RNI Reg. No. DELENG/2001/4847

January 2012 Vol. XII No. I

LIGHT the official NEWSLETTER

of the **indian society of lighting engineers**

Printed & Published by Mr. Harcharan S. Mamak, A 274, Defence Colony, New Delhi 110 024 on behalf of Indian Society of Lighting Engineers and printed by him at Graphic Point Pvt. Ltd., WZ-429 B, Naraina Village, New Delhi.

FROM THE PRESIDENT'S DESK

It gives me immense pleasure in sharing with you the fruitful events we had in the last year i.e. 2011.

The year gone by saw the National Lighting Code being officially launched in January '11 which fulfilled the long awaited demand of the industry. This was followed up by conducting a couple of seminars to increase awareness and reinforce the importance of this document through workshops organised in Hyderabad, Bengaluru, Chennai and Chandigarh.

In March the Lii2011 Exhibition and Conference was organised successfully in Chennai by the Chennai State Centre.

Towards the end, our youngest State Centre in Indore took the initiative and conducted a very well coordinated two day LTT program. Of course, there were contributions and programs conducted by other State Centres as well which have been covered in our Newsletter regularly.

The success of the MP State Centre (and earlier Indore Local Centre) in holding regular monthly lectures and meetings is being replicated at other centres at Pune and Mumbai. NLC programs in collaboration with BIS are being planned at Jaipur, Guwahati and Mumbai.

Ever since its inception, ISLE has always considered education as one of the key areas of activity. The new Governing Body that took over in September is hoping to take some new steps in this area.

I find it heartening to see the widespread interest in ISLE from the student community as is evident from the splurge in receipt of a vast number of applications for student membership. In addition to Student Chapters being set up at Pune and Jaipur, proposals for other centres have also been received and the same shall be finalised on merit soon.

I feel honoured to share with you that ISLE has been graced by two eminent professionals; Mr. V.P. Agrawal

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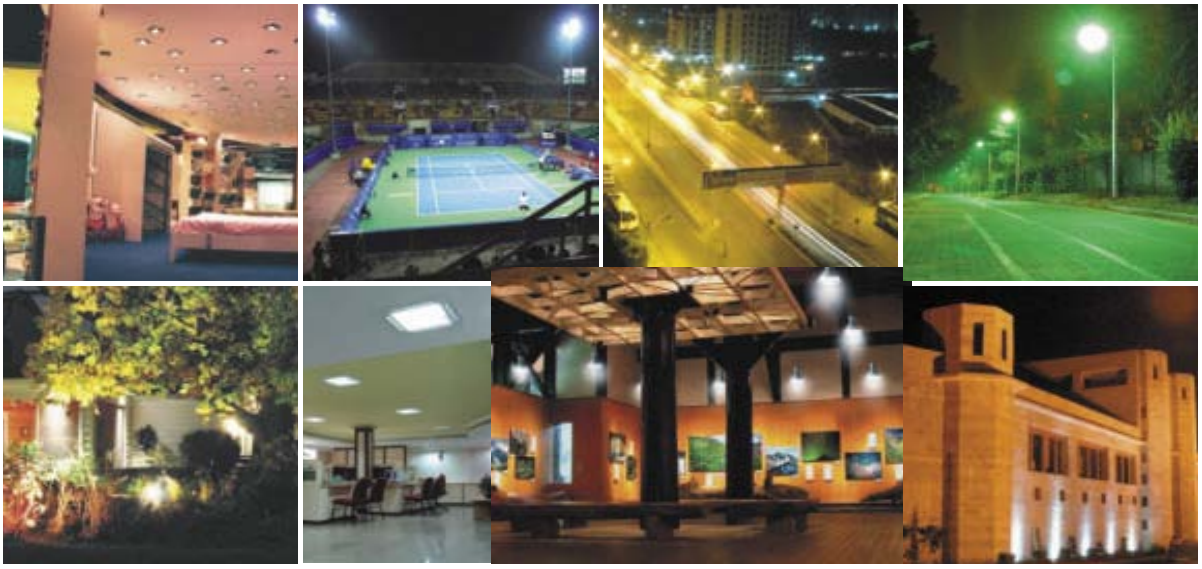






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(Chairman - AAI) and Mr. Ashish Rakheja (COO - Spectral Consultants) who have accepted our invitation to be permanent invitees on the Governing Body. We all welcome them on board.

Further, 2012 shall witness global events which may be of interest to the members and the same are being listed below:

March 13-16, 2012	- Taiwan International Lighting Show,Taipei
April 15-20, 2012	- Light + Building Franfurt, Germany
June 09-12, 2012	- Guangzhou International Lighting Exhibition, China
Sept 15-18,2012	- CIE Lecture on Photometry, Colorimetry, Metrology and Standards for SSL & LED Lighting, Hangzhou, China
Sept 19-21,2012	- CIE 2012 Lighting Quality & Energy Efficiency, Hangzhou, China
Oct.5-8,2012	- Light India 2012, Organised by Elcoma in collaboration with Messe Frankfurt
Oct 27-30,2012	- Hong Kong International Lighting Fair, HK

The above events will showcase new developments in Lighting and are a good opportunity to keep abreast of the latest updates on technologies and applications.

Warm regards,

Gulshan Aghi
gaghi@ho.surya.in
#9717944966

EDITORIAL

In this first issue of the new year we carry reports on the activities of the State Centres in the last quarter. M P State Centre continues with their monthly programmes and is inspiring others to follow the lead.

We have permission to reprint here an article by Dr. Warren Julian on Lighting Photography. He introduced this subject as an optional course in the Master of Design Science Illumination programme at the University of Sydney.

We learned with pleasure that our Immediate Past President, Dr. Avinash Kulkarni was given an award by the Institution of Engineers for his energy saving innovation in air conditioning using UV lighting.

We are also carrying a feature on standardisation by another former President, Mr. P.K. Bandyopadhyay, a very important part of the ISLE mandate.

I am repeating our request to write in with news and articles as well as suggestions to isledel@vsnl.com and look forward to hearing from you.

H.S. Mamak
Editor

MUMBAI STATE CENTRE

20th Annual General Meeting
December 20, 2011, Mumbai

The 20th Annual General Meeting of the Indian Society of Lighting Engineers, Mumbai State Centre was held on the 20th December, 2011 at the Nehru Planetarium, Mumbai.

The Chairman Dr. Prakash Barjatia welcomed all the members and announced the commencement of the AGM. Matters of the agenda were then taken up. The Chairman Dr. Barjatia announced the results of the election for the MSC Committee for 2011 -2013 which was held in June 2011 and Committee elected is as follows:

Mumbai State Centre Committee 2011 - 2013

Mr. Prakash V. Mavinkurve	-	Chairman
Mr. Stan Alvares	-	Hon. Secretary
Mr. Amal Auddy	-	Hon. Treasurer
Mr. Rajendra Gupta	-	Member
Mr. Veerkumar Doshi	-	Member
Mr. Arvind Mule	-	Member
Mr. Pankaj Doshi	-	Member

The meeting had an enthusiastic participation by all the members who supported the revival of the Scholarship Fund by organising a lighting competition for students of engineering colleges etc. It was agreed to form a Committee to guide this programme. Another suggestion from the Chairman was to start a series of breakfast meetings on the successful pattern of Indore and Pune.

On behalf of the members the new Chairman, Mr. Prakash V. Mavinkurve thanked the out-going Chairman Dr. Prakash Barjatia for his long dedication and service to Mumbai State Centre from 2003 and for leading it through various programmes successfully, and presented him with a token of appreciation followed by a floral tribute presented by Ar. Rohini Mani.

The meeting was followed by a presentation on Retail Lighting Concepts and Design.

S. Alvares
Hon. Secretary, ISLE MSC

CHENNAI STATE CENTRE

Presentation on Energy Efficient Lighting
November 25, 2011, Chennai

In order to educate the field engineers at the middle level of the Tamil Nadu Electricity Generation and Distribution Engineers, ISLE Chennai Centre joined hands with the Training wing of TANGEDCO and gave a presentation on "Energy Efficient Lighting Systems -

Session in progress

Recent trends and developments in LED Lighting Systems". The lecture on 25.11.2011 was followed by a practical demonstration of the various types of LEDs, drivers, application luminaires etc. The session was handled by Mr. Ilamathi and Ms. Kalaiselvi. The engineers were very appreciative and thankful for the update on the new developments. They were also provided with a copy of the lecture notes issued during the last Lii2011 technical seminar. The session was attended by twenty engineers

In continuation to the above, the same program was repeated on 17.12.2011 and the session was attended by eighteen engineers

R. Balasubramanian
Chairman

KARNATAKA STATE CENTRE

Annual General Meeting
October 31, 2011, Bengalooru

The Annual General Body Meeting of the State Centre was held on 31st October 2011.

The Chairman announced the names of the New State Centre Committee Members Elected unanimously for the term 2011-13 in the election held during October 2011.

M.S.N. Swamy	–	Chairman
M.G. Sathyendra	–	Hon. Secretary
Riaz Kagalwala	–	Hon. Treasurer
Kalaiselvan	–	Member
B.T. Ajwani	–	Member
Ravi Rao	–	Member
Mathew Kurian	–	Member
Sanjay Jadhav	–	Ex-officio Member
Bhavani Prasad	–	Ex-officio Member
Pradeep Nettur	–	Permanent Invitee

MP STATE CENTRE

Lecture on Lighting for Data Centres
October 30, 2011, Indore

Er. Pradeep Mishra

As part of its monthly lecture series on October 30, the M P State Centre organised a lecture by Er. Pradeep Mishra, Scientific Officer at RRCAT, Department of Atomic Energy, Government of India, Indore. He spoke on "Illumination Design for Data Centres of the Information Technology Sector".

National Workshop - Lighting Trends & Technologies 2011
November 25, 2011

25th November 2011 witnessed the 25th uninterrupted monthly lighting talk by ISLE, MPSC. And what an event it was! A large audience comprising of architects, interior designers, consultants, engineers, students and lighting enthusiasts and a galaxy of speakers made this workshop a truly memorable one.

To celebrate the Silver Jubilee of the uninterrupted monthly lighting talks, the event was organised as a day-long workshop on the theme 'Lighting Trends & Technologies 2011 : Prospering India - Changing Light' at Hotel Radisson Blu, Indore.

At the inaugural session, Mr. Akhilesh Jain, Chairman ISLE, MPSC in his welcome speech threw light on the activities of the centre and how it has attracted more and more lovers and practitioners of lighting to become members and how the attendance is growing month after month. The uniqueness of the monthly meetings lies in fixed day, time and venue that ensure that people are in a position to block this time for the ISLE meets. He also acknowledged the efforts of the members who are putting in untiring efforts in extending the size of lighting fraternity in Indore by getting the right people to join the movement to spread the right knowledge about lighting.

Mr. Rajendra Raje, Convener for the workshop elaborated on the theme of the programme and its relevance

Dignitaries lighting the inaugural lamp

in the modern day India. The progress that India has made in all walks of life in the last decade due to its booming economy is clearly reflecting in development in infrastructure like roads, flyovers, airports, malls, multiplexes, hospitals as well as upgradation of manufacturing facilities, and better housing. Lighting has a stellar role to play in all these areas and hence the theme of 'Prospering India - Changing Light'.

