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

Annual Report
of the
National Illumination Committee of Great Britain

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1st October 2011 to 30th September 2012

CIE-UK

National Illumination Committee of Great Britain

Report for the year ending 30 September 2012

Following the excitement of last year with the installation of Dr Ann Webb of Manchester University as the 24th President of CIE and our success in winning the bid to host the 28th Session Meeting in Manchester in 2015, 2012 has been rather an anticlimax – unless of course you count the Diamond Jubilee and the Olympics!

…and maybe we should, as no-one talks about either event without a comment on how amazing the lighting effects were, whether for the Jubilee concert in front of Buckingham Palace or at that awe-inspiring Opening Ceremony for the Olympic… the UK Events Lighting Industry has done us proud and shown the world that it is second to done in creative lighting effects.

While we can be assured that *CIE Manchester 2015* will not have the budget given to the Olympics, I am sure that we can put on a first class Conference, and with the local expertise of Manchester's Media City who knows what can be achieved? – In the meantime we have the CIE Centenary Celebrations in Paris next year – Remember the dates 12-19 April 2013.

eILV online

Still with the main CIE, an innovative new service just launched is a searchable online database of the International Lighting Vocabulary. It just needs a click on http://eilv.cie.co.at/ to get immediate access to all terms and definitions (> 1400) of the current version of the ILV (CIE S 017/E: 2011). They can all be found in the database, including the according number in the ILV. To get a list of terms containing a certain word or fraction of a word the database can be searched through by using different search options.

Administration

The administration is running smoothly under the most able eye of our Executive Secretary Mike Pointer for whom your Chairman and Trustees are very grateful.

Membership

There were three new members this year, two registering as Individual Members: Michael Hall, and Nick Smith, and the International Association of Lighting Designers as a Participating Society with representative Kevin Theobold.

Finance

The attached accounts again show the relatively healthy state of our affairs although we did again have to limit our travel funds to those travelling to meetings.

Technical

The technical work of the CIE Divisions is ongoing as ever, and can be examined in detail on their respective Division websites.

Our three new UK Division Directors Ronnier Luo, John O'Hagan and Jan Morovic have joined Ann Webb (President) and Teresa Goodman (Vice President-Publications) on the Board to take

the CIE forward into our second century which as noted last year will focus on a more professional Stakeholder Management style that will consist of a continuing dialogue between the following International bodies:

Standards Organisations: ISO & IEC

Lighting Designer Organisations: IALD & PLDA

Astronomical Organisations: IAU & IDA

City Lighting Organisations: LUCI

Industrial/Commercial organisations: GLF

This network is continuing to act as our eyes and ears in the industry and providing us with their strategic priories for Technical Reports and Standards on a regular, organized basis. We therefore continue in good shape for the year ahead.

Signed

Nigel E. Pollard

Chairman

CIE Division 1: Vision and Colour

The Terms of Reference of Division 1 are:

> *To study visual responses to light and to establish standards of response functions, models and procedures of specification relevant to photometry, colorimetry, colour rendering, visual performance and visual assessment of light and lighting.*

Photometry is the science of measurement of visible light in terms of its perceived brightness to human vision and it plays an important part in, for example, assessing the quality of the living and working environment, lit by either artificial light or natural daylight. Colorimetry is the science of measurement of colour in terms of perceived attributes and it plays an important part in many aspects of, for example, industrial process control, imaging systems, and signalling systems.

The emphasis in Division 1 is on the perceptual aspects of these subjects leading to a further understanding of how we see what we see.

CIE Division 1 held its annual meeting on Wednesday 26 and Thursday 27 September 2012 at the National Taiwan University of Science and Technology, Taipei, Taiwan. The meeting was preceded by AIC Interim Meeting *In Color We Live: Color and the Environment* at the Chinese Culture University, Taipei, Taiwan, 23-25 September 2012, and was followed by a one symposium on Colour Science aimed at Taiwanese Industry. Mike Pointer attended as Division Secretary and UK Division Representative. Ronnier Luo was present as Division Director. Several TCs had meetings on the morning of Wednesday 26 September. Twelve member countries were represented, 12 TC chairs and 2 reporters were present.

New Publications:

- CIE S 014-6/E:2012 *CIE Colorimetry - Part 6: CIEDE2000 Colour Difference Formula* is now published as a Final Draft Standard and will now progress to becoming an ISO Standard. It was prepared by TC1-57 *Standards in Colorimetry* chaired by Alan Robertson. Mike Pointer is a member of this TC.
- 200:2012: CIE *Supplementary System of Photometry*. This report was written by TC1-37 *Supplementary System of Photometry*, chaired by Ken Sagawa.

New Technical Committees:

TC1-88 (V)	Scene Brightness Estimation
Terms of Reference:	1. To investigate current research on brightness estimation methods using a calibrated luminance image of a real indoor scene 2. To compare brightness estimations of real indoor scenes with those predicted 3. To recommend a method to predict the brightness of specified regions of a scene from a luminance image of that scene
Chairman:	Yoshiki Nakamura JP

TC1-89 (V)	Enhancement of Images for Colour Defective Observers
Terms of Reference:	To study, evaluate and recommend image enhancing techniques for colour defective observers and to provide a test procedure for the evaluation of those techniques.
Chairman:	Po-Cheih Hung JP

TC1-90 (C)	Colour Fidelity Index
Terms of Reference:	To evaluate available indices based on colour fidelity for assessing the colour quality of white- light sources with a goal of recommending a single colour fidelity index for industrial use.
Chairman:	Hirohisa Yaguchi JP

TC1-91 (C)	New Methods for Evaluating the Colour Quality of White-Light Sources
Terms of Reference:	To evaluate available new methods for evaluating the colour quality of white-light sources with a goal of recommending methods for industrial use. (Methods based on colour fidelity shall not be included: see TC1-XX)
Chairman:	Yandan Lin CN

New Reporters:

R1-58 (C)	Liaison with ISO TC130 *Graphic Technology*
Terms of Reference:	To investigate and respond to ISO TC130 *Graphic Technology* on matters concerned with colorimetric calculations.
Reporter:	Phil Green GB

Next Meeting:

The next meeting of CIE D1 will be at the University of Leeds, Leeds, UK, on 5-6 July 2013. This immediately precedes the 12th AIC International Congress *Bringing Colour to Life* to be held at the Sage, Gateshead 8-12 July 2013: see **www.aic2013.org.**

Active Technical Committees + UK Members

TC1-36	Fundamental chromaticity diagram	John Mollon, Jack Moreland
TC1-42	Colour appearance in peripheral vision	Lindsay MacDonald
TC1-55	Uniform colour space for industrial colour difference evaluation	Gui Cui, Ronnier Luo, Jim Nobbs, Mike Pointer, Bryan Rigg
TC1-57	Standards in colorimetry	Mike Pointer
TC1-61	Categorical colour identification	Mike Pointer, Ronnier Luo
TC1-63	Validity of range of CIEDE2000	Ronnier Luo, Jim Nobbs
TC1-64	Terminology for vision, colour and appearance	Mike Pointer
TC1-67	The effect of dynamic and stereo visual images on human health	Andrew Smedley (D6)
TC1-68	Effect of stimulus size on colour appearance	Ronnier Luo, Malcolm Nicholson
TC1-69	Colour rendition by white light sources	Ronnier Luo, Mike Pointer
TC1-70	Metameric samples for indoor daylight evaluation	
TC1-71	Tristimulus integration	Mike Pointer
TC1-73	Real colour gamuts	Mike Pointer
TC1-74	Methods for re-defining CIE D-illuminants	
TC1-75	A comprehensive model of colour appearance	Ronnier Luo (Chair), Robert Hunt
TC1-76	Unique hue data	Galena Paramei, Kaida Xiao
TC1-77	Improvement of the CIE whiteness and tint equations	Phil Green, Ronnier Luo,
TC1-78	Evaluation of visual performance in the real lit environment	
TC1-80	Research methods for psychophysical studies of brightness judgements	Steve Fotios (TCC), David Simmons
TC1-81	Validity of formulae for predicting small colour differences	Ronnier Luo

TC1-82	The calculation of colour matching functions as a function of age and field size	
TC1-83	Visual aspects of time-modulated lighting systems	
TC1-84	Definition of visual field for conspicuity	
TC1-85	Update CIE Publication 15:2004 *Colorimetry*	Mike Pointer
TC1-86	Models of colour emotion and harmony	
TC1-87	New aspects of colour rendering	Mike Pointer (TCC): This TC was closed in Taipei in 2012 in favour of the two new TCs described above.

Active Reporters

R1-40	Scene dynamic range
R1-42	Extensions of CIECAM02
R1-49	Above threshold pulsed lights: Malcolm Nicholson GB
R1-50	3D aspects of visual appearance measurement: David Simmons GB
R1-51	Reconciling Maxwell vs maximum saturation colour matches
R1-52	Spectral data interpolation
R1-53	Gloss perception and measurement
R1-54	Variability in colour-matching functions
R1-55	Enhancement of images for colour defective observers
R1-56	Skin colour database
R1-57	Border between luminous and blackish colours

Mike Pointer
UK Representative CIE Division 1
Secretary, Division 1

CIE Division 2: Measurement of Light and Optical Radiation

Most of the work in CIE Division 2 relates to the provision of guidance on the correct measurement of the optical radiation (ultraviolet, visible and infrared radiation) emitted by lamps, luminaires and other sources and on the correct characterisation of detectors and materials. Such measurements are essential to ensure the safe and effective working of a very wide range of products with which the public come into regular contact, including: traffic lights, car headlamps, airport runway lights and railway signals; high visibility clothing; ultraviolet lamps used in medical treatment of skin conditions and for curing of dental epoxies etc; barcode readers in super-markets; lighting in homes, offices, schools, shops etc; and visual displays used not only for entertainment applications (television, computer gaming, cinema etc) but also 'serious' applications such as medical diagnosis and surgical training. Optical radiation measurements are also essential for monitoring the impact of human activity on the environment e.g. ozone depletion, changes in land use, deforestation and global warming.

Activities and achievements of the Division during the year October 2011 – September 2012 were as follows:

- Two new CIE publications have been produced by Division 2 during this period:
    - 202:2011: Spectral Responsivity Measurement of Detectors, Radiometers and Photometers
    - CIE DS 023/E:2012 Characterization of the Performance of Illuminance Meters and Luminance Meters
- The Division met in Hangzhou, China, on 22 September 2012 in conjunction with the CIE 2012 *Lighting Quality & Energy Efficiency*. The meeting was attended by Teresa Goodman from the UK.
- A total of 14 Division 2 Technical Committees (TCs) also met during the period 24-26 September 2012, covering a range of topics such as characterising the performance of measurement equipment, mesopic photometry, measurement and testing of LEDs, characterisation of measurement devices, and new technological developments in measurement equipment.
- The Division has a heavy workload, with more than 30 active TCs and more than 20 Reporterships and Liaisons. It was therefore decided not to establish any new TCs this year, in order to ensure that efforts of Division 2 experts are concentrated on completing current work as quickly as possible.
- Much of the work of the Division continues to be focused on the measurement and characterisation of solid state lighting (SSL) products, particularly LEDs. Particular aspects currently being considered, either within TCs or Reporterships, are:
    - The fact that electrical and/or thermal measurement and control is a key limiting factor in many measurements
    - Measurement problems associated with high power LEDs
    - Methods for lifetime measurements and modelling of ageing mechanisms
    - The development of transfer standards for LED calibration
    - Minimum test distance for goniophotometry of LEDs
    - Photobiological safety evaluations
- Four new Reporterships were established to consider areas where Division 2 may have to take action in the future:
    - Flicker measurement and flicker index for solid state lighting
    - Glare rating measurement using imaging luminance measuring devices
    - Internal quantum efficiency measurement for SSL products
    - Uncertainty evaluation for photometric measurements in industry

The next meeting of Division 2 will be held in Paris, France, in April 2012, in conjunction with the CIE Centenary Conference and Mid Term Meeting.

