COMMISSION INTERNATIONALE DE L'ECLAIRAGE
INTERNATIONAL COMMISSION ON ILLUMINATION
INTERNATIONALE BELEUCHTUNGSKOMMISSION

CIE NEWS

NUMBER 78

June 2006

THE CIE AND THE INTERNATIONAL LIGHTING VOCABULARY

The first formal activity of the CIE in the field of the "International Lighting Vocabulary" was decided in 1921 at the Paris meeting by the appointment of a Study Committee entrusted with examining the question of photometry definitions and symbols and submitting proposals on the subject to the Commission at its next session. Following the conclusions of the study committee, at the 1924 Session in Geneva, a subcommittee to consider a vocabulary on illumination is appointed.

After a large number of meetings and a very important work, the first edition of the International Lighting Vocabulary is published in 1938. The year after, in 1939, at its 10th Session, in Scheveningen (the Netherlands), the CIE decided on the preparation of a 2nd edition of the Vocabulary in collaboration with the International Electrotechnical Commission (IEC). This second edition is published in 1957 only by the CIE, but some experts of the IEC have taken part to the work.

In 1964, the CIE and the IEC came to an agreement on a common International Lighting Vocabulary to both organisations. The 3rd edition of the Vocabulary, common to the CIE and IEC, is published in 1970 and, in 1987, the 4th edition is also published as a joint document.

The permanent goal pursued by the CIE in working, almost since its beginning, on vocabulary matters is very well explained in the prefaces of the successive editions of the International Lighting Vocabulary.

- 1957: "The present vocabulary forms an official recommendation of the CIE; it expresses the greatest possible measure of international agreement on the terminology of illumination, especially as regards fundamental concepts."
- 1970: "The establishment of this vocabulary has necessarily compelled concessions on the part of those holding divergent views, and the eventual acceptance of majority decisions in order to obtain the greatest possible international agreement in this wide field of lighting terminology. It constitutes, by way of recommendations of the CIE, especially in respect of units quantities, symbols and fundamental concepts, a working document in a form comprehensible to all."
- 1987: "The aim of this edition of the International Lighting Vocabulary comprising some 950 terms and their definitions is to promote international standardisation in the use of quantities, units, symbols and terminology in this field."

The goal pursues by the next edition of the International Lighting Vocabulary, at present time in process of completion, is always the same:

IN THIS ISSUE

Provide a working document in a form comprehensible to all, based on the greatest possible international agreement especially as regards fundamental concepts, to promote international standardisation. But times have changed. The field of lighting has been dramatically enlarged by the development of new fields of research on the effects of optical radiation not only on the human eyes but also on a large number of photobiological effects, and the development of new technologies for light sources, optical radiation detectors and image processing, leading to the definition of a large number of new terms. Fortunately, new information and communication technologies offer new opportunities for handling and processing a large number of information.

The present edition of the vocabulary was prepared in a different way than the previous editions. Instead of having a special technical committee in charge of the vocabulary for all the CIE, each CIE division was entrusted to offer the terms for the vocabulary relevant to its activities. But this method of working, perfectly justified by the large number of very specific terms which need to be defined by experts in the field, induces some difficulties. Each division having its own approach of the terminology and its own rhythm of work, the provided documents contained some discrepancies (fortunately not too many) and were difficult to combine.

In order to clear up these difficulties, an harmonising committee was set-up with as members the member in charge of the vocabulary matters in each division. At its meeting in León, in 2005, this committee studied the best ways to clear up the discrepancies and to publish the next edition of the International Lighting Vocabulary.

For the study of "conflicting" terms it was decided that the persons in charge of the Vocabulary matters in each division will carry out the work under the control of the chairman of the Interdivisional Harmonising Committee.

In order to speed up the process for publishing the CIE International Lighting Vocabulary it was also decided that the very strict rules of the IEC, used for the last edition, for preparing such a document will be abandoned, but contacts with IEC will be maintained for offering them the new edition of the CIE vocabulary for a joint CIE-IEC standard. At present time the International Lighting Vocabulary is divided into 11 sections, the next edition will be split only into two parts, one for general terms and another one for terms related to applications. The part for general terms concerns mainly divisions 1, 2, 6 and 8 and is related to section 1 to 6 of the present vocabulary. The part for terms related to applications are mainly in the field of divisions 3, 4 and 5 and are related to section 7 to 11 of the present vocabulary.

The vocabulary will be published only in an electronic format with a search engine, for that the terms in the new edition of the vocabulary will be presented in alphabetic order. In a first step the publication will be a technical report only in English. In a second step the translation of the document (only terms or terms and definitions) will be done by the appropriate National Committees and published when ready.

At present time, due to the hard work of the members of the harmonising committee and of the Central Bureau, the “harmonisation” of the terms is almost completed and the final draft of the two parts of the document are in preparation and should be ready soon.

