



LIGHT

the official

NEWSLETTER

of the **indian society of lighting engineers**

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FROM THE PRESIDENT'S DESK

This new year has not begun on the happiest of notes – what with the Mumbai attack toward the end of 2008 and now the revelations of the unfolding Satyam saga. The worldwide economic downturn is not showing signs of letting up just yet.

Professional bodies like ours are however, not just “fair weather” associations and in fact, we need to work harder at times like these. So let us make a New Year resolution to create time in our schedules, however busy they might be, to put in some work for ISLE.

The good news is that this can start right away. On February 20 we have the Lii2009 Conference in Mumbai organised in collaboration with another professional body IIID (Institute of Interior Lighting Designers). We need members to help spread the news and get delegates to register for the Conference. These events do not happen by themselves. A lot of time and energy goes into putting together a worthwhile programme and it is important that such opportunities are not wasted. Of course, it goes without saying that ISLE members, especially those based in Mumbai should register themselves immediately if they have not already done so.

The Conference is taking place at the Bombay Exhibition Centre in Goregaon in Hall V which is the location of the Lighting South Asia Exhibition (in collaboration with the international Expomedia group) from February 20 to 23. Let us make an effort also to encourage all those connected with lighting (designers, engineers, architects, consultants, contractors and users) to visit the Exhibition. This is the first large international Exhibition in Mumbai dedicated to Lighting. Let us make it a success.

All State and Local Centres of ISLE should do their best to promote both the events in Mumbai: LII 2009 and Lighting South Asia. The Indore Local Centre had organized a technical seminar on 17th January to promote these events. Out of the three technical presentations made in Indore

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two were from the local design/consultant/architect fraternity and the third one was my presentation. The meeting, which was presided by the Chairman of MP Chapter of the Indian Institute of Architects was attended by some ninety persons. I suggested to the audience that we all have to go to Mumbai for some reason or the other in any case and so they should plan the next trip to Mumbai to be at LII 2009 on 20th February.

Other collaborative efforts are also scheduled for this year. The 6th Lux Pacifica Conference is taking place in Khabarovsk, Russia in April this year. ISLE is a member of Lux Pacifica and I would urge those of you who can to attend this Conference. It is unfortunate that there will be only 2 papers from India at this conference.

ISLE is also supporting the second Professional Lighting Design Convention taking place in Berlin in October this year. With so much lighting activity taking place in India, it would be great to have participation from India in the programme. See page 26 for details.

For some time now I have been encouraging members to send us case studies and technical articles for publication in the newsletter. You could consider this also as part of your new year resolution!

In addition to these activities I am hopeful that we will observe this, our Silver Jubilee year with enhanced activity at all State and Local Centres. I can therefore feel justified in signing off by wishing you a very Happy New Year indeed.

Avinash D. Kulkarni
President
dradk@hotmail.com

EDITORIAL

The first big International Lighting Exhibition is coming to Mumbai next month. From the floor plan on page 5 you will see the positive response from both domestic and international exhibitors. I look forward to seeing you there.

You will also see that there is an exciting conference programme at Lii2009. Register now and take advantage of the concessional fee for members. Spot registrations will attract the full fee.

You will find a report on the Vision 2010 Conference and Exhibition held in Bangalore in November as well as activities of the Local Centres in Pune and Indore.

This issue carries an article on Indoor Sports Lighting by Mr. Saumen Bhaumik which is based on his presentation at the seminar on Sports Lighting held in Delhi last September.

You will find a repeat announcement of the PLDC 2009, the second conference organized by PLDC taking place in Berlin. With the growing acceptance of lighting design as a separate and important discipline, ISLE is one of the partner organisations for this event. Those of you with an interest in design issues should participate.

In April the sixth Lux Pacifica will take place in Khabarovsk, Russia. Unfortunately there will be only two papers from India, but it is still not too late to register and attend.

Also in this issue, we are covering some more of the IALD prize winning projects in 2008. I would like to reinforce the President's request for sending us technical articles on outstanding lighting projects for publication.

As always, there are several items of interest in the WebWatch column.

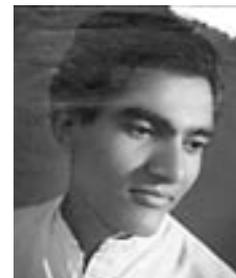
H.S. Mamak
Editor

OBITUARY

Jayantilal D. Mahidharia

July 30, 1930 - Nov 9, 2008

Born in 1930 in the small town of Rajkot, Gujarat, Jayantibhai came from a family of skilled craftsmen. His schooling and college at Gandhian Institutions in Rajkot and Navsari was cut short due to the severe financial hardship and political upheaval of the late 40's. He participated in Gandhiji's Satyagraha Movement and was jailed for his actions.



With great interest in Engineering, in his teen age years, he worked in several engineering industries as foreman in Pattern Shops, Foundries, Machine Shops and Textile Equipment Manufacturing units. This formed the practical engineering base for his career. In the early 50's, he moved to Bombay in search of better prospects.

His break came when he joined as Electrical & Electronics Engineer at Tesla Radio Co., an Indo-Czechoslovakian venture. Here he introduced many innovations in high volume production such as conveyor belts, modular work benches etc.

In those days, electronics was still a newly emerging branch of engineering, and advanced techniques of Calibration and Testing were virtually nonexistent. One of the few places to have fairly good electronic equipment was the St. Xavier's Institute at Mumbai. The person in charge at St. Xavier's was Abid Kagalwala, Professor of



With Tapas Sen at Prakash'99

Electronics. Jayantibhai used to visit St. Xavier's very often and a strong bond was developed between the two. Their relationship lasted a long, long time.

In 1955, Mr. Kagalwala asked him to join as Chief Engineer in his company, General Industries, which manufactured Light Fittings, Chokes and other electrical accessories. This was the beginning of his career in Lighting, which has spanned more than half a century.

During the early years, he handled many National Projects on Lighting, handling design and installation, as well as developing many new designs in Lighting Fittings. Jayantibhai was associated with many other pioneers of the fledgling Lighting Industry of the 50's such as Premier Lighting Industries, Daylight Industries and B. Choudhary & Co. Many innovations came about, such as Instant Start Ballasts, Acid proof holders for light fittings, Open type Ballasts, 5kW Mercury Vapor Lamps etc. as well as projects such as HAL Plant, Ojhar, Kuwait University, Nyveli Lignite and others.

Later as Partner in Anchor Electricals, Jayantibhai worked tirelessly to produce high quality products, thereby creating a strong foundation for the future of the Anchor brand.

In the late 70's, he became an independent Engineering Consultant. His first client was Crafts-de-Fluorescent.



At the 1995 CIE Session with CIE President, Robin Aldworth and PKB.

Strengthened by Jayantibhai's presence, the company tendered a bid for erecting the Lighting System for the prestigious Kudremukh Iron Ore Co., and won the contract against stiff competition from the biggest brands in the Lighting Industry.

By 1978, he felt the need to start a company of his own. This was one of the toughest periods in his life, and with the unconditional support of his wife, Bindu, he started Lumetronics, the name derived from his two greatest passions, Lighting and Electronics. During the initial years, Lumetronics produced various Lighting Products under sub-contracts. However, he felt a great lack of Testing for these products, and slowly started producing a range of in-house Test equipment to ensure the quality of the end products. These were initially meant for internal use, but as more and more companies got to know of the availability of such Test Equipment, orders started coming in. Over a short period of time, contract manufacturing was completely stopped, and full scale production of Test Equipment taken up. Lumetronics now has customers worldwide.

An avid Amateur Radio operator, handle VU2JDZ, he provided yeoman service during the wars in the 1960's as well as during the "Emergency". All of his radio equipment was "home-brew" built by himself. He was also an avid Aviator and in 1964, he made a solo flight in a single seater plane from Mumbai to Surat.



Accepting a lifetime achievement award at Vision 2004

He was the Founder and Fellow Life Member of the ISLE - F(L)002 and held office as a Governing Body member of the Society as well as Chairman of the Bombay State Centre. He was also a member of the Optical Society of India, the Society of Reliability Engineers, the Standards Engineers of India, among others.

Jayantibhai is survived by his sons Anool and Dharwal. ISLE shares their loss and offers them its heartfelt condolences in their bereavement.

ISLE ACTIVITY

Lighting South Asia

February 20 to 23, 2009, Mumbai

The Lighting South Asia exhibition, the first large International lighting exhibition in Mumbai is just around

the corner. Nearly 100 exhibitors from Italy, Germany, Spain, Portugal, China, Taiwan, Singapore, Malaysia, Korea and of course, India will be there at the Bombay Exhibition Centre in Goregaon.

If you visit the exhibition website www.lightingsouthasia.com you can optimise your time by checking out what will be on display and fixing meetings and appointments ahead of time.

Since exhibitions on this scale can be held only periodically, especially for those of you based in Western India, take advantage of this event. While there will be advertisements in the press and spots on the radio as well as outdoor advertising in Mumbai, it is important that members spread news of the event to all those with an interest in lighting.

The exhibition will be open from 10 am to 6 pm on February 20, 21 and 22 and from 10am to 2pm on February 23.

Light India International 2009 Conference

February 20, 2009, Mumbai

The common interest of ISLE and IIID to educate the consumer and propagate good engineering and aesthetic practices and designs makes for a natural bond. It is for this reason that the two organisations have joined hands in organising the Light India International 2009 Conference.

The Conference aims at a high level of practical experience and information sharing. There will be three sessions which will be devoted entirely to subjects which are of the greatest interest to lighting designers and users. The approach of the sessions will be practical case studies and experience rather than the theoretical approach.

LEDs The world famous specialists in the practical applications of LEDs with one of the largest futuristic design kitchens, Color Kinetics will lead this session. LEDs are still somewhat of a mystery and therefore this session is likely to appeal to architects and designers in particular who are increasingly called upon to offer LEDs in view of their tremendous energy saving and versatile characteristics. Mr. Nigel D'Acree, Director Marketing and Market Development for SSL Luminaires of Color Kinetics will make this presentation.

Infrastructure Project: The second session will be a case study of a large multi-disciplinary project where L&T with its architects, consultants, and project team will make a presentation on the challenges they face for the Delhi Airport Project and how they are materializing it to international standards. This project covers the terminal building, shopping arcade, hotel, street lighting, flood lighting etc.

