

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 2014 to 30th September 2015



Report for the year ending 30 September 2015

It is with some nostalgia that I pen this, my last Chairman's Report as I step down after nine years and hand over to Teresa Goodman, our senior Vice-Chair to take you forward through the next Quadrennium and beyond.

Unfortunately, I was unable to be present at the launches of the **International Year of Light (IYOL)** in Paris and London, but am pleased to report that Vice-Chairman John O'Hagan attended both on our behalf together with CIE President Dr Ann Webb.

As you will know, within this rather unique IYOL, the UK hosted its third CIE Quadrennial Session (**CIE 2015**) here in the UK, at the University of Manchester. By all accounts it seems, if I say it myself, to have been a great success, attracting over 490 delegates from 36 countries.

Special thanks must go to the members of the Local Organising Committee (LOC), particularly Ann Webb and Andrew Smedley together with the technical backup we received from the Central Bureau in Vienna. Manchester did us proud and the professionalism of the University Conference team was remarked upon by many. A further member of the LOC I must make mention of is Steve Fotios, who's insistence on ethically sourced bags and useful gifts (we even experienced the attempted theft of some Umbrellas!) was much appreciated as was his inspired suggestion for our opening speaker, Prof Lars Chittka, who spoke on the fascinating subject of the visual system of the bee, a symbol of Manchester and the Session's adopted logo. Our specially commissioned opening Video was also well received with a number of International Committees asking since for permissions to show it in their own countries. It is now up on the CIE YouTube channel and a small number of DVD's have also been distributed. Finally, I must thank all our Sponsors together with Manchester City Council who awarded us a grant for bringing in overseas students all who gave us the confidence and backing to launch our bid in the first place.

Administration

CIE 2015 witnessed the farewell of our CIE General Secretary, Martina Paul as well as the arrival of her replacement Kathryn Nield, who many of us met in Manchester for the first time.

Our own UK administration continues to run smoothly under our Executive Secretary Allan Howard and I welcome Nigel Parry who has joined us to assist Peter Clarke on the financial side. As I said at the beginning of this Report, I too will be stepping down as Chairman and handing over to Teresa Goodman.

Finance

The attached accounts show the current state of our affairs which have been boosted by the surplus we recorded at CIE 2015 which will help increase our travel funds for those travelling to meetings in the future.

Technical

The technical work of the CIE Divisions, all of which met in Manchester this year, is ongoing as ever. All their work can be examined in detail on their respective Division websites as well as in the Conference Proceedings which are available through the CIE Website.

Finally, thank you all for your support over the years, I have enjoyed serving you.

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.

The annual meeting of CIE Division 1 was held as part of the CIE Session in Manchester in June 2015. The Division meeting was attended by 63 people including 23 country representatives, 16 Technical Committee Chairmen and 2 Reporters. Mike Pointer attended the Division event as Division Secretary and UK Division Representative. Ronnier Luo was present as Division Director.

The CIE is now strictly enforcing its Code of Procedure and, at the Board of Administration meeting held before the Manchester Session a number of Technical Committees were closed for non-compliance mostly because they had not completed their tasks within a four-year time span.

TC1-55 Uniform colour space for Industrial colour-difference evaluation	This TC is non-compliant but is to be allowed to submit its Working Draft Technical Report – this has now been done.
TC1-61 Categorical colour identification	A Reportership (R1-65) has been established to complete the Technical Report started by this TC.
TC1-64 64 Terminology for vision, colour and appearance	This TC will be merged into the new JTC-08 <i>Terminology</i> . This JTC had its first meeting in Manchester and has subsequently had a WebEx meeting. Sharon McFadden and Mike Pointer are the Division members of this JTC.
TC1-67 The effects of dynamic and stereo visual images on human health	A Reportership (R1-66) has been established to complete the Technical Report started by this TC.
TC1-70 Metameric samples for indoor daylight evaluation	The Division has lost contact with the TC Chairman and his has been closed.
TC1-71 Tristimulus integration	The TC is out of time and a Reportership (R1-63) has been established to continue this work.
TC1-73 Real colour gamut	The TC is out of time and a Reportership (R1-64) has been established to continue this work.
TC1-75 A comprehensive model of colour appearance	This TC has 3 months to complete the necessary paperwork to become compliant.
TC1-77 Improvement of the CIE whiteness and tint equations	This TC has been closed and a new TC proposal approved at the Division meeting. The TC met in Manchester.
TC1-82 The calculation of colour matching	This TC has 3 months to complete the necessary

functions as a function of age and field size	paperwork to become compliant. The TC met in Manchester.
TC1-85 Revision of CIE Publication 15	Following the death of Janos Schanda, Ellen Carter US has agreed to take over the chairmanship of this TC which is working on Draft 11 of the revised publication.
TC1-88 Scene brightness estimation	This TC has 3 months to complete the necessary paperwork to become compliant. The TC met in Manchester.