The International Lighting Vocabulary is certainly one of the major task the CIE has to achieve. To take into account the rapid changes in the lighting field and to minimise the difficulties encountered with the preparation of the next edition of this document it is necessary to develop a structure to deal with this problem. A possible way should be the appointment of a specific "working group" in charge of the vocabulary with the following tasks :

- Check for every CIE publication, before publication, if the vocabulary used is in agreement with the CIE International Lighting Vocabulary in use.
- Look for the new terms and definitions introduced in CIE publications and discuss if they need to be included formally in the vocabulary or if they are only applicable to that publication.
- Update at least once a year the vocabulary for including the new terms and definitions.
- Revise every 5 years the complete vocabulary for checking that the definitions in use are still valid, and, if necessary, remove the obsolete terms and definitions.

In a world which is knowing a very fast technological evolution, with the development of a lot of new concepts and new equipment, it is necessary to have Vocabularies giving clear and precise definitions of the terms used in order to improve the communication between people working in related field of activities. CIE has a major role to play in offering the International Lighting Vocabulary to the members of the optical radiation community.

Jean Bastie
CIE Vice-President

✉ News from the Divisions

Division 1 - Vision and Colour

http://www.bio.im.hiroshima-cu.ac.jp/~cie1

The Division 1 meeting was held 18-19 May, Ottawa, Canada.

Division 2 - Physical Measurement of Light and Radiation

http://cie2.nist.gov

The Division 2 meeting was held 14-16 June, Braunschweig, Germany.

Division 3 - Interior Environment and Lighting Design

http://ciediv3.entpe.fr

The next Division meeting will be held on 9 September 2006 in Ottawa, Canada, in conjunction with the 2nd CIE Symposium on Lighting and Health.

Division 4 - Lighting and Signalling for Transport

http://www.tut.fi/cie4/

The next Division meeting will be held in Greece, 18-21 September 2006, in conjunction with the conference "Urban Nightscape" (21-24 September).

The draft standard CIE DS 018.1/E:2006 "Standard file format for luminaire photometric data", prepared by CIE TC 4-16, was circulated for Division and Board ballot. Deadline for vote: 2006-07-20.

Division 5 – Exterior and Other Lighting Applications

http://www.cie.co.at/div5/

The next Division meeting will be held in Greece, 18-21 September 2006, in conjunction with the conference "Urban Nightscape" (21-24 September).

Division 6 - Photobiology and Photochemistry

http://physics.nist.gov/cie6/

The next Division meeting will be held on 9 September 2006 in Ottawa, Canada, in conjunction with the 2nd CIE Symposium on Lighting and Health.

Division 8 - Image Technology

http://www.colour.org/

The following new TC was established:

TC 8-10 "Office lighting for imaging" (Chair: Todd Newman, USA)

Terms of Reference: To report on the spectral power distribution and illumination levels used to view images in office lighting conditions. The report is to be based on empirical research.

New CIE Supportive Member

We are pleased to announce that

LEDworx GmbH, Austria

joined CIE as Supportive Member.

Supportive members benefit from the right to use the CIE Supportive member logo on their letterhead and in their publications so as to show that they are fully up to date with the latest information on world wide lighting trends, research and standards, and, depending upon membership category, the internal or external exploitation right of CIE publications. Supportive Members of the CIE also provide additional support that helps CIE to carry out its work.

Supportive Membership is open to companies and organisations working on an international or regional scale, having an interest in light and lighting and wishing to support the work of the CIE. Such organisations may include equipment manufacturing companies, commercial organisations, consultants and lighting designers, local government and government departments, educational organisations, etc.

The level of support is classified by the amount of annual membership fees and benefits received.

- Supportive Member: € 500
- Silver Supportive Member: € 3000
- Gold Supportive Member: € 8000

More information on this membership scheme can be obtained from the CIE Central Bureau (ciecb@ping.at).

🕮 New CIE Publications

UV Protection and Clothing

CIE 172:2006 **ISBN 3 901 906 48 7**

Clothing can provide substantial protection against solar ultraviolet radiation (UVR) and quantifying the amount of protection can have useful applications to recreational, occupational and medical situations.

Various test methods for measurement of UVR transmittance through fabrics are discussed. The measured transmittances can be used to calculate the erythemally weighted UVR transmitted by the fabric and thus the amount of protection provided. Factors affecting the UVR transmission of fabrics are also detailed. Currently existing standard documents are discussed, and then the document outlines a recommended test method for the determination of the UVR transmitted by fabrics and details a rating scheme using Ultraviolet Protection Factors (*UPF*s) to quantify the protection. Areas where research and standardisation efforts are still needed are discussed.

The report is written in English, with a short summary in French and German. It consists of 52 pages with 8 figures and 10 tables. The price of this publication is EUR 56,-- (Members of the CIE National Committees get 50% discount).

CIE Standard S 019/E:2006 Photocarcinogenesis Action Spectrum (Non-Melanoma Skin Cancers)

Solar ultraviolet radiation is recognized as a major cause of non-melanoma skin cancer in man. Skin cancer occurs most frequently in the most heavily exposed areas and correlates with degree of outdoor exposure. Describing the relationship of exposure (dose) to risk (skin cancer) requires the availability of a biological hazard function or *action spectrum* for photocarcinogenesis. This standard proposes the adoption of an action spectrum (weighting function) derived from experimental laboratory data and modified to estimate the non-melanoma tumor response in human skin. The experimental data are sufficient for estimating effectiveness down to about 250 nm, but experimental data are not sufficient for specifying effectiveness above 400 nm.