The Future This session will be by Mr. Behr Champana, Sr. VP of TVS (USA) which is one of the largest Architecture Companies in the World. Mr. Champana is an architect who has been involved in multi-disciplinary architectural projects in several countries of the world. He is presently stationed in Dubai where he is involved with the entire Middle-East which has become the hub of futuristic monuments and projects. His presentation, "Future Shock: Bright Lights, Big City" will consider how innovation in lighting technologies will be shaping our perception of the sustainable cities and architecture of tomorrow. He will also focus on the way we should NOT be designing our urban cities and the need to move away from light pollution and further develop innovative sustainable solutions. His vision of the Future of Lighting and from an architectural point of view will be of immense interest to lighting designers and large consumers in India who are under great pressure to align themselves with international developments and to bridge the gap to an increasingly demanding future.

Lii2009 will be the largest Lighting Conference ever held in Mumbai and has incorporated sufficient time in the programme for effective interaction between the experts and the participants, providing a great opportunity for anyone with an interest in lighting to update themselves.

The Conference is being held at the same venue as the Exhibition providing delegates with an opportunity to visit the stalls.

Registration Fee

ISLE/IIID member	Rs. 1500
Non member	Rs. 2000
Block booking (Min. 10 persons)	Rs. 1200 (each)
Student (Min. 5 through college)	Rs. 500
Spot booking	Rs. 2500

The conference fee includes the conference kit, lunch, morning and afternoon tea, exhibition visit and an invitation to a cocktail dinner on the 20th evening.

The payment should be made by DD/banker's cheque payable at Mumbai in favour of "ISLE-IIID Lii'09" and sent to the address given below.

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Education Committee

Visit to USA by Prof. S. Mazumdar

Dr. Saswati Mazumdar, Professor of Dept. of Electrical Engineering and Director, School of Illumination Science, Engineering & Design of Jadavpur University, and Director Education Committee, ISLE, went to Piedmont Virginia Community College (PVCC), at Charlottesville, USA from October 6-17 on the VACIE-JU exchange programme and there she was hosted by Ms. Valerie Palamountain, Dean of Workforce Services at PVCC.

Prof. Mazumdar delivered the following lectures to the student and staff of PVCC at their request :

- a) Lighting in non-electrified villages.
- b) Education in Jadavpur University.
- c) Activities of School of Illumination Science, Engineering & Design (SISED).
- d) Engineering Education in India.
- e) Vocational Course on Wiring and Lighting in SISED.
- f) Rabindranath Tagore and Indian Music.
- g) Modern Indian Dance based on Indian Classical Dance.

During her stay, Prof. Mazumdar, went to Troy, NY to visit Lighting Research Centre, RPI, USA on October 13 Prof. N. Narendran, Director of Research, Prof. Joan Paul and their team provided all the hospitality for her stay.

There she had thorough discussions with Prof. Frering, Manager of Education. They exchanged their views on Lighting Education System in their respective countries and had discussions on the detailed syllabus. LRC is now running two Master's Courses:

1. One year Master in Architectural Science.
2. Two year Master of Science in Lighting.

Any student from a foreign country seeking admission should apply before January of each year with GRE & TOEFL score and with recommendations from referees. If any teacher from an Indian institute wants to work in LRC, they should stay at least 2-6 months, otherwise it would not be effective for LRC.

There is a four year Ph.D programme also, and if any M.E. degree holder from India wants to join, he/she should complete 68 credits instead of 90 credits as coursework.

There are three on-line web-based courses offered from LRC, each course costs only \$125. The courses are:

1. Lighting Terminology.
2. Lighting Technology and,
3. Residential lighting Design.

There are some publications (of Delta Program) offered free from the LRC website, in which the previous projects taken up by LRC have been thoroughly described.


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INDORE LOCAL CENTRE

Technical Programme

January 17, 2009, Indore

A Technical Program specifically to promote the Lighting South Asia Exhibition and the Lii2009 Conference was arranged at Indore on January 17 by the Indore Local Centre of ISLE.

After a brief Welcome Address by Mr. Dileep Dharkar, Chairman of the Indore Local Centre, a Technical Presentation entitled "From Mercury Vapour Lamps to Metal Halide Lamps : A Technological Journey" was made by Dr. Avinash D. Kulkarni, President of ISLE. This was followed by "Aesthetic Preoccupation with Light," a slide presentation by Ar. Shreya Bhargava in which she described how with the help of artificial lights, the aesthetic appearance of any structure can be enhanced.

At the end, "Thank you Mr. SUN (Surya) for not sending the bill for its usage" with these words Mr. Dileep Dharkar made an informative presentation on Energy Management in Buildings through Lighting. The presentations were followed by an interesting Q&A session.

Senior Architect Lawkesh Tiwari, Chairman, M.P. Chapter of Indian Institute of Architects was the Chief Guest for the Programme, which was attended by more than 90 participants from a wide cross section of Professional Lighting interests. Appreciating the programme, Mr. Tiwari mentioned that at Indore, ISLE and IIA were working hand-in-hand for lighting related activities. On this occasion Dr. Kulkarni was also felicitated on his being elected as the President of ISLE for 2007-11.

Complimenting the ISLE-ILC Team for such a good programme, Dr. Prakash Brajatia, Chairman, ISLE, Mumbai State Centre made an informative presentation on the objectives of ISLE as well as on the forthcoming exhibition and Lii2009 Conference. He appealed to all those present who were not members of ISLE, to become members.

At the end Dr. Kulkarni urged all lighting professionals, architects and interior designers to visit the exhibition and participate in Lii2009. During the Vote of Thanks, Mr. Akhilesh Jain, Hon. Secretary, ISLE-ILC thanked Dr. Kulkarni and Dr. Barjatia who came from Pune specifically for the program.

Dr. Prakash Barjatia
Chairman, ISLE
Mumbai State Centre

A few students and researchers, e.g., Ms. Oindrila Hazra of India, Ms. Amela, the Fulbright scholar from Bosnia, Mr. Ranjith Kartha of India spent a lot of time with Prof. Mazumdar during her stay. Oindrila and Amela are working with LEDs under the guidance of Prof. Narendran. Ranjith is working with Light and Health under the supervision of Prof. Ms. Mariana Figueiro.

Prof. Narendran took Prof. Mazumdar to visit the laboratories of LRC and spent quite a few hours showing her the different laboratories including life testing laboratories of CFLs and LEDs and the Solid state lighting research laboratories, where one Chinese lady Ph.D student has almost completed her work. LRC is conducting extensive research on the following topics - Efficient phosphorus for white LEDs; LED Thermal Management Using Nanomaterials; Investigating the optical properties of phosphor to improve white LED performance ; Investigator of PV-LED lighting system for airport runways; Evaluation of runway guard light; An energy efficient LED lighting module for PV- Powered lighting systems; Advance Energy efficient LED lighting for residential and commercial Lighting Applications; Novel Micro lens materials for Beam control in Thin profile LED Luminaries; Electronic walls and Ceilings offer Adaptable Solid state Lighting; Materials and measurements procedures for LED Lighting Systems; Developing method to improve the detectability of LED fixtures with IR camera. The laboratory where research on Light and Health is being conducted was also shown to Prof. Mazumdar.

It is understood that as 96% of the revenue of LRC is earned from Partners (Business Organisations) and Collaborators (only 4% from University funding), the staff are too busy for long duration collaborative programs with foreign countries. For taking short workshops, the staff of LRC would visit India if ISLE organizes it. From LRC they regularly visit other countries like, China, Korea, Taiwan, Brazil, Philippines on request as part of their Outreach program.

LRC is ready to train groups of industry people / faculty members in USA for 2-3 weeks. ISLE may think over that and send some willing participants to join such a programme (as was organized in 2002).

With funding from USAID and with Japanese collaboration, LRC is planning to open one Centre for seven South-East Asian countries as part of the SAARI programme. That centre would be physically located in Sri Lanka, where the Government. has agreed to provide all the facilities and space there. ISLE should take the major role for participating in that programme from India.

Dr. Saswati Mazumdar
Chair, Education Committee

PUNE LOCAL CENTRE

Technical Program on Metal Halide Lamp for Head Lights

October 17, 2008

ISLE Student Chapter MITSOL Pune

The subject program was organized by MIT School of Lighting & Management Studies (MITSOL) Pune - ISLE Student Chapter on Friday, 17th OCT, 2008 at MIT, Pune. Following the welcome address by Mr. Avinash Chandra, Student, Dr. Prakash Barjatia, Director, MITSOL gave a brief on the activities of the Chapter, and also about the Program. After felicitation of Guests and Speakers, the Program was inaugurated by Mr. Abraham Mathew, Associate Vice President - Engineering, Varroc Engineering Pvt. Ltd., Pune, who was the Chief Guest for the function. During his inaugural address he appreciated the initiative taken by MIT Group of Institutes for starting such Industry Oriented Programmes.



Dr. Kulkarni addressing the audience

Subsequently a Technical Presentation on Metal Halide Lamp for Head Lights was made by Mr. Felix Eigenheer, a well known expert in the field of Metal Halide Lamps from Switzerland. He explained in detail the various processes involved in the manufacture of the lamps. His presentation was supplemented by Dr. Avinash Kulkarni, President ISLE who is also an expert in this field of Metal Halide Lamps.

After the Q & A session, a vote of thanks was given by Mr. Dibyalochan Pradhan, Student. The Program was coordinated by Mr. Shekhar Vats Student Representative, and the introduction of the Guests and Speaker was given by Ms Rakhi Priyadarshani, Student. The Program was attended by 30 Students and 15 participants from Industry.

Shekhar Vats
Student Representative
ISLE Student Chapter MITSOL,Pune

KARNATAKA STATE CENTRE

Vision 2010 - International Conference & Exhibition on Lighting

November 21-23, 2008

Vision 2010 was organised by ISLE KSC around the theme of better Lighting with less energy and least impact on environment and emerging opportunities for lighting applications from new developments, Carbon Trading and Clean Development Technologies.



Dr. Ajay Mathur, Director General BEE inaugurating the Exhibition.

Light, Energy and Environment are the buzz words regulating most of the decisions today. Light, which is basic to all activities is closely related to Energy and Environment. Today, with the growing awareness of the impact of indiscriminate use of energy on the environment, new issues of caring for the environment and conservation of energy have emerged. Many of these issues and in particular the opportunities and impact of Carbon Trading and Clean Development are the topics of the day. However, the details are not clear and often vague. This program was aimed at removing the grey areas and bringing clarity.

