CIE NEWS

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Report on the CIE Symposium '99 "75 years of CIE photometry"

The 1999 Symposium of the CIE was held at the Hungarian Academy of Sciences, Budapest, between 30 September and 2 October 1999, celebrating the 75th anniversary of the CIE photometric system.

Nine Invited papers summarized the pre 1924-situation of photometry, dealt with the establishment of the present photometric system, discussed its shortcomings and possible extensions. Further 16 Contributed Papers and four Poster Presentations elaborated on the subject. 58 experts of the two interested international bodies (BIPM and CIE) and of further 15 countries participated in the discussions. The presented papers and discussions made it clear that the 75 year old photometric system is still the internationally accepted basis for all visually significant light measurements. It defines one of the base units of the SI system, the candela, and as such it should have a permanent status also in the future.

Contributions pointed out, however, that since 1924 great progress has been achieved that found only partly its way into CIE recommendations and standards. By now it is clear that one has to differentiate between foveal vision photometry, to be used when it is important to see and recognise small details, and a photometry that can help illuminating engineers to describe parafoveal vision, brightness perception in the lit environment and mesopic vision.

At the restricted space available here it is impossible to report on all subjects that were dealt with at the meeting. After an introduction by Dr. Hengstberger, at the time of starting the organization of the meeting Director of CIE Division 2 and now Vice President for Publication, some further highlights were the following: Professor Valberg, one of the leading scientists in vision research, described underlying vision research that makes the difference between flicker photometry based V(λ) and opponent colour channel influenced brightness perception understandable. Dr. McGowan could not participate in person but Dr. Bergman was kind enough to read his paper on the application of photometry in lamp industry. Prof. Rea dealt with the applicability of V(λ) based photometry for foveal recognition of tasks, also in the mesopic range, and possible extensions for parafoveal vision, where at mesopic levels a photometry based on a 10 degree observer with rod

IN THIS ISSUE

participation seems to be necessary. Photometry is important in interior design, this question and some of the necessary extensions of the present photometric system to cope with the requests interior designers have were dealt with by Prof. Loe. Papers by Dr. Blevin and Dr. Wallard explained the interaction between CIE and the Meter Convention and how new scientific results could find their way into the system of international units and measures. Dr. Walraven reported on the progress CIE TC 1-36 made to recommend a fundamental chromaticity diagram, and to provide data for the extension of the V(λ) function into the infrared. Dr. Sagawa, Director of CIE Division 1 showed in his closing paper the vision of a future photometer, which is an image photometer, where you can switch among a number of evaluation functions, depending on the actual task to be checked.

For further details see the Abstracts of the Papers at

http://cie.kee.hu/symp99,

or ask for Proceedings/CD-ROM at the

CIE Central Bureau,
Kegelgasse 27
A-1030 Vienna
Austria
e-mail: ciecb@ping.at

Dr. János Schanda
CIE Secretary

🕮 New Publications

CIE Collection in Vision and Colour and in Physical Measurement of Light and Radiation, 1999

CIE 135-1999 *ISBN 3 900 734 97 6*

This volume contains short Technical Reports and Research Notes prepared by various Technical Committees and Reporters within CIE Division 1 and 2.

135/1: Disability glare

On the basis of a preceding theoretical analysis of experimental data on disability glare published in CIE Collection (Vos and Van den Berg, 1997), resulting in a complete glare equation covering the full 0° to 100° glare angle range, three simplified glare equations are presented, each of them defined for a more restricted glare angle domain. This ensemble of three equations together is recommended to define a CIE Standard Glare Observer; the most simple one, the Age Adapted Stiles-Holladay Equation, will suffice for most circumstances of daily practice.

135/2: Colour rendering, closing remarks

The CIE "Test method to calculate a colour rendering index" has a long and complicated history. After first publishing a method in 1965 and updating it in 1974, it was soon realised that further amendments would be necessary. A TC worked on the subject in the 1980s, but had to be closed without any definite recommendation due to disagreements among the TC Members. A second trial was started after the 1991 Quadrennial Meeting. This TC worked – under various chairmen – for about six years, but again it had to be closed without producing a definite recommendation, although this time TC Members agreed in a number of questions.