Full details of recent activities within Division 2, including status reports for all the Technical Committees, are available on the Division 2 website: http://div2.cie.co.at/

Active Technical Committees + UK Members

TC2-17	Simulated solar radiation	
TC2-28	Methods of characterising spectrophotometers	Teresa Goodman TCC
TC2-29	Measurement of detector linearity	Teresa Goodman, Theo Theocharous
TC2-32	Measuring retroreflectance of wet horizontal road markings	
TC2-37	Photometry using detectors as transfer standards	Teresa Goodman
TC2-40	Characterising the performance of illuminance and luminance meters	Teresa Goodman
TC2-44	Vocabulary matters	Teresa Goodman
TC2-47	Characterisation and calibration methods for UV radiometers	Teresa Goodman
TC2-49	Photometry of flashing lights	Teresa Goodman, Ian Tutt
TC2-50	Measurement of the optical properties of LED assemblies	Teresa Goodman
TC2-51	Calibration of diode-array spectrometers	Teresa Goodman
TC2-53	Multi-geometry colour measurements of effect materials	Mike Pointer
TC2-56	CIE/ISO standard on retroreflection measurements	Christine Stratford
TC2-57	Revision of CIE S014-2	Mike Pointer
TC2-59	Characterisation of imaging luminance measurement devices	Teresa Goodman
TC2-60	Effect of instrumental bandpass function and measurement interval on spectral quantities	Emma Woolliams TCC
TC2-62	Imaging-photometer-based near field gonio-photometry	
TC2-63	Optical measurement of high-power LEDs	
TC2-64	High speed testing methods for LEDs	
TC2-65	Photometric measurements in the mesopic range	Teresa Goodman TCC
TC2-66	Terminology of LEDs and LED assemblies	
TC2-67	Photometry of lighting and light-signalling devices for road vehicles	
TC2-68	Optical measurement methods for OLEDs used for lighting	
TC2-69	CIE classification system of illuminance and luminance meters	Teresa Goodman
TC2-70	Standards for the measurement of reflectance and transmittance properties of materials	
TC2-71	CIE Standard on test methods for LED lamps, luminaires and modules	Paul Miller
TC2-72	The evaluation of uncertainties in measurement of the optical properties of solid state lighting devices, including coloured LEDs	Teresa Goodman, Emma Woolliams
TC2-73	Measurement of quantities relating to photobiological safety of lighting products	Simon Hall
TC2-74	Goniospectroradiometry of optical radiation sources	Teresa Goodman
TC2-75	Photometry of curved and flexible OLED and LED sources	
TC2-76	Characterization of AC-driven LED products for SSL applications	

Active Reporters

R2-32	Visual appearance measurement (Mike Pointer)
R2-33	Measurement of laser based projection displays
R2-39	Display measurement standards
R2-45	Measurement of the illumination uniformity for critical applications
R2-49	The measurement of AC-driven LEDs
R2-50	Metric for comparison of luminous intensity distributions
R2-51	Characterization and measurement of LED lighting sources with dynamic control

Teresa Goodman
UK Representative CIE Division 2

CIE Division 3: Interior Environment and Lighting Design

Division 3 of the CIE has an overall aim to examine the various factors which influence the satisfaction of the occupants of a building with their environment, including the effects of both daylighting and electric lighting. The objectives of the Division are to study and evaluate those factors, to provide guidance on relevant design criteria, to study design techniques (including relevant calculations) for the interior lighting of buildings, to incorporate the findings and those of other CIE divisions into lighting guides for interiors in general or of particular types. These aims and objectives are focussed on providing lit environments which are of direct benefit to the users of those environments. The international nature of the Division allows those benefits to be disseminated to all member countries including the UK. In particular the Division draws on the contribution of several members from the UK who are active on nine technical committees (TC). The Division 3 Editor, responsible for all publications is also from the UK. The output of these committees is expected to be available in 2012 and 2013 and would then begin to influence the nature and content of UK lighting design guidance.

- The Division held a WebEx meeting on 8th June. The WedEx was available to all members and 21 were registered for the event. The minutes of the meeting are to be made available from the CIE Division 3 website: www.cie.co.at/div3/.

- During the WebEx meeting there were discussions concerning the closing of TC's and it was agreed that TC3-25; TC3-42 be closed and documents archived at CIE HQ. Further that publication CIE 060-1984 be withdrawn and that three new TC's be established. These are TC3 – 53 to revise CIE S008 CIE/ISO Standard: Lighting of work places – Part 1 Indoor; TC3-54 to revise CIE 16-1970 Daylight (M.Knoop) and TC3-55 Metrics on sunlighting and daylight passing through sunshading devices (M. Fontoynont). A proposal to establish a Joint TC with Division 6, provisionally recorded as TC3-XX JTC Visual, health and environmental benefits of windows in buildings, was tabled. It was agreed that the DD would consult with Division 6 and that Division 3 would only vote on this proposal following a successful conclusion to that consultation. The concept of the formation of a new TC to examine the Glare from LED luminaires was raised but the Division considered that further discussion to formulate a clear objective and terms of reference was required prior to any formal approval by the Division. The outline of a Reportership to collect the various research methods, both historic and current, applied to mock-up rooms was raised and it was agreed that further discussions were needed prior to any formal establishment of a Reportership. The Division agreed that a Lighting research advisory task group be established within the Division. This task group to identify new and emerging areas and any gaps in existing knowledge.

  Earlier and ongoing work of the Division includes:

- TC3-39 *Discomfort glare from daylight in buildings* (W. Osterhaus) following the changes to the Terms of Reference the TC has produced a draft report. The Division agreed that the working draft report was to reach the ballot stage by April 2013.

- TC3-44 *Lighting for older people and people with visual impairment in buildings* (Y. Akashi)
  The chairman, Y. Akashi attended a joint meeting with IES RP-28 Lighting and the visual environment for senior living in Washington over 6th and 7th March 2012 where the work of TC3-44 was discussed and the potential for future collaboration was examined. The latest version of the TC3-44 report was circulated in May and a final version is to be prepared for the next meeting of the Division.

- TC3-45 *Luminance based lighting approach* (Y. Nakamura)
  The latest version of the draft report was circulated to TC members in June 2012.

- TC 3-46 *Research roadmap for healthful interior lighting applications* (J. Veitch). There has been little formal progress on the report of this TC.
- TC3-47 *Climate-based daylight modelling* (J. Mardaljevic)

An extension of the agreed duration of the committee until current results have been consolidated has been helpful. The additional time has allowed the terms of reference to be revisited and the scope of the work to be re-assessed. Re-structuring of the TC membership is ongoing and it is anticipated that a revised draft report on progress will be presented at the next Division meeting.