Active Technical Committees

TC1-36 Fundamental chromaticity diagram with physiologically significant axes	Part 2 of the Technical Report is now with the Central Bureau for production, ballot and publication.
TC1-63 Validity of the range of CIEDE2000	Working on a Technical Report – met in Manchester.
TC1-81 Validity of formulae for predicting small colour differences	Working on a Technical Report – met in Manchester.
TC1-83 Visual aspects of time-modulated lighting systems	Active – met in Manchester.
TC1-84 Definition of the visual field for conspicuity	Active – met in Manchester.
TC1-86 Models of colour emotion and harmony	Active – met in Manchester.
TC1-89 Enhancement of images for colour defective observers	Working on a Technical Report – met in Manchester.
TC1-90 Colour fidelity index	Working on a Technical Report – met in Manchester.
TC1-91 New methods for evaluating the colour quality of white-light sources	Working on a Technical Report – met in Manchester.
TC1-92 Skin colour database	Active – met in Manchester.
TC1-93 Calculation of self-luminous neutral scale	Active – met in Manchester.
TC1-94 Visually meaningful spectral luminous efficiency functions	Now has a new Chairman – Ferenc Szabo HU

Reporters

R1-61 Source whiteness metric	Excellent report presented in Manchester – work ongoing.
R1-62 Typical LED spectra	Excellent report presented in Manchester – work ongoing.

There were no new Technical Committees approved at the Division 1 meeting apart for the proposal to continue the work of TC1-77 *Improvement of the CIE whiteness and tint equations*, with new Terms of Reference and probably with a new number.

New Publications

211:2014 Colour appearance in peripheral vision – TC1-42

212:2014 Guidance towards best practice in psychophysical procedures used when measuring relative spatial brightness – TC1-80

Division Officers

The new officers of CIE Division 1 for 2015-2019 are:

Director	Youngshin Kwak (KR)
Associate Director (Vision):	Nana Itoh (JP)
Associate Director (Colour)	Ellen Carter (US)
Secretary:	Lichen Ou (TW)
Editor:	Phil Green (GB)

Subsequent to the Division meeting the Division has approved that Peter Hanselaer BE be the new Division Editor; this has yet to be approved by the BA.

Next Meetings

Some TCs will meet at the CIE Lighting Quality and Energy Efficiency conference, 3-5 March 2016, in Melbourne, Australia

The formal Division 1 meeting will be held in association with a CIE Expert Symposium on Appearance, 29 August – 2 September 2016, Prague, Czech Republic

The 2017 Division 1 meeting will be held in association with the CIE Mid-term Meeting and as part of the AIC Congress, 16-20 October 2017, Jeju, Korea

UK Members of Technical Committees

TC1-36	Fundamental chromaticity diagram	John Mollon, Jack Moreland
TC1-55	Uniform colour space for industrial colour difference evaluation	Gui Cui, Ronnier Luo, Jim Nobbs, Mike Pointer, Bryan Rigg
TC1-63	Validity of range of CIEDE2000	Ronnier Luo, Jim Nobbs
TC1-64	Terminology for vision, colour and appearance	Mike Pointer
TC1-75	A comprehensive model of colour appearance	Ronnier Luo (Chair), Robert Hunt
TC1-76	Unique hue data	Galena Paramei, Kaida Xiao
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	Arnold Wilkins
TC1-84	Definition of visual field for conspicuity	
TC1-85	Update CIE Publication 15:2004 <i>Colorimetry</i>	Mike Pointer
TC1-86	Models of colour emotion and harmony	Ronnier Luo
TC1-88	Scene brightness estimation	
TC1-89	Enhancement of images for colour defective observers	

TC1-90	Colour fidelity index	Ronnier Luo
TC1-91	New methods for evaluating the colour quality of white-light sources	Ronnier Luo
TC1-92	Skin colour database	Mike Pointer

This is my last report as UK Representative of CIE Division 1 and a new representative will take over after the CIE-UK AGM in December 2015.