This report summarizes those items where TC Members could agree and highlights also those questions where no consensus could be reached. To the latter category two groups of questions belong: items where it is hoped that CIE will come up very soon with further recommendations that should be incorporated in a colour rendering calculation (e.g. new chromatic adaptation transformation) and items where a political decision of the lamp manufacturers is needed, as a change in the calculation method necessarily will favour one lamp spectrum compared to that of an other.

The present closing remarks document summarizes the items discussed by the TC during the past decade, states those items where a consensus could be formed and pinpoints questions where further research is needed to reach consensus.

135/3: Virtual metamers for assessing the quality of simulators of CIE illuminant D50 (Supplement 1-1999 to CIE 51-1981)

CIE 51-1981 describes a method of assessing the quality of simulators of CIE illuminants D55, D65, and D75 (various phases of daylight), for colour measuring instruments, visual appraisal and matching of colours. The spectral power distribution of the simulator is measured and the departure from the ideal distribution is computed, in terms of chromaticity differences between virtual metameric pairs that match under the ideal CIE illuminant. CIE illuminant D50 is simulated for use in photography and colour printing. This supplement provides the virtual metamers needed to apply the method of assessment to D50 simulators.

135/4: Some recent developments in colour-difference evaluation

A compressed overview is given of developments in colour-difference evaluation that trace back to the early beginnings by MacAdam. The correlation of

colorimetric measures of coloured samples with judgements on small colour differences follows normal statistics, but in a three-dimensional space. A wide diversity of experimental conditions in investigations of the colour-difference effect made comparisons of different studies troublesome. Some external influential factors could be identified. Recently developed data sets resulted from much better control of experimental conditions. They form a new basis for deriving colour difference formulae. The CIE is the international body to encourage field research for optimising new colour-difference formulae. The various stages for recommending formulae and exchanging extensive investigation documents make a close link between practitioners and theorists, however, in general industrialists have a faster response. Nonetheless, the CIE still remains the mother-body for international discussion and agreement. Recent developments in colour-difference evaluation show an acceleration of the work of CIE TCs. Their studies first improved the CIELAB-formula, and second now try to fill the gap between the CIE94 and the older CMC(l:c) solutions. A new idea is introduced to optimise the formalism of a formula not at the components of differential terms, but at the co-ordinates which keeps the vector definition of colour-difference as in the CIELAB-formula. An international discussion is proposed on this aspect as a forthcoming step to further improvement of colour-difference evaluation.

135/5: Visual adaptation to complex luminance distribution

One of the most important and difficult tasks in evaluation of perceived brightness in everyday circumstances is to assess what level the visual system adapts to. Especially, this is an inevitable process when putting the new photometric system into practice. In the present report, several studies are reviewed, and tasks and problems of the prospective TC are discussed. Although many studies of brightness perception are potentially related to the matter of adaptation level, we can find no literature in which the issue is discussed explicitly. All what we can do now is to encourage investigators to carry out research concerning the level of visual adaptation not only in experimental conditions but also in natural and complex environments.

135/6: 45°/0° Spectral reflectance factors of pressed polytetrafluoroethylene (PTFE) powder (Reprint of NIST Technical Note 1413)

Pressed polytetrafluoroethylene (PTFE) powder is used for 45°/0° reflectance factor standards. The radiometric and spectrophotometric measurement community such as the Council for Optical Radiation Measurements (CORM) has demonstrated the need for such a standard and its application to quality control and quality assessment. This publication briefly describes the instrumentation used for the 45°/0° spectral reflectance factor measurements of pressed PTFE powder from 380 nm to 770 nm. Also, the variations of 45°/0° reflectance factor with sample preparation and materials are discussed. The expanded uncertainty at a coverage factor of two for the 45°/0° reflectance factors of pressed PTFE powder ranges from 0,009 to 0,017.

The publication contains also abridged abstracts of CIE Publications prepared within Division 1 and 2.