This standard has been approved by CIE National Committees. Price of this standard: EUR 28,- (Members of CIE National Committees get 50% discount).

CIE Statement on the recognition of journals in the field of light and lighting

2006-04-01

CIE, as the world organisation in the field of light and lighting, is much concerned that due to the relatively small number of research papers published yearly in light and lighting, not even the most esteemed international journals of its field are among journals listed in the Citation Index. Academia and other research establishments often consider at promotion of their staff (as well as at the evaluation of the work of their PhD students) the number of papers published in journals enumerated in the Citation Index.

CIE would like to stress that there are a number of journals not enumerated at present in the Citation Index, whose publication policy is at least as strict as of many journals of wider circulation and thus enumerated in the Index. CIE would like to urge universities and other academic and research establishments worldwide to consider papers published in journals, who qualify to the highest editorial criteria, as being of equal status to those published in journals enumerated in the Citation Index.

To help the above organizations in selecting the journals falling into this category the CIE Board of Administration, on the recommendation of the CIE Publications Board and either the CIE-Education Panel (a voluntary group of professors of universities and other higher education establishments) or a CIE Division, will from time to time evaluated the recommended journals publishing in fields related to light and lighting. The CIE will then inform the lighting community of the decision by publishing the list of endorsed journals and the criteria used in evaluating them in the CIE NEWS.

CIE hopes that with this will encourage young scientists to choose light and lighting as their scientific career, and help their peers to evaluate properly their accomplishments.

Mag. Christine Hermann
General Secretary of the CIE

Prof. Ir. Wout van Bommel
President of the CIE

Criteria for the evaluation of journals for official endorsement by the CIE:

The journal:

1) has a significant international impact in a field related to light and lighting,
2) has been in existence for at least 10 years, either under its present name or under another name, and has built up a solid reputation in a field related to light and lighting,
3) has an acceptable publishing policy, including an independent, external peer review mechanism for papers submitted for publication, and
4) is published regularly and with a frequency of at least three issues per year.

The CIE Board of Administration has endorsed the following journals (who have applied and were judged as currently meeting the above criteria):

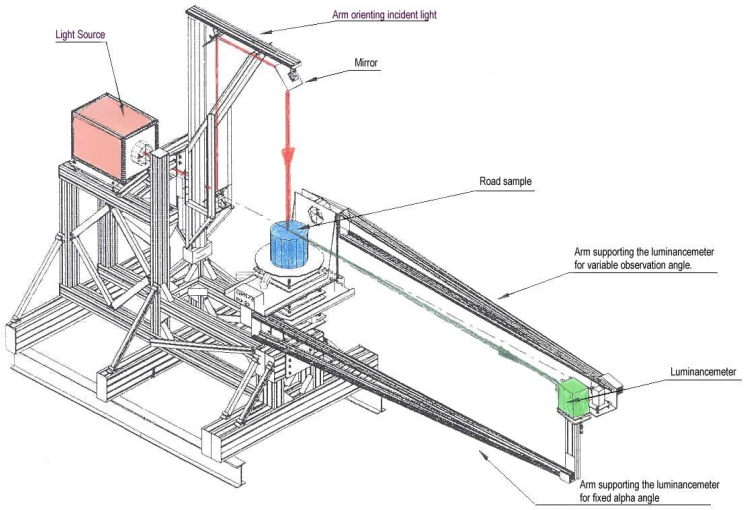
- Leukos
- Light & Engineering / Svetotehnika (L&E / S)
- Lighting Research & Technology (LR&T)

Other journals are invited to apply for inclusion in the list of CIE-endorsed lighting journals, giving information on how they fulfil the required criteria.

Characterization of Road Surfaces using a Mobile Gonio-reflectometer

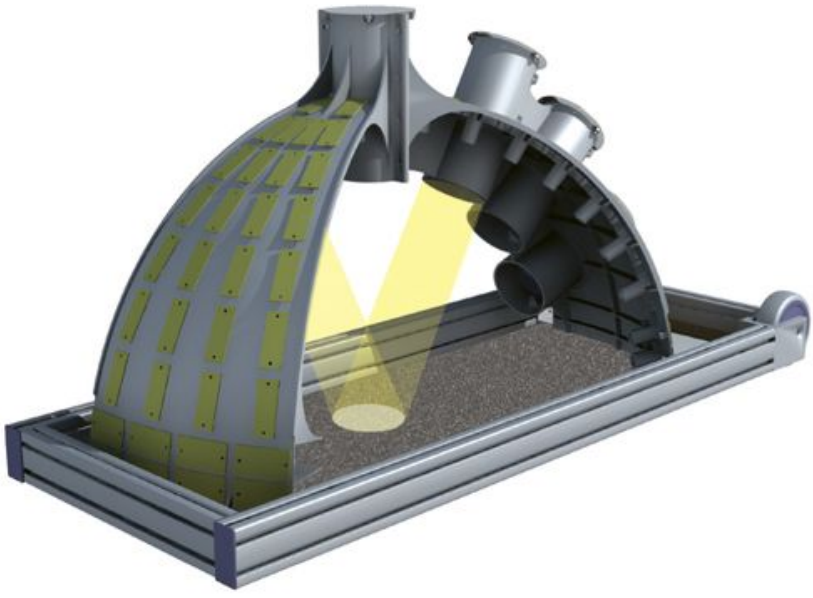
Having a good knowledge of road surface characteristics can lead to a better quality of lighting installations and cost reductions. It is indeed important to know these characteristics in order to estimate the luminance levels in roadway lighting. Many parameters can be influenced by the "behaviour" of pavements, such as the design of the installation, the choice of the optical system involving the type of light distribution and the amount of light needed to achieve the desired luminance levels. The road surface reflection characteristics are the starting point for the design of an optimized lighting installation. A lot of progress can be made in this field especially by measuring the parameters on site.