Lighting users and the Lighting Industry are both interested in knowing more about these issues. While the buzz word today has become GREEN, the Green Building guidelines and LEED do not give a proper weightage or importance



Mr. Sanjay Jadhav, Chairman ISLE, KSC

to lighting, as they are oriented towards the American conditions. The weightage given in LEED or IGBC rating system is a meagre 3 points for residential buildings and 7 points for a new commercial buildings.



Mr. K.K. Rohatgi being felicitated

Greater importance for lighting from the aspects of energy and environment arises in India, as a consequence of the acute shortage of power and in particular the inability of our power systems to meet the peak demand - and the one element of peak demand which can be controlled very easily and effectively comes from lighting.

The two day conference discussed at length the issues in this framework. This program had fifteen domain experts from various related fields to give information and discuss the available opportunities.

Developments in Lighting are taking place at a very fast pace today. While there are problems due to acute shortage of energy, there are solutions to provide even better lighting conditions with less energy. Even though Lighting energy consumption, is of the order of 17% to 23% of the total energy consumption, energy consumed for lighting attracts attention as this demand comes during the peak load.

An Integrated approach for problem solution is another area of interest. Lighting companies or lighting designers cannot work in isolation in their own compartment today. An Integrated team approach covering architecture, HVAC, non-conventional or renewable energy, efficient controls and remote control are also areas of interest. Integrated approach is leading to the concept of Green Buildings, which is finding a growing interest.

Developments in Light Emitting Diodes (LEDs) is taking place in different directions at different places and consolidation as well as building synergy in the R&D effort is very necessary. LEDs appear to be the most promising energy and environment saver in the next decade.

On the application side, India has been on the path of the highest ever rate of development of infrastructure and Lighting is an essential element in all these activities. Street Lighting, City Beautification, Tourism development on the one side, and Retail Lighting and Medical applications on the other attracted the attention of the participants. Sports Lighting, Lighting in airports, sea ports and other

transportation terminals are all of importance from the aspect of giving the best and most comfortable visual impact to the consumer with the least impact on the energy front.

Apart from the focus on urban areas, the importance of lighting in rural areas (which do not have grid power or are subject to severe cuts) was also highlighted in the demonstration project by Mr. M.S.N. Swamy, who demonstrated a LED lighting system that is



Mr. Swamy demonstrating LED lighting with cowdung

based on Cow Dung as the source fuel. The system could bring relief to a large number of rural households and spare them the ills associated with kerosene lamps and also help in reduction of the CO₂ production.

Dr. Ajay Mathur, Director General BEE brought out the economics of the CO₂ and CDM schemes and explained the objectives of using the carbon trading route to subsidise the CFL lamps and LED lamps so that the common man can switch over to these with a low additional investment. Schemes are being worked out with ESCOMs and KREDEL.

Developments in electronics and computing have made available tremendous power at low cost, enabling us to provide sophisticated monitoring and controls even in small and medium installations, which were till recently were affordable only by large chemical industries or power plants etc. Building Automation, automatic and programmed lighting controls, remote central monitoring of external lighting are areas witnessing rapid development. But the developments are in isolated pockets. Vision 2010 aimed at building a platform for exchange of information and knowledge in all these fields.

ISLE-KSC had organized a series of the training programs on Street Lighting and Outdoor Lighting, with assistance from the European Commission. This conference was conceived as an extension of that training program on the initiative of the then Chief Secretary, Shri Mahishi and the DG, BEE, Dr. Ajay Mathur. The theme of the program is convergent with the objective of the BEE.



Mr. Krishnesh Mehta

The program was attended by 434 delegates, consisting of not only engineers and architects, but also banking and financial institutions. Today the need is conservation of



Mr. K. Naveen

energy and as far as lighting is considered, the technological and manufacturing developments put us in a position to have the optimum or good lighting without increasing our energy consumption. This aspect was highlighted by Mr. Bhavani Prasad and Dr. Ajay Mathur. Dr. Ajay Mathur elaborated the success achieved so far by

the BEE in association with CPWD, starting from the Rashtrapati Bhavan and requested adoption of the ECBC by all, even though the ECBC is at present voluntary.

While the lighting industry had a phenomenal growth dependent on the high investments in infrastructure and the real estate boom over the last five years, the lighting industry is now required to change gears to cater to the requirements of the tremendous potential in the replacement and renovation aspects in existing installations. It is anticipated that the lighting industry can continue with its high growth rate in spite of the possible reduction in the real estate area.

Dr. Mathur explained the new methods of renovation through the ESCO (Energy Service Companies) scheme which will analyse the existing installations and take up renovation with energy efficiency. The ESCOs will be paid out of the reduction in energy consumption. The principles required for such operations like measurement, verification and contract modalities are finalized by BEE. The Banks and financial institutions have a leading role to play in this type of operations as they would finance the initial investment component for the installation of the new energy efficient lights.



Mr. Bhavin Soonderji

The conference had brought in selected experts from Japan, Italy, Germany, Malaysia, Hongkong, China, and Indian experts from NID Ahmedabad, BIAL, Major Lighting Companies Like Philips, Crompton Greaves, GE, Bajaj, Venture, etc., for the two day deliberations. The sessions covered LED lights and Source Management, City Beautification, Retail Lighting, Airport Lighting, Controls & Automation and Sports Lighting.

Another area that got highlighted during the deliberations was the absence and/or inadequacy of the specifications for a number of new products which are available. The development of standards and codes by the Bureau of Indian Standards is a process which inherently requires

time and also consensus. ISLE as a professional body without any sectorial bias may well fill the need by developing the specifications for the new devices.

Dr. Mathur also brought out the need for a third party assurance for the efficient products, which may be more expensive.

While the Star rating being given by BEE is a step in this direction, there is need for information dissemination and education or updating the knowledge of even professionals of different disciplines such as engineers, architects, interior designers and it was considered necessary that ISLE should take up the cause.



Mr. Richard Taylor



Mr. Saumen Bhaumik

The exhibition was a showcase of what the scenario will be in the next couple of years in street lighting, home lighting, and affordable automation at home and in offices. Many forward looking lighting companies have brought their products to the exhibition which was

open for three days including the Sunday November 23, which brought in a large number of visitors. Even though the entire event was focused at professionals from manufacturing, application developers, users, designers, associated traders, dealers, distributors, the exhibition attracted a number of general users as well. The most common enquiry was about the time frame when the exhibited energy conservation lighting products would be available at competitive prices in the market.

The whole event was Sponsored by GE, Crompton, Anchor, Philips, Bajaj, Nichia, Venture, K'Lite, Light Form Marketing, BESCO and KPTCL. The Event was supported by Government of Karnataka, Ministry of Energy, International Council of Consultants, Consultancy Development Centre, BEE, ELCOMA, CPWD and BBMP.



Mr. Chin Le Yan

The event was inaugurated by Mr. K. Jairaj, Principal Secretary Energy, Government of Karnataka and Presided over by Dr. Avinash Kulkarni, President ISLE. The Keynote Address was delivered by Dr. Ajay Mathur, Director General BEE. The Master of Ceremonies for the

technical programme were Mr. Bhavani Prasad and Mr. Riaz Kagalwala of Karnataka KSC.

M.S.N.Swamy
Hon. Secretary ISLE-KSC

The conference programme is given below.

Light Source Management

LED Lighting by Hiroki Oguro, Nichia Corporation, Japan
LED Lighting developments in India by K.K. Rohtagi, Binay Optoelectronics
Metal Halide Lamps by Venkateshwaran Venture Lighting

Lighting for Retail Stores

Lighting to persuade the customer, without the penalty of expensive installations or huge energy bills- by Krishnesh Mehta, National Institute of Design
Challenges in Retail Store Lighting Design for balancing Energy Economy & Performance by innovative application of Solid State Lighting with new fittings- by Sameer Dass, Philips Electronics

City Beautification

Street Lighting - case studies and analysis by K.Naveen, Bajaj Electricals
Street lighting and beautification lighting, energy management by design and operating procedures by Nilesh Naik, Philips Electronics

Lighting Controls

Innovative office lighting and Intelligent lighting controls by Praveen Thampi Ministry of Light, Hongkong
Developments and applications in ballasts and control gear for bringing in energy efficiency in lighting installations by Bhavin Soonderji, ATCO Controls

Airport Lighting

Recent Developments worldwide in Airport Lighting from aspects of energy management by Richard Taylor, Trilux Lighting, Germany
Lighting India's latest Airport - Bangalore International Airport by Hari Kumar, BIAL, Bangalore
Techniques and technology for making lighting system cost effective: Case Study comparison by Saumen Bhaumik, Philips Electronics

Sports Lighting

Sports Lighting design Analysis of the new developments in sources and fittings by Massimo Ferrari, Fael Luce, Italy.
Challenging lighting projects for sports; Case studies for renewal of installations for better performance & improving energy efficiency, by Raja Mukherjee, GE

Case Study

Chin Le Yan, Lumileds, Malaysia

Concluding Session

CIE PUBLICATIONS

CIE Standard Colorimetric Observers

CIE S 014-1/E:2006

This CIE Standard is a renumbering of ISO/CIE 10527:2007, which contained only minor changes in comparison to ISO 10527:1991. It has now been clarified that the values of the colour matching functions apply for standard air to make the Standard conform to other CIE photometric and colorimetric data.

Colours with different spectral compositions can look alike. An important function of colorimetry is to determine whether a pair of such metameric colours will look alike. It has long been the practice in colorimetry to make use of sets of colour-matching functions to calculate tristimulus values for colours: equality of tristimulus values for a pair of colours indicates that the colour appearances of the two colours match, when they are viewed in the same conditions by an observer for whom the colour-matching functions apply. The use of standard sets of colour-matching functions makes the comparison of tristimulus values obtained at different times and locations possible.

This International Standard specifies colour-matching functions for use in colorimetry. Two sets of colour-matching functions are specified:

Colour-matching functions for the CIE 1931 standard colorimetric observer

This set of colour-matching functions is representative of the colour-matching properties of observers with normal colour vision for visual field sizes of angular subtense from about 1° to about 4°, for vision at photopic levels of adaptation.