These reports are written in English, with short summaries in French and German. The publication contains 78 pages and is readily available at the CIE National Committees or the CIE Central Bureau in Vienna.

🕮 New Publications in the Field of Light and Lighting

Optical measurement techniques and applications

Ed. Pramod K. Rastogi

Artech House 1997, ISBN 0-89006-516-0

Optical metrology involves a wide range of coherent and incoherent methods. These have been used in different applications of very diverse areas. The interdisciplinary characteristic of these methods results in a scattered publication of the original papers in several journals making it difficult to have easy access to the up-to-date information. This book provides a single source information on a part of optical metrology mainly on coherent methods but not exclusively.

The volume provides essential information from the basic equation and principle to practical applications among others in the fields of optical testing, digital fringe analysis, holographic interferometry, speckle metrology, moiré, fiber optic sensors, optical smart sensing, surface roughness measurement and digital image correlation. As it can be seen from the above enumeration these techniques are to be used to measure interferometric deviations in position, deformation, rotation, displacement, surface topography, etc. The sensor applications, detailed in this book are mainly in this field, too. At the end of the book special introductory sections are dedicated to particle image velocimetry, lidar for atmospheric remote sensing, ellipsometry and optical caustics.

For the optical engineer this book opens an ensemble view to the available techniques and

systems needed to solve their special measurement problems. The techniques are mainly based on the wave characteristics of light and radiation.

☞ Future Meetings

Colour 2000

a two-stage conference organised by the National Physical Laboratory (NPL) and the University of Derby:

NPL Colour and Visual Scales 2000

3-5 April 2000, Egham, Great Britain

Colour Image Science 2000

10-12 April 2000, Derby, Great Britain

NPL will host an international conference NPL Colour & Visual Scales 2000 from 3 to 5 April. This will be followed by meetings of CIE Division 1 and 2. The conference will deal with the following topic areas:

- Colour scales
- Colour measurement and standards
- Colour appearance
- Appearance (attributes other than colour)
- Mesopic photometry
- Vision in the mesopic region

Keynote presentations by international experts in colour and visual scales will be followed by debates on the requirements for refined/new standards for colour, photometry, colour appearance and appearance. A workshop on colour difference evaluation will also be held.

The Colour & Imaging Institute of the University of Derby will host an international conference on Colour Image Science from 10 to 12 April. This will follow a meeting in Derby of CIE Division 8 “Image Technology”. Topic areas to be covered:

- Vision and imaging
- Multispectral imaging
- Device performance
- Colour management
- Image quality
- Interactive imaging

Keynote presentations by international experts in colour imaging will be followed by a debate on the role of colour image science in digital consumer products.

For further information, please contact

Linda Marshall, Colour 2000 Administrator
LM Conferences
The Old Manse, Nottingham Road
Keyworth, Nottingham
NG12 5FB, UK
tel.: +44 115 9376070
fax: +44 115 9375271
e-mail: colour2000@colour.derby.ac.uk

or visit their website
http://colour.derby.ac.uk/colour2000

AIC Color 2001 Rochester

9th Congress of the International Color Association

24-29 June, 2001, Rochester, NY, USA

The Congress will include Special and Invited Lectures, Symposia and Oral and Poster Presentations covering the whole field of Colour Science, Technology and Design. Encouraged topics are as follows:

- What is colour
- What is colour for (e.g. colour design)
- How does colour work (e.g. colour vision, colour in light sources, colour image processing)
- How can we control colour (e.g. colorimetry, photometry, colour rendering, colour management systems, colour order systems, colour matching)
- How should we teach colour

An exhibition featuring the latest developments in Colour Technology will be held in parallel.

For further information, please contact

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❑ Liaison Matters

Dr. Hiroaki Ikeda received
1999 IEC Lord Kelvin Award in Kyoto

The International Electrotechnical Commission (IEC) has honoured a member of its community for his outstanding contributions to global electrotechnical standardization over a number of years. The IEC Lord Kelvin Award marks

exceptional contributions by individuals to IEC work. The recipient of this prestigious award is Dr. Hiroaki Ikeda.