Michael R Pointer

6 October 2015

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: Ron Gibbons (USA)
Associate Directors: Yandan Lin (CN) Dionyz Gasparovsky (ST)
Secretary: Maurice Donner (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 several active technical committees working on a wide variety of topics.

The CIE Quadrennial meeting during the International Year of Light 2015 was held at University Place, Manchester University, 28 June – 5th July 2015, which included the annual meeting of the Division. The UK delegate, Nigel Parry attended: he was also present in his capacity as Divisional Editor.

Conference Review:

There were at least 20 papers on road lighting with a few GB presentations during the conference. Steve Fotios had papers on 'Lighting for cyclists' and on 'Judging others Intentions'. Jemma Unwin had a paper on 'Effects of street lighting on perception of safety' and Diana Del-Negro on 'Wayfinding in the Urban environment. Geoff Draper was an invited speaker on 'Glare and regulations on the automotive industry'.

Conference was well attended with 492 delegates from 36 countries around the globe at the event.

A number of Awards were presented:

Waldram Gold Pin for the most outstanding work connected to a CIE publication in the field of applied lighting technology during the last Quadrennium

- Steve Fotios, for CIE206 and CIE212, but also for his other research and contributions to CIE.

De Boer award (organisation and administration), for long lasting exceptional contribution to building the international reputation of the CIE

- Teresa Goodman, VPP, former DD2, Secretary to be, and contributor to very many TCs in D2 and beyond.

Wyszecki Gold Pin for the most outstanding work connected to a CIE publication in the field of fundamental research during the last Quadrennium

- Peter Blattner, for S023, his extensive contribution to S025, and also for all his efforts to push forward D2 Tcs to comply with the CoP and to move to publication

Division 4 Report:

Technical Committees:

The following TCs met in Manchester, and where either I or a colleague attended the meeting, a short comment on each follows in order of the meetings schedule.

- TC4-33 Discomfort & Disability Glare in Road Lighting
 - New document discussed – not to include disability glare and create a disability glare reportship.
 - A new Chair is required – Stephan Volker appointed as new chair.
- TC 4-40/49: Requirements for Retroreflective Traffic Signs & Guide to Properties and uses of Retroreflectors at night
 - It was noted that TC4-40 work has been completed and the chair Paul Carlson is updating the report following comments from the editor. Once complete it can proceed.
 - TC4-49 does not meet the criteria for a technical committee and it will be closed.
- TC 4-51: Optimization of Road Lighting
 - Per Ole Wanvik to retire next February – New chair required
 - Review of the draft report and comments that had been supplied to date took most of the meeting
 - Section responsibility confirmed
 - Next WebEx meetings in October and January
 - Panel will meet in Melbourne
 - It is hoped to complete next year.
 - Web-ex meetings have been held since the conference
- TC4-52 Lighting for Pedestrians
 - Steve Fotios – first meeting discussed the workplan and data available.
 - Agreed to start Working group on Cycling
- TC4-47 Application of LED's in transport lighting and signalling
 - The chair Steve Jenkins confirmed that this report is two reports, one for road lighting and the other for signs & signalling and the signalling report is basically complete.
 - § Panel members are asked to make their contributions but all final contributions to be before end of October as report is due to complete by end of year.
 - § Guidance is suggesting use of 4000k and use mesopic photometry.
 - § NP to 3.2.3.2 Update in line with mesopic

- TC4-53 Lighting Design Guidance for Exterior Traffic Areas for an Ageing Society
 - Maurice Donner (NL) chaired the meeting and arranged it as a workshop, looking at two locations to illuminate.
 - One being a residential street and the other a crossing point at junction, a number of different proposals were given by the members on how they would light the locations.
 - Discussion on whether a TC should be formed, but agreed to start and details of ToR to be developed between Maurice & Cyril.
 - R4-40 Agreed to form working group on lighting for vision impaired shall be formed.
- JTC 01 Mesopic Lighting in Outdoor Lighting.
 - Stuart Mucklejohn chaired the meeting (as co-chair for Div. 4.)
 - Stuart ran through a number of presentations provided by panel members
 - Teresa Goodman, Stuart Mucklejohn and Maurice Donners are to draft a technical note and will circulate to panel in September based on pragmatic approach from WG2
 - WG1(adaption field) will continue to develop and after Technical Report gets published then Tech Note may be withdrawn
 - Web-ex meetings have been held since the conference and another one is due in Feb. The panel will meet in Melbourne
- TC4-50 Road Surface Reflection
 - Halden current chair – doubt about continuation as chair. Giuseppe chaired meeting. Reviewed draft and data.
 - Cyril will prepare guidelines for measurement and data. Workplan for two years and WebEx in October
 - Possible 2nd CIE symposium on Road Surface reflection