Mr Gulshan Aghi, President ISLE talked about how the lighting has evolved over the years due to changing needs and trends and was no longer being perceived as just a tool to overcome darkness. He also talked about the newer application areas and the specialised and significant role lighting is playing in these applications.

Mr. H.S. Mamak, Ex-President ISLE and Ex-Vice President, CIE in his keynote address emphasised the importance of good lighting and how it is not just relevant but mandatory for leading a good lifestyle. Mr Mamak emphasised that the design should take into consideration performance, efficiency and comfort. He narrated how it was important to know the function of the human eye and its role in sending the signals to the brain as 80% of the signals that the brain gets are through the eye and that everything that we see needs light. He mentioned how important light is for our health and well being. He expressed that good lighting should take into account human factors like work patterns and life styles as well as the environmental issues.

There was special screening of an AV message sent by Dr. Ajay Mathur, Director General, BEE specially for this workshop. Dr. Mathur could not attend this workshop as he was away in Durban, South Africa to represent India in the Climate Change negotiations. Dr. Mathur emphasised the need for more energy efficient products as 40% of India's population is still deprived of electricity. He further stated that the first thing these people would deploy once they got electricity was lighting. This clearly indicated huge scope for lighting in India in the years ahead.

The inaugural session was followed by 5 technical sessions covering different areas of lighting. In the first session, Ms. Sudeshna Mukhopadhyay, Director, Philips India delivered a very interesting presenting on 'Non Visual Effects of Light and Human Well Being'. She highlighted how the lighting affects the bio-rhythm of human beings and influences their behaviour and health by elaborating on the circadian rhythm and how the light or the absence of light affects the secretion of hormones that affect the human mood and behaviour.

The session was followed by a panel discussion on the presentation and was moderated by Mr. S.K. Biyani, Vice President Engineering at Pratibha Group Pithampur. The eminent panellists included Mr. R.P. Kotibhaskar, Senior Electrical Consultant, Mr. R.P. Gautam, Engineering Head at Maral Overseas Limited, Mr. Vishwas Farkya, Sr. Manager at VE Commercial Vehicles as well as Dr. Apoorva Pauranik, a leading Neurologist from Indore.

The second technical session was on Indoor and Architectural Lighting. Whereas Mr. Sanjay Tiwari, National Head, Lighting Solution Group at Wipro talked about 'New Trends in Indoor and Architectural Lighting', Mr. Shreekant Phanse, Lighting Head at Sankalpan Group, Mumbai made a presentation on 'Light - The Fourth Dimension of Architecture'.

Mr Tiwari talked about the trend setters as well as trend changers in interior lighting, evolution of new types of luminaires for the work spaces as well as the new light sources.

Mr Phanse's presentation included breath-taking photographs that revealed the beauty of architecture when lit up with great thought and precision to drive home the reason why lighting is called the fourth dimension of architecture.

The panel discussion that followed was moderated by Mr. Vinay Babar, a leading interior designer and artist from Technocrats, Indore. The panellists included leading architects, Ar. Manish Kumat, Ex-chairman IIID and Managing Director of Abhikalpan Architects, Ar. Dipti Vyas and Ar. Deepak Vipat. The panellists talked about their own experiences with lighting in some of their landmark projects. Ar. Manish Kumat redefined the concept of green building and emphasised the use of daylight to the maximum possible extent through smart architectural design.

The third technical session was dedicated to Lighting in Entertainment Spaces and was addressed by Mr. Sanjeev Sethi, Vice President & Head Lighting BU, C&S Electric. Through his brilliant presentation he showed how lighting excites and entertains everyone in entertainment spaces such as theatres, gardens, stadia and malls. It increases

footfalls in malls and helps shopkeepers sell more while creating a tempting ambiance in restaurants for people to enjoy not just the food but also the company of their near and dear ones. He also touched upon the challenges in designing lighting for the entertainment spaces such as mood setting, comfort, luxury, arousing temptation, excitement, creative, functional requirement as well as power saving.

The session was moderated by Mr. Rajendra Raje, Executive Director from Lotus, Central, India's largest chain of Electronics and Consumer Durables stores and Lighting Designer. The panellists included Ar. Puneet Pandey, recipient of Best Young Architect of the Year Award for the year 2007 and Ar. Divya Pandey from Vima - The Dimension, a leading architectural and interior designing firm, Mr. Tapan Sharma, young business executive and a regular visitor to the entertainment spaces such as malls, multiplexes and restaurants and Mr. Sandeep Mathur, a leading electrical consultant who has to his credit lighting designing of one of the largest theme parks in India. Ar. Pandey talked about the creative and innovative challenges in designing these spaces and the role of lighting as the key element in designing them. Mr. Mathur talked about the challenges in executing such large projects where the aesthetics need to be blended with absolute safety since a large number of people visit them. Mr Sharma spelt out his expectations from the entertainment spaces where people like him can unwind, relax and enjoy themselves after a stressful day in the office. He also mentioned how attractive displays with brilliant lighting lured him in buying certain things he had not planned to buy.

The fourth technical session by Mr. Ajay K.R. Senior Manager, Product Marketing at Philips India discussed how Urban Lighting is laying greater emphasis on City Beautification the world over and how cities are creating their own identity and attracting tourists by becoming beautiful enjoyable places. This exercise also helps in improving the urban life. He also covered the use of automation in outdoor lighting and how proper designing can help save precious energy while creating enjoyable places.

The panel discussion that followed, moderated by Mr. Sandeep Mathur, Electrical Consultant, Versatile Engineering, was one of the highlights of the event. The panellists included such eminent personalities as Mr. P.L. Nene, Retd. Chairman, MP Electricity Board, Mr. Hans Kumar Jain, City Engineer, Indore Municipal Corporation, Mr. Jaideep Karnik, Resident Editor, Nai Dunia, leading Hindi daily and Ar Alok Tiwari. Each of the panellists pitched in with extremely valuable and useful inputs in improving the overall lighting in the city. The healthy panel discussion brought out the need for a lighting master plan for the city just as there were master plans for the other utilities and development. Mr. Hans Kumar Jain expressed a desire to work closely with ISLE and use its expertise for better planning of lighting for the benefit of the city. The discussion also brought out a very interesting comparison between white light and yellow light for street lighting applications.

The final technical session of the day was dedicated to LED Lighting and Automation. Mr. S Chakraborty, Vice President, Surya Roshni and a stalwart in the lighting industry was the first speaker in this session and he delivered a very passionate and power-packed presentation on LEDs. He went into the technical intricacies of LED, its suitability in different applications. LEDs, invented in 1960 as indicator lamps were primarily self luminous objects that have now graduated to an illumination source that is used to view other objects by the light reflected from them. As a widely acknowledged authority on the subject, he mentioned that the arrival of LED as a light source is platform technology that is going to change our lives just as the mobile telephony did. He said that the lumen output and luminous efficacy is doubling every 18-24 months with the reduction in cost. He also mentioned that LED business by 2015 would be 1000 crores. He added that ultimately in future LED will go to OLED or organic LED.

The second speaker, Mr Aseem Gupta of Eagle Techsec, a young entrepreneur engaged in automation, provided the glimpses of how automation is going to engulf our lives in our thrust to save energy while changing the ambience of a place at the click of a button.

The moderator for the panel discussion was Mr Bharat Rawlani, Electrical Engineer at RRCAT, Department of Atomic Energy. He made use of his vast experience and deep knowledge and understanding of the subject to good effect to liven up the proceedings of the panel discussion that included well known technocrat Mr. Tapan Mukherjee, Director Printronix and a widely respected automation expert, Prof. Rakesh Saxena from Shri G S Institute of Technology & Science and Mr. Mukesh Acharya, Chief Engineer, Hotel Radisson Blu.

Prof. Saxena provided his views on LEDs with special emphasis on how the driver can be made more reliable by proper thermal management. Mr. Mukesh Acharya raised his concern on account of harmonics that has been a

major source of headache for them as users of LEDs. Mr. Tapan Mukherjee threw light on the possibilities in the field of automation and why it is going to be put to a greater use in time to come.

Most of the GB members, who had come to Indore for the GB meeting on 24th, chose to stay back to witness and be a part of this workshop.

Mr. Bharat Rawlani, Organising Secretary of the workshop proposed the vote of thanks and promised continuation of regular activities at MPSC.

A two-day exhibition of lighting products was also organised. The exhibition was open to public.

Monthly Lecture
December 25, 2011, Indore

The 26th monthly lecture held by the M P State Centre was held on 25th December, the last Sunday falling on Christmas day this year. With the momentum created first by the Silver Jubilee celebrations and then by the LTT workshop, a large audience attended the lecture.

The speaker was a senior Academician, Dr. D.P. Kothari , Director General, Vindhya Group of Institutions Indore, ex-VC Vellore Institute and ex Director I/C IIT Delhi. He spoke on the topic of Illumination.


Dr. D.P. Kothari

The Chairman in his welcome address highlighted the post event comments received by BEE, Director General, Dr. Ajay Mathur and Mr. H.S. Mamak. The summary and highlights of LTT-11 were presented by the Organising Secretary of the workshop, Mr. Bharat Rawlani. The Convenor of LTT-11, Mr. R.R. Raje in a very interesting and impressive presentation, not only wished the audience with AV on Holy-day and Holiday, but also briefed the audience on the proceedings of the National Workshop.

Dr. Kothari in his very interesting, entertaining and impressive presentation, combined humour with knowledge on the topic of Illumination mentioning the main problems of load growth, effect of stable Government and political parties related to load shedding, voltage fluctuations, tripping and energy conservation. He covered thermal, hydro, mini hydro power, nuclear and tidal power plants (France) , geothermal(New Zealand) , electricity generation by fusion (futuristic approach), distributed/dispersed power systems and other renewable sources of Light.

His matching of humour with knowledge made the morning very pleasant and got an overwhelming response from the audience in the Q & A. The programme was ably anchored by Dr. Alok Mittal, member Executive Committee of MPSC. Finally the Hon. Sec. Er. Dinesh Wadhwa proposed a musical vote of thanks. As always, the Seminar was followed by meeting of the Executive Committee of Madhya Pradesh State Centre.

Dinesh Wadhwa
Hon.Sec. ISLE MPSC

CIE ACTIVITY

CIE 2012 Lighting Quality & Energy Efficiency
September 19-21, 2012, Hangzhou, China

CIE 2012 "Lighting Quality & Energy Efficiency", taking place in Hangzhou/China, September 19-21, 2012, will be the worldwide focus point in technical and scientific topics, in policy frameworks and their implementation in legislation as well as in recommendations to end users.

Scientists, R & D policy makers, public interest groups and international agencies concerned with energy and lighting will come together during these days to exchange ideas and formulate a way forward on how lighting can be used to reduce worldwide energy consumption without sacrificing lighting quality.

Keynote and Invited speakers, workshops and panel discussions, presented papers, the poster exhibition and participants from all continents will cover this scope.

Specialists in measurement and product quality, lighting and its effects on health, vision and colour, public lighting, lighting for transport and lighting design will present the latest developments. All conference related information, such as key dates, online abstract submission, registration fees etc can be accessed through the conference website http://hangzhou2012.cie.co.at (available in English and Chinese).

This conference will be preceded by the 2012 CIE Lecture, details of which are given below.