Bernard H. Falk, Immediate Past President of the IEC, gave the award before the assembled members of the Commission in Council during the 63rd IEC General Meeting in Kyoto, Japan.

A Japanese citizen, Professor Hiroaki Ikeda is a member of several institutes of electronics, information and communication in Japan and in the US. Prof. Ikeda is currently Full Professor in the Department of Urban Environment Systems in the faculty of engineering at Chiba University. His dedicated participation in the IEC's standardization work includes the promotion of innovative methods in the standards' development process.

CIE Central Bureau is also very grateful to Dr. Ikeda for his help in establishing the first CIE homepage in the World Wide Web.

From the Lighting Journals

Journal of Light and Visual Environment

Volume 23, Number 1, 1999

Modeling and estimating of the fluorescent lamp and its pre-heating control
G.-C. Hsieh, C.-H. Lin

Dependence on the operation frequency of negative glow
T. Uetsuki, N. Taguchi

Study on optimal lighting configuration and aberration of inspection system by Monte Carlo method
L. Chen, M. Suzuki, N. Yoshimura

Relationship between illuminance/color temperature and preference of atmosphere
H. Nakamura, Y. Karasawa

Improvement of indoor illuminance distribution with the thin phase hologram
F. Nakamura, H. Kayano

Simplified human and visual MTF measurements
N. Nameda, Y. Shimizu

Measurement of slant visual range in laser radar operation considering the spread of transmitted laser beam caused by small particles in the atmosphere
T. Shiina, K. Ikeda

Lighting Design + Application

September 1999: Hotels & Restaurants

November 1999: Progress Report

Lys (in Danish)

Number 3, October 1999

Festive light evening in Tivoli
J. Klausen

Are we too puritan ?
P. Olesen

Tivoli - light and illumination
L. Skak-Nielsen

Weber Prize and illumination event
A. Espenhain

The pots of Roskilde
B. Corneliussen

New road lighting rules
V. Clausen, K. Sörensen

Lighting and children's developing
J. Nersveen

New arrangement concept in RD
J. Ammundsen, P. Rasmussen

CIE congress in Polish collation
V. Clausen

Shadows of light
T. Kurtzweil

Analysis of daylight
J. Christoffersen, E. Petersen, K. Johnsen

Daylight research in SBI
K. Johnsen

The National Museum of Art
A. M. Indrio, P. Jansen, B. Rask

The Lighting Journal

Volume 64, Number 5, September/October 1999

Designing for the visually impaired
Y. Howard

Dome and away
M. Faithfull

Pick of Britain's best ?
by the Design Council

Edinburgh's earthquake
C. Gardner

Lighting up the dome

Vision Research

Volume 39, Number 3, 1999

Position jitter and undersampling in pattern perception
D. M. Levi, S. A. Klein, V. Sharma

The influence of large scanning eye movements on stereoscopic slant estimulation of large surfaces
R. van Ee, C. J. Erkelens

An orientation anisotropy in the effects of scaling vertical disparities
J. P. Frisby, D. Buckley, H. Grant, J. Garding, J.M. Horsman, S.D. Hippisley-Cox, J. Porrill

Stereopsis based on monocoular gaps: Metrical encoding of depth and slant without matching contours
B. Gillam, S. Blackburn, K. Nakayama

Optimal spatial localization is limited by contrast sensitivity
T. Carney, S.A. Klein

Localization and identification tasks rely on different temporal frequencies
T. A. Busey

The effects of temporal noise and retinal illuminance on foveal flicker sensitivity
J. Rovamo, A. Raninen, K. Donner

Shape and contour detection
M. W. Pettet

On the relationship between the spatial channels for luminance and disparitiy processing
R. F. Hess, F. A.A. Kingdom, L. R. Ziegler

Behavioural visual acuity of wild type and bc12 transgenic mouse
L. Gianfranceschi, A. Fiorentini, L. Maffei

Volume 39, Number 4, 1999

Peripheral and central delay in processing high spatial frequencies: reaction time and VEP latency studies
M. Mihaylova, V. Stomonyakov, A. Vassilev

