



# LIGHT

the official

# NEWSLETTER

of the **indian society of lighting engineers**

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## FROM THE PRESIDENT'S DESK

While the advent of 2008 may have caused major upheavals in the stock markets of the world, I am glad that the outlook for the lighting community promises that it will be a happy new year.

This will be evident in our Lii2008 Exhibition next month where we will see the exciting new products and technologies that are on offer. The rate of advance of some of the technical developments continues to be breathtaking. The improvements in the field of say LEDs to take one example continue to be remarkable and I am really looking forward to the show.

And this perception is also shared by policy makers as well. The Bureau of Energy Efficiency is putting its weight behind the event by its official support as well as by taking a large stall in the Exhibition and a special position in the Directory. Further, Dr. Ajay Mathur, the Director General will be chairing the opening workshop on Energy Saving (Sustainability). The Energy Secretary, Mr. Anil Razdan will also be participating in the Conference.

It would indeed be a pity if the show is not visited by the many constituencies that are affected by and can benefit from better lighting. I would request ISLE members to make the effort to come themselves and to certainly pass on information about the event to architects, consultants, builders, contractors, users (and all of us are users of lighting) so that the time and effort put into the event reaches out to as many as possible.

The ISLE Conference continues to attract the interest and participation of eminent international experts and I am really looking forward to attending the workshops that between them cover many areas of interest and concern. There is an excellent faculty and since there is limited seating in the conference this time you need to register quickly for those sessions that are of interest to you.

The Mumbai State Centre and the Pune Local Centre are taking advantage of the presence of the eminent

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international experts like Dr. Warren Julian and Mr. Reg Wilson to organise seminars between February 16 and 19 in Mumbai and Pune prior to the Lii2008 Conference. All those with an interest in good lighting who are based in Mumbai or Pune or nearby should get in touch with these Centres for more information on the programmes and not miss this wonderful opportunity!

As always the Directory will be providing interesting and important editorial value as well as a comprehensive survey of the Lighting Industry. There is very little time and I would request members to ensure that entries and advertisements from their contacts are rushed to the Secretariat in Delhi before it is too late.

Apart from Lii2008 I am happy to see that our State Centres are active and have a busy year planned. Yes, as I said earlier, for those of us in lighting it does promise to be a happy new year.

My best wishes to you and your families.

A.D. Kulkarni  
President  
[dradk@hotmail.com](mailto:dradk@hotmail.com)

## EDITORIAL

As is only to be expected the January issue opens with a focus on Lii2008. After all, it is just round the corner.

Thanks to tie up with a leading International exhibition organisation, Expomedia, we now have participation at the exhibition from Austria, Belgium, China, New Zealand, Czech Republic, Italy, Japan, Portugal and Singapore. Having sold out every square metre of space in the halls we are now constructing a hangar structure adjacent to Hall 7 to accommodate our international participants and latecomers.

Having become established as one of the most glamorous events on the exhibition calendar in Delhi, it is going from strength to strength and should not be missed by anyone with an interest in lighting and the latest developments in the field.

In keeping with the feedback we collected in 2005 from exhibitors, and the request by several participants this time, we have decided to enhance the business hours. The general public will therefore be invited only on Saturday afternoon and the whole day on Sunday. This decision has been welcomed by the exhibitors.

The Conference is very high profile as well. Among the International experts will be long time ISLE friends and supporters, CIE Past Presidents, Wout van Bommel and Hans Allen Lofberg, current CIE President, Franz Hegstberger, Chair Lux Pacifica, Warren Julian and Past President IDA, Reg Wilson. By locating both events at the

same venue, it will be easier for busy people to make it to both. The flexibility of registration options and the focus of the workshops also enables those with very specific interests to optimise their schedules.

There are a number of reports from the State Centres which reflect a good activity level. We suggest that reporting on programmes are ongoing to ensure that the news is still topical when printed in the newsletter.

Among the new CIE publications released, is the report on Road Transport Lighting for Developing Countries. Some of you may recall that this was begun as a result of an initiative of ISLE at the New Delhi CIE Session. This publication is available as a free download. Study it and pass it on to non members with an interest in road lighting.

We congratulate Dr. Biswajit Ghosh on his being invited to deliver the Royal Society Lecture and Mr. P.C. Barjatia on being awarded a PhD for his work on Socio-Economic Impact of Lighting Education in India.

There is also an interesting paper from Amardeep Dugar on Development of a syntactic technique for architectural lighting design derived from musical principles. This paper was a presented poster at the CIE Session at Beijing.

H.S. Mamak  
Editor

## ISLE ACTIVITY



### **Exhibition**

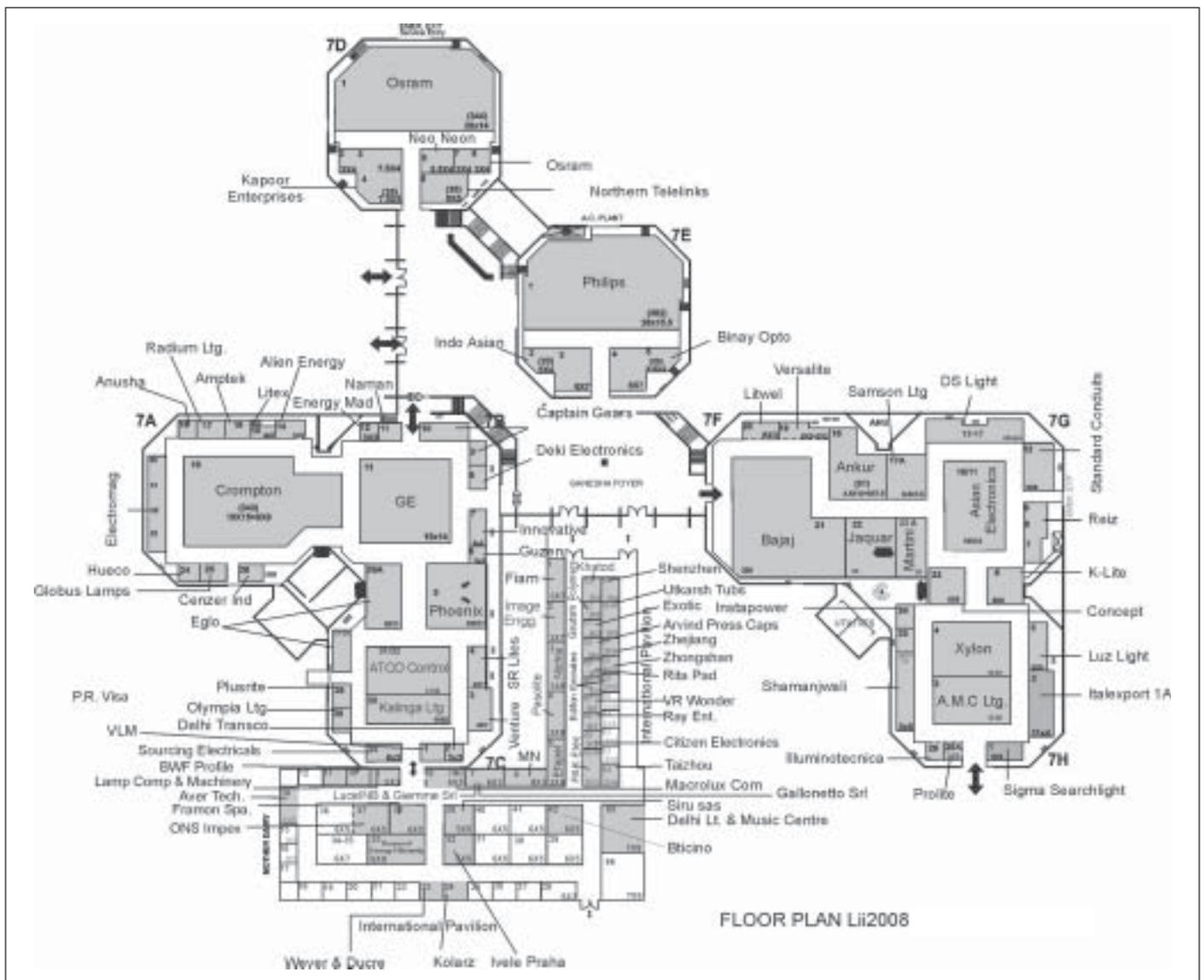
Looking at the floor plan it can be seen that the Exhibition is looking good and we have an exciting show in store for you. The international participation includes companies from Italy, Belgium, Portugal, New Zealand, Czech Republic, Austria, Japan, Singapore and China. Of course, the large multinational companies are also there. While the details are not yet public, there will be many new products and applications on display.