2012 CIE Lecture on Photometry, Colorimetry, Metrology and Standards for SSL and LED Lightings
September 15-18, 2012, Hangzhou, China

These CIE Lectures are intended to provide the most up to date knowledge in the field of colour and vision science and illuminating engineering. This particular course is divided into four sessions:

1. Photometry and Colorimetry
2. Advanced Colorimetry
3. Metrology and Applications for SSL and LED Lighting and 4) Standards Development for SSL and LED Lighting. The first 2 sessions will cover the fundamentals of color science and recent developments in CIE Division 1 (Vision and Colour). The last two sessions will include metrology, applications, and standards for SSL and LED lighting. The lectures will be given by the world leading experts: Ming Ronnier Luo, Yoshi Ohno, Michael Pointer and Janos Schanda.

CIE PUBLICATIONS

Recommendations on Minimum Levels of Solar UV Exposure
CIE 201:2011

This Technical Report addresses the issue of sensible exposure to solar ultraviolet (UV) radiation. The scientific evidence of beneficial effects of solar exposure has been reviewed, in particular on the incidence and mortality to cancers other than skin cancer. Although the evidence is not unequivocal, the committee has found considerable evidence to deem it plausible that solar exposure may reduce the incidence and mortality of colorectal cancer. The evidence for similar effects on breast and prostate cancer and on melanoma is less, but such effects are considered as plausible, too. Possibly the production of vitamin D plays a role in this respect.

Based on a review of the evidence of both the beneficial and the harmful effects of solar exposures it is concluded that people should not shun the sun, even not at noon. However, levels well below sunburn thresholds are generally sufficient to profit from the beneficial effects of solar exposure. Public health guidance should be developed on the basis of this evidence, but account should also be taken of prevailing solar UV levels that depend on latitude and time of the year and day. Special guidance may be necessary for dark skinned people that live at moderate latitudes and people that cover most of their bodies for cultural or religious reasons. The same holds for people who stay most of the time indoors.

The amount of solar exposure commensurate with good health depends on individual and population characteristics, as indicated above. To facilitate public health guidance it is recommended to extend the concept of the UV index promulgated by the World Health Organization to include the beneficial effects of solar exposure.

The report is split into two parts: The first part (Part I) gives guidance for a sensible exposure regime to profit from beneficial health impacts from moderate solar (UV)

exposure, the second part (Part II) is a review of scientific data that underpin the guidance in Part I.

NEWS ABOUT MEMBERS

Dr. A.D. Kulkarni Wins Award

The Institute of Engineers (India) & DSK Udyog Group awarded "Urja Purskar" to Aeropure UV Systems (P) Ltd for their product 'Watmizer' which saves energy and also improves air quality in air conditioned buildings. Dr. Avinash Kulkarni, Chairman, accepted the award on behalf of the company.

Dr. Kulkarni said that 'Watmizer' is a device to be used in central AC systems for shining Ultra Violet (UV) light on cooling coils which prevents formation of mould, mildew or any deposit on coils. In a typical centrally AC building air conditioning accounts for 60% of energy consumption and with the use of 'Watmizers' typically 20% of that energy is saved. Moreover, the germicidal action of UV reduces microbe content in the air by 75% which makes indoor air fresh and healthy. Additionally, since cooling coils do not need any cleaning, its life is prolonged and there is a drastic reduction in maintenance efforts. The payback period on energy saving alone is about one year.

This device has been tried and tested and found very useful in any centrally air conditioned facility such as Offices, Hospital, Hotels, Buildings, Malls, Pharmaceutical & IT Industries.

FEATURE

LIGHTING STANDARDISATION
Indian Scenario at the end of 2011

P. K. Bandyopadhyay

During the first decade of this millennium, one stand out item in the field of lighting standardisation in India was the National Lighting Code (NLC). The finalisation of the draft NLC for printing was done in the beginning of 2009. The editing, formatting, prepress and printing process followed, and finally the NLC was published in November 2010.

Formal launching of NLC was in January 2011 at New Delhi. This was followed by series of seminars during the year all over the country: Kolkata and Hyderabad in April, Bangalore and Chennai in June and Chandigarh in September. All these seminars were very well attended and quite encouraging comments and observations were received regarding the usage of NLC.

From 2009, standardisation work on other important items commenced, all of which have been completed in 2011 and new work has been taken up. In 2009, the Government of India realised the importance of LEDs to mitigate the perennial problem of electric power shortage and the need to have standards on LED lamps and luminaires to facilitate the usage of the same in the country. GOI asked the Bureau of Indian Standards (BIS) to take it up on a top-priority basis, so that industry could start working further on the adoption of the technology in India and bulk purchasing process could be initiated.

BIS has two Sectional Committees for lighting standardisation:

ET 23 Electric lamps and their auxiliaries, and
ET24 Illumination Engineering and Luminaires.

Both these committees took up the work immediately and during 2011 a large number of standards on LED have been finalised for printing. These are given below:

By ET 23:

1. Terms and definitions for LEDs and LED modules in general lighting (to be printed in dual number with corresponding IEC publication).
2. Self-ballasted LED lamps for general lighting services Part 1 - Safety requirements
3. Self-ballasted LED lamps for general lighting services Part 2 - Performance requirements.
4. LED modules for general lighting - Safety specifications
5. LED modules for general lighting. Part 2 Performance requirements
6. Lamp controlgear Part 2 Particular requirements Section 13 DC or AC supplied electronic controlgear for LED Modules.
7. DC or AC supplied electronic controlgear for LED Modules - Performance requirements
8. Method of measurement of lumen maintenance of solid state light (LED) sources.
9. Method of electrical and photometric measurements of solid state lighting (LED) products.
10. Photobiological safety of lamps and lamp systems.

By ET 24:

1. LED luminaires for general lighting purposes. Part 2 Performance requirements.
2. Luminaires performance Part 1 General requirements Section O General Introduction

N.B. This standard also covers LED luminaires with reference to the above standard (item 1 of ET24) for Performance requirements and item 9 of ET23 for Photometric measurements.

3. A set of Amendments for the series of Luminaires standards earlier approved for printing, for inclusion of LED and LED modules. These amendments will be in the Luminaires Part1 General requirements and tests, and part 5 Particular requirements under Sections 1 to 8 covering Fixed general purpose luminaires, Recessed luminaires, Luminaires for road and street lighting, Portable general purpose luminaires, Floodlights, Hand lamps , Lighting chains, and Emergency lighting respectively. This will take care of safety requirements of LED luminaires.

ET 24 has decided to prepare new standards on (a) Road Traffic Signals and (b) Aviation Obstruction Light, both using LEDs.

ET 24 has also taken up work in several areas covering application of illumination engineering. With the publication of the NLC several existing codes of practice have become redundant. On the other hand, the committee felt that some of the applications would still need separate codes for easy reference. Also, preparing new Codes of Practice would give an opportunity to include latest recommendations of CIE, EN etc. over and above the update given in the NLC.

Preparations of the following Codes of Practice have been taken in hand:

1. Lighting of public thoroughfares
2. Interior illumination

   The scope of this will now cover lighting of libraries, hospitals, industry and educational institutions over the existing areas
3. Exterior illumination

   This will cover all outdoor work areas and public places excluding roads and streets, and sport facilities
4. Day Lighting

   This work, however, needs collection of more data. The research on Daylighting by CBRI, jointly sponsored by ISLE in the 1990s, gives Zenith Sky Luminance for only Roorkee and other data for 8 locations throughout the country. Daylighting designers need to identify prevailing sky type for any specific location, date and time. Then the latest CIE Standard on Sky Luminance Distribution Model, in which 15 possible standard skies have been identified, can be used. So it is important to obtain the balance data from CBRI.

It is hoped that with the standards and codes mentioned in the foregoing the lighting community and the consumers will derive full benefits of better lighting from 2012 and beyond. They will have a better choice of light products, better visibility, comfort, productivity, safety and, of course, reduced electricity bills.

Pranab K. Bandyopadhyay
Chairman, ET 24
Member, ET 23
Past President ISLE
pkb_lqac@yahoo.com

WEBWATCH

New Material, Crystal Erbium Compound Offers Superior Optical Properties

Arizona State University researchers have created a new compound crystal material that promises to help produce advances in a range of scientific and technological pursuits.

Cun-Zheng Ning, an electrical engineering professor at ASU, says the material, called erbium chloride silicate, can be used to develop the next generations of computers, improve the capabilities of the Internet, increase the efficiency of silicon-based photovoltaic cells to convert sunlight into electrical energy, and enhance the quality of solid-state lighting and sensor technology. Details about the new compound are reported in the Optical Materials Express on the website of the Optical Society of America.

The breakthrough involves the first-ever synthesis of a new erbium compound in the form of a single-crystal nanowire, which has superior properties compared to erbium compounds in other forms.

Erbium is one of the most important members of the rare earth family in the periodic table of chemical elements. It emits photons in the wavelength range of 1.5 micrometers, which are used in the optical fibers essential to high-quality performance of the Internet and telephones.

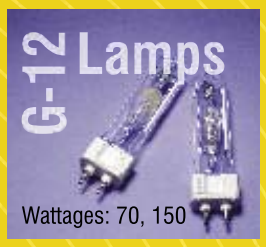
Silicon does not absorb solar radiation with wavelengths longer than 1.1 microns, which results in waste of energy - making solar cells less efficient.

Erbium materials can remedy the situation by converting two or more photons carrying small amounts of energy into one photon that is carrying a larger amount of energy. The single, more powerful photon can then be absorbed by silicon, thus increasing the efficiency of solar cells.

Erbium materials also help absorb ultraviolet light from the sun and convert it into photons carrying small amounts of energy, which can then be more efficiently

Continued on page 23

For a glow like the Sun,



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MAKHIJA 5378

TECHNICAL PAPER

Lighting Photography

Warren Julian

Over the many years that I have edited this journal the poor composition and quality of many of the photographs submitted for publication has surprised me. It is a though people do not care. The problem is most obvious in the material received for the various lighting awards. In the days before digital photography, very small matte prints were often submitted. Sometimes, now, low resolution images arrive with date stamps. However, the major problem has always been in image quality, often prompting the question "How did this possibly win an award?"

Lighting is difficult to photograph, since most film and digital cameras do not have the dynamic range of the visual system, resulting in the risk of under exposed or over exposed areas in am image. There are techniques that can be used which will allow most interiors and exteriors to be photographed without using additional lighting; obviously, additional lighting creates a false impression of the scene. Image composition is a matter of creativity along with the use of appropriate lenses.

I had been thinking about adding a unit on lighting photography to the Master of Design Science Illumination programme for sometime when the 2003 intake of students urged me to add more lighting units to the programme. So, 2004 saw the introduction of Lighting Photography, Lighting Design Software, Daylight in Buildings, Theatre and Performance Lighting, Lighting Design Masterclass and Lighting Design Internship as options supporting the core units of study.

The basic premise of Lighting Photography was to teach and develop practical skills, not only the basics of photography and composition, for which there are hundreds of courses but to explore the techniques to photograph interiors and exteriors using only available light. The other requirement was that the unit should be practical and that it be taught by an outstanding architectural photographer. I knew the person I wanted - Brett Boardman, one of Australia's best whom I had taught during his architecture studies. He found the idea exciting and the 17 students enrolled in 2004. The unit runs every second year with around 20 students.