Up to now, the design of installations is most of the time done by using theoretical road surface characteristics (R1, R2, R3 and R4 defined by the CIE). These four r-tables cannot of course describe all the different existing types of pavements. In the best case, road samples are extracted and measured with a gonio-reflectometer. A service, Schréder is proud to say, that is has been offering for more than 20 years now. However, even if this method using laboratory equipment is reliable and accurate, it costs time, money and presents some disadvantages (modification of the road sample during the extraction, representativeness of the selected samples, …).



In this context, Schréder launched 3 years ago, in collaboration with the University of Liège, a research project called Memphis which aimed to improve the knowledge of road surfaces and overall to develop equipment capable of measuring the reflection characteristics of road surfaces on site.

The result of this research project is the realisation of a mobile reflectometer. This one is autonomous (it works on batteries), can be easily transported and handled by one person, can be used directly on site (no need to wait for lamp stabilisation, calibration on site, etc …) and realise a measurement in only 12 seconds. All the data are collected thanks to a specific new software allowing the user to analyse on site the different results and create directly new "average" r-tables that will be directly used in lighting calculation softwares.



The validation of this new concept has been done in two ways:

a) The results obtained with the mobile reflectometer were compared with those given by our four arms laboratory gonio-reflectometer (observation angle α going from 1° up to 90°). The obtained correlations between the two equipments entirely met our expectations.

b) A measurement campaign was carried out on the Belgian roads during spring 2005.

The goal was to compare on one hand the luminances predicted by using the mobile reflectometer and associated methods to exploit the measured data; and on the other hand the luminances measured on site. In order to do so, 18 sites were chosen in such a way that a large range of pavements (asphalt, concrete, porous asphalt…) and light distributions (extensive, cut-off …) were included. Again, the prediction of the luminances using the Memphis method appears to be very reliable and overall better than by using the 2 other methods (CIE r-tables and extraction-measurement of road samples) due to the average effect only possible with measurements on site.

The Memphis equipment is now fully operational (3 of them are available for measurements).

A second objective taken on board by the University of Liège (Department of Techniques of Sound and Image) was to be able to reconstruct an r-table (reduced coefficient table) from a reduced number of specific measurements on site. These variables could be directly linked to some types of measures obtained with the portable equipment. A mathematical modelisation has been realised in order to do so and allows us to reconstruct a r-table with a relative error below 4% !

The different equipments and methods developed during this research project give us a real opportunity to increase our knowledge of the road surface characteristics.

We all know for example that road surface materials are changing (new types of asphalt, etc…). We have now the tools to characterise them and then adapt the photometrical characteristics of our luminaries to these new road surface. This will be surely synonym of energy saving, cost reduction and better quality of the road lighting installations.

In the future, other badly known aspects of the road surface reflection characteristics can be studied with these new tools. We can for example imagine being able to quantify on site the influence of climatic conditions; the ageing of road surfaces would also be a very exciting subject.

As a conclusion, we can say that with this research project we've developed an important tool to be able to achieve our objective: "Right Light: sending the right quantity of light for each specific application"

🕮 New Publications in the Field of Light and Lighting

The handbook of nanotechnology Nanometer structures. Theory, modeling and simulation

Akhlesh Lakhtakia (ed.)

SPIE Press 2004
ISBN 0-8194-5186-X

Nanotechnology most likely will play a very important role in the coming years in a variety of areas: in electronics, biotechnology, computing, optical detection and excitation, mechanics etc. Since the book was sponsored by SPIE and ASME (American Society of Mechanical Engineering), the coverage of this volume is confined to optical and mechanical topics, including nanostructured thin films, photonic bandgap structures, quantum dots, carbon nanotubes, atomistic techniques, nanomechanics and –fluidics as well as quantum information processing. The reviewer does not claim to have expertise in all of these topics, has only experience in bandgap engineered nanostructures and thin films, consequently the review will focus on these topics, the rest of the chapters especially the ones discussing mechanical aspects will be only shortly mentioned.

After a short introductory section Chapter 2 describes sculptured thin films. They can be designed and realized by vapor deposition, their columnar direction can be easily changed, resulting in a wide variety of morphology. For most optical applications the column diameter and the separation should be constant. Being porous, it can act as a sensor of fluids and also can be impregnated with liquid crystals for switching applications. First the different morphologies are discussed then the electromagnetic wave propagation in these structures is shown, detailing transmission and reflection properties. The chapter concludes with applications concentrating on filters based on the Bragg phenomenon and on sensors.

