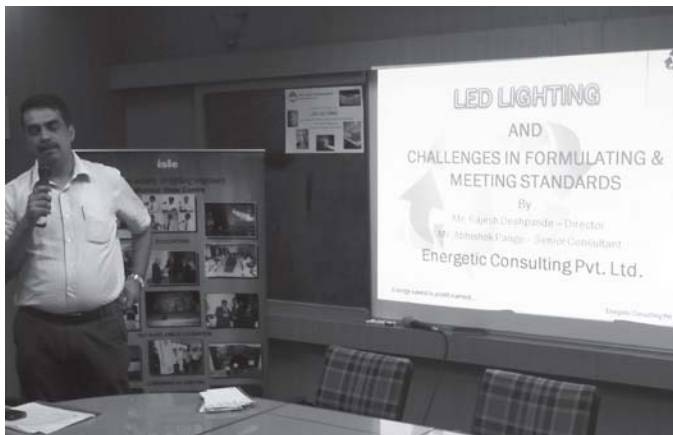
control data to all building management components, a system is required that does away with the problems of isolated devices by ensuring that all components communicate via one common language: in short, a system such as the manufacturer and application domain independent KNX Bus - the Worldwide Standard for Home and Building Control. The speaker presented a case study of Terminal 3 - Delhi International Airport where KNX has been used to provide an efficient lighting system consisting of 100,000 light fittings which are switched and dimmed in perfect coordination using light sensors, brightness sensors, presence sensors, logic control components and central management with visualisation thus providing energy conservation, safety and comfort. Terminal 3, which has a handling capacity of over 10,000 passengers per hour, posed a lot of unforeseen challenges due to the dynamic nature of various zones but these were successfully met with a final energy saving of around 25%.

### Breakfast with Light 15 September 1, 2013, Mumbai

*Subject:* LED Lighting - Challenges in Formulating and Meeting Standards

*Speaker:* Mr. Rajesh Deshpande . Director, Energetic Consulting

Due to the continuous evolution in LED manufacturing and increasing light output, formulating standards



Mr. Rajesh Deshpande

for LED lighting has become challenging. As life of LED fixtures is dependent on multiple factors such as heat sink, driver, luminaire, etc., meeting standards has also become very complex and challenging. From 2010 the process for development of Indian Standards on LEDs has been initiated. Technical Committees, ET 23 and ET 24 of the Bureau of Indian Standards (BIS) are responsible for the preparation of Indian Standards in this area. Considering the widespread demand from all stakeholders like manufacturers, users and Government bodies, two panels on LEDs were formed under these two technical committees ET 23 and ET 24 in June 2010. BIS has also been in contact with all those responsible for bringing out the best possible Indian Standards on LED Lighting. Draft standards developed have undergone changes many times due to this constant interaction. Finally, the committee felt the need to finalise the first series of standards on LEDs on priority. So far ten LED standards have been approved for printing. The remaining two on luminaires are again undergoing changes and are expected to be finalised soon. This presentation evoked extensive discussion and the audience shared their experiences with LEDs.

### Breakfast with Light 16 September 29, 2013, Mumbai

*Subject:* Emergency Lighting - Light When Power Fails  
*Speaker:* Ms. Srishti Joshi, Prolite Autoglo Ltd.

'Let there be light. Let no power failure leave you in the dark'



Ms. Srishti Joshi

Light plays a very important role as it dictates our movements in today's work culture. In this modern world, lighting has become essential without which every thing comes to a standstill. In spite of advancement achieved in the field of electricity generation and distribution, uninterrupted electric power supply cannot be assured, power failures are prone to occur and reoccur at any time. Hence emergency lighting plays a vital part in any installation today. At the outset, the speaker gave vivid examples of disasters where absence of emergency lighting and signage contributed to loss of lives. She also showed how a repeat accident in the same location had minimal loss due to



installation of emergency lighting and signage after the first occurrence. There are various codes and standards specifying requirement of Emergency Lighting for buildings, etc. Placement and arrangement of Emergency Lights is of critical importance and various fixtures are available for different applications. LEDs have made emergency lights very compact with their small size and high light output as well as reduced battery size due to their inherent energy efficiency.