In 2004 Brett processed the students' film in his colour lab; now the photography is digital and the skills learnt now include the use of Photoshop, stitching and high dynamic range (HRD) techniques, however, the objective is to produce "real" photographs, using only available light.

So, the remainder of this story will let a selection of 2011's students' photographs speak for themselves, with a few words of explanation in some cases. They are from Brett's selection of the best of 2011. More can be seen at www.brettboardman.com/LightingPhotography 2011_BestOf_WEB/. Each image caption shows the theme, location, photographer's objectives (briefly), camera and processing details and the photographer's name.

I have selected Simon Chui's explanation of Our Living Room as an example of a fuller description of his image. "The theme here is relaxation and our living room is a personal place where we can take a break, enjoy and take comfort escaping the world outside. This was also my take on the Kaufman House photograph by Julius Schulman,

Relaxation: *Our living room. The theme here is relaxation and our living room is a personal place where we can take a break, enjoy and take comfort escaping the world outside. See text for further details. Canon EOS 60D with 18-55mm zoom lens, mounted on a tripod.* **Simon Chiu**

Public Domain: *Busselton Jetty, Busselton, Western Australia on 28th June 2011. It was a long exposure, 30 seconds, at F11, during the final stages of dusk. Canon EOS 550D.* **Claire Mallin**

Dr. Warren Julian *is Emeritus Professor, Faculty of Architecture, Design and Planning, University of Sydney, Australia and Chair, Lux Pacifica*

This article appeared in the December 2011- January 2012 of Lighting and is reprinted with permission.

but in reverse. The Shulman photograph had some exquisite qualities, which was created using long exposure photography to capture the interior details of the house as well as its exterior surroundings during twilight. It even featured the owner for a human link and perspective.

"Our living room is primarily lit indirectly by floor standing tungsten halogen spotlights, which I use as uplights directed onto the ceiling. I also use a fluorescent batten above the bookshelf to balance the ceiling brightness. During the afternoon, we get filtered daylight from the trees outside. The glass fireplace provides much needed warmth and the RGB LED table lamp is able to dial up various moods. Using this, I wanted to create a colourful visual element to show off the variety of light sources and a deliberate gradual change from cool to warmth in the one shot.

"High Definition Range (HDR) imaging and Panoramic techniques were required to capture the outside view simultaneously with the interior view, with the end effect and colours strangely surreal, not unlike a sci-fi/anime scene. This picture is composed by 4 different photographs stitched together for a panorama, with each photograph consisting again of 5 photographs of varying exposures. My partner also had to remain still for the entire duration to avoid ghosting.

"To ensure a full depth of view, a base f/14 stop setting and a corresponding shutter speed of 3 seconds was used. HDR was accomplished with manual underexposing and over exposing the shots via 2 stops over and under the base setting."

After it was all over, Beth Kalin commented, "The class was an absolute pleasure. I probably had the least expensive equipment in the group but loved pushing what I had to its limits. One day I will invest in higher quality equipment..."

Interior: *CaxiaForum, Madrid, Spain on 16th June 2011. The CaxiaForum was created through the adaptive reuse of Madrid's Central Eléctrica de Mediodía into a stunning art museum and cultural centre. With this shot I wanted to capture the experience created by the striking use of lighting and materials in the main lobby - the lighting hanging overhead like an illuminated web, reflecting off the hard geometric lines and metallic surfaces of the staircase below, filling the space with a brilliant glow. This was a single shot taken using the handrail of the staircase in lieu of a tripod. Canon PowerShot SD880 IS.* **Haley Laurence**

Individual Light: *Dubai International Airport on 14th June 2011. Through this shot of an individual luminaire located in the Dubai International Airport, I hoped to highlight the clean lines and curvilinear forms in the luminaire's design. These elements are repeated in various forms throughout the airport, creating visual interest as well as a sense of harmony in the overall design of the space. I used an HDR composite shot of five bracketed images to capture the fine details of the fixture as well as the light emitting from it. Canon PowerShot SD880 IS.* **Haley Laurence**

Transport: *Brisbane Motorway at 6.30 pm: This shot is of the motorway on the Brisbane River. I left the overexposed lights (45 sec) in here as it gives a great mood. I opened the aperture to capture the traffic; the orange light on the right is an ambulance rushing through the shot. I like the glare created from the street lamps as adds an intense modern stoic mood. Nikon 5100 SLR. Photoshop: Colour Correction(curves 1), Sharpen (High Pass overlay) and Brightness and Contrast (Gradient Film) Sharpen (Level 2) Hue and Saturation.* **Benjamin Baxter**

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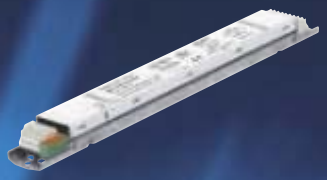

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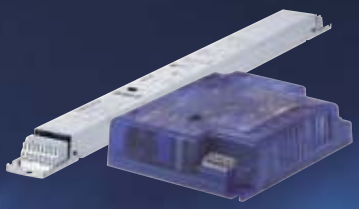

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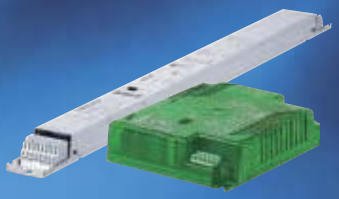

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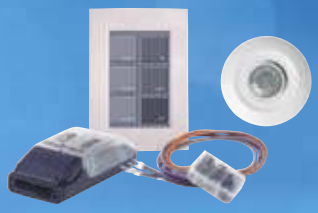

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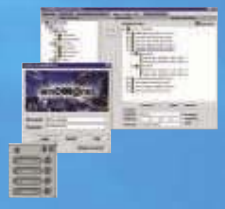

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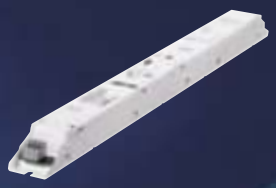

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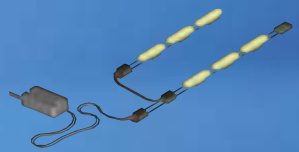

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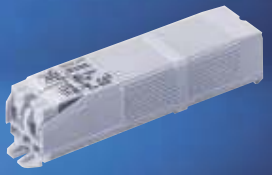

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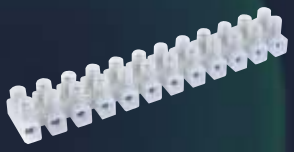

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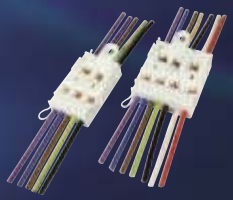

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Panorama: *Sydney Opera House. I took the shot at 5.15pm - the sky was a dark, moody blue. I left the ghosting in as it was my first play with opening the shutter and I liked the effect. The city light looks great. Nikon 5100 SLR. Photoshop: Colour Correction (curves 1), Sharpen (High Pass overlay) and Brightness and Contrast (Gradient Film and layer) Sharpen Hue and Saturation.* **Ben Baxter**

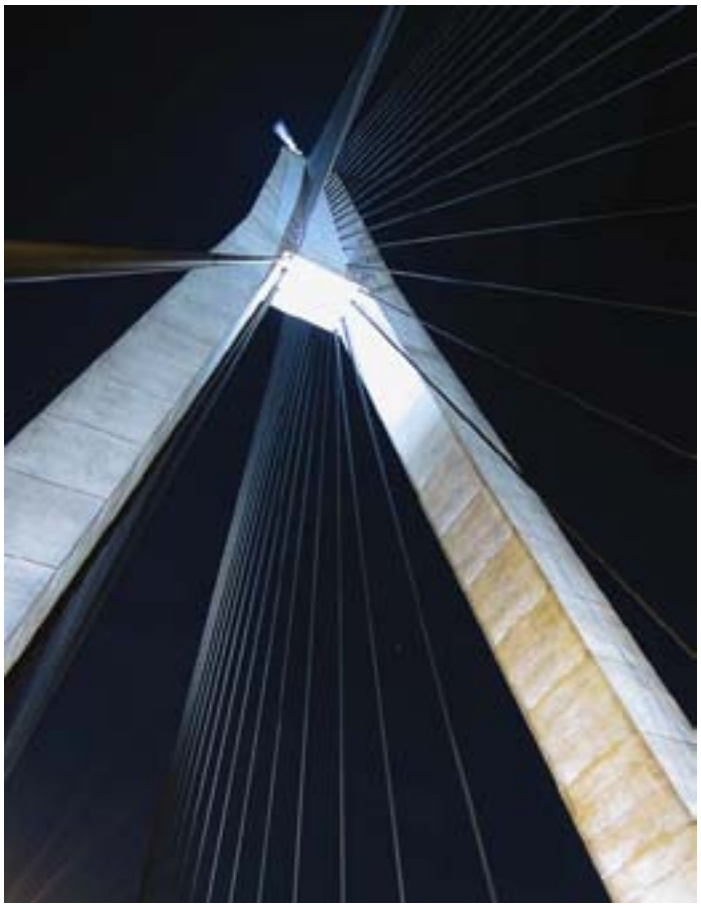
Transport: *Harbour Bridge seen from underneath at 6pm, 3rd June 2011. The picture shows, how the geometrical disposition of its structural elements, make the Harbour Bridge a unique and iconic element in the harbour. It appears to be a light weight structure, that's almost levitating in the harbour in spite of all the steel used for its construction. Cannon G11.* **Pablo Lamarca**

Individual Light: *This light uses the best of both worlds to provide a stunning looking luminaire using the latest in manufacturing and a 5W B9 LED in cool white (5000K) with a 270 beam. This modern, award winning luminaire simulates the Dahlia was designed by Freedom of Creation (Netherlands) and is manufactured to order by 3D printing. Panasonic Lumix micro-lens 14-42mm/F3.5-5.6 altered in Photoshop CS5.* **Alistair Duncan**

Transport: *Commonwealth Bridge - Canberra. Cannon E50 F11 30sec.* **James Nagel**

***Prince Alfred Park**, Sydney, on 23rd May 2011 at 5.16pm. The main lights that illuminate the pathway appear to be custom painted light blue and while most lamp heads appear to be in the same position, a few are clearly higher or lower, enhancing the playful tone of the new design. Canon IXUS 115 HS (point and shoot) f/3.2, 1/4 sec, ISO-100, using a tripod.* **Beth Kalin**

***Transport:** Birkenhead Bridge photograph contrasting the two bridges at Birkenhead point, designed to compare the traditional approach of using steel trusses for bridges and HPS lights with the modern curved lines of concrete and metal halide. The latter basks in the glow of the former. Panasonic Lumix micro-lens 14-42mm/F3.5-5.6 altered in Photoshop CS5.* **Alistair Duncan**



***Transport:** Anzac Bridge, Sydney on 17th May 2011 at 6:13pm using a $50 tripod from Dick Smith. I have a thing for concrete and love the wishbone-esque design of the structure. It is delicate and sturdy simultaneously. I'm curious as to whether a lighting designer came up with the scheme to light the structure but the traffic engineer designed the lighting for the road? It was challenging to shoot this as the best shots included longer shutter times, but then because of fairly high light levels there tends to be quite a bit of noise in the image. Canon IXUS 115 HS (point and shoot) f/2.8, 6 sec, ISO-100.* **Beth Kalin**

