



International Commission on Illumination
Commission Internationale de l'Eclairage
Internationale Beleuchtungskommission

Hot Topics

[CIE Research Strategy Launched – Visit CIE website](#)

[Invitation for international participation in Bulgarian National Committee Bullight 2017 – May 2017](#)

[Proceedings of the 4th CIE Expert Symposium on Colour and Visual Appearance and Tutorial on Visual Appearance Fundamentals and Measurement – Event Update](#)

[CIE-USNC LinkedIn Web Page](#)

CIE-USNC 2016 Annual Meeting



The Joint Annual Business and Executive Committee Meeting of the CIE-USNC was held on October 31 – November 1, 2016 at the Omni San Antonio Hotel at the Colonnade, San Antonio, TX. The event was held in conjunction with the Fall 2016 meeting

of the IES Testing Procedures Committee (IES-TCP), which was held from November 2-4, 2016.

The meeting kicked off on October 31, 2016 with the CIE-USNC Technical Council Meeting, where attendees heard updates about the CIE Divisions in terms of projects that might impact overlapping divisions or where other coordination is needed. Later that morning, CIE-USNC President **James Leland** opened the CIE-USNC Executive Committee meeting.

The Technical Session was led by CIE-USNC Senior Vice-President **David Sliney**, who introduced each speaker and facilitated the technical program. A featured speaker was **Yoshi Ohno**, CIE President. Included in the program were presentations on The CIE Research Agenda, **Yoshi Ohno**; Optimizing Continuous Pulse LED Measurements for Maximum Accuracy, **Jeff Hulett**; Laser Dazzle Vision Disability Function, **Leon McLin**; New Calibration Service at NIST for HP-LEDs Based on the Junction Temperature, **Yuqin Zong**; Two Short Stories: The Effect of a Gentle Breeze and Not All AC Power Supplies are the Same, According to an LED Source, **Cameron Miller**; Work in Progress at the IES Color Committee, **Wendy Luedtke**; Updating Photobiological Lamp Safety Standards, **David Sliney**; and “Seeing” Sound with Light: The Journey to an All-

Upcoming Events

[May 8 – 11, 2017](#)

[CIE Tutorial and Practical
Workshop on LED Lamp and
Luminaire Testing to CIE S
025:2017](#)

[May 25 – 27, 2017](#)

[Invitation for International
Participation in Bulgarian National
Committee BulLight 2017](#)

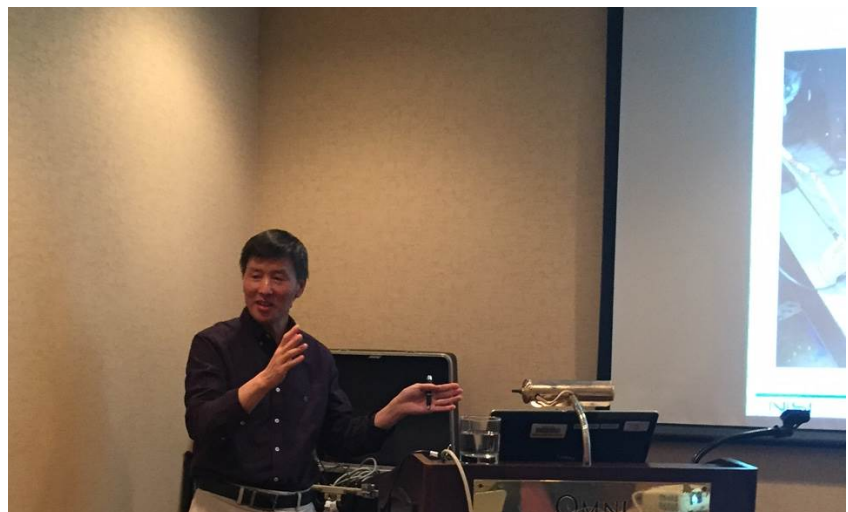
[October 24 – 27, 2017](#)

[Save the Date: CIE 2017 Midterm
Meeting, October 24 to 27, Jeju
Island, Republic of Korea](#)

Optical Detector for Ultrasound and Optoacoustic Applications, **Randolph Glickman**.