Colour-matching functions for the CIE 1964 supplementary standard colorimetric observer

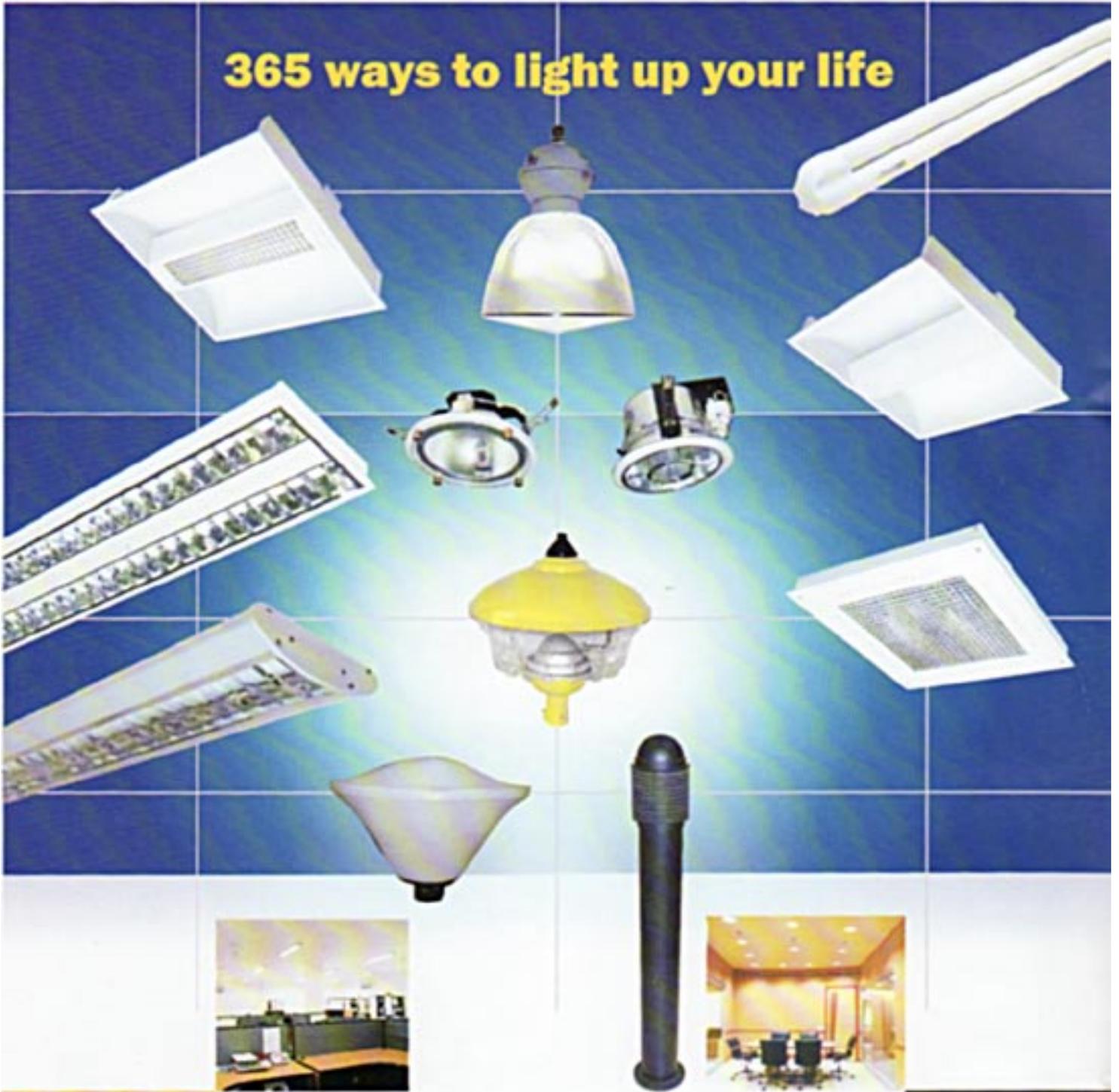
This set of colour-matching functions is representative of the colour-matching properties of observers with normal colour vision for visual field sizes of angular subtense greater than about 4°, for vision at sufficiently high photopic levels and with spectral power distributions such that no participation of the rod receptors of the retina is to be expected.

The values in the tables of the colour matching functions and chromaticity coordinates of the CIE 1931 and 1964 standard colorimetric observers are identical with those in the previous standard.

This standard has been approved by CIE and by ISO. It may be obtained via the website of the Central Bureau of the CIE (www.cie.co.at).

Continued on page 20

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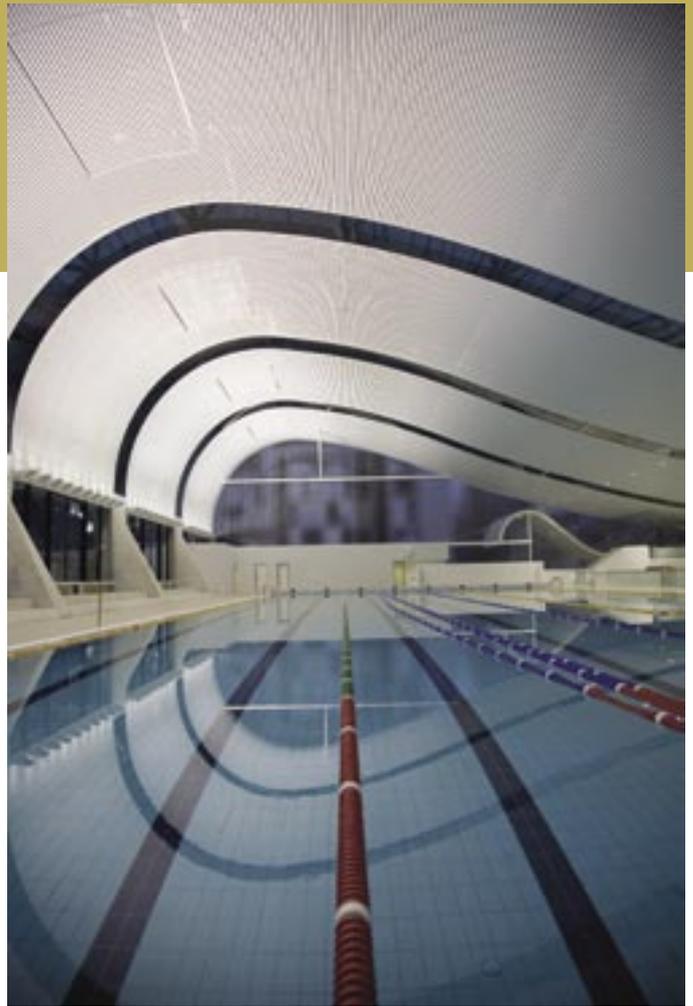
IAN THORPE AQUATIC CENTER

Sydney, Australia

The main thought in designing the lighting for Sydney's iconic aquatic centre was to utilize light with a holistic approach to provide a quality environment for occupants and to complement the building's aesthetics.

The innovative solution compliments the unique wave-shaped architecture of the building, creating a glowing landmark that harmonizes with its surroundings. The design embraces the form of the building and composes a pleasant atmosphere, harvesting natural light.

Lighting brings the daylit atmosphere of the main hall to the lower levels of the building. Although the majority of the lighting is indirect and the spaces are brightly lit, illumination power density is less than 10W/m². The lighting solution consists of energy efficient light sources and luminaires that withstand the corrosive environment, thus providing a sustainable lighting installation.



Lighting Design

Michael Harrold, Assoc. IALD
Steensen Varming

Architects

Harry Seidler & Associates

Photography

© Cavanagh Photography
© Emrah Baki Ulas, Assoc. IALD



RENÉE & HENRY SEGERSTROM CONCERT HALL

Costa Mesa, California USA

This new performing arts center is truly a design of the 21st Century, owing to a lighting scheme that uses the most advanced metal halide and LED sources and fixtures to create a scheme that uses even less energy than allowed by California's challenging Title 24 energy codes.

Given the low prescribed wattage allowances, very tight architectural constraints and complex designs of non-repetitive compound curves, a number of solutions would have been impossible without tapping these new technologies and incorporating them into innovative details and custom-designed LED fixtures.

Lighting Design

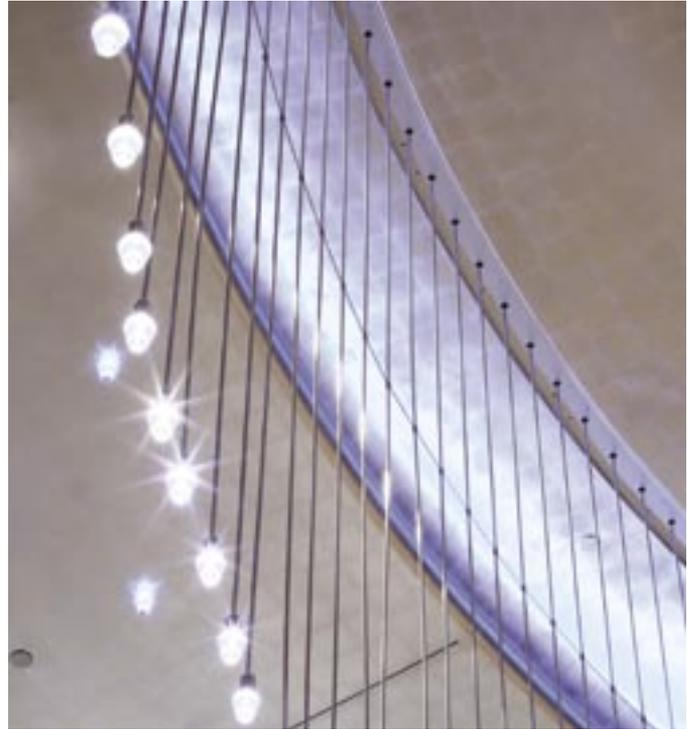
Francesca Bettridge, IALD
Marty Salzberg
Nira Wattanachote
Cline Bettridge Bernstein Lighting Design