Chapter 3 deals with a subfield of nanophotonics, the optical properties of two- and three-dimensional photonic band gap structures. These periodical structures manipulate the properties of the transmitted radiation by the help of the varying properties of the material. The size scale of interest in these structures is in the range of the wavelength, that is not as demanding as in nanoelectronics. Different computational techniques are analyzed in this chapter that can be used to model and simulate electromagnetic wave propagation in an envisioned structure. Plane wave, finite difference time domain and beam propagation methods are compared on different structures. Based on the computational simulations several applications are identified, filtering and waveguiding are the most obvious ones.

The next chapter is dedicated to quantum dots, their most well known commercial application is the quantum dot laser. Designed materials can be grown to tailor the electronic structure, to confine the electrons in foils or grains, resulting in size dependent energy states of the electrons. This shift of the energy states are demonstrated by luminescence spectra. After a comparison of the energy states of bulk, quantum well (foil) and quantum dot, the different fabrication techniques are shown. Further, quantum dot spectroscopy is detailed. Due to manufacturing deviations, quantum dots are not identical, therefore when a great number of them are probed, their integrated photoluminescence spectra show a significant broadening,.compared to a natural single linewidth. Two microscopic techniques are described, how to measure photoluminescence of a single quantum dot: microphotoluminescence and scanning near field optical spectroscopy. Later in this chapter the physical background and again simulation methods are given, concluding with present commercial and future applications.

The rest of the chapters are mainly oriented to solid state physics, mechanics and electronics, Chapter 5, Nanoelectromagnetics of low dimensional structures describes carbon nanotubes, their foundation of quantum electrodynamics and their non-linear optical effects. Chapter 6, Atomistic simulation methods statistically investigates and models quantum structures. Chapter 7, Nanomechanics describes nanoscale mechanical and mechanical behaviour of the material based on computational techniques. Chapter 8, Nanoscale fluid mechanics shows a field that has great potential in biomedical applications. The last chapter, Introduction to quantum information theory gives a comprehensive account on quantum computing.

This handbook is not presenting a fully developed theoretical model, but is presenting significant theory based on sound physical laws. Most of the chapters dealing with photonics describe computational techniques to solve Maxwell's equations within the nanostructures to predict their optical characteristics. A sound knowledge of electromagnetics and computational techniques are required from the reader.

J.M.

Computational electrodynamics The finite-difference time-domain method, 2nd edition

Allen Taflove and Susan C. Hagness

Artech House, 2000
ISBN 1-58053-076-1

The finite-difference time-domain (FDTD) method to solve Maxwell's equations in complex, three-

dimensional space was gaining shape in the early seventies. A model was sought for the microwave penetration into the human eye to better understand the formation of microwave cataract that has been observed during World War II in radar technicians. Due to the complexity of the human eye, its biological tissues and the surroundings a new method was required that was capable to solve two to three orders of magnitude more field unknowns than published at that time with any other methods. Earlier, large-scale solutions of Maxwell's equations have been motivated primarily by the requirements of defence: high speed communications, antennas. Since then the entire field of computational electrodynamics is shifting toward commercial applications, the FDTD method is applied in wide ranging fields, including wave scattering, waveguides, electromagnetic wave absorption of the human body, picosecond optoelectronic switches, propagation of optical pulses in nonlinear dispersive media, photonic bandgap structures, photonic crystal sensors, etc. just to mention some which have interest for the optics and biophysics communities.

Chapter 1 provides an overview on the history of computational electrodynamics, focusing on the FDTD method and its applications since its conception. Chapter 2 describes the numerical FDTD solution of the most basic partial differential equation that describes wave motion, the one-dimensional scalar wave equation. First the analytical propagating wave solutions are obtained, then finite differences on a space mesh and as a function of time are introduced and applied to the wave equation, leading to introductory discussions of numerical dispersion, numerical phase velocity, the time step and numerical stability. Calculated examples on pulse propagation, attenuation, stability, etc. are given to illustrate the concept and the dependence on the different parameters (courseness of the mesh and time step) of the FDTD technique.

Chapter 3 discusses the foundation of the FDTD electromagnetic field analysis, the Yee algorithm, consequently, this is one of the most important chapter of the book. Yee's idea was to choose a geometric relation for his spatial sampling of the vector components of, contrary to the wave equation, both the electric and magnetic fields that robustly represents Maxwell's equations, i.e. the time step has a specific bound relative to the lattice space increment. First, the Maxwell's equations are reviewed in three-dimensional space, then the finite differences are defined and used to Maxwell's equations for space regions with either a continuous variation of material properties or a finite number of distinct materials or nonpermeable materials. Further, the reduction to two-dimensional TM and TE modes and the use of alternative Cartesian and hexagonal grids are shown.