Interior: *Mechanical Engineering Building, University of Sydney on 29th June 2011 at 5.46pm. I shot a series of photos throughout the interior atria in the building. This particular image was cropped to highlight the material palette. The bright yellow railings are a bold contrast to much of the other finishes in the building, but set against the wood wall seem like a conscious, cohesive choice. Canon IXUS 115 HS (point and shoot) f/5.9, 0.6 sec, ISO-100, using a tripod.* **Beth Kalin**

Panorama: *Sydney skyline of the city from the other end of Harbour Bridge at 5.30pm, 3rd June 2011. Straight and curved lines shape circular quay sky. Circular Quay displays the heart of its financial district between two if its major architecture landmarks: The Harbour bridge and the Opera House. Cannon G11.* **Pablo Lamarca**

Heritage: *St Mary's Cathedral at 7 pm. The shot attempts to capture the grand character of St Mary's Cathedral and show how the lighting illuminates the building and its detail. It also captures how the building (with light) contrasts with the figures (without light) to create the outline of the figures at night. Canon 500D DSLR Camera.* **Mo Lung Wong**

Individual Light: *Friend's home at 9 pm. My friend sometimes uses a panel of tea candles to illuminate their home. They have to hold the tea lights. The shot tried to capture the "natural" light of the candle and the warm feeling they create. Canon 500D DSLR Camera.* **Mo Lung Wong**

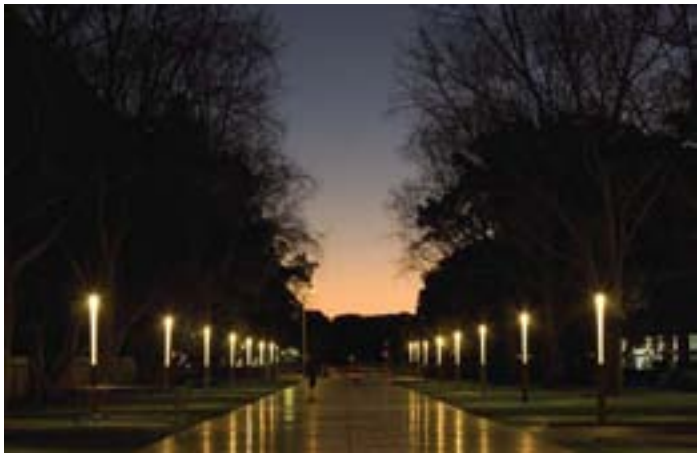
Panorama: *Circular Quay at 7:00 pm. Circular Quay is a focal point in Sydney, due to its location between the Sydney Opera House and the Sydney Harbour Bridge. The shot was taken during the "Vivid Sydney" project, which colours the city with creativity and inspiration, featuring breathtaking immersive light projections on the iconic Sydney Opera House sails. The shot tried to capture several the harbor views and the Sydney Opera House to create a panorama. Canon 500D DSLR Camera.* **Mo Lung Wong**

Panorama: *This panorama looking back at Sydney Harbour from Milk Beach was shot on a Nikon D60 about 20 minutes after sunset on the 18th June 2011 so that the city lights were clearly visible and the sky still had some texture. The required long exposure eerily flattens the harbour surface leaving the focus on the city. Multiple shots were stitched together in Photoshop and the levels balanced across the image.* **Grant Bates**

Individual Light: *Brindabella Lighting Showroom - Canberra ACT showing a DeMajo Italy direct/indirect wall mounted luminaire. E50 HDR image (made up of 5 images).* **James Nagel**

Interior: *Macleay Museum on 22nd May 2011 at 1pm. I wanted to capture as much of the space as possible, including the arched ceiling vault, so I stood as far back as I could at a diagonal to the space and slightly tilted the camera towards the ceiling. There were visitors, but I waited until they were out of the line of view, perhaps a mistake as this gave the space a deserted look. The Nikon SLR D5100D camera was on a tripod in order to get a sharp image with an ISO of 100 and set to aperture priority with f-stop at 11.0 to get most of the space in focus. I used a 18.0-55mm f/3.5-5.6 lens, Centre Weighted the image and the light source was set to tungsten.* **Wafaa Khalil**

Contemporary: *New Macquarie University Library at 4:45 pm. The New Macquarie University Library is the main library of Macquarie University. It opened in March 2011. The shot tried to capture the whole structure of the building, the grid of the window in the central part of the library and the colour panels. In addition, it also shows how the lights illuminate the space with ambient lighting and task lighting in the study area. The twilight shot is tried to give a clear blue sky to contrast the colourful panel of the building. Canon 500D DSLR Camera.* **Mo Lung Wong**



Public Domain: *UNSW Pedestrian Mall. The design and implementation of the university pedestrian mall provides a spacious internal spine to connect various faculties and offer a grand entrance to the main pedestrian traffic off Anzac Parade. The intention is to acknowledge the strength in the wide pathway and its interesting lighting design. The pedestrian lighting provides a modern welcoming feel leading eye lines to the heart of the campus. The reflections from the different surfaces reinforce the pathways width by creating a clear aisle down the middle. Canon EOS 450D; Aperture F11; Shutter: 4 secs; ISO: 100.* **Stephen Johnson**

Heritage: *Australian War Memorial - Canberra. Cannon E50 F11 30 sec.* **James Nagel**

Transport: *When assessing locations for roadway lighting it was disappointing to discover that new and significant roadway projects can be designed and constructed with little desire to celebrate form. The duplicate Iron Cove Bridge, Victoria Rd, Drummoyne, is a case in point. With a construction cost of over $150 million dollars there appears to be little effort to produce anything but a feeling of austerity. The lighting design alone appears to meet AS/NZS: 1158 and not much else. Canon EOS 450D; Aperture F11; Shutter: 3.2 secs; ISO: 100.* **Stephen Johnson**

Heritage: *Twilight snap of St Mary's Cathedral taken with a Cannon sx30is.* **Mathew John Carey**

Public Domain: *Sydney Opera House during Vivid Sydney Festival at 7.12pm on 27th May 2011. Shutter speed: 20.0 sec; aperture priority F-Stop: f/9; ISO speed rating: 200; focal length: 66.0 mm; metering: Spot Mode. Nikon D70s 6.1 MP Digital SLR Camera DSLR Professional, Nikon AF Nikkor 28-80mm 1:3.3-5.6 G Lens.* **Angela Suarez Lozano**

Interior: *In this bathroom interior the lighting design combines LED down lights, lighting horizontal surfaces, with an RGB LED hidden in a glass cabinet and activated by a remote movement detector for general ambience. The intention is to capture the variety of colours available to the user providing many different mood states for a bathroom setting. The block style of presentation is reminiscent of a Warhol print. Canon EOS 450D; Aperture F11; Shutter: 10 secs; ISO: 100.* **Stephen Johnson**

Continued from page 10

converted into electricity by silicon cells. This color-conversion function of turning ultraviolet light into other visible colors of light is also important in generating white light for solid-state lighting devices.

LINK:

https://asunews.asu.edu/0111115_ningerbiumdiscovery

DOE Estimates Energy-Saving Potential of LEDs in General Lighting through 2030

The US DOE has published a report that estimates the broad deployment of LED lighting could reduce energy consumption by nearly half by 2030, assuming roadmap targets for performance and price can be met.

The US Department of Energy (DOE) has released an update of its report that forecasts the energy-savings potential of solid-state lighting (SSL) compared with conventional white-light sources. The 2012 update entitled "Energy Savings Potential of Solid-State Lighting in General Illumination Application," compares the annual lighting energy consumption in the US with and without market penetration of LED lighting beyond current levels. A PDF of the DOE's report can be downloaded at www.ssl.energy.gov/tech_reports.html.

The cumulative energy-savings potential from the predicted LED market penetration over the 2010-2030 study period is 2700 TWh, a savings of $250 billion at today's energy prices or the equivalent of 1800 million metric tons of carbon. This is in comparison to the 1800 TWh of savings estimated in the 2010 report of energy-savings potential. However, several significant changes were made to the study's methodology and assumptions for the latest report, which are discussed below.

The forecast predicts that by 2020, LED lamps and luminaires will have primarily penetrated the commercial and outdoor stationary applications. Proliferation into residential, industrial, commercial and outdoor stationary markets will occur in the 2020-2030 timeframe.

The forecast projects LED lamp and luminaire sales measured in lumen-hours. The analysis indicates that LED lighting in general illumination applications has the potential to represent 36% of sales measured in lumen-hours on the general illumination market by 2020 and 74% of sales by 2030.

By 2030, the annual energy savings from market penetration of LEDs will be approximately 297 TWh, enough electricity to power 24 million homes. At current energy prices, that equates to $30 billion in savings in the year 2030. Assuming the same mix of power stations, these savings, according to the report, would reduce greenhouse gas emissions by 210 million metric tons of carbon in 2030.

The model assumes the price (in $/klm) for LED lamps will decrease from $55.16/klm in 2010 to $6.28/klm in 2020 and to $3.34/klm in 2030. For LED luminaires, price is expected to drop from $180.88/klm in 2010 to $23.69/klm in 2020 and to $12.73/klm in 2030.

The report noted that the best LED lamps and indoor luminaires have lifetimes in the 25,000-hour range, while outdoor luminaires have lifetimes of 50,000 hours. These lifetimes are expected to increase to 50,000 hours for LED lamps and indoor luminaires by approximately 2020, and to 75,000 for outdoor luminaires by approximately 2020, when both lifetime estimates hit a plateau.

The model of adoption rate of LED technology considers both first cost of LED lamps and luminaires as well as annual maintenance and operating cost, which together represent life-cycle cost.

By 2030, the energy-savings potential is greatest in the commercial sector, followed by the residential sector, which contribute 37% and 34% to the total energy savings. Outdoor stationary applications make up the next largest sector, at 25% and industrial makes up 4% of the total. A breakdown of forecasted savings in 2030 shows that the replacement of linear florescent lamps in commercial applications, HID in outdoor applications and incandescent bulbs in residential applications represent some of the most significant opportunities for energy savings from LED implementation

Link

http://www.ledsmagazine.com/news/9/1-32

DOE Releases Consortium Report on LED Street Lights

The U.S. Department of Energy (DOE) has published the final report from a demonstration of LED technology in ornamental post-top street lights, conducted in Sacramento, CA. This report provides an overview of the evaluation of four different LED replacement products using computer simulations, field measurements, and laboratory testing.

In this pilot project, the study was restricted to lamp-ballast retrofit kits and complete luminaire replacements that would preserve the daytime appearance of the existing acorn-style luminaires. This challenge proved formidable, as the results indicate that none of the LED products evaluated could match the performance of the existing 100W HPS luminaires. To allow for apples-to-apples economic comparison, the pricing and input power of the LED products were scaled proportionately to represent

hypothetical products which would match the HPS light levels.

Energy used by three of the "scaled-up" LED systems ranged from 63 to 90 percent of the baseline HPS-the fourth product would actually increase energy use by 15 percent-and none of the products would represent cost effective alternatives to HPS. In response to recent industry developments, the study also investigated the relative significance of mesopic multipliers offered in the new IES Lighting Handbook and the lumen maintenance extrapolation methodology offered in the new IES TM-21.