## MAILING ADDRESS

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Registered Office: C/o Philips Electronics India Ltd.  
Technopolis Knowledge Park, Mahakali Caves Road, Chakala, Andheri (E)  
Mumbai 400 093



### List of Exhibitors

Alien Energy  
 AMC Lighting Co.  
 Ankur Lighting  
 Anusha Technovision  
 Arvind Press Caps  
 Asian Electronics  
 Atco Controls  
 Aver Software Technologies  
 Bajaj Electricals  
 Binay Opto Electronics  
 Bracecorp Publications  
 Bticino Spa  
 Bureau of Energy Efficiency  
 WF Profiles (Wuxi) Co.  
 Captain Gears & Fans  
 Cenzer Industries  
 Citizen Electronics (Singapore)  
 Concept Lighting Solutions  
 Crompton Greaves  
 Deki Electronics  
 Delhi Light & Music Centre  
 Edison Emirates Lighting L.L.C.  
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 Efpapel  
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 Energy Mad  
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 Globus Lamps  
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 Neo Neon Lighting & Designs  
 Nichia Corporation  
 NTL Electronics India

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 Osram India Ltd.  
 PAK Electrical Equipment Co.  
 Pasolite Electric Co.  
 Pearl Lighting  
 Philips Electronics India  
 Phoenix Lamps  
 Plusrite  
 Professional Lighting  
 Radium Lighting  
 Ray Enterprises  
 Reiz Electrocontrols  
 Rita Pad Printing Systems  
 S.R.Lites  
 Samson Lighting  
 Shamanjwali Metals  
 Shenzhen Guoyexing Optoelectronics Co.  
 Sigma Searchlight  
 Silverline Lighting & Exim (I)  
 Siru Sas  
 Standard Conduits  
 Taizhou Fareast Iron Horse Automation Equip. Co.  
 Utkarsh Tubes & Pipes  
 Valuable Impressions  
 Venture Lighting India  
 VersaLite Hi-Tech Lighting  
 VLM India  
 VR Wonder Electricls & Electronics  
 Wever & Ducre  
 Xylon Electrotechnic  
 Zhejiang Dapu Lighting Appliance Co.  
 Zhongshan City Daguang Lighting & Glass Co.

## Conference

The Conference in its new format of interactive workshops has evoked a positive response. From the programme below you can see that we have an exciting programme with a very eminent faculty. In the workshops the lead speakers will make presentations of 20 minutes each. This will be followed by interactive discussion sessions of 90 minutes enabling active participation by delegates to take full advantage of the panel of experts.

The flexibility in registration enables even very busy delegates to attend those sections that are of particular interest to them.

### Conference Programme

<b>INAUGURAL SESSION</b>	
<b>22<sup>nd</sup> February 2008</b>	
<b>09.00</b>	Keynote paper by Prof. Wout van Bommel
<b>WORKSHOPS</b>	
<b>22<sup>nd</sup> February 2008</b>	
<b>11.00-13.30</b>	<b>Energy Saving (Sustainability)</b> Warren Julian (Australia) Martine Knoop (Netherlands) Lou Bedocs (UK)
<b>14.30-17.00</b>	<b>Outdoor (City Beautification Street Lighting, Monument Lighting)</b> Reg Wilson (Australia) Vincent Laganier (France) AGK Menon (India)
<b>23<sup>rd</sup> February 2008</b>	
<b>10.00-12.30</b>	<b>Infrastructure Lighting (Highways, Airports, Railways)</b> Richard Taylor (Germany) Paul J. Rutte (Netherlands) Sudeshna Mukhopadhyay (India)
<b>14.30-17.00</b>	<b>Retail and Hospitality</b> Chip Israel (USA) Jan Ejhed (Sweden) Krishnesh Mehta (India)
<b>25<sup>th</sup> February 2008</b>	
<b>10.00-12.30</b>	<b>LEDs</b> Richard Sng (Hong Kong) Franz Otten (Netherlands) Ted Ferreira (USA)
<b>14.30-17.00</b>	<b>Electronics and Controls</b> Arthur Felder (Malaysia) Ulrich Mathis (Austria) Jas Clare (UK)
<b>CLOSING SESSION</b>	
<b>25<sup>th</sup> February 2008</b>	
<b>17.00</b>	Invited paper by Prof. Hao Luoxi
<b>SPECIAL OPEN SESSION</b>	
<b>24<sup>th</sup> February 2008</b>	
<b>10.00-12.30</b>	Presented papers
<b>14.30-17.00</b>	Pakistan Delegation

In addition to the workshops there will be a keynote paper by CIE Past President Prof. Wout van Bommel at the Inaugural Session and another by Prof Hao Luoxi from Tongji University China at the closing session.

There will be an open session on February 24 with the presentation of technical papers in the morning and an interactive session with a high level delegation from Pakistan in the afternoon.

Social programmes are being organised on February 22 and 25.

### Directory

The sixth edition of the Directory of the Lighting Industry will be published and released at Lii2008.

This publication has proved its usefulness over the last 16 years and continues to be in demand. We are still getting orders for the 2005 edition from both Indian and international sources!

As in the past, the Directory will continue to provide comprehensive information on Lighting in India as well as editorial inputs on international developments and future directions in this field.

Rush your ads and entries if you wish to be part of this comprehensive publication with a long shelf life.

## CALCUTTA STATE CENTRE

### Technical Programme

October 4, 2007, Kolkata

The State Centre organised a talk on Energy Management in Electrical Lighting by Mr. Onkar Mitra, Electrical Advisor and Energy Consultant at the Shri Laxmi Narayan Mandir Society in Kolkata on October 4.

### Annual General Meeting

October 4, 2007, Kolkata

The 19th AGM (2006-2007) was held on October 4 at the Shri Laxmi Narayan Mandir Society in Kolkata. The State Centre Committee for the term 2007-2009 took over charge at the AGM. The composition of the Committee is given below:

Mr. Bipin Dattani	Chairman
Mr. Prakash Chatterjee	Secretary
Mr. Nikhilesh De	Treasurer
Mr. Alope K. Basu	Member
Mr. Soumen Basu	Member
Mr. Prasanta Chowdhury	Member
Mr. Dipak K. Pal	Member

The AGM was followed by dinner.

## DELHI STATE CENTRE

### Lecture on the Importance of Lampholders

November 27, 2007, New Delhi

The Delhi State Centre organised a lecture on The Critical Importance of Lampholders in High Quality Contemporary Lighting Systems. The presentation on this



unusual subject was made by Mr. Harald Vohle and Mr. Wolfgang Tetzlaff of BJB GmbH from Germany, one of the largest lamp holder manufacturers in the world.

Mr. Vohle gave a brief background of this family owned company and its activities. This was followed by a presentation by Mr. Tetzlaff on lampholders. He pointed out that while the importance of a lampholder is somewhat intangible since it is a component whose malfunction is rarely assignable, with the advent of new lamps and a greater usage of electronic ballasts, the quality of lampholders has become increasingly important as these ballasts work on high frequency. In addition, as luminaire designs become more compact with T5 and other lamps, the temperature rating of holders becomes a key issue.

Mr. Tetzlaff explained that any design of a lighting or interior scheme is made keeping in mind that the owner should have a convenient and trouble free environment. It is also important that the operating cost should be as low as possible. Bad quality lampholders make this basic



Mr. Wolfgang Tetzlaff and Mr. Navin Krishen

requirement difficult to achieve, especially when the lighting management schemes are put in place to reduce energy consumption. As innocuous as the lampholder seems he said, it has a critical role in a luminaire for a total quality solution.

Mr. H.S. Mamak, Past President of ISLE introduced the Chairman, the eminent consultant Mr. Navin Krishen. The vote of thanks was given by Mr. N. Nagarajan, Chairman, Delhi State Centre. He gave special thanks to Mr. Bhavin Soonderji of Atco Controls for sponsoring the evening.

The lecture was followed by a discussion over cocktails and dinner. The discussion was animated and was especially practical and useful for the participants as there was an exhaustive display of lampholders for varied applications.

## MUMBAI STATE CENTRE

### Centre Honours Founders of ISLE

October 30, 2007, Mumbai

After the AGM of ISLE MSC held on October 30, 2007 the following ISLE members were honoured for their invaluable contribution in founding the Indian Society of Lighting Engineers.