James Leland, Copia LLC, CIE-USNC President



Yuqin Zong, Ph.D., NIST

New Publications

[CIE x043:2016](#)

[Proceedings of the 4th CIE Expert Symposium on Colour and Visual Appearance 6 – 7 September 2016, Prague, Czech Republic, September 2016](#)

[CIE 220:2016](#)

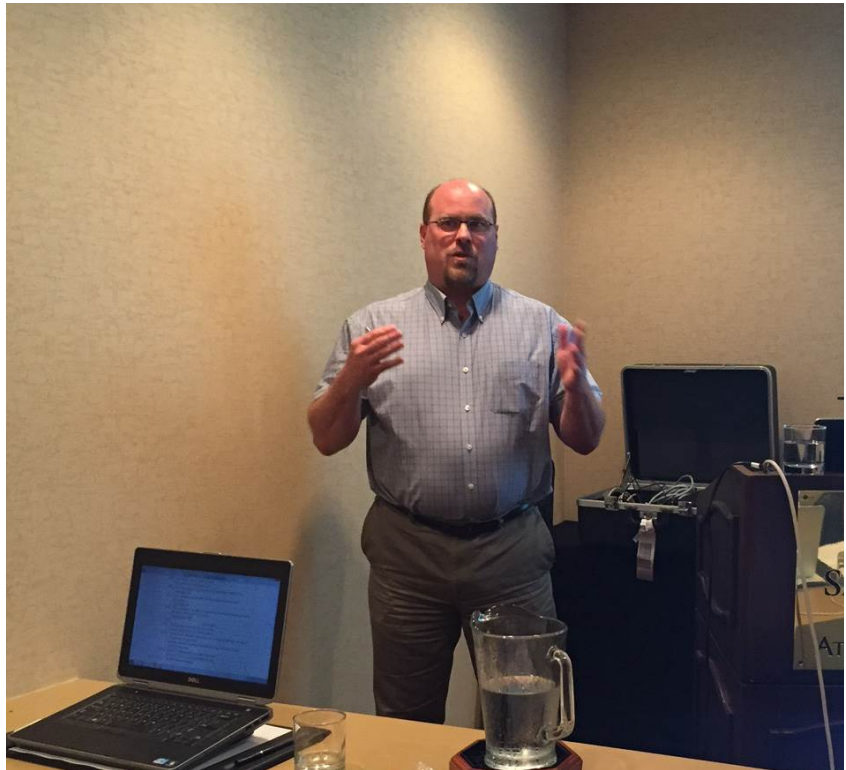
[Characterization and Calibration Methods of UV Radiometers, September 2016](#)

[CIE TN 006:2016](#)

[Visual Aspects of Time-Modulated Lighting Systems – Definitions and Measurement Models, August 2016](#)

[CIE 219:2016](#)

[Minimum Summer Levels of 25\(OH\)D during Winter by Minimal Exposure to Sunbeds: Requirements and Weighing the Advantages and Disadvantages, August 2016](#)



Cameron Miller, Ph.D., NIST



Wendy Luedtke, Electronic Theatre Controls

CIE Newsletters

[CIE Midterm Meeting 2017 – Abstract Submission Now Open](#)

