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LIGHT the official NEWSLETTER

of the **indian society of lighting engineers**

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FROM THE PRESIDENT'S DESK

With the holding of the Lii2005 Exhibition and Conference last month ISLE has crossed yet another significant milestone. The Exhibition has undoubtedly become the most important platform for display of the latest lighting technologies and for forging new alliances with international companies for both export and import as well as for technical tieups.

The Conference was a resounding success in its new format and has reinforced its place on the increasingly crowded international lighting calendar as “must attend” event.

However, we need to ensure that we now use the success of these events as a springboard to take the Society forward. I am personally very disappointed to see that there was such a limited turnout of ISLE members for the conference even though such an opportunity to assemble so many of the world’s leading experts on one platform will not happen so easily again.

There is an urgent need to educate users on the latest technologies and products. The educated user is critical to the proper development of lighting in India. State Centres need to plan and organise programmes that attract participants from all the important segments - architects, consultants, builders, interior designers, large users from the public and private sectors etc.

A good sign for the future is the emergence of the Local Centre at Ahmedabad. This has come about as the result of the efforts of a group of enthusiastic young members who want to promote good lighting. We need to induct younger members into other State Centres as well and increase the technical activity of the Society if we are to continue to be relevant. ISLE will have a viable future only if it is considered relevant by the various groups with lighting interests.

S. Venkataramani
President

Lumilux Range of Lamps comes with Tri Band Advantage.

LPC
LUMILUX PLUS COATING

'LUMILUX TRI BAND COATING'
a new development from OSRAM.
Osram's LUMILUX PLUS lamps are now coated with a new phosphor coating that make these LUMILUX PLUS lamps ***30% more energy efficient*** and ***last 4 times more*** as compared to the conventional fluorescent lamps and also gives you brighter light comfort.

Others are fluorescent tubelights.

SEE THE WORLD IN A NEW LIGHT

OSRAM
A **SIEMENS** Company

OSRAM India Pvt Ltd, Signature Towers, 11th floor, Tower - B, South City - I, Gurgaon - 1220001, Tel. (95124) 2383180/181, Fax No. (95124) 2383182

EDITORIAL

As we go to press the lighting fraternity in India is saddened by the news that it has lost one of its oldest members. We will miss Abid Kagalwala.

As is to be expected, this issue is dominated by news on the recently concluded Lii2005 Exhibition and Conference. This was the most successful of the international events organised by ISLE. This kind of success does not happen by chance. It is the result of the hard work put in over the years and the credibility that your Society has built up both nationally and internationally. More importantly, these events depend upon the full support of the industry. We are indeed fortunate that the lighting industry in India has always come forward to support all ISLE initiatives to promote good lighting practice and in particular our international conferences and exhibitions.

I would like to express our sincere thanks to Philips for sponsoring the Howard Brandston Masterclass Lecture and co-Sponsoring the Farewell Theme Dinner; to Bajaj for sponsoring the Dave Halliday Masterclass Lecture and co-Sponsoring the Farewell Theme Dinner; to Osram for sponsoring the Gert Hof for Masterclass Lecture and the Welcome Reception; to GE for sponsoring the George Brainard Masterclass Lecture and to TVS for sponsoring the Behr Champana Masterclass Lecture. I would also like to thank Philips, Bajaj and Osram for giving us seed money for the start up activities of the Secretariat.

In this issue there is a report on the meeting held in August by the lighting enthusiasts in Ahmedabad that led to the formation of an ISLE Local Centre there. There is also an excellent article by one of these lighting enthusiasts who is a faculty member of the National Institute of Design.

After a gap of several issues we are publishing details of CIE Division work. This issue carries the report on Division 1 that will update all those with an interest in Vision and Colour issues. In the next issues we will publish the activity reports of the other Divisions.

H S Mamak
Editor

Important

The Registered Office in Mumbai is presently not functioning on a regular basis. All correspondence for the Registered Office should be sent to the following address till further notice:

ISLE C/o Thorn Lighting A 274, 1st Floor
Defence Colony, New Delhi 110 024
Tel.: 24333794, 24334570 Fax: 51551789.
email: isledel@vsnl.com, website: www.isleind.org

OBITUARY

Abid Kagalwala

22 February 1916 – 9 October 2005

It is with deep regret that we announce the passing away of one of the pioneers of the lighting industry in India, Mr. Abid Kagalwala.

Mr. Kagalwala was a brilliant student and from an early age was able to finance his studies (in India and susequently abroad) by winning prestigious scholarships. In 1937 he graduated with Honours in Electrical Engineering with a first class first in Radio Communication from the Victoria Jubilee Technical Institute in Bombay and joined St. Xavier's College, Bombay as Professor of Electronics and Radio Communications. In 1946 he went to the US where he obtained a Masters in Electrical Engineering from the Polytechnic Institute of Brooklyn, New York.

His return to India in 1949 and his subsequent pioneering work in the lighting industry is best told in the excerpt below from his article "The Lighting Scenario in India in the Forties and Fifties".

"Pioneering effort for fluorescent luminaires in India

After my M.E.E. in USA and having equipped myself with training at GE, Sylvania and Westinghouse in USA and Thorn of UK, I returned to India in 1949. At that time fluorescent lighting was a novelty in India and only affluent people could afford to use it. All luminaires and accessories were being imported. I, therefore, thought it was the most opportune time to start manufacture of these items locally, and the first production came out in mid 1949. I remember receiving the first order from the Haffkine Institute in Bombay for the Industrial type. These were made by hand, the only machinery used being a hand vise, with the help of labour who were hereditary blacksmiths (known as *Lohars*) from Gujarat. Later on hand operated press brakes were used to increase production. The demand increased more and more for indigenous luminaires due to their low cost and the power operated press brake came into existence in the second half of the fifties.

One Man Exhibition of Fluorescent Luminaires at the Taj, Bombay

In 1954 I organized an exhibition of Fluorescent Lighting to educate and encourage the public to use fluorescent for their lighting requirements. I had arranged for an audiovisual show with the help of coloured slides (received from Thorn) and a commentary from a wire recorder (Tape Recorders were not yet developed). Besides the display of a complete range

of luminaires and accessories a number of stalls giving live demonstrations of the following were also set up:-

1. Lighting of the 21st century where a fluorescent tube was made to glow without any connections by high frequency electromagnetic waves.
2. Anti-stroboscopic effect in a twin tube lead lag service (with a table fan)
3. A good quality choke from a poor quality one by means of current wave forms on an oscilloscope.
4. Instant-start ballast for fluorescent tubes (received patent)
5. Rejuvenation of dead fluorescent tubes with the help of high frequency field.

The exhibition created an unprecedented interest among the public and was a complete success.

Manufacture of Control gear for fluorescent tubes

The production of the choke being the heart of the fluorescent lighting unit, was taken up in 1950. The first version used the 'J' type lamination. I got the die made by Sankey Electrical Stampings, Bhandup. This 'J' type is still being used even after 50 years, the advantage of the lamination being a single operation as zero wastage. The production of starters, pillar type tube holders and starter holders was also taken up by other manufacturers.

Lighting Equipment and Accessories Mfrs. Association (LEAMA)

As the demand for fluorescent lighting increased by leaps and bounds and government requirements going up a number of industrial enterprises sprang up mainly in Bombay. In 1953 it was decided to form an association of manufacturers (LEAMA) of which I was the Secretary. A unique plan of manufacturing lighting equipment and accessories on a co-operative basis was thought of under the banner of LEAMA Lighting Industries Ltd. A number of units were to be established by one or more LEAMA members making only one type of luminaire in each unit in large quantities making use of mass production methods using conveyor belt system to bring down the labour and overhead cost to a minimum. At that time the labour and overhead cost was almost 30% of the total cost of a lighting unit. Initially, 10 units were to be established .

Mr. M.S.N. Swamy felicitating Mr. Kagalwala at Vision 2004

This was indeed a unique plan on a co-operative basis to meet with foreign competition and make fluorescent lighting available to the public and government at the lowest possible cost. However, due to lack of infrastructure and professional management the scheme did not see the light of the day, otherwise it was a model to be copied even by the far advanced western countries of the world."

In 1958 Mr. Abid Kagalwala started his own company, Glolite for the manufacture of luminaires and accessories for fluorescent, incandescent and HID lamps. This company and its subsidiaries were managed by him and his family till 1995 when it was sold.

Mr. Kagalwala remained active and older ISLE members will remember his article "Energy Saving in Lighting" published in the July September 1998 issue of the ISLE Newsletter. In November 2003, ISLE Karnataka State Centre honoured Mr. Abid Kagalwala for his services to Lighting in India at the Vision 2004 Conference in Bangalore.

All his life Mr. Abid Kagalwala made a great effort to help others. In 2001 he published a monograph on his family, which begins appropriately with the lines

If I kindle a heart depressed
If I enliven a soul oppressed
If I revitalize a life once again
I have not lived this life in vain

In their bereavement, ISLE offers heartfelt condolences to the Kagalwala family.

Gift of Lighting Journals

ISLE has been the fortunate recipient of a large number of publications on lighting. The Lighting Research Group, Institute for Research in Construction, National Research Council Canada has donated to ISLE a collection of their duplicate journals dealing with lighting. These include issues of LD+A, Lighting Research and Technology (LRT), Lighting Magazine and the Journal of the Illuminating Engineering Society over the last decade.

This donation is a reflection on the high level of recognition and interaction ISLE enjoys with international organisations.

Those who would like to know more about the donors who are a useful source of research information can log on to http://irc.nrc-cnrc.gc.ca/ie/light/

September 9 -14, 2005

Exhibition

The general view is that Lii2005 was the best Exhibition organized by ISLE so far in terms of products, technologies and display. While the numbers for the general public have fallen below the 2002 level, it was felt that the visitor profile showed a greater interest in lighting. An analysis of the visitors is given below.

Exhibition Visitor Analysis

7,733 Business Visitors
200, 000 General Public

Break up of business visitors based on primary interest

Interest	**No.**	**%**
Lamps	1011	13.0
Domestic Lighting	852	11.0
Architectural Lighting	751	9.7
Office Lighting	707	9.2
Accessories	653	8.5
Decorative Lighting	651	8.5
LEDs	644	8.3
Industrial Lighting	611	7.9
Components	442	5.7
Retail Lighting	432	5.6
Stage + Studio Lighting	371	4.8
Non-Conventional Energy	287	3.7
Raw Material	271	3.5
Others	50	0.6
Total	**7,733**	**100**

Delegation of more than 5 members in a group came from the following organisations:-

Airport Authorities, CPWD, Defence, Ministry of Power, BEE, Dealers, Railways, PWD, Diplomats, MNES, Trade Association and Buyers.

It is interesting to note that business visitors came from 26 different parts of India. The largest numbers (58%) were from Delhi followed by U.P. (12%), Haryana (7.5%) and Maharashtra (5%). However, there were also delegates from the Southern States (4%) from far off Jammu and Kashmir, Assam, Goa, Bhutan and Andaman and Nicobar.

Besides the 28 diplomats that were guided around the Exhibition there were visitors representing 17 countries - Belgium, Georgia, Korea, Oman, Australia, Dubai, Hong Kong, Singapore, Kuwait, Mauritius, Canada, USA, Italy, Poland, Spain, China and Nepal.

Whereas every effort was made to register and record visitors, regretfully this was not always possible and we can safely estimate that 10% did walk into the Exhibition without registering. Also there were about "50" business visitors that indicated "general interest in total light" without being specific. In spite of this the data collected is useful because it reflects interest levels for lighting today.

Conference

The Conference attracted an enthusiastic and knowledgeable participants and the fact that a substantial amount of time had been allocated for discussion was widely appreciated. Also appreciated was the fact that the conference sessions were chaired and run by such eminent persons.

I give below my concluding comments from the Valedictory Session at the Conference.

Mr. Howard Brandston Lighting Consultants have become a necessary profession, and their advice is increasingly being sought. He has personally delivered over 2,500 lighting designs in all kinds of applications.

The promotion of good lighting depends on lighting design on the one hand, and a general awareness by lighting consumers on the other. He highly recommended lighting courses for electricians and builders, which would create a multiplier effect on the numbers of persons who will be informed on good and effective lighting in a country.

Whereas he agreed that energy saving is necessary, he recommended that the total lighting requirements and applications must be kept in mind. He felt that there would be no point in wasting human endeavour by reducing light requirements merely to save energy.

Dr. George Brainard In his outstanding presentation on scientific research with regard to the contribution of lighting in the areas of health, he strongly advised more interactions between lighting practitioners and health providers. Dr. A.K. Banerjee, Director, VIMHANS Hospital, welcomed such interactions, and offered his good offices to bring this about.

Mr. Kaoru Mende Mr. Mende presented lighting designs which have been influenced by local culture and environment in several countries, particularly in the Far East. His advice to lighting designers was that they should live with a project before they attempt to light it. He is already involved with Indian projects, and offered to spend time interacting with Indian architects and lighting professionals on lighting design trends.

Mr. Gert Hof His spectacular journey to several countries in the world where he has materialised excellent event related lighting was an eye opener for Indian lighting practitioners. The vast dimension of creative lighting that has been introduced by Mr. Gert Hof with appropriate music opened the minds of the audience to new avenues for lighting designers and event managers.

Dr. Dave Irvine Halliday He pricked the consciences of the participants at the conference, and made ISLE aware of how much needs to be done by the Society to bring the miracle of light to the underprivileged in rural India. His approach with LEDs driven by solar voltaic makes rural lighting a reachable proposition.

Mr. Behr Champana After spelling out the key components that constitute a project, and therefore its management and planning, he demonstrated the size of the international projects on the anvil and the need for lighting designers to raise themselves to greater levels than have hitherto been attempted. His warning is very timely for India, which is beginning to witness large projects requiring both management as well as professional and creative lighting.

Workshop on Airfield Lighting The CMD of the Airports Authority of India, Mr. K. Ramalingam chaired the workshop which had three expert technical papers by Thorn Airfield Lighting, Idman and Philips. The subjects that were covered included the latest developments in Runway Lighting, preparations for bigger capacity planes, taxi areas, peripheral areas and the indoor lighting of airports.

Mr. Ramalingam suggested that such interactions between lighting experts and the airport authorities should be more frequent. Representatives from the Indian Air Force joined in the lively question answer session.

Workshop on Lighting for Railways The Member (Electrical) of the Railway Board, Mr. Ramesh Chandra, Chaired this very interactive workshop. LEDs are appearing internationally in several applications, in coaches, platforms and even in signals.

International standards in the various areas relevant to lighting in Railways was presented and a comparison made with Indian standards.

International specialists who presented technical papers also offered free investigative service to determine the present position of lighting in the Railways, and to make recommendations for improvement.

Mr. Ramesh Chandra wanted a continuity of such interactions between lighting experts and the Railways.

Workshop on City Beautification Mr. S. Reghunathan, Chief Secretary, Government of Delhi, Chaired the meeting. Technical Papers by the three international experts were well received, and were full of ideas.

The success of this workshop can be seen from the fact that Mr. Reghunathan has requested ISLE to work out a master plan for the lighting of Delhi.

Workshop on LEDs Mr. Ajay Dua, Secretary, Department of Industrial Policy & Promotion, Chaired this meeting. The three presentations by experts were extremely informative on the present state as well as the trends for the future.