- TC3-48 *CIE standard method of UF table calculation for indoor luminaires* (P. Thorns)
  A draft report has been produced which has resolved issues around geometric factor values. The Division has agreed that, based on the quality of the draft report that the deadline for the final report be extended to April 2013.

- TC3-49 *Decision scheme for lighting controls for tertiary lighting in buildings* (P.Dehoff)
  There has been ongoing production of sub-sections of the final report. These were reviewed in February 2012 to produce a consolidated draft report for circulation within the TC. This is under review and an updated draft to be made available to the Division in Paris in 2013.

- TC3-50 *Lighting quality measures for interior lighting with LED lighting systems* (M. Knoop)
  The work is ongoing with input from P. Thorns from GB. The report has undergone several revisions between October 2011 and May 2012 through circulation and content development from within the TC.

- TC3-51 *CIE Standard general sky guide* (S. Darula)
  The TC has revised chapters 5 and 6 of the draft report. This draft report to be finalised over 2012 where the final version is to be uploaded to the CIE e-system for review by the TC members.

- TC 3-52 *Energy performance of buildings – Energy requirements for lighting* (D. Schornick)
  This TC met in May 2012 this included discussions around the European Commission EPBD Mandate 480 activities and the ISO/TC 163/WG4, Joint TC 163-TC 205 WG Energy performance of buildings work. The collation of the content of these and eight other ISO and CEN standards are to form the basis of the TC report. An update is due to Paris in 2013

- TC 3-53 *Revision of CIE S 008 Joint ISO*CIE Standard: Lighting of Work Places - Part 1: Indoor* (Y. Koga)
  This newly formed TC is to review and, if necessary, revise S008/E: 2001 (ISO 8995-1:2002): Joint ISO/CIE Standard: Lighting of Work Places - Part 1: Indoor [incl. Technical Corrigendum ISO 8995:2002/Cor. 1:2005(E)].

- That that next meeting of CIE Division 3 is to be in Paris between 17th and 19th April 2013. The meeting to follow the CIE Centenary and Mid-term Meeting on 15th and 16th April 2013.

Active Technical Committees + UK Members

TC3-34	Protocols for describing lighting	Peter Boyce, Lou Bedocs
TC3-39	Discomfort glare from daylight in buildings	
TC3-44	Lighting for older people and people with visual impairment in buildings	Geoff Cook
TC3-45	Luminance based design approach	Geoff Cook, Peter Thorns
TC3-46	Research roadmap for healthful interior lighting applications	Lou Bedocs, G. Cook, Peter Thorns
TC3-47	Climate-based daylight modelling	John Mardaljevic TCC, F Anselmo
TC3-48	Standard method of UF table calculation for indoor luminaires	Peter Thorns TCC, Lou Bedocs
TC3-49	Decision scheme for lighting controls for tertiary lighting	Lou Bedocs, Paul Littlefair, Peter Thorns

	in buildings	
TC3-50	Lighting quality measures for interior lighting with LED systems	Peter Thorns
TC3-51	CIE Standard general sky guide	Peter Thorns
TC3-52	Energy performance of buildings – energy requirements for lighting	
TC3-53	Revision of CIE S 008 Joint ISO*CIE Standard: Lighting of Work Places - Part 1: Indoor	Peter Thorns

Active Reporters

R3-13	International lighting vocabulary The final document was approved by vote on 18th June 2011. R3-13 is closed.
R3-29	Variable transmission glazing (VTG): Current trends and future prospects for uptake by the building sector (J.Mardeljevic) It is anticipated that a draft report will be available in April 2013.
R3-30	Daylight system metrics – Evaluation of daylight systems and products (M. Fontoynont) The Reportership is to produce a discussion document for use within CIE by April 2013.

Geoff Cook
UK Representative CIE Division 3

CIE Division 4: Lighting for Signalling and Transport

The Terms of Reference of Division 4 are:

> *To study lighting and visual signalling and information requirements of transport and traffic, such as road and vehicle lighting, delineation, signing and signalling for all types of public roads and all kinds of users and vehicles, and visual aids for modes other than road transport.*

Divisional Officers:

Director:	Ad de Visser (NL)
Associate Directors:	Ron Gibbons (USA), Yandan Lin (CN)
Secretary:	Ans van den Broek (NL)
Editor:	Nigel Parry (GB)

The primary aim of the work of the Division is to enhance safety in transport by the publication of relevant technical reports and standards. The Division currently has 14 active technical committees working on a wide variety of topics.

The annual divisional meeting was held at Virginia Tech, Blacksburg, USA during 10 – 13 September 2012. The UK delegate, Nigel Parry attended: he was present in his capacity as UK rep and Divisional Editor.

The following Technical Committees met:

- **TC4-15 Calculation – Chair Sermin Onaygil**

  The meeting reviewed the current draft and considered recent comments and agreed any changes to the report. Much discussion on observer position in different parts of the world finally agreed a way forward. It is anticipated the report will be ready for editing in December.

- **TC4-32 Surface Colours – Chair Juergen Ewlad**

  General discussion around the subject although no draft report was available but the committee is gathering information from around the world to agree on colours.

- **TC4-40 Retro reflective Materials – Chair Paul Carlson**

  The meeting reviewed the current draft and considered recent comments and agreed any changes to the report. It is anticipated the report will be ready for editing within the next few months.

- **TC4-47 Applications of LEDs in Road Lighting – Chair Steve Jenkins**

  The meeting reviewed the current draft and considered recent comments and identified areas for additional input. There was substantial discussion on the aim of the report and target audience and how to ensure it is as topical as possible.

- **TC4-52 Optimisation of Road Lighting – Chair Carl Anderson**

  The meeting reviewed the research project being carried out in the USA based on a number of factors and covering some 2000 miles of highway, Additional presentations on examples from Japan, Italy, Canada and Hungary. The report may be ready by the end of the following year.

- **TC4-49 Retro Reflectors – Chair Gernot Sauter**

  This was the first meeting of the committee and a small number attend, they will meet again in Paris in April.