Design Architects

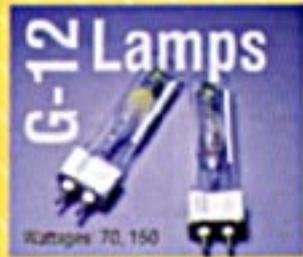
Pelli Clarke Pelli Architects

Photography

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any one...**

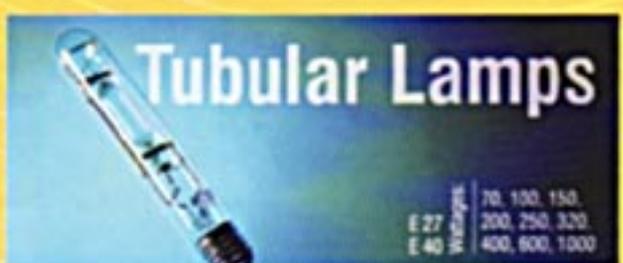
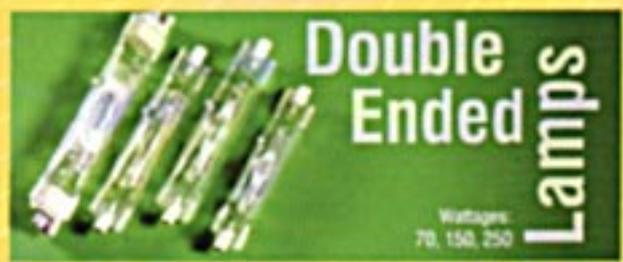
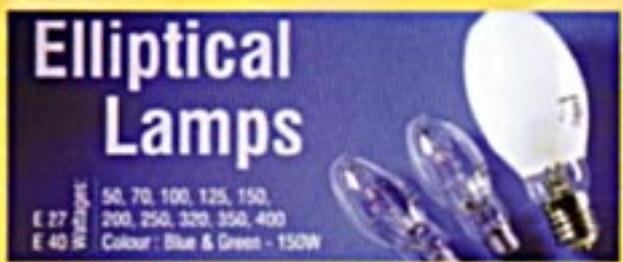


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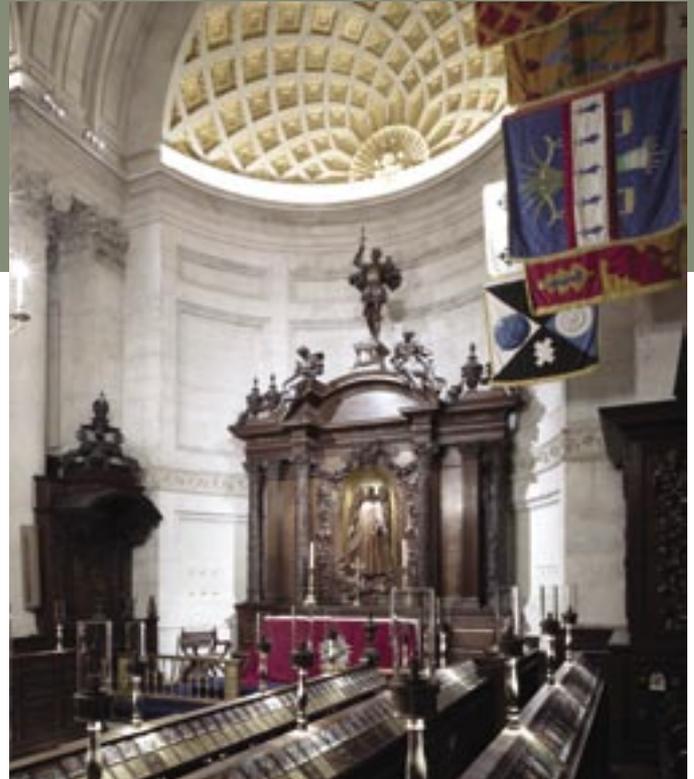
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RE-LIGHTING OF THE INTERIOR OF ST PAUL'S CATHEDRAL

London, United Kingdom

Re-lighting of the interior of St. Paul's Cathedral has been described as the largest technical intervention in its history. The brief was to develop a flexible solution to express the interior while meeting operational needs including worship, tourism, state occasions and events. The concept was to create a series of 'layers of light': general, architectural, liturgical and events.

The mixing of the layers allows different moods to be created that respond to both the architecture and the use of the space. Constraints included minimizing damage to the historic fabric, disability requirements, limited power and creating a sustainable solution.



Lighting Design

Mark Major, IALD
Jonathan Speirs
Colin Ball
Claudia Clements
Gerardo Olvera
Nils Von Leesen
James Newton
Speirs & Major Associates

Architects

Purcell Miller Tritton

Photography

© Tim Soar

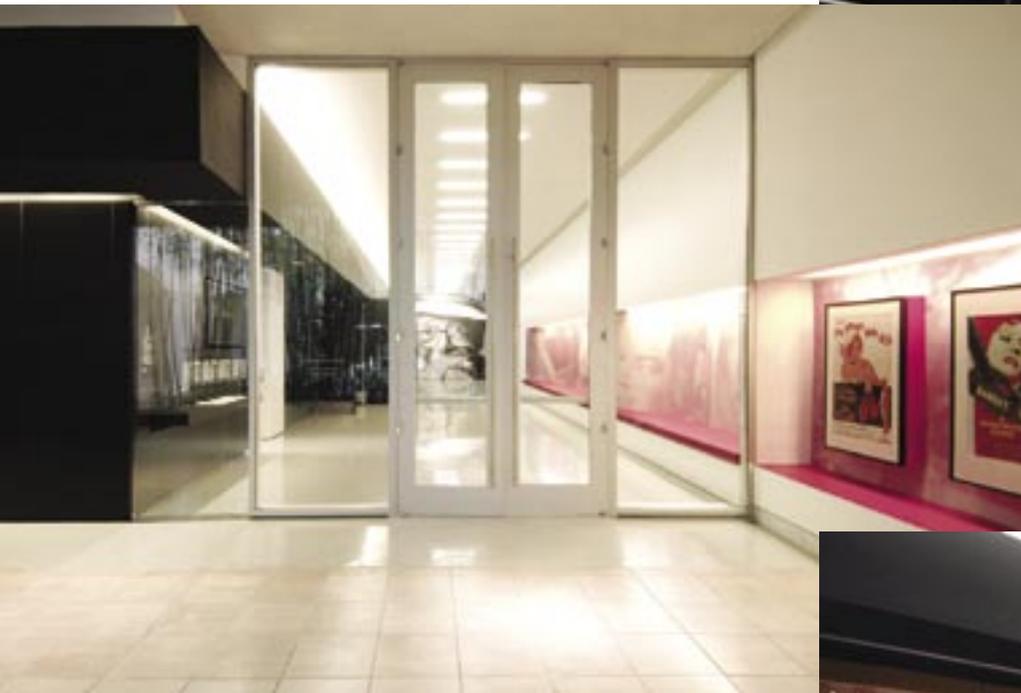
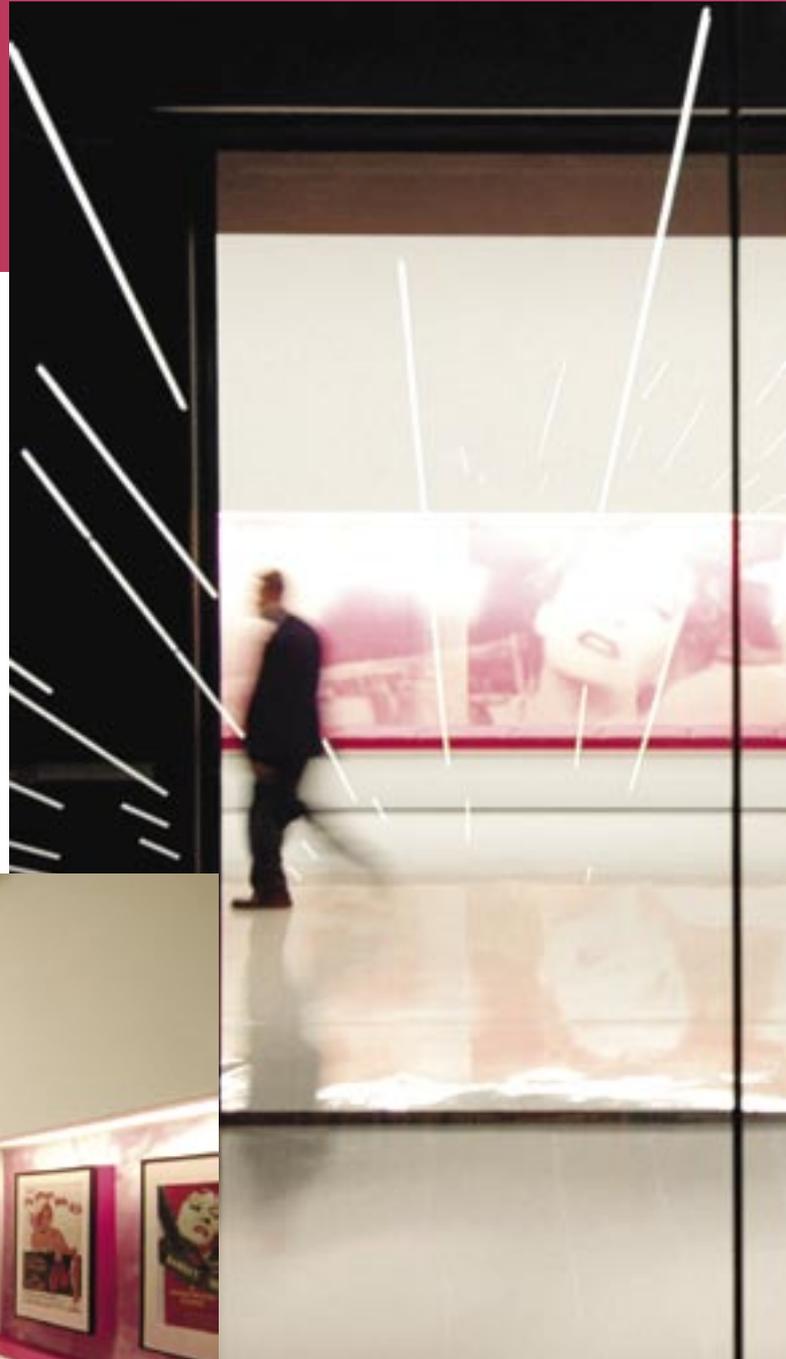


BILLY WILDER THEATER AT THE UCLA HAMMER MUSEUM

Los Angeles, California USA

The newest voice in Los Angeles's cultural dialogue is the Billy Wilder Theater. With the majority of financial resources allocated to projection technology, lighting communicates a clear message with a minimal vocabulary: cinema is light projected through space and time.

To convey this message without resorting to cliché, a design generating a sense of movement and anticipation shapes the sequence of spaces. Light expresses the transition from the prosaic to the lyrical, the predictable to the unexpected, the static to the dynamic. The excitement and luxury of an old movie palace is reinterpreted with simple means and contemporary technology.