The message of this workshop was that LEDs are indeed the lighting of the future because of its size, its tremendous energy saving potential, and its extremely long life. Newer lighting applications are being added almost daily to replace existing light sources. However, the technical experts cautioned that LEDs have a long way to go yet, and lighting practitioners must not have exaggerated expectations from this emerging technology. It has a lot of promise, but it also has a lot of problems that scientists are working to sort out.

The **Welcome Reception**, with the performance by the Nrityagram Dance Ensemble, was appreciated by the delegates and even the heavy rain on the last evening could not dampen the enthusiasm of the participants at the **Farewell Theme Dinner**.

Dr. Warren Julian who is Vice President, CIE and Chair, Luc Pacifica is an old friend of ISLE and has attended all the international conferences organised by us. Below is given his impression of Lii2005.

H.S. Mamak
Secretary, Organising Committee

Another great Odissi to India

Dear Mr Mamak

I have recently returned from India and the Indian Society of Lighting Engineers' Light India International 2005.

This year's was particularly good and the trade show was an excellent indication of the changes that have occurred in the Indian market in a short period. Compared with trade shows in Australia and New Zealand the Indian ones are vast, not only in size but in the numbers of visitors. However, what struck me this year was the sophistication of the stands and the products on display. The Indian market now has a significant high-end component, with a real market for quality products. In the past the largest exhibitors were the lamp manufacturers but now they are almost eclipsed by the luminaire manufacturers/importers. This shift in emphasis is partly the result of changes made by the Indian Government on import policies.

This time the conference was different, too. It became a three-day series of seminars and workshops rather than a conference with many short papers. And unlike many

seminars attached to trade shows, the sessions were excellent and almost totally free from the usual thinly disguised sales pitches which characterise a lot of trade show "seminars". The organisers scored almost 100 percent in the appropriateness of their choice of speakers and topics. The seminars and workshops allowed plenty of discussion of hot topics which included LEDs (of course), non-visual effects of light, city beautification lighting, lighting project management and lighting design.

The dynamics of these events are interesting. From a question to Howard Brandston on the wisdom of the possible floodlighting of the Taj Mahal, to which he responded that it probably did not need to be floodlit, there seemed, by the end of the three days, an inevitability that it would be floodlit. Time will tell!

One of the events I always look forward to at Light India Internationals is the cultural evening — in the past these have included a raga group (sitar, tabla and singer) and a classical Indian concert. This year it was a superb ***odissi*** *dance group. The key characteristics of odissi are the curves of the body which make it a sensual dance form. Poses, as you find in Indian sculpture, are at the core of* ***odissi****, with the most beautiful being the* ***tribunga*** *position, with three bends in the body, at the neck, waist and knee.*

The seminar dinner this time had a Bollywood theme which unfortunately, for me, was too contrived and noisy to be enjoyable. In the past, there have been circus, mock wedding and rural themes.

You should try to attend the next ISLE event and manufacturers should treat these as an essential if they're in the export business.

I would like to congratulate all in the ISLE who planned and achieved this excellent event. It is a credit to the ISLE and to the major sponsors.

I look forward to the next one.

With every best wish,

Warren Julian
Chair, Lux Pacifica

MUMBAI STATE CENTRE

Ahmedabad Local Centre

The Governing Body in its 11th meeting on September 11, 2005 considered the opening of an Ahmedabad Local Centre under the Mumbai State Centre. It was resolved that the Centre would be opened under the MSC in accordance with the norms laid down in the bye-laws.

Mr. Nandish Shah

The opening of this Centre has come about as a result of the enthusiasm of a core group of young lighting professionals with the active support and encouragement of the Mumbai State Centre Chairman, Mr. P.C. Barjatia. The core group of Mr. Nandish Shah, Mr. Krishnesh Mehta, Mr. Jatin Panchal, Mr. Jayant Trivedi and Mr. Kirit Patel had organized a meeting in May to work towards the starting of an ISLE Local Centre at Ahmedabad. A second meeting was organized on August 17.

Mr. Krishnesh Mehta

The meeting, attended by about a hundred people interested in lighting, took place at the Institute of Civil Engineers and Architects The meeting opened with a talk by Mr. Nandish Shah (the driving force behind the new Centre) on the need for starting a professional platform for lighting in Ahmedabad.

Mr. Kirit Patel

Mr. P.C. Barjatia was to make a presentation on the role, objectives and activities of ISLE. Unfortunately, his train was some twelve hours late, so the presentation was made by Mr. Kiran Ganguli of the Lii2005 Secretariat in Delhi. This was followed by a presentation on the Light India International Exhibition and Conference.

Mr. Krishnesh S. Mehta, Faculty Member of the National Institute of Design gave the audience a unique and thought provoking presentation on Lighting. The talk is published separately on page 35 of this issue under the title Choreographing Light.

The meeting ended with a vote of thanks by Mr. Kirit Patel.

KARNATAKA STATE CENTRE

New Chairman Elected

In the State Centre Committee meeting on October 7, 2005 Mr. S.L. Jadhav, Director Sales, Power, Lighting & Protection, GE Consumer and Industrial was elected as the new Chairman of the State Centre. The following resolution was passed:

"Mr. Swamy proposed to elect a Chairman to the Committee in place of Mr. A.P. Joshi. The name of Mr. Sanjay L. Jadhav for the post of Chairman was proposed by Mr. Bhavani Prasad and seconded by Mr. Ajwani. The Committee welcomed this unanimously and Mr. Jadhav was nominated as the Chairman."

CIE ACTIVITY

The 26th Session of the CIE

4 - 11 July 2007 Beijing, China

Format of the session

The 26th Session of the CIE will be held in Beijing, China, from 4 to 11 July 2007.

The *conference* part has provision for three *invited papers*, 72 *presented papers* as well as a number of *posters* presented at the stand and up to six *workshops*. The presented papers and the workshops will be given in three parallel sessions. For the posters presented at the stand ample room will be available.

Call for papers

Prospective contributors are invited to submit papers dealing with new results in the field of light and lighting. The subjects of the papers should be relevant to the work and the terms of reference of the seven CIE Divisions and their Technical Committees. (For detailed information on domains of interest, the CIE website should be consulted.) Contributions published before will not be accepted. Papers dealing with questions of direct concern to the work of the Divisions will get priority.

Procedure For Submission Of Papers

Contributions can be submitted electronically or in paper form.

Electronic submission (will be activated soon): for details on the electronic submission, please visit the CIE website (http://www.cie.co.at/ and click on "Conferences") where also the "Offer of Paper" form can be downloaded.

Submissions on paper: prospective contributors should submit the enclosed Offer of Paper and an extended abstract of their contribution (printed plus on disk) to the Central Bureau of the CIE: Kegelgasse 27, A-1030 Vienna, Austria,

The extended abstract should be submitted in English with a minimum of 500 and a maximum of 1000 words. It should be sufficiently specific and informative and should make clear the novelty the author wishes to describe, referring to results and practical applications. Based on this information the Board of Administration will make decision on the acceptance of the paper and on whether it will be given orally in a paper session, or as a poster presented at the stand.

The submissions must arrive at the Central Bureau by 15 September 2006. Authors will be informed on the decision of the Board of Administration by15 November 2006.

New TCs

TC 1-67: The Effects of Dynamic and Stereo Visual Images on Human Health
Chair: Hiroyasu Ujike, Japan

Terms of Reference: To write a technical report on the physiological and psychophysical effects of dynamic and stereo visual images in terms of photosensitive seizures, visually induced motion sickness and eyestrain. This TC will work in close cooperation with Division 6.

TC 1-68: Effect of Stimulus Size on Colour Appearance

Chair: Peter Bodrogi, Hungary

Terms of Reference: To compare the appearance of small (<2 degree) and large (>20 degree) uniform stimuli on a neutral background.

TC 2-61 Spectral and colorimetric electronic data exchange
Chair: M. Pointer, UK

Terms of Reference: To write a CIE Technical Report to define a specification for the electronic communication of spectral and colorimetric data from measuring instruments.

TC 4-44: Management and Maintenance of Road Lighting
Chair: Pentti Hautala, Finland

Terms of Reference: To revise Publication CIE 115-1995 in such a way that lighting performance requirements may vary depending on actual status of environmental and traffic conditions.

TC 4-45: Performance assessment method for vehicle headlamps
Chair: Geoff Draper, UK

Terms of Reference: To develop a technical report that defines an objective procedure for the evaluation of forward-lighting system performance in terms of active safety. Possibly continue to develop the procedure as an industry standard. To start with EuroNCAP.

TC 5-22 Beam patterns for exterior floodlighting luminaires
Chair: S. Davis, USA

Terms of Reference: To prepare a technical report and make recommendations for new terms and definitions addressing the issues related to beam patterns and performance of exterior floodlight luminaires. To review Publication CIE 43-1979 in the light of these findings and outline proposals to update this if believed appropriate.

TC 5-23 Guidelines for the use of semicylindrical illuminance in outdoor applications
Chair: P. Rombauts, Belgium

Terms of Reference: To prepare a technical report and make recommendations for the use of semicylindrical illuminance in outdoor applications.

TC 6-59: UVC photocarcinogenesis risks from germicidal lamps
Chair: Richard Vincent, US

Terms of Reference: To prepare a technical report on the potential carcinogenic risk of low-pressure mercury discharge lamps used for ultraviolet germicidal irradiation (UVGI).

According to CIE By-Laws 2.5, NCs may appoint a representative who is prepared to be active.

Activity Report Division I - Vision and Colour

Director: Sharon McFadden, CA
Assoc. Director - Vision: Françoise Viénot, FR
Assoc. Director - Color: Michael Pointer, GB
Editor: Ellen Carter, US
Secretary: Yasuhisa Nakano, JP

Vision Section

TC1-30 (V) Luminous Efficiency Functions
Chairman: Y Nakano JP

Terms of Reference: To prepare a Technical Report on luminous efficiency functions which classifies and specifies the existing functions $V_{b,point}(\lambda)$, $V(\lambda)$, $V_{b,2}(\lambda)$, $V_M(\lambda)$ and $V_{b,10}(\lambda)$, and the color matching function $y_{10}(\lambda)$ if appropriate, in their photometric use.

Report: Problems of compatibility of notations with TC1-59 were solved and the arguments about interpolation method were also solved by the report of TC1-38. So, the final draft should be prepared as soon as possible.

TC1-36 (V) Fundamental Chromaticity Diagram with Physiologically Significant Axes

Chairman: F Viénot FR

Terms of Reference: To establish a chromaticity diagram of which the coordinates correspond to physiologically significant axes.

Working Program:

Write a report with a clear statement on the choice of a set of color-matching functions and estimates of cone fundamentals for the normal observer. The committee will take into account the variability among normal and dichromatic observers.

1. Agreement should be reached on the following points:
   a. Choice of a set of color-matching functions and evaluation of the consequence of this choice, compared to other possibilities.

ELEKTROMAG™

ATTENTION LUMINAIRE SPECIFIERS/ LUMINAIRE BUYERS

Do you know what type of Louvre is supplied in the Mirror Optic Luminaire you are purchasing ?

Here are the possible alternatives :

Cheap Louvre made from locally anodised material, patchy surface with high iridescence, only 0.3 mm thick hence quite flimsy, photometry likely to be distorted during cleaning/relamping. Low Louvre Height to save on weight and cost of Aluminium resulting in large opening behind lamp and low efficiency. Made on cheap machinery, using poor quality tooling, likely to have significant light leakage. No accuracy, no consistency in product.

Mid-Priced Louvre made from imported anodised aluminium of lower grade. Uniformly bright surface but with moderate iridescence, 0.3 to 0.35 mm thickness, low to moderate strength, low to medium louvre height. Other constructional features similar to above.

Standard Louvre made from imported anodised aluminium of medium grade, low iridescence, 0.4 mm thick, good strength, deep cell height to ensure correct photometry as per international standards. Manufactured as per prevailing standards in U.K./Europe, using special purpose imported CNC machines, designs and tools.

Premium Louvre made from imported anodised aluminium of high grade, very low to nil iridescence, 0.4 mm thick, sturdy, deep cell with minimum opening behind lamp to ensure high efficiency, glare-free performance, optimum photometry. Very satisfactory lux levels at working plane. World Class Product, complying with International Standards e.g. Cat. 1, 2 or 3 as required.

The choice of quality/performance/price is yours. We would only like you to be well informed before you make your decision.

For more details, please click on
"Reflector Materials Awareness Bulletin"
at our Web Site **http://www.emagindia.com / paranew.htm**

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BANG:2226 2488 **CHEN**: 2434 2855 **DEL**:2576 6364 **KOL**:2229 1614 **PUNE**:2613 8394

b. Accordance with the 1988 $V_M(\lambda)$ luminous efficiency function.
c. Data on ocular media and macular pigment.
d. Use of Konig fundamentals. (Identity of the copunctal points with the fundamentals.)
e. None or little participation of S cones to luminance. If any, evaluation of the luminance discrepancy between a constant (L+M) diagram and a constant-luminance diagram.

2. Establish a chromaticity diagram.
3. Prospect the construction of a color space with significant axes. Basic stimuli and scaling of the axes should be discussed. Reference the literature where such color spaces are used in order to list the topics relevant to this color space.

Report: The TC has agreed on recommending the fundamentals from Stockman and Sharpe, which are available on their Website http://cvrl.ucl.ac.uk/. As explained at the 2003 meeting of the TC in San Diego, the vote on the draft has been organized chapter by chapter: Chapter 2 on the choice of the 10° fundamentals; Chapter 3 on the choice of the parameters that modify the shape of the fundamentals and on the derivation of the photopigment action spectra; Chapter 4 on the reconstruction of the 2° fundamentals, and Chapter 5 dealing with the generalization of the standard observer to field sizes from 1 degree to 10 degrees, and its dependence on age. All these Chapters have received agreement with some suggestions for revision.

A final committee vote will take place, including Chapter 1, of the revised Chapters 2 to 5. This will complete Part I, and after approval by the TC, will then be ready for voting by the Division.

A draft of Part II (the Chapters 6 to 8) is being prepared. This will be sent to the TC for approval.

TC1-37 (V) Supplementary System of Photometry
Chairman: K Sagawa JP

Terms of Reference: To recommend a system of photometry to assess lights in terms of their comparative brightness relationships at any level.

Working Program:

1. To list items on which photometric systems based on brightness matching are evaluated, such as the reference stimulus, linkage to the current CIE photometric and colorimetric systems, practical simplicity and the physiological basis of the system structure, etc. The numerical testing results from TC1-21 are to be included.
2. To evaluate the proposed systems according the items listed above.
3. To recommend a system from the proposed systems, or by some combination of them.
4. To prepare a report on the recommendation of a supplementary system of photometry.

Report: The Chair is preparing a report to summarize the discussions that have taken place so far in the committee and to propose a recommended system for a CIE supplementary system of photometry. At the Division 1 meeting in June 2004 in Tokyo, mesopic photometry was discussed as a one of the current topics including the activity of TC1-58 "Visual Performance in the Mesopic Range". Division 1 requested that TC 1-37 complete the report for further discussion.