Mr. P K Bandhopadhyay  
Mr. Rashmi Bhuta  
Mr. Anil Valia  
Mr. Ajit Mirchandani  
Mr. J D Mahidharia  
Mr. G A Rao  
Mr. S. Roy Choudhary



Mr. Ajit Mirchandani and Mr. G.A. Rao being felicitated by Dr. Avinash Kulkarni

Except for Mr. H.S.Mamak all the Founder members were present. On this great occasion the background circumstances and role played by each of them leading to

the founding of ISLE were highlighted before they were presented with a crystal memento honouring their stellar contribution.

This was followed by a discussion chaired by Dr. Avinash Kulkarni, President ISLE wherein the founders shared their experiences and expectations to boost the image of ISLE. A need for the thrust in launching education programs at various levels was expressed by all. Better interaction with the lighting industry, educational institutions to create a wider presence and membership was also required. Mrs. Rohini Mani, Member ISLE GB proposed that all founders be invited to the ISLE MSC Committee meetings to avail of their rich experience. This proposal was accepted by all present.

Mr. Prakash Barjatia, the newly re-elected Chairman said that it was a matter of pride that for the centre the majority of the Founders were located at Mumbai and with their rich experience, ISLE, MSC could undertake projects that would be beneficial to lighting professionals as well as to the general public.

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## Annual General Meeting

October 30, 2007, Mumbai

ISLE (MSC) held its 16th AGM on October 30 and the election results were announced.

The following members were elected to the Mumbai State Centre Committee for the session 2007-2009.

Mr. Veerkumar S. Doshi  
Mr. Rajendra Gupta  
Mr. Prakash C Barjatia  
Mr. Amalendu Auddy  
Mr. K.Naveen  
Mr. Pulin Tolia  
Mr. Prakash Mavinkurve

The Committee members then selected the following office bearers.

Chairman, Mr. P C Barjatia  
Hon. Secretary, Mr. K Naveen  
Hon. Treasurer, Mr. A. Auddy

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## Lecture on New Energy Efficient Lighting Solutions

November 29, 2007, Mumbai

ISLE Mumbai State Centre had a presentation by BJB GmbH on New Energy Efficient Lighting Solutions at The Orchid on 29th November. About 75 Members and Guests were present.



*Discussions after the lecture*

Mr. Sunil Ullal, Marketing Manager of Atco Controls welcomed the Chief Guest, Dr. Avinash Kulkarni, President, ISLE, who then addressed the audience.

The presentation started with Mr. Wolfgang Tetzlaff, Regional Sales Manager, East speaking about BJB, its worldwide presence and important contribution to the lighting industry. This was followed by Mr. Harald Vohle Manager Product Management, BJB showing how new innovative lamp holders from BJB can provide energy efficiency, reliability and safety to lighting installations. The lecture was followed by an interaction between the audience and the speakers.

The program ended with Mr. Stan Alvares proposing a vote of thanks to all present and specially to Mr. Bhavin Soonderji of Atco Controls for hosting the presentation. He also thanked Mrs. Rohini Mani, Member ISLE GB through whose initiative this program was organised. Products from BJB were also displayed.

## CHENNAI STATE CENTRE

### Lecture on LEDs

May 12, 2007, Chennai

A presentation on the Fundamentals and application of LED lamps in aerodrome, railways and traffic signal lighting by faculty from Anna University was organised on May 12. The 80 persons who attended the presentation included maintenance managers from the Airport, Southern Railways, the Police department, architects and interior designers.

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### Interactive Workshop on LEDs

August 18, 2007, Chennai

A workshop with 15 final year students from Velammal Engineering College and architects from Rotmax

Engineering with a focus on illumination through LEDs was organised on August 18. Architect Suny Akbar explained the design features and the cost benefit ratio to the participants. The interactive discussions that followed revealed the emerging possibilities for different applications in the future.

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### **Lectures on Fundamentals of Lighting and Lighting Design Concepts**

September 14 and 22, 2007, Chennai

Two lectures for students of Electrical Engineering and Interior Design on Fundamentals of Lighting and Lighting Design Concepts were organised in the month of August. The lectures were given by Architect Suny Akbar and Designer Mr. Ilamathy . The first lecture on August 14 was attended by 40 students of Electrical Engineering from SRM Engineering College, Chennai and the second on August 22 by 25 students of interior design from the Exterior-Interior Institute also in Chennai.

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### **Lecture on Energy Conservation**

October 20, 2007

A lecture on Green Energy and Energy Conservation was organised on October 20. Engineers from TNEB and PWD gave a lecture and demonstration of systems powered by solar energy to light LEDs and CFLs as an option to alleviate the prevailing power crisis. The lecture was attended by architects and interior designers.

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### **Technical Seminar**

November 22, 2007, Chennai

A technical seminar organised by ISLE Chennai State Centre, was held on Thursday, the 22nd November 2007 at the Green Park Hotel, in Chennai. The event was planned to make use of the expertise of some of the GB members who were on a visit to Chennai for the meeting of the ISLE Governing Body along with other local experts.

Present at the Seminar were 60 members and the special invitees including Dr. Avinash D. Kulkarni, President, ISLE, Prof. Saswati Mazumdar, Head of the Department of Lighting and Illumination Engineering at Jadavpur University, Mr. R. Viswanathan from Crompton Greaves and Mr. Pon Kumares, Manager LiDAC, Philips Electronics India.

Mr. Dilip Kumbhat, Chairman of the State Centre, extended a warm welcome to all the guests and participants,

introduced the special invitees and gave a briefing on the proposed topics of the seminar and their relevance to the present energy crisis at the national level. Mr. R. Balasubramanian, Secretary, presented the Annual Report and highlighted the activities of Chennai State Centre. On completion of the formal proceedings, the technical presentations commenced.

The first session by Dr. Avinash D. Kulkarni, President, ISLE focused on the journey of lighting sources from yesteryear Mercury lamps to present day Metal Halide lamps. Being a person involved in the design and manufacturing of such lamps with a strong academic background, he presented the evolution from one to other, the problems faced at each level, the advantages in each type of lamp, its relevance to various objectives, and the technology involved.

The second session by Prof. Saswati Mazumdar, on "A nonconventional approach for lighting of unelectrified villages and roads" was basically an application study through a research and implementation project undertaken by their department. The presentation covered innovative applications supported by a very good cost benefit and making use of LEDs/35 watt SOX lamps and 36 watt CFL lamps. The application exhibits on cycle powered battery chargers, 3 watt home lights, solar powered SOX lamps, 6 watt LED street lights with detailed explanation about each, was well appreciated by all.

The third session by Mr. R. Viswanathan, from Crompton Greaves on Energy Saving Aspects in Lighting was an elaboration of the concept of energy saving through the usage of lamp selection.

The fourth and the last session on Solid State Light Technology by Mr. Pon Kumares, Manager, LiDAC Philips Electronics India gave an insight into the exciting possibilities of what could be expected from solid state lighting in the near future. The constructional aspects along with the special features of LEDs and its application and future prospects were elaborated with application models. The presentations were followed by a question answer session.

The seminar was very well received by all participants and to cap it all, the comments of the President ISLE were worth noting. He commended the timing of the seminar along with the meeting of the Governing Body of ISLE and the opportunity given to them to have a first hand knowledge of the chapter's activities and an interaction with the members . It also provided an opportunity to share the expertise of the GB members.

Mr. R. Nagarajan, Treasurer, ISLE proposed a vote of thanks. The meeting concluded with dinner.

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## Presentation on New Energy Efficient Lighting Solutions

November 26, 2007, Chennai

Under the auspices of Tridonic Atco and BJB a presentation on New Energy Efficient Lighting Solutions was organised for the members of ISLE Chennai State Centre at GRT Grand Days, Chennai.

Seventy five participants attended the presentation. The lectures were handled by Mr. Wolfgang Tetzlaff and Mr. Harald Vohle of BJB GmbH and Mr. Bhavin H. Soonderji of ATCO.

Mr. Dilip Kumbhat, Chairman of the State Centre, welcomed the guests and participants, introduced the speakers and gave a briefing on the importance of energy saving measures. Mr. R. Balasubramanian, Secretary ISLE, Chennai State Centre, read out the Annual Report detailing the various activities held at the State Centre and highlighted the details of recently conducted Technical Seminars.

The presentation began with an introductory lecture by Mr. Bhavin H. Soonderji of Atco Controls. He was followed by Mr. Wolfgang Tetzlaff, who detailed the technical aspects involved in new energy efficient lighting solutions and how they are trying to achieve energy efficiency through the proper usage of correct ancillaries for lighting applications. The application aspects and other issues were exemplified by Mr. Harald Vohle. This was followed by a question answer session and product demonstration.