- **TC4-50 Road Surfaces – Chair Giuseppe Rossi**

  The meeting reviewed the current draft, amended slightly the ToR and noted little progress since the last meeting. Eric Dumont presented a paper on Photometric properties of Wet roads and much discussion ensued regarding tolerances of road surfaces and impact upon the lighting.

- **TC4-46 300mm Roundel Signs – Chair Carl Anderson**

  The meeting reviewed the current draft and considered recent comments and agreed changes to the report and will forward for editing by end of the 2012.

- **TC4-33 Discomfort Glare – Chair Ron Gibbons**

  The meeting reviewed the current draft and considered recent comments and agreed to look for new models to calculate glare – generally waiting for input.

- **TC4-36 Visibility Design – Chair Ron Gibbons**

  The meeting reviewed the current draft and considered recent comments and agreed any changes to the report and is moving forward well with hope to provide final draft soon

- **TC4-21 Light Pollution – Chair Ron Gibbons**

  The meeting reviewed the current draft and proposed putting into TC5-28 and then review to see if any particular roadlighting aspects require attention.

Smart Road

A visit to the 'Smart Road' at Virigina Tech was included and the group were invited to take a ride in the adapted vehicles along the 2.2 mile roadway one evening. The road was lit with three different luminaires which were all controllable and the light output varied. The road can also produce fog, rain and even snow conditions. Much research is being carried out with this facility in relation to road lighting and also with smart vehicles that monitor car drivers' behaviour to help inform new improvements.

Other meetings held during the year

CIE 2012 conference: Lighting Quality & Energy Efficiency, Hangzhou, China; 19-21 September 2012

Division 4 and 5 activity

UK members attending the conference:

Steve Fotios, Teresa Goodman, Stuart Mucklejohn, Malcolm Nicholson, Andrew Stockman, Ann Webb

Two keynote presentations related to outdoor lighting:

- Fotios, S and Goodman, T. Research on lighting in residential roads.
- Mucklejohn, S. Recent advances in lighting quality and energy efficiency with traditional light source technology

Of the 15 sessions, two were related to outdoor lighting (Street and Outdoor Lighting, and Mesopic Photometry and Brightness) and these included 9 papers.

Two of the six workshop sessions targeted outdoor lighting:

- Mesopic Photometry and Application led by Teresa Goodman
- Street Lighting – are the currently recommended lighting levels right? led by Steve Fotios.

Contributions of interest to D4:

M. Puolakka – Implementation of CIE 191 Mesopic photometry - Ongoing and future actions (OP01)

T. Uchida – An experimental approach to a definition of the mesopic adaption field (OP02)

X. Zhu – Perception study of discomfort glare from LED road lighting (OP38)

W. Li – Study on visual perception of flicker from low-height mounted LED luminaire for road lighting (OP39)

G. Song – Urban street lighting application investigation & subjective evaluation (OP42)

C. Yang – Research on the lighting of entrance & exit segments of city tunnels & outside-tunnel roads with visual efficiency theory (PP01)

Technical Committees

Although no D4/D5 technical committees met at this event, JTC-1 (Implementation of CIE 191 Mesopic Photometry in Outdoor Lighting) did meet. The meeting was attended by 26 members and observers, minutes from the meeting are expected to be published by the end of September.

The terms of reference and working program have been accepted by the CIE Board.

Terms of reference:

1. To investigate adaptation and viewing conditions and define visual adaptation fields in outdoor lighting.

2. To define lighting applications where mesopic photometry could be used.

3. To provide guidelines for implementing mesopic photometry in outdoor lighting.

Task 1: *Investigate adaptation and viewing conditions and define visual adaptation fields for lighting for drivers and pedestrians for implementing CIE 191.*

Subtask 1.1: *Collect data and conduct measurements on luminances, eye-fixation, pupil size in varied outdoor lighting installations (road, pedestrian/bicycle, park, etc., different weather conditions).*

Subtask 1.2: *Analyse/define importance of foveal and peripheral vision in different applications.*

Task 2: *Define lighting applications where mesopic photometry could be used.*

Subtask 2.1: *Analyse the lighting conditions based on current practice in terms of luminance and viewing conditions (urban/suburban/country roads, motorized, non-motorized traffic).*

Several groups agreed to forward results from their studies to Marjukka Puolakka by 15 March 2013 in advance of the next meeting which will be held in April 2013 as part of the CIE centenary celebrations.

Stuart Mucklejohn & Georges Zissis have supplied (25 Sep 12) the results from the post-installation survey carried out in Albi following completion of the NumeLiTe project.

Steve Fotios will be providing results from the MERLIN project.

Authors: S.Fotios & S.A.Mucklejohn

Proposed Reports

ISO TC “Light and Lighting”

- Colour of light
- TC4-48
- LED allow many colours (colour pollution)

Lighting controls

R4-45, Pål Larssen

TC4-51, Carl Andersen

- Lighting “on demand”
- Radar?
- Adjacent areas, surroundings?
- TUE
- Workshop Steve Fotios Hangzhou: “are lighting levels right?”

Lighting and Crime proposed by Otto Letemendi

Lighting for the Elderly proposed by Cyril Chain

Future Division 4 meetings

- 2013: Midterm session and Centenary CIE; Paris; 12-19 April
    - 12-14 April: General Assembly, Board meetings
    - 15-16 April: Conference
    - 17-19 April: Division and TC meetings
- 2014: Malaysia, date t.b.c. probably second half of April
- 2015: Session Manchester, 28 June-3 July
- 2016: open

Active Technical Committees + UK Members

TC	Subject	Comments	UK Member
TC4-15	Roadlighting calculations	Due to complete by 12/2012	
TC4-21	Interference by light with astronomical observations	A Wakling to be requested to conclude report	
TC4-32	Surface colours for traffic signs	No report in 2011	
TC4-33	Discomfort glare in road lighting	Draft due early 2013	
TC4-36	Visibility design for roadway lighting	RG to finalise	
TC4-40	Requirements for retroreflective traffic signs	Report should be ready for editing. UK HA report supplied	
TC4-45	Performance assessment method for vehicle headlamps	On going	Terry Carter, Geoff Draper
TC4-46	300 mm roundel signals	Combine with 200mm report	Hugh Barton
TC4-47	Application of LED's in transport lighting and signalling	New draft will be circulated post meeting possibly ready in Q2 2012	Hugh Barton, Ian Tutt
TC4-48	White light in road lighting	Edited and due for publication	Steve Fotios
TC4-49	Guide to the properties and uses of retroreflectors at night	On going	
TC4-50	Road surface characterization for lighting applications	On going	
TC4-51	Optimization of road lighting	USA research program will complete within 2 yrs	
JTC1	Implementation of CIE 191 Mesopic Photometry in Outdoor Lighting	JTC001	
JTC2	Merge TC2-67 with D4	Consider Joint committee?	
	Visibility in fog - dormant	Looking for a new chair, connections with metrological link – Director to discuss with Ann Webb and waiting for French input	.