Lighting Design

Jennifer Pieszak, IALD
Paul A. Zaferiou, IALD
Lam Partners Inc.

Architects

Michael Maltzan Architecture Inc.

Photography

© Wil Carson, Michael Maltzan Architecture Inc.



THE SACKLER CROSSING

Royal Botanic Gardens, Kew, UK

The illumination of the Sackler Crossing maintains the simplicity of the architectural concept of walking on water while reinforcing the play of solidity and transparency, with the lighting of the adjacent landscaped island providing a lit context.

The composition reflects in the water of the lake, which in turn reflects in the bridge's bronze uprights. The project posed a number of special challenges and restraints including impact on local wildlife, special detailing to maintain the minimalist appearance and delivering a low-energy solution. The overall scheme is poetic while being highly sustainable and sensitive to its environment.

Lighting Design

Mark Major, IALD
Philip Rose
Speirs & Major Associates

Architects

John Pawson Architects
Client
Royal Botanical Gardens, Kew

Photography

© James Newton



Continued from page 12

The price of this publication is EUR 48,- (Members of national CIE organisations get 50% discount).

CIE Standard Illuminants for Colorimetry

CIE S 014-2/E:2006

This CIE Standard is a renumbering of ISO 10526/CIE S014-2:2006, which contained only minor changes in comparison to 10526:1999, mainly concerning the wavelengths that are to be taken as being in standard air, to make the Standard conform to other CIE photometric and colorimetric data.

CIE standard illuminants are used in colorimetry to compute the tristimulus values of reflected or transmitted object colours under specified conditions of illumination. This International Standard specifies two illuminants for use in colorimetry:

CIE standard illuminant A

This is intended to represent typical, domestic, tungsten-filament lighting. CIE standard illuminant A should be used in all applications of colorimetry involving the use of

incandescent lighting, unless there are specific reasons for using a different illuminant.

CIE standard illuminant D65

This is intended to represent average daylight. CIE standard illuminant D65 should be used in all colorimetric calculations requiring representative daylight, unless there are specific reasons for using a different illuminant. Variations in the relative spectral power distribution of daylight are known to occur, particularly in the ultraviolet spectral region, as a function of season, time of day, and geographic location. However, CIE standard illuminant D65 should be used pending the availability of additional information on these variations.

The numerical values of the relative spectral distributions of standard illuminants A and D65 defined by this Standard are the same, within an accuracy of six significant digits, as those defined in earlier versions of these illuminants.

This standard has been approved by CIE and ISO. It may be obtained via the website of the Central Bureau of the CIE (www.cie.co.at).

The price of this publication is EUR 44,- (Members of national CIE organisations get 50% discount).



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DESIGN APPROACH FOR INDOOR STADIUM LIGHTING

Saumen Bhaumik

Trends

Sport is becoming more and more popular in recent times. More people are participating in sporting activities not only to see the professional level of games, but also there is an increasing trend among people to keep themselves fit. This has resulted in the increase of indoor and outdoor sporting complexes. With the increase in working hours of people there is a trend for both the above being extended to evening times. Hence there is a requirement of artificial lighting for the sporting arenas.

For professional level of sports nowadays there is a huge media interest and the involvement of corporate people for sponsorship. As a result it is important to ensure excellent lighting quality for the sporting arenas.

It has also been seen that day by day the skill level of the players and the speed of play is increasing so there is an absolute requirement to capture these movements along with the emotions of the players and spectators. A recent example being the 100m dash in the Olympics, where every fourth year we see that there is a reduction in the timing for the dash.

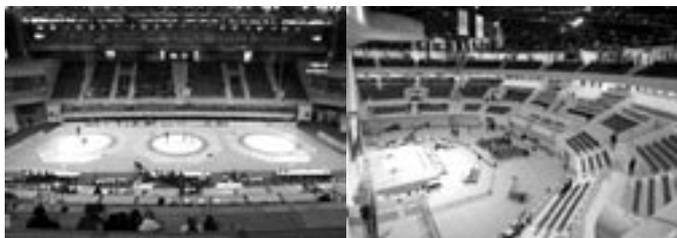
As all these sporting events require very high lighting levels it is very important to keep light pollution under control especially for the outdoor stadiums. In western countries it is absolutely necessary to follow the recommendation of CIE 150. But for indoor stadiums this point is not very critical but a few other points should be kept in mind like lower mounting heights, long burning hours, reduction of direct glare for the players and spectators.

User Requirements

For lighting of a sports facility, design attitude should meet both visual performance and visual comfort parameters of all groups of users, viz. Players, Officials, Spectators and the Media.

Players and Officials

They must be able to see clearly all the activities in the field to perform their best.



Spectators

The spectators should be able to follow the performances of the players and the action of the game with the minimum effort. Also, the viewing should be agreeable and



appealing i.e. not only the playing area, the immediate surrounding should also be visible in a rhythm with the game. In addition the safety criteria of the spectators while entering or exiting the stadium or in case of any unwanted emergency should be taken care of.

Media

Picture quality

Colour television broadcasting has become an indispensable part of any sports activity of National or International standard. The Lighting should provide conditions that guarantee good colour picture quality because that is related to the huge commercial interest of the concerned authority. Also, the lighting should be adequate for taking close-ups for both the players and spectators.

Lighting Criteria:

The following parameters are vital for the right lighting ambience:

Quantitative

Adequate Horizontal Lighting level to create a good Visual field for Players and Spectators Good vertical lighting to meet CTV transmission requirement.

Qualitative

Uniform lighting

Glare control

Horizontal Illuminance

As the illuminated playground itself forms a major part of the field of view of players and spectators it is the horizontal illumination level [Lux level] that mainly serves all the important adaptation state of the eyes. It is the



basic background of the playing area satisfying which the other critical visual parameters are met.

Vertical Illuminance

Sufficient lighting reaching the vertical plane ensures the sufficient contrast across the body of the player, which is essential for identification and media coverage. This is technically termed as adequate vertical illuminance.



Vertical illuminance is characterized not only by magnitude but also with the directions of viewing.

Players should get adequate vertical illumination in all direction where for television coverage the direction is assigned towards the camera position. This has a major influence on the television or film picture.

Apart from the quality point of view media coverage the vertical illuminance also has to be such as to ensure that the flight of a ball above the playground can be easily followed by the players as well as the spectators.

Illuminance uniformity

Good illuminance uniformity in both the horizontal and vertical planes is important as it ensures freedom of adaptability of eyes over the field by both the players and spectators. It is important to have good uniformity along with gradient, to minimize camera adjustments.

U1 – Ratio of lowest to the highest illuminance.

U2 – Ratio of lowest to the average illuminance.

Even when the uniformity as defined above is acceptable for a particular design, changes in illuminance can be disturbing if they occur over too short a distance. This problem is most likely to arise when panning a television camera. Where TV/Film coverage is concerned, the illuminance uniformity at a given grid point has to be expressed as a percentage change from the average illuminance in the eight adjacent grid points. This is commonly called the uniformity gradient.

Also ratio of the average horizontal to average vertical illumination is important for professional level of activity. The most common practice is to keep the ratio between 0.5 to 2.0.

Glare restriction

Glare, brightness that nears or enters the field of view, has a disturbing effect on the visual comfort of both the players and spectators.

Glare can be minimized by paying careful attention to the choice floodlights and by ensuring that they are properly sited and aimed bearing in mind the main directions of viewing.

Glare should not only be considered for the players and spectators or who are very close to the illuminated ground, but for also the people outside the facility who might be disturbed by the stray light from the installation. For example traffic adjacent to the playground or people living in the vicinity.

A straightforward parameter to quantify the degree of such disturbances is directly related to the optical qualities of the floodlights employed and proper aiming and placement of them.

Modeling and shadows

Modelling is the ability of lighting to reveal form and texture and is particularly important in providing a pleasant overall impression of the players, ball and spectators all around the area. The effectiveness of modeling is dependent upon the directions from which the light comes and the number and type of light sources used. Good quality television pictures demand good modelling from the lighting.

Colour Appearance and Colour Rendering

Good colour perception is important in most sports. Two most important aspects of colour have to be distinguished:

The colour appearance of the light. This is the colour impression of the total environment as created by the lamp.

The colour rendering of the light, this is the ability of the light to reproduce the colours of an object faithfully.

Both the Colour appearance and Colour Rendering are achieved by proper spectral distribution of the lamp.

Design Philosophy

How to Achieve This?

Basic Considerations are:

Lighting equipment-Use appropriate Lamp and Luminaire combination

Standard Follow standards, Specifications for Lighting Level, Ballast –wattage delivery, etc..

Application- Use appropriate lighting design tools, and ensure that accurate data is used

Usage of L- Light Regulation by selective switching for different levels of sports.

Design Requirements

The design requirements are clearly spelt out in the tender. The illumination parameters for various classes of play are well defined. The quantitative as well as qualitative lighting parameters are spelt out in the tender and lighting is to be designed to achieve these results at optimum Total Cost of Ownership.

Lighting should provide visual comfort and good visibility to the players, spectators and TV crew for international event broadcasting.

Standards in Sports Lighting:

There are lot of standards and guidelines in sports lighting. The following are some of them.

- CIE83 -1989 – Guide for lighting of sports events for colour television.
- CIE 169 – 2005 – Practical design guidelines for lighting up of sports events for colour television and filming.
- CIE112-1994 – Glare Evaluation system in sports lighting.
- IESNA Handbook.
- CIBSE LG4 1994.
- GAISF: General Association of International Sports Federation.

Apart from the above some games have their own federation guidelines like:

- FIFA
- FIH – Federation Internationale de Hockey.
- ITF – International Tennis Federation.

The lighting level requirements in sports lighting depends on the speed of play, camera shooting distance and level

of activity. As per CIE 83 -1989 all sports are divided into three groups depending on the speed of play.

- Group A – Slow Speed.
- Group B – Medium Speed.
- Group C – Fast Speed.

The following is a list of sports in the different groups

Group A : Archery, athletics, billiards, bowling, curling, diving, horse jumping, shooting, snooker, swimming

Group B : Badminton, baseball, basketball, football, American rugby, gymnastics, handball, hockey, ice skating, ski-jumping, ski-racing, softball, volleyball, wrestling.

Group C: Boxing, cricket, fencing, ice-hockey, lacrosse, racquetball, squash, table-tennis.