Mr. R. Nagarajan, Treasurer, ISLE thanked all and explained the importance attached by the State Center to educating the members on the evolving technologies in lighting and the relevance of the presentation.

### KARNATAKA STATE CENTRE

#### Energy Conservation Week

Karnataka State Centre organised a lecture as part of the Energy Conservation Week at BHEL in Bangalore.

A presentation was organised on the latest developments in the field of LEDs. The presentation was made by Binay Industries from Kolkata. The programme was attended by 30 engineers from BHEL and chaired by their DGM, Mr. Ramachari.

#### Vision 2010

The State Centre Committee has taken a decision to hold Vision 2010, an International Conference and Exhibition on Lighting, Energy and Environment Management, from October 18 to 20, 2008.

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The event will consist of a two day Conference/ Workshop and a three day Exhibition. A detailed brochure with program is under preparation and it will be circulated shortly.

## CIE ACTIVITY

### CIE Expert Symposium on Advances in Photometry and Colorimetry

7-8 July 2008, Turin (Torino), Italy

#### Background

This Symposium will focus on recent research and developments in physical photometry and colorimetry, with a focus on applications of imaging luminance measurement devices, including near-field goniophotometers, for measurement of light sources, luminaires, displays, and lighting environments. Another focus will be on the measurement of spectral characteristics of photometers and colorimeters, including the degree of the  $V(\lambda)$  match (the  $f_1'$ ), whose uncertainty is often questioned. Other topics of new developments in physical photometry and colorimetry will also be covered. The meeting is organised by CIE Division 2 and hosted by INRIM (Istituto Nazionale di Ricerca Metrologica) in Turin, Italy. There will be CIE Division 2 meetings in conjunction with this Symposium.

#### Goals

To discuss and summarise the state of the art of recent developments in physical photometry and colorimetry, with special emphasis on applications of imaging devices for photometry and colorimetry, and measurements of spectral characteristics of photometers and colorimeters. The outcomes of the symposium will be utilised as recommendations for future work in Division 2.

#### Who should attend

This meeting is open to everyone with an interest in any aspect of physical photometry and colorimetry, thus measurement of visible radiation and color. Early registration is recommended to ensure adequate space and support, and to allow adequate distribution and review of relevant documents.

#### Call for papers

The two-day Symposium will feature Invited Papers and Contributed Papers. Ample time will be secured for round-table discussions. A Poster session may be held depending on number of papers received.

*Papers should deal with one of the following subjects:*

- Characterization and/or improvements of imaging photometers and colorimeters

- Applications of imaging luminance measurement devices for photometry and colorimetry (for light sources, displays, luminaires, etc.)
- Measurement of spectral responsivity and  $f_1'$  of photometers/colorimeters and uncertainty evaluation
- Other developments of new techniques in photometry and colorimetry, including improvements in spectroradiometry (for photometry and colorimetry) and object color measurement

Authors are invited to submit two-page extended abstracts of their proposed contributions in English no later than 28 February 2008 by e-mail or mail to

CIE Central Bureau

Kegelgasse 27, A-1030 Vienna, Austria

E-mail: [symposium@cie.co.at](mailto:symposium@cie.co.at)

Authors will be notified of acceptance of their abstract by 1 April 2008. The submitted extended abstracts, if accepted, will be printed in the Abstract booklet, which will be distributed at the Symposium. Accepted authors will be requested to submit a full paper (maximum 6 pages) for the Proceedings. Instructions for preparing camera-ready papers will be distributed to the authors after acceptance of abstracts. Final camera-ready papers are due at the Symposium. The proceedings of the Symposium will be made available after the meeting.

Accepted Symposium contributions will be pre-published for Symposium participants on the Symposium website.

*For further information of the Symposium including registration forms see*

[www.inrim.it/CIE2008](http://www.inrim.it/CIE2008)

## CIE PUBLICATIONS

### Road Transport Lighting for Developing Countries CIE 180:2007

The great majority of the deaths from road accidents happen in the less-motorised developing regions of the world, particularly Asia - and the absolute numbers are growing. As in the highly motorised countries of the world, a significant proportion of accidents occur at night. This report deals with the part that better lighting and visibility can play in reducing the toll of death and injury; it is addressed to those involved in road safety work, not to lighting specialists. Its basic intentions are to guide, inform and encourage.

The report starts by explaining the basic "language of light" and defining the terms and quantities it uses. The night-time value of simple road markings and signs is

*Continued on page 18*

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400, 600, 1000  
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E 40



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(Tubular)**

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Website : www.venturelighting.com

MAKHEA 5364

## AGC Training Corporation

Yokohama-shi, Kanagawa Japan

The training center for this world's leading glass manufacturer aims at transmitting a very special tradition of quality glass manufacturing. There were three main challenges the designers had to overcome. They had to (1) create interactive spaces for active communication among visitors from all over the world, (2) express the company's identity and (3) keep costs low and the construction period short.

As a design solution, the Takeda designers reduced the numbers and sizes of slit windows to a minimum, intensifying the value of glass, lighting and natural light. The light spectrum can be visualized from both inside and outside by lighting falling through the glass, which, in turn, expresses the world's leading glass manufacturer's company identity.

The nighttime view of the building shows a vivid gradation of the spectrum of light through the random slit windows, expressing the identity of the glass manufacturer and presenting a prismatic cutting edge shape in the monotone industrial area. On the top floor of the building, slit windows seamlessly connect to skylight windows, allowing maximum natural light intake during the daytime.