TC1-41 (V) Extension of $V_M(\lambda)$ Beyond 830 nm
Chairman: P L Walraven NL

Terms of Reference: To write a report on the feasibility of the extension of $V_M(\lambda)$ beyond 830 nm, including modification of $V_M(\lambda)$ in the 660-780 nm region of the spectrum.

Report: The terms of reference have been modified as follows: "Extension of $V_M(\lambda)$ beyond 830 nm, including modification of $V_M(\lambda)$ in the 660-780 nm region of the spectrum".

The draft of the report is close to being completed, but awaits the approval of chapter 6 of the report of TC 1-36.

TC 1-42 (V) Color Appearance in Peripheral Vision
Chairman: M Ayama JP

Terms of Reference: To prepare a technical report on color appearance zones for colored lights in terms of unique hues in peripheral vision.

Report: The committee held a meeting on June 11, 2004, as part of the Division 1 meeting in Tokyo, Japan. In the meeting, the following issues were discussed.

Ayama presented the proposal for the contents of Technical Report. The proposed report will consist of following items:

Foreward,
1. Introduction and history,
2. Principle of the method to evaluate colour
3. Colour zone map
4. Experimental conditions
5. Field eccentricity
6. Results
7. Conclusion References

The above contents were basically approved by the members who attended the TC meeting and the other attendees, and sp, e details in each chapter were discussed. The main issues agreed upon at the meeting were as follows: In the results section (chap.6), first the color zone map from the Ayama lab should be presented, and then

intra- and inter-laboratory variability, especially along the horizontal meridian, should be added. Figures representing hue shifts with eccentricity should be included. In the reference section, all of the references in the proposal should be listed.

It is hoped that the first draft will be sent to the members by Dr. Ayama at the end of December, chapter after chapter would be all right.

TC 1-46 (V) Concept and Application of Equivalent Luminance
Chairman: Y Nakano JP

Terms of Reference: To write a technical report describing the fundamental concepts of equivalent luminance and to provide guidelines on how to apply these concepts.

Report: The problems when applying the concept of equivalent luminance to mesopic photometry were reported at the Division meeting in Tokyo. The concept of the equivalent luminance can be used in the mesopic range by assuming that the adaptation level is determined by the target stimulus itself, but it easily leads to misunderstandings. The report should be prepared carefully so as not to lead such misunderstandings.

TC1-54 (V) Age-Related Change of Visual Responses
Chairman: K Sagawa JP

Terms of Reference: To establish luminous efficiency, visual acuity, and contrast sensitivity as a function of age.

Working Program:

1. To survey relevant data in the literature and ongoing studies as well for establishing data bases for the age-related change in spectral luminous efficiency, visual acuity, and contrast sensitivity functions.
2. To establish fundamental data bases for those functions as a function of age.
3. Write a report with those databases.

Report: The TC is still collecting available data on the three visual functions: spectral sensitivity function, the visual acuity, and the contrast sensitivity function of the eye. It has been decided that the methods describing how to use those data should be included in the report. Therefore the Chair is preparing a draft TC report in addition to the database.

TC1- 58 (V) Visual Performance in theMesopic Range
Chairman: L Halonen FI

Terms of Reference: To define mesopic visual performance and related terms.To investigate performance based photometry in the luminance region below approximately 10 cd/m2.To propose a model for the basis of performance based mesopic photometry.

Report: The first meeting of the TC 1-58 was held in Tokyo in June 2004 along with the CIE Div 1 and 2 meetings. The terms of reference were modified in the meeting. After the meeting the Div 1 approved the new terms of reference to be:

To define mesopic visual performance and related terms. To investigate performance based photometry in the luminance region below approximately 10 cd/m2. To propose a model for the basis of performance based mesopic photometry.

Currently TC 1-58 is outlining the existing and forthcoming works in the mesopic field in order to collect and compare data and to form a basis for a future recommendation on performance based mesopic photometry.

The TC1-58 web-site has been established at: http://www.lightinglab.fi/TC1-58.

TC1- 59 (V) Standard Photometric 10° Observer

Terms of Reference: To consider the adoption of the CIE $Y_{10}(\lambda)$ as the spectral luminous efficiency function of the standard photometric 10° observer.

Chairman: J Schanda HU

Report: The report has been completed and a TC ballot conducted. The report has now been submitted to CB for Div. and BA ballot.

TC1-60 (V) Contrast Sensitivity Function (CSF) for Detection and Discrimination
Chairman: E. Martinez-Uriegas, ES

Terms of Reference: To specify a baseline achromatic CSF with its reference conditions and reference observer and to specify CSF extensions based on discrimination thresholds, as well as chromatic CSFs for both detection and discrimination.

Report: The work towards a technical report describing redp,m,emded data has progressed in several areas.

- In the area of tools, we produced Matlab code to compute and plot one of the CSF formulas (Peter Barten's). We expect to develop similar tools to enable further computations using other CSF formulas and models.
- In the area of CSF data, we have made a preliminary comparison that includes classical data from Campbell & Robson (1968), modern data using sinusoidal gratings (Eugenio Martinez-Uriegas, 1995), and more recent data from a considerable number of labs (twelve) that used the same Gabor patches as stimuli and a unified lab protocol and data analysis (Modelfest, 2001).
- Finally, we started looking into the chromatic dimension of the CSF (Sophie Wuerger will provide key reference material).

Documentation on these and other issues as well as a bibliography and discussion documents are archived on the TC's electronic website. The access to this e-Room is restricted to committee members, but CIE members who would like to participate as observers and have access to our e-Room are kindly invited to contact the TC chairman for details.

Vision Reporterships

R1-16 (V) Visual Adaptation to Complex Luminance Distribution: H Shinoda JP

Terms of Reference: To survey state-of-the-art research on visual adaptation to complex luminance distribution and to judge whether CIE should establish a new Technical Committee on this issue.

R1-19 (V) Specification on Individual Variation in Heterochromatic Brightness Matching*: H Yaguchi JP*

Terms of Reference: To report on the possibility to develop a simple test of individual characteristics for heterochromatic brightness matching.

Report: The reporter has surveyed papers on heterochromatic brightness matching in terms of individual difference and examined the possibility to develop a simple test of individual characteristics for heterochromatic brightness matching.

R1-23 (V) Guidelines on Planning a Mesopic Photometry Investigation: P Trezona GB

Terms of Reference: With several new mesopic photometry investigations being contemplated, the impact of theory of other considerations on the experimental design will be reported.

Report: The report prepared by Dr. Trezona has been reviewed by two referees. Dr. Vienot, the associate director for vision, has forwarded the comments from the referees to the reporter.

R1-35 (V) Irregularities in y_{10} (λ) : P Walraven NL

Terms of Reference: To document the irregularities in $\mathbf{y_{10}(\lambda)}$ and, if necessary, to recommend the formation of a Technical Committee to consider possible modifications.

R1-36 (V) Action Spectra for Glare: J Fekete HU

Terms of Reference: To summarize the literature on the subject and make recommendation for terms of reference for a technical committee.

Report: This reportership was formed at the Tokyo meeting of Division 1 in June 2004. The background thinking for this reportership is that we know that halide lamps create more glare than traditional incandescent headlamps on automobiles. In the next five years LED lamps will also come. We should be prepared. It is something other than V lambda. Is it discomfort glare and not disability glare? It would be the job of the reporter to establish whether it is discomfort or disability glare.

R1-37 (V) Definition of the Visual Field for Conspicuity: N Itoh JP

Terms of Reference: To summarize the literature on the Visual Field for conspicuity and make a recommendation for terms of reference for a Technical Committee.

Color Section

TC1-27 (C) Specification of Color Appearance for Reflective Media and Self-Luminous Display Comparison
Chairman: P J Alessi US

Terms of Reference: To study and make recommendations for the specification of a color appearance match between a reflective image and a self-luminous display image.

Working Program:

1. Investigate whether the CIELUV and CIELAB color spaces adequately specify a color appearance match between a reflective image and a self-luminous display image.
2. Investigate whether modifications to the CIELUV and CIELAB equations (such as white point color stimulus specification) would be adequate to specify a color appearance match between a reflective image and a self-luminous display image.
3. Investigate the use of the Hunt and Nayatani color appearance models to specify a color appearance between a reflective image and a self-luminous display image.

Report: CIE TC1-27 is preparing a final report for the CIE Collection.

TC1-38 (C) Compatibility of Tabular Data for Computational Purposes
Chairman: M R Pointer GB

Terms of Reference: To prepare guidelines for tabulating CIE spectral data to provide compatibility of sets of data for computational purposes, considering such factors as spectral range, spectral interval, function, truncations, interpolation, extrapolation and number of digits.

Report: Draft 9 of a technical report has been approved by the members of the technical committee and is now in the process of Division and BA ballot.

TC1-44 (C) Practical Daylight Sources for Colorimetry
Chairman: R. Hirschler HU

Terms of Reference:

1. To compare existing daylight simulators for color measuring instruments and color matching booths
2. On the basis of this intercomparison, to recommend practical methods for simulating daylight sources.

Working Program:

1. Obtain spectral irradiance data on existing simulators for both color-matching booths and color measuring instruments, either directly from the manufacturer or from spectroradiometric measurements performed by the committee members, under standardized conditions.
2. Evaluate the performance of these existing simulators according to various criteria, including: 1.) quality of simulation based on CIE Publication no.51; 2.) integrity of simulation (e.g. stability, insensitivity to instrument geometry and polarization effects, optical throughput); 3.) practicality of implementation (e.g. simplicity of fabrication, economy, compatibility with existing instrumentation.
3. Prepare a CIE technical report on these findings and provide recommendations for practical methods of simulating daylight sources for different applications (e.g. based on allowable color-difference errors). It is expected that more than one method will be required to satisfy practical considerations. This is likely because, for example, it is not possible to have as stable or reproducible a daylight simulation with pulsed lamps as continuum lamps, but they are preferred for on-line measurements; so this reality must be accommodated in the recommendations.

Report: There was no TC meeting in 2004, but new research results were published at the Gaithersburg ISCC, CORM and ASTM meetings in May. Danny Rich and Kent Zessin (Sun Chemical Corp.) presented new data of light booth irradiance comparisons, Irena Frye (NIST) presented data on an LED-based simulator which (in the visible range) seems to be extremely good. New results were also published by Hirschler et al. (SENAI/CETIQT) on Practical Daylight Simulators for the Visual Evaluation of Fluorescent Samples and also on Standards for Assessing the Quality of Daylight Simulators in the UV Range – a Critical Comparison.

The TC Chair is preparing the first draft of the TC Report.

TC1-55 (C) Uniform Color Space for Industrial Color Difference Evaluation
Chairman: J Nobbs GB

Terms of Reference: To devise a new uniform color space for industrial color-difference evaluation using existing experimental data.

TC1-56 (C) Improved Color Matching Functions
Chairman: M Brill US

Terms of Reference:

1. To compare results based on the current CIE color matching functions, color matching functions proposed by Dr. W. Thornton's laboratory, and those of CIE TC1-36.
2. To initiate experiments to obtain data for such comparison in different laboratories.
3. To report to CIE Division 1 on the results of the above investigation and make an eventual recommendation for future CIE color matching functions.
4. To report to CIE Division 1 an eventual recommendation for the use of the new color matching functions in specifying color spaces and color-difference formulas.

Report: There has been no committee activity in the current year, other than some tentative indications of interest in performing an experiment that tests the intra-observer transformability of primaries in a color match.

Because TC1-56 has existed for five years, and the question of transformability has been open for 12 years without the requisite experiments having been done, it is appropriate to ask if enough evidence exists for transformability failure to warrant further attempts to foster a definitive experiment.

Some numerical studies indicate that W. A. Thornton's observations of transformability failure may be consistent with statistical intra-observer matching errors. In April 2001, the chair delivered a paper at CORM called "Numerical Experiment on Transformability of Primaries," and sent a written version to TC1-56. Based on plausible intra-observer errors, the paper concluded that statistically induced departures from transformability have magnitudes similar to the departures noted by Thornton.

If studies existed that averaged intra-observer iterates of the same match, the question of statistical origin of the departures noted by Thornton would be answered one way or the other. In the absence of such experiments even in the 3.5 years since the CORM presentation, the weight of evidence (measured in lack of concern by practitioners) supports the practical success, not failure, of transformability. Additional numerical studies by Hugh Fairman support that conclusion.

Accordingly, the chair plans to wind down the activities of TC1-56 in the next six months, by writing a draft final report with the above as its main point, and with my CORM document as a principal Appendix. He will circulate that short document to the committee, obtain responses, and incorporate them into the report. Minority opinions will be represented in a separate section of the report.

At that point, it will be proposed to dissolve CIE TC1-56 and defer to the excellent program adopted by CIE TC1-36 under the direction of Francoise Viénot.

TC1-57 (C) Standards in Colorimetry

Chairman: A R Robertson CA

Terms of Reference: To prepare a series of CIE/ISO/IEC Standard(s) that describe:

1. The method of calculating CIE tristimulus values and chromaticity coordinates
2. A uniform color space and its associated metrics
3. A formula for industrial color difference evaluation.

The Committee has been inactive pending completion of the 3rd Edition of CIE Publication 15 by TC 1-48. With the Publication of CIE I5 : 2004, TC 1-57 can now continue its work, most of which will be based on this publication. No comments have been received from ISO/IEC committees on the 4th draft of the standard on CIE LAB so this standard can now be roted on formally in TCI 1-57. Standards on CIELUV, the calculation of tristimulus values and CIE DE 2000 will be drafted over the next few months.

TC1- 61 (C) Categorical Color Identification

Chairman: T Ishida JP

Terms of Reference: To prepare a report describing a color categorization map for the photopic and mesopic illumination levels.

Report: This TC has not been active in 2004. The chair collected additional data and the first draft report is being considered.

TC1- 62 (C) Color Rendering of LED Light Sources

Chairman: P Bodrogi, HU

Terms of Reference: To investigate by visual experiments color rendering properties of white LED light sources and to test the applicability of the CIE color rendering index to white LEDs.

Achievements:

1. TC 1-62 continued updating the annotated bibliography.
2. Papers by TC members were given at the CIE Expert Symposium on LED Light Sources (Tokyo 2004) on visual colour rendering experiments and theoretical computations. Experimental results accumulated at various locations show insufficient correlation with the predictions of the CIE CRI. The CIE CRI does not seem to be applicable to white LED light sources, especially to RGB clusters. Reasons were discussed.
3. TC 1-62 is aware of many other indices including a report on a set of indices using recent colour appearance modelling. TC members agree that any new CRI calculation method should be in addition to the current CIE CRI, and it will *not replace* the current CIE CRI. The new method should be formulated to be valid for *all* light sources.
4. TC1-62 will publish a Technical Report describing the findings of the visual experiments and the applicability of the CIE CRI. Then, TC1-62 will be closed and the TC 1-62 will suggest the establishment of a new TC. Its terms of reference will include the development of a new additional index or a set of new additional indices intended to be valid for all light sources.

TC1- 63 (C)*Validity of the Range of CIEDE2000*
Chairman: K Richter, DE

Terms of Reference: To investigate the application of the CIEDE2000 equation at threshold, and to CIELAB colour differences>5.