The following chart gives the recommended vertical lighting level for the main camera at different shooting distances.

Maximum Shooting Distance		25m	75m	150m
Group of Sports	A	500	700	1000
	B	700	1000	1400
	C	1000	1400	-

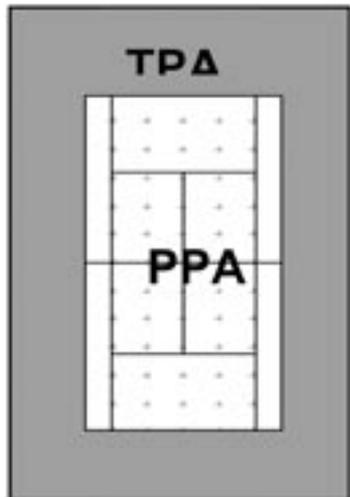
GAISF:

General association of international sports federation is a guideline where all the lighting requirements are given game wise both for non-televised events as well as for major events like Olympics/Asian Games/Commonwealth Games.

Major events								
	Horizontal Illuminance	Uniformity Mn/Ave	Uniformity Mn/Max	Vertical Illuminance	Uniformity Mn/Ave	Uniformity Mn/Max	Colour Rendering	Glare Rating
HDTV	1500-3000	0.8	0.7	2200	0.7	0.6	>90	<50
Slow-motion Camera	1500-3000	0.8	0.6	1800	0.7	0.5	>80	<50
Fixed Camera	1500-3000	0.8	0.6	1400	0.7	0.5	>80	<50
Mobile Camera	1500-3000	0.8	0.6	1200	0.5	0.3	>80	<50
* Average horizontal and vertical illuminance ratios: It is recommended that the ratio for horizontal illuminance (Field of Play) is between 0.75 and 1.5 of the vertical illuminance for cameras. Where there is HDTV all horizontal values for other cameras are as for HDTV.								
National events								
	Horizontal Illuminance	Uniformity Mn/Ave	Uniformity Mn/Max	Vertical Illuminance	Uniformity Mn/Ave	Uniformity Mn/Max	Colour Rendering	Glare Rating
Camera	1000-2000	0.7	0.5	1000	0.6	0.4	>80	<50

Examples:(Indoor Lawn Tennis)

PPA is the principal playing area. The principal playing area of a lawn tennis court is 10.97m x 23.74m.



TPA is the total playing area and is bigger than the principal playing area. This area is also important for lighting design as during rallies players and the ball frequently go in this area.

The recommended size for the total playing area is 18.28m x 36.57m.

If there are multiple courts laid parallel to each other minimum distance between two parallel courts should be 4.2m edge to edge.

Activity	E_h			
	Outdoor		Indoor	
	PPA	TPA	PPA	TPA
Private recreational tennis:				
— Standard	150	125	250	200
— De luxe	300	250	500	400

Table 1: Average (maintained) horizontal illuminance (E_h) for private tennis courts.

Activity	E_h			
	Outdoor		Indoor	
	PPA	TPA	PPA	TPA
Club Tennis (organised):				
— Recreational, including Physical training	250	200	500	400
— Club and national competition	500	400	750	600
International Competition	750	600	1000	800

Table 2: Average (maintained) horizontal illuminance (E_h) for (organised) club tennis.

Camera Shooting	E_v	E_v	
		PPA	TPA
CTV and film	25 metres	1000	700
	75 Metres	1400	1000
HDTV*:		2500	1750

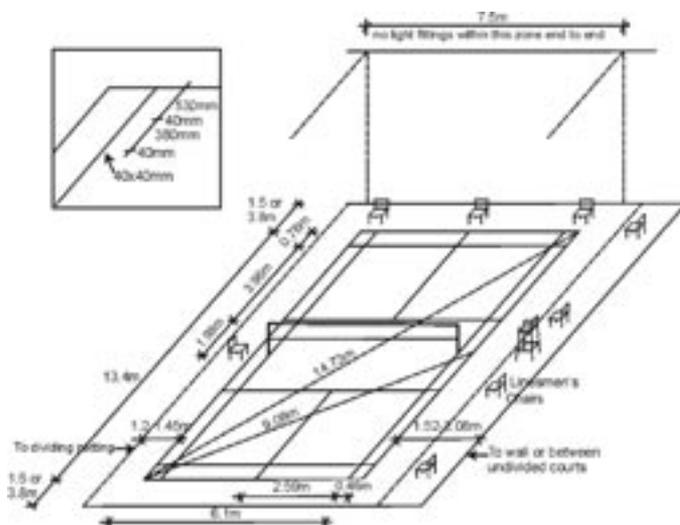
Table 3: Average (maintained) Vertical illuminance (E_v) at a height of 1.5 metres above the court in the direction of the main cameras)

Activity	$U1 = E_{min}/E_{max}$		$U2 = E_{min}/E_{av}$					
	Outdoor		Indoor		Outdoor		Indoor	
	PPA	TPA	PPA	TPA	PPA	TPA	PPA	TPA
Private recreational Tennis:								
— Standard/Deluxe	0.3	0.2	0.3	0.2	0.6	0.5	0.6	0.5
Club tennis (organised):								
— recreational, including physical training								
— club and national competition	0.4	0.3	0.4	0.3	0.6	0.5	0.6	0.5
International competition								
Television and film Coverage:								
— CTV and film	0.5	0.3	0.5	0.3	0.6	0.5	0.6	0.5
— HDTV	0.7	0.6	0.7	0.6	0.8	0.7	0.8	0.7

Table 4: Requirements for illuminance on the horizontal plane and for television and film coverage also on the vertical planes

The charts above show the lighting requirements of lawn tennis for different level of activities.

The glare calculations for lawn tennis should be done as per the recommendation given in the International Tennis Federation (ITF).



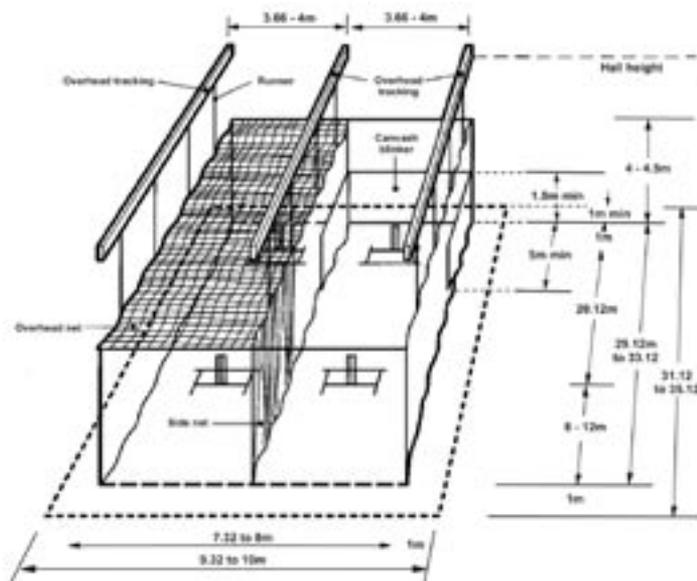
The above is the typical layout of a single badminton court. The Principal playing area for badminton is 13.4m x 6.1m and the Total playing area is 18m x 10.5m.

Indoor Practice Pitches Cricket:

It is important to have good quality lighting so the players can follow the travel of the movement of the ball travelling at 120km/hr having being struck by the batsman or bowled by the bowler.

Type of sport: BADMINTON

	E_h	E_v main	E_v sec.	horizontal		vertical		R_a	T_k
				U1	U2	U1	U2		
Amateur level:									
- Physical training	150	-	-	0.4	0.6	-	-	20	4000
- Non-competitive and recreational activity	300/250	-	-	0.4	0.6	-	-	65	4000
- National competition	750/600	-	-	0.5	0.7	-	-	65	4000
Professional level:									
- Physical training	300	-	-	0.4	0.6	-	-	65	4000
- National competition	1000/800	-	-	0.5	0.7	-	-	65	4000
(HD) TV-film:									
- TV:- national	-	1000/700	750/500	0.5	0.7	0.3	0.5	65	4000
- international	-	1250-900	1000/700	0.6	0.7	0.4	0.6	65*	4000
- HDTV	-	2000/1400	1500/1050	0.7	0.8	0.6	0.7	80	4000
- Emergency TV	-	1000/700	-	0.5	0.7	0.3	0.5	65*	4000

*an R_a of >80 is preferred

The batsman must sight clearly the bowler throughout all elements of run up and delivery and the ball in its flight with the bowler having clear view of the pitch. Glare or brightness of the lighting system should not distract the sight of either. It is a mistake to economise on the lighting system, firstly because safety is of importance and secondly due to the specialist nature of cricket and at least a minimum level of lighting over the netted areas should be provided.

It is recommended to provide indoor practice pitches with average maintained illumination of 800-1000 lux with an uniformity ratio (min/avg.) of 0.8.

Multipurpose Sports Halls

Most indoor facilities have to serve for a variety of different sports. It is therefore impossible to create a standard lighting design that will completely satisfy all possible requirements.

The following are the main forms of usage of a multipurpose hall :

- General Purpose.
- Sports Training.
- Sports Recreation.
- Sports with TV coverage.
- TV shows.

All the above events have specific lighting requirements so a complete flexibility of lighting system is required.

Before finalizing on the lighting scheme following key points should be considered :

- Analysis of functions.
- Court layout of individual sports area. It is important to understand the direction of play.
- Position of TV camera i.e. the main broadcasting camera. It is also different for different sports.
- Lighting requirements may be different for different sports/activities.

Apart from this also requirements may be for individual switching steps for each sport and also sub switching steps for different level of play. It is also important for optimizing the number of luminaires to reduce the initial and running costs by sharing luminaires for different sports.

Associated Lighting:

Apart from the sports lighting lighting up of the spectator's gallery is important for safety of the spectators and should be backed up by emergency lighting to take care of the power failure situation.

Also, it is now customary to have large score board screens to apprise the spectators about the course of the game.