At the end of this presentation the audience felt the need to have proper certification for emergency light fixtures. It was suggested that manufacturers should join hands in starting a dedicated testing lab for this purpose for common benefit.

**AGM 2013**  
**October 25, 2013**

The 22nd Annual General Meeting of the Indian Society of Lighting Engineers, Mumbai State Centre was held on Friday, October 25, 2013 at the Seminar Hall, All India Institute of Local Self Government in Andheri. The Chairman, Mr. Prakash V. Mavinkurve welcomed all the members and announced the commencement of the AGM. Matters of the agenda were then taken up. The Chairman Mr. Prakash. V. Mavinkurve announced the results of the election for the MSC Committee for 2013 -2015 which was recently held.



Messrs. S. Alvares, P.V. Mavinkurve and A. Auddy

Members elected are as follows:

- Mr. Prakash V. Mavinkurve - Chairman
- Mr. Stan. Alvares - Hon. Secretary
- Mr. Amal Auddy - Hon. Treasurer
- Mr. Arvinda Mule - Member
- Mr. Pankaj Doshi - Member
- Mr. Bhavesh Mehta - Member
- Mr. Gulab Jha - Member

The meeting had an enthusiastic participation by all the members who complimented the Committee for



successfully conducting the Breakfast Meetings and spreading Lighting knowledge as well as promoting networking of Lighting professionals through this program. A need was felt up to improve the fund position by charging participants for this program or improving sponsorship. The meeting was followed by a presentation on Energy Efficiency through Lighting Control / E2LM by Hager Electro Private Limited

**Lecture on Energy Efficiency through Lighting Control / E2LM**  
**October 25, 2013**

*Speaker:* Tejas Doshi, Area Manager. Hager Electro

E2LM - Energy Efficiency through Lighting Management, E2LM is an initiative by Hager to help manage lighting applications in a most efficient way, with maximum comfort and flexibility.

Lighting consumes around 20% of total electricity consumption in India, which is quite substantial. For commercial buildings, it's estimated to be even higher at 40%. So saving energy in lighting is of prime importance. E2LM helps designers to build superlative lighting



Mr. Tejas Doshi



management solutions for various applications and strengthen our commitment to build a greener society. These lighting management solutions are implemented through installation of movement and presence detectors along with light regulators integrated into this system. Time switches, Twilight switches, Time Lag switch and Latching Relay are also applied for outdoor applications to enable efficient use of lights.

This presentation was sponsored Hager Electro Private Limited and ISLE Mumbai State Centre is grateful to for this gesture.



agreed to organise a membership drive and a technical programme towards this end.

It was also planned that student chapters would be opened at Jaipur Engineering College, Poornima University, JECRC University and Manipal University. A one day seminar is planned at Amity University.

It was proposed that the schemes of AICTE and other government agencies be explored. It was also proposed that the State Centre create a website for linking to the ISLE site.

The meeting was followed by singing and poetry recitals by Mr. R.S. Saxena, Mr. Sushil, Mr. Madhavendra Saxena, Mr. Rahul Srivastava and others.

Dr. Manoj Gupta proposed a vote of thanks.

## RAJASTHAN STATE CENTRE

### Annual General Meeting

July 19, 2013, Jaipur

The Rajasthan State Centre held its AGM at the Hotel Highway King in Jaipur on July 19.



AGM in progress

The meeting was attended by 56 members together with the office bearers, Mr. R.S. Saxena, Chairman, Mr. Manoj Gupta, Secretary and Mr. Prashant Bajpai, Treasurer.

Mr. Saxena welcomed the members. Dr. Manoj Gupta presented the Annual Report and Mr. Prashant Bajpai presented the Statement of Accounts, both of which were accepted by the members.