Report: Two members reported on work on the topic. Claudio Oleari reported about the presentation and the publication of several papers related to the color metrics for color discrimination. Pieter Walraven reported on the statistics of color thresholds by color vision models. Both topics are important and are planned to be included in a future CIE report. Some work by the chairman on related topics may also be reported.

In 2004 the chairman worked as editor of a Technical Report ISO/IEC TR 19797:2004-09 (20 pages) and of a Draft Technical Report ISO/IEC DTR 24705: 2004-09 (80 pages in the field of Image Technology for Office Equipment (scanners, printers, monitors), see http://www.ps.bam.de/4STAE.

Both topics are highly connected to the terms of reference of CIE1-63. ISO/IEC TR19797 describes a method for output linearization of 16-step color scales that are equally spaced in CIELAB. The produced analog ISO/IEC-test charts include 16-step color series, for example the series White - Cyan, White - Black, and others. Most samples have CIELAB Differences of about 5 CIELAB units.

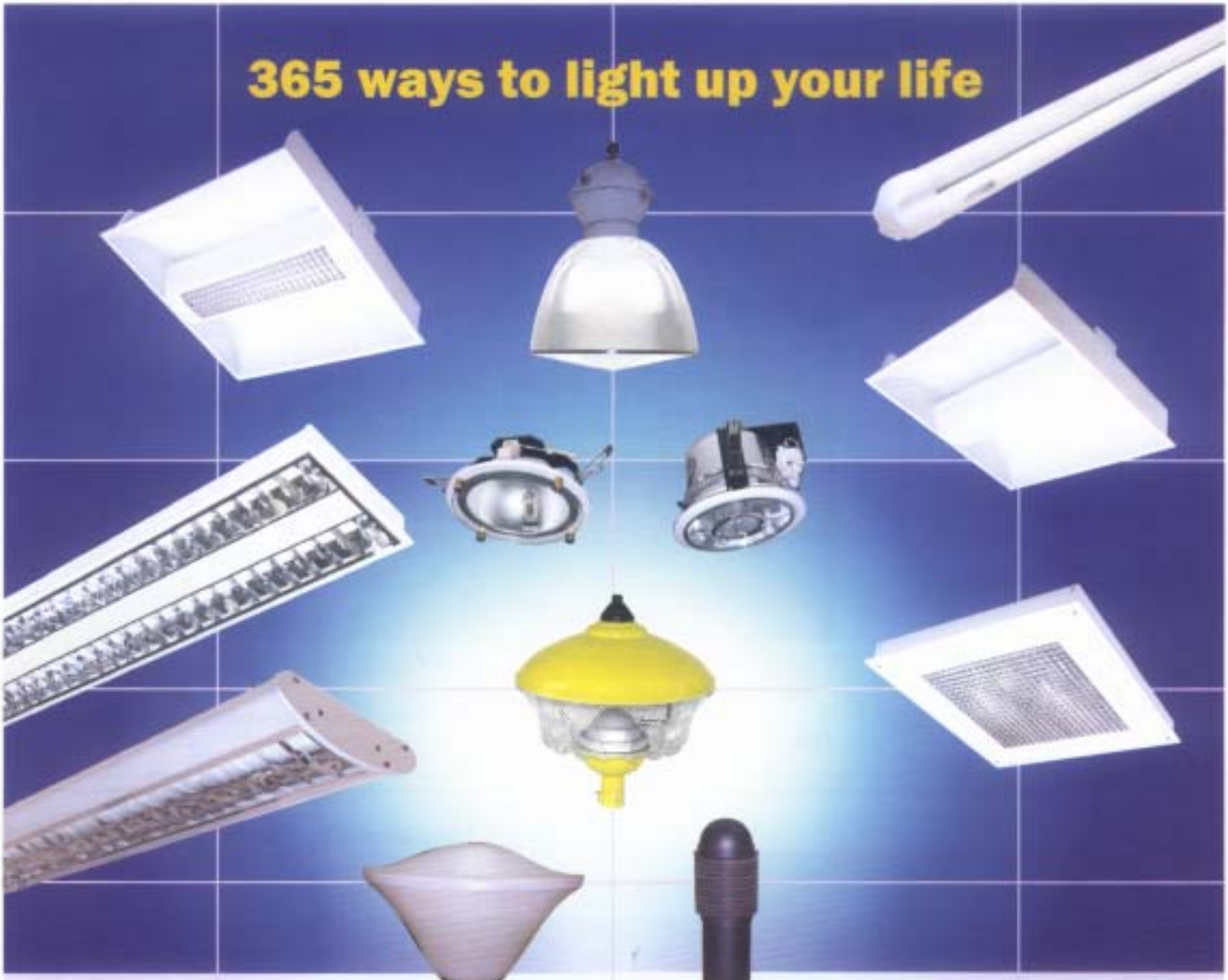
The coordinate difference of cyan (1 - red) in the sRGB and scRGB color spaces (IEC 61966-2-1, -2:2003) varies by a factor 8 along the 16-step series. White - cyan is equally spaced in CIELAB. The sRGB coordinate differences are much larger near cyan (at the chromatic color boundary) than when compared to near white.

As a result, the sRGB color metric is similar near the most chromatic cyan (at the most chromatic color boundary) and for the lower chromatic complementary hue red near black (near the achromatic axis). According to the basic 2003 papers, the color difference and the color metric is similar at threshold for the lower chromatic cyan near white and the lower chromatic complementary color red near black (both complementary near the achromatic colors). Any idea how to solve the problems are appreciated and experimental data are welcomed.

For newer papers about image technology, see under “Publications” at http://www.ps.bam.de.

Continued on page 28

365 ways to light up your life



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LII 2005
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International Exhibition and Conference on Lighting Technology

Mr. R.V. Shahi, Secretary, Ministry of Power inaugurating the Exhibition

Exhibition
September 9 -12, 2005
Pragati Maidan, New Delhi

Conference
September 12-14, 2005
FICCI Auditorium, New Delhi

H.S. Mamak, VP CIE & Past President ISLE

S. Venkataramani
President, ISLE

Shekhar Bajaj
President, ELCOMA

R.V. Shahi
Secretary, Ministry of Power

C.R. Ravindranath
Vice President, ISLE

Simi A Pandeya, Project Coordinator felicitating, Mr. Shahi

Conference
Inaugural Session

"It is important that the lighting fraternity involves itself very actively in ensuring that the Government's priority on energy saving also becomes the driving force for all the stake-holders involved with Light."
P.M. Sayeed, *Minister for Power, Government of India*

"We need to be energy efficient and we need to save to the extent we can, by proper usage, by proper practices, by use of proper technologies in our system."
R.V. Shahi, *Secretary, Ministry of Power*

"As creative people the principles of their work must rest on the three legs that support all creative professionals who are trying to improve the built environment: firstly Technology – secondly Aesthetics or sense of beauty and thirdly Social
Romi Khosla, *Architect*

H.S.Mamak
VP, CIE & Past President, ISLE

Shekhar Bajaj
President, ELCOMA

S. Venkataramani
President, ISLE

H. Mukherjee
Hon. Gen. Sec. ISLE

Warren Julian
VP, CIE & Chair, Lux Pacifica

Philips Masterclass Lecture

Howard Brandston

'Design' - Bringing the Humanities to Lighting Design

Chair : H.S. Mamak
Vice President, CIE and Past President, ISLE

Secretary : Sudeshna Mukhopadhyay
General Manager, Central LiDAC, Philips Electronics India

"I want you to consider taking true responsibility for your work."

"Marlene Dietrich knew, ... if beauty lies in the eye of the beholder, the perception of beauty often lies in the hands of the one who controls the lighting."

GE Masterclass Lecture

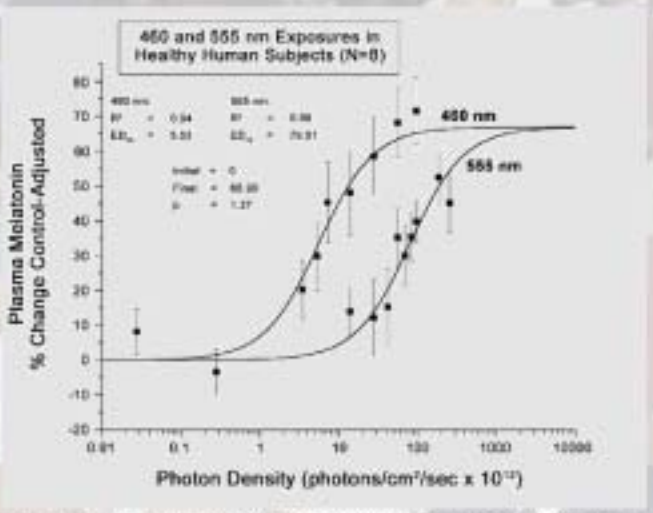
George C Brainard

Power of Light: Biological, Behavioural and Therapeutic Effects in Humans

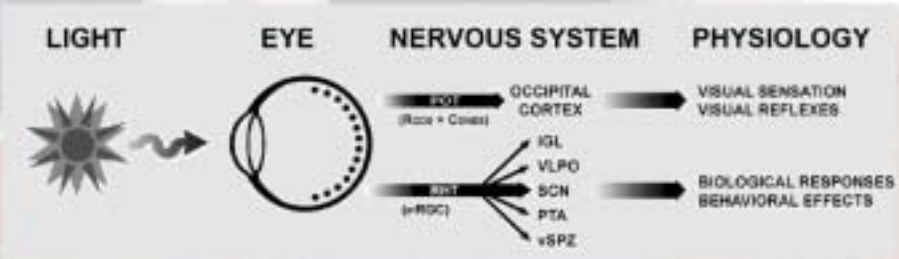
Chair : Dr. A.K. Banerji
Director and Senior Consultant Neurosurgeon, VIMHANS

Secretary : Sanjay Jadhav
Director Sales, Power, Lighting & Protection, GE Consumer & Industrial

"In conclusion, light is the important biological force on human beings. It affects our physiology, it affects our behaviour, and can be used as a therapeutic intervention."



This figure illustrates the fitted fluence-response curve for photon density and % control-adjusted melatonin suppression in healthy male and female subjects following ninety minute exposures to 460 nm (curve on left, n=8) and 555 nm (curve on right, n=8) monochromatic light.



Masterclass Lecture

Kaoru Mende

Architectural Lighting Design in Asia

Chair : Dr. Warren G. Julian
Vice President, CIE and Chair, Lux Pacifica

Secretary : S. Chakraborty
Dy. General Manager, Quality & Technology, Crompton Greaves

"Of course, lighting design is deeply concerned with technology and business or economy, but it is much more concerned with culture."

"I always expect the natural glow from inside the architecture."

Osram Masterclass Lecture

Gert Hof

A Light Journey to the Heavens:
The Architecture and Aesthetics of Light

Chair : Amitabh Kant
Joint Secretary, Ministry of Tourism

Secretary : Rajat Mandal
Sr. General Manager, Marketing, Osram India

"Theatre for me has always been a way of getting extreme reaction so that people get involved right away."

"My challenge was how does one conquer the sky."

Bajaj Masterclass Lecture

Dave Irvine Halliday

India Can Lead the World into Solid State Lighting - Does It Have the Will?

Chair : Sudha Pillai
Additional Secretary, Ministry of Panchayati Raj

Secretary : Gulshan Aghi
Sr. General Manager, Luminaires, Bajaj Electricals

PROBLEM

2 Billion people live in the Dark as soon as the sun goes down

REALITY

Lighting begets literacy, economic and social development, equality and cleaner environment

Pico Power Nepal, June 2002

Solid state operating theatre lighting, Bagdogra, India

"The 'poor' are customers too – if you simply give them the opportunity!"

TVS Masterclass Lecture

Behr Champana Gagneron

Management of Projects

Chair : B. Majumdar
Director General, CPWD

Secretary : MSN Swamy
Consultant and Secretary, ISLE Karnataka State Centre

"There are design issues. You design for the maximum marketability. Whatever the idea you market, keep this in mind."

"Quality has to be upfront."

"There are ways of building and not killing the environments."

Workshop
Airfield and Airport Lighting

Chair : K. Ramalingam
Chairman, Airport Authority of India

Secretary : Sudesh Gupta
General Manager, Thorn Lighting India

Kari Virtanen
Idman, Finland

Sudeshna Mukhopadhyay
Philips Electronics India

Fernando Ribeiro
Thorn Airfield Lighting, Australia

Workshop
City Beautification

Chair : S. Regunathan
Chief Secretary, Government of Delhi

Secretary : Deepak Gehlowt
Architect

Edward Ferreira
Head, City Design Group, USA

Behr Champana Gagneron
Principal, TPS International, UAE

Dorien van der Weele
Head, LDAC International, Philips, Netherlands

Workshop
Railway Lighting

Chair : Ramesh Chandra
Member (Electrical) Railway Board

Secretary : Sushma Goel
Reader, Lady Irwin College, Delhi Univ.

Jari Tahell
Tekoware, Finland

Ravi Koil
Acuity Brands Lighting, USA

H.S. Maesk
Presenting paper of Axle Stockmar
LCI, Germany

Workshop
LEDs

Chair : Ajay Dua
Secretary, Department of Industrial Policy

Secretary : A.K. Datta
Dept. of Physics, Calcutta Univ. & Member GB ISLE

B.K. Chandrasekhar
GE Lighting, India

Luc van der Poel
Philips, Netherlands

K.K. Rohatgi
Bitray Optoelectronics, India

14:09:05

Valedictory Session

Chair : H.S. Mamak
Vice President, CIE and Past President, ISLE

Secretary : P.K. Bandyopadhyay
Visiting Professor, Jadavpur Univ. and Past President, ISLE

Osram Welcome Reception

12:09:05

Gagan Mehra

Nrityagram Dance Ensemble

Philips Bajaj Farwell Theme Dinner

14:09:05

Shekhar Bajaj with Shibani Kashyap

H.S. Mamak with S. Venkataraman

Continued from page 14

TC1- 64 (C) Terminology for vision, color, and appearance
Chairman: S. McFadden, CA

Terms of Reference: To monitor the terminology requirements of Division 1 including the revision of the present ILV terms and the addition of new terms.

Report: TC1-64 held its first formal meeting in conjunction with the annual meeting of Division 1, in Tokyo, Japan. The Chair provided a background on the TC and outlined a possible work plan for maintaining and updating the sections of the International Lighting Vocabulary (ILV) that are the responsibility of Division 1. As well, two sets of terms were reviewed. The first set had been submitted by Division 8. They wanted to know if any of the terms should be the responsibility of Division 1. The second set includes terms that had been suggested by Division 1 members during the Division 1 ballot on proposed changes and additions to the ILV. Those terms that were identified as suitable for inclusion in the ILV and the responsibility of Division 1 will be further reviewed by members of the TC before the next meeting of Division 1. Since the meeting, the Chair has agreed to participate in a Committee, formed by the Board of Administration, to integrate the new and modified terms from all the Divisions prior to publication of a revised version of the ILV.

TC1-65 (C) Visual Appearance Measurement
Chairman: M R Pointer, GB

Terms of Reference: To study, develop, and recommend a soft-metrology framework for measuring visual appearance. This should include potential measurement areas, psychophysical procedures and real applications.