### Lighting Designers

Kakudate Masahide  
Takao Odajima  
Yasuyuki Kanebako  
Takenaka Corporation

### Architects

Hirotsugu Yamaguchi  
Nobuaki Miyashita  
Seiko Tanaka



Taisuke Ogawa

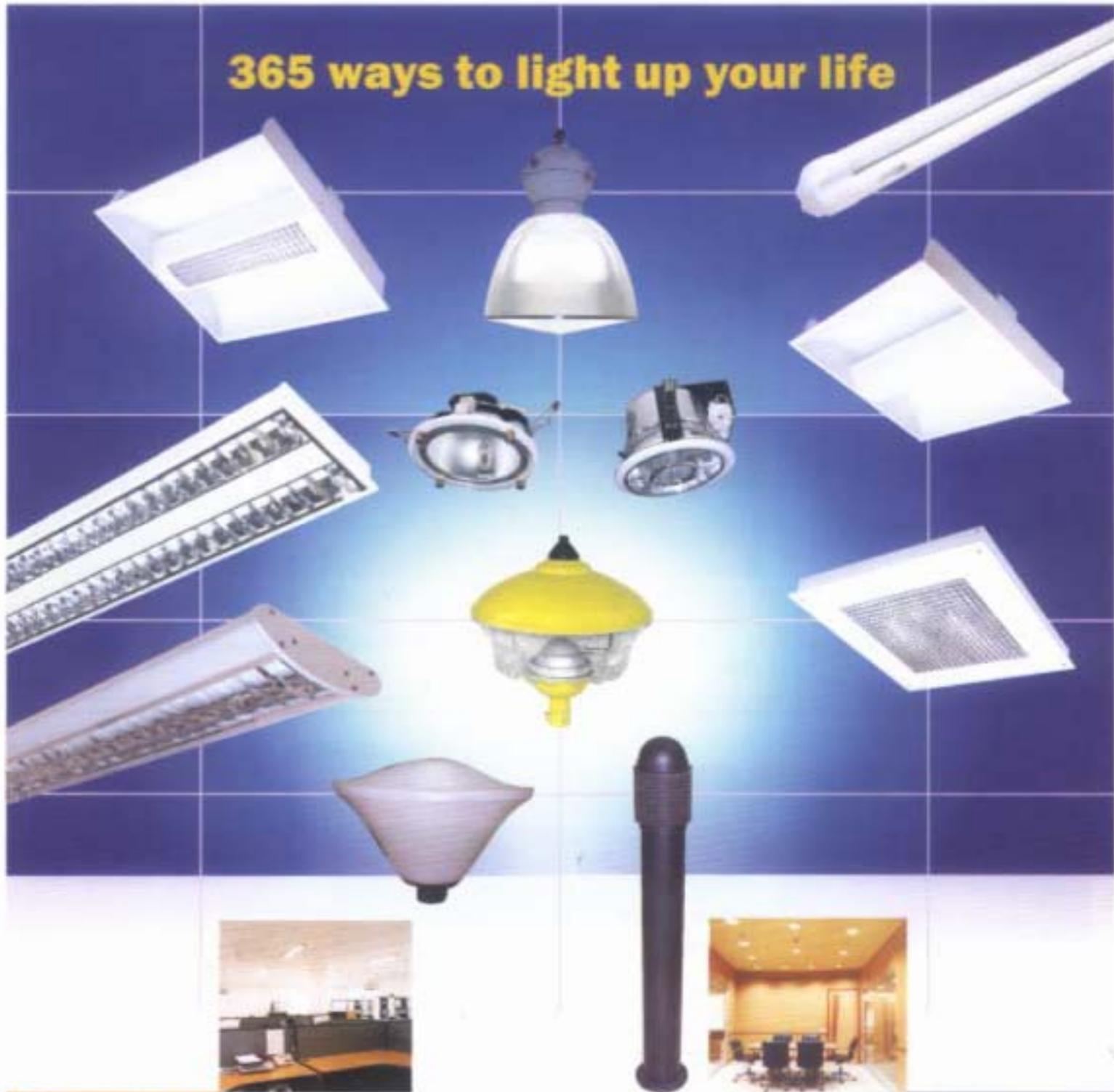


Taisuke Ogawa



Taisuke Ogawa

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## Greenville Liberty Bridge

Greenville, South Carolina U.S.A.

The Liberty Bridge traverses the Reedy River and the adjacent natural ravine, connecting the divided downtown areas of Greenville, South Carolina. Pedestrians experience views of the river and park as well as other sensorial connections to the natural setting as distinct contrast to the surrounding urban landscape. Conceptually, the lighting design sought to psychologically reinforce this complex relationship between nature and the built environment.

Preserving the sculptural cleanliness of the bridge design was of equal importance, and was achieved through: integrating custom luminaires to the bridge structure, using bridge elements as light “infrastructure” and eliminating the presence of “attached” hardware.

**Lighting Designers**  
Derek Porter, IALD  
Katie Green  
Katrina All  
Derek Porter Studio

**Bridge Architect**  
Rosales Gottemoeller & Associates

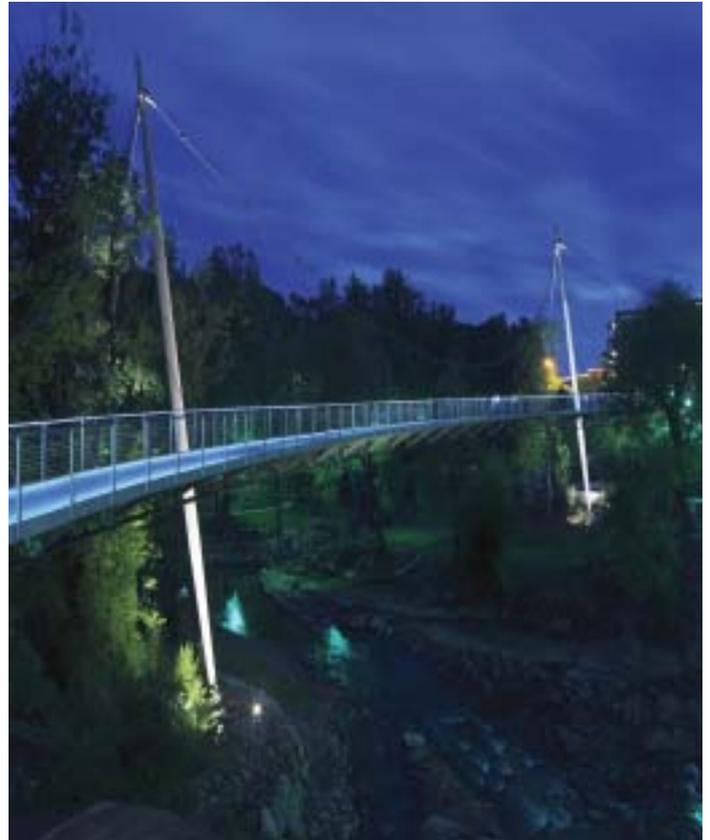
**Structural Engineer/Bridge Designer**  
Jorg Schlaich



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## Berlin Main Station, Underground Platforms and Shopping Areas

Berlin, Germany



© Roland Horn, Hans-Christoph Brinkschmidt, 2005

The new Berlin Main Station serves a dual purpose, combining Europe's largest most modern rail transportation hub with the facilities of a major shopping center. The lighting design goals were to create a feeling of comfort and safety and to support visual clarity and orientation with an overall emphasis on system efficiency and maintainability. The lighting of elliptical ceiling cutouts combine with the functional linear platform lighting to provide rhythm and structure to the space.

The project was completed on budget and on schedule, opening in time to support Berlin's role as co-host of the Soccer World Cup 2006.

The lighting design concept is based on the interaction of functional linear lighting along the platforms with decorative lighting in elliptical ceiling cutouts at the top of the columns. The visually structuring character of the ellipses is enhanced by the blueish-white accent light, creating the impression of a skylight.

### Lighting Designers

Dr. Thomas Müller  
LichtVision GmbH

### Architects

von Gerkan, Marg and Partner Architekten

### Design & Construction of Suspended Ceiling

Winkens Architekten



© Roland Horn, Hans-Christoph Brinkschmidt, 2005



© Roland Horn, Hans-Christoph Brinkschmidt, 2005

## Luz Railway Station

São Paulo, Brasil

Estação da Luz is a traditional old railway station whose former office buildings have been renovated and converted into the Museu da Língua Portuguesa (Museum of the Portuguese Language). The project, initiated in 2003, has gone through various stages until finally completed in 2006 as part of a master plan of urban renovation in the city centre.

The existing façades and access to the station were fully maintained and restored, but the museum area was completely reorganized and redesigned due to the new functions. Accordingly, the exterior lighting concept of the station entirely respected the original architecture while the interior lighting was adapted to the needs of the museum.

The lighting concept of the façades is based upon two fundamental elements: First, by means of the door and window openings to enhance the mood of an “alive” building. The second element involves the homogeneous and subtle illumination washing across the entire facade.



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### Lighting Designers

Gilberto Franco, IALD, Principal  
Carlos Fortes, IALD, Principal

### Lighting Design Team

Martina Weiss  
Orlando Marques  
Paula Longato  
Letícia Mariotto  
Cláudia Borges Shimabukuro

### Architect

Paulo Mendes da Rocha

### Client

Roberto Marinho Foundation

### Museography

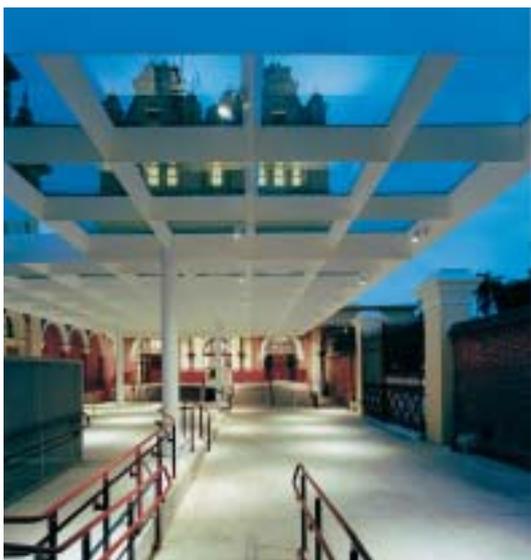
Ralph Appelbaum  
Marcello Dantas  
Marcelo Tas  
Rafic Farah

### Scenery Designer, Exhibition

Bia Lessa

### Restoration

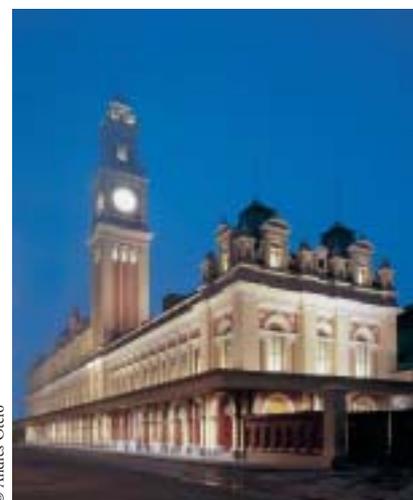
Wallace Caldas



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## 7 World Trade Center

New York, New York U.S.A.

The design team sought to create a building of dignity and presence to herald the spirit of a new beginning at ground zero, but had the additional challenge of how to deal with a building whose 80-foot base needed to hide transformer vaults. The solution was a shimmering light and metal screen wall and a lobby, inserted into it, with an illuminated ceiling, which changes color over the evening.