After this the following committees were nominated:

General Administration	:	Mr. Pramod Kashyap
Technical committee	:	Mr. G.S. Charan
Finance Committee	:	Mr. Arvind Khatri
Events and Seminars	:	Mr. M.S. Yadav
Education	:	Mr. Sanjay Poojari
Membership	:	Mr. Ashutosh Tripathi
Publicity	:	Mr. Umesh Verma

Future plans discussed included the opening a new Local Centre in Jodhpur. Mr. Roopaman Choudhary has

## MP STATE CENTRE

### Photon 2013

October 18-20, 2013

The Indian Society of Lighting Engineers MP State Center has been holding its Monthly breakfast seminars on various topics of Lighting for the past three and half years. This has been a very successful and well received programme of ISLE and it has completed 47 such seminars. This however was confined to the members of the Society and the common man was bereft of any knowledge. It was therefore decided to have an exhibition of Lighting and allied products open to all.

The exhibition was christened Photon 2013 since the photon is the elementary particle involved in the quantum of light and all other forms of electromagnetic radiation. Professor Rakesh Saxena Head of the Electrical Engineering Department at SGSITS showed keen interest in the exhibition and offered the college ground as the venue for Photon 2013. Massive spade work was done; the entire managing committee sat for more than a dozen times in duration of four months under the meticulous planning of its secretary Mr. Atul Pandey. An event



Ar. Vinay Babar

manager was appointed to handle the entire event professionally.

ISLE Treasurer, Mr. A.N. Dubey was very instrumental in rounding up the participants and sponsors. The media and publicity was looked after by Mr. Rajendra Raje. Mr. Sandeep Mathur managed the power supply part of the event. The three professors from the core committee, Mr. Dinesh Wadhwa, Dr. Alok Mittal and Dr. Rakesh Saxena shortlisted some forty student volunteers from five institutes. These volunteers played a very important role in the venue management of the event.

Mr. Sanjay Dubey IAS, Divisional Commissioner Indore consented to inaugurate the exhibition on 18th October morning. The function was held in the Golden Jubilee hall of SGSITS and was well attended by faculty, Engineers, Architects, Interior designers, students and media persons. While SGSITS Electrical Engineering Department acted as the knowledge partner, Nai Dunia was the print partner, Red FM the radio partner, Eagle Techsec the security partner and Shree Diesels of Mahindra D.G. sets was the power partner of the event. The entire event was managed by Priya Events.

As a glamour quotient to the event, it was decided to release sky lanterns in the evening and as this would make a spectacular sight, the event was converted into a photography competition. More than 30 photographers turned up at the scheduled time and went berserk with



their cameras as the sky was lit up with multiple lanterns on the *Sharad Poornima*.

Saturday and Sunday saw a heartwarming footfall and the purpose of the event was served. ISLE had intended to bring to the cognizance of the common man the latest in Technology in Lighting and allied products. And the common man was more than educated. There were the latest LED products as well as home automation and security products on one hand and industrial lights on the other.

Philips participated as the main sponsor while Wipro was the co-sponsor. Other companies like HPL, Legrand, Mido Lumiere, Abba, Glomac Venture etc. were happy to be a part of the exhibition. This was the first such attempt by ISLE under the chairmanship of Mr. Vinay Babar and it was met with a very positive response. ISLE MP State Centre hopes to hold similar exhibitions in the future as well.