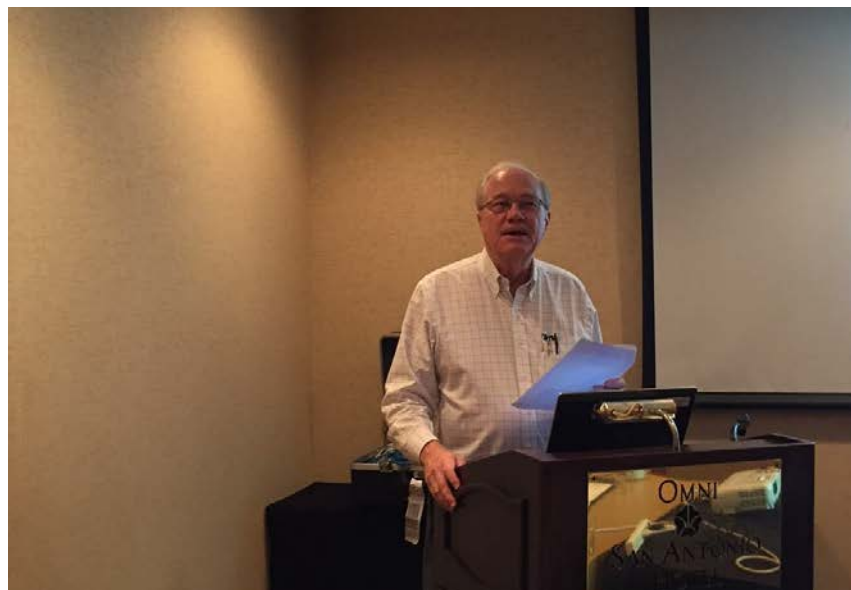
[Invitation to the CIE Midterm Meeting 201](#)

[News, Publications in 2016, Call for Experts and Division News](#)

[CIE Tutorial and Practical Workshop on LED Lamp and Luminaire Testing According to CIE S 025:2015 – Registration Open](#)

[CIE Tutorial and Practical Workshop on LED Lamp and Luminaire testing to CIE S 025:2015](#)

On November 1, 2016, the day's events began with technical session presentations featuring Activity in CIE Division 1 – Vision and Color – Update from Prague, **Ellen Carter**; Activity in CIE Division 2 – Physical Measurement of Light and Radiation, **Yuqin Zong**; Activity in CIE Division 3 – Interior Environment and Lighting Design, **David Sliney**; Activity in CIE Division 4 – Lighting and Signaling for Transport, **James Leland**; Activity in CIE Division 5 – Exterior Lighting, **James Leland**; Activity in CIE Division 6 – Photobiology and Photochemistry, **David Sliney**; and Activity in CIE Division 8 – Image Technology – Material Adjustment Transforms, **Max Derhak**. Attendees learned about the latest advances from leading North American researchers and practitioners in the science and art of light and lighting and updates from the Division meetings held during the 4th CIE Expert Symposium on Colour and Visual Appearance held on September 6-7, 2016 in Prague.



***David Sliney, Ph.D., Consulting Medical Physicist, Chairman
CIE-USNC Technical Council***



Ellen Carter, Ph.D., ECCarter Color Research, CIE Division 1



James Leland, Copia LLC, CIE-USNC President

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*Later in the afternoon of November 1, 2016, **James Leland** adjourned the meeting and thanked attendees for contributing to another informative and successful meeting of CIE-USNC.*

Randi Myers
CIE-USNC Secretary

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Technical Council News

Division I

Color & Color Vision



During the first week in September, there was a CIE event in Prague, Czech Republic. It was hosted brilliantly by **Marek Smid** and his fellow colleagues at the Czech Metrology Institute. The week

consisted of the following events:

1. Monday – CIE Tutorial on Visual Appearance Fundamentals and Measurement
2. Tuesday & Wednesday – 4th CIE Expert Symposium on Colour and Visual Appearance 2016 (sponsored by Division I and 2) – (CIE x043:2016 Proceedings of the 4th CIE Expert Symposium on Colour and Visual Appearance available from CIE webshop)
3. Thursday and Friday AM – TC Meetings
4. Friday PM – Division I Meeting

Sixteen TCs met on Thursday or Friday morning:

- JTC-7 Discomfort caused by glare from luminaires with a non-uniform source luminance - **Naoya Hara**
- TC1-63 Validity of the Range of CIEDE2000 - **Klaus Richter**
- TC1-83 Visual Aspects of Time-Modulated Lighting Systems - **Dragan Sekulovski**
- TC1-84 Definition of Visual Field for Conspicuity -