Active Reporters

R4-34	Peter Strasser	Retroreflective and other passive devices as energy savers
R4-35	Otto Letamendi	Crime and road lighting
R4-36	Axel Stockmar	CEN/TC169, Lighting Applications
R4-37	Pentti Hautala	CEN/TC226, Road Equipment
R4-38	Elizabeth M. Alvarez del	IAU (International Astronomical Union)

	Castillo	
R4-39	Ad de Visser	GTB (Association for the Preparation of UNECE Automotive Regulations)
R4-41	Axel Stockmar and Cyril Chain	Lighting for elderly
R4-42	Cyril Chain	LUCI (Lighting Urban Community International)
R4-43	vacancy	PIARC
R4-44	Malcolm Nicholson	IALA (International Association of Marine)
R4-45	Pål Larssen	Enabling technologies for energy savings.

Symposiums and conferences 2012

Mesopic Vision, 24-25 January 2012, Vienna, Austria
Lighting Quality and Energy Efficiency, 14-17 March 2012, Hangzhou, China

Nigel Parry
UK Representative CIE Division 4
Editor, Division 4

CIE Division 5: Exterior Lighting and Other Applications

The Terms of Reference of Division 5 are:

To study procedures and prepare guides for the design of lighting for exterior working areas, security lighting, flood lighting, pedestrian and other urban areas without motorized traffic, areas for sports and recreation, and for mine lighting.

The Technical Committees in Division 5 tend to provide indirect/long-term benefits for the public. Examples of long term benefits are improvements to night-time ambience that will result from TC5-21 *Urban master planning* and the review on the Effects of Obtrusive Light: TC5-28. *Artificial lighting and its impact on the natural environment*.

- Meetings of the technical committees of D5 were held in Blacksburg, Virginia, USA, 10-12 September 2012. UK attendee to D5 meeting was Nigel Pollard. Unfortunately only two TCs were able to meet.

- The new division director Peter Schwarz presided over the meeting.

- There are no new publications from D5 this year, but three TCs (5-20, 5-21 and 5-22) have submitted final reports for editing and approval.

- There are no new Technical Committees from D5 this year; the need was raised for three new TCs, and two reporters are still in progress.

- The next D5 meeting will be held in Paris, France; April 2013 following the CIE Centenary Celebrations.

Active Technical Committees + UK Members

TC5-18	Practical design guidelines for the lighting of exterior work areas	Kelvin Austin
TC5-20	Guide for Sports lighting	Kelvin Austin
TC5-21	Urban master planning	Nigel Pollard
TC5-22	Beam patterns for exterior floodlighting luminaires	Nigel Pollard
TC5-23	Guidelines for the use of different Illuminance parameters in outdoor applications	(none)
TC5-24	Guide for architectural and decorative lighting	Nigel Pollard
TC5-26	Guide for the lighting of sports events for colour TV and film systems	Alan Smith
TC5-27	Artificial lighting and its impact on the natural environment	Martin Morgan-Taylor
TC5-28	Guide on the Limitation of the Effects of Obtrusive Light	Nigel Pollard, Martin Morgan-Taylor

Technical Committee Progress

TC5-18: *Practical Design Guidelines for the Lighting of Exterior Work Areas.* A fourth draft has been circulated for additions and corrections. The committee did not meet in Blacksburg.

TC5-20: *Guide for Sports Lighting.* The report has been edited by the Division Editor, approved by the committee and submitted to the CIE for processing. The committee did not meet in Blacksburg and the TC Chairman has subsequently retired.

TC5-21: *Urban Master-Planning.* The document has been edited by the Division Editor and is now being voted by the committee. The committee did not meet in Blacksburg.

TC5-22: *Beam Patterns for Exterior Floodlighting Luminaires.* The report has been edited by the Division Editor, approved by the committee and submitted to the CIE for processing. The committee did not meet in Blacksburg and the TC Chairman has subsequently retired.

TC5-23: *Guidelines for the Use of Different Illuminance Patterns in Outdoor Applications.* A new draft was recently sent to the committee for their comments and was further discussed at the meeting in Blacksburg.

TC5-24: *Guide for Architectural and Decorative Lighting.* The committee is requesting that the CIE hire a technical writer and an illustrator to prepare this report. It is hoped that the money to accomplish this will be raised by the committee. However, to date nothing has materialised.

TC5-25: *Guide for the Photometric Specification and Measurement of Sports Lighting.* Having been confirmed that a chairman and committee members must be obtained before the Board will allow this committee to proceed with the revision of Publication # 67, this TC is currently in suspension.

TC5-26: *Guide for the Lighting of Sports Events for Colour TV and Film Systems.* This committee is proceeding with its work, although it did not meet in Blacksburg this year.

TC5-27: *Artificial Lighting and its Impact on the Natural Environment.* Having had no contact with the Chairman (P. Strasser), it had now been reported that he has left the lighting world and thus if no new Chairman/Reporter can be found, the TC/Reportership will be closed.

TC5-28: *Guide on Obtrusive Light.* The committee met in Blacksburg and had a good meeting with a number of new ideas tabled. It is hoped that a 5th and final draft can be produced by the next meeting in Paris 2013.

Reporters & Liaison Officer Reports

R5-17: Environmental Assessment. M Morgan-Taylor was not at the Meeting in Blacksburg and had not sent in a Report.

R5-18: Comparison of Glare Assessment Methods. S. Volker was not at the meeting in Blacksburg and had not sent in a Report.