## CIE ACTIVITY

### **CIE 2014 Lighting Quality and Energy Efficiency** April 23-26, 2014, Kuala Lumpur, Malaysia

***Dear Colleagues,***

The CIE, which recently celebrated its centenary, is the oldest and most respected international scientific and standards organisation in the field of light and lighting. It is totally committed to the development of energy efficient lighting technologies and standards, but without sacrificing lighting quality, the safety and security of human well-being, the environment and the economy. This objective can be achieved through the intelligent use of new technologies and a scientific understanding of the varied human needs for different types of lighting in different settings:

- A more efficient use of daylight, augmented with the use of more efficient lamps and the latest lighting technology, should enable us to save energy without sacrificing quality of lighting.
- Findings in medical science reveal that light plays important roles in maintaining optimum regulation of biological rhythms and hormones on a daily basis. While this knowledge can be used to positive effect, it also shows us that ill-conceived lighting can be detrimental to health and safety.
- Darkness has many benefits: electronic control systems enable us to adapt light levels and timing of artificial lighting to direct need, and thus minimise both energy consumption and unintended effects on living systems.

Good lighting brings safety, security and a better quality of life to all but needs to be supplied in a task-dependent

manner, that is of a quantity and quality appropriate to the task, and with the minimal use of resources.

As President of the CIE, and as Conference President, we are proud to present CIE 2014 "Lighting Quality & Energy Efficiency" as a unique forum for discovering the latest developments and results from the lighting world. The meeting will be held in Kuala Lumpur, Malaysia from April 23-26, 2014. I invite you to join me there in the effort to enhance lighting quality and reduce energy consumption worldwide.

We look forward to a fascinating and informative meeting in Kuala Lumpur. CIE 2014 will highlight topics in:

- Daylight, Lighting Systems and Energy Saving
- Light and the Visual Perception of Quality
- Photobiological Effects
- Characterizing lighting systems

Prof. Ann Webb  
CIE President/Conference President

## CIE PUBLICATIONS

### **Review of Lighting Quality Measures for Interior Lighting with LED Lighting Systems** CIE 205:2013

With recent increases in luminous flux and efficacy, LEDs have started to compete with conventional light sources in luminaires for general lighting. Typical LED characteristics, such as directional light, small size and high brightness are as such not new light source characteristics; nonetheless they are (alone or as combination) new characteristics in some areas of functional interior lighting, such as offices, class rooms, meeting rooms or patient rooms. Most existing quality measures for those applications are derived from research with and referring to the use of diffuse fluorescent lighting. This report provides information on the suitability of existing lighting quality measures when applied to (commercial) interior LED lighting systems. It identifies the gaps and weaknesses in existing quality measures, recommends new quality measures and includes suggestions for required research.

The publication is written in English, with a short summary in French and German. It consists of 34 pages with 3 figures and 1 table and is readily available via the CIE Webshop.

### **Light Emitting Diodes (LEDs) and LED Assemblies - Terms and Definitions** CIE Draft International Standard DIS 024/E:2013

This Draft International Standard summarises the most important terms and definitions in the field of

lighting by inorganic semiconductors used in CIE documents, which are intended to become part of the International Lighting Vocabulary.

The Draft International Standard has been sent to CIE National Committees for comments and sales to interested parties. It is still subject to changes and may not yet be referred to as a CIE International Standard. When approved by the CIE NCs, it will be published as a CIE International Standard and later on be part of the International Lighting Vocabulary. The Draft International Standard is readily available via the CIE Webshop.

## WEBWATCH

### **Lighting Research Center's Report on Plasma Lighting Systems**

The National Lighting Product Information Program (NLPIP) at Rensselaer Polytechnic Institute's Lighting Research Center (LRC) recently released its latest publication, *Lighting Answers: Plasma Lighting Systems*. Plasma lighting systems, also known as electrodeless high-intensity discharge, light-emitting plasma, high-efficiency plasma, or advanced plasma lighting are emerging in the marketplace primarily for high-bay and outdoor lighting applications. Many specifiers and others involved with lighting technologies have heard of plasma lighting systems, but would like more information on how plasma compares with other light sources, regarding performance characteristics such as light output, system efficacy, color characteristics, lumen maintenance, and rated life. *Lighting Answers: Plasma Lighting Systems* provides straightforward information on these performance characteristics and others such as operating orientation, dimming, warm-up and restrike times, electromagnetic compatibility, and ultraviolet radiation.