A cutout in the windowless screen wall reveals a softly glowing cube within the lobby. The cube represents the heart of the building from which all other light conceptually emanates. At dusk, the light cube transitions into violet and then, as darkness falls, moves to cool blue-white with intervals of deep blue.

A gleaming stainless steel of the exterior screen wall comes alive with the white and blue LED lighting imbedded within it. Custom designed luminaries with alternating blue and white LEDs aiming in two directions are housed within a one-inch wide covering. The sealed aluminum and clear polycarbonate fixtures were highly engineered to manage heat dissipation and protect the LEDs from moisture. The entire podium glows softly, as if the illuminated lobby cube radiates light out through the exterior screen walls. The elegant and mysteriously shimmering effect belies the considerable technical challenges overcome to create a custom light art-piece that wraps around a city block.

### Lighting Designers

Francesca Bettridge, IALD  
Michael Hennes  
Mitul Parekh  
Cline Bettridge Bernstein Lighting Design, Inc.

### Architects

Skidmore, Owings & Merrill LLP  
James Carpenter Design Associates

### Owner

Silverstein Properties, Inc.

### Artist

Jenny Holzer



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Continued from page 10

then explained, stressing the importance of retroreflective materials. This leads to the role of vehicle lighting, with particular emphasis on the need for individual drivers to take responsibility for cleaning and aiming. A chapter on fixed roadway lighting deals with the basic design of simple installations and explains the many different factors that need to be considered. Because of its importance, maintenance is considered in a separate chapter. Finally, there is some general lighting-related material for use in road safety campaigns.

A consistent message of the report is that it is worth doing something rather than nothing, as long as it is done intelligently and with an understanding of the basic principles involved.

The report is written in English, with a short summary in French and German. It consists of 47 pages with 36 figures and 12 tables, and can be downloaded free of charge at the website of the Central Bureau of the CIE ([www.cie.co.at](http://www.cie.co.at)).

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## **Hand Protection by Disposable Gloves against Occupational UV Exposure**

CIE 181:2007

A number of applications in industry, research and medicine involve occupational exposure to ultraviolet radiation (UVR) from a variety of lamps and lasers. While solar UVR exposure has been extensively studied, there is little information on methods to evaluate the efficiency of personal protective equipment (PPE) against exposure to artificial UVR sources.

Various test methods and instrumentation for measuring the spectral attenuation of disposable gloves are discussed. Factors affecting the UVR transmission through disposable gloves are investigated, and a method of assessing the level of protection provided by the glove when protecting against monochromatic or broad-band UVR sources is discussed. Application-specific examples are provided, and areas where research and standardisation efforts are still needed are discussed.

The Research Note is written in English, with a short summary in French and German. It consists of 36 pages with 34 figures and 8 tables, and is readily available via the website of the Central Bureau of the CIE ([www.cie.co.at](http://www.cie.co.at)).

The price of this publication is EUR 48,— (Members of the National Committees of the CIE get 50% discount).

## **Calibration Methods and Photoluminescent Standards for Total Radiance Factor Measurements**

CIE 182:2007

This technical report provides the recommendations of the CIE concerning total radiance factor measurements of photoluminescent samples. The scope is limited here to photoluminescent samples whose fluorescence is excited by ultraviolet or visible radiation only. These recommendations include procedures for both one-monochromator and two-monochromator methods. Detailed information is provided on the influence of various measurement parameters, such as the illuminant, instrument geometry, polarization, reflectance standard and photoluminescent standard. The report includes a survey of currently available photoluminescent material standards and calibration laboratories.

The publication is written in English, with a short summary in French and German. It consists of 54 pages with 9 figures and 5 tables, and is readily available via the website of the Central Bureau of the CIE ([www.cie.co.at](http://www.cie.co.at)).

The price of this publication is EUR 56,— (Members of the National Committees of the CIE get 50% discount).

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## **CIE Standard Illuminants for Colorimetry**

Joint ISO/CIE Standard, ISO 10526:2007(E)/CIE S 014-2/E:2006

This CIE Standard replaces ISO 10526:1999/CIE S005:1998. It contains only minor changes from the previous standard, 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](http://www.cie.co.at)).

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

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### **CIE Standard Colorimetric Observers**

Joint ISO/CIE Standard ISO 10527:2007(E)/CIE S 014-1/E:2006

This CIE Standard replaces ISO/CIE 10527:1991. This Standard contains only minor changes from the previous Standard, 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 colourmatching 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](http://www.cie.co.at)).

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

## OTHER NEWS

### **Lighting Research Academy Inaugurated at MIT Pune**

On August 9, the Lighting Research Academy was inaugurated at MIT in Pune. The Institute is offering a post graduate programme in Lighting Technology Management.

The Chief Guest was Mr. Manoj Verma, Vice President, Crompton Greaves and President, ELCOMA.



### **Training Programme**

*December 10-14, 2007, Pune*

The MIT Lighting Research Academy in association with MIT College of Engineering organised a five day training programme on Light Sources - Control and

Applications. The Programme was approved by the Indian Society for Technical Education (ISTE), sponsored by the All India Council for Technical Education (AICTE) and supported by ISLE.



The programme covered the following subjects: Measurement of Light, Vision and Colour, Lamps and Luminaires, Lighting Controls and Ballasts, Biological Effects of Light and Solid State Lighting.

The programme attracted 70 participants from different parts of the country comprising professionals, academicians, faculty members and students.

Dr. Avinash Kulkarni, President ISLE complimented MIT for this initiative that was coordinated by Mr. Prakash Barjatia, Director MIT LRA and Chairman ISLE Mumbai State Centre.

## NEWS ABOUT MEMBERS

### Dr. Biswajit Ghosh invited to give Royal Society of Chemistry lecture

Dr. Biswajit Ghosh who was on a Visiting Fellowship at the University of Newcastle was invited in November to give the prestigious Royal Society of Chemistry lecture at the University of Bangor. His lecture was on Clean Energy Technologies: Impact in Energy Technologies.



Dr. Biswajit Ghosh

The lecture evoked great interest in the “Plugging into a new life” project being conducted at Jadavpur University.

### P.C. Barjatia Awarded PhD

Mr. P.C. Barjatia, Chairman ISLE Mumbai State Centre has been awarded a PhD by the All India Shah Behram Baug Society (For Scientific & Educational Research) – An NGO in Special Consultative Status with the United Nations Economic & Social Council (UNESCO) for his thesis, Socio-Economic Impact of Lighting Education in India.



Mr. P.C. Barjatia

## TECHNICAL PAPER

### Development of a Syntactic Technique for Architectural Lighting Design Derived from Musical Principles

Amardeep M Dugar

#### Introduction

Architects and designers spend considerable amount of time in resolving spatial compositions, materials and textures to design spaces that are appealing to the end user. However the salience of lighting in architecture is seldom understood by designers. Once the geometry of the space, the material properties, and the viewing parameters are specified, the appearance of the space depends exclusively on lighting. Lighting of interior and exterior environments is normally designed to be functionally supportive while eliminating or minimising any sources of sensory discomfort or distraction. This parochial approach very often leads to “sense-deprived” designs that fail to provide stimulating environments that are a pleasure to work. This is so because lighting can enhance the visual component in a way which complements and extends the overall sensory experience. Sensory richness is achieved as a by-product of lighting of surfaces rather than this titivation being achieved as a focus of lighting design<sup>1</sup>.

And as research which would support lighting design for its sensory richness is quite complex and requires an interdisciplinary approach, it is left uncharted (more so for the fear of failing!). The implications of the above discussion are that current approaches to research into the relationship between lighting and people’s perception and experiencing of built spaces are inappropriate and inadequate.

#### Need for this study

Poorly designed lighting contains under- and over-illuminated regions that exhibit poor contrast resulting in spaces that are difficult to comprehend, therefore negating its architectural design. On the contrary, there are instances where lighting deliberately highlights or suppresses certain architectural elements synonymous to music where dissonance is intentional. How is it possible to gauge the lighting designers’ intent with relevance to the architectural design of the space? Is there a method of predicting the response of observers towards a lit space? At present there is a distinct problem with the acceptance of white light from fluorescent, metal halide and LED lamps as the colours are typically described as gray or hard or just displeasing by many users. Is there a means of getting beyond prejudices existing against these lamps?

Though a considerable amount of thought has gone into defining the parameters of light, there is no evidence of a predictive tool for the aesthetic response of the spectator. The central thesis of this research is to evolve a predictive tool for lighting design based on genuinely quantifiable parameters.