Proposed New Committees

- None

Nigel Pollard
Acting UK Representative CIE Division 5

CIE Division 6: Photobiology and Photochemistry

The Terms of Reference of Division 6 are:

> *To study and evaluate the effects of optical radiation on biological and photochemical systems (exclusive of vision).*

The work of Division 6 is directly related to the health of people and more generally to the ecosystem. It considers both the beneficial and detrimental implications of exposure to optical radiation.

- The annual meeting of Division 6 took place on 25th June 2012 in conjunction with the American Society for Photobiology 36th Annual Meeting. John O'Hagan was the only UK attendee in person. However, Andy Smedley and Andy Pearson were able to take part by WebEx. The experiment to use WebEx was not a huge success due to the availability of only a single microphone in the meeting room and a lot of noise from the projector. However, these lessons have been learned for the future.

  A proposal for a joint TC with D3 on daylight was discussed with the following terms of reference: To review the scientific literature in all relevant fields and to produce a concise document that identifies the values of windows in buildings. Examples of such values could be the provision of light for visibility, ventilation, means of egress; aesthetic benefits, access to a view, and light for physiological functioning, including circadian rhythm regulation. If possible, based on this literature, the committee will propose preliminary criteria for daylighting metrics (the metrics being already under development by TC 3- 47) to support these functions.

  A new Reportership was proposed which would summarise the conclusions of the 1st International Workshop on Action Spectra (IWAS) to be held in the UK in January 2013. This closed workshop will bring together experts involved with the development of Action Spectra for the (non-visual) beneficial effects of visible optical radiation. The Workshop is being funded by ZVEI following an initiative from CEN TC169 WG13.

- John O'Hagan remains as DD6 with Andy Smedley as DS6 and Andy Pearson as DE6.

  D6 has two Associate Directors: Karl Schulmeister from Austria and Kohtaro Kohmoto from Japan.

- The following D6 reports have been published during the year:

  - CIE 203:2012 (including Erratum 1) A Computerized Approach to Transmission and Absorption Characteristics of the Human Eye (from TC6-15)
  - CIE 201:2011 Recommendations on Minimum Levels of Solar UV Exposure (from TC6-58)

- A number of reports are being, or have been, edited and are in progress:

  - Guidelines for Obtaining Action Spectra Definitions (TC6-08)
  - Sensitivity of Human Skin to Ultraviolet Radiation, Expressed as Minimal Erythema Dose (MED) (TC6-48)
  - Low Level UV-A Cataract (TC6-21)
  - Rationalising UV Units (TC6-66 – joint TC with the WMO)
  - Definition of UV Wavebands (R6-37 Masako Sasaki)

- The next meeting is planned for Paris, France, in conjunction with the CIE Centenary Conference, April 2013. An invitation has also been received to hold the 2014 meeting in Hangzhou, China, and it was expected that the 2015 meeting would be held in Manchester.

Active Technical Committees

TC6-08	Guidelines for obtaining action spectra	Report with DE6.
TC6-15	A computerized approach to reflection, transmission and absorption characteristics of the human eye	Published as CIE 203:2012
TC6-20	Phototoxicity in domestic and industrial environments	No information available. Closed
TC6-21	Cataractogenesis by low-level exposure to ambient ultraviolet radiation	Awaiting TC amendments following DE6 comments
TC6-28	Standardization of sunscreen testing: Method of UV-A sunscreen testing	Awaiting report
TC6-33	Photoimmunological effects mediated through the skin	Closed
TC6-36	UVR protective materials used in shading	Mature draft available.
TC6-37	Light and retinal disease	Mature draft available, but some problems with contacting TC members for voting.
TC6-39	UV radiation in lighted environments	Closed, but some challenges with TCC
TC6-42	Lighting aspects for plant growth in controlled environments	Awaiting report
TC6-43	UV water disinfection	Closed
TC6-44	Illuminators for treatment of infant hyperbilirubinemia	Further work required.. Considering converting to a Reportership since an UK author has been identified
TC6-45	Optical radiation hazard measurements in the work space	Report has been promised by the end of 2012
TC6-46	Standard action spectrum for uv disinfection	Closed
TC6-47	Photobiological safety of lamps and lamp systems	TC was closed on publication of S009. New joint TC with IEC TC76 and TC34 to be established to undertake the revision
TC6-48	Typical minimal erythema doses	Mature draft available.
TC6-49	Infrared cataract	New TCC. Awaiting report.
TC6-50	Photodegradation of pharmaceuticals	Concern that report is to be a concatenation of two published papers. DS6 liaising with CB on options.
TC6-51	Standardized solar simulator spectral irradiance for sunscreen	Closed
TC6-52	Proper measurement of passive UV air disinfection sources	Work progressing
TC6-53	Personal dosimetry for UV radiation	Closed
TC6-55	Photobiological safety of light emitting diodes	Mature draft available. Difficulty with contacting TC members. Possibly convert to Reportership
TC6-57	Standardization of terms and action spectra for blue light and retinal thermal hazard functions	Closed, but some challenges with TCC
TC6-58	A Recommendation on lower limits for UV exposure	Published as CIE 201:2011

TC6-61	Measurement of radiation using the phytometric system for plant applications	First draft produced.
TC6-62	Action spectra and dosimetric quantities for circadian and related neurobiological effects	Awaiting draft report
TC6-63	Photobiological strategies for adjusting circadian phase to minimize the impact of shift work and jet lag	Report is progressing. Some overlap with reportership in D3.
TC6-64	Optical Safety of Infrared Eye Trackers Applied for Extended-Durations	Awaiting final draft.
TC6-65	Photobiological Dosimetry for Low Level Laser/Light Phototherapy	Work progressing

Reporterships

A survey of action spectra in the scientific literature: 19XX – 200X	Almost complete
Definition of UV wavebands	With DE6
The issues of vitamin D kinetics	Awaiting draft

John O'Hagan
UK Representative CIE Division 6
Director, Division 6

CIE Division 8: Image Technology

The Terms of Reference of Division 8 are:

> *To study procedures and prepare guides and standards for the optical, visual and metrological aspects of the communication, processing, and reproduction of images, using all types of analogue and digital imaging devices, storage media and imaging media.*

The overall goal of Division 8 can be summarized as seeking to provide methods for better understanding the components of imaging systems with a view to providing both the professional user and home picture-taker with consistent colour images over a wide variety of media.