Numerical dispersion, detailed in Chapter 4, is a factor in FDTD modeling that must be accounted for to understand its operation and its accuracy limits. The FDTD algorithm causes nonphysical, numerical dispersion of the simulated waves in the free-space computational lattice. The phase velocity can differ from the speed of the electromagnetic wave by an amount varying with wavelength, direction of propagation in the grid and grid discretization. This can lead to broadening and ringing of pulsed waveforms, imprecise calculation of scattered waves, anisotropy, etc. The time step bound, mentioned above is necessary to avoid numerical instability that can cause the computed results to increase without limit as time passes. The chapter derives key relations for numerical dispersion and stability in multiple dimensions. Additional results are presented for non-Cartesian space lattices and emerging low dispersion FDTD techniques.

Chapter 5 is dedicated to the modeling of electromagnetic wave sources in the lattice as compact as it is possible. It reviews four classes: time dependent electric and magnetic source, current sources, total field/scattered field for plane wave excitation and waveguide sources. Although not compact, the pure scattered field source is also included. Absorbing boundary conditions are introduced in Chapter 6 to limit the computational field, since no computer can store an unlimited number of data. In this process, the outer boundary conditions must suppress reflections to an acceptable level that would not influence the model in the vicinity of the investigated structure. This chapter discusses in detail several important approximate solutions. The next chapter provides a treatment of an alternative approach, the perfectly matched layer that literally absorbs outgoing waves.

Chapter 8 describes the basis of frequency-domain and time-domain near-to-far-field transformation suitable for use in FDTD simulations. Using the near field data obtained in a single run of FDTD modeling, this transformation efficiently and accurately calculates the complete far field i.e. there is no need to extend the lattice to the far field. Dispersion and nonlinearity effects of materials are discussed in Chapter 9. To handle these phenomena two methods are shown, they enable the complete modeling of a broad variety of materials ranging from human tissues to radar absorbers even in very unusual structures comparable in size with the wavelength without neglecting the vital physics of wave diffraction.

Chapters 10 to 12 consider the use of different types of lattices, a varying one to model fine structures at given regions, nonorthogonal and unstructured ones to model the physical shapes of curved materials and the use of cylindrical coordinates to model for example wires. The next chapter discusses the modeling of periodic

structures like photonic bandgap structures. The rest of the chapters (14 to 16) are dedicated to applications: antennas, high speed electronic circuits and microcavity optical resonators.

This book is well written, the chapters are logically based on each other and for the profound understanding the introduced methods are mathematically thoroughly proved. For the understanding basic knowledge of Maxwell's equations and wave propagation is required.

J.M.

☞ CIE Symposia

2nd CIE Expert Symposium on Lighting and Health

7-8 September 2006, Ottawa, Ontario, Canada

This symposium is aimed to bring together experts from the health research and the lighting communities in order to examine proposals regarding optimal lighting parameters to enhance health. A specific aim is to define the ranges of daily doses of light and ultraviolet radiant energy that are physiologically optimum. The Symposium will examine the impact of spectrum and spectra; variations, optimal profiles of light exposure variations, constraints regarding flickering, and recommendations for potential changes as a function of time of the day, season, climate, work conditions.

The sessions are organized to present new health information where the basic scientists will be asked to speculate on the impact of their research to the indoor lighted environment. At least one-third of the time will be devoted to discussion of the possible consequences for different lighting scenarios, lamp and luminaire specifications. The panel discussion will be triggered by a featured speaker in each session.

The programme is now being finalized. Please check the CIE and symposium websites (http://www.cie.co.at/ and http://www.irc.nrc-cnrc.gc.ca/ie/lighting/health/cie_e.html) for up-to-date information. Registration forms are also availble on the website.

For information on registration, please contact:

Ms Monique Myre, Client Services
National Research Council of Canada
Institute for Research in Construction
Bldg M-20, 1200 Montreal Road
Ottawa, Ontario, Canada K1A 0R6
tel. +1-613-993-0435 / fax +1-613-952-7673
e-mail: monique.myre@nrc-cnrc.gc.ca

CIE Expert Symposium on Visual Appearance

19-20 October 2006, Paris, France

This symposium will span all aspects of visual appearance, including metrology, perception, and application.

Emphasis will be placed on:

- Gloss, texture and translucency
- Appearance measurement
- Instruments and standards

The visual appearance can be one of the most critical parameters affecting customer choice and it needs, therefore, to be quantifiable to ensure uniformity and reproducibility. A starting point in assessing the appearance of a consumer product might be the measurement of its colour. The description of its total appearance, however, cannot be achieved by the definition of colour alone; other attributes of the object contribute to the overall appearance and these might include gloss, translucency and surface texture, as well as the environment in which the object is seen.

The aim of this symposium is to report and review the interactions between these various components that provide a framework to describe and measure visual appearance. The interactions between the various components are complex. Physical parameters are related to the objects in scenes and these in turn are influenced, at the perception stage, by the physiological response of the human visual system and, in addition by the psychological aspects of human learning, pattern, culture and tradition.

By dealing with the optical properties of materials under the four headings of colour, gloss, translucency and texture it is possible for measurements to be made: It is recognised that these measures are not necessarily independent; colour may influence gloss, colour will certainly influence translucency, and texture is probably a function of all three of the other measures.

This meeting is open to everyone with an interest in the science of visual appearance, in visual aspects of appearance, as well as the development of novel measurements techniques and the applications to the real world in industry, architecture etc.