This pilot project is the first in a series conducted by the DOE Municipal Solid-State Street Lighting Consortium, which serves as an objective resource for LED product evaluation and a repository for valuable field experience and data. The report highlights some of the critical nuances involved in LED product selection, and data generated from this project may be useful to standards groups, manufacturers, and those considering retrofits to LED.

To view the full report see:
http://apps1.eere.energy.gov/buildingspublicationspdfs/ssl/2011_gateway-msslc_sacramento.pdf

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LRC Study Challenges Claims that Satellite Images of Outdoor Lighting Predict Breast Cancer Incidence

A recent study conducted by the Lighting Research Center (LRC) at Rensselaer Polytechnic Institute found that satellite images of outdoor lighting are unrelated to actual light levels reaching the eye. These results challenge previous studies linking satellite images of outdoor lighting with increased incidences of breast cancer. Light entering the eye regulates our body's circadian rhythms, and disruptions in these rhythms may lead to serious health problems such as cancer. However, according to the LRC study, the spectrum, quantity, and duration of light exposure reaching the eye must be specified in order to determine the effects of light on human health, and satellite photometry cannot do this.

"After shift work was identified as a probable carcinogen by the World Health Organization, some studies were published that claimed a statistical association between light at night and the incidence of breast cancer. However, these studies relied on satellite photometry and subjects' self-reports of bedroom brightness as measures of light exposure. None of these studies employed actual light measurements at the eye," said LRC Director and principal investigator Mark Rea, Ph.D. "Before statistical associations between light at night and disease can graduate to a cause and effect relationship, it is necessary to measure the light as a potential causal agent. Our study showed no relationship between the measured light on the ground and the measured light in space."

Scientists at the LRC are among many groups who have been working to identify factors, such as circadian disruption, that may lead to the higher incidence of breast cancer among rotating shift nurses. Patterns of light and dark are the main cues for synchronizing our internal biological clock with the 24-hour solar day, keeping us "in synch" and contributing to good health. These light/dark cues must, however, reach the retina, the back part of the eye, in order to have an impact on our circadian rhythms, according to Rea.

Link:
http://www.lrc.rpi.edu/resources/newsroom/pr_story.asp?id=210

Load-Shed Ballast System Field Test Results Published

It can be challenging and expensive for electric utilities to balance supply and demand during peak periods, for example during summer-time heat waves in New York State. The utilities seek cost effective, automated, and reliable ways to reduce the demand (demand response) in order to avoid expensive generation plants, distribution and transmission infrastructure. Commercial building owners are considering ways to reduce electricity costs and curtail usage during times of peak electric loads. Lighting in many commercial buildings can be temporarily reduced to lower electric load without impacting productivity. Until recently, that strategy involved turning off banks of lights manually or through a complicated wiring system. The Lighting Research Center (LRC) at Rensselaer Polytechnic Institute has released a new publication detailing field test results for a load-shedding ballast system for fluorescent lighting commercially available. This system enables a building to easily and effectively step-down lighting, as needed during times of peak electric demand, without the need for costly wiring or wireless communications typical with more sophisticated lighting control system.

"The objective is to demonstrate how reductions in commercial lighting loads across multiple sites can have an impact on peak electric demands," according to Jeremy Snyder, LRC's Manager of Lighting Programs.

Study Findings

- Demand-reduction goals were achieved, confirming that the load-shedding ballasts operated as designed. Speed of the ballasts shedding response was near-instantaneous.
- Electricians characterised installation of the load-shedding ballast system as straightforward.

- Remote activation and feedback of the load shedding systems via the Internet operated as intended.
- Most building occupants indicated they had sufficient light levels to perform their assigned tasks. There was no significant change in the perception of lighting quality or quantity as related to performance.
- Specialised operations where illuminance levels are critical, such as precision machining areas, may not be suitable candidates for temporarily reduced lighting levels.
- The most advantageous economic outcome is a potential reduction in a customer's demand billing.
- The load-shedding ballast system can provide a reasonable economic return for new construction as well as when replacing older T12 lighting systems. However, the economic return when replacing existing, efficient T8 lighting systems may exceed most customers' economic criteria.

The load-shed system is most economical in buildings with large numbers of high-wattage fluorescent fixtures on relatively few circuits.

For complete details, access the Field Test DELTA: Demand Response, Load-Shedding Ballast System publication online at

Link

http://www.lrc.rpi.edu/programs/DELTA/pdf/DELTA-LoadShedBallastSystem.pdf.

MEMBERSHIP APPLICATIONS APPROVED BY GOVERNING BODY

New Members Admitted on 22nd December 2011

M. No	Name & Addresses	Grade	Centre
I.0158	Fulham India Pvt Ltd 01, Sukhada Bldg, Ground Floor Sir Pochkhanwala Road, Worli Mumbai 400 030	Institutional	Mumbai
IM.0158	Gautam Moti Malkani Fulham India Pvt Ltd 01, Sukhada Bldg, Ground Floor Sir Pochkhanwala Road, Worli Mumbai 400 030	Institutional Representative	Mumbai
S.0625	Surendra Patidar Main Road, Kotada Bujurg Teh Garoth, Dist Mandsaur Madhya Pradesh 458 880	Student	Rajasthan
S.0626	Sushil Kumar Bairwa 15, Kalyan Colony Dudu road, Barijdal Nagar Malpura (Tonk) Rajasthan	Student	Rajasthan
S.0627	Vedprakash Gupta B-89 Ranjeet Nagar, Alwar Rajasthan	Student	Rajasthan
S.0628	Vipin Kumar Sharma C-5 Nandpuri Sodala Jaipur	Student	Rajasthan
S.0629	Vishal Taneja V.P.O. Chu Dist-Sri Ganganagar Rajasthan	Student	Rajasthan
S.0630	Yogendra Singh VP Barahmaphi, Tehsil Roopwas Dist Bharatpur Rajasthan	Student	Rajasthan
S.0631	Yashodanandan Gauttam Near Saint Francis School Mahkulan Jawahar Colony, Gangapur City Dist Swai Madhopur Rajasthan	Student	Rajasthan
S.0632	Manish Kumar Dhaka Neelam Tent House Maan Nagar, Road No 2 Jhunjhunu Rajasthan 333 001	Student	Rajasthan
S.0633	Mayank Bansal 401 A New Model Railway Colony Izatnagar Bareilly Uttar Pradesh	Student	Rajasthan
S.0634	Mayank Kumar Awasthi 54, Green Nagar Durgapura Jaipur	Student	Rajasthan
S.0635	Nowreena Shakdwipee F - 122 Hiran Magri, Sec - 14 Udaipur Rajasthan	Student	Rajasthan
S.0636	Pragya Sethi Sethi Hospital Jani Shopping Centre Station Road, Dhanera (B.K.) Gujarat	Student	Rajasthan
S.0637	Prashant Kumar Sharma Shubhlaxmi Mills, Behind High School Gangapur City, Dist Sawai Madhopur Rajasthan 322 201	Student	Rajasthan
S.0638	Rohit Verma P. No. 140, Vardman Nagar A Nirapura, Ajmer Road Jaipur	Student	Rajasthan
S.0639	Sawan Garg Ratan House, Moti Mahal Nagira Bagh Ajmer	Student	Rajasthan
S.0640	Shivangi Khadiya 42 Santosh Nagar Ajmer Road Jaipur	Student	Rajasthan
S.0641	Shivangini Trisal 14 A Shiv Nagar Nivaru Road, Jhotwara Circle Jaipur 300 012	Student	Rajasthan
S.0642	Shivani Mathur D 44 Chomu House, C Scheme Jaipur	Student	Rajasthan
S.0643	Shubham Jaiman Punch Mukhi Balaji Road Near Bus Stand Surya Hotel Jhalawar Rajasthan	Student	Rajasthan

S.0644	Supriti Room No. 406 Gayatri Girls Hostel II Poornima College of Engineering Sitapura Jaipur	Student	Rajasthan
S.0645	Prital Pravinbhai Vachhani Digjam Circle, Khodiyar Colony Opp. Friends Hall, Jaisar State "Maa" Jamnagar Gujarat	Student	Rajasthan
S.0646	Vikas Choudhary Rajawas Sikar Road Jaipur	Student	Rajasthan
S.0647	Vikas Kumar Jangid Near Power House Ganesh Gung Road Toda Bhim (Karauli) Rajasthan	Student	Rajasthan
S.0648	Vikash Kumar Sharma Mantri Krishi Farm, Near Power House V.P.O. Didwana, Teh. Lalsot Dist. Dausa Rajasthan	Student	Rajasthan
S.0649	Yogendra Kumar Near Nagar Palika Bhusawar, Bharatpur Rajasthan	Student	Rajasthan
S.0650	Amit Kumar Yadav Poornima Inst. of Eng. & Tech. Room No. 115, GS 1 PIET Campus, ISI 2, Sitapura Jaipur	Student	Rajasthan
S.0651	Chitrakshi Jaiswal 1615, Khijron Ka Rasta Indra Market Jaipur	Student	Rajasthan
S.0652	Deependra Singh Kushwaha C/o Narendra Singh Vill. Nangal Jhamar Wara, Post Biwai, Teh.Baswa, Distt.Dausa Rajasthan	Student	Rajasthan
S.0653	Deepesh Upadhyay C/o Shivcharan Sharma Village & Post Baler Teh. Khandar, Dist. Sawai Madhopur, Hapur Rajasthan	Student	Rajasthan
S.0654	Gourav Kumar 12-B, Peeth Ka Bas Ram Dev Road, Pali Rajasthan	Student	Rajasthan
S.0655	Hitesh Hirani Sri Ram Darbar G.T. Road, Etah U.P. 207 001	Student	Rajasthan
S.0656	Indrajeet VPO Ramgarhi Teh. Nohar, Dist.Hanumangarh Rajasthan	Student	Rajasthan
S.0657	Jagrat Gupta C/o Dilip Kumar Gupta Near Amardeep Palace Hotel Nai Abadi, Banswara Rajasthan 327 001	Student	Rajasthan
S.0658	Avantika Sharma Raza Bazar, Hanuman Nagar Jehanabad Bihar 804 408	Student	Rajasthan
S.0659	Harishankar Khari C/o Ramniwas Gocher 2-H-16, Rangbari Vistar Yojna Kota 324 001	Student	Rajasthan
S.0660	Himanshu Dave C/o Shri Vijaram Dave Post Bander, via.Nana Dist. Pali Rajasthan	Student	Rajasthan
S.0661	Kanhaiya Lal Aalriya Post Jhajhar, Teh. Nawalgarh Dist. Jhunjhunu Rajasthan	Student	Rajasthan
S.0662	Latoor Lal Gocher Vill. Madhorajpura, P.O. Saucloi Teh. Nainwan, Dist. Bundi Rajasthan	Student	Rajasthan
S.0663	Manish Agrawal Baba Kirani Store, Main Market Near Sabji Mandi Mahwa (Dausa) Rajasthan	Student	Rajasthan
S.0664	Manish Meena Village-Post Gagawana Teh.-Mahwa Rajasthan	Student	Rajasthan
S.0665	Mohit Yadav Village Shyampura, Post Bengna District Baran Rajasthan 325 205	Student	Rajasthan
S.0666	Murlidhar Choudhary Devaram Chaina Ram Krishi UPJ Mandi Shop No. 84 Nokha Mandi, Bikaner Rajasthan	Student	Rajasthan
S.0667	Pradeep Sagar 37, Dilip Nagar, Lal Sagar Jodhpur Rajasthan 342 026	Student	Rajasthan
S.0668	Rahul Garg Ram Vihar Colony, Ward No. 29 Kotputli Jaipur 303 106	Student	Rajasthan
S.0669	Raj Kumar Sharma Vill. Sujanpura, Post Sharakher Teh. Todabhim, Dist. Karauli Rajasthan	Student	Rajasthan
S.0670	Sahdev Yadav C/o Hansraj Yadav VPO Kaysa, Teh. Behror Dist.Alwar Rajasthan	Student	Rajasthan
S.0671	Santosh Kumar Godara Vill. Udnasar Teh. Shridungargarh Dist.Bikaner Rajasthan	Student	Rajasthan
S.0672	Shubham Jain N-74 Ratan Niwas Shivagi Park Road, Newai Tonk Rajasthan	Student	Rajasthan
S.0673	Shyam Agarwal Mishro Ka Mohalla Bansur, Alwar	Student	Rajasthan
S.0674	Shivam Pandey 232/ S 4, Pratap Nagar Sec-23, Oppsite NRI Jaipur	Student	Rajasthan
S.0675	Shriya Jain 6/35 Malviya Nagar Jaipur	Student	Rajasthan
S.0676	Somesh Kumar Gaurav 5, Panchwati Bungalows Society Opp. ONGC Colony Palavasana, Mehsana Gujarat 384 003	Student	Rajasthan