### **Research potential**

What designers require today is a perceptual quality metric for lighting design with practical computational ways to quantify the effectiveness with which the lighting scheme relates to spaces and eventually their end users<sup>2</sup>. This research has the potential to equip designers with such a tool for the appropriate evaluation of a lighting design scheme. In doing so, my study also builds on the direction of categorizing different lighting typologies. The research will also cover a thorough study of lamp colour of fluorescent and LEDs to convince architects, designers, and end users to move towards efficient light sources. I believe that these are currently selected on the basis of efficacy rather than as elements in a composition to create whites that are harmonious in terms of their spectral composition. Given the need I believe there is scope to study the composition of white light sources to provide some alternative colour groupings that will seem more harmonious and acceptable to the eye.

### **Partnering opportunities**

The European Lighting Designers Association (ELDA+) has been involved in developing a research work-group for undertaking quality research on lighting design and related fields. ELDA is a network of lighting designers, lighting educators and sponsors involving lamp and luminaire manufacturers who are willing to share their expertise and technical equipment in developing areas of research which have relevance to the future.

### **Background**

My masters' thesis dealing with the development of a syntactic technique for architectural lighting design uses a musical formalism to give a finite (and therefore manageable) description of an infinite (and therefore intractable) set of structures. It is based on the human spatio-temporal visual processing system responding selectively to three basic parameters in an architectural space, namely – Form, Motion and Colour<sup>3-6</sup>.

- Form – of a spatial envelope is perceived on the basis of the applied illumination levels and reflective co-efficiencies of its surfaces.
- Motion – applies to all phenomena in the time dimension and may therefore occur in a static form<sup>5</sup>, with changes in luminance levels.
- Colour – is an optical phenomenon non-existent without light. In a given combination of hue,

saturation and value these three factors may retain the same relation to each other, while being moved into a higher intensity range by increased illumination<sup>5</sup>.

By the law of trichotomy, each note of a piece can only be of higher, lower, or the same pitch as another note temporally preceding it<sup>7</sup>. If this law is applied to lighting, the illumination level at one particular point in space can only be of a higher, lower, or the same level as another spatio-temporal point/surface in its vicinity and these are subsequently mapped as consonance and dissonance. By the law of colour combinations the colour schemes used in the space are grouped into consonant and dissonant mappings using colorimetric values. The results of each of these are mapped onto a calculative matrix that gives a collective total of the consonant and dissonant mappings thus evolving a syntactic technique. A combination of basic units not listed in the syntax's rules is viewed as dissonance, ex. any combination of colours that do not follow the laws of colour combination or high-brightness ratios that are disturbing to the eye.

In effect<sup>8</sup>, the syntax classifies combinations of luminance levels and colorimetric values as either consonant (grammatical) or dissonant (ungrammatical) in the form of a mathematical model. This model is basically a combined total of the form, motion and colour mappings, where all the information is intertwined into one - The Matrix. The matrix incorporates a final score of the design in terms of its total consonant and dissonant mappings. With this matrix, an architectural lighting designer can precisely pin-point and rectify the area of dissonance. Every design has its own respective matrix total depending upon the number of lighting elements/ observation points taken into account. Each matrix gives a respective matrix ratio of the final score to the maximum possible score that defines the consonance of the design. A ratio that nears one means a visually harmonious design. Two designs are compared with the quantity of this ratio. The idea is to use the light matrix as a guiding machination to design spaces with a meaningful musical expression.

### **Literature survey<sup>1</sup>**

Visual perception comprises of transmission and processing of information via visual pathways from the eyes to the visual cortex area of the brain. Though effort has been put into examining the variety of cell types, their characteristics and the complex array of interconnections between them, very little has been applied directly to lighting design. Noted researchers have postulated processing of visual signals through three separate pathways, each with its own distinctive function, response time and level of detail resolution. One subsystem appears to process information about colours and shades of greys;

the second subsystem carries high resolution information about borders seemingly important for shape recognition; the third subsystem carries information about movement and stereoscopic depth. Influential theories have assigned the first and second subsystems collectively termed the 'Ventral' pathway the task of identifying the spatial layout of objects to build a representation of the person's surrounding. The third or 'Dorsal' pathway is specifically focussed on providing information for controlling movement.

The fact that both pathways now need to build a spatial perception with respect to architectural design, it can be posited that the ventral pathway is concerned with the relationship of objects to each other whereas the dorsal pathway is concerned with the relation of objects to the person. Therefore as architectural lighting designers, it is the latter form of spatial perception which would gather our attention and the way lighting can shape the experience that each person has of their environment. The implications of the above discussion are that current approaches to research into the relationship between lighting and people's perception and experiencing of built spaces are inappropriate and inadequate.

### ***Experimental method***

The standard methodology will be to study and identify those critical parameters in lighting design that appeal to the sensory experience of end-users. In doing so the syntax will be used again to identify parameters as individual representations and then compose them in a single structured statement to describe the combined meaning of the space. A validity check will be performed on the analysis tool (light matrix) to prove that it can be used to predict the human response to a lighting scheme.

- Experimental spaces with defined geometries and materials will be built to study the impact of light using CAD software. Within architecture, concentration will be given on those spaces (interior or exterior) where there is a high possibility of portraying the behaviour of light with radiosity renderings using software like Relux and Lightscape. This is so because visualizations make computation and aesthetic analysis for lighting a lot easier. The perception of a lighting design scheme is subjectively dependent upon specific observation points, view location and the method of depiction. Different aspects are revealed when a project is shown, for example, in axonometric versus plan or in diagrammatic lines versus ray-traced surfaces<sup>9</sup>. The total number of observation points is defined by the absolute geometry of the space. The observation points will measure the quality of the space in-terms of the overall illuminance for visual comfort and task

performance, and luminance ratios of different surfaces for contrast, glare and brightness. These basic measurable parameters will be used as the basis for identifying those parameters to which humans can respond. Certain deduction will be made assuming that human will react to these lit conditions in a specific manner.

- This research hypothesizes that in the context of sensory richness, the dorsal pathway dealing with visual input to the control of actions and establishing information on the spatial relationship between person and surroundings has to be addressed by lighting design. In doing so it explores different lighting design methods that have the potential of addressing the dorsal pathway and consequently make spaces "sense-rich." The methodology will be to study and identify those critical parameters in the research and application of lighting design that have appealed to the sensory experience of end-users. The next step would be to identify case studies that come close to the experimental set-up in terms of their function, geometry and material properties to make actual observations and study the response of end users. Several international award-winning design projects will be studied to identify those parameters that arouse the interest of the dorsal pathway. Some of these case studies have to be actually built in a lighting laboratory. This practical survey with human end users will adequately challenge the parameters, system of analysis used in my previous works and deduction made using the software calculations.
- The next objective will be to further develop the comparative representational methods, find critical dependable variables and fine-tune these variables for more effective representations of the syntax.
- There is a marked difference between the use of surface colour and light colour. During the course of the study this thesis will also attempt to study the impact of white light with different colour temperatures on the material properties of a space. One of the major problems with fluorescent and discharge lamp technologies that will also be apparent with white LEDs is that the white is produced by peaks of quite specific groups of wavelengths depending on the phosphors or metals used. The research is likely to reveal facts about such efficient light sources which can be rectified or be given a more acceptable light composition by end users.

### ***Graphed results***

The final analytical results will lead to testable predictions about the lighting design of spaces that are lit with respect to their architecture. The main goal of undertaking this study is to arrive at a perceptual quality metric that will prove to be didactic not only to architects

and designers, but also lamp manufacturers to evolve light source technologies that are consonant with the architectural quality of spaces. The parameters identified in the research can then be used to formulate a comprehensive set of principles that can equip professional lighting designers to design lit-spaces that are "sense-rich."

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8. Amardeep M Dugar; Chapter 6 – Development of a syntactic technique for Architectural Lighting Design derived from Musical Principles
9. Nancy Yen-wen Cheng and Edwin Pat-Yak Lee - Depicting Daylighting: Types of Multiple Image Display (ACADIA 2001) edited by Wassim Jabi, Oct. 11-14, 2001, University of Buffalo, Buffalo, NY
10. The IESNA Lighting Handbook – Ninth edition

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*(NOTE: This paper was a presented poster at the CIE Session in Beijing in July 2007 and is reprinted here with permission.)*

## FORTHCOMING EVENTS

### **7<sup>th</sup> National Lighting Congress** November 27-28, Istanbul, Turkey

The 7th National Lighting Congress aims to enable the meeting of people working on various fields of lighting such as research, design, application and production, to ensure the exchange of knowledge and experience, to discuss the new developments.