The report details findings from NLPIP's study of plasma lighting systems, conducted from 2012 to 2013, and responses from a survey of more than 300 lighting specifiers who provided their opinions on the application of plasma lighting systems and information on any installations they had evaluated.

Key findings include:

- Purchasing plasma lighting systems can be difficult.
- The tested plasma lighting systems have system efficacies comparable to conventional sources used for high-bay and outdoor lighting applications.
- The tested plasma lighting systems have color rendering characteristics comparable to conventional sources although they have a greenish-white tint.
- The tested plasma lighting systems could be dimmed but dimming impacts color and system efficacy.



"NLPiP's mission is to rapidly provide the best information available on energy-efficient lighting products," said Leora Radetsky, LRC research scientist, principal investigator, and author of the report. "This plasma lighting systems report provides independent, objective and reliable information not found elsewhere that is critical for specifiers, electric utilities, and others involved with lighting technologies to understand how best to incorporate this emerging technology."

The report was sponsored by the Connecticut Energy Efficiency Fund, Natural Resources Canada (NRCan), and the New York State Energy Research and Development Authority (NYSERDA).

Lighting Answers: Plasma Lighting Systems is available free to the public, courtesy of the above sponsors, at: <http://www.lrc.rpi.edu/nlpip/publicationDetails.asp?id=936&type=2>.

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## Dimming Behaviors of LED Replacement Lamps

As new lamp technologies become viable for more applications, manufacturers must design for the many facets of general illumination that the consumer takes for granted, like dimming with standard wall dimmers.

LEDs are intrinsically dimmable light sources and are commonly marketed as such; however, that does not mean that all integrated LED lighting products, particularly replacement lamps for incandescent lighting, are dimmable, or that residential dimmable LED products provide the same end-user experience when coupled with the existing installed base of triac dimmers. Thus, dimming has been often discussed as one feature that needs to work well for solid-state lighting to achieve widespread adoption in general lighting applications, including residential uses.

It is possible to evaluate dimming in two parts: technology performance evaluated in terms of user expectations, and technology compatibility (electrical and otherwise) to provide an acceptable end result and safe operation. On behalf of ASSIST, LRC researchers conducted a two-part study to better understand these aspects of dimming. The first part investigated the dimming performance of commercially available LED replacement lamps and the performance variations among different commonly available residential dimmers. The second part involved human factors experiments to understand what people expect when dimming indoor residential lighting.

### **Technology Performance Study**

One requirement for LED replacement lamps entering the residential lighting marketplace is compatibility with

dimmers designed for incandescent lamps. The task of designing LED replacement lamps compatible with common residential dimmers is complicated by the fact that dimmers may vary considerably in performance, even with the same incandescent lamp. This presents difficulties for manufacturers attempting to design replacement lamps compatible with a wide range of dimmers.

To understand the performance of some currently available lamps, the LRC conducted technology evaluations of six CFL and six LED lamps, each with five different commercially available dimmers, for a total of 60 combinations. The lamps were evaluated based on existing standards for many different parameters, including minimum and maximum light level, dead travel, flicker, and current and voltage levels.

The three key trouble spots for compatibility were minimum light level, dead travel, and flicker.

For minimum light level, 43% of CFL/dimmer combinations and 53% of LED/dimmer combinations were able to meet the minimum light level requirements stated by NEMA SSL-6. When examining dead travel in relation to dimmer travel (i.e., the travel position of the mechanical actuator of the dimmer), the data show that 63% of working lamp/dimmer combinations had dead travel of less than 20% of the total dimmer travel. For directly perceivable flicker (when lamps were dimmed), 36% of CFL/dimmer combinations and 44% of LED/dimmer combinations were characterized as having no perceptible flicker.

Link:

<http://www.lrc.rpi.edu/programs/solidstate/assist/dimming.asp>

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## Lighting Up the Lawn With 16 Million Colors

In their recent New York Times article Roxie Hammill and Mike Hendricks ask "do you have lights that can be controlled by tracing your finger over the face of a smartphone? A reindeer face with a mouth that moves with the music you've provided over an FM radio connection? Do you have 16 million colors available at the flick of a switch?"