Report: This TC was established in 2003 in San Diego and met for the first time in 2004 in Tokyo. A program of work discussed as follows:

1. To produce a technical report describing a suitable framework for the measurement of visual appearance.
2. To consider the necessity of establishing new TCs to work on specific aspects of visual appearance measurement, e.g. gloss, translucency.
3. To address appearance terminology.
4. To produce a list of available instruments, and their specifications, that could support the various elements of the framework.
5. To construct a database of academic, and other research institutions that are working on aspects of the framework.
6. To consider the publication of case studies that show individual applications of appearance measurement.
7. To encourage participation from industry in the work of refining the framework and building measurement procedures that relate to appearance.

A first draft of the Technical Report has been circulated to the committee members.

TC1-66 (C) Indoor Daylight Illuminant
Chairman: J. Schanda, HU

Terms of Reference: To prepare a CIE recommendation on an Indoor Daylight Illuminant and a corresponding Indoor Daylight Source, considering the needs of the partner international standards organizations.

Report: The chair is in the process of setting up the TC Membership and invites experts to contact him if they wish to contribute to the work of the TC.

Color Reporterships

R1-11 (C) Cognitive Aspects of Color: G Derefeldt SE

Terms of Reference: To survey and present a report on cognitive functions of color in terms of behavioral, neuropsychological and neurophysiological data.

Report: The article, "Cognitive Color" was published in Color Research and Application **29:7-19 (2004).** A version of that article is planned for publication in the CIE collection. The reporter has written a summary, which is currently being edited by the division editor. The the summary and article will then be published in the CIE Collection.

R1-32(C) Emotional Aspects of Color: G Derefeldt SE

Terms of Reference: To review the literature on various non-image related effects of color and light.

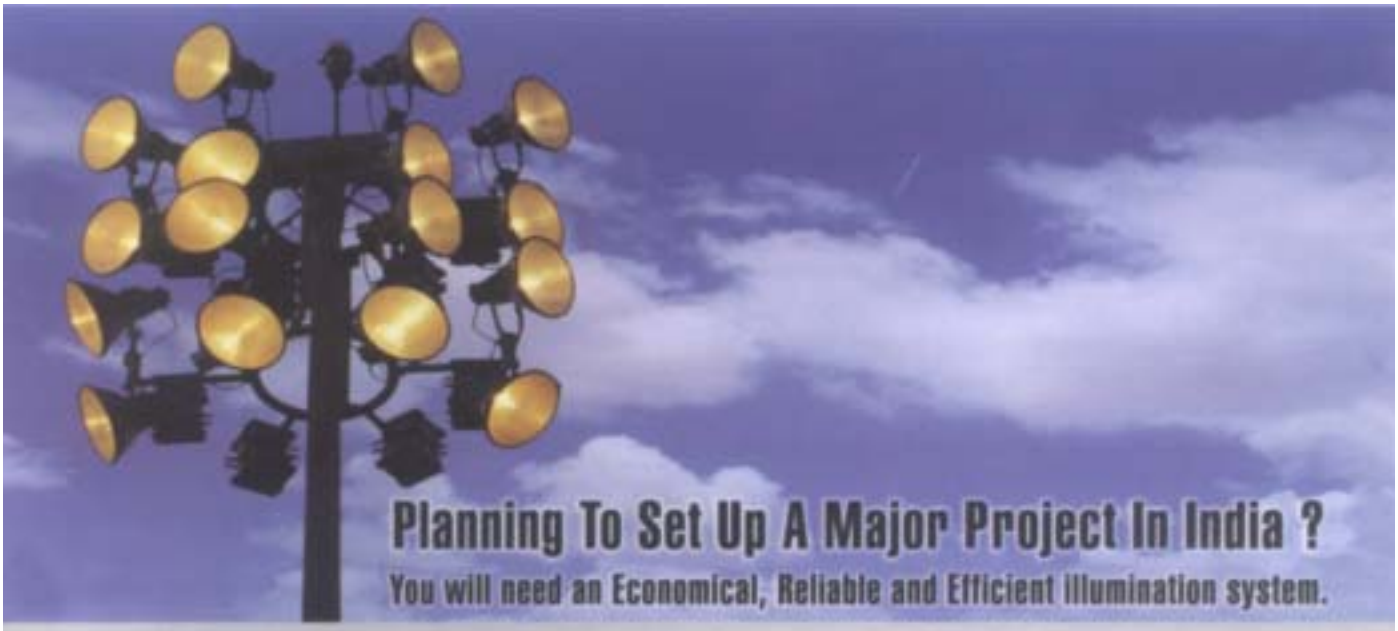
Report: There has been no progress on this reportership this year.

R1-33 (C) Color Difference Evaluation: M R Luo, GB

Terms of Reference: To monitor the response to CIEDE2000, including receiving comments, reviewing relevant literature, and recommending future activity.

Report: Four sets of experimental results based on textiles were reported recently to test the performance of CIEDE2000. These results are named Spain, USA-AATCC RA36, Brazil and Vik data. Textile researchers are interested in comparing the CIEDE2000 and the current ISO standard, CMC. A brief account is given below:-

The Spain Data included 109 pairs of textile samples with a mean D*E*ab* of 1.5. Each pair was assessed by a panel of 8 to 13 observers using the grey scale method. The USA- AATCC RA36 Data included 17 pairs of textile samples with a mean D*E*ab* of 1.8. Each pair was assessed by a panel of 31 professional assessors using the pass/fail scaling method. The Brazil Data included 5610 pairs of samples with a mean of D*E*ab* of 1.8. Each pair was assessed by 8 to 12 observers from a total of 98 (from different factories) using the pass/fail scaling method. The Vik (Czech) Data included 53 pairs of samples with a mean of D*E*ab* of 1.4. Each pair was assessed by a panel of 87 observers assessed by using grey scale method.



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The results from all the studies agreed well with each other and showed that all advanced formulae such as CIEDE2000 and CMC gave a similar degree of accuracy in predicting different data sets. However, CIEDE2000 did consistently perform the best for all colour differences in the blue region.

Two more recent articles have been published by Melgosa *et al* (Spain) and Sharma (USA). The former investigated the significance of the correction terms in CIEDE2000 and the differences between different corrected versions using the 'Combined' data set which was used to develop the CIEDE2000 formula. All the 5 corrections are significant at 95% CL indicating that these corrections are necessary to make improvement to the original CIELAB formula. The weaker terms are the ones giving the lightness and the grey corrections. There is also a significant difference between the CIEDE2000 and CMC at 95% confidence limit.

The Sharma paper indicates that some discontinuities occurred for the calculation of CIEDE2000. This is caused by the calculation of mean and difference of hue angles between two samples in a pair. However, the error is relatively small, i.e. less than 2% of the total colour difference units calculated.

CIE PUBLICATIONS

Criteria for The Evaluation of Extended-Gamut Colour Encodings

CIE 168:2005

The CIE TC 8-05 terms of reference include defining a "minimal set of standard colour spaces that addresses a wide range of imaging applications". One set of applications that was identified by the committee required the use of extended-gamut colour encodings. This document defines a set of objective metrics for evaluating the characteristics of output-referred extended-gamut colour encodings. Detailed metrics have been developed to evaluate a number of important attributes of extended-gamut colour encodings. These criteria include:

- gamut volume characteristics,
- colour quantization characteristics,
- hue constancy when applying non-linear tone scale modifications to RGB colour values,
- complexity of transformation required to and from typical standard spaces (sRGB, ICC PCS, etc.).

The relative importance of the individual metrics will vary on an application-by-application basis. As a result, the committee concluded that the actual evaluation of candidate colour encodings for use in particular applications should be left to other standards bodies that are more closely aligned with the relevant industry segments, and therefore would be better able to define the appropriate application-dependent requirements.

The report is written in English, with a short summary in French and German. It consists of 68 pages with 61 figures and 18 tables.

Photometry – The CIE System of Physical Photometry

The visual brightness of a light source depends not only on the amount of radiation it emits but also on its spectral composition and on the visual response function of the observer viewing it. Because human visual response varies at different light levelsand from person to person, precise photometry requires the definition of representative standard observers. The CIE system of physical photometry specifies procedures for the quantitative evaluation of optical radiation in terms of the spectralluminous efficiency functions of two such standard observers. One, *V*(ë), represents photopic vision and the other, *V*•Œ(ë), scotopic vision. Used in conjunction with the SI photometric base unit, the candela, these functions constitute a system that enables the values of photometric quantities for all types of luminous source to be precisely determined, regardless of the spectral composition of the radiation emitted.

This international Standard specifies the characteristics of the system of physical photometry established by the CIE and accepted as the basis for the measurement of light. It defines the photometric quantities, units and standards that make up the CIE system of physical photometry and that have been officially accepted by the Comité International des Poids et Mesures. They comprise:

- the definition of photometric quantities and units,
- the definition of CIE standard spectral luminous efficiency functions for photopic and scotopic vision,
- the definition of a CIE standard photometric observer that conforms to these functions,
- the definition of maximum luminous efficacies for photopic and scotopic vision.

An informative annex provides a vocabulary of related terms.

This standard has been approved by CIE and by ISO.

Standard Method of Assessing the Spectral Quality of Daylight Simulators for Visual Appraisal and Measurement of Colour

This standard specifies a method of assessing the spectral quality of the irradiance provided by a daylight simulator to be used for visual appraisal of colours or for colour measurements and a method of assigning a quality grade to the simulator. It specifies the maximum permissible deviation of the chromaticity of the simulator from the chromaticity of the CIE Standard Daylight Illuminant or CIE Daylight

Illuminant being simulated, for a simulator to be graded by this method.

The basis for the assessment is the special metamerism index for change in illuminant, using pairs of virtual (rather than real) specimens specified by their reflecting and fluorescing properties. The pairs of specimens are metameric matches under the CIE daylight illuminant, when evaluated with the CIE 1964 Standard Colorimetric Observer. The method described in this standard quantifies the mismatch when the pairs of virtual specimens are illuminated by the simulator under test and evaluated by the same standard observer.

The standard is accompanied by a disk containing the spectral data of Tables 3-6 of the standard in MS Excel format.

This standard has been approved by CIE and by ISO.

CIE Standard S 016/E:2005
Lighting of Outdoor Work Places-Lighting Requirements for Safety and Security

To enable people to perform visual tasks efficiently and accurately, especially during the night, adequate and appropriate lighting has to be provided. The degree of visibility and comfort required in a wide range of outdoor work places is governed by the type and duration of activity.

This standard specifies the lighting requirements that will contribute to the visual needs for safety and security within outdoor work places.

This standard has been prepared by CIE Division 5 and should be read in conjunction with CIE S 015/E:2005 "Lighting of Outdoor Work Places".

FORTHCOMING EVENTS

Vision 2006
December 9-11, 2005, Bangalore

In association with ISLE, Karnataka State Centre and KASSIA, the Small Industries Service Institute, Govt. of India, Ministry of SSI, is organising Vision-2006 Lighting and Allied Products Exhibition cum Vendor Development Programme from 9 to 11 December 2005 at the SISI Campus in Bangalore.

Objectives

Showcasing the competencies of Small Scale and Medium Scale Enterprises, as well as the needs of Large Scale Industries, Central / State Departments, Defence, Railways, Public Sector Undertakings, and corporations of the State, Lighting and Allied Electrical products, Automobile and Solar lighting etc.

Platform for interaction among the buyers and sellers, including original equipment manufacturers / wholesalers and traders.

Opportunity for diversification and development of new products by entrepreneurs.

Enhancing opportunities for Marketing and Outsourcing.

To act as a platform for Interaction among the buyers and sellers in the wake of the Global energy crisis.

To provide an insight into modern R & D works.

To create awareness about the strength and benefits of working in clusters.

For stall booking and further information contact:
Mr. G. Nagaraja, SISI, Bangalore 500 044
Tel:23351581/82, Mobile: 9945098660

Mr. M.S.N. Swamy, ISLE Bangalore
Tel: 23448421, Mobile: 9341231755

Mr. Suresh, KASSIA, Bangalore
Tel: 23353250/23358698, Mobile: 9845462041

Application form available at : www.sisikarnataka.org

Experimentation in Street Lighting for Visually Impaired People and the Elderly
December 8, 2005, Lyon, France

This symposium will be held during the Lyon Light Festival.

Objective: to compare experiences concerning testing and proposals of innovative lighting solutions aimed at improving the night-time luminous environment in cities, for the elderly and the visually impaired people.

The city of Lyon has launched an experiment conducted in spring 2005 on a test street of Lyon (length 300 m, judged by 60 visually impaired people with various handicaps). Different lighting schemes were tested, as well as surface types, street signs, bus stops, colours, and street furniture, etc. For further information, please contact: marc.fontoynont@entpe.fr

Lighting Research Symposium on Light and Color
February 5-8, 2006, Orlando, Florida, USA

Background

Consistent, industry-wide communication of lamp color properties to end users in a simple, easily understood way is non-existent. Historically, the lighting industry has either not communicated these color properties at all, or has used jargon which is unfamiliar to most people. Consequently, the industry has left uncommunicated some of the "value added" features of good lighting. This symposium is one step toward correcting this missed opportunity.

The lighting industry is looking for a better way to communicate the concept of color quality to the end user, using appropriate measures that everyone understands. The term *color quality* includes three color dimensions:

- Color Rendition: How colored materials appear under this light source when compared to their appearance under reference light sources.
- Color Discrimination: How well can I discriminate different colors under this light source.
- Color Preference: How attractive do colored materials appear under this light source.

While separate ways of measuring these three dimensions of color quality currently exist, the goal is to develop an indicator (a word, icon, picture, or number) that effectively communicates the aggregate color quality of a light source or lighting system.

The purpose of this symposium is to develop a new understanding of how light and color work together to affect the appearance of people and things plus discuss research and other developments leading to new ways of communicating color information.

Who Should Attend

Persons involved with light and color in any of its various aspects, and who want a deeper understanding of the subject and how it applies to cross-cutting applications involving technology, products, marketing, education, and communications. Those involved in new light source technologies such as LEDs will find this symposium of particular interest.

Benefits

The symposium begins with a separate, one-day tutorial on Light and Color. This tutorial will provide attendees with an update on current color technology, including measurement and specification models. The next two days will cover the symposium itself, where innovative solutions to problems of communicating color rendering and color appearance measures will be explored as they apply to light sources, the graphic arts, visual displays, and lighting appplications.

A Symposium brochure, registration form and additional Symposium information will be available on the LRO Web Site at: www.lightingresearchoffice.org.

- 150 Symposium ($ 180 after January 3, 2006)
- 100 Tutorial ($ 130 after January 3, 2006)

For registration, please contact:
Conference Registration Specialist, EPRI
1355 Willow Way, Suite 278
Concord CA 94520-5728, USA
fax: 925 609 1310
e-mail: meeting@epri.com

ISCC/CIE Expert Symposium 75 Years of the CIE Standard Colorimetric Observer

May 16-17, 2006, Ottawa, Canada

This symposium is organized by the Canadian NC of the CIE and the Inter-Society Color Council

The year 2006 marks the 75th Anniversary of the CIE 1931 Standard Colorimetric Observer. It seems an opportune time to reflect on all that has been accomplished in the area of colorimetry, the current status of our understanding, and to provide guidance to CIE Division 1 on what work they should undertake in the future in the area of colorimetry. Thus, the Inter-Society Color Council (ISCC) and the Canadian National Committee of the Commission Internationale de l.Eclairage (CNC/CIE) are hosting a CIE Expert Symposium in celebration of this very important 75th Anniversary.