Analysis of red/green color discrimination in subjects with a single X-linked photopigment gene
M.A. Crognale, D.Y. Teller, T. Yamaguchi, A.G. Motulsky, S.S. Deeb

The spatial tuning of color and luminance peripheral vision measured with notch filtered noise masking
K. T. Mullen, M. Angeles Losada

Evidence for the stochastic independence of the blue-yellow, red-green and luminance detection mechanisms revealed by subthreshold summation
K. T. Mullen, M. J. Sankeralli

Reading with central field loss: number of letters masked is more important than the size of the mask in degrees
E. M. Fine, G. S. Rubin

The oblique effect with colour defined motion throughout the visual field
L. Bilodeau, J. Faubert

Orientation discrimination and tilt aftereffects with luminance and illusory contours
C. J. Bockisch

Figure ground segregation modulates perceived direction of ambiguous moving gratings and plaids
L. Tommasi, G. Vallortigara

Alignment of separated patches: multiple location tags
H. Akutsu, P. V. McGraw, D. M. Levi

Integration after adaptation to transparent motion: static and dynamic test patterns result in different after-effect directions
F. A.J. Verstraten, M. J. van der Smagt, R. E. Fredericksen, W. A. van de Grind

Integration and segregation of local motion signals: the role of contrast polarity
M. J. van der Smagt, W. A. van de Grind

✞ In Memoriam

Ing. Konrad Höfler ✞

We have lost a highly intelligent, industrious man, an expert in his field, who was at the same time kindly and modest and an exemplary husband and father. After a long illness which he bore bravely, remaining alert until the end, Ing. Konrad Höfler died following a heart attack on the 3rd of June 1999, in his 91st year.

Konrad Höfler was born into modest circumstances on January 1st 1909 in Linz, Austria. On leaving school he started his career as an apprentice electrician and later, although working full-time, he also found the time to gain further knowledge, eventually qualifying as an electrical engineer.

From 1929 until his retirement in 1972 he was employed by the Electricity and Tram Company (ESG) in Linz. This company was responsible for supplying electricity to the region of Upper Austria, including the regional capital, Linz, as well as providing the public transport system.

In 1942 his career was interrupted by Second World War, when he was called-up to serve as a corporal in the Alpine Division and was posted to the Arctic Sea front. After his release from a prisoner of war camp and his return home in 1946, he devoted himself to the rebuilding of Upper Austria's badly damaged energy supply system. In 1964 he was appointed as a director of the Electricity Supply Department, which at that time had more than 1000 employees. Simultaneously he had the responsibility of being the Business Manager to the company. Apart from these duties, he was involved in youth and adult training and was also a member of various technical expert committees.

His special interest was lighting technology. During the years of reconstruction, he and his colleagues installed strategic lighting projects in

the area served by the ESG, which led him later on to turn his attentions to the theoretical side of lighting technology.

Konrad Höfler's work was published in various specialist journals and he was the co-author of the 1975 edition of 'The Handbook for Lighting'. From 1955 he was a member of the Austrian Lighting Technology Society and was chairman from 1963 to 1975. From 1959 until 1963 he was Secretary of the Austrian National Committee of the CIE and from 1963 until 1975 its President. His duties, amongst other things, included organising and running the CIE conference held in Vienna in 1963. He was also the initiator of the first German speaking joint conference of the LiTG, NSVV, SLG and LTG held in Salzburg in 1974, an event which has continued every second year since then.

Konrad Höfler retired from the CIE in 1975. He became an honorary member of the LTG. His participation in international conferences in such places as Brussels, Washington, Barcelona and London made him a well-known and respected figure far beyond the boundaries of Austria.

In his free time he was an enthusiastic mountaineer, an activity which he continued to enjoy until a ripe old age, his proudest achievement being reaching the summit of Montblanc. He received many awards, amongst them the Golden Medal of Honor for Services to the Republic of Austria and in 1989 the CIE Award.

Konrad Höfler is survived by his wife and son. All those who knew him will honor his memory forever.