New holiday lighting systems and smartphone apps can make that inflatable Frosty look downright austere - from an exotic lighting system called Lumenplay to a shivering snowman from the outfit that created that classic of kitsch, the singing mounted fish, Big Mouth Billy Bass.

The secret of the 16 million colors is single light bulbs that hold three LEDs - red, blue and green. Those three can be dialed up and down in various combinations by a smartphone app, creating an unimaginable number of possibilities.

Controlled via any Bluetooth smart device, the app has a range of up to 150 feet, so you can control the colors and action from across the yard or from your couch, simply by moving your finger along a color wheel on the screen of your Apple or Android phone or tablet. And they can be synced to music, set to twinkle or made to dance in nearly any pattern you'd like.

Since the color range is so varied, the same lights can be used for Halloween, Easter, Fourth of July, just about anything. They can even be left up year round - the holy grail of exhausted, height-fearing homeowners.

The addition of smartphone apps and R.G.B. (red, green and blue) units is the latest variation in a trend that has been going on since light-emitting diode holiday lights started popping up in stores over the last decade.

A San Diego company, Environmentalights.com, says it has close to 800 holiday lighting products, thanks to the possibilities created by LEDs. Among those products is a 10-by-10-foot LED light "curtain" that can be hung on a wall, indoors or out. A controller sets the speed of white lights that flow down the strands like water, at rates that range from "a trickle to a torrent." Price: \$125.50.

Another offering, light tubes that mimic snowflakes, is likewise not cheap, beginning at \$26 for each footlong tube, \$47 for the 36-inchers.

For the full story use the following link:

[http://www.nytimes.com/2013/11/28/technology/personaltech/for-the-holidays-lighting-up-the-lawn-with-16-million-colors.html?nl=todaysheadlines&emc=edit\\_th\\_20131129&r=0](http://www.nytimes.com/2013/11/28/technology/personaltech/for-the-holidays-lighting-up-the-lawn-with-16-million-colors.html?nl=todaysheadlines&emc=edit_th_20131129&r=0)

## MEMBERSHIP APPLICATIONS APPROVED BY GOVERNING BODY

### New Members admitted on 20th September, 2013

I.0175	Sanjay Electronics Shop #5, Ansari Market Near SBI Bank, Gurudwara Road, Jwalapur, Haridwar 249407	Institutional	Delhi
IM.0175	Mr. Parteek Gola Sanjay Electronics Shop #5, Ansari Market Near SBI Bank, Gurudwara Road, Jwalapur, Haridwar 249407	Institutional Representative	Delhi
F.0817	Mr. Neeraj Kumar Bansal Superintending Engineer (E) E-304, Prince Apartments 54, I.P Extension, Patparganj Delhi 1100092	Fellow	Delhi
F.0818(L)	Mr. Jagadish Chandra Pati Qrs.No. D-56, Near Carom Field B.J.B. Govt. Flats, B.J.B. Nagar Bhubaneswar 751014	Fellow (Life)	Calcutta

M.1841(L)	Mr. Debangshu Mukherjee Purbita Apartment, A/2 295/1, Dum Dum Road Kolkata 700074	Member (Life)	Calcutta
M.1842	Mr. Gopal Krishan Mangla Vikas Industries 8, 10/67, Kirti Nagar Industrial Area New Delhi 110015	Member	Delhi
M.1843	Mr. Rauf Baig 1/3 3rd Floor, New Lahore Colony Shastri Nagar Delhi 110092	Member	Delhi
M-1844(L)	Mr. Manohar Lal Khurana 160, Raja Garden New Delhi 110015	Member	Delhi
A.1195(L)	Mr. Ranjan Keshari Pati Vice Principal Balasore School of Engg. Ranipatna, Chunbhati Balasore, Odisha	Associate (Life)	Calcutta