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Nana Itoh

- TCI-85 Update CIE Publication 15:2004 Colorimetry - **Ellen Carter**
- TCI-88 Scene Brightness Estimation - **Yoshiki Nakamura**
- TCI-90 Colour Fidelity Index - **Hirohisa Yaguchi**
- TCI-91 New Methods for Evaluating the Colour Quality of White-Light Sources - **Yadan Lin**
- TCI-92 Skin colour database - **Kaida Xiao**
- TCI-93 Calculation of self-luminous neutral scale - **Rob Carter**
- TCI-95 The Validity of the CIE Whiteness and Tint Equations - **Robert Hirschler**
- TCI-96 A comprehensive model of colour vision - **Ronnier Luo**
- TCI-97 Age- and Field-Size-Parameterised Calculation of Cone-Fundamental-Based Spectral Tristimulus Values - **Jan Henrik Wold**
- TC2-68 Optical Measurement Methods for OLEDs used for Lighting - **Yasuki Yamauchi**
- TC2-85 Recommendation on the geometrical parameters for the measurement of the Bidirectional Reflectance Distribution Function (BRDF) - **Gael Obein**
- TC8-14 Specification of Spatio-Chromatic Complexity - **Noel Richard**

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Delegates after the CIE Division 1 meeting

© Semin Oh

The CIE Division 1 meeting had 42 attendees – (including 19 country representatives or their by proxy person for voting purposes). Of note was a new Division 1 publication- CIE TN 006:2016 Visual Aspects of Time-Modulated Lighting Systems – Definitions and Measurement Models (August 31, 2016). During the meeting there were summaries of the activities of the six vision technical committees and ten color technical committees as well as all the reporterships. A new reportership was proposed and approved: Title: Revisiting Correlated Colour Temperature, Reporter: **Youngshin Kwak KR**, with the Terms of Reference: To review the literature related to perception of colour of white light sources with a goal to investigate the concept of correlated colour temperature. Future Division 1 meeting were agreed upon, including:

- In 2017 the meeting will be held as part of the 2017 CIE Mid-term Meeting 20-27 October 2017, to be held in

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Papamichael at kpapamichael@ucdavis.edu.

Thank you!

Jeju, Korea.

- In 2018 the Division 1 meeting will be held as part of the 2018 CIE Symposium April 2018, in Taipei, Taiwan.
- In 2019 the Division 1 meeting will be held during the CIE Quadrennial Meeting in Washington DC.

Please contact the technical committee chairs for more information about their meetings. Also the details of the Division 1 meeting are available in the minutes on the Division website.

Ellen Carter

Division 1 Primary Member

Division 3

Interior Environment & Lighting Design



The annual Division 3 meeting was held via Webex on September 20, 2016. There are currently 39 Division Members from the CIE's roster of 42 member countries. Division 3 has 13 Technical Committees, 2 reporters and 6 liaison officers who keep the Division current on CEN and ISO standards work as well as the activities of other organizations involved in areas of interest to the Division.

Planning and execution, as always, are the key efforts and there is a continuing discussion about how to approach and manage high-priority efforts including proposed TCs.

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It has become more complicated now as Division 3 seeks to develop working relationships with other organizations especially those involved in writing joint documents. An example is the proposal for a new joint TC (ISO/TC 274) which will write a document about applying the CIE maintenance factor determination method. The CIE wishes the document to be ISO approved and so the work would be headed by the ISO committee with a joint working group from Division 3. Division Director, Dr. **Jennifer Veitch**, commented that while determining maintenance factors may not be the most exciting of tasks, like all things in lighting, the growing use of SSL sources has profoundly affected the value and way such factors are determined and new information is essential.

Division 3 is the CIE's largest division and with a growing work load Dr. **Veitch** has now organized the division work into two major areas by adding two assistant division directors. They are Prof. **John Mardaljevic** from the UK (Daylighting) and Prof. **Nozomu Yoshizawa** from Japan (Electric Lighting).