For further information, please contact:

Françoise Viénot
Muséum National d'Histoire Naturelle
Centre de Recherches sur la Conservation
des Documents Graphiques
36 rue Geoffroy Saint-Hilaire
75005 Paris, France
Tel: + 33 (0) 1 40 79 53 17
Fax: + 33 (0) 1 40 79 53 12
vienot@mnhn.fr
http://www.mnhn.fr/cievisualappearance/

☞ Future Meetings

Razsvetljava / Lighting Engineering 2006

12-13 October, 2006, Bled, Slovenia

This conference is organized by the Lighting Engineering Society of Slovenia and the Slovenian National Committee of CIE. The emphasis is both on the research and practical applications. This year's topic of interest: Lighting of Work Places.

The working languages will be Slovene and English.

Registration fee:

EUR 184,- (before 29 Sep.)

EUR 205,- (on-site registration)

For further information, please contact:

Mr. Matej B. Kobav
Faculty of Electrical Engineering
Trzaska 25
SI-1000 Ljubljana, Slovenia
tel: +386 1 47 68 759
fax: +386 1 47 68 289
e-mail: matej.kobav@fe.uni-lj.si
http://www.sdr.si

International Conference on Colour Harmony

24-26 April, 2007, Budapest, Hungary

Call for Papers

The following main topics will be covered:

- Theory and the colour harmony (harmony systems and models, colour vision, colour preferences, etc.)
- Colour harmony in architecture (architecture, interior decoration, environmental design, etc.)
- Colour harmony in art and design (fine arts, graphic arts, applied arts, arts and crafts, handcrafts, fashion, etc.)
- Colour harmony in the folk art (colouration and toning in the folk architecture, folk wear, folk handcrafts, etc.)
- Colour harmony in the nature (lifeless nature, living nature, etc.)
- Computer technology and the colour harmony (web design, colour display, etc.)

Abstracts (no more than one page A4, in pdf or .doc format), should be submitted before 31 October 2006.

Registration fees:

EUR 200,- (before 31 Dec.2006)

for students: EUR 100,- (before 31 Dec.2006)

For further information, please contact:

ICCH'07
International Foundation Light and Colour
1145 Budapest
Műegyetem rkp. 3
Hungary
tel./fax: +36 1 2202618
e-mail: colour.harmony@t-online.hu

Lighting'2007

10-12 June, 2007, Varna, Bulgaria

This conference is organized by the Bulgarian National Committee on Illumination.

Topics include:

- Energy efficiency in lighting and ecology
- Indoor lighting
- Outdoor lighting
- Ergonomics and physiology of vision
- Photometry and colorimetry
- Daylighting
- Architectural, decorative and advertising lighting
- General aspects of lighting, terminology, standardization

An exhibition of lighting products will be held during the conference.

Registration fee: EUR 100,-.

Deadline for abstracts: 25 February 2007.

For further information, please contact:

Ms. Nicolina Yaneva
Technical University Sofia
tel.: +359 2 965 27 14
e-mail: niya@tu-sofia.bg

From the Lighting Journals

Color Research and Application
(www.interscience.wiley.com)
Volume 31, Number 2, April 2006

Talking about color ... and ethics
J. Hutchings

Investigating von Kries-like adaptation using local linear models
G.D. Finlayson, S.D. Hordley, A. Alsam

Two-primary crosstalk model for characterizing liquid crystal displays
S. Wen, R. Wu

The Villalobos Colour Atlas: an analysis
M. Brown, R.G. Kuehni, D. Hinks

The use of reflectance measurements in the determination of fixation of reactive dyes to cotton
N. Ahmed, D.P. Oulton, J.A. Taylor

Experimental study of back-scattering spectrum of textile structures
A. Moussa, D. Dupont, D. Steen, X. Zeng, M. Elias

Apperance variations of textile materials due to different near gray backgrounds
F. Agahian, S.H. Amirshahi

Irregularity in CIECAM02 and its avoidance
M.H. Brill

Clarification of differences between variable achromatic color and variable chromatic color methods in the Helmholtz-Kohlrausch Effect
Y. Nayatani, H. Sakai

Journal of Light & Visual Environment

(www.soc.nii.ac.jp/ieij/)

Volume 30, Number 1, 2006

Spectral properties of medium - or high-pressure plasmas ionized to high degrees
T. Hiramoto

The effect of buffer gaz and excitation mode in low pressure nitrogen discharges
S. Kitsinelis, H. Motomura, M. Jinno

Processes in low pressure mercury-rare gas discharges
S. Kitsinelis, H. Motomura, H. Kurokawa, M. Jinno

The influence of lightness, chroma and hue of chromatic letters against an achromatic background on readability and equivalent luminance contrast
N. Hara, T. Noguchi

Changing binocular fusional area with retinal shift in binocular vision
D. Qin, M. Takamatsu, Y. Nakashima

Investigation on the minimum maintenance discharged power of a low-frequency driven electrodeless compact fluorescent lamp - Buffer gas and driving frequency dependence
T. Arakawa, K. Seki, K. Katase, K. Hashimotodani, A. Hochi

Case study on combination of fluorescent materials for white LED to obtain high color rendering indexes
S. Nayama, K. Itoh