Divisional Meeting:

Session 1

Ron Gibbons opened the meeting and introduced the officers and asked all attending to do the same.

A number of reports were provided by the DD, AD's, Secretary and Editor. In addition reports on liaison bodies were provided

A review of the current documents was carried out following the meeting with technical reports being agreed to be withdrawn, reviewed or confirmed. RG proposed that CIE 115 should have an annual review

Session 2

Ron chaired the session.

Workshops:

For elderly & visually impaired proposed by Cyril Chain

Document Review Concluded that:

Dionyz appointed as Reviewer Reporter for Div. 4 & 5 has been assigned – see attached list for latest version.

TC4-51 requires Doc 100

New Standards this year

En13201

IES RP8

Hungarian Ped crossing guidance

Road Work zone Guidelines in France and outdoor installations

China has new guidelines on tunnel lighting

Germany has new guidance on Rail yard lighting

Research on:

US – Lighting for Fog & Rain

US - Visibility for Police vehicles

US – Active road studs

US – LED Luminaire performance 2 yr. test

FR – Road Surface photometry new guidelines – could be across Europe

FR – Vision impaired people, use in 20 KMH speed limit area in mixed use.

Turkey – Strategy on Lighting controls.

Norway – Studies on Tunnel Lighting – wall surface materials etc.

Norway – studies of Led in 7 locations

Norway – Traffic control on/off

Norway – Solar powered lighting being trailed.

China – LED in tunnels

China – Intelligent road lighting

Hungary – Test Area of Solar Powered research for outdoor area for street lighting. Similar project in Denmark

Taiwan – High Speed road lighting – smart light control –

EU – Utilization factors for road lighting based on CIE 132

Div. 4 will produce listing on research across the world.

TC progress not in Manchester:

TC4-15 final amendments being done. New draft ready for vote in September.

TC4-36 – Visibility due to go for vote

TC4 -40 Awaiting feedback from chair

TC4-45 – on going

TC 4 46 – RG to edit

TC4 -49 to be cancelled

TC's that met: see notes above.

TC4-33

TC4-47

TC4-50

TC4-51

TC4-52

TC4-XX(53)

JTC1

TC4-32 & 40 to be re-instated but with new numbers. TC4-49 to be closed.

New items

Joint Div 4&5 reportership on document review

WG on Cyclists

WG on Visually impaired

LED billboard reportership Steve Jenkins

Intrusive Light reportership awaiting name

High Speed Lighting Flicker reportership – short presentation given on flicker suggesting that spacing above 50m will cause annoyance - Chao Hua Wen ITRI Taiwan

Raoul on Tunnels – review of standards regarding LEDs chapter 9, could add a section on LED, short tunnel clarification on interior zone, also energy, conflict zones, and hard shoulders? Proposal to open TC to address these points to review CIE88:2004 committee agreed – so will be TC4-54?

A summary of Reporters and Liaisons updates were heard and written reports are located in Coll Tool

Future Division 4 meetings

The next meeting of will take place in Melbourne Australia, 3-5 on 'Lighting Quality & Energy Efficiency. Div. 2, 4, & 5 TC meetings 7-9th March 2016

2017: South Korea (Jeju on an Island)

2018:?