### New Members admitted on 19th October 2013

M.1845(L)	Mr. Saurabh Kumar A 27C, Munirka DDA Flats Munirka New Delhi 110067	Member (Life)	Delhi
M.1846(L)	Mr. V. Mohan 215, IInd Floor, Prince Panna 375/24, Awai Shanmugam Road Chennai 600005	Member (Life)	Chennai
M.1847(L)	Mr. Amar Kumar Hazra Flat No. G-02, P-11/4 Prayas Coop. Hsg Society B.P. Township Kolkata 700094	Member (Life)	Calcutta
M.1848(L)	Mr. Sougata Jana C/o Shyam Sundar Jana Satabdibag (2nd Lane), Police Line (South) P.O. Sripally, Burdwan, W. Bengal 713103	Member (Life)	Calcutta
M.1849(L)	Mr. Goutam Debnath 5/2C; Panditia Road Near - Gariahat Kolkata 700029	Member (Life)	Calcutta
M.1850(L)	Mr. Indrajit Sarkar Pranjit Plaza, Flat No. C/4 361/25, Jessore Road (South) Bankimpally, Madhyamgram, Kolkata 700129	Member (Life)	Calcutta
M.1851	Mr. Bidrohi Bhattacharjee Adhora Kali Bari Nalgara, P.O. + P.S. Baruipur South 24 Parganas 700149	Member	Calcutta
M.1852	Mr. Ambarish Basu 24 A, M.B. Sarani (Moore Avenue) Tollygunge Kolkata 700040	Member	Calcutta
A.1196(L)	Ms. Priyanka Yadav Lightron Industries C-51, Sudershanpura Industrial Area (Extn.) P.O. Bais Godam Jaipur 302006	Associate (Life)	Rajasthan
A.1197(L)	Ms. Yashika Pareek Club First 6/7, Mahatma Gandhi Road Sitapura Jaipur 302002	Associate (Life)	Rajasthan