A work strategy developed over the past couple of years and based upon a member survey now drives the division's efforts. The strategic topic areas are:

1. Recommendations for healthful lighting
2. Integrated glare metric
3. Conditional lighting recommendations
4. Retrofitting for improved daylighting
5. Post-occupancy evaluation and verification
6. Lighting and the Internet of Things (IoT)

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7. Spectral sky models
8. Design guide for lighting controls in tertiary spaces
9. Lighting for display screens

Several of these topics were incorporated into the CIE's recently-published comprehensive, integrated Research Strategy for CIE which can be found on line at: <http://www.cie.co.at/index.php/Research+Strategy>

During the on-line meeting, there was agreement about adding a reportership on the topic of "resilient lighting". Resilient lighting is defined as lighting which is specifically designed to operate under emergency conditions such as floods, earthquakes, storms and other natural and man-made disasters. It is to be used in places of shelter and other resilient facilities, including homes, where normal operations must continue. The attendees commented that they knew of resilient building work already underway in several countries as well as research on the subject. A Resilient Lighting Committee has been organized by the IESNA and the subject is also included in a British Standard: BS 5266:2016 Emergency Lighting – Part 1: Code of Practice. Note that this inclusion may be confusing to some as resilient lighting is as defined above while the purpose and design of emergency lighting, at least in North America, is usually thought to be lighting for emergency egress only and not designed to operate for more than limited periods. There is more about resilient design at: <http://www.resilientdesign.org/> A description of resilience work at NIST may be seen at: <https://www.nist.gov/node/571621>

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Thank you!

***Terry McGowan & Naomi Miller**
Division 3 Primary & Alternate Members*

Division 8

Image Technology



Additive Manufacturing and the Reproduction of Colored Objects



CIE Division 8 has identified that 3D reproduction is a top priority for the CIE in terms of research and new Technical Committees and recommendations. The traditional methods of the CIE for characterization of the color and appearance of 2D materials (textiles, paint films, plastics and printed inks)

which have been utilized so successfully in the past 85 years do not work well on 3D objects. The technology of so-called 3D printers, used to manufacture materials by building up the objects layer by layer, has been increasing the use of colorants and other appearance modifying materials and processes. Assessing the quality of these processes is difficult at best and today often involves methods utilized in the 1940s and 50s or is based on digital photography which has limited capabilities in radiometric and colorimetric analysis. CIE Division 8 has recently submitted a proposal to form a new TC to develop a recommendation on the assessment of color differences on objects that have color as a critical component of their final appearance and yet, when placed in a viewing cabinet with diffuse illumination exhibit ranges and bands of varying lighting that can fool the human visual system. Since much of the additive manufacturing technology is being pioneered by US universities and companies, this is an opportunity for the USNC to become involved in the leading edge of the

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requirements for lighting and measurement of products produced by these new manufacturing processes.

Improved model of Color Appearance

CIE Division 8 was key in the development of the widely utilized CIECAM02, color appearance model used to predict the appearance of a material as the spectral quality and quantity of illumination of a scene is changed. Many digital camera systems have incorporated such models to allow them to capture reasonably accurate images of objects under varying conditions of illuminations. In the past, film cameras would have required the photographer to change the capture medium from studio balanced to film to daylight balanced film or to add a temperature correction filter to the lens of the camera. As can be attested by the increasing number of images captured with mobile phones, this model has been accepted by consumers enthusiastically. Additionally, it has been adopted by the IESNA in the development of a new method for the assessment of the color rendering properties of modern lighting. But, CIECAM02 has been shown in the past to have some problems in implementation that may lead to wrong predictions. Recent publications from the color technology community [1, 2] have demonstrated that the problems with CIECAM02 can be fixed without losing its good visual accuracy. A new Joint Technical Committee (JTC) is being proposed by CIE Division 8 to examine the equations proposed in the literature and if the claims hold true then to publish a new recommendation, tentatively named CIECAM16, based on the improvements to CIECAM02.

1. CJ Li*, Z Li, Z Wang, Y Xu, M R Luo, G Cui, M

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Melgosa, and M Pointer, Final Revision to CIECAM02 and its CAT and UCS, Color Imaging Conference 2016, November 7 – 11, 2016 in San Diego, California, USA.

2. CJ Li, Z Li, Z Wang, Y Xu, M R Luo*, G Cui, M Melgosa, MH. Brill and M Pointer, Comprehensive colour solutions: CAM16, CAT16 and CAM16-UCS, submitted to Color Research and Application, 2016

Max Derhak & Danny Rich

Division 8 Primary & Alternate Members

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Papamichael at kpapamichael@ucdavis.edu.

Thank you!