The Symposium will be part of an exciting week-long Jubilee celebration in Ottawa including the Annual Meeting of the ISCC (also celebrating its 75th Anniversary in 2006), 14-15 May 2006, and the Division 1 meetings, 18-19 May 2006.

Background

By general consent in all countries the specification of basic standards for use in colorimetry is the province of the CIE. The CIE made the first major recommendations regarding colorimetric standards in 1931 by approving the Standard Colorimetric Observer. These recommendations formed the basis of modern colorimetry. The original recommendations of 1931 were reviewed from time to time by the CIE Colorimetry Committee and later by CIE Division 1, *Vision and Colour*. When necessary, changes were made. New recommendations were added to supplement the existing ones or to broaden the scope of colorimetry in accordance with developments in practice and science. The most recent summary of these recommendations can be found in the 3rd edition of CIE Publication 15, Colorimetry, published in 2004. Currently, Division 1, through TC 1-57, is preparing standards on key aspects of the CIE recommendations on colorimetry. Recent years have also seen tremendous strides in the development of colour appearance models. These go beyond the specification of colour in a three dimensional colour space to take account of the influence of factors such as ambient illumination and surround on perception of colour. The advent of a wide range of imaging technology and light sources has also given rise to many new issues.

Call for Papers

The two-day Symposium will feature Invited Papers and Contributed Papers. Ample time will be allocated for round-table discussions. A Poster Session will also be included.

Papers should deal with one of the following subjects:

- Standard Colorimetric Observer . past, present, and future
- Colour matching functions
- Colour appearance
- Temporal and spatial issues in colorimetry
- Colour differences and tolerances
- Colour management
- Instruments and standards

Authors are invited to submit two-page extended abstracts of their proposed contributions in English using the Submission Paper Form to be found at the website of the Symposium (www.jubilee2006.org).

Extended abstracts should be sent by e-mail or post to the Chair of the Technical Program of the Symposium no later than 15 January 2006.

Dr. Alan Robertson
National Research Council
1200 Montreal Road
Ottawa, Ontario K1A 0R6
CANADA
E-mail: alan.robertson@nrc-cnrc.gc.ca

Authors will be notified of acceptance of their abstract by 15 February 2006. Instructions for preparing camera-ready copy of papers will be forwarded to accepted authors. Final camera-ready copy is due at the Symposium. The proceedings of the Symposium will be made available after the meeting.

For registration, please contact:
Cynthia Sturke
Office of the Inter Society Color Council
Tel: +1 (703) 318-0263
Fax: +1 (703) 318-0514
E-mail: iscc@compuserve.com

2nd CIE Expert Symposium on Measurement Uncertainty: Methods and models for analysis of uncertainties in optical radiation measurement
June 12-13, 2006, Braunschweig, Germany

Since the "Guide to the expression of uncertainty in measurement" often referred to as "GUM" - was published, the view on the uncertainty associated to the result of a measurement changed. Meanwhile, the metrology community recognised that a meaningful uncertainty budget following GUM will lead to much more outcome for interpretation and comparison of measurement results than former error propagation ever did. Taking this into account, the CIE Division 2 Technical Committee TC 2-43 worked out a guideline for uncertainty evaluation for selected quantities in photometry (valid also in radiometry), which will be introduced during this symposium. In 2001 the CIE already organised in Vienna a very successful Symposia on Measurement Uncertainty. But there are still some questions unsolved regarding the determination of measurement uncertainties, e.g. in nonlinear models or functions like spectrally resolved measurements.

The meeting will be supported by the German National Committee of the CIE.

The symposium will be held in conjunction with the CIE Division 2 Meeting (14-16 June) and the Interlumen conference (16-17 June).

The goals of the meeting are to:

- Provide guidance on techniques for the evaluation of uncertainties associated to values of photometric and radiometric quantities;
- Present the latest developments relating to methods for assessment of uncertainties for values of quantities which are derived from spectral measurements;

Provide a forum for discussion of related effects such as correlation of data.

This meeting is open to everyone with an interest in any aspect of measurement uncertainty but prior registration is required. The following individuals are specifically encouraged to attend:

- Scientists, engineers and technicians whose work involves optical radiation measurements, particularly photometric or colorimetric measurements;
- Those working on optical radiation metrology at laboratories for research or accredited for calibration / testing and at National Measurement Institutes.

The meeting is split into 2 parts; participants can attend either one or both parts. The first part includes tutorial presentations with Invited Papers, while the second part is a Workshop with Contributed Papers. Ample time will be secured for round-table discussions. As with the last Symposium on Measurement Uncertainty it is anticipated that this Workshop will aid towards the future development of best practice guidelines in this area.

The Tutorial Sessions will cover fundamentals for uncertainty evaluation, particularly for photometry and radiometry:

- Fundamentals of uncertainty analysis, including evaluation of standard uncertainty for both repeated measurements and other knowledge, degrees of freedom and expanded uncertainty
- Modelling of measurements especially the development of measurement equations under the consideration of correlations and their use in uncertainty evaluation
- Introduction to the work of CIE TC 2-43

The Workshop Sessions will cover recent work related to uncertainty evaluation for optical radiation

measurements. Contributed Papers should deal with one of the following subjects:

- Correlations and interdependencies between data
- Uncertainties associated to values of spectrally integrated quantities determined from spectrally resolved measurements including correlation
- Uncertainties determined in industrial environments sufficient for accepted tolerances
- Key comparisons and database for the international guide to the Calibration Measurement Capabilities Authors are invited to submit two pages extended abstracts of their proposed contributions in English. A link to the Submission Paper Form will be found at the WEB site of the PTB: http://www.ptb.de/cie

Extended abstracts should be sent by e-mail to the Chair of the Symposium no later than **15** January 2006:

Dr. Georg Sauter: Georg.Sauter@ptb.de

Registrations are accepted for

- Uncertainty tutorial, 12 June 2006.
- Uncertainty workshop, 13 June 2006.
- Deadline for early registration will be 1 March 2006.

For information and registration, please contact:

Mrs. Sabine Rodriguez
Physikalisch-Technische Bundesanstalt
Dep. 4.1 Photometry and Applied Radiometry
Bundesallee 100
D-38116 Braunschweig, Germany
fax: +49 531 592 4105

CGIV'2006 IS&T's Third European Conference on Colour in Graphics, Imaging and Vision
June 19-22, 2006, Leeds, UK

This conference will cover a wide range of topics related to colour and visual information. Its single-track structure will encompass technical areas that strike a balance between academia and industry.

Technical areas to be covered:
- colour science
- computational colour
- colour in computer graphics
- colour reproduction
- colour vision psychophysics
- colour image quality
- colour image processing
- multispectral imaging

For further information, please contact:

The Society for Image Science and Technology (IS&T)
http://www.imaging.org/conferences/cgiv2006/

2nd CIE Symposium on Lighting and Health
September 7-8, 2006, Ontario, Canada

This symposium is Co-hosted by the National Research Council of Canada, Institute for Research in Construction

Call for papers

Background

Unexpected discoveries in photobiology, most notably the identification of a novel photoreceptor in the human retina and its role in regulating circadian rhythms, have alerted the lighting community to new possibilities for lighting design. The first CIE symposium on Light and Health, held in Vienna in 2004, provided a forum for scientists and lighting practitioners to become acquainted with the scientific findings and issues. This second symposium, on Lighting and Health, will provide updates on scientific progress, with a stronger emphasis on how we might apply this new information in lighting recommendations and lighting design. The Symposium will feature Invited Papers and Commentaries in plenary sessions, and contributed posters are also sought. Ample time will be secured for round-table discussions.

The Goal

The development of suggested actions for CIE Divisions to undertake, in order to progress to understand and to apply the knowledge about light and health into lighting recommendations and lighting design. For example:

- What is the necessary daily light exposure for good health?
- What are the acceptable limits of night-time light exposure?
- What possible conflicts exist between lighting for health and existing recommendations?

Who should attend?

All disciplines (with e.g. medical, biological, psychological, lighting practitioner background) may attend. We especially invite the international community of lighting practitioners and designers to attend and to lend their knowledge to the discussions. Prior registration is required (see below).

Call for Symposium Contributed Posters

Posters should report original research or theory related to:

- Effects of light exposure on physiological or psychological processes, including light exposure at night, shift work and jet lag adjustments, daytime light exposures

- Use of light exposure for treatment of medical disease or disorders, including sleep disorders, dementias, seasonal mood disorders
- Implications of light and health research for lighting recommendations and lighting practice, including ethical and educational implications.

Authors are invited to submit two-page extended abstracts of their proposed contributions in English no later than 1 May 2006 to

CIE Central Bureau, Kegelgasse 27, A-1030 Vienna, Austria per mail or e-mail: ciecb@ping.at (please do not fax, as the extended abstracts, if accepted, will be used to print the Abstract Booklet).

Authors will be notified of acceptance of their abstract by 1 June 2006. Instructions for preparing camera-ready copy of papers will be forwarded to accepted authors. Final camera-ready copy is due at the Symposium. The Proceedings of the Symposium will be made available after the meeting.

Accepted contributions will be pre-published for Symposium participants at the web site of themeeting.

Registration Desk

Registration forms will soon be available on the Internet at: www.irc.nrc-cnrc.gc.ca/ie/lighting/health/cie_e.html as well as www.cie.co.at Or contact:

Ms Monique Myre
Client Services
National Research Council of Canada
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Choreographing Light

Krishnesh S. Mehta

While on a night safari in a dense jungle on a dark moonless night, imagine that you lose your way and find yourself inside the famous Ajanta caves at two o'clock in the night. It is pitch dark inside and you have no source of light. In that situation can you admire the beauty of the caves and the paintings? Imagine further that a glow worm were to glow just at that moment. In that moment of light wouldn't your perception of the space change? What did that ever so little light do?

It is light that gives birth to space. It is in the presence of light that space takes shape, form and volume. It makes things visible. No matter how beautiful the space or the objects in it are, it is how the light falls or is directed on them that finally decides how they will eventually look – how they will be sensed, perceived and experienced. The nature and the quality of lighting guide the observer in deciding how alluring, delightful and charming the given space and the other elements in it are. Good lighting can make even the most un-charming things charming and bad lighting can make even the most charming things highly ugly and undesirable. Light lights your imagination, it also high*lights* your errors!

Just how important lighting is can be illustrated with the help of the following images:

Fig. A

Fig. B

Source: Sensation and Perception: An integrated approach by Harvey Richard Schiffman, 6th ed., John Wiley and Sons, USA, 2001, 220

Figure A is the inverted image of figure B. Notice that due to this inversion the direction of light is changed and hence the bumps appear to be pits and the pits appear to be bumps. This is the power of lighting. And this is how significantly it can affect our perception. It can create such drastic an effect so as to make bumps appear as pits and vice versa. Hence, lighting is not just about putting on the light. It is about directing light, about choreographing light.

The influence of Light

Light enters and affects our day to day life in a myriad of ways. Ever wondered in how many different ways does

light affect us and our lives?

Ever felt the beauty, joy, love, grace, blessings of light?
Ever felt the intoxication, enchantment, exuberance of light?
Ever been swirled by the vibrancy, pulsations, dance, fizzle, sizzle, of light?
Ever been perceived the sacredness, holiness, serenity, peace, bliss, divinity of light???
Ever been inspired by light?
Ever been moved and swayed by light?
Ever been engaged in the humour and wit of light?
Ever been provoked and persuaded by light?
Ever been drowned in light?
Ever been repelled by light?
Ever been depressed, sickened, dulled, and gloomed by light?
Ever felt the embrace, security and safety of light?
Ever been hugged by light?
Ever experienced the sweetness of light?
Ever sensed the volume, depth, contours, texture, and pattern of light?
Ever experienced the harshness, coolness of light??
Ever heard the SOUND of light?
What is the SMELL of light?
What are the colours of light?
Ever tasted light?
Ever experienced the LIGHT touch that touches the SOUL?
Ever heard the invocation, music, tunes, rhythms, harmony of light??
Ever felt the seasons of light?
Ever sensed the TIME of light?
Do you hear the whisper/voice of light?
Ever perceived the emotions, moods of light?
Ever been swept by the ROMANCE of light???
Ever fallen in love with light?
Ever been entranced by the sensory-ness, sensuality of light??
Ever been drenched in the fountain, rain, shower of light?
Ever been HEALED by light???
Ever been sensed the glamour, glitter, glitz and shimmer of light?
Ever listened to the POETRY of light?
Ever participated in the DRAMA of light?
Ever experienced the MAGIC of Light???
What is the SPIRIT of light??
Ever imagined life WITHOUT light???

Light and Lighting

Light is a physical entity; created physically, powered electrically/naturally, sensed biologically, perceived neuro-psychologically, experienced holistically. We can do little to alter the properties of light but we can certainly use them to create the desired and intended effect. We may not be able to design light but we can certainly direct light. Hence, lighting design is more about choreographing light than about designing light. Further, in this emerging knowledge and experience economy, isn't all of the world a stage and all work theatre, dance and play? Isn't the entire world a stage and all lighting, choreographing light? Lighting is not just about illuminating or illumination.

What's the difference between illumination and lighting?

Illumination is engineering, helps meet the required lux levels and makes the space visible and lit. Lighting is an art and science; helps create interest, magic, surprise and anticipation, persuasion and attention, focal hierarchy. It enhances the overall perception of the space and the elements therein.

Illumination is about switching on the light so that the space and things become visible; lighting is about directing light –*choreographing light*- to show what needs to be seen as it is intended to be shown. Illumination removes darkness, lighting creates darkness. Illumination is about creating a sterile wash of light, about spreading light evenly; lighting is about carefully and meaningfully choreographing the dance and play of highlight and shadow. Illumination is a homogenized ocean of light generated by street light at an intersection; lighting is a spot light on a stage. Illumination is about meeting the lumens need; lighting is about addressing the human dreams, emotions, sensations and perceptions and sensibilities –meeting the human needs. Illumination tends to flatten the space and the objects within; lighting enhances the three/four dimensionality of the form and space. Illumination elicits general interest and so lack of attention in anything particular; lighting generates interest points and focal hierarchy to make things that much more desirable. Illumination creates just one more space, lighting crafts a destination. Illumination lights, lighting de*lights*. Illumination is a function; lighting a celebration.

Good lighting enacts suspense, tells a story, weaves poetry, plays the tunes, presents a drama, evokes emotions, sells dreams, appropriately triggers the human perceptions, senses and sensibilities, and produces experiences. Good lighting is a treat for the senses. Good lighting attracts, persuades, distinguishes, satisfies, seduces, transforms, sublimates, synergizes, serenades, entices, tickles, personifies, inspires, motivates, teases, captivates, romances, mystifies, thrills, provokes, amuses, wows, surprises, lures, celebrates, enchants, entrances, fascinates, bewilders, perplexes, relaxes, embraces, soothes, comforts, synthesizes, simplifies, delights...Good lighting makes one **lust** for it...makes one fall in love with it...makes it irresistible!