A.1198(L)	Mr. Bhuvanesh Mishra Club First 6/7, Mahatma Gandhi Road Sitapura Jaipur 302002	Associate (Life)	Rajasthan	A.1216	Mr. Swarup Kumar Das A74/1, Purbadiganta Santoshpur, Jadavpur Kolkata 700075	Associate	Calcutta
A.1199(L)	Ms. Smrutiranjana Nayak At-Tunga, P.O. Aul Distt. Kendrapara Orissa 754211	Associate (Life)	Calcutta	A.1217	Mr. Baddinath Das 54, Sitalatala Lane Kolkata 700011	Associate	Calcutta
A.1200(L)	Ms. Shruti Chauhan 117/1090, 'M' Block Kakadeo Near Sharda Public School Kanpur	Associate (Life)	Rajasthan	A.1218	Mr. Rajat Mondal Ekanta Coop. Housing Society New Town, Rajarhat, Flat -2A Plot -DA 28, Kolkata 700156	Associate	Calcutta
A.1201(L)	Mr. Dinesh Lakha 104/64, Sector-10, Pratap Nagar Sanganer, Jaipur	Associate (Life)	Rajasthan	<b>Student Members</b>			
A.1202(L)	Mr. Sonal Panwar 22, Adarsh Nagar Rangpur Road Kota Jn. Rajasthan	Associate (Life)	Rajasthan	S-1493	Biswanath Dehury	Student	Calcutta
A.1203(L)	Mr. Ashish Jangid Club First Techno Edusolutions A-71, Sichai Nagar, Post Beelwa Sitapura, Jaipur	Associate (Life)	Rajasthan	S.1494	Dibesh Parida	Student	Calcutta
A.1204(L)	Mr. Deepak Sharma H.N.2, Street No. 2 Meershali, Indira Colony Ajmer 305001	Associate (Life)	Rajasthan	S.1495	Animesh Abinash	Student	Calcutta
A.1205	Mr. Rajesh Sarkar Vill & P.O South Jhapordah P.S. Domjur, Dist. Howrah West Bengal 711405	Associate	Calcutta	S.1496	Biswadatta Mohanty	Student	Calcutta
A.1206	Mr. Monojit Sinha 66, Natta Mahajati Road Yuvaraj Apartment, Flat No. 201 Dum Dum, Kolkata -700028	Associate	Calcutta	S.1497	Akash Kumar Panda	Student	Calcutta
A.1207	Mr. Aparajita Dutta 36/1, Middle Road, Kalianibash Barrackpore. P.O. Nona Chandan Pukur Kolkata 700122	Associate	Calcutta	S.1498	Satyaram Pradhan	Student	Calcutta
A.1208	Mr. Pradip Kr. Maiti Vill - Gurchakli, P.O. Gopal Nagar P.S. - Parskura, Dist- Purba Medinipur 721189	Associate	Calcutta	S.1499	Ashis Kumar Pradhan	Student	Calcutta
A.1209	Ms. Smita Sinha Flat No. 3A, P-205, CIT Road Beliaghata Kolkata 700010	Associate	Calcutta	S.1500	Swagat Das	Student	Calcutta
A.1210	Mr. Satabda Datta 9/10/1 Kasundia 2nd Bye Lane Howrah 711104	Associate	Calcutta	S.1501	Arijit Mitra	Student	Calcutta
A.1211	Ms. Rajalakshmi Chandrasekhar 8/B Ashoka Road, Alipore Kolkata 700027	Associate	Calcutta	S.1502	Archit Patnaik	Student	Calcutta
A.1212	Mr. Arnab Ganguly 2/197 Sree Colony Kolkata 700092	Associate	Calcutta	S.1503	Chittaranjan Behera	Student	Calcutta
A.1213	Mr. Amartya Roy Bhakti Bhavan, New Upper Chelidanga Asansol Burdwan 713304	Associate	Calcutta	S.1504	Fanil Kumar Behera	Student	Calcutta
A.1214	Ms. Payel Bhattacharya E.E.-101/4, Sector -II Saltlake, Kolkata 700091	Associate	Calcutta	S.1505	Pinaki Kumar Upadhyaya	Student	Calcutta
A.1215	Mr. Shambhaji Chatterjee 21, K.K. Road, Haridevpur Kolkata 700082	Associate	Calcutta	S.1506	Lalit Mohan Sahoo	Student	Calcutta
				S.1507	Om Chandrachur	Student	Calcutta
				S.1508	Satya Vijay Nath	Student	Calcutta
				S.1509	Bhargav Chakraborty	Student	Calcutta
				S.1510	Basant Kumar Mishra	Student	Calcutta
				S.1511	Debarka Sarkar	Student	Calcutta
				S.1512	Siddhartha Roy	Student	Calcutta
				S.1513	Supriyo Nath	Student	Calcutta
				S.1514	Manojit Das	Student	Calcutta
				S.1515	Swarnendu Das	Student	Calcutta
				S.1516	Rakesh Biswas	Student	Calcutta
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				S.1518	Shubhajit Das	Student	Calcutta
				S.1519	Arumay Mukhopadhyay	Student	Calcutta
				S.1520	Moupia Sarkar	Student	Calcutta
				S.1521	Aryama Roy	Student	Calcutta
				S.1522	Nitish Adhikary	Student	Calcutta
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				S.1530	Rita Kumar	Student	Calcutta
				S.1531	Sudipto Das	Student	Calcutta
				S.1532	Proneel Mukherjee	Student	Calcutta
				S.1533	Sourav Kundu	Student	Calcutta
				S.1534	Andrita Mandal	Student	Calcutta
				<b>Transfer of Grade</b>			
				F.0819(L)	Mrs. Chandra Banerjee Flat -3-B, 1/434 Gariahat Road (S) Jodhpur Park Kolkata 700068	Fellow (Life) from M.0983(L)	Calcutta



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