- An informal meeting of CIE Division 8 was held as part of the IS&T *Color and Imaging Conference* in San Jose, California, USA, on 9 November 2011.

- Publication: CIE 199:2011 *Methods for Evaluating Colour Difference in Images*, produced by TC 8-02 *Colour Difference Evaluation in Images*, chaired by Ronnier Luo.

- Part of the meeting was devoted to a brainstorm to seek new ideas for future activities of D8. Ideas recorded included:
    - 3D archival digitizing recording and format
    - Efficient material perception and communication file format
    - Visual differences between images
    - Evaluation of 3D content with the QUALINET project
    - Device color gamut description
    - Review of image difference metrics
    - HDR encoding/processing
    - Common color appearance color reproduction

- The next meeting will be held in November 2011 in San Jose, USA, in conjunction with the IS&T Color Imaging Conference followed by a WebEx meeting on 6th December 2012.

Active Technical Committees

TC8-02	Colour difference evaluation in images	
TC8-07	Multispectral imaging	
TC8-09	Image archiving	
TC8-10	Office illumination for imaging	
TC8-11	CIECAM02 mathematics	Ronnier Luo
TC8-12	Image and video compression assessment	

Active Reporters:

R8-09	Output linearization methods for displays and printers

Mike Pointer
UK Representative CIE Division 8

APPENDIX A

THE CIE & NIC

Each country participating in the work of the International Commission on Illumination (the CIE) forms a National Illumination Committee (NIC). This Committee is representative of all bodies in that country which have an interest in light and lighting.

The CIE:

- provides an international forum for the discussion of all matters relating to science technology and art in the fields of light and lighting
- co-ordinates the international activities of individuals and organisations, to identify outstanding and fundamental issues pertaining to light and lighting and to find solutions
- develops basic standards for measurement and application design
- publishes Technical Reports and Standards and maintains liaison with other international standards organisations.

The CIE technical programme is divided into seven Divisions covering Vision and Colour; Physical Measurement of Light and Radiation; Interior Environment and Lighting Design; Lighting and Signalling for Transport; Exterior and Other Lighting Applications; Photobiology and Photochemistry; and Image Technology. Each Division establishes Technical Committees (TCs) with international representation of experts, to undertake specific tasks. Each TC is disbanded when the work is complete.

The CIE holds a Sessional Conference every four years, which reviews the latest developments in the field and plans the work of the divisions and their Committees for the next quadrennium.

The CIE Central office is based in Vienna. The Secretary General and her assistants are responsible for the administration associated with co-ordinating the activities of all member countries and for publishing the Commission's Technical Reports and Standards.

The CIE is supported through the time and expertise of individuals, most of whom are associated with companies, institutions and organisations interested in light.

The CIE is supported financially by each country's National Illumination Committee which contributes according to a Central Office allocation based on the scale of assessments for the contribution of Member States of the United Nations Organisation, but with modified upper and lower limits. Each NIC depends on contributions from supporting organisations, income from the sale of published Technical Reports and Standards and from the organisation of seminars.

The National Illumination Committee of Great Britain is supported by sponsoring and co-operating organisations. Many universities and colleges participate, as do Government Departments and official bodies interested in or concerned with the design, development and use of light. There are also representatives of the lighting industry as well as independent consultants and architects representing professional bodies.

The NIC is selects and sends delegates to the sessions of the CIE. It keeps in close touch with developments throughout the world, both in research and in practical applications, by personal contact as well as via the issues of the CIE News and CIE Division Activity Reports. It also ensures that the British contributions are made known and properly recognised in other countries.

Great Britain, one of the founder members of the CIE, established its National Illumination Committee in 1913 and since then has played a major part in the development of the Commission. The original decision to establish the CIE was considerably influenced by Leon Gaster, the founder of the British Illuminating Engineering Society, now the Society of Light and Lighting.

APPENDIX B

CONSTITUTION OF THE NATIONAL ILLUMINATION COMMITTEE AT 30 SEPTEMBER 2012

Officers and Trustees

Chairman	Nigel Pollard
Vice Chairman	Teresa Goodman
Vice Chairman	John O'Hagan
Honorary Secretary	Peter Raynham
Honorary Treasurer	Peter Clarke

Secretariat

Executive Secretary	Michael Pointer 9 Bishops Drive, East Harnham, Salisbury SP2 8NZ

Sponsoring Organisations

Institution of Lighting Professionals	Stuart Bulmer Nigel Parry Allan Howard
Society of Light & Lighting	Steve Langford Peter Raynham Vacancy

Cooperating Organisations

Abacus Lighting	John Telford
Ceravision Limited	Stuart Mucklejohn
College of Optometrists	Alan Smith
Colour Group (Great Britain)	Valerie Bonnardel
Health Protection Agency	John O'Hagan
International Association of Lighting Designers	Kevin Theobold
Institute of Physics	Lawrence Whittaker
Lighting Industry Association	Bernard Pratley
National Physical Laboratory	Teresa Goodman
Society of Dyers and Colourists	Ronnier Luo
Thorn Lighting Ltd	Peter Thorns
Trinity House Lighthouse Service	Malcolm Nicholson
Urbis Lighting Ltd	Patrick Baldrey
VeriVide Ltd	John Dakin

Participating Universities

University of Liverpool	David Carter
University of Manchester	Ann Webb
De Montfort University	Martin Morgan-Taylor
University of Reading	Geoff Cook
University of Sheffield	Steve Fotios
University College, London (The Bartlett)	Kevin Mansfield

Individual Members

Peter Clarke	The Tintometer Ltd
Mike Hall	Mike Hall Technical Services
Gareth Jones	LUX-TSI Limited
Leslie Lyons	Bentham Instruments Ltd
Nigel Pollard	NEP Lighting Consultancy
Nick Smith	Nick Smith Associates
Ian Tutt	Consultant
Christopher Wilkes	Holophane Europe Ltd

CIE Division Representatives

Division 1	Michael Pointer
Division 2	Teresa Goodman
Division 3	Geoff Cook
Division 4	Nigel Parry
Division 5	Steve Fotios
Division 6	John O'Hagan
Division 8	Michael Pointer