2019: Quadrennial (USA Washington DC)

Nigel Parry

UK Representative - CIE Division 4

October 2015

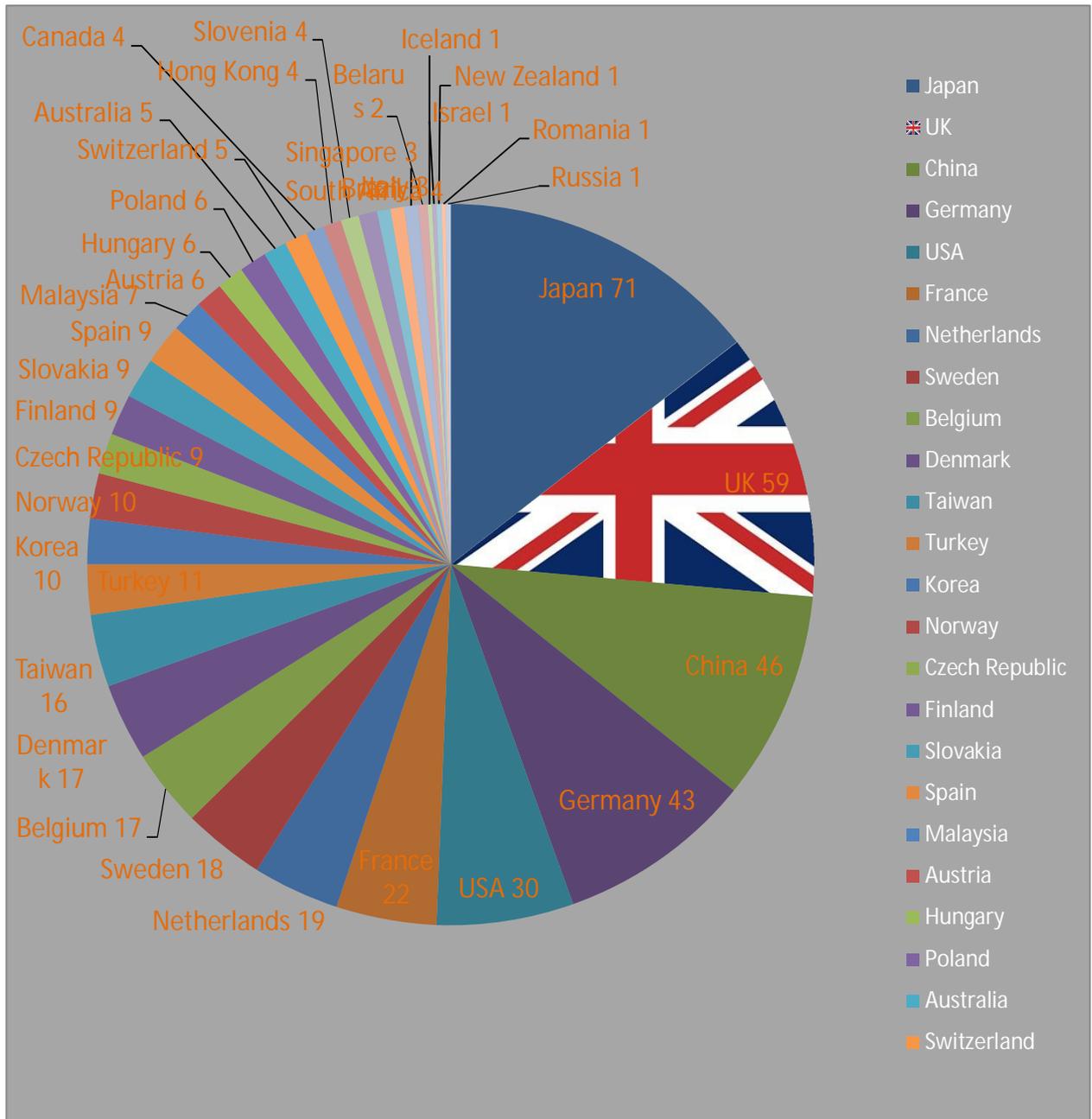
UPDATED LIST WILL BE IN COLL TOOL

Active Technical Committees			
TC	Subject	Comments	UK Rep
15	Roadlighting calculations	Rescheduled to complete 2013	
21	Interference by Light with Astronomical Observations	Decided to wait until TC5-28 is complete	
32	Surface Colours for Traffic Signs	On Going	
33	Discomfort Glare in Road Lighting	Been little activity - ongoing	
36	Visibility Design for Roadway Lighting	Completed	
40	Requirements for Retroreflective Traffic Signs	Report returned to author for amendments	
45	Performance assessment method for vehicle headlamps	On going	Terry Carter, Geoff Draper
46	300 mm Roundel signals	Report returned to author for amendments	Hugh Barton
47	Application of LED's in transport lighting and signalling	Two drafts exist – road lighting and signalling. Will be ready in 2014	Hugh Barton, Ian Tutt
48	White light in road lighting	Edited and awaiting vote	Steve Fotios
49	Guide to the properties and uses of retroreflectors at night	Closed	
50	Road surface characterization for lighting applications	On going	
51	Optimization of road lighting	New chair appointed	
52	'Lighting for Pedestrians'	Following workshop new TC set up with Steve Fotios as chair	
53	Lighting for the Elderly	TOR to be established	
JTC1	Mesopic Vision	On going	
JTC2	Merge TC2-67 with D4	Consider Joint committee?	

Active Reporters		
R	Subject	Comments
34	Retroreflective and other passive devices as Energy Savers	Bob Parks - No report
35	Crime and Road Lighting	Otto Letamendi will combine into new TC 4-52
36	CEN/TC169,Lighting Applications	Axel Stockmar new standard out this year EN13201
37	CEN/TC226, Road Equipment	Pentti Hautala – No report
38	IAU (International Astronomical Union)	Elizabeth M. Alvarez del Castillo report reced
39	GTB (Association for the Preparation of UNECE Automotive Regulations)	Ad de Visser
40	Lighting for elderly	Axel Stockmar and Cyril Chain. Proposed to move towards new TC 4-53 (TBC)
41/42	LUCI (Lighting Urban Community International)	Cyril Chain reported