Mr. Jiří Švehla ✞

On the 15th of November 1999, Mr.Jiří Švehla CSc, aged 78 years, passed away after a long illness. Ing. Švehla devoted his entire life to light technology and was a significant organizer in the production of light sources in the former Czechoslovakia. He was, for many years, the head of Research and Development at Tesla Holešovice company, and internationally renowned as an expert in the economic aspects of lighting. Mr. Švehla‘s career also entailed chairman of NC CIE for a significant number of years.

After the 2nd World War, the end of which he spent in a concentration camp, Mr. Švehla graduated from the School of Economic Engineering, joined Tesla Holešovice and was eventually promoted to the Head of research of light sources. Mr. Švehla was a devoted promoter of illuminating engineering and published a number of professional articles as well as lecturing at many conferences, both in the Czech Republic and abroad. He was also one of the initiators of the journal Svêtelnä technika (Illuminating Engineering).

Mr. Švehla actively co-operated with the CIE, where he established a study group to address the economic aspects of lighting which later became the Technical Committee (TC 7-03), chaired by Mr. Švehla. The results of this comittee include the development of trends in the basic parameters of lighting, on a global basis, which had never been observed and documented before.

To his last days he demonstrated a lasting interest in recent events in the area of illuminating engineering.

I am honored to write these words about such a great person. He will be sadly missed by colleagues, family and friends.

Ing. Vladimir Dvoracek

For your Diary

Date	Title of Meeting	Organizer	Place of Meeting
2000			
Feb. 19-21	ISCC 2nd Panchromatic Conference - Color in its Surround	ISCC, Ms.C.Sturke iscc@compuserve.com fax: +1 703 318 0514	Savannah, Georgia, USA

April 3-5	NPL Colour and Visual Scales 2000	NPL, fax: +44 (0) 208 943 6283, julie.taylor@npl.co.uk	Great Britain
April 6-8	CIE Division 1 Meeting	CIE Division 1	Great Britain
April 6-8	CIE Division 2 Meeting	CIE Division 2	Great Britain
April 10-12	Colour Image Science 2000	W.MacDonald, Univ.Derby, fax:+44 1332 622218, L.W.MacDonald@colour.derby.ac.uk	Derby, Great Britain
April 13-14	CIE Division 8 Meeting	CIE Division 8	Great Britain
May 11-13	Light & Lighting 2000	CNRI, fax: +401 252 4367	Bucharest, Romania
May 15-18	Argencolor 2000 - Fifth Argentine Color Congress	Argentine Color Group, jcaivano@fadu.uba.ar, fax: +5411-4702 6009	Mendoza, Argentina
May 15-19	GKPO'2000: Intern.Conf.on Computer Graphics & Image Processing	Polish Assoc.for Image Processing, wmokrzyc@IPIPAN.Waw.pl	Poland
early July	CIE Division 6 Meeting	CIE Division 6	San Francisco, USA
July 8-9	CIE Division 3 Meeting	CIE Division 3	York, Great Britain
early Sep.	CIE Division 5 Meeting	CIE Division 5	Toronto, Canada
Sep. 3-7	CIE Division 4 Meeting	CIE Division 4	Toronto, Canada
Sep. 20-22	Licht 2000	LiTG, Germany, fax: +4930 2601 1255	Goslar, Germany
Nov. 6-7	2000 AIC Meeting: Color & Environment	Korean Soc.of Color Studies, fax: +822-3650014, interad@unitel.co.kr	Seoul, Korea
2001			
May 17-18	CIE Division 2 Meeting	CIE Division 2	USA
June 18-20	Lux Europa 2001	Illuminating Eng. Society of Iceland fax: +354 515 9008 luxeuropa@lv.is	Reykjavík, Iceland
June 24-29	AIC Quadrennial Congress	AIC, pjalessi@kodak.com	New York, USA
Sep.	CIE Midterm Meeting	CIE	Istanbul, Turkey

The staff of the CIE Central Bureau is sending you

SEASON'S GREETINGS
MEILLEURS VOEUX

und wünscht

FROHE FESTTAGE

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