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FORTHCOMING EVENTS

20th Lightfair International

May 5-7, 2009, New York USA

The LFI Conference program brings together the foremost designers, educators, architects, engineers and consultants to address topics that cover lighting fundamentals, software, applications, controls and solutions, as well as design innovation, product updates and case studies. The 2009 program offers 75 unique courses, totaling more than 200 hours of education, and provides AIA, ASID/IIDA, IESNA and IFMA accreditation. Participants can choose from:

- 12 Daylighting Institute® Workshops
- One two-day Daylighting Fundamentals Institute
- 21 LIGHTFAIR Institute® Workshops
- Four one-day LIGHTFAIR Institute® courses
- Three two-day LIGHTFAIR Institute® courses
- Two Masters courses
- 32 seminars

Additionally, LFI will once again offer the New Attendee Orientation and the Educational Lighting Forum on May 5—the opening day of the trade show.

The Daylighting and LIGHTFAIR Institutes take place Sunday, May 3 and Monday, May 4 and the seminars occur Tuesday, May 4 through Thursday, May 7. The Masters' courses are held Wednesday, May 6.

The LFI Exhibit Hall will feature some 500 domestic and international exhibitors covering 165,000 square feet, including the European Light + Design, Daylighting, and Design Pavilions.

For further information contact:
Ben Coleman directly at +1 404.220.2004
or by email at: benc@lightfair.com

The 2nd Global Professional Lighting Design Convention PLDC 2009

October 28-31, 2009, Berlin, Germany

ISLE is supporting Lighting Design Convention which follows up on PLDC 2007, held in London, UK in October 2007. The PLDC 2009 convention will synthesize the follow-up on the corner stones laid in London regarding the official establishment of the profession of Architectural Lighting Design. It will also focus on all issues that make Lighting Design a contemporary discipline that shares the global responsibilities of creating a better world and contributes to preserving and safeguarding its existing achievements. The Convention will include a three-day conference with invited papers, presented papers, an electronic self-running poster session, a small exhibit of the manufacturers sponsoring the event, and a Gala Dinner during which outstanding achievements in Lighting Design will be recognized as well as efforts by the young generation of lighting designers.

Prospective contributors are invited to submit papers dealing with recent findings or achievements or professional issues in the field of light and lighting design. The papers should be relevant to the following four tracks: a. *Lighting Application Research* (in fields such as Light and Health, Lighting Sustainability, Light and the Environment, Urban Development and Lighting, Light and Economy, Light and Perception, Light and Psychology, etc.) b. *Lighting Application Case Studies* (presentation of completed projects in interior and exterior lighting, demonstrating original approaches, uses of novel technologies, implementation of research findings, etc.) c. *Daylighting and Sustainability* (presentation of completed projects in which the study of daylighting and its design were major issues, demonstrating original approaches, uses of novel technologies, implementation of research findings, etc.; presentation of lighting solutions for interior and exterior projects in which sustainability issues are or were at the top of priorities while keeping a high quality of the lit environment, etc.) d. *Professional Practice Issues* (Status quo of the Architectural Lighting Design profession, Professional Deontology, Architectural Lighting Design Services, Writing Safe and Sound proposals/ contracts, Professional Indemnity Insurance, Fee setting, etc.)

For further information please contact:

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Online photosensor tutorial

For specifiers, contractors, lighting designers, manufacturers, and anyone interested in reducing the energy they use for lighting. Information in this tutorial is organized in levels of increasing detail to make it accessible to everyone. There is no charge for this tutorial.

<http://www.lrc.rpi.edu/education/outreachEducation/photosensorTutorial.asp>

Lighting Terminology

Nearly every field or profession has a language that is unique to its own practitioners. The field of lighting is no exception to this. Designers, specifiers, and manufacturers within the lighting industry use unique terms and concepts, which have evolved into professional usage over a period of time and have been officially defined by professional bodies such as the Illuminating Engineering Society of North America (IESNA).

These terms represent important concepts in the study of lighting. Each term in this section has its own page, which begins with the official IESNA definition. This is followed by a description of how the term is typically used in lighting practice along with a graphic or animation designed to further illustrate the term or concept.

You may find it helpful to review the terminology in its entirety before beginning this lighting education program. Each term will also be linked to its definition when it is used for the first time in each section of the program.

<http://www.lrc.rpi.edu/education/learning/intro.asp?mode=terminology>

World Record White OLED Performance Exceeds 100 lm/W

Universal Display Corporation (UDC) has successfully demonstrated a record-breaking white organic light-emitting diode (WOLED) with a power efficacy of 102 lm/W at 1000 cd/m² using its proprietary, high-efficiency phosphorescent OLED technology. This achievement represents a significant milestone for OLED technology, demonstrating performance that surpasses the power efficacy of incandescent bulbs with less than 15 lm/W and fluorescent lamps at 60-90 lm/W. Funded in part by DOE, UDC's achievement is a major step toward DOE's roadmap goal of a 150 lm/W commercial OLED light source by 2015.

http://www.netl.doe.gov/ssl/highlights_udc08.html

CALiPER Benchmark Reports

To help users better compare LED products with conventional lighting technologies, DOE conducts CALiPER testing of traditional (non-LED) lamps and fixtures. Benchmark Reports provide detailed analysis of test results for both traditional and LED products for a given application, comparing a range of standard lighting measures (e.g., power usage, light output and distribution, efficacy, correlated color temperature, color rendering index). Potential performance and application issues indicated by CALiPER testing results also are examined.

- * Performance of Incandescent A-Type and Decorative Lamps and LED Replacements (PDF 583 KB)
Report includes test results and analysis for common omni-directional incandescent lamps (A-type and small decorative, candelabra-type lamps) and their commercially available LED replacements. (24 pages, November 2008)
- * Performance of Halogen Incandescent MR16 Lamps and LED Replacements (PDF 415 KB)
Report includes test results and analysis for halogen MR16 lamps and their commercially available LED replacements. (23 pages, November 2008)

<http://www.netl.doe.gov/ssl/caliper-benchmarkreports.htm>

Using LEDs for General Illumination

Rapid progress in solid-state lighting (SSL) research and development (see DOE's SSL R&D Portfolio) has resulted in the advent of light-emitting diodes (LED) for general lighting applications. This section of the website provides information on the important performance characteristics of white light LEDs for general illumination, with particular emphasis on energy efficiency and lighting quality.

Energy efficiency of light sources can be characterized in several different ways. Luminous efficacy indicates how much light the source provides per watt of electricity consumed. This is stated in lumens per watt (lm/W). Another measure of energy efficiency is the total watts a device consumes in providing the intended service. Both measures are important to consider.

For example, an LED-based refrigerated display case light has lower lumens per watt compared to linear fluorescent systems, but uses about half the total watts to provide the necessary lighting.

Lighting quality is a subjective term, but generally includes color quality (including appearance, color rendering, and color consistency); illuminance levels (the amount of light

the light source provides on a task or surface); photometric distribution of the light source in a fixture or luminaire; lifetime; ease of maintenance; and cost.

This section is designed to provide useful information for energy efficiency program sponsors, utilities, government agencies, lighting fixture manufacturers, lighting designers, and others who are interested in energy-efficient lighting technology.

- **LED Basics:** This section provides basic information on how LEDs work, and explores important technical issues (energy efficiency, color quality, lifetime, thermal management) in greater detail.
- **LED Applications:** Learn more about using LEDs for recessed downlighting, undercabinet, and portable desk/task lighting applications. Information on additional applications will be added to the site over time.
- **LED Measurement:** This section provides information about measurement protocols and test procedures that are currently being developed or revised to accommodate specific attributes of LEDs.

<http://www.netl.doe.gov/ssl/usingLeds/index.htm>

Spectrally Enhanced Lighting

The U.S. Department of Energy (DOE) conducts studies on spectrally enhanced lighting (SEL) as part of its lighting activities. Here you'll learn about spectrally enhanced lighting and find information about studies and implementation.

SEL is a simple strategy that uses existing products and technology to significantly reduce energy use from lighting in commercial buildings. This low-risk, high-return strategy can provide energy savings of more than 20-40% at no additional cost.

The concept behind SEL is that a significant amount of energy can be saved by using lamps that have less light output, but higher correlated color temperature (CCT). Lamps with higher CCT appear brighter than those with lower CCT, so the actual light output of higher CCT lamps can be decreased, while maintaining equivalent perceived brightness and visual acuity. Unlike other energy efficiency strategies, SEL is not a technology — it's a different way to quantify light that can be used with any type of lighting design to improve energy performance. Energy savings are achieved by using high performance and high CCT lamps coupled with lower ballast factor, extra efficient electronic ballasts. SEL is a market-ready, cost effective solution for quick energy savings.

Learn more about SEL by viewing the following:

- 2004 Feasibility Study: University of California, Office of the President
- 2006 Economics Validation Study: Three-Building Field Assessment Implementing Spectrally Enhanced Lighting Solutions

http://www1.eere.energy.gov/buildings/printable_versions/spectrally_enhanced.html

A Consumer's Guide to Energy Efficiency and Renewable Energy Lighting

Artificial lighting consumes almost 15% of a household's electricity use. Use of new lighting technologies can reduce lighting energy use in homes by 50%-75%.

You can reduce lighting energy use by selecting lighting and sources that use energy more efficiently, and by installing lighting controls.

Here you'll find the following information:

- * **Lighting principles and terms**
Lighting performance and design factors to consider for energy efficiency.
- * **Lighting design**
Basic indoor and outdoor lighting design principles and methods for energy efficiency.
- * **Types of Lighting**
Lamp types to consider and compare for energy efficiency.
- * **Lighting controls**
Controls to automatically turn lighting on and off as needed.
- * **Lamp and ballast replacement**
Replacing lamps and/or ballasts in light fixtures to improve energy efficiency.
- * **Lighting maintenance**
Basic maintenance to help keep your lights operating at their optimum energy efficiency.
- * **When to turn off your lights**
Energy-saving advice for when to turn off incandescent and fluorescent lights.

http://apps1.eere.energy.gov/consumer/your_home/lighting_daylighting/index.cfm/mytopic=11980

The Lighting Portal

The Lighting Portal is an online resource developed to present a contiguous location for energy efficiency enthusiasts, researchers, manufacturers, lighting designers, architects, policy makers, etc., to exchange ideas, information, and visions for the future.

The site is organized with two main sections: the forum and iSource. The forum, through online discussion groups (i.e. message or bulletin boards), supports visitor discussions and exchange of information. The topics of these boards include research opportunities, daylighting, codes and standards, human factors, and lighting technologies. The iSource section is a repository of links that connects visitors to online lighting resources. Another important part of the site is the Events calendar. There are many national events posted on the calendar, with the intention of sharing conference information and opportunities to those in the industry.

<http://thelightingportal.com/>

Anool Mahidharia

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