42/43	PIARC	Eric Dumont reported
44	IALA (International Association of Marine)	Malcolm Nicholson reported
4x	Enabling technologies for energy savings.	Pål Larssen – link to TC4-51

46 Raoul Lorphere GLA global lighting association – looking at ISO 274 – proposed to close reportership

Attendee Breakdown:



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.

Division Director:	John O'Hagan (UK)
Division Secretary:	Luke Price (UK)
Division Editor:	Andy Pearson (UK) until July 2015 Eric Liggins (UK) from July 2015
Associate Directors:	Karl Schulmeister (AS) David Sliney (US) from July 2015 Shu Takeshita (JP) from July 2015

- The annual meeting of Division 6 took place on 30th June 2015 in Manchester in conjunction with the 28th Session of the CIE. 37 people attended: the UK was represented by John O'Hagan, Andy Smedley, Luke Price, Becky Hooke, Andrey Lyachev, Katarzyna Baczynska, Neil Haigh and Ann Webb.

CIE Certificates of Appreciation were presented to Andy Smedley (as the former DS6) and to Kohtaro Kohmoto (former ADD6).

A number of TCs were closed at the meeting, as noted below.

- During the year, the following was published:
TN 003:2015 Report on the First International Workshop on Circadian and Neurophysiological Photometry, 2013
This is available to download for free from the CIE website.
- The following report has been reviewed by the Division Editor:
 - TC6-64 Optical Safety of Infrared Eye Trackers Applied for Extended-Durations
- It was agreed to create an area on Collaboration Tools for anyone with an interest in the work of D6, subject to registration with the Division Secretary (called Division 6 Associates).
- The next annual meeting is intended to take place by WebEx in mid-2016. In 2017, it was hoped to hold the D6 meeting in conjunction with the CIE meeting in the Republic of Korea.
- TC6-66 (Maintaining summer levels of 25OH vitamin D during winter by minimal exposure to artificial UV sources; requirements and weighing the (dis)advantages) met in conjunction with the Manchester meeting.
- JTC5 (Revision of CIE S009/IEC 62471) met in conjunction with the Manchester meeting.