Good lighting requires that light is directed, trickles or spills into the space without, as far as possible, directly or indirectly showing the light source. Hidden sources,

or the placement of sources such that the audience is kept guessing as to where the light is coming from is any day a universally surefire hit. Light is to be seen, not the light source. Further, good lighting integrates the different spaces through a well defined connectivity and system. It leads one from one space to the other in full continuity and flow. However, this necessitates that the lighting design is integrated into the building right from the drawing board stage of the project. Though, lighting is often likened to the last coat of paint, it is the final most important element of design that can make or mar the subtle detailing, delicacies and intricacies so painstakingly accomplished by the architect and the interior designer and hence is too important to be taken up after everything else is done with. Unfortunately, nonetheless, even today, most lighting is applied as the last coat of paint, and sadly is treated so as well. It is generally done after all of the building and interiors are over. Small surprise, then, that it almost always ends up being illumination and not lighting.

The way lighting is done these days, one could actually tell the time when the building was built, or the interiors were done, by looking at the light sources used. Generally, most architects and lighting designers use the light sources that are the latest in the market at the given time, little caring about whether the type of light given by that light source is appropriate to the given space, function and context. Worse still is that the people responsible for lighting do not talk to those doing the interior design / architecture and vice versa. A glaring, jarring example of this is the countrywide stores of a famous retail chain in the country which has used high ceilings to hide the light sources from the cone of vision of the customers, but has used glossy vitrified flooring that reflects all the light sources and brings them within the cone of vision.

It is also so depressing that worldwide almost 90% spaces, public and private, retail or recreational, are illuminated in the name of lighting. One common excuse is that lighting is not energy efficient but illumination is. Under the garb of lighting, when, even the unnecessary spaces and objects are illuminated, it is illumination that is not energy efficient, not lighting. And, by the way, what are more important and relevant, energy efficiency alone, or the quality of life and the overall well-being of the humans. Does social responsibility mean energy efficiency at the cost of health, peace of mind, security and safety of the very social beings for whom the energy is being saved? World over, lighting is still mostly done by the illumination engineers and designers, who are mainly electricians or electrical engineers by training and very rarely by lighting designers or even more sparingly by those who transcend lighting design –those who choreograph light. Besides, doing and teaching illumination is easy –it is like teaching 2+2=4, not much thinking or creativity is required, simply follow the rules or the 'light meter', whereas executing and imparting lighting design and choreography is difficult. It requires a distinct intuitive sensitivity to feel the space, empathize with the people who will use that space and their needs, experience and envision the connection of that space with the other spaces, have the contextual clarity about the focal hierarchy to be created and of the nature of light required and hence the appropriateness of the light source/s to be used and an ability to creatively collate and synergize all of these to then direct light to produce a choreography that is one continuum of an all sensory experiential delight. No wonder, live examples of lighting design and further choreographing light are few and far apart. But, where there is one, one connects instantaneously and is moved by the sheer excellence and brilliance of such artistic expression, and feels at once attuned, transcendental and transformed –blessed and sublimely 'blissed'. Which is a bigger social responsibility, lighting or illumination?

What is lighting?

Lighting is creating intended, contextually meaningful and purposeful contrast/harmony in a given space using light.

Types of lighting

Lighting can be said to have many different types depending on the function performed by the light. However different they may sound the basic underlying principles for choreographing light for each of them remains the same. Only the detailing may be different. Often these different types are seen as watertight compartments and each type is treated separately. And there is a separate expert for each of these. The proverbial right nostril doctor cannot understand what's wrong with the left nostril syndrome. However, they need not be and should not be so. Just as the whole body functions holistically, so does lighting, they are all done with the same light, which follows the very same principles. Modern lighting and especially lighting design and choreography demands that there is optimal and appropriate mix of each or the relevant few of these in every type as necessitated by and is apt for the given context. This can only bring synergy and not chaos. The following is an indicative and by no means exhaustive list of the various specialized function specific types of lighting:

- **Perceptual, Mood and Emotional Lighting, Ambience Lighting** – lighting that invokes/induces emotions and moods, perceptions, lighting to create desired ambiance/s
- **Spiritual, Transformational, Transcendental, Sublime, Divine and Ecclesiastical lighting** –

cathedrals, churches, temples, and other religious buildings, Meditative places, memorials

- **Lighting for Safety and Crime reduction** – lighting of public spaces
- **Experiential and event lighting** – galleries, museums, exhibitions, events
- **Retail and Presentational lighting** – shops, stores, supermarkets, visual and retail merchandising
- **Auditorial lighting** – theatre, assembly and auditorium, lecture halls
- **Lighting for Corporate and Professional Communications** – Board rooms, Conferences Meeting rooms, presentation suites
- **Human Interaction and Conversational Lighting**– Cafes, restaurants, pubs, bars, and dining areas
- **Therapeutic lighting** – alternative therapies, fitness and wellness centers
- **Transportation Lighting** – lighting the interiors of vehicles, lighting for navigation, lighting for airports, railway stations, bus terminus, etc.
- **Ambulatory/Transitory lighting** – Reception Space, Waiting Areas, Corridors and WCs
- **Altitudinal lighting** – Atria, Malls and High Spaces,
- **Behavioural and Attitudinal lighting** – lighting to affect the behaviour, circadian rhythms, etc
- **Integrative and Systemic lighting** – lighting for connectivity, brand identity
- **Functional and Operational lighting** – offices and workspaces, shop floors, industrial
- **Inclusive-Universal lighting** – lighting to meet the needs of the able and the less abled – elderly, physically challenged, lighting for special needs, etc.
- **Glitterati and Special Effects (SFX)and Futuristic lighting** – Starlight and other special effects and high tech – lasers, projections, gobo lighting, robotic lighting, electronic and artificial intelligence based light control
- **Nightscaping** – Lighting as nocturnal image maker, city beautification and human lighting, street lighting
- **Stadium Lighting** – stadiums, sports fields, etc. (indoors and outdoors)
- **Natural Lighting** –using the sun, moon as the sources of light
- **Recreational lighting** – spas, jacuzzis, swimming pools, etc.
- **Dynamic Lighting** – for signboards, focal hierarchy, subliminally transient lighting
- **Lighting for Health and healing** – hospitals, operation theatres, patient rooms
- **Hospitality lighting** – hospitality spaces, Monumental lighting, enhancing tourism
- **Landscape and outdoor lighting, Water body lighting**
- **Atmosphere lighting and Lighting the sky**
- **Façade lighting and Ambient lighting**
- **Lighting for film and photography**

Learning Lighting Choreography

Can Lighting and lighting choreography be taught and learnt? If some one can do it, all else can learn to do it, given the right attitude and guidance. Learning lighting design and choreography requires not only a good thorough knowledge of the physics and engineering of light but also the philosophy of light, of how the light blends with the various elements of space, ability to synthesize, understand the part and whole relationship, a very robust ability to imagine and visualize space in 3D and 4D –how it changes with time (computers still are way off as visualization tools for lighting)-, a very good understanding of humans and human behaviour, of human sensation and perception, of the human senses and sensibilities, the effects of light on neurophysiology and the neurobiology, neuropsychological cognition, human behaviour and the brain. A deep ability and sensitivity to empathize with the humans, the given space and its context; capability to feel a space and understand the aesthetics, poetry, drama, music and emotion relevant to it, and then find the appropriate light source and lighting technique to best express the same. Basically, have an 'eye' for all of these. Of course, these things cannot be taught in the conventional mode of imparting. It needs learning by imagining, thinking, questioning, doing and experiencing. Teaching lighting is much like learning choreography; one has to be clear of how each element behaves individually and how they work collectively, how to put all the elements together to create that perfect harmony, a faultless synergy. To learn lighting one has to constantly and aggressively learn to see, observe and perceive, how the light and shadow interplay, what emotions they evoke. What light sources, colours, angles; what effects are suitable for what context. For example observe how the shadows emerge, move, elongate and vanish, how their grey value changes, as you ride under the street lights, or how the light filters through the leaves of the tree, or how the water casts a shimmering reflection on the wall.

Artificial light is mainly used for human consumption but it can be employed meaningfully for all living and non living things. For this, a proper understanding of how it affects and alters all of them is necessary. For the well being of animals, it is essential that the artificial light mimics the natural light as far as possible. For the non living, it is essential to gauge the sensitivity of the given material to heat and to different light intensities and frequencies.

To be able to choreograph light as intended and to achieve proficiency in lighting for any of the above mentioned lighting types, one needs to master the following principles. Of course, each is a full topic in itself and requires a lot of experimentation and exploration before

it is mastered. All these are to be dabbled into keeping in mind the other softer skills mentioned above.

Lighting, in principle is just about manipulating any one, two or all of the following three things to create the desired contrast and/or harmony:

- **Manipulate Source:**
  - What light source to use (incandescent, fluorescent, CMD, HMI, LED, etc.) and with which kind of luminaire –ready made or custom made, its optics, enclosures, matte or clear, direct or indirect, whether at all to use a luminaire or not, etc.
  - Where to keep this source –the right angle of throw, whether to hide or make visible
  - What source with what light distribution -the colour spectrum and intensities, whether to use filters –depends on what are the properties of the objects lit
- **Manipulate Medium:**
  - Whether to use smoke, water screen, scrims, holographic screens, screen curtains, etc.
- **Manipulate Illuminated forms & surfaces:**
  - Change the texture, surface finish and material, colour, reflectivity, form, etc. of the objects/ surfaces on which light is directed

Some of the various kinds of contrasts-harmony that can be created are as follows:

Light – dark: using absence and presence of light

Diffuse – harsh: between light sources that create harsh and diffuse shadows. Given the same coloured source, diffuse lighting is relaxing and harsh is stimulating. On the other hand harsh lighting creates texture, sparkle and glitter, diffuse lighting creates smoothness

Colour contrast: lighting a green object with a light source producing more green light will enhance greenness of the object, using a light source with more of red on the same object will lessen the greenness and so on. Use the light source with a colour spectrum appropriate for the colours of the objects to be lit, to create the planned contrast or harmony. Also, understand the concepts of simultaneous colour contrast and colour interaction. The same colour looks different under different light sources. Also, colours tend to give a sense of depth depending on the colour interaction, for e.g. yellow tends to jut out and blue tends to recede on a black background and reverse happens on a white background.

Static – Dynamic: Light that is moving / changing with time as opposed to a fixed light, e.g. blinking neon as opposed to a static bulb; or a static light falling on a moving and stationary object. Moving objects are perceived before static ones are.

Vertical plane lighting v/s horizontal plane lighting: Horizontal plane is better suited for lighting the humans

Pure v/s filtered light: to get the right colour rendering

Warm light –Cool light: using both usually enhances the colour rendering

Direct light –Transmitted light: to create special effects

Electric light sources v/s Electronic: e.g. incandescent bulb v/s LED

Mid field v/s far field v/s near field: where to light most decides how large the space will be perceived as. Lighting the near field brighter than the far field makes the space look smaller and so on.

Front lighting v/s backlighting: front lighting tends to flatten the 3Dness, backlighting shows the silhouette or enhances the figure.

Natural Light v/s Artificial light: how to mix and match the both to create harmony and energy saving

Texture Contrast:
Pattern Contrast:
Plane v/s volumetric:
Sparkle v/s glitter:
Focused v/s Defocus*ed:*

Our eyes do not see the whole space in one go. When we encounter a new space, our eyes register the different areas of that space in small spots in rapid succession and then our brain stitches all these small images and creates an illusion of seeing the full picture all together. Hence our eyes get confused when everything is evenly lit. There are no interest points. Lighting produces these interest points by generating focal hierarchy –creating contrasts and directing light. Our brains sense any new space in a particular order. When exploring a new space the first thing that will attract our attention is people, the next is movement, then brightness, followed by high contrast, vivid colours and strong pattern. Of course, this will be overpowered by the meanings and combinations of the above (adapted from *Light: The Shape of Space*, by Lou Michel, John Wiley and Sons, USA, 1996, 62) For e.g. moving people will be looked at before the static ones, among a sea of people if someone of the crowd has meaning (someone is known to the viewer) then that person will be seen first; a faster moving object will be noticed before a slow moving one and so on.

To choreograph light it is important to remember to use more than one light source, more than one effect

(create relevant synergy), lighting from more than one level (avoiding the conventional ones as far as possible –like why not generate ambient lighting for the passage way by giving wash on the wall or the floors rather than putting light sources on the ceiling) and directions and layers. To light the space for more than one task so that multiple effects can be generated in the given space. While doing this, care should be taken so that the light source is not in direct or indirect view (the suspense should not be leaked), as far as possible, and no unwanted glares and reflections are produced. Of course, choreographing light does not mean using all the latest gizmos in the most complex and exuberant display of technical and financial extravagance, but about directing light meaningfully and purposefully to where it is required in the most requisite and optimal way. This can most often be achieved in the most simplistic of ways with minimum of technology and finance. In fact, the most masterly test of expertise of a lighting choreographer is to be able to use single crude and cheap light source (like a torch) and yet light a delight, still create a fête. Play wild, but never lose the sight of the thin line between light and delight, between illumination and lighting.

The above contrasts and manipulation can be achieved by employing some of the following lighting effects and functions. The effects mentioned here are indicative only and it is beyond the scope of this article to get into the subtleties, finer nuances, interactions and permutations and combinations of each of them.

Synergistic Effects:

Mix light –natural + artificial etc.
Multi-Layering
Multi-level lighting
Multi-tasking

Physical Effects:

Reflect
Scolloping (all types and forms)
Filters
Optical Effects
Transmission
Projection (projection and mirror)
Focal Glow
Disperse
Diffract
Refraction
Polarization
Projecting light and patterns
Bounce
Light Beam types (Pin spot, Spot, Accent, Flair, and Flood)
Skylight
Textures, Patterns, Gradation
Unconventional applications

Directional and Angular Effects:

Wash (all types)
Flood
Glance
Graze
Spill
Sparkle/Glitter/Shimmer
Accent lighting
Task lighting
Spot lighting
Fill lighting
Back light
Silhouette
Up light
Down light

Measuring the quality of lighting

Most lighting practitioners are used to measure the lumens and are happy with the results if the lighting meets the required lumen levels. To them that's a job well done with glorious success. Lighting is not that dry and human perception not that easy to address, that its performance can be adjudged so easily. Lumens do not measure the psychological and biological effects that the light is having on the human mind, it does not tell whether the lighting is stimulating enough for the person to perform the given task or is relaxing enough to produce rejuvenation.

One further way of measuring the success of lighting is by going through all the words mentioned above under good lighting and see how many of them are fulfilled. Some scientific minded people have even coined some softer measurements like the Visibility and Comfort factor, the Delight factor, the Drama factor, the Display factor, the Serenity factor, the Functional Ease factor and so on. These basically measure the said feelings of the audience generated by the given lighting on a scale from 0-10 or 0-100.

The other way to measure is –did it wow you, with the top line to the bottom line being -will you want to experience that space again, did it engulf you in its drama, did you identify with it, did it become a part of you, did it delight you enough, did it make you feel and experience the celebration?

Some Provocations

Will you be lighting or illuminating?
Are conventional light sources to be used conventionally only?
Are unconventional light sources to be used unconventionally only?
Should stage lighting be limited to the stage only? Isn't the entire world a stage?