#### **Topics**

- Vision and Colour
- Physical Measurement of Light and Radiation
- Interior Environment and Lighting Design
- Lighting and Signalling for Transport
- Exterior and other Lighting Applications
- Photobiology and Photochemistry
- Image Technology
- General Aspects of Lighting (terminology, education, energy efficiency in lighting, lighting and health, development of light sources, luminaires, etc)

Abstracts with the aim, method and the expected results (min. 400 words) should be sent to the Congress Secretariat by April 11, 2008.

Notification of abstract evaluation will be given by May 16, 2008 and final paper submission is due by October 10, 2008

#### **Registration**

Please fill in the registration form available at [www.atmk.org.tr](http://www.atmk.org.tr).

#### **Registration fee**

Until 10th October 2008 50 Euro

After 10th October 2008 75 Euro

*For further information contact:*

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## WEBWATCH

### **LRC Develops Framework to Quantify Light Pollution, Asks for Input**

How can lighting designers and city planners be sure they are getting their intended results when they try to reduce the amount of light pollution in their communities?

The Lighting Research Center (LRC) reports that, while restricting outdoor luminaires to full- or semi-cut-off versions would seem to reduce pollution, quantitative analyses have shown that they have little or no effect.

To remedy that, the LRC - working with a group of North American and European outdoor lighting manufacturers - developed Outdoor Site (Lighting) Performance, or OSP, a framework for quantifying light pollution from an installation.

The manufacturers working with the LRC on OSP are Acuity Brands, Lumec, R-Tech/Schreder, and Philips.

"OSP is the first comprehensive, quantitative system of assessing light pollution based upon the concept that property owners should be able to meet their lighting design objectives while adhering to light pollution regulations set by their communities," says Mark Rea, director of the LRC.

OSP uses a calculation 'shoebox' that follows the boundaries of a property and a top plane. "Using property boundaries is a logical system because they form a natural dividing line between private property and public interests," Rea explains.

The OSP calculation box uses calculation planes that can be generated by any commercial lighting software that can calculate inter-reflections. OSP calculates the light crossing the planes in every direction and provides practical insight into the characteristics of the light that leaves a property.

#### **OSP considers three metrics:**

- Glow, the average illuminance on the entire calculation box, indicative of potential to cause sky glow;
- Trespass, the maximum illuminance on any of the vertical calculation planes, indicative of the potential to disturb neighbors; and
- Glare, the degree to which illumination from luminaires will cause discomfort to observers.

Using actual lighting installations, OSP provides a realistic and accurate basis for developing limits on glow and trespass.

The LRC used indoor and outdoor experiments to develop sensible criteria for limiting discomfort glare.

Specific limits for glow, trespass, and glare are now being discussed by many interested stakeholders, from practicing engineers to dark sky advocates.

The LRC is inviting engineers to participate in building a database on which to form a statistical foundation for OSP.

The results of recent OSP work have been published in the October 2007 edition of The Lighting Journal from the U.K.'s Institution of Lighting Engineers (ILE).

More information about OSP can be found of the links given below

Links:

<http://www.lrc.rpi.edu/resources/newsroom/lightPollution.asp>

<http://www.lrc.rpi.edu/researchAreas/outdoor.asp>

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## **NLPIP releases Specifier Reports: Photosensors**

NLPIP The National Lighting Product Information Program (NLPIP) has released Specifier Reports: Photosensors. This new report updates information found in the original report on photosensors published in 1998. Photosensor technology has advanced significantly, and interest in photosensors has increased dramatically over the years. A growing desire to create sustainable buildings has led to the current trend in building design of increasing emphasis on daylit spaces that use lighting controls to reduce electrical energy needs.

This new report presents the findings of testing conducted by NLPIP on the latest photosensor products and provides information to assist in the selection, setup, and general understanding of photosensors. It also includes data sheets on each photosensor product tested and discussed by NLPIP.

Specifier Reports: Photosensors is available online.

<http://rpi-lrc.ip02.org/rd/9z1zbjnutubsg20serr94v8ubt93dpqlmjerhgo348g>

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## **Now Downloadable: Award-Winning Lighting Design Book**

Do you wish you had access to a guidebook for residential lighting design?

Well, now there is a book created just for this purpose. If you're remodeling or building a new home, the Lighting Pattern Book for Homes is an excellent resource. Whether you need lighting design ideas or help with energy efficiency, the book contains information for every room in your home.

Winner of the International Award of Achievement from the Society of Technical Communication, this 222-page book explains all the details of the lighting process.

Featured designs in the book will accommodate most residential needs, and come with illustrated prototypes, information on lighting products and techniques. Not written for the lighting trade, the book is more like a lighting primer for electrical contractors, builders, interior designers, and homeowners alike.

Amazingly, this outstanding resource, which was originally published as a hard cover book, is now available in downloadable form for free, or it can be purchased in CD format. Either way, these digital versions offer an interactive table of contents that makes it very easy to search out your specific subject matter.

Get your copy today from the Lighting Research Center.

<http://www.lrc.rpi.edu/patternbook.asp?id=13306>

Book title: The lighting pattern book for homes

Year: 1996, 2007 (online)

Authors: Leslie, Russell P.; Conway, Kathryn M.

ISBN: 0-07-038079-1

Place of Publication: New York

Publisher: Rensselaer Polytechnic Institute

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## Display Your Artwork in the Best Light

Have you invested in artwork for your home? Perhaps you have a special piece that was created by someone dear to your heart?

Either way, displaying your art for all to enjoy can be an art in itself. Below, you'll find the pros and cons of several lighting options, as well as a few tips to preserve your precious works and provide the best viewing.

### **Sunlight**

While natural light might seem like a good way to show off your art, it's actually not so favorable due to the UV and infrared light, which can actually damage your artwork - particularly anything created on paper or made with textiles. The sun can fade the dyes in fabrics within a few short months - so you might want to think about protecting your upholstery as well. And of course, natural light isn't a sure bet after dark.

### **Incandescent Bulbs**

The upside of incandescents is that they bring out the rich warm tones like browns, yellows and all the colors of the red spectrum like orange and pink. However, these bulbs are not the best for blues and greens, leaving these normally vibrant colors dull and flat.

### **Halogen Bulbs**

Low-wattage halogen bulbs are bright and clear, but they emit UV and infrared rays. By using a filter or one of the newer bulbs that redirects the harmful rays, these lights do permit easy viewing of subtleties in a painting.

### **Fluorescent Bulbs**

First of all, fluorescents lights don't use the entire color spectrum of light, which is not optimum for viewing

art. And, fluorescent bulbs also produce high levels of UV rays, which are not the best thing to preserve your artwork. Most museums and galleries avoid these lamps for these reasons.

### **LED Lights**

Recently, a new LED lamp has been developed for the purpose of lighting artwork. The light uses batteries, so placement is a breeze since an outlet is not required. In addition, long-lasting LEDs don't emit UV rays, making this one of the safest and most energy efficient options.

### **Tungsten Lights**

Tungsten bulbs are another option, but throw a good deal of heat. While the lighting is good, the heat can be problematic if too close to the art.

### **Light Plan**

To showcase your artwork, the most appropriate lighting regardless of bulb type is indirect, which helps minimize fading or any deterioration. For example, downlights or spots in the ceiling above paintings will provide plenty of light, but will not shine directly on the surface of the art. This is particularly important for works on paper, the type most susceptible to damage from ultraviolet rays.

It's also wise to avoid lamps that clip on to the top of the frame, due to the close proximity to the art itself. The lamp may throw too much heat, have UV or infrared issues, or simply create too much glare to permit optimal viewing. The only exception to this is the new LED light created specifically for showcasing art, since LED bulbs are low-voltage, much cooler, and are without UV concerns.

Dimmer switches are a good idea for lights that illuminate your art. This is because the dimmer extends the life of the lamps, which are turned on and off frequently.

Last but not least, don't keep any light source on your art for any great length of time. That's one reason museums rotate their collections - keeping them out of the light preserves their beauty and value.

If you have valuable artwork or museum-quality pieces, your best course of action is to consult a lighting professional. You might also find some museums or larger galleries with professionals who are willing to share their methods to showcase and enjoy your art and keep it safe for years to come.

Link:

<http://www.lighting.com/content.cfm?id=3097&sid=30&page=/>

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