Status of Technical Committees

TC6-08	Guidelines for obtaining action spectra	Closed in Manchester
TC6-21	Cataractogenesis by low-level exposure to ambient ultraviolet radiation	Closed in Manchester
TC6-28	Standardization of sunscreen testing: Method of UV-A sunscreen testing	Closed in Manchester
TC6-37	Light and retinal disease	Closed in Manchester
TC6-42	Lighting aspects for plant growth in controlled environments	Closed in Manchester
TC6-45	Optical radiation hazard measurements in the work space	Closed in Manchester
TC6-49	Infrared cataract	Closed in Manchester
TC6-52	Proper measurement of passive UV air disinfection sources	TC members have been recruited from Division 2. Mature draft report is available.
TC6-61	Measurement of radiation using the phytometric system for plant applications	Closed in Manchester
TC6-62	Action spectra and dosimetric quantities for circadian and related neurobiological effects	Closed in Manchester
TC6-63	Photobiological strategies for adjusting circadian phase to minimize the impact of shift work and jet lag	Closed in Manchester
TC6-64	Optical Safety of Infrared Eye Trackers Applied for Extended-Durations	Going through final editing
TC6-66	Maintaining summer levels of 25OH vitamin D during winter by minimal exposure to artificial UV sources; requirements and weighing the (dis)advantages	Mature draft is available
Joint Technical Committees		
JTC4	Visual, Health, and Environmental Benefits of Windows in Buildings during Daylight Hours	Work started in Paris in April 2014. UK TC Members include Luke Price and John Mardaljevic. Slow progress
JTC5	Review of IEC 62471/CIE S009	Work started in Paris in April 2014. UK TC Members include John O'Hagan (JTC Chair), Marina Khazova, Leslie Lyons, Eric Liggins and Neil Haigh. Met in Manchester and meeting in Didcot as part of the IEC TC76 meeting

Reporterships

R6-37	Definition of UV wavebands	Published in the Division 6 Associates area of Collaboration Tools
R6-40	A survey of action spectra in the scientific literature: 19XX – 200X	No progress
R6-41	The issues of vitamin D kinetics	Published in the Division 6 Associates area of Collaboration Tools
R6-42	Report on the 1st International Workshop for Action Spectra of Non-Image Forming Photobiological Effects of Light, IWAS 2013	Complete and published as TN003
R6-43	Illuminators for Treatment of Infant Hyperbilirubinemia	Draft being prepared
R6-XX	Optical Radiation Hazard Measurements in the Workspace	Initiated at Manchester following the closure of TC6-45

John O'Hagan

UK Representative CIE Division 6

Director, Division 6

24 October 2015

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.

The most recent formal meeting of CIE Division 8 was held as part of the CIE Session in Manchester in July 2015. Approximately 33 people attended (8 via the internet) including seven Country Representatives, six Technical Committee Chairmen and three Reporters.

Status of Technical Committees

TC8-07 Multispectral imaging	A Working Draft report is in committee ballot.
Abstract: This technical report describes the basic model of multispectral imaging technology followed by the requirements and examples of multispectral image formats suitable for colour imaging applications. Four example formats: JPEG2000, Spectral Binary File Format, Natural Vision, and Multispectral image file format AIX, are introduced and compared in typical use cases. The specifications of those formats, except for JPEG2000 are provided in the Appendix.	
TC8-09 Archival colour imaging	Non-compliant and needs to be re-instated with a new chairman.
TC8-10 Office lighting for imaging	Now closed and moved to a Reportership which will write a Technical Note.
TC8-11 CIECAM02 mathematics	Non-compliant and needs to be re-instated with a new chairman. Ronnier Luo is the UK member of this TC.
TC8-12 Image and video compression assessment	Non-compliant and needs to be re-instated with a new chairman. Working Draft Report near completion.
TC8-13 Colour gamuts for output media	Active – meets regularly by WebEx
TC8-14 Specification of spatio-chromatic complexity	New TC – Approved by the BA on 27 June 2015

Status of Reporters

R8-09 Output linearization methods for displays and printers	Report approved
Report Summary: The R8-09 Output Linearization Method is appropriate for the rgb data output on printers, in offset printing, on displays, and for data projectors with different reflections on the projection screen. Within R8-09 the rgb file data are interpreted in a special colorimetric manner with a linear relation to the CIELAB data L^* , C^*ab , and h_{ab} values. If a colour output device interprets the rgb data according to R8-09, then it is called an rgb^* colour device. Any two rgb^* colour devices produce a colorimetric affine match in CIELAB with equal hue angles h_{ab} and usually different values in	

lightness L^* and chroma C^*ab . This colorimetric affine match is different compared to the usual colorimetric match with equal CIELAB data on different devices. The usual colorimetric match produces a clipping of colour areas and this disadvantage disappears with the colorimetric affine match.