Should LASER lights only be used as lines?
Should LED lights only be used to check on-off, or that your disk is busy?
Are tube-lights the only office/home lights?
Is lighting the last coat of paint?
What is a bigger social responsibility –illumination or choreographing light?

Krishnesh S Mehta
National Institute of Design
Ahmedabad

R & D UPDATE

New Phosphors for Efficient White-light LEDs

Two approaches are available for making white light LEDS. One is combining red, green and blue from LEDs emitting the re-spective colours to produce white light. This is complicated as individual controls are required for the different coloured LEDs.

An alternative approach is to use phosphors to produce red and green under a blue LED which together result in white light. Wolfgang Schnick and his team at the university of Munich used two new phosphors called nitridosilicates, which when doped with europium, emit red and green light under blue light, to produce white light. The phosphors are chemically and thermally stable.

The LED fabricated by them using the newphosphors and a blue emitting LED gave white light of excellent quality and good colour rendering. The efficiency of the white light LED with the new phosphors was 25 lumens per watt, much higher than that of incandescent lamp. They expect that the efficiency can go up by a factor of 2 to 4. The materials used present, according to the team of scientists, no environmental hazards during production, service, and disposal. It is expected that that this new LED would be a low cost and low energy replacement for incandescent and fluorescent lighting.

Light-emitting Nanoantennas

The efficiency of antennas to receive or radiate electromagnetic radiation depends on the matching of antenna dimensions with the wavewlength of the radiation. It is easy to do this for long radio waves. For light waves with wavelengths in the nanometer range it is now possble to fabricate nanoantennas with nano-technology.

A team of scientists at the university of Basel and the Federal Institute of Technology in Swtzerland fabricated optically resonant antennas using patches of gold on an indium-tin substrate and illuminated them with 8-ps pulses from an 830 nm laser repeated at 80 MHz. Tney observed emission of white light continuum which covered a wavelength range from 400 to 800 nm at an optimum input power of 110 microwatts. Two large peaks were also noticed at 560 nm (close to the sensitivity maximum of human eye) and 750 nm.

However, it turned out that the output peaked when the length of the antenna was 255 nm, quite unrelated to the wavelength of the input light. An unexplainable variation in the output was also noticed for different antennas of the same length. It was reported that further research was needed to understand this output variation for antennas of the same length. The developments in this field should interest lighting engineers as they might lead to another light source for lighting.

V.D.P. Sastri

WEBWATCH

Can LED Makers Learn a Lesson from Edison?

Who would think that, in the year 2005, we would look to the inventor Thomas Alva Edison to help us think about how to introduce LEDs to the world?

Makarand “Chips” Chipalkatti for one.

At the LEDs 2005 conference recently, Chipalkatti—Osram Sylvania’s corporate innovation manager—challenged an audience of LED professionals to imagine how they can speed the adoption of a disruptive technology.

”For Edison, there was no electric lighting. The infrastructure supported gas lighting, which was the incumbent,” Chipalkatti told the 400+ professionals who gathered in San Diego to discuss the future of the LED industry in lighting.

read full story here:http://www.lighting.com/content.cfm?id=585&sid=9&page=/

Philippine Department Develops Energy Efficient Lighting Standards

MANILA, Oct 17 Asia Pulse - The Philippine Department of Trade and Industry’s Bureau of Product Standards (DTI-BPS) is developing 21 new standards to make lighting products sold in the local market more energy efficient in light of the global energy crisis.

Under the Philippine Efficient Lighting Market Transformation (PELMAT) Program, a five-year project of the Department of Energy (DOE) to promote the energy efficient lighting (EEL) system in the country, the BPS is

committed to develop 21 standards on EEL systems in an 18-month period.

"The DTI strongly supports the DOEs efforts in reducing the energy consumption of the country. It is extending its expertise and facilities to help develop standards and promote the widespread use of energy-efficient lighting systems in the country," BPS Director Jesus L. Motoomull said.

read full story here: http://au.news.yahoo.com/051017 3/p/we6v.html or http://au.news.yahoo.com/051017/3/ we6v.html

Infinilux(TM) Introduces New 150 Lumen, RoHS Compliant, InfiniPower(TM) Light Engine Powered by Cree XLamp(TM) Technology.

New 150 Lumen InfiniPower basic light engines allow designers to rapidly develop luminaries, fixtures, backlights and general illumination products and are RoHS and WEEE compliant ensuring worldwide compatibility.

Carson, CA, September 28, 2005 - Infinilux(TM), announces the introduction of the first in their series of proprietary InfiniPower light engines featuring 150 lumens output of white (6500K) light. This 2.40" (61mm) diameter module was specifically designed to address the needs of designers worldwide that are currently in the product development phases or exploratory stages of solid-state lighting.

Featuring 150 lumens output of white (6,500K) light, InfiniPower(TM) IP-3 Series incorporates 0.157 in. thick metal core printed circuit board that allows for control of thermal dissipation and provides plug-and-play mounting method. RoHS-Compliant module measures 2.40 in. in diameter and operates on 10 Vdc @ 350 mA. It features 100° viewing angle, and individual custom optics are available that provide collimated outputs and viewing angles of 15° or 30°.

read full story here: http://news.thomasnet.com/ fullstory/468422

LRC Designs First-of-its-kind Interactive Lighting Lab

LRC researchers teamed up with Curtis Lumber Co., Inc., a full-service home improvement retail chain, to develop an interactive lighting lab located in Curtis Lumber's flagship store in Ballston Spa, N.Y.

The lab was funded by New York State Energy Research and Development Authority (NYSERDA) as part of an outreach program promoting the use of ENERGY STAR® lighting products among builders and consumers in New York State. The lab enables customers to compare lighting options in terms of energy use, aesthetics, and lighting quality at the time of purchase—a first-of-its-kind lighting tool for consumers.

"A lack of knowledge about energy-efficient lighting technologies has created a barrier to the acceptance of energy-efficient lighting in residential applications," said Patricia Rizzo, LRC residential lighting program manager and lead researcher on the lighting lab project. "As a result, the incandescent lamp, despite its inefficiencies, remains the dominant light source used in the home."

- Mary Cimo

to read full story: http://www.lrc.rpi.edu/resources/news/ enews/Oct05/general288.html

Anool Mahidharia

OTHER NEWS

Lecture on Daylight Responsive Photosensors
August 22, 2005 Kolkata

A technical lecture programme was organized by the Illumination Engineering Section of the Electrical Engineering Department of Jadavpur University, Kolkata.

The technical lecture was delivered by Mr. Abhijit Sarkar, B.E.E.(Jadavpur University), M.S.A.E. (Lighting) Pennsylvania State University, USA and the topic was "Daylight-Responsive Photosensors – Present and Future".

The programme was preceded by an inaugural session, which was presided over by Prof. S.K. Sanyal, Pro Vice Chancellor, Jadavpur University.

The two hour lecture programme was attended by 125 invitees comprising Architects; Consultants; Engineers from Govt. departments like PWD, West Bengal Housing Board and Lighting companies; Members of Indian Society of Lighting Engineers and Alumni Association of Jadavpur University; Faculty members, Students and Research Scholars.

Mr. Abhijit Sarkar's talk provided enough new ideas for everyone.

For a professional with an interest and background in lighting, it offered an overview of daylight – responsive Photosensors and a discussion on CamSensor – a prospective candidate for the next generation of daylight sensors.

Mr. Abhijit Sarkar

For a lighting student/researcher it gave an overview of analytical research on Photosensors and a discussion on proof-of-concept research in Lighting control.

For those without a lighting background it provided a discussion on an interdisciplinary research involving state-of-the-art technologies in the fields of lighting, computer graphics and digital imaging.

Mr. Sarkar's comprehensive lecture covered the technologies for lighting control, the performance characteristics of photosensor controlled systems, details of the new lighting control system, the CamSensor and its advantages and limitations as well as the future direction of work in this area.

The inaugural lecture was delivered by Prof. Pranab K. Bandyopadhyay, UGC Visiting Professor and Past President of Indian Society of Lighting Engineers. He reminded the audience that Jadavpur University, which was recently rated by the Govt. of India among the top five Universities in India and was awarded 5-star status, was a pioneer in the field of Lighting Education in India.

It was in 1983, the year when the Indian Society of Lighting Engineers was founded, Prof. Dr. Sunil Ranjan Bandyopadhyay was independently thinking of starting a course on Illumination Engineering at Jadavpur. He recounted how this course at the undergraduate level started soon after with the support of many people. Prof. Dr. Sunil Ranjan Bandyopadhyay's pioneering work was acknowledged by the CIE, when the world body gave him the CIE Award in the Warsaw session in 1999. (Here the audience rose and joined the speaker in applauding Dr. S. R. Bandyopadhyay).

Prof. Pranab K Bandyopadhyay then outlined his vision for the future after relating briefly how the lighting field developed. To empower people with the knowledge in Lighting there should be more technical lecture programmes at regular intervals.

He also saw a growth opportunity for the Illumination Engineering activity at Jadavpur with the recent decision of Govt. of India to entrust Jadavpur University with the responsibility of running the National Instruments Ltd. There was synergy between NIL's products and Illumination Engineering. With proper planning, there could be expansion of Photometry lab, State-of-the-art Research facilities, industrial exposure to students, building an Outdoor Lighting Lab. Thus with time Research work, Consultancy jobs and students, would come from all over the country, neighboring countries and even developed world. Jadavpur would then become the Centre for Lighting Activity in India and a bright spot in the World Lighting Map.

Dr. (Mrs.) Saswati Mazumdar, Reader-Illumination Engineering, made a brief presentation on the present status and the activities of Illumination Engineering Section including the laboratory set-up and testing facilities. See January 2005 Issue of Light Newsletter for detaled report).

Presidential Address by Prof. S.K. Sanyal, Pro-Vice-Chancellor, Jadavpur University

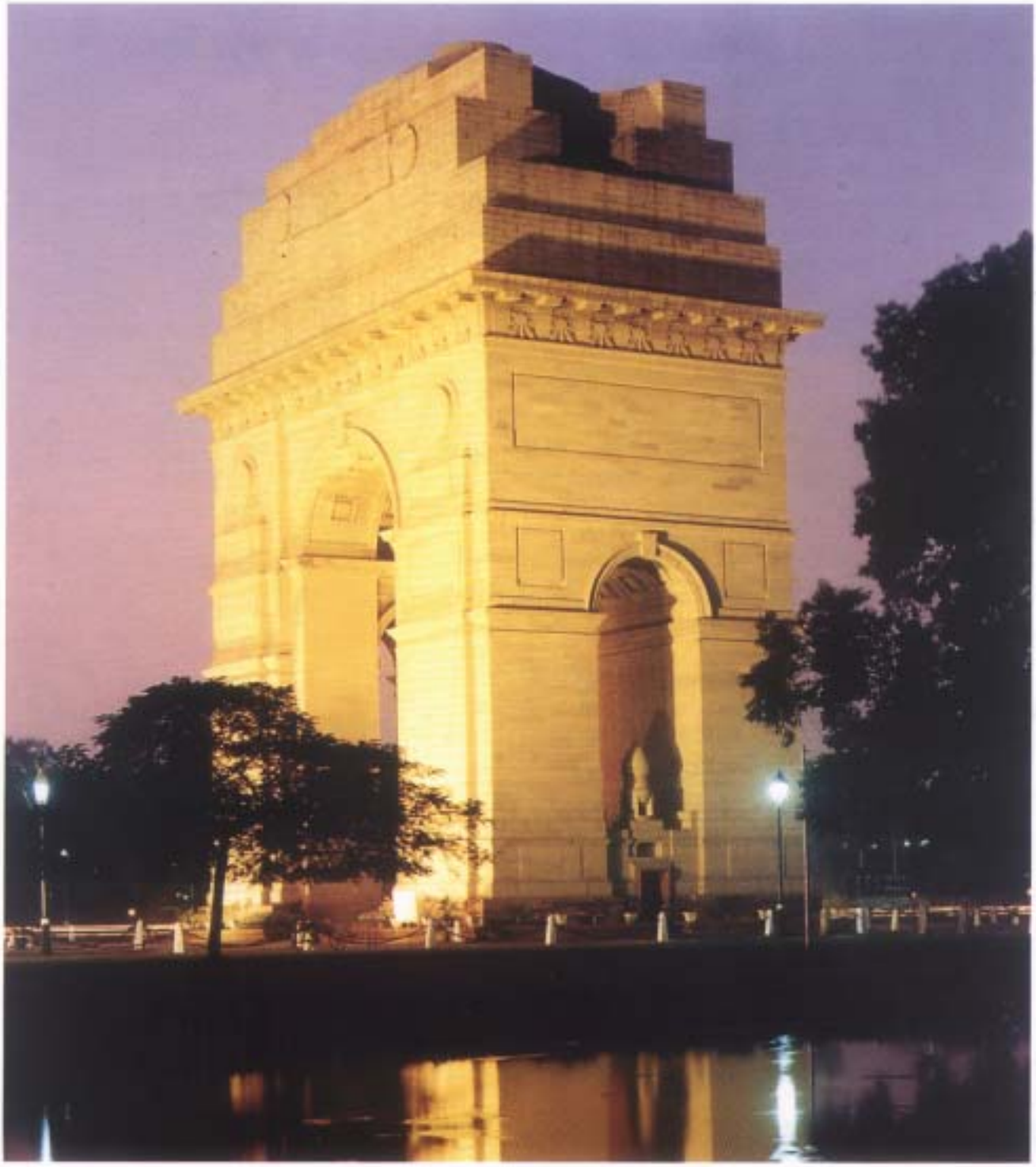
Prof. T.K. Basak, Head of the Electrical Engineering Department, in his address appreciated the initiative taken by Faculty members of the Illumination Engineering Section to initiate the ongoing ME Illumination Engineering Course from the Session 2004-2005 and stressed the need for research in the field of Lighting and Health.

Two eminent teachers present in the meeting were then requested to share their thoughts by Prof. S.K. Sanyal.

Dr. Sunil Ranjan Bandyopadhyay, Retired Professor, Electrical Engineering Department and Founder of Illumination Engineering Section at Jadavpur University expressed his satisfaction and pleasure in seeing that the ME Course, the work for which was initiated by him, had reached its second year with good intake of students.

Dr. Madhu Bhattacharya, Retired Professor, Mechanical Engineering Department, recounted his close association with the modernization of Photometry Laboratory and stressed on the benefits of both scientific and creative lighting.

In his Presidential address Prof. S.K. Sanyal reminded the audience that Jadavpur University had reached the current position, where the Central Govt. considered it as a "Centre of Excellence", due to the contribution of many people over the years. The National Council of Education, Bengal, the forerunner of Jadavpur University was celebrating its centenary in 2005. So while encouraging the Illumination Engineering Section to continue further with the activities, he requested the guests to come forward and co-operate with this Section by actively participating in such lecture programmes, lighting courses, seminars etc. to be organized by this Section in future.



India Gate with Philips Lighting

Tonight, as dusk gives way to darkness, Philips Lighting brings this national monument to light... Watch the beauty of the Dholepur stones come alive as light rekindles the memories of our true martyrs ...and great deeds.

Lighting solutions that really last

PHILIPS

Let's make things better