S.0677	Varun Chandran E-443 Vaishali Nagar Jaipur 302 021	Student	Rajasthan
S.0678	Vikash Singh VPO Kujota, Teh Kotputli Dist Jaipur Rajasthan	Student	Rajasthan
S.0679	Vineet Kumar F-9/424, Chitrakoot Nagar Near Vaishali Nagar Jaipur	Student	Rajasthan
S.0680	Manoj Kumar C/o Mangla Ram Chouhan V/P. Ramgarh Dist. Jaisalmer Rajasthan	Student	Rajasthan
S.0681	Neeraj Yadav VPO Palri Panihara (Dhani) Dist. Mahendergarh Haryana	Student	Rajasthan
S.0682	Piyu Purohit 19, Shiv Nagar VKIA Road No. 1 Jaipur	Student	Rajasthan
S.0683	Punit Khandelwal Ihakuria Traders, Tel Factory Area Baran Rajasthan 325 205	Student	Rajasthan
S.0684	Rajat Kumar Gupta Adarsh Colony, Mohan Nagar Hindaun City, Kasauli Rajasthan	Student	Rajasthan
S.0685	Rishabh Soni Near Shyam Mandir Tijara, Alwar Rajasthan	Student	Rajasthan
S.0686	Rupali Rana Rajni Chowk, Purnea Bihar Rajasthan	Student	Rajasthan
S.0687	Sanmit Jain 3/102, Khandu Colony Banswara, Rajasthan	Student	Rajasthan
S.0688	Aman Gulia 107, Tej Nagar Kamla Nagar Agra	Student	Rajasthan
S.0689	Anuj Kumar Singh VPO Sonyia Dist. Chapra (Sharn) Bihar	Student	Rajasthan
S.0690	Chandan Kumar H.No. 85/411, Pratap Nagar Sect. 8, Jaipur Rajasthan	Student	Rajasthan
S.0691	Deepak Garg Laxmi Khad Bheoj Bhandar Near High School Uchain (Bharatpur) Rajasthan	Student	Rajasthan
S.0692	Gaurav Upadhyay A-34, Anand Vihar Jagatpura, Jaipur	Student	Rajasthan
S.0693	Hitendra Singh Rathore 325, Kherda, RIICO Colony Sawai Madhopur Rajasthan	Student	Rajasthan
S.0694	Kapil Dev Vill. Poharka, Teh. Rawatsar Dist. Hanumangarh Rajasthan 335 524	Student	Rajasthan
S.0695	Ankit Agarwal C/o Ankit Electronics, Circular Road Bharatpur Rajasthan	Student	Rajasthan
S.0696	Ashwani Darji Maltan Mohalla Near Lal Kui Hanuman Mandir Ward No. 3 Sadulpur (Churu)	Student	Rajasthan

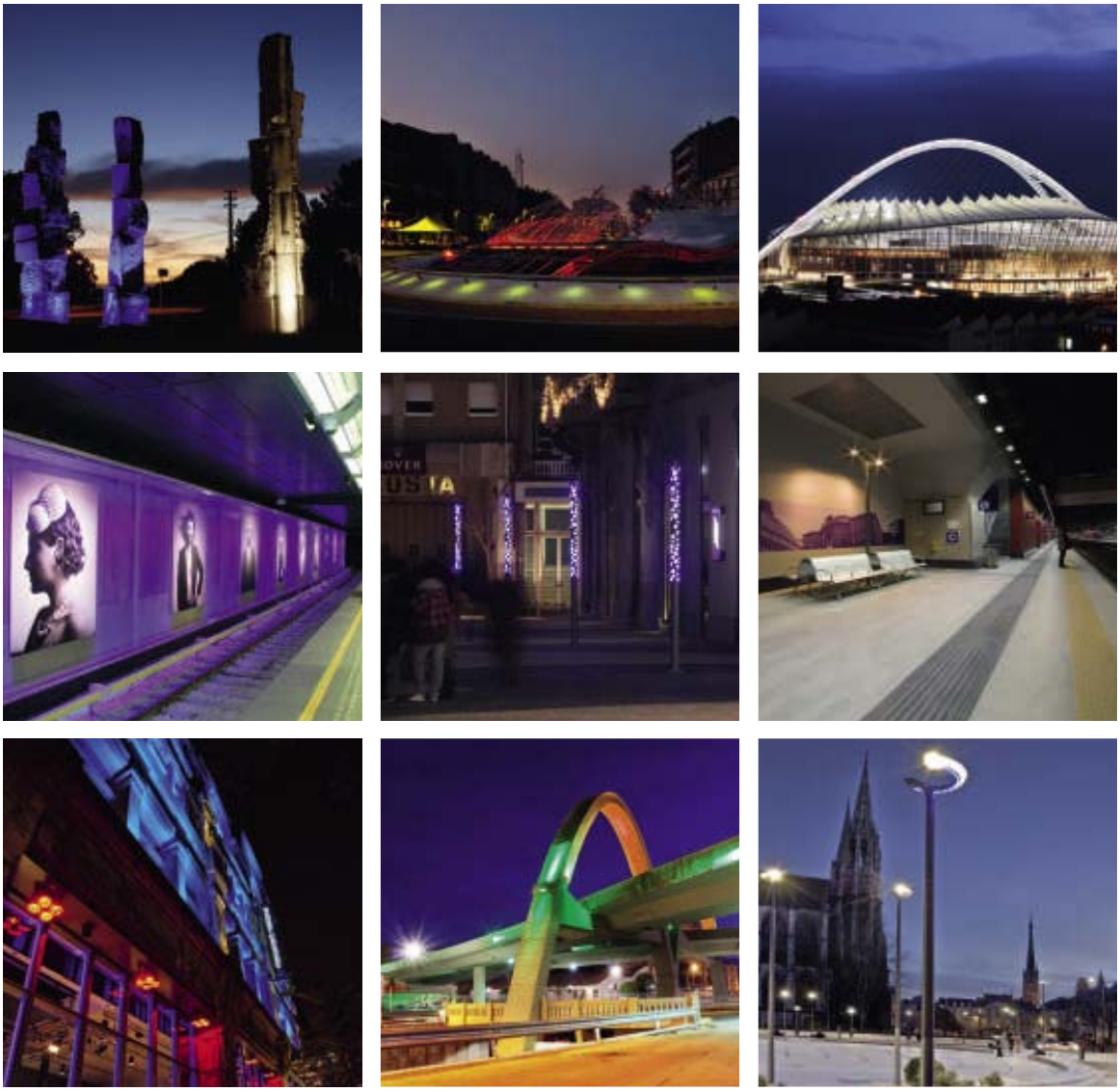
New Members Admitted on 31st January 2012

I.0159(L)	BAG Elecronics (I) Pvt Ltd Survey No. 19 Kondhwa Road Opp. Lapracy Hospital Yewlewadi Dist. Pune 411 048	Institutional	Mumbai
IM.0159(L)	Mr. Gajana Inamdar Ushawapna 277 Herambh Society Sahakar Nagar No 2 Pune 411 009	Institutional	Mumbai
I.0160	JSK Light & Building Automation Solutions Pvt Ltd. 35/1, Ahaliya Mata Colony Rani Sati Gate Indore	Institutional	M P
IM.0160	Salil Borkar JSK Light & Building Automation Solution Pvt Ltd. 35/1, Ahaliya Mata Colony Rani Sati Gate Indore	Institutional	M P
F(L).0748	Prakash H. Bhave B2/504 Sarkus Park Kalwa (W) Thane 400 605	Fellow (Life)	Mumbai
F(L).0749	Santosh Banka Banka & Associates 3rd Floor, N.H. Centre Point Opp. Bora Service Petrol Pump G.S. Road Guwahati 781 007	Fellow (Life)	Kolkata
F(L).0750	Ramendra Baishya Architects Collaborative M.R. Dewan Road, Chandmari P.O. Silpukhuri Guwahati 781 003	Fellow (Life)	Kolkata
F(L).0751	Surajit Barooa A-502, Shree Enclave Beltola Bazar Road Guwahati 781 028	Fellow (Life)	Kolkata
F(L).0752	Md. Nurul Huda A-402, Shree Enclave Beltola Khanapara Road Guwahati 781 028	Fellow (Life)	Kolkata
F(L).0753	Suresh Ranga MLR Traders 1B/10 Sindhi Colony Opp. Idgah, Brahmbagh Jalorigate, Jodhpur	Fellow (Life)	Rajasthan
F(L).0754	Anil Mehta Shanti Electricals 947, Dharam -Karam 10th "B" Road, Sardarpura Jodhpur	Fellow (Life)	Rajasthan
F(L).0755	Sudershan Kumar D-2-2406 Vasant Kunj New Delhi 110 070	Fellow (Life)	Delhi