Change of wavelength difference limit for binocular color fusion with wavelength and brightness of stimuli
D. Qin, M. Takamatsu, Y. Nakashima, X. Qin

Lighting Design + Application

(www.iesna.com)

April 2006: Archi-tainment + Attractions

May 2006: Lightfair 2006 Preview

Lighting Research & Technology

(www.lrtjournal.com)

Volume 38, Number 2, 2006

Monte Carlo ray-tracing in particle-doped light guides
C.A. Deller, J. Franklin, G.B. Smith

The method of aperture meridiane: a simple calculation tool for applying the ISO/CIE Standard General Sky
R. Kittler, S. Darula

Evaluation of high dynamic range photography as a luminance data acquisition system
M. N. Inanici

Average daylight factor for the 15 CIE standard skies
D.H.W. Li, G.H.W. Cheung

Modelling of multichip LED packages for illumination
J.M. Gaines

Light piping performance enhancement using a deflecting sheet
L. Venturi, M. Wilson, A. Jacobs, J. Solomon

The Lighting Journal

(www.ile.co.uk)

Volume 71, Number 6, March/April 2006

The lighting of urban spaces

The effect of pavement material on road lighting performance
S. Fotios, P. Boyce, C. Ellis

For your Diary

Date	Title of Meeting	Organizer	Place of Meeting
2006			
August 24-25	6th National Lighting Congress & Interlight Istanbul Fair	Istanbul Techn. Univ., fax: +90212 283 60 51, e-mail: onder.guler@itu.edu.tr	Istanbul, Turkey
Sep. 7-8	2nd CIE Expert Symposium on Lighting and Health	CIE/NRC http://www.irc.nrc-cnrc.gc.ca/ie/lighting/health/cie_e.html	Ottawa, Ontario, Canada

Sep. 9	CIE Division 3 Meeting	CIE Division 3	Ottawa, Ontario, Canada
Sep. 9	CIE Division 6 Meeting	CIE Division 6	Ottawa, Ontario, Canada
Sep. 10-13	Licht 2006	SGL, slg@bvmberatung.net fax: +41 31 313 88 99 www.licht2006.ch	Bern, Switzerland
Sep. 18-21	CIE Division 4 Meeting	CIE Division 4	Athens, Greece
Sep. 18-21	CIE Division 5 Meeting	CIE Division 5	Athens, Greece
Sep. 19-22	VI International Lighting Conference Light without Borders	VNISI, Russia, tarabrinaso@vnisi.ru, vnisi@bk.ru	Kalinigrad, Russia
Sep. 21-24	Urban Nightscape 2006	Hellenic Illumination Committee info@efe.gr, www.efe.gr	Athens, Greece
Sep. 25-27	BOLcolor 2006, Bolivian Congress of Color	Asoc. Boliviana del Color www.asociacionbolivianadelcolor.8m.com/ asociacionbolivianadelcolor@entelnet.bo	La Paz, Bolivia
Sep. 28-29	LUMEN V4	borsanyi.csilla@kvk.vmf.hu schwarcz.p@schreder.hu	Balatonfüred, Hungary
Oct. 9-10	AIDI International Conference 2006 "Light & Architecture"	AIDI, segreteriadue@aidiluce.it	Venice, Italy
Oct. 12-13	Razsvetljava/ Lighting engineering 2006	Lighting Eng. Soc. of Slovenia, matej.kobav@fe.uni-lj.si, http://www.sdr.si	Bled, Slovenia
Oct. 19-20	CIE Expert Symposium on "Visual Appearance"	CIE Division 1, http://www.mnhn.fr/cievisualappearance/	Paris, France
Oct. 24-27	AIC Interim Meeting	www.colourgroupsa.org.za	Johannesburg, South Africa
Nov. 14-16	3rd International Conference on Metrology: Trends and Applications	confer@isas.co.il fax: +972 2 6520558	Tel-Aviv, Israel
Dec. 6-9	Interlight Moscow 2006	Ost-West-Partner, www.interlight-moscow.com	Moscow, Russia
Dec. 11-16	6th Intern. Conf. on Advances in Metrology AdMet-2006	Nat. Phys. Lab., www.apmp2006.org.in	New Delhi, India
2007			
March 6-9	Tokyo Lighting Fair	Space Media Japan, smjapan@tiscali.it	Tokyo, Japan
April 24-26	Intern. Conf. on Colour Harmony	Intern. Foundation Light & Colour, colour.harmony@t-online.hu	Budapest, Hungary
June 10-12	Lighting'2007	Bulgarian National Committee, niya@tu-sofia.bg	Varna, Bulgaria
July 4-11	CIE Session 2007 with meetings of all CIE Divisions	CIE	Beijing, China
July 12-14	AIC Midterm Meeting	Prof. Ye Guanrong, ygr@moi-lab2.zju.edu.cn	Hangzhou, China

CIE NEWS is published by the

CIE Central Bureau
Kegelgasse 27, A-1030 Vienna Austria
Tel. +43 1 714 31 87 0
Fax +43 1 714 31 87 18
e-mail: ciecb@ping.at
http://www.cie.co.at/