There are several advantages of the colorimetric affine match with the rgb^* colour devices:

1. The whole device gamut is used on any rgb^* device.
2. The hue output remains constant on any rgb^* device.
3. The elementary hue, for example Red as neither yellowish nor bluish, is produced for $rgb^*=(1,0,0)$
4. Equal relative spacing in CIELAB is realized on any rgb^* device.
5. There is no clipping of colour areas on any rgb^* device and the output may be called a trusted output.

If the colorimetric affine match is realized for any rgb^* device according to R8-09, then

1. Many user wishes of DIN 33872-X are solved.
2. The undefined colour output properties change to the rgb^* device output property.
3. According to ISO/IEC 19797 the intended startup stage for colour management is reached.
4. The output accuracy is by a factor 5 higher compared to the ICC encoding with 8 bit in CIELAB.

A disadvantage may be the usually different chroma and lightness on two rgb^* devices. However, the colour gamut of two colour devices is usually different. Based on this device property the colorimetric affine match seems an appropriate solution which solves for example the many user wishes of DIN 33872-X.

R8-10 Full-reference image quality metrics: classification and evaluation	Report approved
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Report Summary: The wide variety of distortions that images are subject to during acquisition, processing, storage, and reproduction can degrade their perceived quality. Subjective image quality evaluation is time-consuming, expensive, and resource-intensive. Objective methods do not have these shortfalls. One type of these methods, image quality metrics, has become very popular and new metrics are proposed continuously. This report aims to give a survey of full reference image quality metrics. These image quality metrics have been classified into different groups. Furthermore, image quality metrics from each group were selected and evaluated against a state-of-the-art quality database, the Colourlab Image Database:Image Quality ([CID:IQ](#)).

R8-11 Colour image reproduction for 3D printing	Active
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R8-12 3D multi-view image/video colour data format conversion and quality control	Report approved
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Summary: To report on methodologies of colour data format conversion of 3D multi-view image/video for 2D/3D display and their effect on 2D/3D image and colour quality, with the aim to identify opportunities for future CIE Division 8 activity in this field.

R8-11 Common colour appearance	Active
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Terms of Reference: To study the topic of common colour appearance to determine whether people mean the same thing when they use this term. The report will collect examples of what people refer to as common colour appearance including for displays, printing systems and brand management. The report will also identify some counter examples.

New Reporter

R8-12 A survey on quality metrics on stereoscopic imaging	Terms of Reference: To publish a Technical Note to describe the state of the art of the Stereoscopic Image Quality Assessments (SIQA), and psycho-physical experiments to evaluate the Metrics on Stereoscopic Imaging.
<p>Abstract: The aim of this work is to describe the state of the art of the Stereoscopic Image Quality Assessments (SIQA) from recent years, since it covers a compendium of models from 2007 to date. Furthermore, this report will summarize 27 algorithms from 17 authors and their possible variations giving as a result of 280 stereoscopic metrics tested. This benchmarking is not only intended for researchers on the Image Quality Evaluation but also for researchers on the field on acquisition, processing and display of stereoscopic images. To this aim, we will present not only a survey on image quality metrics but also psychophysical experiments on image databases available in this field. First, we will sketch a general view of the importance of Stereoscopic Imaging. Thus, we will propose different classifications in order to group the state of the art of SIQA. Then, we will describe the performance of 280 metrics of SIQA using LIVE 3D Image Database. The results as well as the algorithms evaluated will be available for researchers in the field in order to perform further tests and proposing future models.</p>	

This was my last meeting as UK Representative of CIE Division 8. Dr Kaida Xiao from the University of Liverpool now has taken over this role.

Michael R Pointer
6 October 2015

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 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

30th SEPTEMBER 2015

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	Allan Howard

4 Symonds Green Road, Stevenage, Herts SG1 2HA

Sponsoring Organisations

Institution of Lighting Professionals	Stuart Bulmer Nigel Parry Allan Howard
Society of Light & Lighting	Steve Langford Peter Raynham Brendan Keely
Cooperating Organisations	
Ceravision Limited	Stuart Mucklejohn
College of Optometrists	Alan Smith
Colour Group (Great Britain)	Valerie Bonnardel
Public Health England	John O'Hagan
International Association of Lighting Designers	Kevin Theobald, Emma Cogswell
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
Loughborough University	John Mardaljevic
University of Manchester	Ann Webb
University of Reading	Geoff Cook
University of Sheffield	Steve Fotios
University College, London (The Bartlett)	Kevin Mansfield