F(L).0756	Inder Krishan Dhar Integ Electronics 59 DSIDC, Phase - II Scheme - III Okhla Industrial Area New Delhi 110 020	Fellow (Life)	Delhi
F(L).0757	Manish Kumat Abhikalpan Architects Pvt Ltd 6/7/8, Shantiniketan Colony Aanande Behind Bombay Hospital Indore 452 010	Fellow (LIfe)	M P
F(L).0758	Akhilesh Jain 82-B, Vidya Nagar Behind Sapana-Sangeeta Indore 452 001	Fellow (Life)	M P
F(L).0759	Yogesh Pahariya B5/105 Sch. No.98 Samvad Nagar Indore 452 001	Fellow (Life)	M P
M(L).1664	Umesh Verma 404, South West Block Alwar (Rajasthan) 301 001	Member (Life)	Rajasthan
M(L).1665	Hari Mohan Meena 1094, Kisan Marg Barkat Nagar Tonk Road Jaipur	Member (Life)	Rajasthan
M(L).1666	Rajan Bhardwaj 71-A, Hathroi Colony Behind Rotary Club Jaipur	Member (Life)	Rajasthan
M(L).1667	Hem Chandr Nath Engineering Section IIT Guwahati Guwahati 781 039	Member (Life)	Kolkata
M(L).1668	Kumud Barman Engineering Section Indian Institute of Technology Guwahati Guwahati 781 039	Member (Life)	Kolkata
M(L).1669	Chandana Dey Electrical Engineering Enterprise Purbi Complex R.N. 201, A.T. Road Guwahati 781 001	Member (Life)	Kolkata
M(L).1670	Samit Dey Electrodynamics Dr. B. Baruah Road Ulubari Chariali Guwahati 781 007	Member (Life)	Kolkata
M(L).1671	Patanjali Bhattacharya Flat 4B, Block A Subansiri Apartment Govt. Press Road Bamunimaidam Guwahati 781 021	Member (Life)	Kolkata
M(L).1672	Hemanga Sarma House No. 41, Joyanagar Maligaon, Guwahati 781 011	Member (Life)	Kolkata
M(L).1673	Gautam Baruwa Gautam Baruwa & Associate Nabin Bhawan Lamb Road, Ambari Guwahati 781 001	Member (Life)	Kolkata
M(L).1674	Ashanka Sarmah Design Team North Eastern House No. 11, J.B. Road Chenikuthi Guwahati 781 003	Member (Life)	Kolkata
M(L).1675	Debasish Chakraborty Designers Guild House No. 21, 1st Floor H.B. Road, Uzan Bazar Guwahati 781 001	Member (Life)	Kolkata
M(L).1676	Probhat Sarmah M & P Associates Gajanan Bhawan S.C. Goswami Road Panbazar 01, Assam	Member (Life)	Kolkata
M(L).1677	Ashok Kumar Saikia Avikalpan 3rd Bye Lane, Rajgarh Road Guwahati 781 003	Member (Life)	Kolkata
M(L).1678	Atonu Baruah Madhab Enclave (4A+B) Janakpur Journalist Path Kahilipara Guwahati	Member (Life)	Kolkata
M(L).1679	Prabal Das Associated Builders 3 Rajat Kamal Path 12th West Bylane off R.G. Baruah Road Guwahati 781 024	Member (Life)	Kolkata
M(L).1680	Arup Kumar Das Design & Development Sagarika Bhawan, Zoo Road Guwahati 781 024	Member (Life)	Kolkata
M.1681	Sandeep Bhattacharjee Nirodakutir H No. 22 2nd Bye Lane Pahartoli, Kalapahar Binovanagar, Guwahati	Member	Kolkata
M.1682	N.K. Lalwani WZ 91A, IIIrd Floor Shoe Market, School Road Uttam Nagar New Delhi 110 059	Member	Delhi
M.1683	R.K. Grover R.K. Projects Pvt Ltd 20 Main Market Moti Nagar New Delhi 110 015	Member	Delhi
M.1684	R.K. Malik R.K. Projects Pvt Ltd 20 Main Market Moti Nagar New Delhi 110 015	Member	Delhi
M(L).1685	Yashwardhan Singh Yadav M.S. Yadav & Associates 4/1 Old Palasia Indore	Member (Life)	M P
M(L).1686	Sanjay Jain Universal Transformer 254 Dhar Road Indore	Member (Life)	M P
M(L).1687	Ritesh T. Vyas Epcos India Pvt Ltd 58/1, Chhipabakhal Indore	Member (Life)	M P
M(L).1688	Prashant Soni C/o Shri Kalika Prasad Soni Sarafa Bazar Katni (Madhya Pradesh) 483 501	Member (Life)	M P
M(L).1689	Sanjay Shastri E6/68, Orera Colony Bhopal (Madhya Pradesh) 462 016	Member (LIfe)	M P
M(L).1690	Abhijit Nirkhiwale PH-1, Jagannath Apts Plot No. 115-116, Snehlata Ganj Behind Agniban Press Indore	Member (Life)	M P
M(L).1691	Shashank Kshirsagar Devita Landscope G 14-15 Indrasen Complex Jaora Compound Indore	Member (Life)	M P

M(L).1692	Monish Agrawal Monish Agrawal & Co. 5 Sitaram Park Colony Airport Road Indore 452 002	Member (Life	M P
M(L).1693	Bhushan Jain 9 B Rajendra Nagar Opp. State Bank of India Rajendra Nagar Main Road Indore	Member (life)	M P
M(L).1694	Nilesh Golwalkar HPL India Ltd 203, Milinda Manor 2 RNT Marg Indore 452 001	Member (life)	M P
M(L).1695	Vijay Kumar Jain Indian Tupex Co. FF-14 Labh Shree Complex Phattar Godam Road Indore	Member (Life)	M P
M(L).1696	Rajesh Hassanandani 405-A, Lotus Garden 26/2 Manorama Ganj Indore	Member (Life)	M P
M(L).1697	Sameer Kotwal Friends Combine 115 Sneh Nagar Near Lotus Indore	Member (Life)	M P
M(L).1698	Ajay R Jain Manglam Sales Corporation 120/221, MTH Compound First Floor, Indore	Member (Life)	M P
M(L)1699	Shailen H. Shah Siddharth Electricals 29, Lodhi Mohalla Behind Novelty Market Jail Road Indore (M.P)	Member (Life)	M P
M(L) 1700	Rajeev Bumb 48, Goyal Nagar Near Ring Road Indore 452 018 (M P)	Member (Life)	M P
M(L).1701	Preshit Jain 45-Palash Palace Bicholi Hapsi Road Near Bangali Square Indore	Member (Life)	M P
M(L).1702	K. Jagdish Breeze Electric Company Kapil Chamber 9/2 Siyaganj Indore	Member (Life)	M P
M(L).1703	Satendra Pal Singh School of Energy and Environmental Studies D.A.V.V. Khandwa Road Indore	Member (LIfe)	M P
M(L).1704	Sujata Bhagwat BW 201 Supercity Gyansheela Talawali Chanda, A.B. Road Indore	Member (Life)	M P
M(L).1705	Sachin Jayant Tilak Dynatech Engineers B-22 New Siyaganj Patthar Godown VIP Route No 1 Indore	Member (Life)	M P
M(L).1706	Vishwas Farkya VE Commercial Vehicles Ltd 101 Industrial Area No 1 Pithampur, Distt. Dhar Madhya Pradesh	Member (Life)	M P
M(L).1707	Manish Kumar Patodi G-2 Rajsheela Apartment 136 Ramchandra Nagar Ext Indore	Member (Life)	M P
M(L).1708	Deepak Kumar Pandey Flexituff International Ltd C 41-50, SEZ, Sect 3 Pithampur 454 775	Member (Life)	M P
M(L).1709	Laxmandas Girdharilal Nachwani Pratibha Syntex Ltd Plot No 15/16, Apparel Park Especial Economic Zone II Pithampur Dist. Dhar (M P)	Member (Life)	M P
M(L).1710	Sanjay Agrawal Tirupati Agencies 13, Press Complex A.B. Road Indore (M P)	Member (Life)	M P
M(L).1711	Pradeep Jain Ace Engineerings & Chemicals (P) Ltd 659/1, Rau-Rangwasa Road Industrial Area Kishkindha Dham Rau, Dist. Indore 453 331	Member (Life)	M P
M(L).1712	Amit Gupta Abhinav Enterprises 85 Ramchandra Nagar Extn Aerodrome Road Indore	Member (LIfe)	M P
M(L).1713	Anubhav Shukla 42 Royal Bungalows Nipaniya Indore 452 016	Member (Life)	M P
M(L).1714	Ashok Kumar Khandelwal Khandelwal Electric Corporation 4 Telgali Maharani Road Indore	Member (Life)	M P
M(L).1715	Bhupendra Sinha 36, 37 Manbhavan Nagar 202 Kesari Appt Kanadiya Road Indore	Member (Life)	M P
M(L).1716	Girish Kumar Geria Sun Electricals 195/3 Nanda Nagar Indore	Member (Life)	M P
M(L).1717	Rajneesh Shashikant Taose Unitech Engineers and Consultants 16, Dhenu Market Indore	Member (Life)	M P
M(L).1718	Prashant Sudhakar Joshi Flat No. 102 Panchvati Apt. 40 Chandralok Colony Indore 452 001	Member (Life)	M P
A(L).1094	Mukesh Manshani M.N. Trading Co. Pvt Ltd Plot No. 111, Aram Nagar Part 2 Versova, Andheri (W) Mumbai 400 061	Associate (Life)	Delhi
A(L).1095	Partha Pratim Bora Bora Electricals Kapur Singh Bhawan H.No. 35, Jayanagar Khanapara Guwahati 781 022	Associate (Life)	Kolkata

A(L).1096	Shyam Sharma Vikas Design 216 Phadnis Complex 88 M.G. Road Near Kothari Market Indore	Associate (Life)	M P
A(L).1097	Mahendra Kumar Jain Neolon India 567/5, M.G. Road Behind Rajani Bhawan Indore	Associate (Life)	M P
A(L).1098	Manish Shah A 3/202 Adarsh Nagar Ujjain 456 010	Associate (Life)	M P
A(L).1099	Manoj Yadav Network Marketing & Consultants 10 M.G. Road Indore	Associate (Life)	M P
A(L).1100	Abraj Verma 25 B, 203 Classic Vihar Rajendra Nagar Indore 452 012	Associate (Life)	M P
A(L).1101	Satya Dev Yadav 129 ADL Building RRCAT Indore	Associate (Life)	M P
A(L).1102	Khuman Singh Sisodiya 97 A Dindayal Upadhay Nagar Sukhliya Main Road Indore (M.P.)	Associate (Life)	M P
S.0697	Suraj Choudhary 186 Sai Kripa Colony Near Mahalaxshmi Nagar Indore	Student	M P
S.0698	Gaurav Tiwari C/o S.P. Tiwari, DIG TAC Wing, BSF Academy Tekanpur Gwalior 475 005	Student	M P
S.0699	Neha Dhongdi 36, Joy Builders Colony Rani Sati Gate Indore	Student	M P
S.0700	Nyanbeni Jami C/o P.R. Jami D.A.O. Office Wokha Town Nagaland 797 111	Student	M P
S.0701	Rekha Maida 100, Sardar Patel Marg Thandla Dist. Jhabua Madhya Pradesh	Student	M P
S.0702	Ruby Aashish Parmar 70, C-5-5 Lal Bangla Sch. No 78 Vijay Nagar Indore (M.P.)	Student	M P
S.0703	Abhijeet Bajaj C/18, Sector-B Scheme No. 71 Indore	Student	M P
S.0704	Durga Kundanmal Kumawat 54, Kailash Puri Near Bangali Square Kanadiya (M.P.)	Student	M P
S.0705	Prasad Shrirang Shendurnikar 55, Prince Yashwant Road Opp. Gandhi Bhawan Indore	Student	M P
S.0706	Ankita Upadhyay 50, Jaora Compound Rubal Girls Hostel Indore	Student	M P
S.0707	Rashmi Yadav 43 Netram Ka Bagicha Near Daly College Indore	Student	M P
S.0708	Prateek Sharma 139 Prime City Sukhliya Behind Maa Gayatri Motors Indore	Student	MP
S.0709	Yagya Yadav 56, New Dewas Road Lal Bungalow, Malwa Mill Indore	Student	M P



LED GENERATION

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